



November 5, 2004

Secretary Ellen Roy Herzfelder  
Executive Office of Environmental Affairs  
Attn: MEPA Office  
William Gage, EOE A No. 12021  
100 Cambridge St., Suite 900  
Boston MA 02114

Re: Comments on the Final Environmental Impact Report for BioSquare Phase II  
EOEA # 12021

Dear Secretary Herzfelder:

These are the comments of the Safety Net and Alternatives for Community & Environment (ACE) on the Final Environmental Impact Report (FEIR) for Biosquare Phase II.

The Safety Net is comprised of public housing residents and others in Roxbury who came together in 2000 to develop a voice and vision for a sustainable Roxbury and equitable metropolitan development. Members of the Safety Net are concerned about BioSquare Phase II because the project is near their neighborhood and they believe that the project as proposed will have adverse environmental, health, safety, and economic impacts. Based in Roxbury, Massachusetts, ACE works in partnership with low income communities and communities of color to achieve environmental justice. The Safety Net and ACE are part of the Stop the BU Bioterrorism Lab campaign, a coalition of many persons and groups, both within and outside Boston, that believe that Boston University's proposed BSL4 Bioterrorism Laboratory<sup>1</sup> presents too many environmental, health, and safety risks to be located safely on Albany Street in Boston's densely populated South End.

A thorough review of the FEIR will demonstrate that the FEIR does not adequately describe the potential impacts of the bioterrorism laboratory project. We urge you to find the FEIR inadequate and to require University Associates to file a supplemental FEIR as authorized by 301 CMR § 11.08(8)(c)2 because the FEIR:

- Does not include a true or accurate "worst case scenario." Instead, the FEIR contains a purported "worst case scenario" that: 1) contains serious mistakes in analysis that cause a significant underestimate of the potentially devastating and deadly impact of a release of

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<sup>1</sup> The facility is a bioterrorism laboratory because under federal funding requirements the laboratory must give preference to biodefense research and other NIAID research programs for the first twenty years. The laboratory will host and perform experiments on some of the most dangerous and incurable diseases known, diseases that are easily transmissible, can cause public health crises, and can be used in bioterrorism and biowarfare.

anthrax from the proposed bioterrorism laboratory; 2) fails to perform a site-specific release analysis, 3) fails to consider the environmental impact of the release; and 4) fails to analyze an accidental or intentional release of the deadly and incurable viruses and toxins<sup>2</sup> that, unlike anthrax, are highly contagious.

- Fails to include a worst case release scenario for when a select agent is in transit to the laboratory or provide other essential information about the transport of hazardous biological and toxic agents to the laboratory.
- Fails to include a threat and vulnerability analysis for a terrorist attack on the laboratory and resulting release of select agents and other damages to the surrounding community.
- Is inconsistent with the Massachusetts Environmental Justice Policy.
- Does not include an alternatives analysis of other potential locations for the laboratory or provide the criteria used by University Associates to base its decision to locate the laboratory on Albany Street in Boston's South End.
- Does not include an explanation of how the laboratory will comply with regulatory requirements and fails to list the Boston regulation that prohibits recombinant DNA research requiring BSL4 containment in the City of Boston.
- Does not include a discussion of how the project proponent will assure that its health and safety operating procedures are met, considering that the federal government has not yet chosen the entity that will operate the laboratory and that many outside researchers, including students with no BSL4 experience, will use the laboratory.
- Fails to comply with the requirements of the December 1, 2003, Certificate of the Secretary of Environmental Affairs on the Draft Environmental Impact Report (hereinafter, the "Certificate"). It does not respond to many comments made on the DEIR, consequently denying agencies and the public the opportunity to review and comment on important issues that have a potential impact on the environment.

These inadequacies of the FEIR are discussed in more detail below.

#### I. THE WORST CASE RELEASE SCENARIO SET FORTH IN THE FEIR IS NOT AN ACCURATE EVALUATION OF A WORST CASE RELEASE FROM THE PROPOSED BIOTERRORISM LABORATORY

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<sup>2</sup> Select agents are biological agents and toxins that have a potential to pose a severe threat to public health and safety. The select agent rule is found at 42 CFR Parts 73 and 1003. The list of select agents and toxins, found at 42 CFR § 73.4 and 73.5, is based on criteria specified in the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, including the effect on human health of exposure to the agent or toxin, the degree of contagiousness of the agent or toxin and the method by which the toxin is transferred to humans, and the availability and effectiveness of therapies and vaccines to treat and prevent an illness resulting from the agent or toxin.

The Certificate requires the FEIR to include, *inter alia*, an evaluation of a “worst case” safety event involving the loss of physical integrity of the laboratory’s containment systems, noting that the draft EIR (DEIR) “did not include a detailed discussion of the potential environmental impacts of the biocontainment building.” The Certificate also requires the FEIR to respond to the comments received, “in particular to the detailed comment letter submitted by Alternatives for Community and Environment” (hereinafter, “ACE”). ACE’s comments noted that the lab DEIR “did not provide information about the environmental impact of a potential release of deadly agents from the laboratory” and the project proponent should include a comprehensive discussion of the impact of building a laboratory “with a BSL4 component that must perform federally required bioterrorism research on deadly organisms... Such discussion must describe and analyze... all aspects of the project, including... environment, health and safety....”

MEPA mandates that there be a complete assessment of a potential release from the bioterrorism lab so that “the nature and extent of the proposed project and its environmental impact” is described. MGL c.30 § 62B. A FEIR must “present a complete and definitive description and analysis of the Project and its alternatives, and assessment of its potential environmental impacts and mitigation measures....” 301 CMR § 11.07(4). A FEIR that understates the impact of the release, or fails to analyze the release of select agents and toxins with different properties, does not assess potential environmental impacts and, in this instance, is not protective of the public health, safety, and environment.

The FEIR contains a purported worst case release scenario based on a *Summary Report Hazard and Risk Assessment* (hereinafter, the “Summary Report”) prepared by RWDI West, Inc., (University Associates’ paid consultant) and contained in the September 24, 2004, Comments of Clarification on the FEIR. Whether the FEIR has adequately identified and analyzed the potential impacts to the public health and the environment in the event a select agent or other virus or toxin is released from the bioterrorism laboratory depends on whether the Summary Report is accurate and complete. As we discuss below, the Summary Report is seriously flawed and does not present a worst case release scenario. It is not a description of the potential environmental impact of the project.

Jeanne Guillemin, Ph.D., has reviewed the Summary Report. Dr. Guillemin, a Senior Fellow, MIT Security Studies Program, and Professor of Sociology, Boston College, works in the area of medical anthropology. Her teaching includes a seminar on Risk and Danger. She has more than twenty years of experience in the investigation of biological weapons controversies and has published broadly about them. She is the author of *Anthrax: The Investigation of a Deadly Outbreak* (University of California Press, 1999), the definitive account of the 1979 team research of the largest inhalational anthrax epidemic in recorded history, which in 1979 killed sixty-six people in the Soviet city of Sverdlovsk. Her interviews with the families of victims were the basis for the epidemiological map that proved an anthrax aerosol from a nearby military facility caused the outbreak and her data proved that the incubation period for inhalational anthrax can be as long as six weeks. She is also the author of the forthcoming book, *Biological Weapons: From the Invention of State-sponsored Programs to Contemporary Bioterrorism*. Dr. Guillemin’s curriculum vita is available at [http://www2.bc.edu/~guilleje/Homepage\(Frames\).html](http://www2.bc.edu/~guilleje/Homepage(Frames).html).

Dr. Guillemain has given us permission to include her review of the Summary Report in our comments. It is found in the appendix to these comments. In brief, Dr. Guillemain's conclusions about the Summary Report are that:

- The Summary Report contains serious mistakes that lead to the erroneous conclusion that an anthrax spore release caused by a laboratory spill would pose no risk to the public.
- The Summary Report ignores what would happen on a community level after a dangerous release.
- The Summary Report ignores contagious disease outbreaks that could result from BSL4 accidents.
- The Summary Report does not address workplace contamination even though the 2001 anthrax postal attacks and indoor simulations showed the ease with which anthrax spores disperse throughout buildings and cause health risks and the extreme difficulty, time, and expenses associated with building decontamination. A recent report concerning anthrax contamination at Ft. Detrick also raises concern about leaks from high containment laboratories.
- The Summary Report ignores environmental contamination even though any outdoor release brings with it the possibility of soil contamination.

Based on Dr. Guillemain's review of the Summary Report, we believe that the FEIR presents a best-case release scenario, not a worst-case release scenario required by the Certificate. The FEIR is inadequate because, in violation of 301 CMR 11.07(h), it fails to include an assessment of the negative potential environmental impacts of the laboratory. It is a critical failing of the FEIR on a most crucial issue and is reason alone to require a Supplemental FEIR. Relying on the erroneous conclusion that there will be no harm from a release, the FEIR then fails to describe and assess the mitigation measures it will institute in the event of a release, a MEPA requirement.

We request that you incorporate Dr. Guillemain's recommendations in your determination of the FEIR and that you require a Supplemental FEIR that includes a risk assessment report by the independent oversight committee recommended by Dr. Guillemain. We suggest that the Executive Office of Environmental Affairs convene and chair a meeting that would include the project proponent and those who commented on the FEIR's risk assessment to determine how such a committee should be constituted and the charge for the committee. To prevent a potential conflict of interest, the members of the committee should not be affiliated with BU or NIH, listed in BU's NIH funding application to construct the bioterrorism laboratory, or have an intention to operate or perform research in the laboratory.

Having a BSL3/4 bioterrorism laboratory in Boston and Massachusetts is unprecedented, presents unprecedented risks to the community, and requires a serious and unbiased review. We must have an independent committee to provide a risk assessment for the laboratory, including disease outbreak scenarios, and on future plans for biodefense research, so as to fulfill the mandate of MEPA that the impacts of the project be known, and mitigation measures identified and evaluated, before the project may go forward.

A recent study of the anthrax releases at Fort Detrick supports the need for a thorough and unbiased risk assessment of the proposed bioterrorism laboratory. We have included in the appendix an article in the October 14, 2004, USA Today reporting on the U.S. Army report on the anthrax releases from the Fort Detrick BSL3/4 laboratory. Three strains of anthrax escaped the supposedly secure BSL3 laboratory, which is designed to enable scientists to safely work with deadly microbes. Two of the strains were used in biodefense work. The report and statements of experts in the article serve to show that the FEIR is incorrect in its conclusion that there would be no human health or environmental damage from an anthrax release from the containment laboratory. Highlights of the article include:

Researchers expressed relief that no one was hurt or killed in the episode, but Stephanie Loranger of the Federation of American Scientists asks, "Fort Detrick is one of the premier biodefense labs, and if they have problems, what does it mean for all the others?"

"The good news is nobody got the disease (*i.e.*, anthrax)," says Alan Zelicoff, a biodefense expert who is now a consultant at ARES Corp., a risk analysis firm. "The bad news is that nobody got the disease because just about everybody near the BL-3 suite had been vaccinated."

"The message here from a scientific and policy standpoint is profound," Zelicoff says. "Facilities that are medical and microbiological may not be suitably equipped for dealing with aerosolized versions of the organisms that they otherwise deal with in great safety. These facilities probably ought not be located in a heavily populated area. How do you contain smoke?"

We have also included in the appendix a December 15, 2000, memorandum obtained from NIH that acknowledges the risk of releases from BSL4 laboratories. In pertinent part, the memorandum reads that a reason to build a BSL4 laboratory in rural Montana, "well removed from major populations centers," is that "the location of the laboratory reduces the possibility that an accidental release of a biosafety level-4 organism would lead to a major public health disaster."

## II. THE FEIR MUST BE REQUIRED TO INCLUDE AN ANALYSIS OF A RELEASE WHEN SELECT AGENTS ARE IN TRANSIT TO THE LABORATORY AND OTHER ESSENTIAL INFORMATION ABOUT THE TRANSPORT OF HAZARDOUS BIOLOGIC AND TOXIC AGENTS TO THE LABORATORY

The FEIR fails to contain any assessment of a release of a select agent when in transit to the laboratory. Instead, the FEIR discusses the protocols it will use for shipment of biological materials and claims, without any support, that "the risk to the community from transport of infectious agents or other biological derived material is negligible." (FEIR 5-26.) That is inconsistent with 301 CMR § 11.07(6)(h) and the Certificate, which require the FEIR to "address safety considerations related to any transport of potentially hazardous biological agents to and from the biocontainment facility." Simply stating that the risk is negligible, without any support whatsoever for that statement, does not address the safety considerations of what would occur if

there were a release during transport or allow agencies and the public to determine whether the level of risk asserted in the FEIR is accurate.

Two recent accidents when shipping infectious agents show that there is indeed a risk to the public from shipping and consequently the proponent must be required to analyze that risk. First, earlier this year a laboratory accidentally shipped live, rather than dead, anthrax from Maryland to California. The mistake was discovered only when laboratory animals in California died from anthrax and the researchers using the anthrax found that the dead anthrax that they had ordered was alive and virulent. The laboratory shipping the anthrax has admitted the error. Second, last year a package containing West Nile virus exploded at the Federal Express facility in the Port Columbus International Airport, Ohio, forcing the evacuation from the facility of about fifty workers. Fortunately, no persons died from these accidents, but they show that there is a real and substantial risk of errors in shipping that may put the public at risk.

In addition to the two recent shipping accidents, the federal government itself has acknowledged the vulnerability of shipping biological agents, writing that infectious agents such as anthrax may pose a security risk in transport and that it needs to determine if additional federal rules are necessary to assure the safety of hazardous materials in transit. 67 Fed.Reg.157, p.53131 (August 14, 2002).

Further, the FEIR provides no information on designated transport routes. The only reference is that “the receiving and shipping location(s) for select agents will have a designated route to and from BUMC and will be accessed and egressed to the site only by the local highway system (presumably Frontage Road).” Yet, the Massachusetts Turnpike Authority prohibits the transport of hazardous materials in all its tunnels, including the tunnel under the Prudential Center, and the Central Artery, Callahan, Sumner, and Ted Williams tunnels. 730 CMR 7.10. Hazardous materials are those defined and listed in 49 CFR Chapter 1, Subchapter C, which include infectious materials. Because designated routes are not mentioned in the FEIR, other than noting access and egress by the local highway system, it is unknown whether the project proponent is aware of or has considered the prohibition and how the routes will be adjusted accordingly. Because vehicular traffic to the project site may be primarily from Frontage Road, it is essential that the public and regulatory agencies are fully aware and have the opportunity to comment during MEPA review on the routes of transport of select agents to the site.

We request that the recommended oversight committee include an analysis of risk during transport of biological agents to the laboratory and that you require a report on transit risks as part of a Supplemental FEIR.

### III. THE FEIR MUST BE REQUIRED TO INCLUDE A THREAT AND VULNERABILITY ANALYSIS FOR A TERRORIST ATTACK ON THE LABORATORY AND AN ANALYSIS OF A RESULTING RELEASE OF SELECT AGENTS AND OTHER DAMAGES TO THE SURROUNDING COMMUNITY.

The bioterrorism laboratory will house and perform experiments with select agents that can be used in bioterrorism and biowarfare. It is generally acknowledged that terrorists in the possession of such agents could do great damage but terrorists cannot make such agents and

would need to obtain them from a source such as the laboratory. Richard Ebright of Rutgers University recently wrote, “The simplest, most likely, path for a sub-state adversary, such as Al Qaeda, to acquire bioweapons capability is to obtain bioweapons agents and training by penetration of a biodefense research project in a US laboratory.” Terrorists will view the bioterrorism laboratory as a source of bioweapons materials or a facility to destroy. An attack on, or infiltration of, the laboratory could result in the release of pathogens or the escape of infected insects or animals, with deadly results. An attack on the lab that did not release pathogens might nonetheless cause damage to nearby communities.

As noted in the FEIR, in recognition of the threat of terrorism, the facility will be constructed with an outdoor security perimeter, limited and controlled access points, and an anti-scale fence that will serve as a vehicle and pedestrian barrier. There also will be internal laboratory controls designed to limit access to select agents. Inexplicably, however, the FEIR fails to analyze the threat of a terrorist attack or the consequences of a pathogen release caused by an attack. In public meetings, the project proponent has claimed that any attack would destroy the stored pathogens, but that analysis must be provided in a Supplemental FEIR for review and comment. Further, as noted in the FEIR, the facility will be infecting insects and animals, including non-human primates, with infectious diseases for which there is no known cure. Infected insects and animals could be released as a result of terrorism and spread disease to other insects and animals, including humans, outside the laboratory yet the FEIR contains no analysis of those risks.

The FEIR’s failure to consider and analyze the risks of a terrorist attack on or penetration of the laboratory, and its failure to assess the impact of a pathogen release caused by terrorism is a significant failure of the FEIR to comply with the mandate of MEPA that the FEIR must assess the direct and indirect potential environmental impacts from all aspects of the project. 301 CMR 11.07(6)(h). It is reason alone to reject the FEIR as inadequate.

We request that the recommended oversight committee include an analysis of the risk of a terrorist attack on or penetration of the laboratory, the risk that such attack could release pathogens, including infected insects and animals, and the impact of such a release on human health and the environment.

#### IV. THE FEIR IS INCONSISTENT WITH THE MASSACHUSETTS ENVIRONMENTAL JUSTICE POLICY

The proposed location of the laboratory is within one mile of an Environmental Justice population and within a few blocks of a large public housing complex and the Suffolk County House of Corrections. The Massachusetts Environmental Justice Policy recognizes that residents of EJ communities live side by side with numerous undesirable and dangerous facilities that can pose risks to public health and the environment and consequently its statement of purpose is that environmental justice shall be an integral consideration in the implementation of all EOEAs programs. The EJ policy defines environmental justice as “the equal protection and meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies and the equitable distribution of environmental benefits.” The EJ Policy defines “meaningful involvement” as meaning that “all neighborhoods

shall have the right to participate in partnership with government in environmental decision-making including needs assessment, planning, implementation, enforcement, and evaluation....”

Notwithstanding these statements, there has been no involvement of the nearby EJ community in planning for the bioterrorism laboratory. Instead, Boston University applied for federal funding for the laboratory without EJ community involvement, and many government agencies and officials have assisted University Associates in the project without any input from or apparent regard for the nearby EJ communities.

As noted in Dr. Guillemin’s comments, socio-economic factors (*e.g.*, language barriers, access to health insurance and services) may increase the vulnerability of EJ communities to the types of public health emergencies that may result from releases from the laboratory and yet there is no consideration of those factors in the FEIR. In addition, the proposed laboratory will add yet another burden to an EJ population that already has much more than its fair share of undesirable facilities in its community, yet that issue is not analyzed in the FEIR even though MEPA regulations require an analysis of the cumulative impact of the project with other work or activity in the area. 301 CMR 11.07(6)(h).

Further, there are many instances, as set forth throughout these comments, in which the FEIR does not provide sufficient information to allow for meaningful public participation and comment (*e.g.*, not including a detailed analysis of alternative locations for the laboratory). Failure to provide that information deprives the affected EJ community of the opportunity to review and comment fully on a dangerous facility proposed for its community.

Thus, we strongly urge you to require a Supplemental FEIR that analyzes the EJ implications of having a BSL3/4 bioterrorism laboratory in an EJ community.

## V. THE FEIR MUST INCLUDE A DETAILED ANALYSIS OF ALTERNATIVE LOCATIONS FOR THE BIOTERRORISM LABORATORY

Our comments on the DEIR noted that a deficiency of the DEIR was its failure to include a discussion of alternative sites for the bioterrorism laboratory and alternative development at the site that does not include a BSL4 bioterrorism laboratory. In the Certificate, you required the FEIR to respond to the detailed comments that we submitted on the DEIR. Nonetheless, the FEIR does not contain any discussion of alternative locations for the bioterrorism laboratory. Instead, buried in the FEIR’s response to comments, appendix 1-30, is the statement that a separately issued Environmental Impact Statement has been developed that includes an alternative analysis.<sup>3</sup>

The failure to include an alternatives analysis in the FEIR is a violation of 301 CMR 11.07(6)(f), which requires, unless otherwise indicated by the Secretary, a description and analysis of

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<sup>3</sup> We received the NEPA DEIS on October 28, 2004. It analyzes a no-build option, but does not analyze any alternative locations. (One rationale given for not analyzing other locations is the same flawed RWDI Summary Report used in the FEIR.) If the project proponent intends to rely on the DEIS to fulfill a MEPA requirement, then the DEIS must be submitted under MEPA as part of a Supplemental FEIR so that it is subject to MEPA review.

alternatives to the project, including, “all feasible alternatives...” as well as “the alternative of not undertaking the Project...” To our knowledge, you have not indicated otherwise.

Compliance with MEPA requires that the FEIR include an analysis of all reasonable locations for the laboratory, all feasible alternatives, and the principal differences between the alternatives. 301 CMR 11.07(6)(f). This analysis is critically important, considering that the project proponent proposes to locate a bioterrorism research laboratory that will host and manipulate bioterrorism and biowarfare agents and may be a terrorist target in a densely populated urban Environmental Justice community, near a major hospital used by inner city residents that might be unavailable in the event of a release from or attack on the laboratory, and close to major roadways. A true alternative analysis is necessary so that other options may be considered and the option chosen is one that minimizes risk to the public and environment. Without the analysis of reasonable alternative locations, as required by MGL c.30 § 62B, the mandate of MEPA is not met.

We request that the proponent be required to submit a Supplemental FEIR that includes the criteria it used for locating the laboratory in a densely populated EJ community, the other locations it considered for the laboratory, including population density and characteristics of those locations, why it rejected those other locations, and how the current site meets those criteria. To the extent proximity to researchers at Boston University and at the NIAID Regional Center for Excellence is a criterion, the Supplemental FEIR must explain why the project proponent did not consider or rejected other locations in less densely populated areas within a one hour drive of Boston.<sup>4</sup> The Supplemental FEIR must also explain how the decision considered risks to public health and safety and the environment and how a decision could have been made on siting before the RWDI Summary Report was completed.

#### VI. THE FEIR FAILS TO IDENTIFY ALL STATUTORY AND REGULATORY STANDARDS AND REQUIREMENTS AND THE MEASURES TO BE TAKEN TO ASSURE COMPLIANCE WITH THOSE STANDARDS

MEPA regulations require the FEIR to contain a “list of any Permit, Financial Assistance, or Land Transfer that is or may be required, and a brief description and analysis of the applicable statutory and regulatory standards and requirements thereof and the measures to be taken to ensure due compliance therewith.” 301 CMR § 11.07(6)(i). In our comments on the DEIR, we noted that the DEIR failed to describe the performance standards for each state permit and approval and how the project would meet the standards. Notwithstanding the regulatory requirement and the Certificate’s requirement that the FEIR respond to ACE’s comments, the FEIR does no more than list, page 1-8, the anticipated required permits and approvals but again provides no information on the standards or the measures to be taken to ensure compliance.

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<sup>4</sup> To the extent the project proponent did not consider other locations, the Supplemental FEIR should identify and consider other locations. We anticipate that the project proponent will say that it chose the location at least in part because it owned the land. That, however, would be an inadequate rationale for three reasons. First, that is not an acceptable rationale under MEPA for not undertaking an alternatives analysis. Second, the project proponent did not own the land when it applied to NIAID. It acquired the property later, after negotiations with the state and BRA. It could have identified other properties, including perhaps at or adjacent to closed or currently operating military bases, which it could have acquired for the project. Third, federal requirements allow the land to be leased.

Instead, in violation of the regulatory requirement and the Certificate, it notes in the response to comments section that during the state permitting process it will “demonstrate compliance with all relevant performance standards.” The project proponent may prefer that method of proceeding, but that is not the MEPA requirement and does not give the public the opportunity to comment during the MEPA process on the proposed measures to ensure compliance. That is especially important for those permits and requirements that have no public participation process, where the public does not know of the permit application, or may be unable to monitor compliance.

For example, the Boston Public Health Commission regulation on recombinant DNA (rDNA) use contains an important standard not noted in the FEIR. It prohibits rDNA use requiring BSL4 containment. Modern biological research requires rDNA use and one would expect rDNA use in the BSL4. Notwithstanding, the FEIR fails to list this critical standard or describe how the laboratory will comply with the standard.<sup>5</sup>

The FEIR, page 5-13, also notes that the facility will generate up to 10-15 pounds of radioactive waste each month, that long-lived isotopes will be shipped off site and short-lived isotopes will be held on site for up to two years and nine months while they decay before being discharged to the sewer. The FEIR, however, fails to list at page 1-8 the requirements and standards for radioactive waste. That information must be made available to the public, regulatory agencies, and MEPA.

We urge you to require a Supplement FEIR in which the project proponent is required to meet the standard set forth in 301 CMR § 11.07(i), including how the laboratory would assure compliance with the Boston rDNA regulations.

VII. THE FEIR DOES NOT INCLUDE A DISCUSSION OF HOW THE PROJECT PROPONENT WILL ASSURE THAT ITS HEALTH AND SAFETY OPERATING PROCEDURES ARE MET CONSIDERING THAT THE FEDERAL GOVERNMENT HAS NOT YET CHOSEN THE ENTITY THAT WILL OPERATE THE LABORATORY AND THAT MANY OUTSIDE RESEARCHERS, INCLUDING STUDENTS WITH NO BSL4 EXPERIENCE, WILL USE THE LABORATORY.

Our comments on the DEIR noted that the federal government had not yet chosen the operator of the laboratory and that the operator chosen might not be BU. Consequently, we asked how BU could assure safe operation of the laboratory. We also asked whether the research in the laboratory would be subject to federal secrecy requirements and, if so, how that would affect state and local environmental, health, and safety oversight of the laboratory.

The FEIR response is found in its appendix, 1-30. It claims that the “building will be owned and operated and research to be undertaken will be directed by Boston University Medical Center University.” It provides no documentary support or evidence for that statement. We have enclosed in the appendix the pertinent pages from the Request for Proposals and Applications (RFPA) under which BU is being funded to build the laboratory, showing that BU must compete

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<sup>5</sup> The FEIR also misstates the regulation as requiring project registration whereas the regulation requires a permit.

for an operations contract. There is no evidence that BU has been chosen for the operations contract.

The FEIR also claims that various committees in the laboratory will “authorize research.” Yet, the RFPA requires that the laboratory “must give priority to Regional Centers of Excellence for Biodefense and Emerging Infectious Diseases (RCEs), followed by other NIAID funded biodefense research, and finally to biodefense work funded by other agencies and entities.”<sup>6</sup> The FEIR does not explain whether and how it can ignore those priorities set forth in the RFPA -- both as to the type of research to be performed and the entities expected to perform research.

Finally, the FEIR is silent on whether federal secrecy requirements apply and if so how they would affect state and local environmental, health, and safety oversight of the laboratory. Considering that the laboratory must give priority to biodefense work, there is a high likelihood of secret research.

These important issues go to the heart of whether the laboratory will have an adverse environmental and health impact on the community. The FEIR claims that BU will have procedures and practices in place to assure that the laboratory will experience no health or safety failures, but has provided no information showing that BU will have the authority necessary to implement and enforce those procedures and practices. It also fails to address the real possibility that the secrecy of the research to be conducted in the laboratory will prevent necessary oversight by regulatory entities.

The FEIR was required to have responded to these issues, but failed to do so. We urge you to require a Supplemental FEIR that responds to these issues.

#### VIII. THE FEIR FAILS TO COMPLY WITH THE REQUIREMENTS OF THE CERTIFICATE

The FEIR fails to comply with the Certificate for many issues in addition to those noted above. Those others that require the preparation of a Supplemental FEIR because the FEIR’s failure to analyze them prevents important opportunities for agency and public review and comment on matters that have a potential environmental impact include:

- The Certificate required the FEIR to include an analysis of how the proponent would meet any applicable inflow and infiltration (I/I) requirements. The FEIR does not address Inflow and Infiltration (I/I) removal requirements.
- The Boston Transportation Department’s (BTD) comments on the DEIR asked for details about truck routes into and out of the site, including turning templates. The FEIR does not provide any.
- BTD’s request for pedestrian information is ignored. On page 8 of 11 of its letter, BTD asks for “A graphic showing all existing and proposed pedestrian paths and crosswalks (with a distinction for unsignalized crossings) between Harrison Avenue, the Mass. Ave. Connector (MAC), East Canton Street and East Concord St., a detailed pedestrian internal circulation

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<sup>6</sup> We have included in the appendix the pertinent pages from the RFPA and a January 28, 2003, letter from BU to NIAID that acknowledges that the laboratory will be “devoted exclusively to biodefense research and other NIAID-defined research programs....”

plan for the Site that shows all sidewalks, paths and pedestrian entrances...” The only relevant graphic in the FEIR is Figure 2-19 (which is the same as Figure 4-18) and which does not provide the required information. Noticeably absent from the figure is that there is no pedestrian connection between the MAC and either East Concord St., East Newton St., or East Brookline St. In fact, there is no connection from the site to the MAC. The proponent’s response is: ““No connection to the South Bay Harbor Trail will be provided through the campus rather, access to the trail will be afforded from Massachusetts Avenue and Albany Street.” Yet, the site does not even extend to Mass. Ave. and Albany St. but the proponent claims a 10% reduction in trips because of a TDM program. Few employees would bike west on Albany St. to go east on the Harbor Trail.

- Our comments, page 5, on the DEIR, compared the project to Executive Order 385, noting that the roadways and intersections near the site were at or above capacity and requesting that the proponent describe how the lack of roadway capacity is adequate infrastructure. We also asked whether the sewer system in the area contributes to a Combined Sewer Overflow and, if so, how that is adequate infrastructure. The FEIR, appendix 1-31, concludes that the project is consistent with E.O. 385, but fails to demonstrate how increasing traffic on already overburdened roadways aids adequate infrastructure. Further, its failure to address I/I requirements means that one cannot assess whether its discharge would increase the frequency or severity of CSO activations or the costs of necessary sewer improvements elsewhere.
- Our comments, page 8, on the DEIR traffic study, noted that the DEIR analyzed traffic data, collected at different locations on different dates, as a single comprehensive data set, that most intersections were measured on one day only, and that several of the traffic study dates were after the end of the academic year, likely resulting in traffic undercounts. We suggested that the proponent generate the traffic numbers again. The FEIR response is that the data collection and traffic count times and locations were approved by BTM and are standard practice. That does not show that the data is correct or representative. It is incumbent on the proponent to generate representative traffic data, which cannot be done by measuring most intersections on only one date and many intersections on a day when school is not in session -- especially near the project site, where many roadways are at or near capacity and where it proposes to construct a 1,400 car parking garage. There should be a new traffic study, generated on the multiple same dates at each intersection during days when schools are in session.
- Section 1.2 of the BTM Scope requested a complete analysis of all parking facilities in the area. The FEIR, appendix 1-32, states that BTM modified the scope to include only parking on the BUMC/BioSquare campus. Although the BTM narrowed the scope of its request, to adequately assess parking supply and demand, the proponent should be required to evaluate all nearby parking facilities, including BioSquare, BUMC, BWSC, Crosstown, and the proposed Dudley Garage, Renaissance Park, and Northeastern University’s Master Plan. The FEIR’s parking discussion, pages 4-43 - 4-44, proposes to satisfy parking demand through leased satellite parking lots at Northeastern University. The FEIR fails, however, to discuss the traffic and environmental impacts resulting from an additional 900 parking spaces at Northeastern University and from shuttle buses. Those impacts must be studied to determine the level of service provided by the local and regional roadways caused by the increase use and how to mitigate the impacts.

- Our comments on the DEIR noted that a 25% subsidy for MBTA passes may be insufficient to encourage public transit use and requested that BUMC analyze the impact of providing free passes. We also requested review of whether a single zipcar space is sufficient, 32 carpool spaces are appropriate, and how the proponent might comply with the DEP ridesharing regulation that requires a reduction of customary commuting vehicles of 25% from the base date. The FEIR, appendix 1-32, responds merely by referring to the Transportation Demand Management (TDM) at §§ 4.3.8, 4.4. Section 4.3.8 does not exist in either the DPIR or the FPIR. Section 4.3.7 provides a cursory discussion of TDM. Section 4.4, does not explain why a 25% subsidy for employees, and a 0% subsidy for students adequately encourages public transit. Instead, it merely states that the MBTA subsidy costs BUMC \$120,000 per year, without stating the amount of money it saves BUMC in terms of automobile infrastructure, such as reducing the number of additional parking spaces, fewer roadway improvements and less maintenance, and less congestion. The FEIR, at 4-50, states that there are 2 Zipcar spaces located at Lot A, but does not indicate whether those spaces will be included in the proposed inconvenient parking garage. The FEIR, at 4-49, does not explain why BUMC chose 32 spaces for carpoolers, or describe the location of these 32 spaces, but claims that they are in a central location. The FEIR does not explain how the BUMC carpool program meets the DEP ridesharing regulation.
- Our comments on the DEIR, pages 10-11, included that the parking evaluation is inadequate because the proponent failed to analyze parking needs fully. The FEIR, app. 1-32 states that parking is discussed at Section 4.3.5. It does not, however, explain how BUMC chose 1,400 as the number of parking spaces needed. It does not explain the number of employee and visitor spots that will be needed. It states that prior studies indicate that the turnover rate for patients and visitors at BUMC is about 4.0, and that the average parking duration is 1.5 to 2 hours but does not cite those studies. It states that the continued increase in parking fees and reduction in overall supply are expected to decrease single occupant vehicle use, but does not state how a net increase of 800 parking spaces (200 more spaces at the Phase II garage and 600 satellite spaces at Northeastern University) will do so, particularly in light of the 800 person waiting list. Finally, it claims that the original 1999 scope that required a parking needs assessment for the entire South End Medical Area was limited in May 2002 to BUMC and BioSquare facilities. Consequently, it does not discuss parking needs for the South End Medical Area.
- Our comments on the DEIR, page 11, noted that the ENF required a discussion of construction period traffic impacts, quantification of associated truck trips, and any necessary coordination with the Central Artery/Tunnel construction activities in the project area but none were provided. The FEIR, app. 1-32, states that construction impacts are discussed in Section 4.7, and that a detailed Construction Management Plan will be filed by project contractors, subject to approval by BTM. Section 4.7 states that “[t]he developer of each building will submit a detailed Construction Management Plan to BTM as a condition of obtaining a building permit.” Thus, even though a discussion of construction period traffic impacts is required, the FEIR merely states that it will provide analysis at a later date.
- Our comments on the DEIR, page 13, noted that the Mesoscale Air Quality Analysis failed to consider the increased use of light trucks and SUVs, thus undermining a key assumption in the analysis and requested that the analysis be rerun with no assumed reductions in motor vehicle emissions. As far as we can determine, the FEIR does not respond to this.

- Our comments on the DEIR, page 13, noted that northwest winds would blow emissions into residential areas of Roxbury and Dorchester and stated that the potential impacts should be addressed. We also noted that the proponent needed to evaluate the necessity of filters and scrubbers and discuss their usage in greater detail. The FEIR did not respond to these comments.

In addition, there are a number of comments that we made on the DEIR relating to security for the building that have no response in the FEIR or for which the proponent claims it will consult or coordinate with others at a later date. We believe these issues are important because they may affect the safe operation of the laboratory and require a response in a Supplemental FEIR so that they are subject to agency and public review and comment. They include: 1) Methods to protect infrastructure (from terrorist activity relating to the lab); 2) capacity and adequacy of utility systems (*e.g.*, gas, electric, and steam) serving the building and the building's energy requirements. They should be discussed in the FEIR.

## IX. CONCLUSION

The FEIR is woefully inadequate. It presents a critically flawed release scenario that seriously understates the potential impact of a release from the lab, thus presenting a best-case release scenario rather than worst-case release scenario. It omits critical information such as an alternative locations analysis. It ignores that the laboratory will be a terrorist target and that a terrorist attack or infiltration could release deadly pathogens into the community. It fails to consider environmental justice issues. It does not describe the existing regulatory standards for the laboratory and how the laboratory will meet those standards. It does not provide the required and necessary assessment of its negative impacts and its alternatives or any mitigation measures. It fails to comply with the Certificate and with MEPA regulations. It evinces a significant disregard for the requirements of MEPA and the right of the public to review and comment on important aspects of a project that presents a significant potential environmental risk.

We urge you to find that the FEIR is inadequate for the reasons set forth in these comments and to require a Supplemental FEIR that responds to the issues we have raised herein. We also urge that you facilitate the creation of an independent committee to review and report on a true risk assessment.

Thank you for the opportunity to comment. For follow up on these comments, please contact Eugene B. Benson, Staff Attorney, ACE, at 617-442-3343 x226 and [gene@ace.ej.org](mailto:gene@ace.ej.org).

Respectfully submitted,

Alternatives for Community & Environment  
Safety Net

APPENDIX TO  
COMMENTS OF ACE AND SAFETY NET  
ON THE  
FINAL ENVIRONMENTAL IMPACT REPORT  
BIOSQUARE PHASE II, EOE # 12021

1. October 24, 2004, memorandum by Dr. Jeanne Guillemin: Comments on Final Environmental Impact Report/Anthrax Aerosol Release Models
2. October 14, USA Today article: *Anthrax Slip-Ups Raise Fears about Planned Biolabs*
3. December 15, 2000, memorandum: constructing a BSL-4 building at Rocky Mountain Laboratories (2 page cover letter and 3 page memorandum. See page 2 of the memorandum for the relevant statement about a release from the laboratory.)
4. Selected pages from the Request for Proposals and Applications to which Boston University applied for construction funding for the bioterrorism laboratory (RFPA) and Amendment #1 to the RFPA, showing that:
  - The laboratory “must give priority to Regional Centers of Excellence for Biodefense and Emerging Infectious Diseases (RCEs), followed by other NIAID funded biodefense research, and finally to biodefense work funded by other agencies and entities.”
  - BU must compete for an operations contract.
  - The entity may own or lease the land on which the laboratory is located.
5. January 28, 2003, letter from BU to NIAID that acknowledges that the laboratory will be “devoted exclusively to biodefense research and other NIAID-defined research programs....”

***Note: The webpage copy of the appendix contains only document #1 of the appendix. The others are not available to us in electronic format.***

From: Jeanne Guillemin

Date: October 24, 2004

Re: Comments on Final Environmental Impact Report/Anthrax Aerosol Release Models

The report by RWDI West Inc. uses three potential anthrax release scenarios to “provide an estimate of the maximum possible risk of exposure.” The report contains serious mistakes that lead to the erroneous conclusion that an anthrax spore release caused by a laboratory spill would pose no risk to the public.

In its conclusion and in its methodology, the RWDI report also ignores the question of what would happen on a community level after a dangerous release. The 2001 anthrax postal attacks revealed “an unacceptable level of fragility” in public health and hospital response that remains unaddressed (Gursky, Inglesby, and O’Toole 2003: 97). Difficulties (including unpredicted fatalities) in administering the 2003 federal smallpox vaccination campaign pointed to serious shortfalls in defending the public and to increased risks to public health (Hillel, Gould, and Sidel, 2004).

In addition, the report ignores contagious disease outbreaks that could result from BSL-4 accidents. Smallpox and plague outbreaks, widely discussed in the Homeland Security literature, could pose serious threats to the public.

Before addressing these problems, I want to offer some background on what we know about anthrax as a disease and about anthrax spores.

#### *About Anthrax*

Anthrax as a disease originated thousands of years ago in grazing animals and only later passed to humans who came in touch with infected livestock carcasses, from butchering or eating infected meat or in industrially processing skins, wool or hair.

The anthrax spore is about one micron in diameter and forms as a protection after the bacterium is exposed to air. Research on anthrax aerosols to attack enemy civilians is fundamental to the history of state biological weapons programs (Guillemin 2005). That history begins with the French in the 1920s, followed by the Japanese Imperial Army in the 1930s. Anthrax spores for use in bombs and spray generators were most extensively developed by the United States from 1943 until it abandoned biological weapons in 1969. From 1975 to 1992, anthrax bacteria were secretly researched and produced by the USSR. A main goal was to increase the virulence of anthrax spores, which could be done by passing the disease through successive animal hosts and also by new methods in biotechnology.

Inhalational anthrax is an extremely rare disease. Most of what we know about it comes from military research, from the 1979 Soviet outbreak in the city of Sverdlovsk, and from the 2001 postal anthrax attacks (WHO 2004: 229-243). The Sverdlovsk outbreak, the largest of its kind in recorded history, was later shown to have resulted from an outdoor spore release from a military facility in the city (Abramova, Yampolskaya, and Walker 1993; Meselson et al. 1994; Guillemin

1999). Sixty-eight people died in the outbreak, from what is estimated as a gram or less of spores disseminated in a plume that blew over a local neighborhood. The released spores killed livestock as far as 30 miles from the source of the emission.

The optimal size of any particulate for inhalation in the human lung is 1-10 microns. Although anthrax spores can clump into larger particle sizes, weapons research showed that spores can easily be separated into the small particle sizes that would increase the chances of infecting the enemy under attack.

A single anthrax spore can cause inhalational anthrax if it is inhaled deep into the lungs and subsequently reaches the lymph nodes. Even small amounts of lethal anthrax spores are dangerous, such as the trace amounts that cross-contaminated letters during the 2001 anthrax attacks.

The early symptoms of anthrax infection are flu-like (not those of the common cold as the RWDI report states on page 2) and can easily lead to misdiagnosis. After symptoms commence, death often occurs within two to three days from massive internal inflammation and hemorrhage (Dixon et al. 1999). Antibiotics can prevent infection in those exposed but once symptoms begin, saving the patient is difficult. An 80-90% fatality rate is associated with inhalational anthrax.

The Sverdlovsk outbreak strongly suggested that, in some cases, the spores can remain dormant even after being inhaled and infection can be delayed as long as six weeks. For this reason, during the 2001 postal attacks, those at high risk of exposure were advised to remain on antibiotics for as long as three months (Jernigan et al. 2002).

The current anthrax vaccine is presumed to be an adequate defense against inhalational anthrax, although, because the disease is so dangerous, the vaccine has never been tested on humans. A large dose of anthrax spores could overwhelm the protection afforded by a vaccine.

Although workplace contamination is not addressed in the RWDI report, the 2001 anthrax postal attacks and indoor simulations showed the ease with which anthrax spores disperse throughout buildings and cause health risks and also the extreme difficulty, time, and expense associated with building decontamination (WHO 2004: 98-108; DRES 2001). The recent report concerning anthrax contamination from Fort Detrick's BSL-3 laboratory also raises concern about leaks from high-containment laboratories (US Army 2004).

Environmental contamination is also not a part of the RWDI report, but any outdoor release brings with it the possibility of soil contamination. Sunshine can eventually degrade anthrax spores but they are otherwise impervious to extremes of heat or cold. They have been known to survive in arid soil for as long as 140 years and to cause repeated animal outbreaks for decades after soil contamination.

### *The RWDI Report on a Potential Anthrax Release*

The central problems in the RWDI report concern:

- 1) the estimated number of spores that could be released
- 2) human dose response to anthrax
- 3) the dispersal of spores in the urban environment.

### **The Estimated Number of Spores Released**

For each of its three scenarios, the RWDI report concludes that the maximum number of spores likely to be inhaled by an individual at ground level in the center of a plume is less than one. “Since the release and inhalation of a partial spore is not feasible, this number may be considered as zero.” A serious mistake, though, appears to have been made in reckoning the number of spores released.

The US and Canadian military and other authoritative sources commonly calculate that there are around a trillion anthrax spores per gram (Meselson et al. 1994, He and Tebo 1998, Meselson 2002, DRES 2001). In contrast, the RWDI report (p.3) relies on just ten billion spores per gram.

The RWDI report also relies on a reported NIH simulation calculating that 400,000 spores (per ten billion) or 4% would be “respirable”, that is, in the 1-10 micron range. The 4% estimate might be reasonable; but for a gram of anthrax (a trillion spores) 4% would mean 40 billion spores in the respirable range would be released.

This increased amount would likely change the “zero” conclusion about the predictable number of spores inhaled to some whole number.

That said, the attempt to calculate risk in terms of a single individual positioned in the center of an anthrax plume fails to capture the way in which anthrax affects different individuals and also the collective nature of the impact of an anthrax release.

### **Human Dose Response**

The RWDI emphasis on the lone exposed individual ignores the importance of human dose response as it depends on individual susceptibility. We like to average risk assessments, but we must remember that some people are more vulnerable to infectious diseases than other.

For example, in Sverdlovsk, we estimated that the number of inhaled spores per victim was nine and, based on the number of people exposed, around 5000, it was possible to estimate a 2% fatality rate (or, in military terms, attack rate) from the release.

Yet among the victims, older people were more susceptible to inhalational anthrax than younger people or children. No one under age 24 in Sverdlovsk contracted the disease, although many were exposed. Those who contracted inhalational anthrax during the 2001 postal attacks were also in their forties or older. It could be that older people and perhaps those afflicted with respiratory or lung diseases would have increased risks of infection from an anthrax release. For

that reason, beyond even any accurate models RWDI might construct, census data and figures on health and disease are necessary to predict potential harm to the local population.

### **The Dispersal of Anthrax Spores in the Urban Environment**

The RWDI emphasis on a lone exposed individual located at ground level oversimplifies the physical and temporal conditions that affect urban aerosol dispersal. An anthrax aerosol flowing through an urban environment would expose *all those in its path*. That path, if from a single source, would gradually expand, like a cone growing both larger and longer.

Depending on wind velocity and direction and on atmospheric conditions, an anthrax aerosol emission could expose people at a range of altitudes, not only at street level but on different floors in apartment, hospital, office or factory buildings. Even if windows are closed, anthrax spores could penetrate indoors. (Note that in the anthrax postal attacks, spores penetrated the paper of the envelopes in which they were mailed. Such ordinary paper has apertures up to 3 microns in size.)

Population density is, of course, crucial in calculating the risks of exposure. In Sverdlovsk, the neighborhood near the military facility was much less densely populated than more northerly area of the city, where fatalities would have been higher. Within the afflicted neighborhood, the most crowded workplace in the path of the plume, a large ceramics factory employing thousands, lost 19 employees to inhalational anthrax. Equally large industries on either side of the projected plume were unaffected by it.

Although it used models for different weather conditions, the RWDI report could have modeled a potential release in Boston (as opposed to some other metropolis) as a real-time dispersal with impact on communities rather than on a standard individual.

The understanding of the importance of distinct urban characteristics is well represented in US military research on anthrax aerosols. In 1953, the US Army chose three North American cities (Minneapolis, St. Louis, and Winnipeg) for their similarities in population density and climate to Soviet industrial cities targeted for biological attacks (US Army 1954). Since anthrax spores have a tendency to stick to surfaces on impact (like the sides of buildings, trees, or the ground), a city's distinctive topology affects how a plume would spread. Using anthrax simulants, its researchers conducted repeated year-round aerosol release experiments to gauge dispersal in different parts of these cities. Whether a city area was built up or open, had parks, high buildings, highways or waterways made a difference, along with atmospheric conditions, in the plume's potential impact.

Boston is a northeastern port city with predictable prevailing winds and seasonal variations in temperature and daylight hours, which affect the direction and altitude of a potential anthrax plume. The area immediately around the proposed BUMC building has a distinctive topology for which models of aerosol dispersion could be made, in order to estimate the paths of potential anthrax plumes and their impacts on local populations.

## *Contagious Disease Scenarios*

The WHO has recently published guidelines on responses to outbreaks of diseases caused by biological weapons agents (WHO 2004: 53-85). A main point of the WHO guidelines is that a community's existing "well-designed public health and emergency-response system" should be able to handle a medical emergency from any source. On-going community-level disease surveillance should be part of that capability, to identify unusual disease outbreaks as early as possible.

But how should gaps in the system be identified? The WHO strongly advises the use of scenarios involving different agents to pinpoint problems:

The level of threat that exists is also a function of the potential vulnerability of the community concerned. Vulnerability analysis will identify potential scenarios as well as weaknesses in the system...and will determine the current ability to manage the emergency. (2004:58)

Regarding biological weapons, even when public health systems are effective, there are limits to medical interventions to protect against select agents. Although we want to believe in "magic bullet" defenses, none exist that would protect the public without risk. The possible short-term and long-term effects of the anthrax vaccine have been an on-going source of controversy in the US military (Sidel, Nass and Ensign, 1998; Guillemin 2000, 2003a; Institute of Medicine 2002). The 2003 smallpox vaccination campaign faltered quickly after five first responders over age fifty died from heart problems aggravated by the vaccine. Nor should individuals with skin diseases, compromised immune systems, or other medical vulnerabilities be vaccinated against smallpox. The biodefense initiative aims to invent better protections, but in the meanwhile an exposed public has to be vigilant about risks and hazards.

### **Contagion Scenarios and Smallpox**

Worst-case scenarios involving highly contagious disease outbreaks from select agents, (such as those for smallpox, pneumonic plague, tularemia or one of the hemorrhagic fevers, such as Ebola virus) would necessarily reveal complexities that can be avoided in models of a single-point source anthrax emission. Unlike scenarios for inhalational anthrax, which is not transmitted human-to-human, a contagion scenario requires calculation of how a disease is introduced into and can proliferate in a community and possibly beyond, and what public health measures are either in place to contain the epidemic or are insufficient or lacking.

In the simplest scenario, a single index case contacts and infects others who in turn pass on the disease. How many people an individual is likely to infect is called the contagion rate, which can vary by the virulence of the disease and the relative immunity or susceptibility of those exposed. If contagion began with an aerosol release, the number of vectors could be multiplied with catastrophic consequences. Modern travel has also accounted for the rapid spread of dangerous infectious diseases like AIDS, smallpox, and SARS.

Smallpox, highly communicable and, with anthrax, a disease of great national security concern, is the most likely candidate for a worst-case contagious disease scenario. Officially eradicated from the world in 1981, long after it was a serious threat in North America, smallpox causes fear because of reduced immunity in the general population. Those under twenty-five are unlikely to be vaccinated and older people who are vaccinated may have only residual immunity or none at all. Only two reserves of smallpox strains now exist, at two WHO reference laboratories, one at the Centers for Disease Control and Prevention (CDC) in Atlanta and the other at Vektor, the Russian research center in Novosibirsk. Intermittent research that exposes animals, including primates, to smallpox aerosols is currently conducted at the CDC. Concerns have been raised about security at the Vektor facility. In the run-up to the 2003 invasion of Iraq, rumors that Saddam Hussein might attack the US with smallpox were rampant and affected public opinion about a vaccination campaign (Blendon et al. 2002).

The World Health Organization summary of its eradication campaign includes descriptions of the laboratory accidents that caused outbreaks in the United Kingdom in 1966, 1973, and 1978 (WHO 1988:1095-1101). Following early misdiagnoses, all were contained by public health intervention. The earliest and latest epidemics were apparently caused by insufficient ventilation precautions between a Birmingham medical school laboratory and the floor above it. The 1973 outbreak was started at the London School of Hygiene and Tropical Medicine when a laboratory assistant, vaccinated as a child and again in 1972, nevertheless contracted smallpox after briefly visiting the poxvirus laboratory. Safety measures are more stringent today but, should smallpox return, its consequences could be not only national but international.

Experts concerned with bioterrorist attacks have differed with each other about a likely contagion rate, should a smallpox outbreak occur in the United States. Authors of the well-known table-top exercise “Dark Winter,” relying on information from the 1972 smallpox outbreak in Yugoslavia, postulated a 1:12 rate of transmission (O’Toole, Mair, and Inglesby 2002). They also conjectured 3000 initial cases, an especially virulent smallpox strain, and a shortage of smallpox vaccine, which in the exercise led to an international pandemic in a matter of weeks.

Others have argued that a ratio of 1:2-3 is more in line with past epidemics (Meltzer et al. 2001; Ganl and Leach 2003). Historically, the mortality rate associated with smallpox also varies, from 12% to 30% of those who contract it. Those most at risk for secondary infection and death would be small children and pregnant women, along with those with suppressed immune systems, malnourished, elderly, or sick with other diseases.

### **Public Trust and Communication Failures**

Experts agree that the successful containment of a contagious disease from any source depends on the public’s trust, cooperation and understanding of risks (Levy and Sidel 2003).

Transparency is vital. To protect themselves, people need information about the nature of the disease threat, the kinds of protective interventions that are available, and how to access those interventions. Any disease outbreak model for Boston should reckon beforehand the main obstacles to trust and communication and therefore increase the vulnerability of communities.

Two such obstacles are predictable: 1) existing social barriers; and 2) secrecy surrounding biodefense research.

Social barriers to communication based on differences in education, ethnicity, race and language can hinder diagnoses and increase the dangers of any outbreak. Boston's population is both diverse and, in many instances, segregated. To what extent would this hinder communication in an unusual disease outbreak?

When a biological weapons agent is involved, services can break down along existing racial divides even when government agencies are technically prepared for an emergency. During the 2001 anthrax postal attacks in Washington, DC, the 97% African-American postal workers where two of the contaminated letters were processed were only belatedly warned of their risks and given antibiotics, while the government early on distributed antibiotics to other, mainly white employees.

State secrecy regarding dangerous epidemics has been a repeated source of danger to the public (Guillemin 2003b). We saw this most recently with China's reluctance to admit to the SARS epidemic. In 1972, Iraq kept silent about the smallpox epidemic in Baghdad that later spread to Yugoslavia and in the early 1990s India denied epidemics of plague affecting its cities.

The 1979 Sverdlovsk anthrax outbreak was an extreme instance of state secrecy; the Soviet military never admitted its responsibility for the aerosol release and the affected community remained ignorant of the source and nature of the disease. By the time antibiotics and treatment were available, nearly half the victims had died or were beyond help.

Defense research on weapons seeks innovative advantages in anticipation of what an enemy might acquire and strives to keep these innovations secret. We should expect that is no less true for biological weapons than for other weapons, even though offensive development is banned by international treaty. For example, in early 2001, the US secret development of a vaccine-resistant anthrax strain was leaked to the press (Miller, Engelberg, and Broad 2001: 231). Critics pointed out that such weapons development is forbidden by the 1972 Biological Weapons Convention and, moreover, that it dangerously stimulates less powerful nations to emulate American flaunting of the treaty (Wright 2002: 15-16). The line between offensive and defensive research, though, has been historically difficult for military and intelligence agencies to draw.

Most microbiologists working in this country have not had their work classified or restricted as "sensitive." Open review and publication in medical research have led to altruistic advances for the general benefit of humanity. Yet there are pressures now on scientists funded to do secret biodefense research in the name of US national security, like physicists who work on nuclear weapons programs. In reaction, a recent National Research Council commission report urges scientists become vigilant about the risks of research on select agents and recommends against secrecy: "Given the increased investments in biodefense research in the United States, it is imperative that the United States conduct its legitimate defensive activities in an open and transparent manner." (NRC 2003:9)

The secrecy around biodefense research that could erode the altruistic goals of medical research could also pose a risk to local vulnerable communities if they are kept in the dark about potential disease threats.

### *Recommendations*

Models for assessing the health risks of a BSL-4 laboratory to Boston and surrounding communities should be more complex and various and meet the WHO guideline for identifying community vulnerability and gaps in public health response systems.

Scenarios for anthrax and other aerosols should take into account the demography of communities that could be affected, as well as the particular atmospheric, weather, and topological characteristics of Boston and its suburbs.

Scenarios for contagion should involve two sources: a) outdoor aerosol release; and b) a BSL-4 employee or visitor to the building as an index case.

Around 40 select agents are commonly listed as dangerous to humans (WHO 2004: 230-231). Many more exist which affect animals and crops. Those in charge of modeling scenarios should consult with Boston University Medical Center and NIAID about the agents likely to be researched in the proposed BSL-4 laboratory.

For transparency on a local level, to protect the public in the Boston area, BUMC should immediately agree to an independent oversight committee to consult on risk assessment for the BSL-4 laboratory, including disease outbreak scenarios, and on future plans for biodefense research. The members of this committee should not be affiliated with Boston University or NIH. The committee should include knowledgeable scientists and Boston community residents most likely to be affected by the laboratory.

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