DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

National Institutes of Health
Bethesda, Maryland 20892

DEC 2 2005

Dear Reader:

Enclosed for your review and comment is the National Institutes of Health's (NIH) Final Environmental Impact Statement (FEIS) for the proposed National Emerging Infectious Diseases Laboratory at the Boston University Medical Center, Boston, Massachusetts. The National Laboratory Research Facility would include a Biosafety Level –4 (BSL-4) laboratory, in addition to new BSL-3 and BSL-2 laboratories. The facility is needed to improve the nation's ability to study and combat emerging infectious disease and to protect public health in keeping with the NIH's mission.

Two alternatives are considered in detail in the FEIS: the Proposed Action (to partially fund the construction of the National Emerging Infectious Diseases Laboratory at the Boston University Medical Center, Boston, Massachusetts) and the No Action (to not construct the National Emerging Infectious Diseases Laboratory at the Boston University Medical Center, Boston, Massachusetts). The agency's preferred alternative is the Proposed Action.

The FEIS addresses concerns identified by the NIH and issues raised and comments received during the comment period of the Supplemental Draft EIS. Following a 30-day waiting period, the NIH will prepare and issue a Record of Decision on the project.

Public comment on the FEIS will be accepted during a 30-day waiting period ending Friday, **January 13, 2006**. Comments should be sent to Valerie Nottingham, NIH, B13/2W64, 9000 Rockville Pike, Bethesda, MD 20892 or emailed to nihnepa@mail.nih.gov.

Sincerely,

Juanita M. Mildenberg

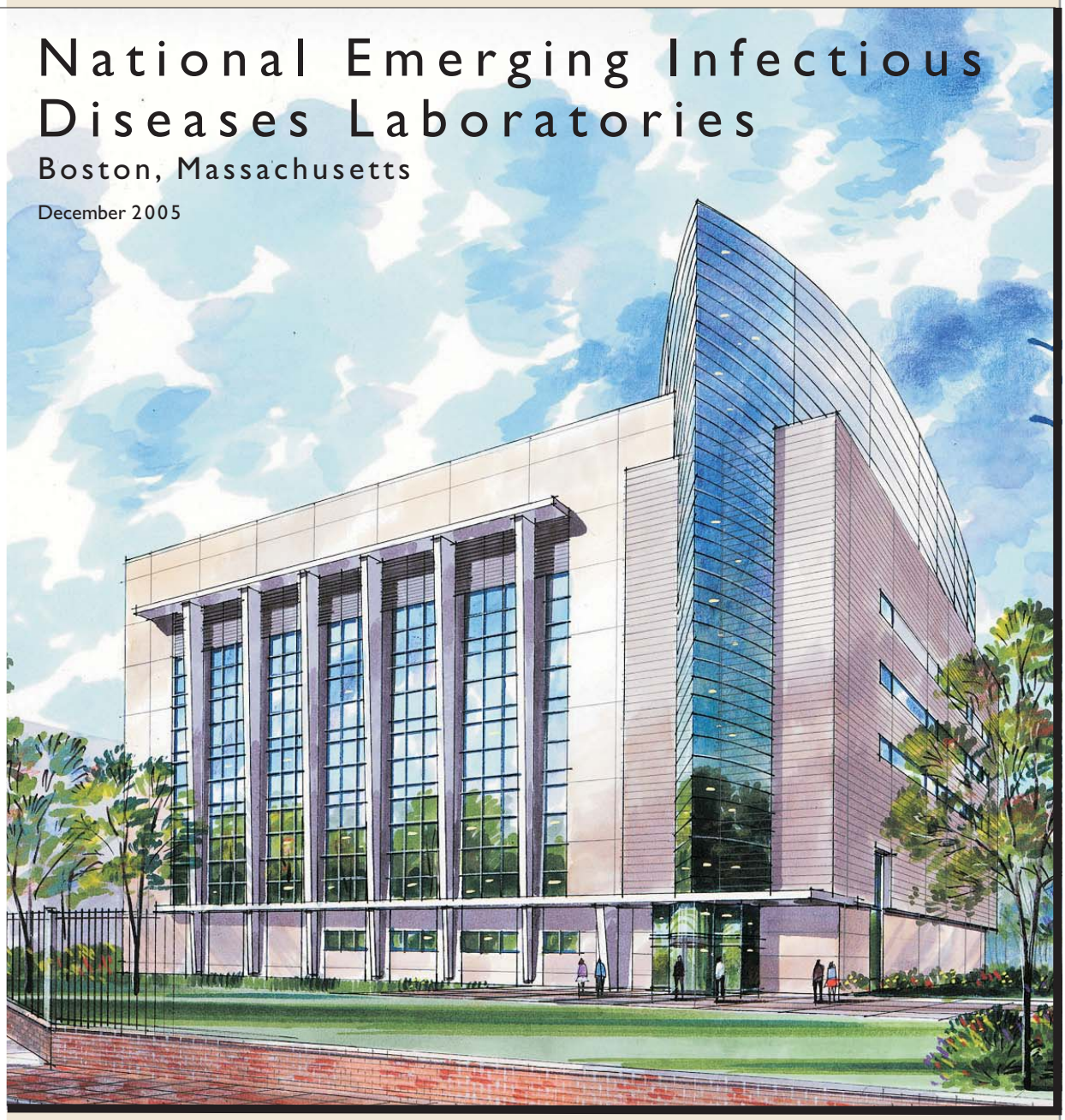
Juanita M. Mildenberg, FAIA
Acting Director, Office of Research Facilities
Development and Operations
National Institutes of Health

Final Environmental Impact Statement

National Emerging Infectious Diseases Laboratories

Boston, Massachusetts

December 2005



National Institutes of Health

U.S. Department of Health and Human Services

FINAL ENVIRONMENTAL IMPACT STATEMENT
NATIONAL EMERGING INFECTIOUS DISEASES LABORATORIES

National Institutes of Health

Responsible Official: Juanita M. Mildenberg, FAIA
Acting Director, Office of Research Facilities
Development and Operations

For Further Information, Contact: Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892
Fax (301) 480-8056
nihnepa@mail.nih.gov

Abstract

The National Institutes of Health (NIH) proposes to partially fund the construction of the National Emerging Infectious Diseases Laboratory at the Boston University Medical Center campus in Boston, Massachusetts. The National Emerging Infectious Diseases Laboratories facility would include Biosafety Level (BSL)-4 laboratories, in addition to BSL-3 and BSL-2 laboratories, animal rooms, clinical research space, offices and support space.

Two alternatives were considered in detail in the Final Environmental Impact Statement: the Proposed Action (to partially fund the construction of the National Emerging Infectious Diseases Laboratories facility at Boston University); and No Action (no construction). Three additional alternatives were considered but were eliminated from detailed study.

The agency's preferred alternative is the Proposed Action. The waiting period on the Final Environmental Impact Statement will close 30 days after the Notice of Availability appears in the Federal Register. Comments should be sent to Valerie Nottingham at the above address.

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EXECUTIVE SUMMARY

INTRODUCTION

Following the events of September 11, 2001, the focus on national security in the United States has greatly intensified. Through the National Institutes of Health (NIH) and the National Institute of Allergy and Infectious Diseases (NIAID), which support broad-based programs of basic and applied research to prevent, diagnose and treat infectious and immune-mediated diseases, the Department of Health and Human Services (DHHS) is advancing biomedical research. Integral to this mission is the responsibility to conduct biomedical research aimed at addressing the constant threat of naturally occurring, newly emerging and re-emerging infectious diseases. The specific mandate of the NIAID in the post-September 11 national security effort is to support research that will ultimately lead to the development of medical countermeasures in the form of therapies, vaccines, and diagnostic tools to protect the country from deliberate attacks with biologic agents (Hirschberg, et al. 2004).

In February of 2002, NIAID, in consultation with a blue ribbon panel, developed a strategic plan for biodefense research to accomplish short and long-term goals. The NIAID strategic plan emphasizes both basic research and the application of that basic research to the development of products. The plan identified a critical need to expand the availability of national resources for biodefense research and identified a serious shortage of high-level biocontainment laboratories. NIAID issued a Broad Agency Announcement (BAA) in the fall of 2002 to build national laboratories to expand the research capacity. Boston University Medical Center (BUMC), a consortium of Boston University and Boston Medical Center, submitted an application to NIAID in response to the BAA to construct the National Emerging Infectious Diseases Laboratories at the Boston University Medical Center (BUMC) campus in the South End neighborhood of Boston, MA. The Boston National Biocontainment Laboratory (NBL) is hereinafter referred to as the "Boston-NBL" or the "Project".

The mission of the Boston-NBL, which will be owned, operated and managed by BUMC, is to provide biomedical research facilities for research and development of diagnostics, vaccines and therapeutics to combat emerging and re-emerging infectious diseases. The facility would serve as a venue for training researchers in infectious diseases and would not conduct research to develop offensive biological weapons. The Boston-NBL Project is one of two National Biocontainment Laboratories (NBL) funded by the NIAID in 2003. Construction of the facility would add to the growing life sciences industry in the region that is supported by both the Commonwealth of Massachusetts and the City of Boston.

PURPOSE OF AND NEED FOR ACTION

NIAID has recognized that there is a well-documented and serious strategic national shortage of biological containment facilities with laboratories and procedures for handling potentially lethal infectious agents. This condition represents a substantial impediment to conducting research on infectious diseases and is a national biodefense vulnerability. Therefore, additional facilities are required, which are partially comprised of laboratories designed and constructed to biosafety standards that would allow for the safe conduct of biomedical research with emerging and re-emerging infectious diseases.

The purpose of the Boston-NBL is to provide a highly contained and secure laboratory dedicated to studying emerging and re-emerging infectious diseases, many of which have potential as bioterrorism agents. The Boston-NBL facility, which would be owned, operated and managed by the BUMC, would contain state-of-the-art laboratories designed to conduct research in a safe and secure environment to find treatments and vaccines for many significant infectious diseases.

The facility's proposed location, in the BioSquare Research Park, allows for dynamic collaborations among investigators at multiple research entities such as the Boston University School of Medicine, Harvard Medical School, Massachusetts Institute of Technology, Massachusetts General Hospital, Brigham and Women's Hospital, the Center for Blood Research, University of Massachusetts Medical Center, Massachusetts Biological Laboratories, Tufts University, New England Medical Center, Brandeis University and others. The laboratory would serve as a national resource for efforts in conducting laboratory research and testing on hazardous biological agents to prevent, diagnose and treat these infectious agents.

SUMMARY OF PROPOSED ACTION

The National Institutes of Health proposes to partially fund the construction of the National Emerging Infectious Diseases Laboratories at the BioSquare Research Park in Boston, Massachusetts. The 194,000 square foot (sf) facility would contain state-of-the-art Biosafety Level (BSL) -2, BSL-3 and BSL-4 laboratories constructed to the National Institutes of Health's (NIH) and Centers for Disease Control (CDC) standards of safety. The facility would not be used to work on or develop biological weapons, as this is forbidden by a national security directive and international law. President Nixon, in 1969, agreed to a National Security Decision Memorandum which renounced the use of lethal methods of bacteriological/biological warfare and ordered the destruction of all stockpiled agents. The United States signed the *Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their*

Destruction, which became effective March 26, 1975 (signed by President Ford and ratified by Congress) and remains in effect.

The Boston-NBL would emphasize comprehensive core research facilities that would enable basic, translational and clinical research and the development of products related to emerging infectious diseases. The facility would contain core support laboratories with sophisticated facilities including high power microscopes, Magnetic Resonance Imaging (MRI) machines, and diagnostic tools to study new vaccines and drugs to treat infectious diseases.

PROJECT ALTERNATIVES

The only alternative studied in detail is the No Action Alternative. Under the No Action Alternative, the Boston-NBL at the BioSquare Research Park would not be built.

Alternative locations for the Boston-NBL were considered by BUMC during the early planning phases of the Project. Alternatives suggested during the public scoping process on the Environmental Impact Statement (EIS) include:

- Locations outside Massachusetts or lower density areas outside of Boston
- Alternative locations for the BSL-4 facilities
- Other Boston University-owned sites/facilities

The above Project alternatives are not analyzed in detail as they are technically unfeasible, provide no environmental advantage over the Proposed Action or No Action, or do not meet the purpose and need for the Project.

The only alternative to the Proposed Action discussed in detail in the Environmental Impact Statement (EIS) is the No Action Alternative.

SUMMARY OF IMPACTS

Analysis of potential impacts and mitigation measures associated with the Proposed Action and Alternatives is presented in Chapter 4, Environmental Consequences. The following is a summary of potential impacts resulting from the Proposed Action and the No Action Alternative.

SOCIAL RESOURCES

PROPOSED ACTION

The Proposed Action would not result in adverse housing or educational impacts. The existing housing supply and school systems have adequate capacity to accommodate the projected additional population growth. The Proposed Action would result in a minimal increase in traffic in the South End but would not create unacceptable conditions. The Project would include implementing traffic improvements and participation in transportation demand management activities as described in Chapter 4. Construction traffic would create temporary impacts in the project vicinity. BUMC would work closely with the Boston Transportation Department to develop a construction management plan to maximize direct access from the interstate highway system and minimize impacts on neighborhood streets to the greatest extent possible.

The Proposed Action would not create undue burdens on community safety. The existing fire, police and emergency services provided by the City of Boston are adequate to service the proposed Boston-NBL facility. BUMC would expand its security staff to ensure that the Boston-NBL facility achieves a high level of safety and security.

The Boston-NBL facility is being designed to incorporate state-of-the-art security systems as well as redundant utility systems. Continuing systems maintenance procedures would be instituted to ensure a high level of reliability of the safety infrastructure. Strict operational protocols would be imposed on laboratory personnel including specific training and background checks prior to working in the facility.

Scenarios involving terrorist, intentionally destructive acts or other malevolent acts at the proposed Boston-NBL have been analyzed in an independent Threat and Risk Assessment (TRA). Because the analysis contains sensitive information, the TRA is a confidential/official use only document. Both Boston University and NIH security personnel have reviewed the analysis and conclusions of the TRA. The design as well as security plans and procedures of the proposed Boston-NBL building address the TRA analysis and recommendations.

The overall safety record of biomedical and microbiological laboratories indicates that there is negligible risk of accidental release. However, as required, a quantitative worst-case risk analysis was conducted for the Boston-NBL BSL-4 laboratory and is presented in Chapter 4. The worst-case risk assessment involves a complete loss of containment systems at the BSL-4 laboratory that coincides with a release of anthrax spores within the facility. The results of the analysis demonstrate that the community risk resulting from the potential release of infectious agents is negligible.

Chapter 4 also includes a qualitative risk assessment including a review of the Boston-NBL proposed infectious waste handling procedures, animal containment and procedures for biological material shipment. Appendix 4 includes a summary of the safety record of

biocontainment laboratories at BUMC and the results of a survey prepared for the NIH which reviewed the safety records of BSL-4 laboratories worldwide with 20 or more years of operating experience (Johnson, 2003). Similar to the quantitative risk assessment conducted for the Boston-NBL facility, the qualitative risk assessment demonstrates that the community risk resulting for the potential release of infectious agents is negligible.

NO ACTION

Under the No Action Alternative, no additional jobs would be created and housing will be unaffected. The construction-related and long-term traffic associated with the proposed Boston-NBL facility would not be generated. The existing fire, police and emergency services would not need to accommodate the Boston-NBL facility. The Boston-NBL facility would not be constructed and the negligible risk associated with the BLS-4 laboratory would not be present.

ECONOMIC RESOURCES

PROPOSED ACTION

Construction of the proposed Boston-NBL facility would occur over a 36-month period and would generate approximately 1,300 construction jobs. Once the facility is opened, approximately 660 new positions would be created. These positions would include research technicians, safety officers, animal lab technicians, and building maintenance personnel, as well as research professionals and principal investigators. The increase in new jobs would add 0.1% to the current work force in the City of Boston. Based on current employment statistics for BUMC, approximately 244 or 37% of NBL employees would be residents of the City of Boston. The Proposed Action would have direct positive economic impacts on the City of Boston. Annual payroll associated with the facility is estimated at $33,000,000. Using the U.S. Department of Commerce Regional Input-Output Modeling System (RIMS II), the economic activity generated would be $72 million annually, of which $19.7 million would be within the City of Boston. Total economic impact of the facility, including direct, indirect and induced activity, is projected to be $130.5 million annually. Public finance revenues would increase from payroll income tax, taxes on real property purchased by employees and the BUMC payment in lieu of taxes to the City of Boston. In addition, BUMC would contribute to the City's Housing and Jobs Trust Funds.

NO ACTION

Under the No Action Alternative, the economic benefits associated with the Boston-NBL facility would not occur.

ENVIRONMENTAL JUSTICE

PROPOSED ACTION

The Project area is considered an Environmental Justice (EJ) area because the population of the area is at least 25% minority. The Project is similar in nature to the other research buildings in the area and presents no impacts which disproportionately affect disadvantaged populations.

NO ACTION

Under the No Action Alternative there would be no impacts to Environmental Justice populations.

VISUAL QUALITY

PROPOSED ACTION

The Project has been designed to complement the existing urban design context of the Project Area. The site and building design have been reviewed with the Boston Redevelopment Authority's (BRA) urban design staff as part of the design review process to assure compliance with BRA guidelines and recommendations. The building's placement on the site and treatment of the façade has projected the image of three "front doors": Albany Street to the north, the expressway to the south, and the BioSquare Research Park to the west. In addition, the facility has been configured to maximize the open space on the site and future development potential.

NO ACTION

Under the No Action alternative, the Boston-NBL facility and its associated public realm improvements would not be constructed. The site would remain an at-grade parking lot.

NOISE

PROPOSED ACTION

Construction of the Project would result in a temporary increase in daytime sound levels near the site at a level that complies with the City of Boston noise regulations. The peak noise impacts estimated for the Project would only occur for brief periods during pile driving and during the excavation period of the Project, when it is conservatively estimated that two heavy-duty vehicles would be operating simultaneously on the site. Mitigation measures would be employed as necessary to minimize the potential impact of noise generated by construction operations on all locations surrounding the Project site. Post-construction, the Project generated noise would be in compliance with City of Boston and state noise regulations.

NO ACTION

Under the No Action alternative, the noise associated with the construction and operation of the Boston–NBL facility would not occur.

AIR QUALITY

PROPOSED ACTION

Emissions would be generated during normal laboratory operations as well as from boilers and emergency generators. The laboratory exhaust system and pollution control equipment built for the Project would be designed to avoid air quality impacts inside or outside the building under normal operations. Source emissions would comply with all federal, state and local air quality standards.

NO ACTION

Under the No Action alternative, the air emissions associated with the operation of the Boston–NBL facility would not be generated.

WATER SUPPLY AND WASTEWATER

PROPOSED ACTION

The estimated average daily water usage for the Project when the facility becomes operational is 50,000 gallons per day (gpd). The South End area of Boston receives its domestic and fire protection water from an existing system of Boston Water and Sewer Commission water mains. The water itself is supplied by the Massachusetts Water Resources Authority, which has adequate capacity to service the facility.

The peak sewage flows are estimated at 45,825 gpd based on existing flows at similar BUMC labs. Sanitary sewage from the proposed Project would be carried by the New Albany Street Interceptor, which has more than adequate capacity to accommodate the Project flows.

NO ACTION

Under the No Action alternative, the water consumption and additional flows to the sewage system would not occur.

HISTORIC RESOURCES

PROPOSED ACTION

The Project is located near the South End National Register District and the South End Landmarks District. The proposed Project would meet the goal of the South End Harrison/Albany Protection Area, which is to protect the adjacent South End Landmark District, through design review of proposed projects. The Project would meet all of the

Protection Area standards and criteria for new projects and thus will not create adverse impacts to historic resources.

NO ACTION

Under the No Action Alternative, there would be no impact on historic resources.

CUMULATIVE EFFECTS

PROPOSED ACTION

The Proposed Boston-NBL and the five identified reasonably foreseeable actions would not result in any direct or indirect adverse impacts. The existing and proposed developments in the project area have been included as background assumptions for the analysis of the Proposed Action. The primary cumulative effect is in the area of transportation impacts. The transportation analysis, which was based on the total impact of the Proposed Action combined with other existing and proposed development and proposed mitigation measures, indicates that there would be no unacceptable adverse impacts. Since there are no direct or indirect effects from the reasonably foreseeable actions, the proposed Boston-NBL project would have no cumulative impacts.

NO ACTION

Since there are no direct or indirect effects, the No Action alternative would have no cumulative effects

PREFERRED ALTERNATIVE

The NIH has identified the Proposed Action as the preferred alternative.

1.0 PURPOSE AND NEED

1.1 BACKGROUND AND PLANNING CONTEXT

Following the events of September 11, 2001, the focus on national security in the United States has greatly intensified. Through the National Institutes of Health (NIH), which includes the National Institute of Allergy and Infectious Diseases (NIAID), which support broad-based programs of basic and applied research to prevent, diagnose and treat infectious and immune-mediated diseases, the Department of Health and Human Services (DHHS) is advancing biomedical research. Integral to this mission is the responsibility to conduct biomedical research aimed at addressing naturally occurring, newly emerging and re-emerging infectious diseases. The specific mandate of the NIAID in the post–September 11 national security efforts is to support research that will ultimately lead to the development of medical countermeasures in the form of therapies, vaccines and diagnostic tools to protect the country from deliberate attacks with biologic agents (Hirschberg, et al. 2004).

A lack of available and adequate research facilities is a major impediment to the study of emerging infectious diseases. As a result, many important pathogens have received little attention recently, and many have not been examined using the tools of modern science. This research deficit becomes most apparent now when there has never been a greater demand for information on the pathogens and host responses to them. Information from basic research studies is critical to the development of effective vaccines and therapies to combat infectious diseases. Such products can be developed only through understanding the basic biology of disease-causing agents. Cutting-edge discoveries in infectious disease research have resulted from NIAID programs. This proposed facility will enhance the capability of NIAID to support basic research on important pathogens. These enhanced capabilities, once in place, would have an additional benefit to the American public in that they would strengthen the nation's ability to respond to outbreaks of naturally occurring diseases. Recent outbreaks of SARS and West Nile Fever underscore the need to have an extensive and flexible infrastructure to support infectious disease research to meet the challenge of emerging diseases.

In February of 2002, NIAID, in consultation with a blue ribbon panel, developed a strategic plan for biodefense research to accomplish short and long-term goals. The NIAID strategic plan emphasizes both basic research and the application of that basic research to the development of products. The plan identified a critical need to expand the availability of national resources for biodefense research and identified a serious shortage of high-level biocontainment laboratories.

NIAID has a history of research that has had global impacts on public health improvement. This research capability allows NIAID to address unknown, future health threats associated with emerging and re-emerging infectious disease. NIAID is comprised of both intramural and extramural research areas. The Division of Intramural Research (DIR) and the Vaccine Research Center conduct intramural research. DIR conducts research in virology, biochemistry, parasitology, epidemiology, mycology, molecular biology, immunology, immunopathology, and immunogenetics, and supports clinical, patient-centered research in allergy, immunology, and infectious diseases at the NIH's Clinical Center (NIAID 2002a). NIAID supports extramural research, done by non-federal scientists in universities, medical schools, hospitals and research institutions through grants and contracts.

NIAID issued a Broad Agency Announcement (BAA) in the fall of 2002 to build national laboratories to expand the research capacity. Boston University Medical Center (BUMC), a consortium of Boston University and Boston Medical Center, submitted an application to NIAID in response to the BAA in February of 2003 and received a $128 million dollar grant award in September of 2003 to construct a National Biocontainment Laboratory (NBL). The NBL facility would be called the National Emerging Infectious Diseases Laboratories (hereinafter referred to as "Boston-NBL" or the "Project"). The Project is one of two National Biocontainment Laboratories funded by NIAID in 2003. These facilities, as well as several Regional Biocontainment Laboratories (RBLs), are being funded to help achieve NIAID's research and development mission.

The proposed Boston-NBL facility would be constructed at the BioSquare Research Park on Albany Street in the South End neighborhood of Boston across the street from the BUMC campus (see "Figure 1-1, Project Location"). The BioSquare Research Park, which is the City of Boston's only research park devoted exclusively to the life sciences sector, is located on a 14-acre site with a capacity for 2.2 million square feet of medical research facilities.

The BioSquare Research Park is immediately adjacent to the BUMC and its extensive medical, clinical and research facilities. Construction of the facility would add to the growing life science industry in the region that is supported by both the Commonwealth of Massachusetts and the City of Boston.

The Boston-NBL facility would be owned, operated and managed by the BUMC. The entity holding legal title to the site is University Associates, a Massachusetts limited partnership, the general partners of which are Univer Development Foundation, Inc. (the sole member of which is Boston Medical Center Corporation, a Massachusetts non–profit corporation), and the Trustees of Boston University, a Massachusetts non-profit, educational corporation. The Boston-NBL facility would contain state-of-the-art laboratories designed to safely find treatments and vaccines for many emerging and re-emerging diseases.

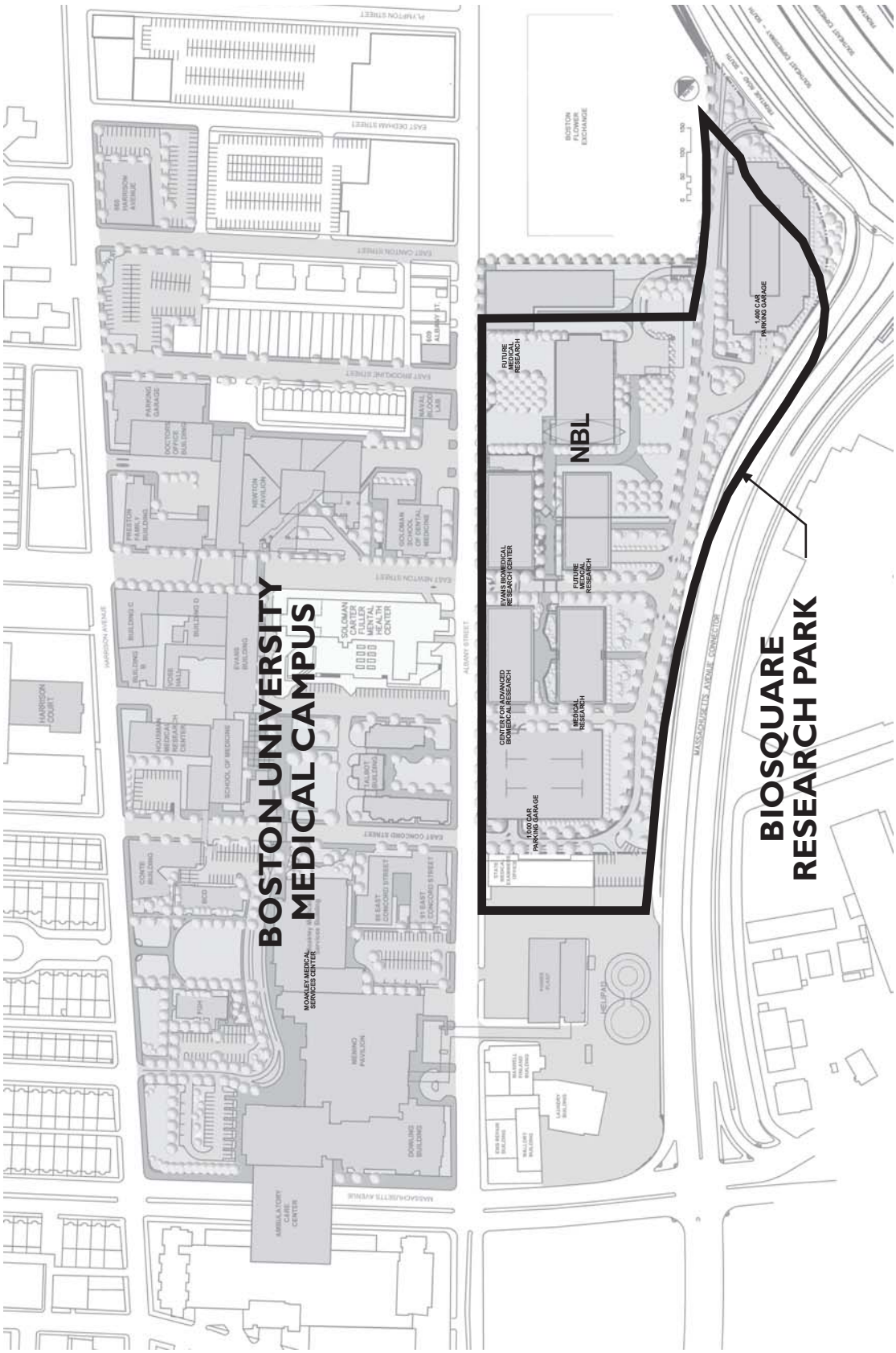

FIGURE 1-1
Project Location
source: Stubbins Associates, Fort Point Associates, Inc.

The facility would be approximately 194,000 gross square feet (sf) and constructed to the National Institute of Health's (NIH's) standards of safety. NIH safety standards include recently revised construction and design standards specific to high containment areas, redundant utility sources, extensive security and access control systems, and multiple site-specific safety, security and audit protocols that would be enforced by highly trained staff.

A major portion of the Boston-NBL would center on providing comprehensive core research facilities that would enable basic, translational and clinical research on emerging and re-emerging infectious diseases. The facility would contain core support laboratories with very sophisticated facilities including high power microscopes, Magnetic Resonance Imaging (MRI) machines, and tools to study new diagnostics, vaccines and drugs to treat infectious diseases.

As a national resource, these core research facilities at the Boston-NBL must anticipate the research needs of investigators over at least a 20-year time period and must complement existing and planned research facilities. To meet these needs, flexible core facilities devoted to a comprehensive array of research methodologies that contribute to the entire product development continuum from basic science to clinical research would be provided. The facility would support basic research to identify mechanisms of pathogenesis (origination and development of disease within body tissue) and potential targets for new diagnostics, vaccines, biologicals and therapeutics; translational research focused on identifying molecules/reagents/leads that might be useful as diagnostics, immunogens, biologicals or therapeutics; *in vivo* studies in small animals and non-human primates; and clinical studies.

Boston-NBL investigators would be able to utilize existing research space and Biological Safety Level (BSL)-2 and BSL-3 facilities located in the BioSquare Research Park. The Boston-NBL would also serve as a training facility, and would add to the region's and the nation's capacity to respond in the event of a bioterrorism threat/attack or an emerging infectious disease emergency, by providing facilities and support to first-line responders. As in all of the biomedical research facilities at BUMC, including the BioSquare Research Park, senior, experienced investigators would serve as research mentors for junior faculty, postdoctoral fellows (M.D.s and Ph.D.s) and graduate students in the biomedical sciences. All trainees would undergo intensive safety training, certification and background checks prior to their research work in the high level containment facilities.

The facility would not work on or develop biological weapons, as this is forbidden by a national security directive and international law. President Nixon, in 1969, agreed to a National Security Decision Memorandum, which renounced the use of lethal methods of bacteriological/biological warfare and ordered the destruction of all stockpiled agents. The United States signed the *Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction*, which became effective March 26, 1975 (signed by President Ford and ratified

by Congress) and remains in effect today. All research activities at the proposed facility will be carried out in strict compliance with federal, state and local regulations.

1.1.1 ORGANIZATION OF THE DOCUMENT

Chapter 1 – Purpose and Need. This chapter explains the purpose and need for the Proposed Action. It also includes a summary of public comments and issues raised during public scoping process.

Chapter 2 – Proposed Action and Alternatives. This chapter discusses and compares in more detail alternatives to the Proposed Action considered in the EIS.

Chapter 3 – Affected Environment. This chapter explains the current condition of resources that may be affected by the Proposed Action. Resources that would not be affected are identified and rationale provided as to why they will not be discussed further.

Chapter 4 – Environmental Consequences. This chapter discloses potential effects of the Proposed Action and alternatives, including direct, indirect and cumulative effects.

Chapter 5 - Response to Comments. This chapter provides copies of all comments received on the SDEIS and responses to those comments.

Literature Cited

List of Preparers

Acronyms and Glossary

Distribution List

Appendix 1 – Includes a NIAID publication that describes the need for biosafety laboratory facilities.

Appendix 2 – Identifies the characteristics of the diseases currently studied at BUMC and those which may be studied at the BUMC and Boston-NBL.

Appendix 3 – Provides a list of community meetings related to the proposed Project.

Appendix 4 – Contains information of the safety record of biocontainment laboratories.

Appendix 5 – Boston-NBL Security Program and Emergency Response

Appendix 6 – BUMC Standard Operating Procedures

Appendix 7 – High Hazard Material Management (HHMM) Policy

Appendix 8 – BUMC ICP Table of Contents

Appendix 9 – Risk Assessment Reports – September 1, 2004 and March 23, 2005

Appendix 10 – Supplemental Air Quality Analysis

Appendix 11 – Executive Summary Threat and Risk Assessment

Appendix 12 – BUMC/NEIDL Risk Assessment – September 2005

1.1.2 REQUIRED DISCLOSURES

Pursuant to the regulations that implement the National Environmental Policy Act (NEPA) found in 40 Code of Federal Regulations (CFR) 1502.16, the following are the required disclosures and where they are found in this document:

- Direct and indirect effects and their significance (Chapter 4)
- Potential conflicts between the Proposed Action and objectives of federal, state and local land use plans, policies and controls (Chapters 1 and 4)
- Potential environmental effects of alternatives (Chapter 4)
- Energy requirements and conservation, natural and depletable resource requirements and conservation and mitigation measures (Chapters 2 and 4)
- Urban quality and design and historic and cultural resources (Chapter 3 and Chapter 4)
- Mitigation to offset adverse environmental impacts (Chapters 4)

1.2 ELEMENTS OF BIOSAFETY CONTAINMENT

The three elements of containment in biosafety laboratories are laboratory practice and technique, safety equipment and facility design. The NIH and the DHHS Centers for Disease Control and Prevention (CDC) have defined four Biosafety Levels (BSL), which require different levels of containment and security based on the biological agents used and the types of research being conducted at the laboratories. While certain biological agents may require a given biosafety level, the recommended biosafety level may vary with the type of agent and type of research. The example discussed below for Hantaviruses illustrates this point.

According to the CDC, Hantaviruses are Category C biological agents (U.S. DHHS, 2002a). Category C agents are emerging pathogens that could be engineered for mass dissemination in the future because they are available, easy to produce and disseminate, and have potential for high mortality rates and major health impacts. Hantavirus pulmonary syndrome is an emerging disease. According to biosafety standards, BSL-2 practices and procedures are recommended for laboratory handling of sera with potential infections of Hantavirus pulmonary syndrome. Use of a certified biological safety cabinet is recommended for handling human body fluids when potential exists for spillage or aerosol. Potential infected tissue samples are handled in BSL-2 facilities following BSL-3 practices and procedures. Preparation and handling of viral concentrates is performed in BSL-4

containment facilities. Therefore, appropriate biosafety levels and the agent and type of research determine which procedures are to be used.

The proposed Boston-NBL facility would contain BSL-2, BSL-3 and BSL-4 labs, which, in addition to the BSL-1 designation, are discussed below and summarized in Table 1-1.

BSL-1

Biosafety Level 1 is suitable for work involving well-characterized agents not known to consistently cause disease in healthy adult humans, and which pose minimal potential hazard to laboratory personnel and the environment. The laboratory is not necessarily separated from the building's general traffic patterns and work is generally conducted on open bench tops using standard microbiological practices. Special containment equipment and/or facility design is not required. Laboratory personnel have specific training in the procedures conducted in the laboratory and are supervised by a scientist with general training in microbiology or related science.

BSL-2

Biosafety Level 2 is similar to Biosafety Level 1 for work involving agents of moderate potential hazard to personnel and the environment. These types of laboratories have laboratory personnel with specific training in handling pathogenic agents and access to the laboratory is limited when work is being conducted. Within the facility, extreme precautions are taken with contaminated sharp items and biological safety cabinets or other physical containment equipment are used in certain procedures where aerosols or splashes may occur.

BSL-3

Biosafety Level 3 is used for clinical, diagnostic, teaching, research or production facilities where work is done with indigenous or exotic agents that may cause serious or potentially lethal disease as a result of exposure by inhalation, absorption, ingestion, or injection. The laboratory has special engineering and design features, and laboratory personnel have specific training in handling pathogenic and potentially lethal agents. All procedures involving the manipulation of infectious materials are conducted within biological safety cabinets or other physical containment devices. Personnel may have additional personal protective equipment requirements, possibly including respiratory protection in some laboratories. Access is restricted to only those that have proper training and security access to work in the facility.

BSL-4

Biosafety Level 4 is required for work with dangerous and exotic agents that pose a high individual risk of laboratory infections and life-threatening disease and for which there is no vaccine and no cure. The laboratory staff has specific and thorough training in handling extremely hazardous infectious agents, the use and function of primary and secondary containment, and the standard laboratory practices and procedures. The laboratory director

Table 1-1: Biosafety Laboratory Levels

Biosafety Level	Agents	Practices	Safety Equipment	Facilities
BSL-1	Agents not generally associated with disease in healthy people	Good microbiological practice; hand washing; and no eating, drinking or gum chewing in the laboratory	Pipeting devices-mouth pipeting is prohibited	Open bench-top sink for hand washing is required
BSL-2	Agents associated with human disease	Limited lab access; most work may be performed on a bench top; biohazard warning signs; "Sharps" precautions; and biosafety manual defining any needed waste decontamination or medical surveillance policies	Class I or II Biological Safety Cabinets (BSC) or other physical containment devices and lab coats, gloves and face protection, as needed	Open bench-top sink for hand washing is required and autoclave or another approved decontamination procedure is available
BSL-3	Agents associated with human disease and which cause illness by spreading through the air (aerosol), and agents that cause diseases that may have serious or lethal consequences	BSL-2 practice plus controlled access; decontamination of all wastes; and decontamination of lab clothing before laundering	Class I or II Biological Safety Cabinets (BSCs) or other physical containment devices; protective lab clothing, gloves and respiratory protection as needed	BSL-2 plus physical separation from access corridors; self-closing, double-door access; no recirculation of exhaust air; negative airflow into laboratory and design includes back-up/redundant systems
BSL-4	Agents associated with human disease and which cause illness by spreading through the air (aerosol) or agents with an unknown cause of transmission and which also cause diseases that are usually life-threatening	BSL-3 practices plus clothing change before entering; shower on exit; and all material decontaminated on exit from facility	All procedures conducted in Class III BSCs or Class I or II BSCs in combination with full-body, air-supplied, positive-pressure personnel suit	BSL-3 plus separate building or isolated zone; dedicated supply and exhaust, vacuum, and decontamination systems; design includes back-up/redundant systems

Source: U.S. Department of Health and Human Services, 2004.

strictly controls access to the laboratory, which is either in a separate building or in a controlled secured area within a building completely isolated from all other building areas. A special training program for staff is required, including training on the personal protective equipment (positive pressure suit). A specific facility operations manual is prepared or adopted.

1.3 PURPOSE AND NEED FOR ACTION

The Proposed Action is to partially fund the construction of the Boston-NBL facility at the BioSquare Research Park in Boston, Massachusetts. The Boston-NBL facility would be a highly secure biocontainment laboratory that would support basic, translational and clinical research on vaccines and hazardous biological agents. The 194,000 sf facility would be located on the BUMC campus in Boston, MA and would house state-of-the-art BSL-4 biocontainment laboratories and the necessary associated BSL-2 and BSL-3 laboratories, animal facilities, insectary facilities, clinical facilities and research support space. The facility would serve as a national resource for conducting clinical and laboratory (in vitro and in vivo) research and testing on hazardous biological agents in support of the NIAID's biodefense agenda.

The NIAID is a component of the NIH, an operating division of the DHHS, and supports basic and applied research to prevent, diagnose and treat infectious and immune-mediated illnesses, including Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) and other sexually transmitted diseases, tuberculosis, malaria, autoimmune disorders, asthma and allergies. The overall objective of NIAID's NBL construction program is to provide funding to design, construct and commission comprehensive, state-of-the-art Biosafety Laboratories (BSLs) including BSL-4, BSL-3 and BSL-2 laboratories, as well as associated research and administrative support space (see Appendix 1, "The Need for Biosafety Laboratory Facilities", prepared by NIAID, February 2004).

The Boston-NBL facility would include state-of-the-art BSL-2, BSL-3 and BSL-4 laboratories as well as associated research and administrative support space (see Appendix 2, Characteristics of Diseases studied at BUMC and which could be studied at BUMC and the Boston-NBL). The BSL-2 and BSL-3 laboratories would be similar to those already on the BUMC campus and the proposed BSL-4 laboratory, which would comprise approximately 16% of the total assignable space at the Boston-NBL, would be designed and built in compliance with federal standards. The BSL-4 laboratory would incorporate special engineering and design features to prevent microorganisms from being released into the environment, and safety and decontamination features would provide multiple layers of protection for the surrounding environment. The proposed laboratory would be owned and operated by BUMC, managed by BUMC personnel, and would meet the most stringent security and safety guidelines.

1.4 SCOPE

The scope of the Environmental Impact Statement (EIS) is established by the purpose and need for the Project and by DHHS procedures and authority. The scope consists of the range of actions, alternatives, environmental issues, impacts and mitigation measures to be considered and discussed in the EIS. The scope of this EIS complies with the NEPA regulations in 40 CFR 1508.25. The document evaluates the direct, indirect and cumulative effects of the Proposed Action on the existing environment (see Chapter 4, Environmental Consequences).

The document evaluates two alternatives – Proposed Action and No Action. Other alternatives, which were not considered feasible, are also described (see Chapter 2, Proposed Action and Alternatives).

1.4.1 IMPACTS

The regulations of the Council on Environmental Quality (CEQ) in 40 CFR 1508.25(c) require analysis of direct, indirect and cumulative impacts. Direct impacts are caused by the action and occur at the same time and place. Indirect impacts are caused by the action and occur later in time or farther removed in distance, but they are still reasonably foreseeable. Cumulative impacts result from incremental impact of the action when added to other past, present and reasonable foreseeable future actions.

1.4.2 ALTERNATIVES

The NIH must consider three types of alternatives to determine the scope for analysis (40 CFR 1508.25(b)): no action, other reasonable courses of action and mitigation measures. Other reasonable courses of action include alternatives that meet the stated purpose and need. Alternatives are discussed in Chapter 2. Impacts of the No Action Alternative, which would maintain the existing conditions, are also considered.

1.4.3 CONNECTED, CUMULATIVE, AND SIMILAR ACTIONS

The CEQ regulations at 40 CFR 1508.25 address the scope of analysis and elements to be considered in a Proposed Action. The regulations recognize that separate activities can combine and interact to create impacts that may be significantly beyond the effects of individual actions. These actions are considered cumulative and their additive effects must be addressed in the analysis.

Federal regulations also require a combined analysis of connected actions. Connected actions are closely related and 1) automatically trigger other actions, 2) could not or would not proceed unless other actions are taken previously or simultaneously and 3) are interdependent parts of a larger action and depend on the

larger action for their justification. The effects of connected actions are analyzed together. Similar actions are those that share a common timing or geography and are evaluated together.

The CEQ regulations implementing NEPA require consideration of environmental effects and prescribe mitigation where practical to limit those effects.

1.5 NEPA PUBLIC SCOPING AND ENVIRONMENTAL REVIEW PROCESS

This Environmental Impact Statement (EIS) has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969, regulations of the CEQ in 40 CFR 1500-1508, and the NEPA compliance procedures of the DHHS found in the General Administration Manual, Part 30 (Environmental Protection). The comments received on the Supplemental Draft EIS were used to scope the development of this Final EIS.

NEPA does not require preparation of a programmatic EIS for NIAID's overall NBL and RBL program, as each project represents an independent undertaking located in geographically dispersed areas with no common cumulative impacts. The NIAID grant award to BUMC for the Boston-NBL facility requires, and is contingent upon, compliance with NEPA. NEPA allows planning and design activities to proceed during the EIS preparation. This allows projects to be sufficiently well defined so that impacts can be assessed. The NIH will decide whether or not to partially fund the construction of the Boston-NBL Project based on the environmental analysis contained in this EIS and review and consideration of public comments.

On January 9, 2004, the NIH published its Notice of Intent to prepare an EIS on the proposed Boston-NBL in the Federal Register. Publication of the Public Notice initiated the NIH scoping activities. On February 9, 2004, the NIH published notice of a public scoping meeting and an extension of the comment period in the Federal Register. A Public Scoping Meeting was held at historic Fanueil Hall in Boston on Tuesday, February 17th from 7:00 PM to 10:00 PM.

Comments were provided during the extended public scoping period, which began on January 9, 2004 and ended on March 2, 2004. Of those comments, 52 members of the public provided oral testimony at the Scoping Meeting and 37 written comments were submitted. Commentors identified issues that are addressed in the EIS as discussed in Section 1.7 below. A summary of the issues raised during the scoping period is found in Table 1-2, Summary of Scoping, Draft EIS and Supplemental Draft EIS Comments.

The NIH filed a Draft EIS with the U.S. Environmental Protection Agency (EPA) on October 15, 2004. On October 22, 2004, the EPA published notice that the Draft EIS had been filed, was available for public review and comment and that a public meeting was scheduled for November 10, 2004. The public meeting was held at historic Fanueil Hall in Boston on Wednesday, November 10th, 2004 from 7:00 PM to 9:00 PM.

Comments were received during an extended 75 day public comment period, which began on October 22, 2004, and ended on January 3, 2005. Forty seven members of the public provided oral comments at the public meeting and 24 written comments were submitted. A summary of the Draft EIS comments is found in Table 1-2, Summary of Scoping, Draft EIS and Supplemental Draft EIS Comments.

NIH filed a Supplemental Draft EIS with the U.S. Environmental Protection Agency (EPA) on March 25, 2005. On April 1, 2005, the EPA published notice that the Supplemental Draft EIS had been filed, was available for public review and comment and that a public meeting was scheduled for April 25, 2005. The public meeting was held at historic Fanueil Hall in Boston on Monday, April 25th, 2005 from 7:00 PM to 9:00 PM.

Comments were received during an extended 48 day public comment period, which began on April 1, 2005 and ended on May 18, 2005. Fifty one members of the public provided oral comments at the public meeting, of which 29 were in favor of the project. One hundred and fifteen written comment letters were submitted, of which 68 were supportive of the project. Many commentors identified issues that were already addressed in the Draft and/or Supplemental Draft EIS. Others raised new comments, as discussed in Section 1.7 below. Additional information is included in the Final EIS based on comments on the Supplemental Draft EIS. A summary of the Supplemental Draft EIS comments is found on Table 1-2, Summary of Scoping, Draft EIS and Supplemental Draft EIS Comments.

To continue the Boston-NBL EIS process a 30 day waiting period will follow the publication of the Notice of Availability of the Final EIS (FEIS) in the Federal Register. The NIH will then consider all comments on the FEIS and prepare a Record of Decision approving or denying the Proposed Action.

A list of representative federal, state and local agencies with environmental regulatory responsibility for the project is found on Table 1-3, Representative Agencies with Regulatory Responsibilities, and a list of federal, state and local authorities with regulatory oversight responsibilities for the facility is found in Table 1-4, Existing Regulatory Oversight.

Table 1-2: Summary of Scoping, Draft EIS and Supplemental Draft EIS Comments

Comments	Issue Category	Ch. Addressed in FEIS
	COMMENTS FROM SCOPING	
44	Human Health and Safety (risk to public)	Ch. 4
35	Public Information	Ch. 1
32	Safety and emergency response	Ch. 2 & 4
31	Alternatives to Proposed Action	Ch. 2
27	Socio/Economic Issues	Ch. 3 & 4
26	Risk Assessment – Outside Threats	Ch. 4
20	Risk Assessment - Transportation	Ch. 4
18	Environmental Justice	Ch. 3 & 4
12	Regulatory Compliance	Ch. 1
4	Traffic and Transportation	Ch. 3 & 4
3	No Action Alternative	Ch. 2
2	Waste Management and Pollution Prevention	Ch. 2, 3 & 4
2	Historic / Cultural Resources	Ch. 3 & 4
1	Outside scope of EIS	Ch. 2
1	Air Quality	Ch. 3 & 4
1	Cost/Benefit Analysis	Ch. 3 & 4
	COMMENTS ON DRAFT EIS	
14	Cumulative Impacts	Ch. 4
5	Safety Record	Ch. 2 & 4
33	Risk Assessment model and assumptions	Ch. 4
8	Transportation of Agents	Ch. 3 & 4
16	Environmental Justice	Ch. 3 & 4
14	Community Relations	Ch. 1 & 4
21	Alternative Site Analysis	Ch.2
19	Emergency Response	Ch. 2 & 3
12	rDNA research	Ch. 2
10	Outside of Scope of EIS	Ch. 2
	COMMENTS ON DRAFT SUPPLEMENTAL EIS	
49	Safety, Security, and Emergency Response	Ch. 2 & 4
101	Risk Assessment	Ch. 4
12	Transportation of Agents	Ch. 3 & 4
9	Environmental Justice	Ch. 3 & 4
20	Community Relations	Ch. 1 & 4
32	Alternatives	Ch. 2
36	Socio/Economic Issues	Ch. 4
7	rDNA research	Ch. 2
15	Tularemia	Ch. 2 & 4
13	Waste Management and Pollution Prevention	Ch. 4

Table 1-2: Summary of Scoping, Draft EIS and Supplemental Draft EIS Comments (cont.)

Comments	Issue Category	Ch. Addressed in FEIS
1	Cumulative Impacts	Ch. 4
60	Regulatory Compliance	Ch. 1 & 3

Table 1-3: Representative Agencies with Regulatory Responsibilities

FEDERAL	**Permit/Approval**
Federal Aviation Administration	Notice of Air Hazard
Environmental Protection Agency	NPDES Construction Stormwater General Permit
Environmental Protection Agency	NEPA Compliance
Department of Health and Human Services	NEPA Compliance
Council on Environmental Quality	NEPA Compliance
Occupational Safety and Health Administration	Construction Safety
Nuclear Regulatory Commission	Radioactive Materials License
STATE	
Massachusetts Environmental Policy Act Office	Environmental Impact Review
Massachusetts Historical Commission	Determination of No Adverse Effect
Massachusetts Water Resources Authority	Industrial Wastewater Discharge Permit
Department of Environmental Protection	Notification of Construction/Demolition
	Sewer Connection Permit
	Air Plan Approval Permit
	Massachusetts Contingency Plan
Massachusetts Highway Department	Highway Access Permit
LOCAL	
Boston Redevelopment Authority	Article 80 Large Project Review
	Cooperation Agreement
	Master Plan PDA Approval
Inspectional Services Department	Building Permit
Boston Civic Design Commission	Recommendation Pursuant to Article 80 Review
Boston Committee on Licenses	Flammable Storage Permit
Boston Department of Public Works	Street Occupancy and Sidewalk Permits
Boston Fire Department	Fire Safety Approvals
Boston Public Health Commission	RDNA Project Registration
South End Landmark Commission	Harrison/Albany Protection Area Design Approval
Boston Transportation Department	Transportation Access Plan Agreement
	Construction Management Plan
Boston Water and Sewer Commission	Site Plan Approval/Sewer Connection Permit
Public Improvements Commission	Various approvals for work in public ways

Table 1-4: Existing Regulatory Oversight

	Inspection	Close Lab or Operation	Permit or Approval	Design Construction Review	Penalty Authority	Siting
Federal						
Centers for Disease Control	●	●	●	●	●	
U.S. Department of Transportation	●	●	●		●	
Occupational Safety and Health Administration	●	●			●	
U.S. Environmental Protection Agency	●	●	●	●	●	
National Institutes of Health			●	●		●
Nuclear Regulatory Commission	●	●	●		●	
U.S. Department of Agriculture	●	●	●	●	●	
State						
Massachusetts Environmental Policy Act Office			●	●		●
Massachusetts Department of Public Health	●	●	●		●	
Massachusetts Department of Environmental Protection	●	●	●	●	●	
Massachusetts Water Resources Authority	●	●	●	●	●	
Local						
Boston Public Health Commission	●	●	●		●	
Boston Fire Department	●	●	●	●	●	
Boston Water and Sewer Commission	●	●	●	●	●	
Boston Redevelopment Authority			●	●		●
Boston Zoning Commission			●			●
Boston Inspectional Services	●	●	●	●	●	

1.6 PUBLIC PARTICIPATION

In addition to the required NEPA public review process described in Section 1.5 above, BUMC has made an institutional commitment to informing and educating the public about the proposed Boston-NBL facility. Comments from the community have indicated positive support as well as opposition to the Project. In 2004, BUMC established the Biosafety Laboratory Advisory Group (B-LAG) to serve as a forum for community input and feedback on the Boston-NBL facility. Comprised of 21 community members from the Dorchester (2), Roxbury (4), South End (13) and South Boston (2) neighborhoods, the B-LAG membership includes both supporters and opponents of the Project. Facilitated by the Director of Community Relations at BUMC, the group assists in identifying key topics of interest and concern for community stakeholders. The meeting discussions are based on member concerns and questions surrounding protocols and systems for biosafety laboratories in general. For example based on requests from the committee members, BUMC representatives hosted B-LAG members on a site visit of biosafety level 2 and biosafety level 3 laboratories located on the Boston Medical Center campus.

Community input on the development of the Boston-NBL facility has also been sought from the existing Project Advisory Committee (PAC). The Boston-NBL facility is proposed to be located within the BioSquare Research Park, an area that was designated by the Boston Redevelopment Authority for the development of medical research uses in the early 1990s. The PAC was established by the City of Boston in 1991 to strengthen community participation in the public process for the BioSquare Research Park. Its members are charged with advising the City, the Boston Redevelopment Authority and BUMC on activities proposed for the campus. The PAC is currently convened on an as needed basis by the Boston Redevelopment Authority at the City of Boston to discuss development projects and master planning efforts affecting the BioSquare and BUMC campuses. BUMC will continue to work with the PAC to discuss and identify issues for the proposed development of the Boston-NBL facility within the context of the BioSquare Research Park.

In the winter of 2005, the Boston-NBL was adopted by charter as an Institute at Boston University. The National Emerging Infectious Diseases Laboratories Institute will be housed at the Boston University Medical Campus and headed by a Director. The governance structure for the facility includes several committees, including those that provide external scientific and community oversight of the operations at the lab. The Executive Committee advises the Director of the NEIDL Institute on the scientific research and operational activities of the Boston-NBL and includes one community member as an appointee. In addition, a Community Liaison Committee (CLC) comprised of six committee members who are not employed by Boston University or Boston Medical Center will review projects and activities of the Boston-NBL and assist the Director and other committees as needed to ensure effective communication on programs and activities involving the Boston-NBL and

the community. Going forward, the CLC will replace the B-LAG during construction and operation of the Boston-NBL. Finally, the External Scientific Advisory Committee, which will review all proposed research projects, will include a representative of the Boston Public Health Commission.

In all, more than 150 community meetings have been held in the Dorchester, Roxbury, and South End neighborhoods to provide factual information, answer questions and respond to concerns. These meetings have been supplemented by other forums, including briefings with federal officials, state legislators and agencies such as the Governors Office and Public Safety departments and representatives from the City of Boston including the City Council. Appendix 3 provides a list of some of the meetings held since filing the grant application for the Boston-NBL facility with the NIH in February of 2003.

A variety of other strategies and mediums have been employed to facilitate community exchange and input on the Boston-NBL. To ensure that interested residents understand the purpose, intent and programming for the facility, BUMC began supplementing the broad community-wide meetings. Breakfast Briefings were held to provide a basic orientation and overview of the research that will take place at the Boston-NBL and to provide opportunities to ask questions and get answers. Generally held on the Boston University Medical Campus, key researchers and safety and security personnel were made available to answer both general and more detailed questions in a small-group format. To date, more than 3,100 community residents have been invited to attend one of the more than twenty Breakfast Briefings held.

In addition to the Breakfast meetings, open Office Hours were hosted at different locations and times throughout the Dorchester, Roxbury, and South End neighborhoods. Held on a monthly or bi-monthly basis with representatives from BUMC's medical research and security staff, Office Hours provide community residents with one-on-one opportunities to learn more about the Boston-NBL. Upcoming Office Hours are advertised in local community newspapers. To date, three Office Hours have been held in the Roxbury neighborhood, three have been held in the South End, and one has been held in Dorchester.

Outreach efforts have gone beyond regular meetings to engage community residents in fact-finding activities that provide first-hand knowledge and understanding of research in biosafety laboratories and career opportunities in the biotechnology industry.

In addition to hosting community members on a tour of an Atlanta, Georgia, BSL-4, in January 2005 BUMC, Boston University and Boston Medical Center hosted the 1st Annual campus-wide job/training fair to showcase the diversity of employment opportunities available at the University's Medical and Charles River campus locations and at the medical center. Representatives from City Lab Academy, an entry-level training program for lab

technicians, were on hand to field questions about career opportunities and training in the biotechnology field.

In all, BUMC has conducted, and will continue to conduct a comprehensive public information program to facilitate access and understanding of the Boston-NBL. In addition to the activities above, Information Repositories were created to house Project materials and other relevant documents related to the development of the lab at easily accessible locations. Repositories are located at the Boston, Dudley, Roxbury and South End branches of the Boston Public Library and project overviews have been translated into Spanish and placed at each of the four local repositories.

The website for the Boston-NBL was redesigned with the goal of serving as a more useful and user-friendly tool for those interested in learning more about the project and providing feedback on the same. Between September and December of 2004, website announcement postcards and informational brochures were mailed to more than 3,100 households. Key project documents, including the Final Environmental Impact Statement prepared by the National Institutes of Health, will be made available for download electronically at www.bostonbiosafety.com.

Media and print advertising, particularly on public transit and in local community newspapers, television and radio, have been a key component of BUMC's outreach efforts as it relates to both the development of the Boston-NBL and the institution's presence as a good neighbor in the community. In the fall of 2004, BUMC launched "Health Matters", a weekly 15-minute radio show devoted to discussion of matters that affect and impact the community's health and showcasing the institutional resources that are available to address these. A few of the radio segments have dealt more directly with emerging and reemerging infectious diseases and the proposal to build the Boston-NBL facility.

In summary, input from the community outreach process revealed community concerns centered around five key areas: 1) transparency and access to information; 2) safety and security planning; 3) transportation of infectious agents; 4) emergency response; and 5) access to jobs and training. In response to these concerns, BUMC has expanded its public information process, enhanced and refined the safety and security operations for the Boston-NBL facility including updating its Emergency Response and High Hazard Materials Management Policy (see Appendix 7) and made significant community commitments to create jobs and sponsored job training initiatives. For example, resident concerns over transportation of infectious agents through residential streets led to a revised transportation policy that gives BUMC flexibility to hire dedicated drivers and carriers. In addition, BUMC has committed to invest $1 million for job training scholarships in the biomedical research and biotechnology fields for 105 local City of Boston residents.

1.7 IDENTIFICATION OF ISSUES

As mentioned in Section 1.5 above, 52 comments on the EIS Scope were received orally at the public meeting and an additional 37 comments were submitted in writing. Forty-seven comments were received orally at the public meeting on the Draft EIS and an additional 24 comments were received in writing. Fifty-one comments were received orally at the public meeting on the Supplemental Draft EIS and an additional 115 comments letters were received. Several issues were raised during the Supplemental Draft EIS process, some of which were already raised during the Scoping and Draft EIS processes. The issues included: Project alternatives; safety, security, emergency response and risk assessment; transportation; socio-economic; environmental protection, including waste management and pollution prevention; environmental justice; regulatory compliance; and cumulative impacts as described below.

1.7.1 ALTERNATIVES

Many of the comments on the Scope and Draft EIS related to alternatives including: alternative locations outside of Massachusetts or in lower density areas outside of Boston; alternative locations for the BSL-4 laboratory component; and alternative locations at sites owned by Boston University. Chapter 2 discusses alternatives to the Proposed Action.

1.7.2 SAFETY/RISK ASSESSMENT/EMERGENCY RESPONSE

There were several comments relating to the modeling and assumptions used in the worst case analysis presented in the Draft EIS. Other comments were made regarding the accuracy of the BUMC and NIH safety records presented in Appendix 4 of the Draft EIS and questions regarding BUMCs emergency response program. Chapter 2 outlines the safety and security program for the Boston-NBL facility that ensures the facility would be operated in strict conformance with the governing federal safety regulations. Concerns over the safety of transporting agents to the facility were also raised, and are also addressed in Chapter 2. Chapter 4 includes a "worst case" analysis utilizing three different quantitative models to evaluate the risk from the loss of containment systems of the BSL-4 laboratory. Appendix 12 includes an additional risk assessment prepared by NIH.

1.7.3 TRANSPORTATION AND PARKING

Managing transportation impacts was a concern raised in the comment letters, including traffic generation, use of public transit and parking. Analysis of transportation impacts is provided in Chapter 4.

1.7.4 SOCIO ECONOMIC

Socio-economic issues mentioned include the Project's effect on the South End including both gentrification and adverse impact on property values, as well as quality of life issues. Additional discussion is provided in Chapter 4.

Finally, questions regarding the adequacy of the proposed community benefits were raised. Chapter 4 discusses the proposed community social and economic benefits.

1.7.5 ENVIRONMENTAL PROTECTION

Environmental Protection issues focused on waste disposal and pollution prevention, which is discussed in Chapter 2.

1.7.6 REGULATORY COMPLIANCE

Regulatory compliance issues focused on compliance with rDNA research regulations and a further understanding of laboratory safety issues surrounding the recent tularemia exposures at a research laboratory. Discussion of these issues may be found in Chapters 2, 4, and 5.

1.7.7 ENVIRONMENTAL JUSTICE

Several commenters also raised Environmental Justice as an issue, stating that the Project is proposed in an area with large minority populations. The federal government has a policy relating to environmental justice. Chapter 3 describes the criteria used to designate Environmental Justice neighborhoods and Chapter 4 describes the Project's environmental consequences on those neighborhoods.

The U.S. EPA comments on the Draft EIS suggested that the area defined for analysis of Environmental Justice issues should be expanded and that a description be provided of the public outreach efforts to date. The area of analysis for Environmental Justice issues has been expanded to include a one-mile radius, including all of the South End and portions of South Boston, Roxbury, Dorchester, Chinatown, Back Bay and Kenmore/Fenway. Baseline conditions are described in Chapter 3 and Project impacts are described in Chapter 4. As mentioned in Section 1.6 above, BUMC will continue to engage the entire community, including people of color and low-income members, through meetings, discussions and other forms of outreach and to respond to community needs and concerns.

1.7.8 CUMULATIVE IMPACTS

The U.S. Environmental Protection Agency requested that more information be provided on the cumulative impacts of the Project in combination with other projects currently being developed in the area. Chapter 4 addresses the cumulative impacts of the Proposed Action and other reasonably foreseeable actions.

1.8 ISSUES OR CONCERNS OUTSIDE THE SCOPE OF THE EIS

The following comments made during the initial scoping process and/or the comment period on the Draft EIS were determined to be outside the scope of the analysis as the issues are not relevant to the decision, affected by the proposed action, within the analysis area, or already decided by law or policy.

- Programmatic EIS for NIAID's proposed national NBL and RBL construction program. A Programmatic EIS is not necessary to assess the potential environmental impacts of the various biodefense facilities proposed to be either constructed by the NIH itself or partly funded by the NIH. The various proposed biodefense facility projects are not located in the same geographic region, and the proposed projects' potential impacts are neither synergistic nor cumulative. The various projects are not so interrelated or connected that their possible environmental impacts cannot be considered independently. Moreover, the NIH's approval of one project does not commit the agency to approve the other projects. As required by NEPA, the NIH is conducting an environmental review for the various biodefense facilities.

- Statements in support or in opposition to the Proposed Action. Such comments will be considered in the decision making process on this EIS.

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2.0 PROPOSED ACTION & ALTERNATIVES

2.1 INTRODUCTION

The Proposed Action is to partially fund the construction of the National Emerging and Infectious Diseases Laboratories at the BioSquare Research Park in the South End neighborhood of Boston, MA. As required under the NEPA regulations, the following sections describe the reasonable alternatives that were evaluated, alternatives that were eliminated from further consideration and the process used to determine the Proposed Action.

The two reasonable alternatives that are evaluated below include the Proposed Action involving partial funding of the construction of an NBL facility by the National Institutes of Health (NIH) at the BioSquare Research Park in Boston, and the No Action. The No Action Alternative is included in accordance with Council of Environmental Quality (CEQ) regulations (40 Code of Federal Regulations (CFR) 1502.14(d)) and creates a baseline against which to compare other alternatives. Under the No Action Alternative, the Boston-NBL at the BioSquare Research Park would not be built. The No Action Alternative does not serve the purpose and need of the Project.

Other alternatives not considered reasonable include alternative locations outside of Massachusetts or lower density areas outside Boston; alternative locations for the BSL-4 laboratory component and alternative locations at Boston University-owned sites. These alternatives are discussed in Section 2.3 below.

2.2 PROPOSED ACTION

2.2.1 LOCATION

The proposed Boston-NBL facility site is located in the BioSquare Research Park (see "Figure 2-1, Project Area Context"). The facility's location in the BioSquare Research Park, which is adjacent to the Boston University Medical Center (BUMC) campus and within the Greater Boston academic hub, would allow for dynamic collaborations among investigators at multiple research entities such as the Boston University School of Medicine, Harvard Medical School, Massachusetts Institute of Technology, Massachusetts General Hospital, Brigham and Women's Hospital, University of Massachusetts Medical Center, the Massachusetts Biological Laboratories, Tufts University, New England Medical Center, Brandeis University and others.

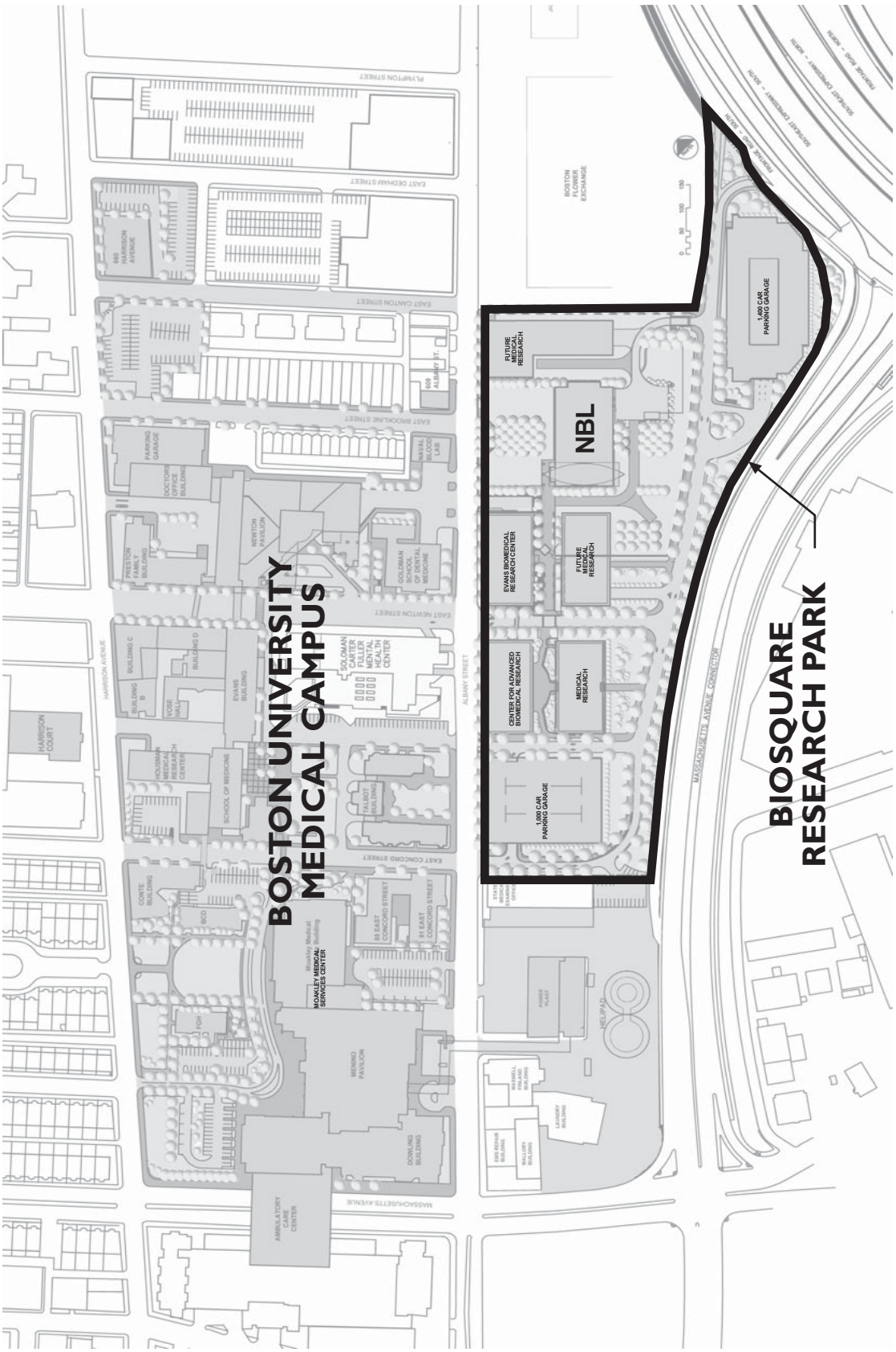

FIGURE 2-1
Project Area Context
source: Stubbins Associates, Fort Point Associates, Inc.

"Figure 2-2, BioSquare Research Park", shows the location of the proposed Boston-NBL facility including the parcel boundary. The proposed facility would be constructed on an approximately 3.4-acre parcel of land.

The building would be situated on the site surrounded by an anti-scale fence that allows for controlled access at staffed checkpoints for both vehicles and pedestrians and to create setbacks of approximately 150 feet from any location that could accommodate unchecked vehicles and 100 feet from areas that could accommodate unscreened pedestrian traffic. Vehicular access would be strictly limited to BUMC vehicles and selected delivery and service vehicles. The service and loading area would be located on the south side of the facility within the secure perimeter. Pedestrian access to the building would be limited to a single entrance and security officers would be assigned to provide protective services at the site twenty four hours a day, monitoring both the building and grounds (see "Figure 2-3, Site Plan Safety Features").

2.2.2 BUILDING PROGRAM

The Boston-NBL facility would contain approximately 194,000 gross square feet (sf) of state-of-the-art BSL-2, BSL-3 and BSL-4 laboratories as well as associated research and administrative support space. The high-level containment labs would be designed and built using the strictest federal standards, incorporating special engineering and design features to prevent microorganisms from being released into the environment (see "Figure 2-4, Conceptual Laboratory Design and Safety Features").

The building would be approximately 126 feet in height with four stories of occupied biomedical research space and three stories of mechanical/building support space. The building program would include high-level containment BSL-4 modules. The BSL-4 modules would support work with live agents for tissue culture, antigen production, and in-vivo studies. The three modules would each include procedure space such as centrifuge and isolation areas; support space such as suit rooms and decontamination showers; and animal holding space. A discussion of the building program follows and is summarized in Table 2-1, Boston-NBL Building Program.

2.2.2.1 LABORATORIES

BSL-4 core laboratory space would incorporate the most technologically advanced scientific equipment for infectious disease research in a high containment environment. The BSL-4 modules would support research on agents with no known prevention or treatment and those found in animals that may cause human infection. All of these agents are found on the Centers for Disease Control and Prevention (CDC) select agent list.

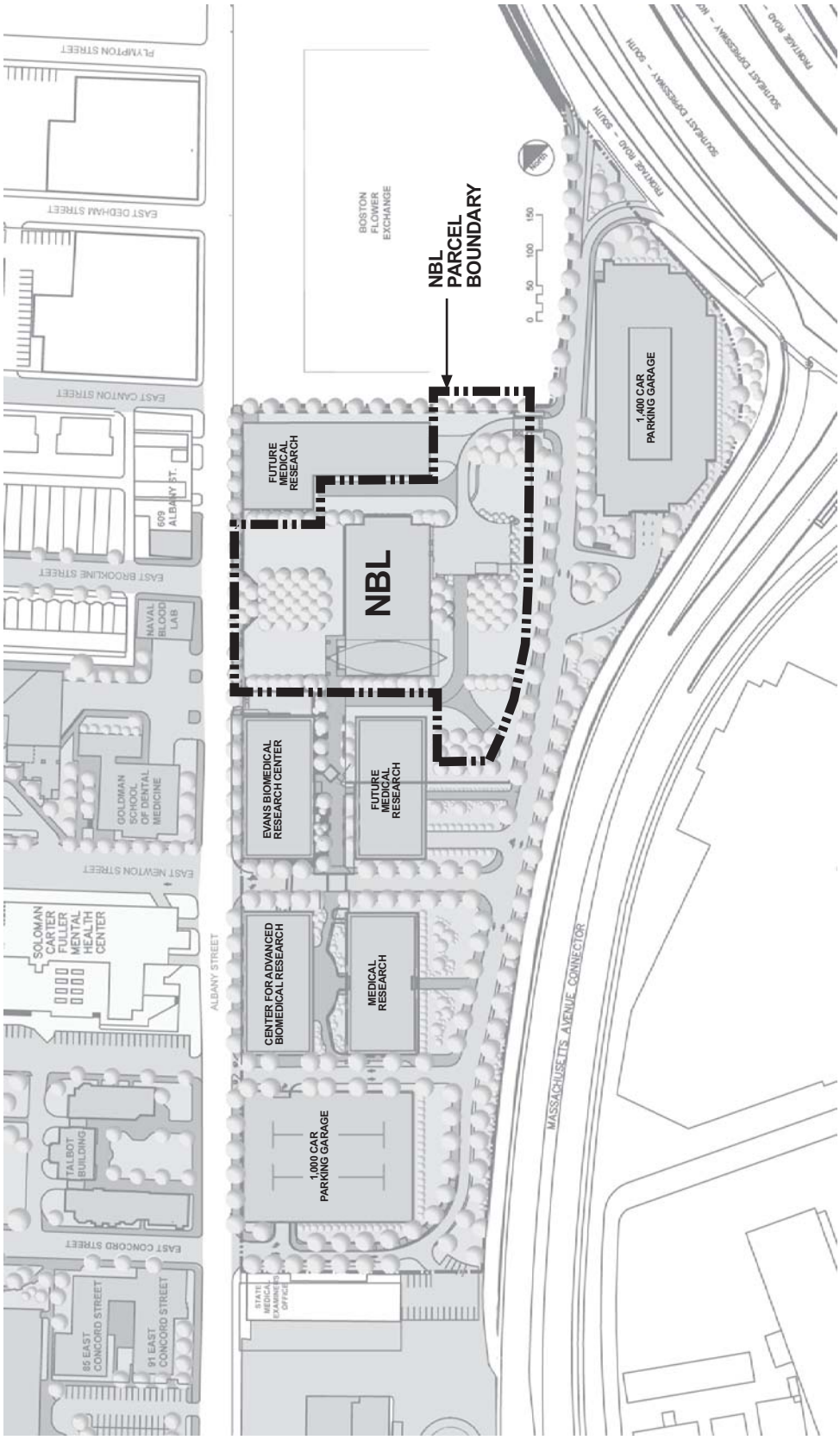

FIGURE 2-2
BioSquare Research Park
source: Stubbins Associates, Fort Point Associates, Inc.

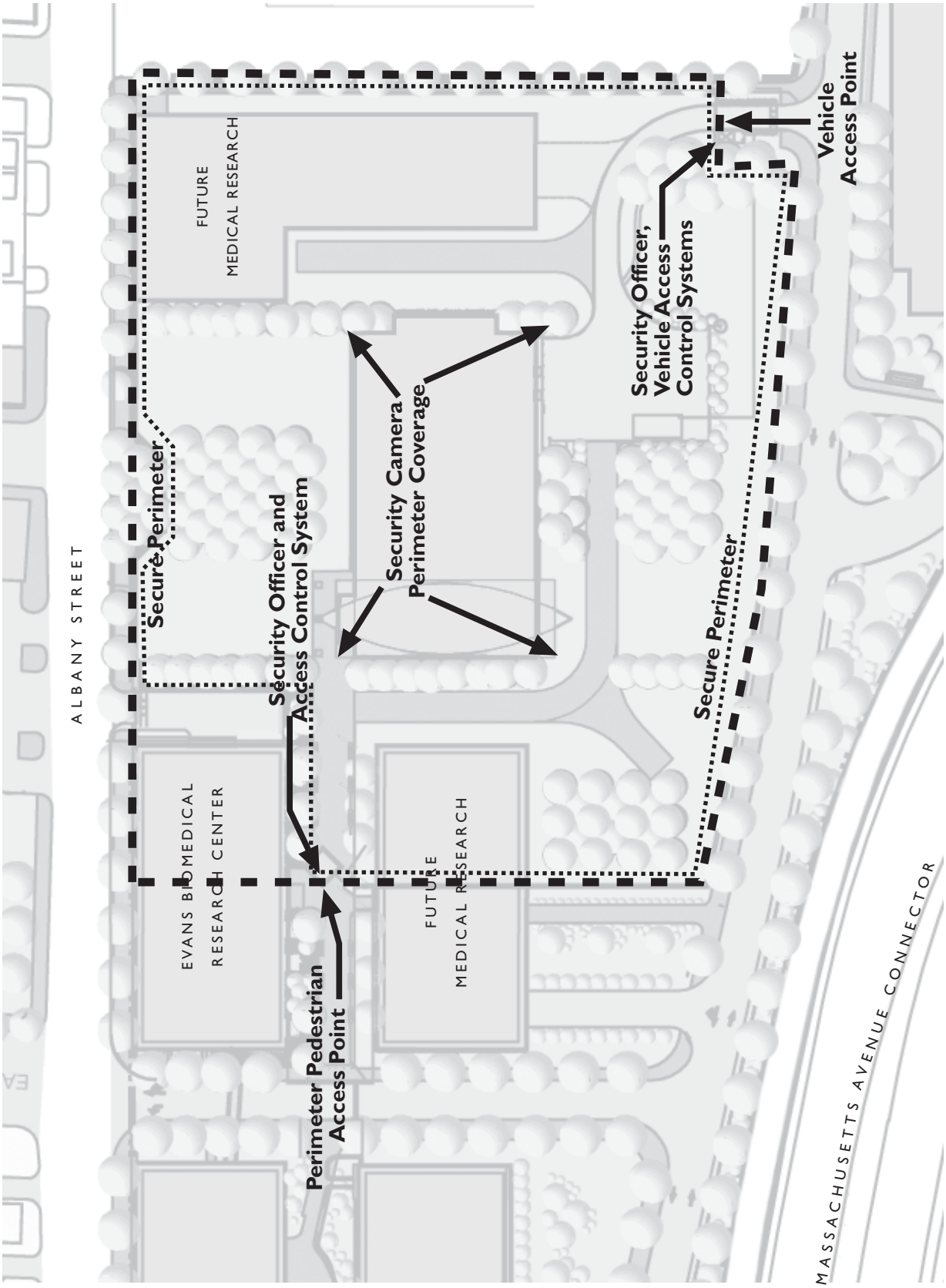

FIGURE 2-3
Site Plan Safety Features
source: BUMC Operations and Public Safety

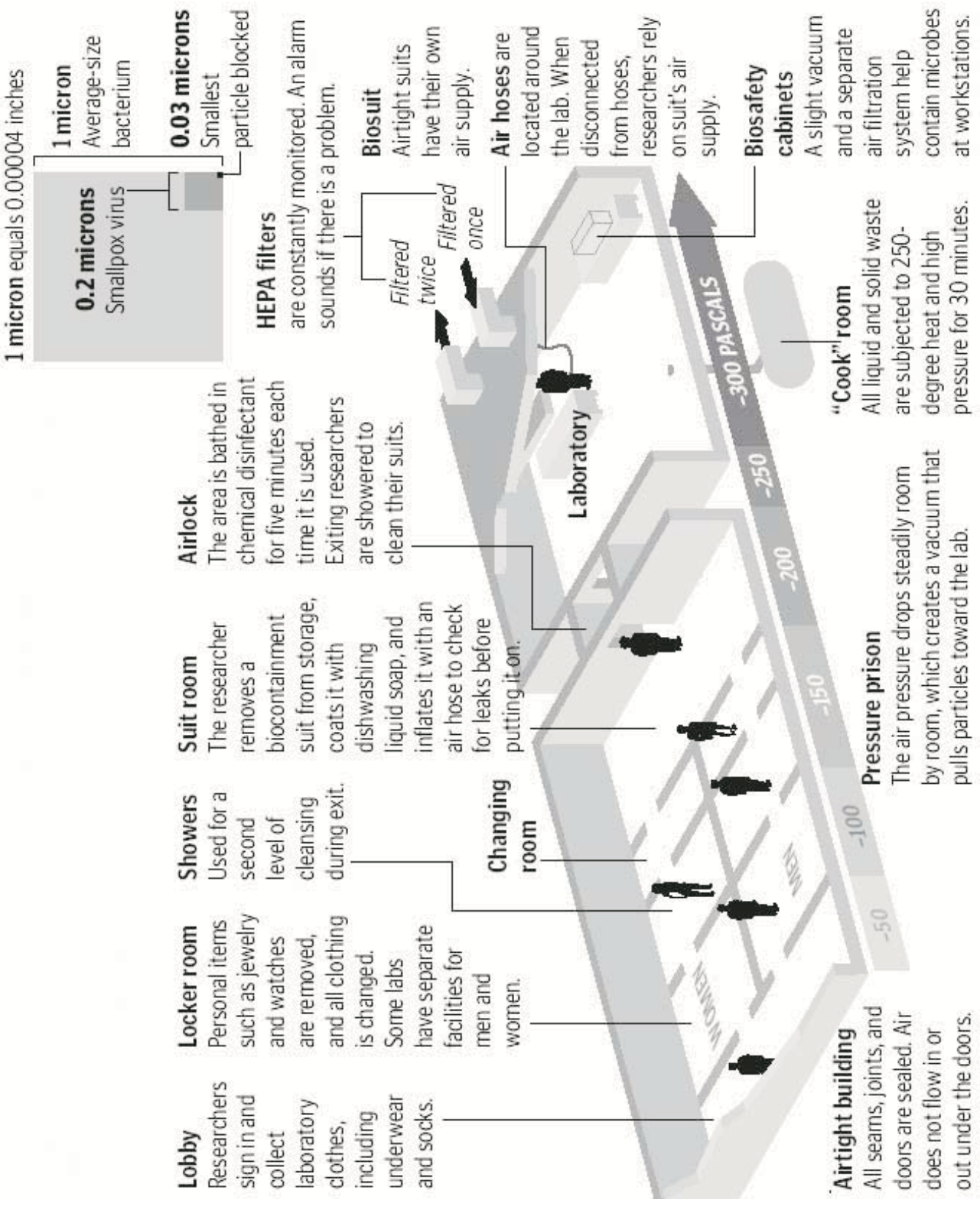

FIGURE 2-4
Conceptual Laboratory Design and Safety Features
source: Boston Globe,September 30, 2003

Appendix 2 describes the characteristic of agents currently studied at BUMC and which may be studied at BUMC and the Boston-NBL.

Table 2-1: Boston-NBL Building Program

Use	Program SF
BSL-4 Laboratories	13,100
BSL-3 Laboratories	10,900
BSL-2 Laboratories	17,700
Clinical Research	3,500
Laboratory Support	15,400
Offices and Support	15,400
Building Support	8,100
Subtotal Assignable Space	84,100
Circulation, Mechanical, Elevators, Restrooms and other support space	109,900
Total	194,000

BSL-3 laboratories would be provided to accommodate research work on many of the NIH and Centers for Disease Control and Prevention (CDC) "A" and "B" list agents, which can be safely handled for routine use in a BSL-3 environment.

Basic biochemistry and molecular biology laboratories at BSL-2 would be provided to support the non-hazardous aspects of the work on BSL-3 and BSL-4 infectious disease agents. The adjacency of the BSL-2 and BSL-3 laboratories at the Boston-NBL facility with similar, nearby BioSquare Research Park facilities would increase productivity for researchers and lab workers. Animal holding rooms and their associated support space would also be provided in connection with the BSL-3 and BSL-4 laboratories. All research protocols involving animals would be reviewed and approved by the Institutional Animal Care and Use Committee, in accordance with the Public Health Service Policy on Humane Care and Use of Laboratory Animals (U.S. DHHS 2002e).

2.2.2.2 CLINICAL RESEARCH

Clinical research space would be provided to support clinical research protocols. The clinical research facility would include reception, nursing, administration, and exam rooms. The facility would accommodate approximately 3,000 ambulatory visits of healthy, normal volunteers per year with no overnight stays. Boston Medical Center has a number of protocols designed to address concerns surrounding patient confidentiality, patients with infectious conditions and patients who require isolated areas for both clinical and non-clinical reasons. These protocols are in place and would be utilized in the event that laboratory workers, or others, were exposed to infectious diseases and were determined to be in need of secure clinical facilities for

treatment. Specific protocols are being developed to address the transport of infected individuals from the Boston-NBL facility to the existing isolation facilities at Boston Medical Center, should that be necessary. In accordance with current practices, the BUMC Institutional Review Board, which is comprised of members of the academic community overseen by the BUMC Provost, would approve all human investigation studies to be undertaken at the Boston-NBL. All research undertaken at the Boston-NBL will comply with local, state and federal regulations.

There is a detailed mechanism for the recruitment of subjects, both normal volunteers and individuals with particular conditions, that complies with regulations of the Human Investigation Review Committee. This institutional committee functions under the authority of the Office of Human Protections at the DHHS. All protocols which involve human subjects are reviewed prior to approval. Part of the materials that are reviewed include how subjects would be recruited. All flyers and advertisements would be approved by the Institutional Review Board before posting. In virtually all cases adult individuals are required to give informed consent prior to enrollment in an approved study. The risks and benefits of all protocols are thoroughly explained to each potential participant prior to their informed consent. BUMC does not intend to solicit any individuals who are unable to provide informed consent.

2.2.2.3 OFFICE AND SUPPORT SPACE

Offices and support space would be provided to house administrative staff, safety staff, resident principal investigators (PI), visiting PIs, and facility support staff employed to operate the facility. Building support spaces would include spaces for glassware cleaning, materials handling, waste handling, security, radiation safety and housekeeping.

2.2.3 GENERAL BUILDING DESIGN COMPONENTS

The building would be designed with redundant critical mechanical and electrical systems to ensure that the facility can operate at all times. The utility infrastructure for the facility is designed for multiple redundancies. The electrical service would be what is known as a network service where the utility provides three separate incoming feeds installed in such a way that any one of the feeds may be de-energized without interrupting facility service. As a back up to the electrical utility, the facility would be equipped with on-site diesel generation of sufficient power to operate the facility in the event of a utility failure with two days worth of on-site fuel storage. The facility would be designed to have two heating mediums; the first being a connection to the district steam service, and the second a natural gas-fired heating plant. The water service would have two independent utility connections.

The building infrastructure has been designed with redundant systems where critical building systems are designed to operate at full capacity with the loss of any single component. For example, the building cooling plant would be equipped with three refrigeration machines, however; only two are needed for full operation of the facility.

During the design process all possible failure modes of mechanical systems and design components for the building were identified in a procedure similar to a fault-tree analysis, a graphical technique that provides a systematic description of the combinations of possible occurrences in a system. As a result, the health and safety protection elements of the laboratory design have built-in redundancies to ensure essentially zero risk of failure for safety features.

2.2.3.1 WATER SYSTEM

An existing Boston Water and Sewer Commission (BWSC) water main located in Albany Street would provide water service to the Boston-NBL facility. The Project would require extending the looped water services through the site and creating new connections to the service water mains in Albany Street. The building water services would incorporate reduced pressure assembly backflow preventors on the connections to the municipal water supply as required by the Massachusetts State Plumbing Code and NIH Design Policy and Guidelines (U.S. DHHS 2003b). The backflow preventors would be inspected annually to ensure proper operation. In addition to these devices, the facility would incorporate several further levels of protection by segregating all non-potable systems connections including HVAC make up water and laboratory water services. An added layer of protection would be incorporated as water services enter the BSL-4 envelope.

2.2.3.2 SANITARY SEWER

An existing BWSC sanitary sewer line in Albany Street would provide sanitary sewer service to the Boston-NBL facility. All liquid waste from all laboratories would be monitored and receive additional treatment prior to discharge to the sanitary system (see Waste Decontamination below).

2.2.3.3 STORMWATER

Stormwater runoff from the site would discharge into the existing BWSC system entering the Roxbury Canal Conduit, which runs through the site and flows easterly toward an outfall in the Fort Point Channel, a coastal water body located approximately 0.9 miles from the Project site.

2.2.3.4 AIR TREATMENT

Air supplied to the Boston-NBL would be filtered upon entering the facility at levels increasing from 65% efficiency at the core office and BSL-2 to High Efficiency

Particulate Air (HEPA) filters for the BSL-4 facilities. Air exhausted from biological safety cabinets (a piece of laboratory containment equipment in which infectious materials must be manipulated at BSL-3 and above) is passed through a HEPA filter prior to recirculation to a laboratory room or discharge through the building exhaust system. HEPA filters acceptable for biological safety installations routinely give collection efficiencies greater than 99.99% when tested with 0.3 μm diameter particles (Edwards 2002). This is the most difficult particle size to capture, aerodynamically. The filters are even more efficient above and below this size range for a variety of technical reasons related to interception of the particle, the effect of inertial forces and capture by diffusion. Therefore they capture a full size range of organisms, from very tiny viruses to much larger bacteria (approximately 20 nm – 200 μm).

These mechanisms have been fully described for HEPA filters by the International Atomic Energy Agency. In a BSL-4 laboratory, two HEPA filters are used in series to assure the exhaust air is sufficiently treated before discharge to the outdoors. In effect, all discharge air is filtered at least twice, and in many cases three times, prior to discharge, making the risk to the public from any infectious exhaust essentially zero. HEPA filter installations, whether in containment equipment such as biological safety cabinets or in building mechanical systems, are tested in place at least once per year using National Sanitation Foundation (NSF) Standard 49 procedures that provide quantitative assurance that the installations do not contain defects that reduce microbiological safety. HEPA filters are known to have long functional lives; however, age can play a factor in decreasing tensile strength of the filter media. For this reason, the Boston-NBL would use a conservative service life of five years for HEPA filters in biological safety cabinets and other ventilation system applications. HEPA filters are decontaminated in place prior to removal from equipment and ventilation system housings and therefore pose no risk to the public from subsequent handling and/or disposal. Perhaps the best and most practical proof that HEPA filters are effective is that they are used in respirators worn by researchers working with high concentrations of infectious organisms (bacteria and viruses). These HEPA filtered respirators are uniformly protective in the laboratory and in field applications.

In the Boston-NBL facility, exhaust from the BSL-4 suite area, decontamination shower, and decontamination airlocks would pass through a series of two HEPA filters rated for microbial aerosols before discharge to the outside.

Laboratory biological safety cabinets (including air filters) would be certified annually to ensure proper function. Safety cabinets would be re-certified when moved or re-located to other locations. The re-certification process would include testing of the HEPA filters, gaskets and other air-handling systems in the cabinet. HEPA filters would be decontaminated prior to disposal (see below).

The Boston-NBL facility will be designed with a redundant mechanical ventilation and High Efficiency Particulate Air (HEPA) filtration system for treating air prior to its release outside of the laboratory. NIH design guidelines (U.S. DHHS 2003b) require that HEPA filters be configured in the ventilation system so that they can be isolated for individual unit testing or decontamination. When a HEPA filter needs to be serviced, a redundant HEPA filter is put into service or the zone being serviced is isolated ensuring all exhaust air is properly filtered. The ventilation design for the facility includes fail-safe controls so that no contaminated air can bypass both HEPA filters.

The HEPA filters are designed to be resistant to moisture and the low level of solvents present in laboratory exhaust. In compliance with CDC requirements and National Sanitation Foundation (NSF) Standard 49 procedures, all HEPA filters would be tested and certified at least once per year, and if any degradation of the filter is found it will be replaced. CDC requires that the HEPA filter design allow for *in situ* decontamination of the filter prior to removal or removal in a sealed container for transport and disposal off-site. HEPA filters used at NEIDL will be decontaminated in place following a strict decontamination protocol. Depending on the exposure history of the unit, decontamination will utilize either vaporized hydrogen peroxide or formaldehyde gas.

The in situ decontamination process is carried out in the HEPA filter housing an air tight assembly so that the sterilizing gas does not escape to the environment before it is neutralized. Hydrogen peroxide vapor decontamination of HEPA filters is a relatively quick technique that can be used for BSL-4 laboratory filters. It decomposes to oxygen and water vapor and leaves no residues in the filter. The other decontamination method utilizes formaldehyde gas to sterilize the filter element, followed by neutralization with ammonia vapors. The neutralization process leaves a harmless solid residue of hexamine on the filter, and purging of the decontamination space after neutralization may release small amounts of hexamine into the air. Hexamine is used as an antiseptic and antibacterial agent and is harmless at the low concentrations that might occur in ventilation air for a short period of time. The selection of the decontamination approach would depend on the microbiological agents that were filtered out by the HEPA filter. No toxic releases will be made to the outside environment from the decontamination process.

2.2.3.5 HVAC

The Boston-NBL is incorporating a redundant design approach to the installation of the HVAC system. Each air handling system and corresponding exhaust system would incorporate multiple air handlers and exhaust fans. Each system would be sized to operate at full capacity with any individual unit out of service. This concept

would be carried into all HVAC support systems including refrigeration machines, boilers and steam service as well as heat exchangers for terminal reheat. These redundant systems would be operated in parallel under an integrated automatic control system. This integrated system arrangement would allow active control and compensation throughout the system. A system that experiences a failure under operating conditions would compensate by increasing the loads served by the remaining systems while isolating the failed unit from the system.

All laboratory ventilation systems would be single pass or 100% outdoor air units, with no air being re-circulated through the laboratory facilities. Under this design tempered "fresh" outdoor air is distributed throughout the building and the facility is constantly being supplied and simultaneously being exhausted at a predetermined rate. This air exchange rate, measured in air changes per hour (usually between 8 and 12 air changes per hour) provides a level of protection to the researchers by reducing the ability of laboratory agents or chemicals to build up concentration in the laboratory environment.

The integrated HVAC system provides a controlled indoor environment. The system allows the ability to adjust temperature and humidity (within selected laboratories) to parameters required by individual research requirements.

2.2.3.6 SYSTEMS MONITORING

The Boston–NBL is being designed with a fully integrated Building Automation System (BAS). All building HVAC systems would be controlled and monitored through this system. The BAS is a fully integrated computer control system. The system architecture consisting of a dedicated "head end" server, user workstations, and field panels would operate on a dedicated local area network. The building automation system would have the ability to operate in both automatic and manual modes through user interaction. The ability to control system operations would be limited to select individuals with security clearances.

All HVAC systems throughout the facility would be operated on the BAS, from the refrigeration plant down to the individual laboratory temperature controls. All systems would be controlled within the facility as well as outside of the building in the existing dedicated BUMC Control Center. All points on the system would be viewed and adjusted remotely by the dedicated BUMC Control Center Staff. The Control Center, a manned twenty four hours a day, seven days a week operation, would be responsible for monitoring building systems and coordinating maintenance response to abnormal operating conditions throughout the system.

2.2.3.7 FIRE PROTECTION

Fire protection systems in the Boston-NBL would be designed to meet existing code requirements for both the State of Massachusetts and the City of Boston. The fire suppression system for the facility is being designed to incorporate both traditional sprinklers and a water misting system for within the BSL-4 laboratory. The system would be designed to incorporate zones so that repairs and modifications may be made with minimal impact to the systems operation and coverage.

2.2.3.8 EMERGENCY ELECTRICAL POWER SYSTEM

Two 1,750 kilowatt (KW) emergency generators with emergency / standby switchboard are needed to support the standby requirements of the facility. Sufficient fuel storage would be available on site to run the emergency generators for 48 hours.

2.2.3.9 SEISMIC REQUIREMENTS

The Boston-NBL facility would be designed to the seismic performance requirements of the Massachusetts State Building Code, Sixth Edition. The code assigns Seismic Hazard Exposure Groups and Seismic Performance Categories to buildings depending on the nature of their occupancy.

The proposed facility would be classified as Seismic Hazard Exposure Group II, which includes buildings having substantial hazards due to occupancy and use. The Seismic Hazard Exposure Group II classification assigns Seismic Performance Category C to this facility.

Seismic forces, as provided in the code, are based on a predicted "Design Earthquake". The provision of Seismic Performance Category C assures that the building structure stays functional after an event.

2.2.3.10 DECONTAMINATION FACILITIES

Considering the variable and possibly unknown nature of agents to be used in containment facilities, decontamination of facilities, equipment, and personal protection equipment is as important as the research being performed within the facility. Within BSL-4 laboratories, researchers would be protected from accidental laboratory exposures by a positive pressure suit. The suits would be decontaminated prior to researchers exiting the containment laboratory. The researcher's primary exit mode would be via a decontamination shower, a contained shower unit isolated between the containment laboratory and change room by sequenced air pressure resistant isolation doors (or submarine doors). The shower, utilizing a liquid disinfectant that has been selected for its efficacy against the agents being used within the laboratory, uses a pre-validated shower and rinse cycle to disinfect the positive pressure suit as well as the chemical shower itself prior to the room being opened and being exposed to the non-contained environment.

As described above for the chemical shower, all access paths to the BSL-4 laboratories would follow a strict protocol of disinfection prior to access to the uncontained environment. In following the sequence from first opening a clean, previously disinfected passage, the outer access would be opened, the material placed in the pass, and the outer access sealed. The inner door can then be opened and the material accessed from within the containment. The inner door would then be resealed and the passage decontaminated. The disinfection method is dependent on the passage. The chemical shower or sterilizer would be put through a cycle prior to outer non-containment door being opened. A fumigation room would be utilized to transfer large equipment and would be decontaminated by either gaseous or aerosolized disinfectant.

The laboratory would be designed with multiple decontamination zones. These independent zones would allow the laboratory to be decontaminated in smaller sections, taking only the facilities that need to be decontaminated out of service and leaving the remaining ones in operation. The BSL-4 laboratory would be decontaminated by introducing gaseous or aerosolized disinfectant into the laboratory for a predetermined time period. After the facility has been decontaminated, previously inserted biological indicators would verify decontamination prior to allowing unprotected personnel access to the decontaminated facility.

WASTE DECONTAMINATION

No waste materials would be removed from the BSL-4 laboratory unless those materials are first autoclaved or decontaminated by a method approved and managed by the Boston University's Office of Environmental Health and Safety (OEHS). There are several materials that require special decontamination methods in order to assure safe removal from the BSL-3 and BSL-4 laboratories. These materials are biological samples needing further analysis, laboratory equipment, and laboratory clothing.

Biological materials that would be removed from the BSL-4 laboratories would undergo a decontamination process that would be validated using biological indicators. Once validated, electronic monitoring and charting of the processes would verify the decontamination cycle. These materials would be packaged in sealed containers that would circulate through a disinfectant dunk tank, fumigation chamber or an airlock in order to decontaminate the container. This material would then be irradiated using a gamma cell machine used to render various BSL-3 and BSL-4 organisms non-viable and, therefore, appropriate for research in BSL-2 laboratories.

Liquid wastes from BSL-4 laboratories have a special method to ensure two layers of decontamination. All liquid waste from the BSL-4 laboratories would first be decontaminated with a chemical disinfectant. This sterilized liquid would then be piped to a biowaste cooker and heated under pressure until the temperature reaches

121º C for at least 60 minutes. Decontamination would be verified via biological indicators and electronic monitoring and charting of the process. Once cooled to acceptable levels, the waste, with an estimated peak discharge of 4,800 gallons produced over an 8-hour operational period, would be discharged to the BWSC sanitary sewer system. Ventilation from plumbing systems would pass through a microbial filter prior to discharge to the atmosphere. The filters would be decontaminated and disposed of as appropriate.

Laboratory equipment or material that could be damaged by the high temperatures or steam of an autoclave may be decontaminated using gaseous or vapor methods in an airlock or chamber. Laboratory clothing would be removed by laboratory staff in an inner change room and then autoclaved before being removed from the laboratory for safe laundering services.

BUMC operates in accordance with all plumbing codes and MWRA regulations requiring that sinks in laboratories drain to a pH adjustment system, where pH, flow monitoring and water sampling take place. The Boston-NBL would have a plumbing system, which would carry laboratory waste water from every non-BSL-4 area to mixing tanks in the basement where pH adjustment and compliance sampling would occur.

2.2.3.11 ENERGY CONSUMPTION

NATURAL GAS

The Project would purchase natural gas from KeySpan Energy. The facility is designed to use either district steam or natural gas as the primary heating medium. There is currently a 30″ intermediate pressure main which runs the full length of the site in Albany Street. The anticipated gas requirement for the Boston-NBL is approximately 1,650 cubic feet per hour (cfh) when self-generating steam. Gas service would be provided by a natural gas service connection from Albany Street.

STEAM

The Project is capable of utilizing district steam as its heating medium. There is currently an existing 12″ steam line located beneath Albany Street south of East Newton Street. This service line was extended into the BioSquare Research Park development. The existing service would be extended to the Project site. Anticipated steam demand from the Project is approximately 19,300 pounds per hour.

ELECTRICAL

NStar Electric would provide electric service for the Project. An existing 13.8 kilovolt (KV) distribution system in Albany Street would be extended into the Project site. The building would be provided with secondary service at 480/277 volts from a secondary

spot network located within the building. Each spot network would include multiple transformers, each fed from a different 13.8 KV circuit to provide redundancy in the event of a primary feeder or transformer failure. Anticipated electric demand from the Project is approximately 8,900 Kva.

2.2.3.12 NOISE

An analysis of the Project's noise impact conducted for the 2003 BioSquare Phase II Draft Project Impact Report/Environmental Impact Report (Fort Point Associates, Inc., 2003) indicated that the Project would be in compliance with City of Boston and the Commonwealth of Massachusetts Department of Environmental Protection (DEP) noise regulations. During the final design of the Project, appropriate low noise equipment and noise control measures would be selected, as necessary, to ensure compliance with the City of Boston and the state DEP noise regulations at all nearby sensitive locations.

Design elements to reduce noise include:

- Selecting fans for exhaust and air handling units that can work adequately at their lowest possible speed to reduce fan noise;
- Installing a silencer or bank of silencers in the air-handling unit, in the exhaust ductwork or stacks, and in the emergency generator;
- Smooth transitions and elbows to limit turbulent airflow;
- Selecting quiet equipment;
- Conducting tests of the emergency generator during normal weekday working hours and not during quiet periods;
- Installing a muffler as part of the generator exhaust system;
- Provide sound attenuating generator enclosures; and
- Limiting the discharge air opening for the emergency generator to as small as feasible.

Existing sound levels at the closest sensitive locations in the Project area during the quietest period of the day (late night/early morning) were measured to range from 54 to 57 decibels. Future sound levels, with the Project and the described measures to reduce noise impacts, were predicted to be the same as the existing noise levels.

2.2.4 OPERATIONS

The Boston-NBL facility is designed with high level security as described in the Building Safety and Security paragraphs below. Seven security layers would extend from the first layer at the site's perimeter fence to the seventh layer of select agent storage areas within the building (select agents are any biological agent or toxin listed

in 42 CFR Part 73 and all select agents, researchers working with select agents and the BUMC will be registered with the CDC prior to possessing, transferring, or using a select agent). The security layers would be operationally assured using security officers, biometric and card access devices, closed circuit television cameras, automatic door locking systems and access alarms assigned or installed at each layer's barrier.

2.2.4.1 COMMISSIONING

Prior to occupation, the Boston-NBL facility would be commissioned in accordance with the NIH Commissioning Guidelines (U.S. DHHS 2005) and the Massachusetts State Building Code to ensure that all systems are operating according to design and required program. All mechanical systems and equipment would be tested to ensure proper operation as described in the System Testing paragraphs below.

Commissioning is a systematic process of ensuring that all building systems perform interactively according to the design intent and operational needs. The commissioning process would encompass and coordinate the traditionally separate functions of system documentation, equipment start-up, control system calibration, testing and balancing, performance testing, and training.

Commissioning during the construction phase is designed to achieve the following:

- Verify applicable equipment and systems are installed according to the manufacturer's recommendations and industry standards, and they receive adequate operational checkout;
- Verify and document proper performance as well as failure modes of critical equipment and systems;
- Verify that operation and maintenance documentation is complete; and
- Verify that operating personnel are adequately trained.

SYSTEM TESTING

The facility would undergo an extensive commissioning process. The objective of commissioning is to provide documented confirmation that a facility fulfills the functional and performance requirements of the building owner, occupants and operators. To obtain this goal, it is necessary for the commissioning process to establish and document the owner's criteria for system function, performance, and maintainability as well as to verify and document compliance with these criteria throughout design, construction, start-up and the initial period of operation.

During design, a tailored commissioning plan would be developed for an integrated system testing protocol. During the construction process, the commissioning agent

would witness and verify installation of equipment and witness factory startups. Upon substantial completion of the facility, each system would be operated through all modes of operation (seasonal, occupied, unoccupied, warm-up, cool-down, part- and full-load and redundant, fail safe) where there is a specified system response. The operational sequences would be verified and tailored where applicable to produce the best system responses.

The following is a representation of building components and systems within the building's commissioning plan that would require development of custom testing protocols.

HVAC SYSTEMS

- Chillers
- Cooling Towers
- Heat Exchangers
- Boilers & Associated Equipment
- All Pumps
- Air Handling Units
- Laboratory Exhaust Fan Systems
- Humidifiers
- Space Heating Equipment
- Ventilation Fans
- Variable Frequency Drives
- Air Terminal Units
- Laboratory Air Valves
- Ductwork
- HEPA Filter Systems
- Piping
- Grills, Registers & Diffusers

LABORATORY SPECIALTY SYSTEMS

- Biowaste Decontamination System
- Breathing Air System
- Chemical Showers
- Tissue Digester System
- Pressure Testing Laboratory Suites
- Pneumatic Air Pressure Resistant Doors
- Air Pressure Resistant (APR) Windows

- APR Frames & Glazing
- Camera Bubbles
- Laboratory Equipment
- Environmental Rooms (Cold Rooms & Freezers)
- Specialty Gas Systems
- Animal Watering Systems

BUILDING AUTOMATION SYSTEM (BAS)

- Operator Work Station
- BAS Network
- Control Panels (Including System Controlled)
- Field Sensors & Devices
- Room Space Pressure Sensors
- Air Compressor

PLUMBING SYSTEM

- Plumbing Equipment
- Reverse Osmosis Water Systems
- Plumbing Fixtures & Trim
- Plumbing Piping
- Fire Pump

ELECTRICAL SYSTEMS

- Normal Power Systems
- Emergency Power Systems
- Grounding Systems
- Lightning Protection
- Un-Interruptible Power Supply
- Generators
- Automatic Transfer Switches
- Security
- Telecommunications

INTEGRATED SYSTEM TESTS

- Room / Laboratory Module Test
- Biowaste Decontamination System
- Fire / Life Safety System

- Normal Power Failure Test

2.2.5 BUILDING SAFETY AND SECURITY

BUMC security staff would provide building security. Security staff assigned to the Boston-NBL would undergo training with respect to the nature of the research, the risk associated with the building's unique emergency response protocols, and enhanced police academy training in addition to the significant ongoing training program currently in place. See Appendix 5 for the Boston-NBL Security Program and Emergency Response.

Within the facility, a combination of security systems and staffing would reinforce the access layers. The anticipated personnel required to staff the facility is approximately 660 workers, including research, security, safety, maintenance staff, and support personnel. Access to the BSL-3 and BSL-4 labs would be restricted to workers who have received appropriate immunization, if an immunization is available, and security clearances for the agents in use at the labs. Access to different areas or layers may require positive identification and signing in with a security officer, utilizing access control systems such as biometrics or proximity card technologies, requesting access with an authorized colleague, or a combination of these approaches. Work being performed within high level containment areas will be monitored by systems to ensure that there are two authorized persons in each area to minimize risk.

Other safety design features that would be incorporated into the building include:

- Locating the high containment laboratories outside of the general facility circulation;
- Positioning the high containment laboratories as a "box-in-a-box" where both gas-tight (pressure decay tested) physical and pressure differential barriers would separate high hazard areas from the outside;
- Isolating infectious biological agents within containment laboratories equipped with biological safety cabinets (the initial means of containment developed for working safely with infectious microorganisms, designed to provide personnel, environmental and product protection);
- Isolation workrooms, directional air flow and air pressure resistant doors; and
- Providing decontamination facilities including chemical showers, autoclaves, fumigation rooms, HEPA filters, and biowaste cookers to ensure that all personnel's garments, laboratory materials, exhaust air, and liquid effluent are decontaminated before leaving the BSL-4 high containment area.

2.2.5.1 LABORATORY SAFETY

The BUMC OEHS oversees a laboratory safety program that emphasizes prevention of illness and injury, promotion of safe work practices, and protection of the environment related to work with chemical and biological agents. Through this program, safety staff provides risk assessment, consultation and support to workers, supervisors, and management. Laboratory safety services include specialized safety training in chemical and biological safety, annual laboratory inspections, new laboratory setups as well as laboratory decommissioning services in collaboration with BUMC's Facilities Department. BUMC currently has policies and procedures in place to monitor and prevent worker exposure. These include a detailed medical surveillance training program, serum banking, and other procedures effective at prevention and monitoring of worker exposures. The Boston-NBL would have a comprehensive medical surveillance program which would be integrated into the current medical monitoring system. Compliance with local, state and federal regulations and the promotion of safe work practices for researchers and support staff is achieved through these services.

The laboratory safety program requires all personnel who work with chemical or biological hazardous materials to be aware of the hazards that are present, use appropriate personal protective equipment, and be trained in emergency response procedures. The OEHS Chemical Hygiene Plan includes procedures for laboratory use of chemically hazardous materials and the Integrated Contingency Plan includes protocols to be followed in the event of hazardous materials spills.

BUMC will comply with all federal, state and local regulations regarding rDNA use. Any research involving rDNA must be registered with the Institutional Biosafety Committee (IBC), and monitored by the OEHS Biosafety Officer. The Boston Public Health Commission has regulations governing the use of rDNA molecules by institutions in the City of Boston. The regulations require strict conformity with the National Institutes of Health Guidelines for Research involving recombinant DNA molecules as published in the Federal Register of May 7, 1986 and any amendments, revisions or substitutions that are made subsequently.

OEHS currently manages the Select Agent Program for BUMC. Under the Select Agent rule at 42 CFR Part 73, the DHHS regulates the possession of biologicals (bacteria, viruses, and toxins) that have the potential to pose a severe threat to public health and safety (U.S. DHHS, 2002c). BUMC requires all principal investigators proposing work with any select agents be registered through the CDC or USDA.

Standard measures would be in place for personnel protection. All laboratory personnel would be trained in safety measures including potential hazards associated with the work. If an agent-specific immunization is available, laboratory personnel

would receive immunizations for agents handled or potentially present in the laboratory. Laboratory equipment would be surface-decontaminated on a daily basis, including following lab procedures, and prior to the performance of any maintenance or repairs. A surveillance system would be installed to monitor areas where critical substances are collected and/or stored.

BUMC provides annual laboratory training as a minimum standard and increases training frequencies depending upon the type of work being done in each specific laboratory. BUMC would determine the levels of training necessary to ensure that all employees are compliant with and fully knowledgeable of all regulations. Regulatory authorities would ask for training rosters and levels of competency and would interview employees to determine if training, education and knowledge are appropriate.

All persons who would work in the BSL-3 and BSL-4 laboratories would be required to undergo additional specialized training. Individuals requiring the use of radioactive materials in their research would receive prior authorization from the BUMC's Radioisotope Committee.

A training area would be provided to support training programs for laboratory practices and safety protocols in high containment laboratories. The block would include a seminar room, a mock BSL-4 laboratory, and viewing windows into the operating high containment suite. Once trained in lab procedures and wearing a positive pressure suit, laboratory workers would enter the main BSL-4 laboratory in order to shadow trained staff until they demonstrate proficiency in entering, exiting, and working in the facility. Locker rooms and showers would be provided for all BSL-3 and BSL-4 laboratories. In the BSL-4 laboratory, workers would be required to remove all personal clothing and wear only approved laboratory clothing and positive pressure suits. Prior to exiting the BSL-4 laboratory, workers would be required to take a chemical shower to decontaminate the positive pressure suits. Following the chemical shower, workers would remove their positive pressure suit and all laboratory clothing and take a personal shower. No suits or laboratory clothing would be removed from the facility without going through proper decontamination.

Access to the BSL-4 laboratory would be restricted to people whose presence is required and authorized. Strict operational protocols would be imposed on laboratory personnel including specific training and background checks prior to working in the facility. Positive pressure, lockable doors would be monitored and controlled by the security system. A log of persons entering and exiting the laboratory with name, time, date, and reason for entering the lab would be maintained, and the log would be frequently audited by BUMC's OEHS professionals, as well as Security Officers assigned to the lab.

2.2.5.2 BUILDING SECURITY

Furthermore, access to the Boston-NBL would be strictly controlled by the following measures:

- Background and security checks on all employees prior to being assigned to a laboratory area;
- Security Officers on duty 24 hours per day;
- Multiple security layers including perimeter fencing around site and controlled access;
- Photo identification badges;
- Security cameras;
- Biometric systems; and
- Screened and secure deliveries.

As mentioned, the building has been designed to incorporate significant security systems as well as redundant utility systems. Continuing systems maintenance procedures would be instituted to insure a high level of reliability of the safety infrastructure.

2.2.6 TRANSPORT OF SELECT AGENTS

Infectious substances have specific shipping and transport requirements regulated by several federal agencies. The definition of an infectious substance is a viable microorganism or toxin that causes or may cause disease in human beings or animals. These substances include Select Agents listed under the DHHS Select Agent rule (U.S. DHHS 2002c) and any other agent that causes or may cause some disabling or fatal disease.

The Boston-NBL facility would include work on a variety of infectious agents at BSL-2, BSL-3 and BSL-4 laboratories. The agents to be used in these laboratories would be transported according to the strictest federal regulations for identification of materials, packaging, labeling, documentation, personnel training, transport and final receipt of materials. Several federal and other government agencies including the U.S. Department of Transportation (DOT), International Civil Aviation Organization (ICAO) (an organization promoting cooperation in the development of uniform standards and practices for civil aviation), DHHS, USDA and the U.S. Postal Service (USPS) strictly regulate the shipping and transport of infectious substances. Transportation of materials to and from the Boston-NBL would follow all regulations for shipping packages.

The packaging, labeling, and transport of etiologic agents are regulated by 42 CFR 72 (Interstate Shipment of Etiologic Agents); 49 CFR 172 and 173 (U.S. Dept. of Transportation regulations concerning shipment of hazardous materials); 9 CFR 122 (U.S. Dept. of Agriculture [USDA]-Restricted Animal Pathogens), and International Air Transport Association (IATA) rules. In addition, special rules apply for the transport of materials regulated by the U.S. Food and Drug Administration (21 CFR 312.120, Drugs for Investigational Use in Laboratory Research Animals or in Vitro Tests). Recent legislation – the USA PATRIOT Act, and the Public Health Preparedness and Bioterrorism Response Act of 2001 – have further strengthened the regulations controlling transport of certain etiologic agents, referred to as Select Agents, to include controls over possession and use. Boston-NBL will be registered with the Centers for Disease Control and Prevention and the USDA for possession, use, and transport of these agents. A Responsible Official will be designated at Boston-NBL and approved by the regulating agencies to oversee the shipping, receipt, and usage. These individuals are subject to security risk assessments performed by the Federal Bureau of Investigation. Packaging requirements are strictly implemented in accordance with IATA regulations.

There have been no cases of illness attributable to the release of infectious materials during transport, worldwide, although incidents of damage to outer packaging of properly packaged materials have been reported (World Health Organization 2002; U.S. DOT 2001).

The risk to the community surrounding the Boston University and specifically the Boston-NBL from transport of infectious agents or other biologically-derived material is negligible.

The BUMC OEHS recently updated its High Hazard Material Management (HHMM) Policy governing shipping of materials determined to be high-risk (see Appendix 7 - High Hazard Material Management (HHMM) Policy). This policy applies to all select agents. OEHS would be responsible for the management of hazardous materials shipping, receiving and transportation in accordance with federal guidelines. OEHS and the BUMC Office of General Services (OGS), through its Security Investigations Unit, would determine the appropriate locations for the receipt, storage and shipping of packages determined to be potentially high risk. This location would have a specially trained OEHS staff member assigned to receive and ship OEHS-authorized materials, and the location would be routinely audited by the BUMC Security Manager and the OEHS Biosafety Manager. OEHS would train appropriate Boston-NBL personnel in the laws, regulations, polices, and requirements involved in the shipping and receiving of materials determined to be high risk and the approved procedures for packaging of materials, the contracted services to be used, and the

penalties of failing to follow all aspects of this policy. OEHS would manage the tightly controlled, pre-approved scheduling of shipment and delivery times.

BUMC requires adherence to a stringent protocol for the transfer of biological agents, and no agents may be transported without significant advance notification. The BUMC OEHS, along with the Institutional Biosafety Committee, must first authorize approval for the use of the agent. If an agent is approved for use, the investigator may submit for the transfer of the agent to OEHS. Both the personnel and the facility are then reviewed by OEHS and the sending institution, and submitted to the appropriate federal authority (CDC or USDA) for review. Upon subsequent approval by the federal authority, the transfer process can be initiated. The OEHS HHMM Policy defines the roles and responsibilities for each office in the shipping process. The HHMM Policy requires federal background checks for all transporters, as well as OEHS personnel handling the receipt of these packages. OEHS and OGS would ensure that all staff involved in the high-risk materials shipping and receiving areas would undergo a background clearance check, as appropriate, consistent with the Select Agent law requirements prior to being approved to work in these locations.

Transportation of infectious agents occurs by air, sea, or land depending on where the agent is located and method of transport available. All personnel throughout the process of transport, from shipper, transporter, to receiver, would be thoroughly trained in the process. Such training teaches employees how to recognize improperly packaged or labeled boxes and how to respond to emergency situations.

The receiving and shipping location(s) for select agents would have a designated route to and from BUMC utilizing the local and interstate highway system and would avoid residential streets. These routes would be mandated at all times when materials determined to be high risk are en route to or from BUMC.

2.2.6.1 DOCUMENTATION

Prior to shipment of any infectious agent, shippers would be required to coordinate with the OEHS regarding all appropriate shipping documentation. Shippers would complete a Shippers Declaration Form and submit three original copies to the transporter for review. Original documentation of every shipment would be kept by the shipper, transporter, and receiver at each facility for every infectious substance package shipped or received by a facility.

2.2.6.2 TRANSFER OF BIOLOGICAL AGENTS

Any agent listed and defined under the select agent rule in 42 CFR 73 must be formally processed for facility transfer, using a form called an EA-101. This form is completed and sent to the transferring institution, which then sends the paperwork to the CDC or USDA for verification. In order to be in full compliance with the select

agent rule, no facility may transfer or accept agents without prior approval of the CDC, and if approved, agent transfer is limited to organizations that are formally registered with the CDC. Facilities that have animal or plant pathogens must contact the USDA for all facility transfer approvals. Once the CDC or USDA approves the transfer, the material is shipped to the requester in accordance with the strict shipping requirements described in this section.

All packages determined to be high risk in accordance with BUMC policy would be managed at a special shipping station. Once packages are received, OEHS would inspect, verify, document and transport the high hazard materials to the appropriate location within the Boston-NBL. Transport from the receiving location into the Boston-NBL would be completed using a secure BUMC vehicle and would include OEHS or BUMC security personnel. Supplies and materials for the BSL-3 and BSL-4 laboratories would then be transported through a double-door autoclave, fumigation chamber, or airlock, which would be decontaminated after each use. Biosafety cabinets would be used for the inspection of packages and locked refrigerators or freezers would be used to secure those packages once in containment.

All bacteriological, virological, and toxic laboratory materials would be packaged and labeled in accordance with all applicable federal, state and local regulations when shipped.

2.2.6.3 TRAINING

Under the requirements of DOT, all shippers, transporters, and receivers of infectious substances must receive training every three years. Under the International Civil Aviation Organization (ICAO) regulations however, such training is required every two years.

Boston-NBL employees that ship or receive infectious substances would be required to undergo training every two years to ensure compliance with the transportation guidelines and regulations. Such training is currently offered at BUMC to meet the requirements of both DOT and ICAO and includes information on facility policies and procedures, the proper packaging, labeling, and documentation of materials to be mailed, and other information on safety procedures and notification systems to confirm package receipt.

2.2.6.4 PACKAGING

All materials would be packaged according to DOT regulations, including the basic requirement for triple packaging of each substance. The outer package would comply with particular tests for leakage, durability and safety, including a drop test of 1.2 meters, pressure test of 14 pounds per square inch (95 kPa), and temperature tolerance range of 40° Fahrenheit (F) to 131°F (4.4° Celsius (C) to 55°C).

2.2.6.5 LABELING AND MARKING

Also in accordance with DOT regulations, each transport box must clearly indicate the material being shipped and whether it affects humans or animals. For example, a box containing a sample of rabies virus would be labeled "Infectious substance affecting humans (rabies)." Required markings include a diamond shaped biohazard symbol, containing the words "infectious substance", and if shipping on dry ice, a diamond-shaped symbol with seven black stripes indicating presence of dry ice as a refrigerant for the infectious material.

2.2.6.6 NOTICE OF DELIVERY

For infectious agents under the select agent rule, received packages have a very specific notification scheme. The recipient must confirm receipt by telephone to the shipper, and then complete the required information in the EA-101 form. This form must be sent to the CDC within 24 hours of package receipt and should also be sent to the shipper. If the material is not a select agent, then the shipper is notified of receipt.

2.2.7 EMERGENCY RESPONSE

BUMC already has a very sophisticated emergency response plan which incorporates an Incident Command System (ICS). The program-planning group works closely with local response agencies including the Local Emergency Planning Committee, which is chaired by the Boston Fire Department, and whose membership includes public and private representation from utility providers, healthcare, emergency response and a variety of municipal agencies. BUMC is currently one of two hospitals represented on the Executive Board of the Metropolitan Medical Response System (MMRS), chaired by the Chief of Boston Emergency Medical Services (EMS).

In addition to participating in these committees, BMC has the largest Level I Emergency Department (ED) Trauma center in New England. The ED, which is located two blocks from the proposed Boston-NBL facility, sees over 117,500 patients annually and includes a dedicated isolation/decontamination facility for patients with biological, chemical or radiological contamination. The facility is equipped to decontaminate victims of a hazardous materials incident providing Level B and Level C protection for its hazardous materials decontamination team. Level B protection includes supplied air respiratory protection with protective suits including Tyvex, Barricade, and Sarinex brand suits. The facility is staffed by trained ED personnel and monitored by a Disaster Coordinator and the OEHS. The staff is trained under the Occupational Safety and Health Administration's (OSHA) Hazardous Waste Operations and Emergency Response (29 CFR 1910.12) standard. The decontamination room contains supplied air for up to 12 staff (eight outside connections and four inside connections), dedicated exhaust, a heated water supply

system and wastewater rinse and collection. Level B and Level C personal protective equipment is on-site should the incident warrant that level of protection. The Level C protective equipment includes various types of chemical resistant suits and power air purifying respirators. A minimum of four trained BUMC ED staff are on duty at all times. Disaster drills have been conducted as recently as May 2004, in conjunction with the local emergency response agencies.

BUMC also has a detailed Disaster Plan, which includes specific plans for eleven different hazards, including biological emergencies. The Biological Emergency Plan contains a biological event-reporting algorithm as well as fact sheets on five specific select agents, namely: anthrax, plague, Ebola virus, smallpox, and Botulinum toxin. BUMC has recently amended a higher-level disaster plan called the Phase D Disaster Plan in light of the September 11 events, to deal with large-scale off-campus mass casualty events. BMC's dedicated Disaster Coordinator is responsible for coordination of disaster drills, hospital staff training, and disaster management in the event of an emergency. The Coordinator, through BUMC's ICS, is the liaison to local emergency response agencies including the Boston Public Health Commission (BPHC) during disaster events. The Coordinator chairs a Disaster Committee, which provides a forum for discussion and evaluation of plans and response effectiveness. Following every disaster drill, a formal critique process is held to determine if improvements to the system can be made.

2.2.7.1 EMERGENCY RESPONSE PLAN

An Emergency Response Plan for the Boston-NBL facility would be developed in conjunction with the disaster coordinator, facility administrators, investigators, laboratory and OEHS, BUMC staff and the NIH safety and security personnel to address the specifics of the Boston-NBL facility. Local police, fire and other emergency responders would be informed of the types of biological material used in the laboratory and consulted in the preparation of an Emergency Response Plan to address the following:

- Evacuation
- Room clear
- Shelter in place
- Lockdown
- Dangerous person on site
- Suicide threat or attempt
- Death, serious injuries or medical condition on site
- Fire or explosion
- Hazardous materials spill

- Bomb or suspicious device
- Bomb threat
- Earthquake
- Civil disturbance
- Severe weather conditions
- Utility Failures / electrical outage
- Blood borne pathogen exposure
- Medical assessment procedure
- Emergency communication for use in extreme emergencies
- Radiation spill on body
- Chemical spill on body
- Biological spill
- Suspicious packages or mail
- Elevator failure

At the local level the Boston-NBL would directly link to the BPHC by having the Communicable Diseases Section of the BPHC participate on the Boston-NBL's External Advisory Board. The BPHC is currently developing the Boston Emergency Preparedness Training Institute to provide free, competency-based training to key public health professionals, infectious disease specialists, emergency department staff, EMS providers, and public safety professionals from the eastern region of the Commonwealth of Massachusetts on bioterrorism, disaster, and large-scale emergency response.

The laboratory staff of the Boston-NBL would be cross-trained to rapidly assess the identity of environmental samples as well as how to report these results directly to public health officials through the development of a secure, web-based laboratory reporting system. The Boston-NBL would partner with local, state and federal public safety and emergency management agencies to increase reporting efficiency and develop a more uniform context for action relating to emergency response triage, public health decision-making and external communications.

2.2.7.2 INCIDENT REPORTING AND PROTOCOLS

BUMC already has several incident reporting and protocol systems in place. Policies and procedures have been developed by BUMC for reporting incidents involving hazardous materials in accordance with local, state, and federal laws and standards. The Integrated Contingency Plan (ICP) would be updated prior to occupancy of the Boston-NBL and is reviewed and updated any time that a change in protocol, personnel or equipment is needed. These changes typically occur annually. The

updated plan would provide specific information on how hazardous materials incidents specific to this building would be handled. It would also outline the reporting protocol to local, state, and federal agencies. These reports would be communicated to appropriate regulatory authorities, including the U.S. Environmental Protection Agency, the Massachusetts Department of Public Health (DPH), the Massachusetts Department of Environmental Protection and the Boston Fire Department, and reviewed and disseminated to the public as necessary. This system would work similar to the existing communication plan executed during citywide emergency events. The Incident Command System (ICS) would be activated for all BUMC events to effectively communicate to internal response personnel, staff, and local emergency responders. The ICS is reviewed and updated on an ongoing basis due to the need for continuous testing of emergency response systems and protocols in a 24 hour a day, 7 days a week urban academic medical center environment.

2.2.8 POLLUTION PREVENTION

2.2.8.1 SPILL PREVENTION

An ICP has been prepared by BUMC pursuant to the Environmental Protection Agency's (EPA's) Oil Pollution Prevention Regulations (40 CFR 112), EPA's Hazardous Waste Regulations (40 CFR 260-265), and the state DEP's Hazardous Waste Regulations (310 Code of Massachusetts Regulations (CMR) 30.000). The ICP is updated regularly and the Boston-NBL would be incorporated into the plan.

The purpose of the ICP is to establish preparedness, prevention, planning, spill response, and spill notification procedures as set forth in the applicable state and federal regulations related to hazardous waste and oil management. It identifies the procedures and equipment implemented and maintained by BUMC to prevent and to minimize hazards to public health, safety, or welfare of the environment from fires, explosions, or any other unplanned sudden or non-sudden release of hazardous waste, hazardous waste constituents, or oil to air, soil, surface water or groundwater, and activities and guidelines to be implemented to mitigate these situations should they occur. The Plan also details the procedures implemented to prevent spills/releases of oil or hazardous waste that violate applicable water quality standards.

As required by 40 CFR 112, 40 CFR 265.55 and 310 CMR 30.521, BUMC has appointed Primary and Alternate Emergency/Spill Prevention Controls and Countermeasures (SPCC) Coordinators for the facility. The Primary Emergency/SPCC Coordinator is directly responsible for the implementation of this Plan and all policies and procedures described in the Plan. The Emergency/SPCC Coordinator and Alternate Emergency/SPCC Coordinators have been authorized by BUMC to implement the Plan and utilize any resources described within the Plan to minimize

the hazards to human health or the environment from a fire, explosion, or spill/release of oil or hazardous waste. The Alternate Emergency/SPCC Coordinators assume the responsibilities of the Primary Emergency/SPCC Coordinator in his/her absence. The Primary and Alternate Emergency/SPCC Coordinators for the facility, and their respective phone numbers and addresses, are identified on the Emergency Contact List of the Plan. Specific responsibilities of the Primary and Alternate Emergency/SPCC Coordinators include:

- coordinating the amendment and distribution of the Plan;
- conducting the ICP training program;
- directing response efforts;
- assess human health and environmental hazards and impacts;
- assess spill/release to determine if external reporting is required and/or if spill contractor is needed;
- initiating/coordinating incident response and communicating required follow-up actions;
- conducting follow-up notifications with outside agencies;
- initiate/coordinate sustained actions;
- initiate/coordinate termination and follow-up actions;
- implementing identified corrective actions; and
- ensuring the allocation of necessary resources (e.g., manpower and equipment) to address site-specific ICP implementation issues.

A copy of the Table of Contents for the ICP is provided in Appendix 8 as a reference to the scope of the plan.

2.2.8.2 WASTE MANAGEMENT PRACTICES

Current waste management practices at BUMC are laboratory-specific and dependent on the waste streams generated by individual BSL-1, BSL-2 and BSL-3 laboratory activities. In general, disposal of waste is particular to the organisms or standard operating procedure of the research group, but in general the following principles apply:

- Cardboard boxes lined with red biohazard bags are provided in every clinical and research lab at BUMC for all biohazard waste; and
- Sharp containers are also provided specifically for needles, syringes, and scalpel blade disposal.

There would be approximately 28,750 pounds of solid waste volume generated monthly for the Boston-NBL. Solid waste would include all non-hazardous waste

generated from offices and maintenance areas, including recyclable materials. In addition to normal solid waste, the Boston-NBL would generate three types of special waste: biological waste, radioactive waste and hazardous chemical waste. The use, storage and disposal of all solid and special waste would be performed in accordance with state and local regulations. All contaminated solid wastes would be treated prior to disposal including all wastes from the BSL-4 laboratory. Pre-disposal treatment would include alkaline hydrolysis. The waste disposal program is further described on pages 2-31 through 2-33 below.

SPECIAL WASTES

In addition to normal solid waste, the Boston-NBL would generate three types of special waste: biological, radioactive and hazardous chemicals. The use, storage and disposal of all special waste would be performed in accordance with state and local regulations. All contaminated solid wastes would be treated prior to disposal including all wastes from the BSL-4 laboratories.

BIOLOGICAL WASTE

The proposed Boston-NBL would have a separate waste management system, which would only be integrated with the current BUMC system in the final steps of the process. The proposed system would include a multi-sterilization system for BSL-3 and BSL-4 facilities, tissue digesters for animal waste, and a dedicated liquid effluent decontamination system.

The range of monthly biological waste volumes for the Boston-NBL is estimated to be 7,500 to 9,500 pounds. Biological waste would be disposed of in strict compliance with the DPH State Sanitary Code Title VIII (105 CMR 480.00), the Massachusetts Solid Waste regulations (310 CMR 19.000) and Section 2.01 of the BPHC Regulation titled "Waste Container Lot, Junk Yard, and Recycling Facilities." These regulations require written manifests.

The multi-sterilization system for the BSL-3 and BSL-4 laboratories would include five large autoclaves and 11 medium autoclaves. Animal carcass materials would be placed on rack sterilizers for easy entry/exit of large materials while smaller autoclave models would be used for general laboratory waste. Once waste material has been autoclaved in biodegradable bags and removed from the BSL-3 and BSL-4 contained space, all animal carcass waste would be placed in the tissue digestion system and undergo alkaline hydrolysis for final processing. This process uses heated caustic solutions to completely digest and disinfect biological matter that might be infectious.

A dedicated liquid effluent decontamination system would treat all liquid wastewater from the BSL-4 facilities, including both autoclave drains and chemical disinfectant wash waste. The liquid waste would be plumbed through a dedicated drainage

system directly into the cook tanks for processing prior to discharge to the municipal sanitary system.

The BSL-2 laboratories would use the current system of bagging biohazardous waste and shipping the material off-site for incineration, using a licensed third-party contractor. In all cases, BSL-3 research waste would be autoclaved onsite prior to shipping for off-site incineration. Laboratories would be responsible for autoclaving the waste material prior to shipment. Following completion of laboratory work in the BSL-3 facilities, workspace areas would be disinfected using a newly prepared 1:10 bleach solution or other OEHS-approved disinfectant.

RADIOACTIVE WASTE

Radioactive waste generated at the Boston-NBL would consist primarily of solid waste such as paper, plastic and glass contaminated with trace amounts of radioactive isotopes (radioisotopes). It is expected that the facility would generate about 10 to 15 pounds of radioactive waste each month, which is typical of such research facilities.

Radioactive waste is strictly regulated by the Massachusetts DPH, Radiation Control Program. On March 21, 1997 the state of Massachusetts became an Agreement State with the Nuclear Regulatory Commission (NRC) and was granted regulatory authority over the use and disposal over byproduct radioactive materials. The NRC issues facility-based radioactive material licenses for the management of radioactive waste and the facilities are inspected on an annual basis.

BUMC's Radioisotope Committee oversees the disposal and management of radioactive waste. Any waste containing biological agents would be deactivated biologically (as described in the previous section) prior to treatment as radioactive waste. Researchers typically place radioactive waste in labeled, special containers at the point of generation, and contact the BUMC's Radiation Protection Office (RPO) when the special container is filled. An RPO representative then removes the waste, obtains a list of materials placed in the container, and manifests and transports the container to a licensed radioactive waste storage facility for storage and handling. All records associated with radioactive waste, beginning from waste collection to final disposition, are maintained by the RPO.

The radioisotopes include both long-lived and short-lived radioisotopes. Long-lived radioisotopes require disposal off-site, such as at the Duratek site in Barnwell, South Carolina. Waste contaminated with short-lived radioisotopes would be held on-site in BUMC's decay-in-storage facility for periods ranging anywhere from one week to not more than 2¾ years, depending on the radioisotope's half-life, to wait for complete decay and subsequently disposed as non-radioactive sanitary waste.

HAZARDOUS WASTE

The generation of hazardous chemical waste at the entire Boston-NBL facility has been estimated based upon biological laboratories in comparable sized facilities at BUMC. Approximately 10-15 containers would be generated per month including the following typical waste streams with estimated monthly volumes generated:

Flammable Liquids:	400-600 lbs.
Flammable, Toxic Liquids:	300-400 lbs.
Corrosive Liquids:	50-100 lbs.
Oxidizing Liquids:	20-40 lbs.
Ethidium Bromide Solids:	100-150 lbs.

The Boston-NBL would obtain a U.S. EPA identification for hazardous waste generation and would be subject to all the federal and state "cradle-to-grave" regulations for container management, shipping and disposal. The existing BUMC campus-wide ICP, Waste Minimization Plan and Recycling Program would be modified to incorporate the Boston-NBL facility. The BUMC OEHS would manage all regulatory documentation including shipping manifests.

2.2.9 TRANSPORTATION DEMAND MANAGEMENT

Transportation Solutions for Commuters (TranSComm) is the Transportation Management Association (TMA) for the Boston University Medical Center and BioSquare. The TMA, established in 1993 in association with BioSquare Phase I implementation, is one of the oldest and most effective TMAs in the Boston area. Over the years, the continuing efforts of TranSComm, with the support of University Associates and BUMC administration, have yielded a reduction in Single Occupant Vehicle use from 70 percent in July 1993 to 48 percent in 2003, as measured by employer surveys. This is a significant reduction of 31 percent over about 10 years. Over the same time period, transit use increased from 17 percent of mode share up to 40 percent. Walking increased from 3 to 4 percent, and ridesharing dropped from 11 percent to 8 percent. Over the years, TranSComm has been active in helping its members implement a variety of Transportation Demand Management (TDM) measures. These programs, which are described in more detail in the following paragraphs, include parking management and pricing, transit pass subsidies, shuttle bus service to Massachusetts Bay Transportation Authority (MBTA) stations and other destinations, car pooling, van pooling, bicycling, car sharing, flex time, telecommuting and guaranteed ride home. Membership in TransComm would be part of the TDM implementation plan for the NBL.

TransComm is the Transportation Management Association (TMA) for the BUMC and BioSquare Research Park. The Project would participate in TransComm's TMA measures including:

- Reduce off-street parking and charge reasonable fees.
- Participate in MBTA transit pass subsidies for employees.
- Participate in MBTA transit pass subsidies for students.
- Continue evening shuttle bus service to the MBTA's Orange and Red line stations.
- Participate in additional free shuttle services described in Chapter 3.
- Continue working with State Ridesharing Agency to provide carpooling and vanpooling.
- Provide bicycle spaces at nearby sites.
- Provide Zipcar opportunities for car sharing.
- Encourage flex time and telecommuting.
- Provide Guaranteed Ride Home for carpool and vanpool commuters in case of an emergency.
- Continue to participate in Transportation Demand Management (TDM) programs to reduce single occupant vehicle use.

Furthermore, the Project would work with the Boston Transportation Department (BTD) to finalize a package of transportation improvements to be implemented as part of the traffic mitigation for the overall buildout of the BioSquare Research Park including the following:

- Right-turn-in, right-turn-out site driveway at Southbound Frontage Road;
- Modification of the East Newton Street/Albany Street intersection as a four-way intersection, including associated traffic signal upgrades;
- Improvements at East Concord Street/Albany Street, including any required traffic signal upgrades;
- A traffic and parking management plan for Albany Street between East Newton Street and Union Park Street. Subject to BTD approval, the plan would convert Albany Street to a 3-lane cross-section that typically consists of a single travel lane in each direction and a center left-turn lane. No widening of the street is proposed. The plan would also include recommendations for changes to the existing on-street parking regulations.
- Installation of fiber optic communications cable and conduit within the Albany Street sidewalks that are scheduled to be rebuilt as part of the BioSquare Project;
- Directional signage for employees, hospital patients, and visitors on and near the campus;
- The provision of up to 2 variable message boards in the area to provide opportunities for real-time traffic information.

2.2.10 CONSTRUCTION MANAGEMENT PLAN

The Project would work with the BTD to develop a Construction Management Plan (CMP) to minimize such impacts. The Plan would detail measures to ensure the maintenance of existing levels of service on adjacent roadways during the construction of a project and to minimize disruption in the area. The CMP will be submitted to BTD for approval as text with an accompanying plan prior to obtaining a building permit from the City of Boston Inspectional Services Department. The CMP will address work phasing with specific provisions for activities such as site preparation and deliveries. A separate CMP will be devised for each phase if such phases are determined to be substantially different in terms of site set-up and/or operations. The CMP will specifically address coordination issues between the BioSquare Phase I Building D, which is currently under construction, the proposed roadways and the proposed parking garage. The plans will include provision of jersey barriers, fencing, pedestrian walkways, pavement marking and on-street parking, to ensure safe and efficient movement through the work area. All existing traffic control devices affected by the work will be noted. In addition to access, storage, and queuing, the CMP will also show truck-maneuvering paths to and within the site. The location of any incidental equipment, such as cranes or concrete pumps, will also be shown on the plans. Potential off-site areas and locations adjacent to the site for truck staging will be investigated and identified if required by the City.

The Project would also comply with the City of Boston and the state DEP's air and construction noise regulations and DEP's Diesel Retrofit Program for Construction Vehicles. The DEP Diesel Retrofit Program for Construction Vehicles includes the use of retrofitted equipment and/or cleaner diesel fuel. Electric welders would be used and no diesel powered generators would be used unless for emergency reasons. The exhaust system of all heavy equipment including excavators and cranes would be modified with scrubbers if they were to remain on site for more than two months. All diesel equipment would utilize low sulfur fuel. All diesel equipment would be equipped with a mufflers and sound shrouds / shields.

2.3 PROJECT ALTERNATIVES

Alternatives to the Proposed Action are limited to No Action and actions that were considered but eliminated from further consideration. These alternatives are discussed below.

2.3.1 NO ACTION

Under the No Action Alternative, the Boston-NBL would not be built.

2.3.2 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

This section discusses three alternatives to the Proposed Action that were identified during the public scoping process, considered and subsequently eliminated from further review. These alternatives provide no environmental advantage over the Proposed Action or No Action, do not meet the purpose and need of the Project, or are not suitable given the programmatic and siting criteria stated below. These alternatives include:

1. Locations outside Massachusetts or lower density areas outside of Boston
2. Alternative location for the BSL-4 facilities

BACKGROUND

BUMC undertook a comprehensive analysis of potential site alternatives prior to submitting a proposal to NIH in response to the Broad Agency Announcement (BAA) issued on October 15, 2002 (U.S. DHHS, 2002b). This section reviews the programmatic and siting criteria used by BUMC to select the preferred site and provides further information regarding the above alternatives.

PROGRAMMATIC CRITERIA

Criteria that were used by BUMC to determine appropriate sites included:

- Meeting NIAID's national research goals,
- Incorporation of existing BUMC institutional programs and objectives,
- Use of existing medical research facilities,
- Support for the research of other institutions in the greater Boston area, and
- Partnership with the Harvard University Medical School's NIAID-sponsored Regional Center of Excellence (RCE).

SITING CRITERIA

Sites for the proposed NBL were evaluated if there was a reasonable expectation that a facility could be constructed with the available funding, in a reasonable time, and while meeting federal safety criteria. To meet these constraints, two minimum siting criteria were established:

1. The site must be controlled (owned or currently leased) by Boston University (to remain within funding and timing constraints); and
2. The lot size must be sufficient to accommodate a minimum building size of 190,000 sf and at the same time meet federal security setback requirements (to meet federal safety criteria).

The lot size criterion was established around the proposed program for the facility, which requires a building of approximately 190,000 sf including research laboratories, support space and mechanical space. This building form could be a mid-rise vertical structure or a low rise horizontal structure, depending on soil conditions, land values, availability of nearby employee parking and public transit and local zoning constraints. For urban sites, it was assumed that a 7 story, 26,500 sf footprint building with off site parking and nearby public transit would require a lot size of at least 60,000 sf. The actual lot size required could be substantially larger due to the required setbacks of approximately 150 feet from adjacent vehicular ways and, if applicable, 100 feet from pedestrian areas.

A second tier of site evaluation was developed for those sites that met the two minimum siting criteria listed above. The second tier criteria addressed other BUMC locational and programmatic objectives deemed necessary to make the proposal nationally competitive and institutionally feasible from a medical, research, and teaching perspective. These objectives included the following:

- Proximity to the proposed Harvard University Medical School's NIAID-Sponsored Regional Center of Excellence
- Ease of access to and use of existing medical research institutions/research facilities, opportunities for efficient medical research collaboration and ability to function as a training center (see "Figure 2-5. Location of Nearby Research Facilities").
- Proximity to a trained workforce
- Proximity to state of the art emergency response programs and facilities including police, fire, public health and medical trauma
- Proximity to interstate highway systems and a regional airport
- Presence of adequate public infrastructure including water and sewer
- Facility use and building dimensions allowed under local zoning
- Siting achieves Smart Growth objectives (locating new development near existing transit and utility infrastructure and redeveloping brownfield sites).

2.3.2.1 ALTERNATIVE LOCATIONS OUTSIDE MASSACHUSETTS OR LOWER DENSITY AREAS OUTSIDE OF BOSTON

Some commentors suggested that the Boston-NBL facility be located outside of Massachusetts or in a lower density area outside of the City of Boston.

Boston University has several landholdings in Massachusetts and New Hampshire, as shown on "Figure 2-6, Boston University Controlled Properties". These sites include: the BUMC campus and the BioSquare Research Park located in Boston's South End, the main campus of Boston University at the Charles River campus, the Corporate Education Center in Tyngsborough, MA, and the Sargent Center for Outdoor

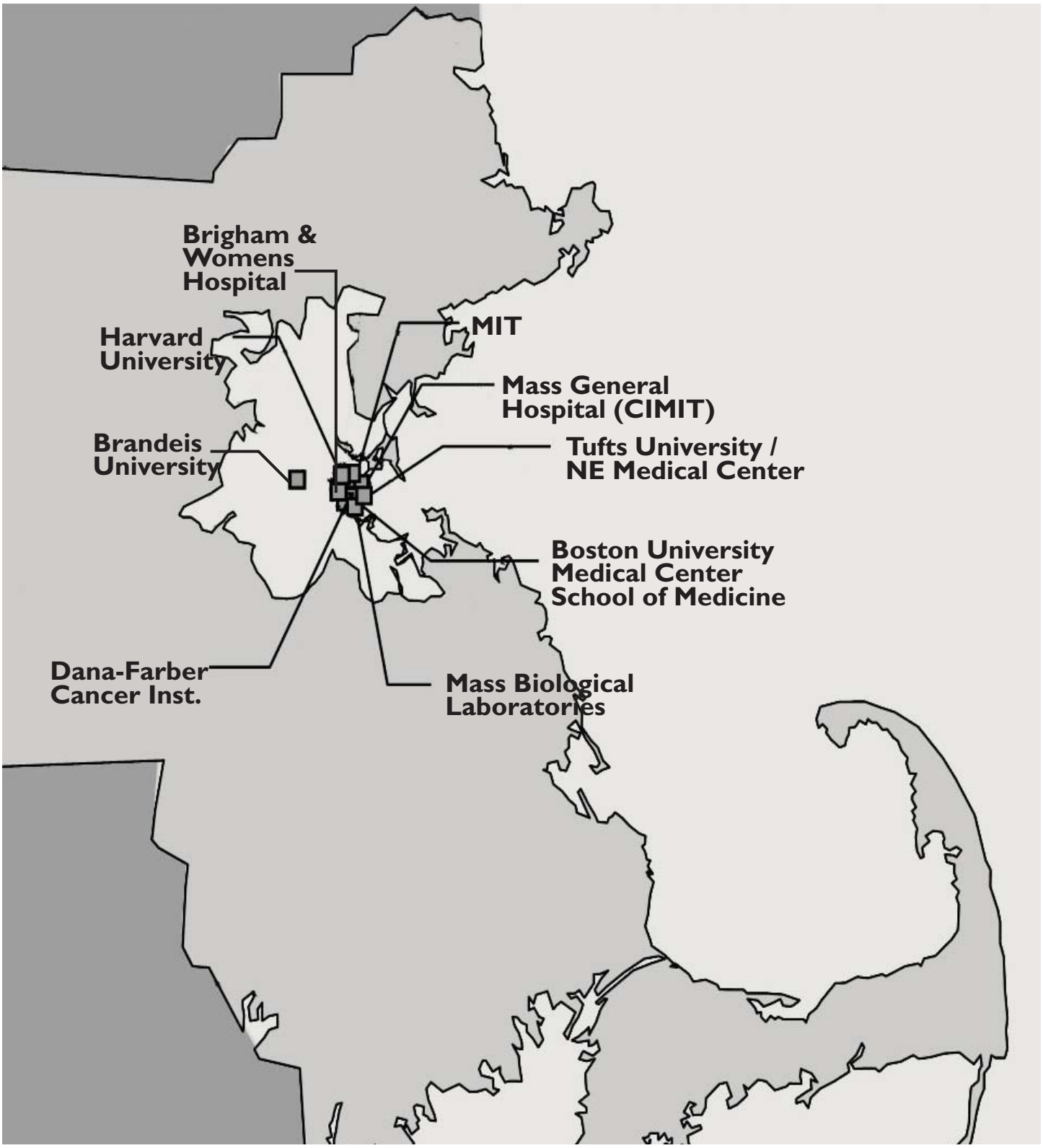

FIGURE 2-5
Location of Nearby Research Facilities
source: NIH Office of Extramural Research

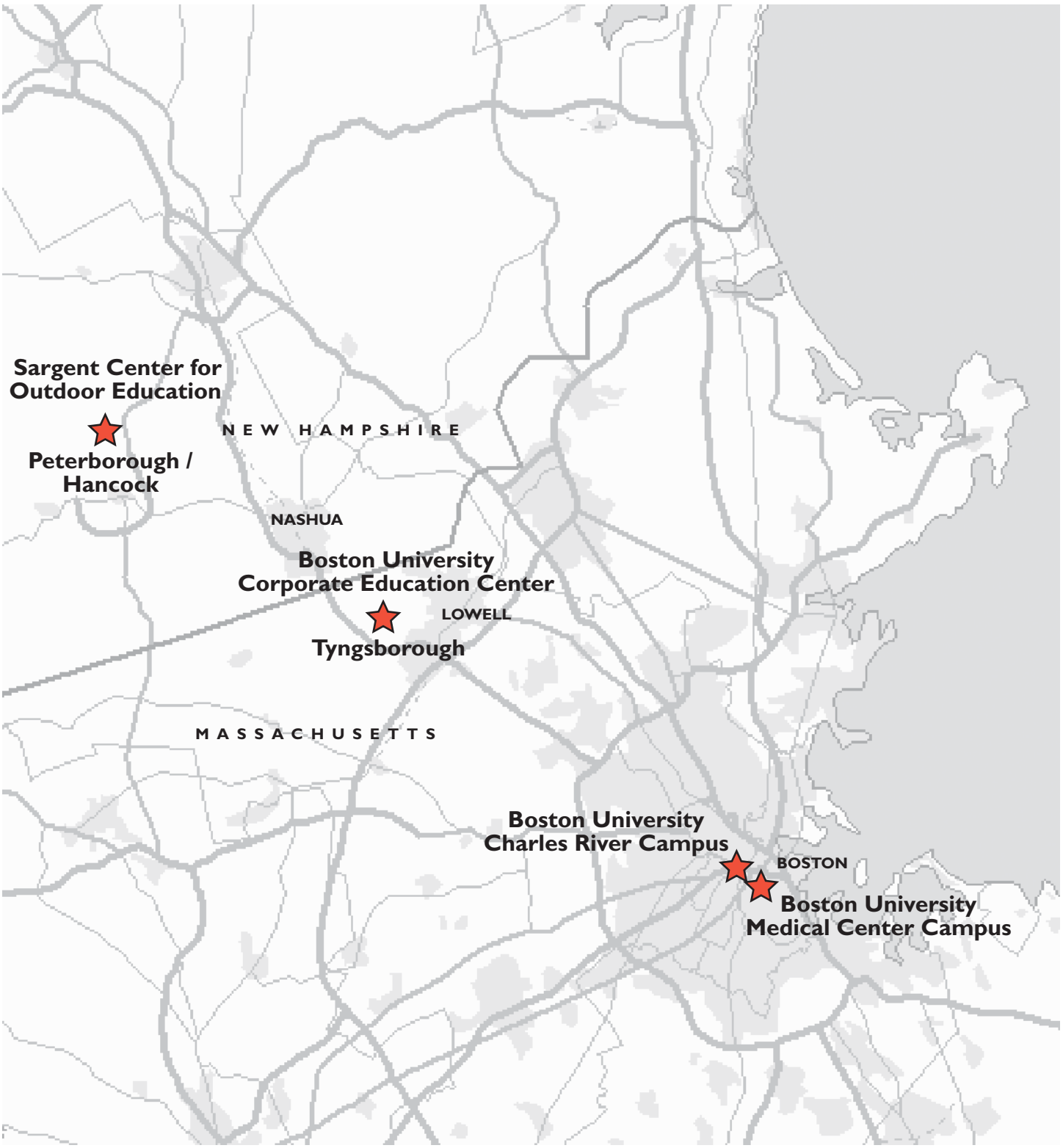

FIGURE 2-6
Boston University Controlled Properties
source: Fort Point Associates, Inc.

Education in Peterborough, New Hampshire. Brief descriptions of these landholdings and potential development sites are provided below.

BOSTON UNIVERSITY CORPORATE EDUCATION CENTER TYNGSBOROUGH, MA

The Boston University Corporate Education Center is located on the site of the former Wang Institute for Graduate Studies on Tyng Road in Tyngsborough, MA, approximately 30 miles from downtown Boston.

The site consists of 210 acres, the majority of which are located in the Town of Tyngsborough with 6.6 acres located in Chelmsford and 22 acres located in Westford. The site includes the historic Tyng mansion which houses a high-tech training facility providing over 20,000 square feet of conference space including a 280-seat auditorium and seven conference rooms, a caretaker's residence and a Quonset hut. The conference center complex is located along the northern portion of the site off of Tyng Street. The balance of the property contains heavily wooded areas, wetlands, several open fields and the remnants of a rock quarry operation. See "Figure 2-7, Boston University Corporate Education Center".

BOSTON UNIVERSITY SARGENT CENTER FOR OUTDOOR EDUCATION, PETERBOROUGH, NH

The Boston University Sargent Center for Outdoor Education is located along Sargent Camp Road in Hancock and Peterborough, New Hampshire, approximately 70 miles from downtown Boston. The facility has operated since 1912 as a training facility, summer youth camp, and year round outdoor education and conference center. The entire site, which is located in the northwest portion of the community, consists of 850 acres with 505 acres in Hancock and 345 acres in Peterborough. Of the 850 acres, approximately 166 acres are non developable with an estimated 24 acres of protected wetlands, 82 acres of protected watershed and a 60 acre pond, Half Moon Pond. Of the 684 remaining acres, the main campus of Sargent Camp, located in the southern portion of the site, occupies a 16-acre parcel.

This parcel is improved with a number of buildings including staff and guest housing as well as support lodges and offices containing approximately 59,000 sf. See "Figure 2-8, Boston University Sargent Center for Outdoor Education".

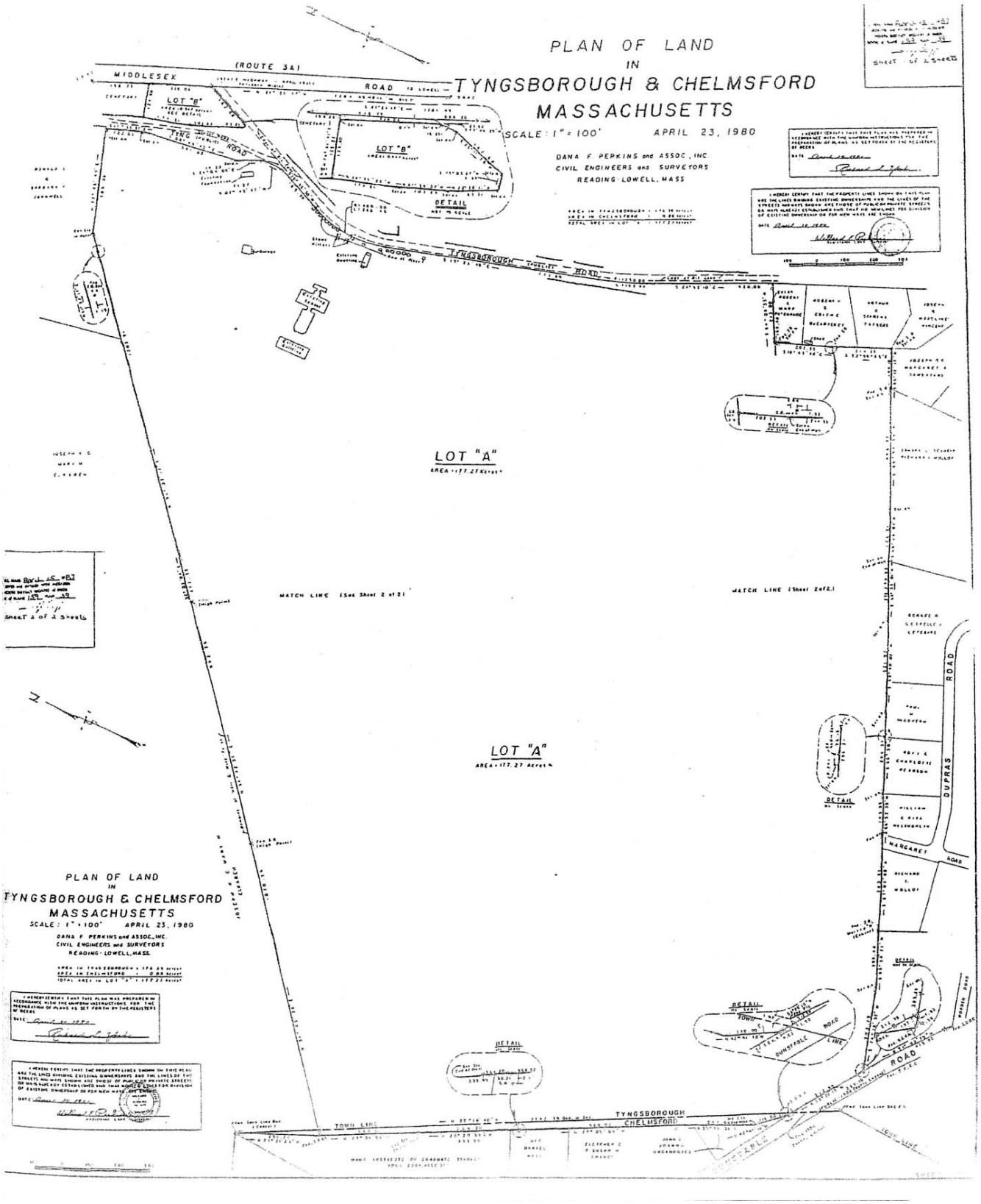

FIGURE 2-7
Boston University Corporate Education Center (Tyngsborough, MA)
source: Boston University

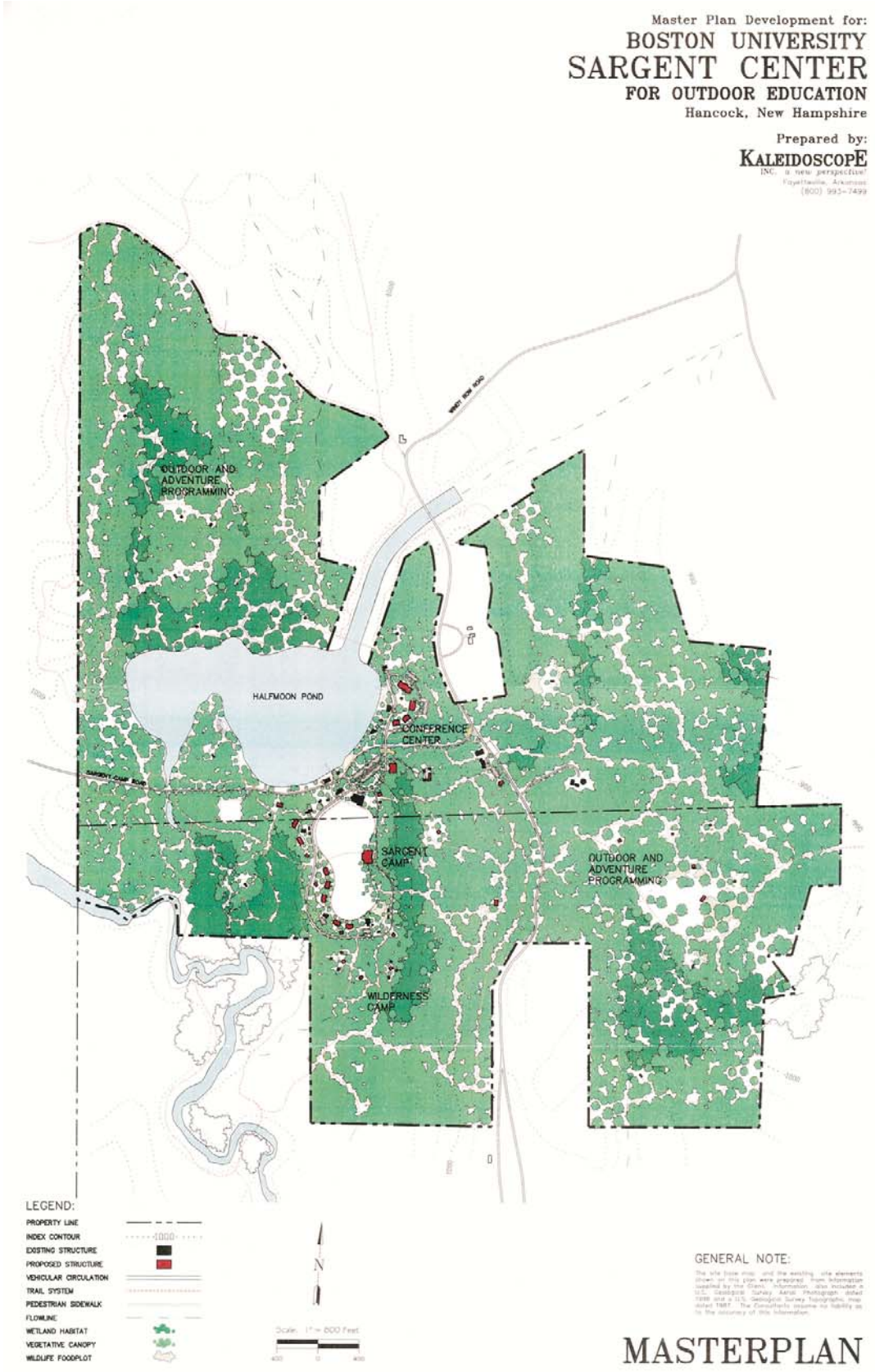

FIGURE 2-8
Boston University Sargent Center for Outdoor Education
source: Comprehensive Master Plan Development, October 2001

RATIONALE FOR DISMISSING

In February of 2003, the National Institute of Allergy and Infectious Diseases (NIAID) received competitive proposals to construct NBLs in response to the BAA. As stated in the BAA, the overall objective of NIAID's NBL construction program is "to provide funding to design, construct, renovate (if needed) and commission and install and certify fixed equipment into comprehensive, state-of-the-art BSL-4 biocontainment laboratories and the necessary associated BSL-3 labs, BSL-2 labs, animal facilities, clinical facilities and research support space." The BAA further stated that NBLs would serve as a national resource and must support the research of Regional Centers of Excellence (RCE). Among numerous sites submitted nationwide, NIAID selected the BUMC in Boston, Massachusetts as one location to construct an NBL. The selection was based on multiple factors including a review of environmental issues, but focused primarily on the scientific and technical merit of the application as assessed by peer review and on BUMC's ability to contribute to the overall NIAID biodefense research agenda (U.S. DHHS, 2003).

The extensive research expertise on infectious diseases found within BUMC and within the surrounding institutions participating in the RCE is not available elsewhere in the country and is one of the prime reasons for the choice of the proposed Boston-NBL facility location.

Furthermore, one of the program requirements of the BAA was that the Applicant must be "associated with or have planned linkages to one or more institutions or consortia that are applying for NIAID Regional Centers of Excellence (RCE), Biodefense and Emerging Infectious Diseases research grant awards" (U.S. DHHS 2002b). RCE's are consortiums of universities and complementary research institutions serving a specific geographical region which will build and maintain a strong scientific infrastructure supporting multifaceted research and development activities that promote scientific discovery and translational research capacity required to create the next generation of therapeutics, vaccines, and diagnostics for the NIAID Category A-C agents. BUMC has established a formal association with the Region 1 RCE located at Harvard Medical School in Boston, MA. Like other national research-intensive enterprises, the Boston-NBL would become a hub of research training for these future RCE investigators. Within the Boston-NBL, there would be principal investigators, staff, trainees, and a large number of support personnel. There would also be principal investigators and their research teams from the RCEs as well as from other NIAID supported programs whose research projects would mature to require access to BSL-4 high containment facilities.

Placement of the lab outside Massachusetts or outside the City of Boston in a lower density area would run counter to the goals of the NIH program and lessen the value

of the above-described physical and intellectual capital present at the BioSquare Research Park. Alternatives located in lower density areas also would not alter, reduce or mitigate the environmental impacts of the preferred alternative because as demonstrated by the "worst case" analysis included in Chapter 4, locating the facility in a lower density area would not in any way reduce the risk to the public.

Locations outside Massachusetts or outside the City of Boston in a lower density area are not feasible alternatives as they do not meet several of programmatic or second-tier siting criteria listed above, specifically:

- Incorporate existing BUMC institutional programs and objectives,
- Support the research of other institutions in the greater Boston area, and
- Be considered in proximity to the proposed Harvard University Medical School's NAIAD-Sponsored Regional Center of Excellence.

Locations in a lower density area outside of Boston are not feasible alternatives as they do not meet the purpose and need for the Project, nor do they meet several of the second-tier siting criteria listed above. Areas of lower density outside of Boston would not have the:

- Proximity to trained workforce,
- Proximity to interstate highway systems and a regional airport, or
- Presence of adequate public infrastructure including water and sewer.

2.3.2.2 ALTERNATIVE LOCATION FOR THE BSL-4 FACILITIES

Some commentors suggested that the BSL-4 laboratories should be separated from the Boston-NBL facility and located in a less densely populated area. This alternative is similar to the above alternative and would also result in great inefficiencies in terms of capital expenditures and labor.

RATIONALE FOR DISMISSING

The NIAID BAA for the NBL construction described above requires the NBL facilities to include BSL-3, BSL-4 and other facilities in one location. For this reason and the reasons described in the paragraphs below, the proposed location represents the most efficient use of resources and capital facilities and the alternative location for a BSL-4 laboratory does not meet the program criteria.

A key component of the research proposed at the Boston-NBL relies on the integration of existing BioSquare Research Park and BUMC scientists with those who would work in the new facility. Locating the BSL-4 laboratory at a separate location would eliminate the connected research on projects that use the existing and proposed BSL-2 and BSL-3 facilities, resulting in inefficient and impractical research efforts. This

alternative fails to meet the NIAID's purposes "to provide…state-of-the-art BSL-4 biocontainment laboratories and the necessary associated BSL-3 labs, BSL-2 labs, animal facilities, clinical facilities and research support space" that would serve as a national resource and support the research of RCEs. In preparing the funding proposal for the Boston-NBL facility, BUMC surveyed the RCE scientific objectives and developed a program to accommodate the unique needs of the RCEs at a national biocontainment laboratory.

Separating the BSL-4 laboratories from the BSL-2 and BSL-3 laboratories would also result in great inefficiencies of capital expenditures and labor. The integration of the existing BUMC safety and security programs into the Boston-NBL facility would not occur and researchers at the proposed Boston-NBL facility and existing researchers at the BUMC and BioSquare Research Park would not benefit from the adjacency of the BSL-4 laboratory. For the above reasons, this alternative is not a feasible alternative and would not achieve the stated purpose and need for the Project.

2.3.3 AGENCY'S PREFERRED ALTERNATIVE

The Proposed Action is the agency's preferred alternative. While the Proposed Action results in mitigated impacts that would not occur with the No Action, the Proposed Action fulfills the purpose and need of the NIH biodefense research.

The proposed site for the Boston-NBL provides a unique setting where established teams of researchers already work side-by-side on medical research. The Boston-NBL facility would be constructed within the 14 acre, 2.2 million square foot BioSquare Research Park, which is the City of Boston's only research park devoted exclusively to the life sciences sector. The site is immediately adjacent to the BUMC and its extensive medical, clinical and research facilities as well as several other medical research facilities in the City of Boston and neighboring Cambridge. The site also has excellent highway access and sufficient utility infrastructure to support the Boston-NBL Project without any adverse impacts.

An important advantage of the proposed location is the ability to integrate with these extensive research facilities and BUMC research employees, which would not need duplication within the Boston-NBL building. In addition, investigators at BUMC, whose research programs would be part of the facility, currently occupy 27,000 square feet of new BSL-2 and BSL-3 laboratory space in the existing BioSquare biomedical research buildings. This adjacency would create enormous added value since these laboratory facilities would not need to be duplicated in the Boston-NBL facility. Furthermore, the proposed location would allow dynamic collaborations between investigators at multiple research entities such as the Boston University School of Medicine, Harvard Medical School which is a NIAID designated RCE, Massachusetts Institute of Technology, Massachusetts General Hospital, Brigham and

Women's Hospital, The Center for Blood Research, University of Massachusetts Medical Center, The Massachusetts Biological Laboratories and Brandeis University .

Locating the Boston-NBL in the BioSquare Research Park in the City of Boston takes advantage of the extensive biomedical and biotechnology research portfolio of this area. Because of its large concentration of research-intensive biomedical institutions, Boston is ranked #1 among recipients of the NIH research grant funds of all cities in the United States. The proposed Boston-NBL would be located in proximity to proposed Project Principal Investigators and is conveniently accessible to all the Principal Investigators of the other New England RCEs. The Principal Investigators of the research projects to be undertaken at Boston-NBL are located at these institutions. Because the Boston–NBL would be located in proximity to the conventional laboratories of these investigators (which includes 11,000 sf of conventional laboratory space for New England RCE projects alone) the Boston-NBL would not need to duplicate all of the BSL-2 and infrastructure space that is so critical to the research mission.

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3.0 AFFECTED ENVIRONMENT

3.1 INTRODUCTION

The existing environmental resources found in the Project area are described in this Chapter. The U.S. Department of Health and Human Services (DHHS) General Administration Manual, Part 30-50-00 (U.S. DHHS, 2000) requires Environmental Impact Statements to incorporate material required by applicable statues or Executive Orders. The following environmental resources may be affected by the Project and are addressed in this Chapter include the following:

- Social Resources
- Economic Resources
- Environmental Justice
- Visual Quality
- Noise
- Air Quality
- Wastewater and Water use
- Historic Resources

The following environmental resources have been analyzed and are either not present in the Project area or would not be affected by the Project and thus are not discussed in this Chapter:

- Soil
- Geology
- Floodplains
- Wetlands and Riparian Areas
- Vegetation
- Fish
- Wildlife
- Threatened and Endangered Species
- Surface Water
- Water Supply
- Groundwater
- Coastal Zone

3.2 SOCIAL RESOURCES

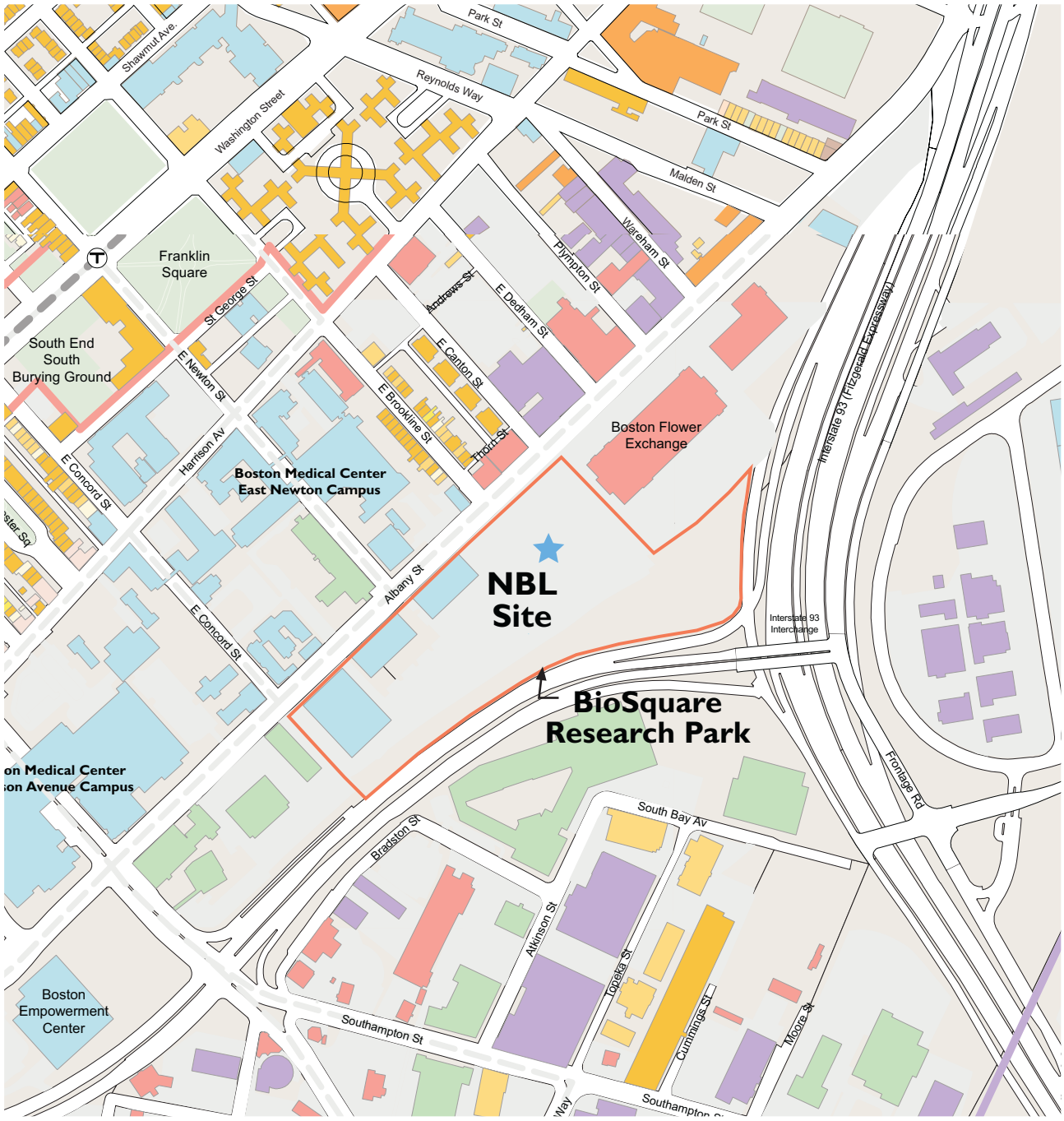
3.2.1 ANALYSIS METHODS

The socioeconomic study area includes the South End neighborhood and the City of Boston. The South End neighborhood as officially defined by the Boston Redevelopment Authority is comprised of multiple Census Tracts from the 2000 U.S. Census, including a portion of Census Tract 703, Census Tracts 704, 705, 706, 707, 708, 709, 711, 712 and a portion of Census Tracts 801, 804, 805 and 806. Data from Suffolk County and the State of Massachusetts are used where appropriate for comparison purposes.

Data was collected to comprehensively describe existing conditions for the primary impact area and the City of Boston. Baseline data for the primary impact area includes population statistics, including age and education; demographic data; information on land use; housing data, including number of units and occupancy; and current economic statistics. Data was collected to comprehensively describe existing conditions for both the City of Boston and the South End neighborhood. Data contains current population statistics including age categories and education levels taken from the 2000 U.S. Census (U.S. Census Bureau, 2000 and 1990), from the Boston Redevelopment Authority's (BRA) South End 2000 Census of Population & Housing (BRA, 2003) and the University of Massachusetts' *Massachusetts Benchmarks* project (University of Massachusetts, 2004). Existing land use is described based on field observations. Housing information includes number of units, vacancy rates and costs based on statistics from the 2000 U.S. Census, and the BRA's South End 2000 Census of Population & Housing. Economic information includes employment by industry, labor force and income from the 2000 U.S. Census, the BRA's South End 2000 Census of Population & Housing and from the University of Massachusetts' *Massachusetts Benchmarks* project. Information on public finance was obtained from the City of Boston Office of Budget Management (City of Boston Office of Budget Management, 2004a, b & c).

3.2.2 AFFECTED ENVIRONMENT

The Project site is located in the southeast portion of the South End neighborhood in the City of Boston within Suffolk County (see "Figure 3-1 Neighborhood Context Plan"). The South End is a densely developed residential area bordered by institutional and industrial areas south of Harrison Avenue. Beginning in the 1900s, the South End began to attract a number of the city's churches, hospitals and other institutions, including Boston City Hospital (now Boston Medical Center).



- 1 Family Residential
- 2 Family Residential
- 3 Family Residential
- Apartments/Condos
- Mixed Use (Res./Comm.)
- Commercial
- Institutional
- Industrial
- Open Space
- Surface Parking
- Main Streets District
- MBTA Stations
- MBTA Surface Subway Lines
- MBTA Underground Subway Lines
- Commuter Rail
- Below Ground Commuter Rail
- Water Transit Facilities
- Water Transit Routes
- Bus Routes

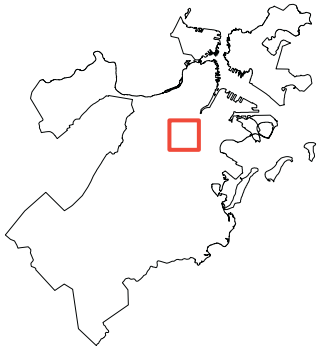


FIGURE 3-1
Neighborhood Context Plan
source: Boston Redevelopment Authority

Today, commercial activity in the South End is concentrated along Columbus Avenue, Tremont Street and Washington Street, and includes many fine restaurants while the medical and research uses are concentrated along Albany Street and Harrison Avenue. The institutional/industrial uses located south of Harrison Avenue include the Boston University Medical Center (BUMC), the BioSquare Research Park, the Boston Flower Exchange facility on Albany Street and the Suffolk County House of Correction. The 28,160 residents of the South End are highly diverse in terms of race, ethnicity and household income. The area has a significantly higher than average male population, an above average median income, a lower than average unemployment rate, and an above average poverty rate compared to the rest of the City of Boston.

The Greater Boston Region, which includes all of Suffolk County, as well as a large share of Middlesex and Norfolk Counties, and portions of Plymouth and Essex Counties, is widely recognized as one of the world's most innovative economic areas. Home to some of the finest institutions of higher education, the region has generated a tremendous concentration of science- and technology-related research and development (University of Massachusetts, 2004). There are 22 hospitals and 35 colleges and universities within Boston's city limits (BRA, 2002). According to the University of Massachusetts' *Massachusetts Benchmarks* project, these intellectual resources, combined with the region's rich heritage and extensive cultural offerings, make Greater Boston the center of much of Massachusetts' economic activity (University of Massachusetts, 2004).

The region is home to half the state's workforce and jobs. According to the Bureau of Economic Analysis, the personal income generated by the residents of Suffolk, Norfolk, and Middlesex Counties accounts for more than 50% of the state total. The knowledge-intensive export clusters that drive the state's larger economy, knowledge creation, information technology, financial services, and health care are concentrated in Greater Boston (University of Massachusetts, 2004).

POPULATION TRENDS AND DEMOGRAPHIC INFORMATION

Greater Boston is the most populous of the state's regions with its 3,015,981 residents accounting for nearly half of the Commonwealth's population. Between 1990 and 2000, the region lagged behind the state in population growth rising 4.9% versus 5.5% (University of Massachusetts, 2004). In the City of Boston, population actually grew between 1990 and 2000, from 574,283 to 589,141, an increase of 3%. Table 3-1 provides a comparison of population and demographic trends of Boston and the South End.

Table 3-1: A Comparative Overview of Boston and the South End

	Boston	South End
Population	589,141	28,160
Foreign Born Population	25.8%	20.6%
White alone	320,699	14,048
Black or African American alone	146,958	7,053
American Indian and Alaska Native alone	2,581	199
Asian, Pacific Islander alone	44,563	3,236
Other race alone	46,709	2,504
Two or more races	27,631	1,120
Non-Hispanic, White Population	290,972	12,751
Hispanic Population	85,199	4,578
Poverty Rate	19.5%	23.9%
Unemployment Rate	7.2%	6.9%
Median Household Income	$39,629	$41,590
Housing Units	251,935	15,261
Occupied Housing Units	95.1%	93.6%
Median Gross Rent	$802	$707
Spoken Language at Home - English Only	66.6%	67.8%
Occupation - Service Industry	17.8%	14.4%
Occupation - Management, Profess. Etc.	43.3%	55.6%

Source: BRA, 2003, from Comparative Overview Table and p. 1, Table 2, Racial Composition. Additional data about race in the City of Boston was taken from U.S. Census Bureau, 2000, Table P6, Race.

In the 1990s, the median age in Greater Boston rose from 34.0 to 36.3, slightly below the statewide median of 36.6 years. This small increase masks a significant shift in the region's age profile. The population of those ages 45 to 64 increased almost 22% to 666,805, while the 19- to 24-year-old group fell by almost 19%, to 291,454 (University of Massachusetts, 2004). In the South End, the median age is 34.1, which is slightly younger than the median age in the City of Boston.

While both the state and region experienced a mini "baby boom," this has not been enough to counter the aging of the population, which is likely to have a significant effect on the economy. Employers will find that the aging workforce will require them to adjust their hiring practices to accommodate older, more experienced workers for entry-level positions (University of Massachusetts, 2004).

According to the 2000 U.S. Census, 28,160 people reside in the South End, comprising 5% of the population of Boston. Of that population, 50% are minority. Table 3-2 below details demographic characteristics for the Commonwealth of Massachusetts, Suffolk County, the City of Boston and the South End for Year 2000.

Table 3-2: Demographic Characteristics, 2000

Demographic Characteristics	Massachusetts	Suffolk County	Boston	South End
Total Population	6,349,097	689,807	589,141	28,160
Gender				
Male	3,058,375	332,918	283,548	15,262
Female	3,290,722	356,889	305,593	12,898
Age Group				
0-4	394,848	38,099	31,765	1,067
5-9	431,318	40,426	34,045	1,219
10-14	431,562	39,218	32,582	1,171
15-19	411,955	47,980	42,283	1,200
*20-24	406,139	77,580	70,892	2,641
25-34	920,320	140,406	123,522	7,295
35-44	1,075,986	104,807	88,041	5,241
45-54	873,074	75,672	63,691	3,533
55-59	307,886	27,262	22,511	1,288
60-64	236,408	21,855	18,208	1,129
65-74	430,427	38,743	31,357	1,375
75-84	315,532	27,523	22,139	741
85 and over	113,642	10,236	8,105	260

Source: BRA, 2003, p. 2, Table 7, Age, Race and Sex. Additional data for the Massachusetts, Suffolk County and the City of Boston was taken from U.S. Census Bureau, 2000, Table P8, Sex by Age.

3.2.3 HOUSING

In the mid to late 1980s, Boston's real estate market experienced unprecedented growth, creating 80% of Boston's current condominium stock. In 1980 there were 4,500 condominiums in Boston. By 1990 there were 34,575 condominiums, and the median sales price was $135,000. In 1999, condominium sales in Boston represented 36% of the city's residential property types (one, two, three family homes and condominiums). The median sales price for condominiums during that year was $175,000, a 30% increase from the median sales price in 1990. Sales volume increased by 134% from 1990 to 1999 (1,997 sales compared to 4,683 sales). The Boston median condominium sales price per square foot also increased from $202 per square foot to $221 per square foot from 1998 to 1999, a 9% increase (City of Boston Department of Neighborhood Development, 2000).

The majority of the South End consists of Victorian row houses, which are protected by landmark designation and recognized as the largest neighborhood of this type in

the United States. In the 1980s, extensive public and private investment led to many of those buildings being returned to single-family units or condominiums.

According to the 2000 U.S. Census, there are 15,261 housing units in the South End, representing 6% of the city's total 251,935 housing units. Twenty-six percent (26%) of the units are owner-occupied with an average of 1.87 people residing in each household. Approximately 93.6% of the housing units in the South End are occupied.

The housing market in the South End is dominated by condominiums. In 1998, the South End had the highest number of new unit condominium conversions in the City of Boston, with a total of 179. In 1999, 93% of all residential sales were condominium sales. At $323 per square foot, the South End had the second highest condominium sale price per square foot in the city of Boston in 1999 (City of Boston Department of Neighborhood Development, 2000). In 2002, 761 condominiums were sold in the South End, while only 18 single-family homes, 13 two-family homes and 14 three family homes sold during the same year. The median sale price in 2002 was $717,250 for single-family homes, $1,125,020 for two family homes, $977,500 for three family homes and $400,000 for condominiums (City of Boston Department of Neighborhood Development, 2002).

Of the 15,261 housing units in the South End, 14,278 units are occupied, leaving 6.4% vacant. Of the occupied units, 10,320 or 72.3% are renter occupied. Forty-four percent (44%) of the 983 vacant units in the South End are available to the rental market (BRA, 2003).

3.2.4 EDUCATION

The Boston Public School System (including neighborhoods such as the South End) is managed on a City-wide basis, such that children do not necessarily attend school in the neighborhoods in which they live, (as evidenced by the fact that the South End does not have its own high school). The Boston Public School System oversees the five public schools in the South End: three elementary schools, including Blackstone Elementary, Joseph J. Hurley Elementary and McKinley Elementary; McKinley Technical High; and the Carter Development Center, devoted to serving the educational needs of severely disabled students. All of the neighborhood's schools are multicultural in nature, and one school, Joseph J. Hurley Elementary School, offers English-only as well as bilingual education. In addition, both of the McKinley schools serve students with serious emotional, behavioral and learning disabilities. The South End lacks a regular high school, but Boston High School is nearby in the Back Bay.

Total enrollment at all of the schools is 1,371. Approximately 1,150 students attend the three elementary schools, 200 attend McKinley Technical High, and 24 attend the Carter Development Center.

There are 3,023 school age children currently residing in the South End, which is 10.7% of the total population. The number of school age children residing in the City of Boston is approximately 84,109, or approximately 14.3% of the City's total population. Information about school age children is taken from the 2000 U.S. Census age bracket of 5 to 17 years old.

3.2.5 COMMUNITY SAFETY AND RISK

LAW ENFORCEMENT

The existing BioSquare Research Park has BUMC Security Officers on site at all times and is patrolled by Boston University Police Officers on a regular basis. BUMC has a 100-person security department that includes 85 security officers, investigators, and management and systems staff.

The City of Boston Police Department provides law enforcement in the South End neighborhood. The Department has eleven district stations. The Project site is served by the District D-4 Police Station, located at 650 Harrison Avenue. Thirty-five officers are assigned and deployed at Station D-4 and patrol three shifts per day on foot and in car. When necessary, aid is sought from District B-2 in Roxbury, District D-14 in Brighton/Allston or District A-1 in downtown Boston and District C-6 in South Boston.

FIRE PROTECTION

Division 1, District 5 of the Boston Fire Department, provides fire protection and emergency rescue services for the Project area. The companies serving the Project area include Engine 3 at 618 Harrison Avenue (District 4), Engine 22 at 700 Tremont Street (District 4), Engine 14, and Ladder 4 at 174 Dudley Street (District 5). Although the Project area is located in District 5, the closest station is Engine 3 in District 4. The ladder companies are equipped with entry tools, ladders, hooks and axes. Their job is to gain entry, locate fires, search for and remove victims, and handle life-threatening situations. Their primary objective is to confine and extinguish fires. All engine companies are equipped with tanks that carry 500 to 750 gallons of water to be used before the fire company can hook into local hydrants. The rescue squad is equipped for any magnitude of rescue operation.

All of the companies serving the Project area (including District 5) have a minimum staffing level of one officer and three firefighters per shift. Given the location of the Project area, a first full fire alarm would provide 16 to 22 firefighters, with additional staff arriving with each additional alarm issuance.

HEALTH CARE

The Project site is located across the street from the Boston Medical Center (BMC). BMC has two campuses, including the East Newton Street campus and the Harrison Avenue campus, each with their own emergency rooms. BMC is a private, not for profit, 547-licensed bed academic medical center. The hospital is the primary teaching affiliate for Boston University School of Medicine. Emphasizing community-based care its mission is to provide consistently accessible health services to all and is the largest safety net hospital in New England. BMC provides a full spectrum of pediatric and adult care services, from primary to family medicine and advanced specialty care. Seventy percent of BMC's patients are minorities and nearly 50% speak English as a second language. BMC also responds to the unique needs of children who are the most vulnerable among underserved minorities. In 2004 BMC provided $350 million in free care to the public. Of 853,050 prescriptions filled last year by BMC's outpatient pharmacy, which is the busiest single-site pharmacy in the United States, 75% were free care.

BMC is currently one of two hospitals represented on the Executive Board of the Metropolitan Medical Response System (MMRS) chaired by the Chief of Boston Emergency Medical Services (EMS). In addition to participating in these committees, BMC has the largest Level I Emergency Department (ED) Trauma center in New England which is located two blocks from the proposed Boston-NBL facility. Boston EMS uses a dynamic dispatch model so that ambulances are continuously dispatched to the next available call. There are several ambulance stations located in the vicinity of the Project site, including Ambulance 6 at the District C-6 police station located on Broadway Street in South Boston, Ambulance 2 at the District B-2 police station located on Warren Street in Roxbury, and Ambulance 16 at Beth Israel Hospital located at 330 Brookline Avenue in Boston. All of the stations are staffed by two persons per shift and there are three shifts per day.

3.2.6 TRANSPORTATION

The Boston-NBL facility site is part of the BioSquare Research Park located within the research/institutional area of the South End neighborhood of Boston, adjacent to the BUMC campus. While situated immediately adjacent to the regional highway system, the campus does not at the present time have direct highway access. Existing vehicle access to the BioSquare Research Park currently occurs exclusively from Albany Street from five site driveways (see "Figure 3-2, Existing BioSquare Research Park Site Access and Circulation Plan").

Existing vehicle trip counts in the area have been measured to be 18,000 vehicles per day (vpd) on Albany Street, 15,000 vpd on Frontage Road, and 64,000 vpd on the Massachusetts Avenue Connector.

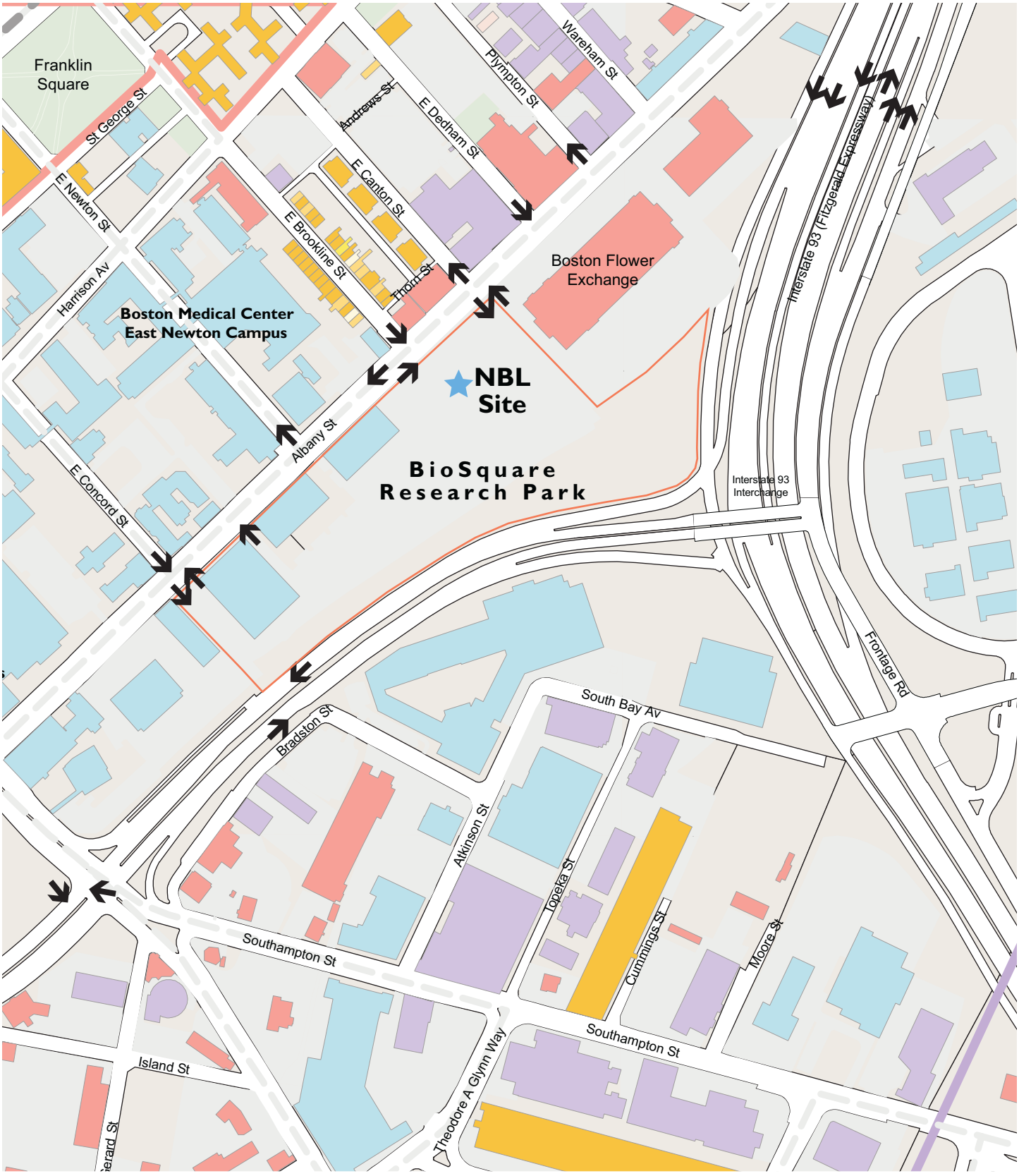


FIGURE 3-2
Existing BioSquare Research Park Site Access and Circulation Plan
source: Boston Redevelopment Authority

There are approximately 2,200 parking spaces located within the BioSquare Research Park including the 1,000 spaces in the Albany Street Garage and 1,200 surface parking spaces.

In 1991, BUMC created a transportation management association, Transportation Solutions for Commuters (TranSComm). TranSComm's other members include the BioSquare Research Park and the Boston Public Health Commission. The organization works to bring more frequent and accessible public transportation to the Medical Center community and provides information on transportation services. In addition, TranSComm operates the following 15- to 30-passenger shuttles:

- VA Shuttle travels from Boston Veterans Administration Medical Center (VA) in Jamaica Plain to BUMC several times per day on the half-hour from 9:30 a.m. to 5:30 p.m;
- All-Day Campus Shuttle travels within the campus boundaries (from 1010 Massachusetts Avenue to 560 Harrison Avenue) from 6:30 a.m. to 6:30 p.m. It runs every 20 to 30 minutes;
- Evening Shuttle travels from BUMC to MBTA subway stations, the South End neighborhood, and BUMC surface parking lots from 5:15 p.m. to 12:15 a.m;
- Inner Campus Shuttle travels between institutions, primarily for patients and employees, from 8:30 a.m. to 5:30 p.m. on a continuous loop;
- Healthnet Shuttle travels from Boston neighborhoods to Boston Medical Center (for patients only); and
- Charles River Campus Shuttle travels from the BU Charles River Campus to BUMC several times each day, September–May.

TranSComm allows South End residents to use its shuttle services at no cost. This includes the all-day campus shuttle stopping at St. Helena House, a facility for elderly and handicapped South End residents.

3.3 ECONOMIC RESOURCES

The economic boom of the 1990s benefited the Greater Boston region un-evenly, as some residents actually saw a decline in their financial well-being. The economy currently faces the growing challenge of housing affordability. There is an insufficient stock of affordable housing and a growing "affordability gap", the difference between families' median income and the income required to buy a median-price home (University of Massachusetts, 2004).

In 2000, educational, health and social services made up the greater Boston region's largest industry sector in terms of employment. This was followed by retail trade; manufacturing; and finance, insurance, and real estate (FIRE). The industry mix changed during the

economic expansion between 1993 and 2000. Notable changes were the increases in services and FIRE, at the expense of manufacturing and some government employment. Overall, regional employment grew 20.7% during this period, with services growing 30.7%, retail trade 15.4%, and construction 67.5% (University of Massachusetts, 2004). Much of the region's economic growth during the 1990s benefited high-wage, educated workers and was concentrated in its outer ring.

3.3.1 EMPLOYMENT

Over the 1990-2001 period, the Greater Boston Region's workforce increased by 3.6%, the same as the state's overall rate. Almost all of this growth came in 2001, after a decade of recovering losses incurred in the early-1990s recession. During the decade between 1990 and 2000, the Greater Boston unemployment rate was below that of the state, reaching a low of 2.2% in 2000 (University of Massachusetts, 2004).

The unemployment rate in Greater Boston increased from 2.2% in 2000 to 2.8% in 2001, and then to 4.3% in 2002. The increase has been accompanied by the loss of thousands of jobs, especially in the high-tech sector. While household-based data shows a decline of approximately 23,000 jobs in 2002, the number of "establishment" jobs lost is larger. "Establishment" employment data accounts for commuters into the Boston area, while household data does not (University of Massachusetts, 2004).

Table 3-3 below details the Year 2000 employment characteristics as defined by the 2000 Census for the Commonwealth of Massachusetts, the City of Boston and the South End. Management, professional and related occupations comprise the majority of jobs within the State, City and within the South End neighborhood, with sales and office occupations following behind in all three areas.

Table 3-3: Employment Characteristics, 2000

Industry	Massachusetts	Boston	South End
Employed civilian populations (16 yrs or older)	3,161,087	285,859	15,483
Management, professional and related occupations	1,298,704	123,850	8,604
Service occupations	444,298	50,839	2,237
Sales and office occupations	818,844	73,199	3,557
Farming, fishing and forestry occupations	6,642	223	0
Construction, extraction and maintenance occupations	235,876	14,118	357
Production, transportation and material moving occupations	356,723	23,630	728

Source: BRA, 2003, p. 11, Table 36, Occupation. Additional data for the Massachusetts and the City of Boston was taken from U.S. Census Bureau, 2000, Table P50, Sex by Population for the Employed Civilian Population 16+ Years.

3.3.2 INCOME

Personal income is defined as all income received by individuals from all sources including income from work (labor and earnings), income from savings and investments (investment income), and income from outside sources such as Social Security or Medicare (transfer payment income). According to the Boston Redevelopment Authority's South End 2000 Census of Population and Housing Report #576, there are a total of 14,300 individual households in the South End with a median household income of $41,590. These households are further broken down by family and non-family designations. The 2000 U.S. Census defines a household to include all the persons who occupy a housing unit, regardless of their relationship. A housing unit is a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. A family household has at least two members related by birth, marriage, or adoption, one of whom is the householder. Non-family households are those people who are living alone or are householders who share living space with non-relatives only, such as a boarder or roommate. These categories are the typical income brackets for Census data. The number of family households in the South End is 4,723 with a median income of $35,416. The number of non-family households in the South End is 9,577 with a median income of $42,842.

Table 3-4 shows the per capita personal income, which is calculated by dividing all personal income, received by all permanent residents by the total population, in the

nation, state of Massachusetts, City of Boston, and South End neighborhood for 1990 and 2000. The Massachusetts state per capita personal income in 2000 was $37,756. In 2000, the per capita personal income for the South End was $36,083 which is similar to the per capita income for the state which is ranked 7th in the nation for per capita personal income by state. The South End per capita income level for the year 2000 is $36,038 or 1.2% above the national level. This is a significant change compared to the South End's 1990 per capita income level of $17,824.

Poverty levels indicate the percentage of the population with incomes below that necessary for basic necessities including adequate housing, food, transportation, energy and health care. According to the 1999 U.S. Census data 573,421 people or 9.3% of the state's population were living below the poverty level. This is less than the poverty statistics for the nation as a whole, which in 1999 listed 33,899,812 people (or 12.4%) living below the poverty threshold.

In the City of Boston, the 2000 poverty levels were 19.5%, while in the South End the levels were higher at 23.9%. The South End poverty level and above average median income level provide an indication of the area's economic diversity.

Table 3-4: Per Capita Personal Income

Year	U.S.	Massachusetts	Massachusetts % of U.S.	Suffolk County	Boston	South End
2000	$29,847	$37,756	126%	$22,766	$23,353	$36,083
1990	$19,477	$23,043	118%	$15,414	$15,581	$17,824

Source: Information for U.S. and Massachusetts taken from U.S. Department of Commerce Bureau of Economic Analysis, 2000, SA1-3, Personal Per Capita Income. Information for Suffolk County and Boston taken from U.S. Census Bureau, 2000, Table P8, Sex by Age and Table P158, Aggregate Income in 1999 (Dollars) for the Population 15+ Years; and from BRA, 1992, p. 16. South End information taken from BRA, 2003, p. 14, Table 44, Per Capita Income; and from the BRA, 1993, p.16.

3.3.3 GOVERNMENT AND PUBLIC FINANCE

The Boston-NBL facility would be located within the City of Boston and therefore revenues and spending within the area would result from the Proposed Action. The primary sources of local government revenues are intergovernmental transfers (funds passed through from federal and state governments) and local real estate taxes and other fees and assessments.

Although generally exempt from local taxation as a non-profit educational institution, Boston University is currently one of the larger taxpayers in the City of Boston. The University makes annual payment in lieu of taxes (PILOT) payments of $3.2 million and real estate tax payments of $3 million. BUMC currently makes PILOT payments in excess of $300,000 per year to the City. In total, PILOT payments accounted for $40,910,000 or 2.3% of the City's revenues in 2003.

The City's revenues in 2003 were $1.8 billion (City of Boston Office of Budget Management, 2004c). Real estate and personal property taxes in 2003 were $1.0 billion, an increase of 6% from the previous year. Property tax levy alone has been the City's largest and most dependable source of revenue growth during the past 20 years (City of Boston Office of Budget Management, 2004a). In 2003, property taxes provided 56% of all City revenue.

The second largest source of revenue for the City of Boston is state aid. State aid makes up $476 million of total City revenues (City of Boston Office of Budget Management, 2004b), a decrease of $46 million over Fiscal Year (FY) 2002. The stability of State Aid is of critical importance in determining the City's ability to deliver quality services while managing fiscal stability and a balanced budget. Other sources of revenue for the City of Boston include excise taxes, fines, investment income and other funds. Total revenue generated from sources of other revenue accounted for approximately $284 million of the total City of Boston budget.

In summary, the City of Boston has a large and diverse economy with multiple income streams, which have led to fiscal stability. While recent downturns in the state and national economy have reduced state and federal aid, the City has been able to maintain basic municipal services.

3.4 ENVIRONMENTAL JUSTICE

U.S. Executive Order 12898 (Federal Actions to Address Environmental Justice (EJ) in Minority Populations and Low-Income Populations) directs federal agencies to assess proposed actions or alternatives for disproportionately high and adverse human health or environmental impacts on minority and low-income populations. Identification of health and environmental issues is accomplished through public involvement and the scoping process. Environmental justice has been an important consideration in the NEPA process since the issuance of Executive Order 12,898 in 1994, which required all federal agencies to identify and address "disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations in the United States." In addition to Executive Order 12,898, two important guidance documents help define how to address environmental justice concerns during the preparation of an Environmental Impact Statement: The Council on Environmental Quality's December, 1997 document Environmental Justice Guidance Under the National Environmental Policy Act, and an April 1998 document produced by an EPA workgroup with representatives of each EPA region, entitled Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses. A comprehensive approach to environmental justice in the preparation of an Environmental Impact Statement involves:

- Encouraging meaningful community representation in the NEPA process through the use of effective public participation strategies and special efforts to reach out to communities of color and low-income populations;
- Identifying the area impacted by the proposed facility or activity and assessing whether there is the potential for a disproportionately high and adverse human health or environmental effect on low-income or minority populations from the Proposed Action;
- Considering alternatives that have a less disproportionate effect on low-income and minority populations if a disproportionate impact is found, and
- Identifying mitigation measures that address the needs of affected low-income and minority populations.

To address public participation related issues, BUMC has made an institutional commitment to informing and educating the public about the proposed Boston-NBL facility as described in detail in Section 1.6. The study area for EJ was expanded since the filing of the DEIS to include neighborhoods within a one mile radius from the Project site.

Because the Commonwealth of Massachusetts Executive Office of Environmental Affairs (EOEA) has an Environmental Justice Policy, additional analyses were undertaken outside of the NEPA process (Fort Point Associates, Inc. 2004). According to the EOEA Policy, EJ populations are defined as neighborhoods that meet one or more of the following criteria:

- The annual median household income is at or below 65% of the statewide median household income;
- 25% of the residents are minority;
- 25% of the residents are foreign born; or
- 25% of the residents are lacking in English language proficiency.

Neighborhoods, as defined by the Environmental Justice Policy of the Executive Office of Environmental Affairs in the Commonwealth of Massachusetts, are U.S. Census Bureau census block groups. Neighborhoods and populations adjacent to the Project site are areas that may have potential environmental justice effects. The U.S. Census Bureau tracts located wholly or partially within the one mile radius are listed in Table 3-5 and shown in "Figure 3-3, Project Site Census Tracts". A total of 52 block groups within these census tracts were analyzed.

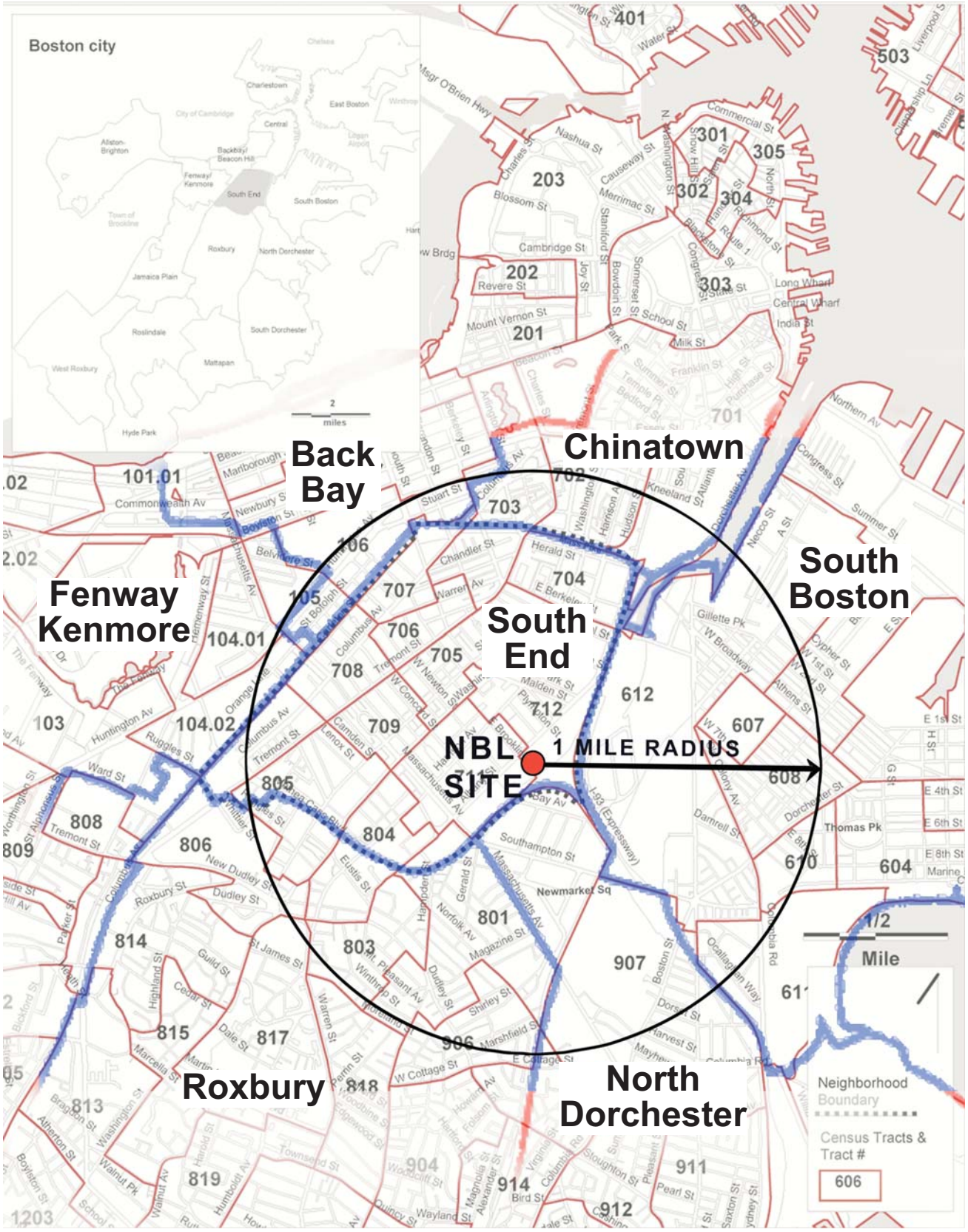


FIGURE 3-3
Project Site Census Tracts
source: Boston Redevelopment Authority

The EJ study area represents a diverse cross section of the population within the City of Boston with a total population of 53,470. The area is comprised of 7 neighborhoods, including the entirety of the South End and portions of South Boston, North Dorchester, Roxbury, Chinatown, Back Bay and Fenway/Kenmore. Within the study area, the range of incomes, percent foreign-born and minority populations vary greatly according to neighborhood. See Table 3-5, Block Group Data for detailed Census Data for each neighborhood and block group within the EJ study area. For example, the poorest block groups are in South Boston while the block groups with the highest percentage of minorities are located in Roxbury. In addition, when compared with the City of Boston, the study area presents a similarly diverse social makeup in terms of economic and racial composition.

Table 3-5: Block Group Data

Neighborhood	Census Tract	Block Group	Population	% Minority	% Foreign Born	% Lacking English Proficiency	Median Annual Household Income*
Back Bay	106	2	1,283	21%	24%	1%	$61,830
Chinatown	702	1	942	85%	73%	11%	$22,083
Chinatown	702	2	1,195	94%	67%	15%	$30,114
Chinatown	702	3	1,945	59%	48%	21%	$9,327
Chinatown	703	2	654	22%	24%	2%	$64,637
Fenway/Kenmore	104.02	3	583	42%	33%	7%	$11,815
Fenway/Kenmore	105	2	1,091	28%	37%	2%	$14,125
Fenway/Kenmore	105	3	816	26%	18%	0%	$34,265
No. Dorchester	801	1	1,852	68%	8%	0%	$32,375
No. Dorchester	907	4	709	20%	31%	5%	$45,326
Roxbury	801	2	833	97%	32%	0%	$25,337
Roxbury	801	3	696	95%	17%	0%	$29,792
Roxbury	803	1	483	100%	16%	0%	$21,855
Roxbury	803	2	1,162	91%	21%	4%	$25,365
Roxbury	804	2	619	100%	12%	0%	$33,438
Roxbury	805	2	1,481	88%	16%	0%	$11,607
Roxbury	806	1	1,002	58%	32%	4%	$21,813
Roxbury	906	1	459	90%	43%	10%	$34,327
Roxbury	906	2	581	87%	42%	9%	$33,235
So. Boston	607	1	835	45%	25%	1%	$18,864
So. Boston	607	2	708	42%	30%	7%	$14,914
So. Boston	608	1	705	3%	7%	0%	$67,000
So. Boston	608	2	680	0%	11%	0%	$60,296
So. Boston	608	3	936	10%	18%	1%	$38,684
So. Boston	608	4	1,522	7%	12%	4%	$35,815
So. Boston	610	3	938	62%	39%	7%	$7,870
So. Boston	611	1	494	59%	29%	4%	$12,059
So. Boston	612	1	508	0%	4%	0%	$52,045
So. Boston	612	2	600	6%	9%	0%	$30,833
So. End	703	3	2,083	17%	11%	0%	$72,619

Table 3-5: Block Group Data (Cont.)

Neighborhood	Census Tract	Block Group	Population	% Minority	% Foreign Born	% Lacking English Proficiency	Median Annual Household Income*
So. End	704	1	1,827	96%	50%	14%	$12,165
So. End	705	1	1,556	44%	26%	3%	$73,889
So. End	705	2	1,238	68%	14%	7%	$11,609
So. End	705	3	1,566	32%	15%	1%	$61,743
So. End	705	4	1,071	52%	10%	5%	$32,159
So. End	706	1	1,079	19%	15%	0%	$87,323
So. End	706	2	1,114	9%	16%	0%	$92,498
So. End	707	1	1,042	68%	20%	0%	$37,500
So. End	707	2	1,196	34%	11%	0%	$69,427
So. End	708	1	1,572	50%	20%	0%	$42,298
So. End	708	2	984	44%	13%	0%	$36,154
So. End	708	3	1,045	19%	19%	0%	$61,411
So. End	709	1	2,039	46%	15%	0%	$48,036
So. End	709	2	826	70%	15%	0%	$17,885
So. End	711	1	914	52%	29%	0%	$11,572
So. End	711	3	755	79%	42%	0%	$26,894
So. End	712	1	465	77%	17%	0%	$15,643
So. End	804	1	152	72%	20%	0%	$38,646
So. End	805	1	813	88%	29%	0%	$33,292
So. End	805	3	1,528	95%	26%	0%	$13,304
So. End	**711	2	1415	28%	7%	0%	$57,353
So. End	**712	2	878	47%	26%	0%	$33,750
Average			1,028	52%	24%	3%	$36,312
Total			53,470				
City of Boston			589,141	**46%**	**26%**	**2%**	**$39,629**

* Bold text indicates a value in excess of the 25% threshold or a Median Annual Household Income below 65% of the Statewide Median Income ($32,826)

** Census Tracts evaluated in the Draft EIS

MINORITY POPULATION

Within the study area, 52% of the residents are minority (see Table 3-6, Minority Population Summary). The Project site is therefore located in an Environmental Justice *minority population* area, as the average of minority residents within the study area block group exceeds 25%. For purposes of this assessment, minority refers to people who classified themselves in the 2000 U.S. Census as Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, Some Other Race or Two or More Races.

Table 3-6: Minority Population Summary

EJ Study Area Block Groups	Total population	Number Minority	Percent Minority
City of Boston	589,141	271,005	46%
EJ Study Area	53,470	27,408	52%
South End	27,158	13,562	50%
South Boston	7,926	1,804	23%
North Dorchester	2,561	1,401	55%
Roxbury	7,316	6,430	88%
Chinatown	4,736	3,180	67%
Back Bay	1,283	269	21%
Fenway/Kenmore	2,490	762	31%

The percentage of minority populations in the study area varies from 0% to 100%, with block groups in the South Boston neighborhood representing the former end of the spectrum and block groups in Roxbury the latter. Fifty-two percent (52%) of the study area is comprised of minority populations, compared with the City, which has 46% minority population.

LOW-INCOME POPULATION

In 1999, the statewide median household income for Massachusetts in 1999 was $50,502. Sixty five percent of this number is $32,826, which is the threshold used to determine whether a low-income population exists in a block group. Twenty-five (25) block groups in the study area had median household incomes less than this threshold according to the 2000 US Census (see Table 3-7, Low-income Population Summary).

Table 3-7: Low-income Population Summary

EJ Study Area Block Groups	Total number of block groups	Number of low-income block groups
EJ Study Area	52	25
South End	23	8
South Boston	10	5
North Dorchester	2	1
Roxbury	9	6
Chinatown	4	3
Back Bay	1	0
Fenway/Kenmore	3	2

The range in annual median household income within the Study area is significant, with the lowest median household income of $7,870 occurring in a block group in South Boston. Block groups in Chinatown and the South End rank second and third

lowest for median annual household income. The highest occurring income level in a block group is in the South End at $92,498.

FOREIGN BORN POPULATION

For purposes of this assessment, foreign-born residents are those residents who were not born in the United States, Puerto Rico, other U.S. Island Areas, or born abroad to American parents.

The percentage of foreign born varies from 4% in a block group in South Boston to 73% in a Chinatown block group. The average percentage of foreign born in the Study Area is 22%. The City of Boston average for foreign born is 29% (see Table 3-8, Foreign Born Population Summary).

Table 3-8: Foreign Born Population Summary

EJ Study Area Block Groups	Total population	Number Foreign Born	Percent Foreign Born
City of Boston	589,141	170,995	29%
EJ Study Area	53,470	11,969	22%
South End	27,158	5,357	20%
South Boston	7,926	1,384	17%
North Dorchester	2,561	368	14%
Roxbury	7,316	1,779	24%
Chinatown	4,736	2,030	43%
Back Bay	1,283	308	24%
Fenway/Kenmore	2,490	743	30%

ENGLISH LANGUAGE PROFICIENCY

According to the 2000 U.S. Census, languages spoken at home other than only English include Spanish, Indo-European languages, Asian and Pacific Island languages, and other languages.

No block group in the Study Area meets the EJ criteria that 25% of residents lack English language proficiency and in fact, the majority of block groups have populations that are language proficient. The highest occurrence of non-English speakers is in a block group in Chinatown, with 21% of the population lacking language proficiency.

SUMMARY OF EJ CRITERIA IN EJ STUDY AREA

The EJ Study Area contains neighborhoods with highly diverse populations in terms of race, income and foreign-born characteristics.

- Minority EJ populations exist in block groups in all neighborhoods in the Study Area except Back Bay.
- Low income EJ populations exist in block groups in all neighborhoods in the Study Area except Back Bay.
- Foreign born EJ populations exist in block groups in all neighborhoods in the Study Area except Back Bay and no neighborhoods have English language deficient EJ populations.

HEALTH CONDITIONS FOR LOW INCOME AND MINORITY POPULATIONS WITHIN THE EJ STUDY AREA

Some of the communities located in the Environmental Justice study area, including the South End, Roxbury, and Dorchester are neighborhoods with high rates of asthma morbidity (Gottlieb et al, 1995). "Figure 3-4", prepared by the Boston Public Health Commission Research Office, shows asthma hospitalizations rates per 1,000 population in various Boston neighborhoods from 1998 to 2002. The average rate for the City of Boston as a whole is 8.4. Three of the communities included in the EJ study area have rates higher than the Boston average including Roxbury at 14.6; North Dorchester at 13.0 and the South End at 10.8.

Asthma is thought to be triggered by many environmental factors including house dust, pet dander, and air pollutants. In a 1995 study of the correlation between asthma hospitalization rates and poverty, race and medication use in the City of Boston, Gottlieb et al describe how asthma morbidity and mortality disproportionately affect minority populations in the United States but that the causes of such excess morbidity and mortality are not known. The study posits explanations such as higher levels of exposure to agents that cause or exacerbate asthma and the general "lack of access to or use of medical therapies "(Gottlieb et al 1995 p. 29).

3.5 VISUAL QUALITY

The Project site is located in the South End of Boston across Albany Street from and south of BUMC, and west of Interstate I-93 and north of the Massachusetts Avenue Connector. The parcel is bordered on the west by the BioSquare Phase I site and on the east by the Boston Flower Exchange and Frontage Road.

The South End is a stable yet diverse neighborhood in the City of Boston, which has experienced economic growth in the past two decades. The area consists of a variety of land uses including residential neighborhoods, institutional uses such as the BUMC, and commercial and industrial uses (see "Figure 3-5, Photograph of Project Vicinity"). The immediate Project area is comprised of commercial, industrial, transportation and industrial uses.

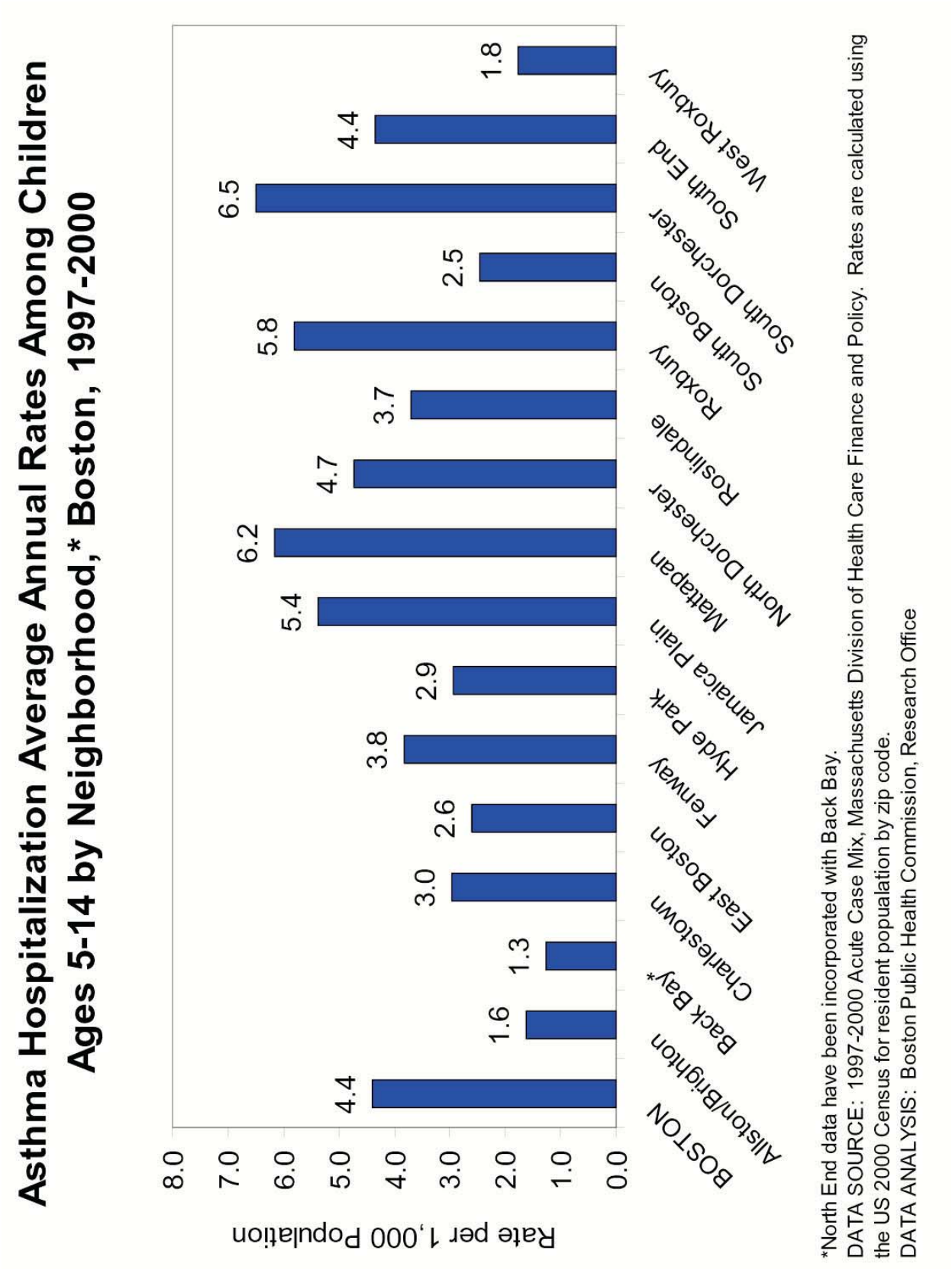


FIGURE 3-4
Asthma Hospitalization Rates by Neighborhood
Source: Boston Public Health Commission

The visual quality of the area is framed by the existing 150-foot high BioSquare Research Park buildings, the BMC Power Plant, the 11-story Suffolk County House of Correction, Interstate I-93 and a variety of large institutional buildings north of Albany Street in the BUMC campus. A section of the adjacent neighborhood, along East Brookline Street, is composed of two and three story brick townhouses.

3.6 NOISE

The Boston Air Pollution Control Commission regulates noise in the City of Boston based on land use classification. The regulations establish a maximum sound level for residential areas, of 60 decibels (dBA) during the daytime (7:00 am to 7:00 pm) and 50 dBA at nighttime (7:00 pm to 7:00 am). The City of Boston has also established noise limits that apply to nine octave band center frequencies. The state Department of Environmental Protection (DEP) regulates noise from industrial facilities as an "air contaminant". The regulations prohibit activities that increase the broadband sound pressure level more than 10 dBA above the ambient (background) level, or which results in a pure tone condition. The ambient (background) sound pressure level is defined as the background L_{90} level measured when the facility is not operating, but during a time period when it would normally operate. The L_{90} is the measured sound level that is exceeded 90 percent of the time. That is, 10 percent of the time the sound level would be less than this amount and 90% of the time the sound level would be higher than this amount. The L_{90} provides a good representation of the general background sound level since it excludes the impacts from brief spikes in the noise level. A pure tone condition occurs when any octave band sound pressure level exceeds the average of the two adjacent octave band sound pressure levels by 3 dBA or more. The DEP noise regulations are applied at the nearest property line and the nearest residence and they do not regulate noise from moving motor vehicles.

A noise level study was undertaken as part of the 2003 Draft Project Impact Report/Environmental Impact Report for the BioSquare Phase II development project (Fort Point Associates, Inc., 2003), which included the Boston-NBL site. Noise monitoring was performed at the Project site to evaluate the existing ambient sound level (L_{90}) during the quietest time of the day (nighttime). Table 3-9, Summary of Nighttime Sound Level Measurements Taken at and Near the Project Site summarizes the nighttime sound level measurements.

The study results indicate that the main sources of noise during the nighttime sound level measurements are motor vehicle traffic on the Southeast Expressway, traffic on the Massachusetts Avenue Connector, other local roadway traffic, and mechanical equipment (primarily air conditioners). As shown in Table 3-9, the existing nighttime sound levels in most locations already exceed the City of Boston criteria of 50 dBa.

FIGURE 3-5
Photographs of Project Vicinity
source: Fort Point Associates, Inc.

Table 3-9: Summary of Nighttime Sound Level Measurements (dBA) Taken at and Near the Project Site

Location	**A-Weighted**			**Octave Band Center Frequency (Hz)**								
	L_{10}	**L_{90}**	**L_{eq}**	**32**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**
1	62	56	62	65	65	61	58	54	50	44	35	25
2	66	57	64	64	66	62	60	54	51	45	34	<25
3	56	54	55	61	63	60	56	52	49	41	29	18

Notes:
Location 1: Near Residences on E. Canton Street
Location 2: Between the Phase II Site and Albany Street
Location 3: Near Boston Medical Center – Newton Pavilion
Each measurement is for approximately 30-minutes, taken with a CEL-593.C1T sound level meter. Measurements were taken between 2:30 a.m. and 4:33 a.m. on Thursday, July 25, 2002.

3.7 AIR QUALITY

3.7.1 AIR QUALITY STANDARDS

The U.S. EPA uses seven "criteria pollutants" as indicators of air quality, and has established for each of them a maximum concentration above which adverse effects on human health may occur (see Table 3-10). These threshold concentrations are called National Ambient Air Quality Standards (NAAQS). Massachusetts has established the same air quality standards. The City of Boston is currently classified as being in attainment (i.e. in compliance) with the NAAQS for all of the criteria air pollutants (except ozone).

In 2004, the U.S. EPA designated Eastern Massachusetts as moderate nonattainment for 8-hour ozone NAAQS. However, as shown on Table 3-10, data from the ozone air monitor closest to the project site at Harrison Avenue shows that 8-hour ozone levels in the project area for the past three years have been in compliance with the NAAQS for ozone. Additionally, information from air monitoring data for 2004, recently made available, also show compliance with the 8-hour ozone standard at the Harrison Avenue monitor. Major sources of these ozone precursor air pollutants in urban areas include power plants and motor vehicles. Ozone concentrations in the project area are made up of natural ozone; locally generated ozone; and ozone transported from upwind urban areas. Emissions of VOC and NO_x in the study area have almost no effect on local ozone levels due to their relatively small size and are

insignificant when compared to emissions from the entire region and urban areas upwind (such as Providence, RI; Hartford, CT; and New York City), and do not have a significant impact on ozone levels in the project area.

On January 5, 2005 the EPA published a final rule that designated that the entire Commonwealth of Massachusetts is classified as being in attainment of the fine particulate matter (PM2.5) air quality standards (Federal Register, 2005). These air quality standards have been established to protect the public health and welfare in ambient air, with a margin for safety.

3.7.2 EXISTING AIR QUALITY

The state DEP currently operates air monitors in various locations throughout the City of Boston. The closest, most representative, DEP monitors for nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), fine particulate matter ($PM_{2.5}$), and ozone are located at Dudley Square (Harrison Avenue Monitor). The closest DEP monitor for lead is located at Kenmore Square, and the closest DEP monitor for particulate matter (PM_{10}) is located at 115 Southampton Street.

The data from these DEP monitoring stations for the most recent available, complete, three-year period (2001-2003), shown in Table 3-10, Representative Existing Air Quality in the Project Area, reveal air quality measurements that comply with the NAAQS for all air pollutants and averaging periods, and that the existing air quality in the Project area is generally much better than the NAAQS. The highest measured concentrations relative to a NAAQS are for ozone and $PM_{2.5}$.

3.7.3 AIR POLLUTANT EMISSIONS FROM FUEL COMBUSTION EQUIPMENT

The space heating for the Project buildings would be provided by steam purchased from Trigen, using an existing street distribution system.

The fuel combustion equipment for the Project would consist of three 1,750 kW emergency generators. In the event of a loss of electrical service to the Project, both generators would start under a paralleling arrangement. After starting, the second generator would stop if the load allows. Massachusetts regulations limit the use of emergency generators to 300 hours per year.

Table 3-10: Representative Existing Air Quality in the Project Area with Massachusetts and National Ambient Air Quality Standards (NAAQS)

Pollutant, Averaging Period	Monitor Location	Background Value ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
CO, 1-hour[P/S]	Harrison Avenue, Boston	5,635	40,000 [a]	14%
CO, 8-hour[P/S]	Harrison Avenue, Boston	3,220	10,000 [a]	32%
NO_2, Annual[P/S]	Harrison Avenue, Boston	47	100	47%
Ozone, 1-hour[P/S]	Harrison Avenue, Boston	221.5	235 [a]	94%
Ozone, 8-hour[P/S]	Harrison Avenue, Boston	150.3	157 [b]	96%
PM_{10}, 24-hour[P/S]	115 Southampton St., Boston	43	150 [b]	29%
PM_{10}, Annual[P/S]	115 Southampton St., Boston	23	50	46%
$PM_{2.5}$, 24-hour[P/S]	Harrison Avenue, Boston	33	65 [b]	51%
$PM_{2.5}$, Annual[P/S]	Harrison Avenue, Boston	12.5	15 [c]	83%
Lead, Quarterly	Kenmore Square, Boston	0.04	1.5	3%
SO_2, 3-hour[S]	Harrison Avenue, Boston	107.4	1,300 [a]	8%
SO_2, 24-hour[P]	Harrison Avenue, Boston	62.9	365 [a]	17%
SO_2, Annual[P]	Harrison Avenue, Boston	18.3	80	23%

Source: US EPA, http://www.epa.gov/air/data.
Notes:
(1) Annual averages are highest measured during the most recent three-year period for which data are available (2001 - 2003). Values for periods of 24-hours or less are highest, second-highest over the three-year period unless otherwise noted.
(2) The one-hour ozone value is the highest one-hour value over the 3-year period, the eight-hour ozone value is the 3-year average of the annual fourth-highest values, the 24-hour PM_{10} value is the 3-year average of the 99th percentile values, the 24-hour $PM_{2.5}$ value is the 3-year average of the 98th percentile values, the annual $PM_{2.5}$ value is the 3-year averages of the annual values – these are the values used to determine compliance with the NAAQS for these air pollutants.
P = primary standard; S = secondary standard.
a One exceedance per year is allowed.
b 98th percentile (PM2.5) (99th percentile PM10) 24-hour concentrations in a year (average over three years).
c Three-year average of annual arithmetic means.
d Three-year average of the annual 4th-highest daily maximum 8-hour ozone concentration.

3.8 WASTEWATER/WATER SUPPLY

The Project site is currently used for surface parking and does not generate wastewater flows. Wastewater infrastructure serving the Project vicinity has been recently upgraded. The New Albany Street Interceptor, which serves the Project site, has been designed to carry a theoretical flow of 16 million gallons per day (mgd). The wastewater flows connect from the Albany Street interceptor to the new Massachusetts Water Resources Authority (MWRA) Deer Island Sewage Treatment Plant, which treats the wastewater, which is then

discharged into Boston Harbor. The Deer Island Sewage Treatment Plant has a total flow capacity of 1.2 billion gallons per day. Accordingly, there is sufficient capacity in the system to both convey and treat both current and future wastewater flows.

BUMC operates its current laboratory facilities under a MWRA Discharge Permit #45 006015, which was renewed on October 19, 2004 and expires on August 16, 2006. Plumbing codes and MWRA regulations require that sinks in laboratories drain to a pH adjustment system, where pH and flow monitoring and water sampling take place prior to discharge.

The MWRA supplies the City of Boston and other communities with its public drinking water supply. The primary water source is the Quabbin Reservoir located in western Massachusetts, which holds 412 billion gallons within its 39-square-mile surface area. MWRA has designed and is constructing a new water treatment plant at Walnut Hill that will treat water delivered to the majority of the MWRA's 2.2 million customers in metro Boston. MWRA turned on the MetroWest Water Supply Tunnel, a critical project for water transmission, at the end of October 2003. The new water tunnel has greatly improved water transmission reliability and redundancy since it has gone online and will increase the water delivery system's overall capacity by 450 million gallons per day. The Project would utilize water during construction and operation however; the existing water supply system has been significantly upgraded in the past several years and has more than adequate capacity to service the Boston-NBL facility.

3.9 HISTORIC RESOURCES

Portions of the South End are included in the South End National Register District, which contains the largest intact Victorian row house district in the country. The district was listed in the National Register of Historic Places in May 1973 and is included in the State Register of Historic Places. A slightly expanded area of the South End was designated as a Boston Landmark District by the City of Boston in November 1983 (see "Figure 3-6 Photographs of South End Landmarks District"). In the same year, the City of Boston also created the South End Harrison/Albany Protection Area "so as to maintain a transitional area adjacent to the Landmark District".

The Project site is not located within the South End National Register District or within the South End Landmark District (see "Figure 3-7, South End Historic Resources"). The site is located within the South End Harrison/Albany Protection Area. The Proposed Action would construct a building within the commercial, industrial and institutional area near the South End National Register District. The proposed building would be visible from within the

FIGURE 3-6
Photographs of South End Landmarks District
source: Fort Point Associates, Inc.

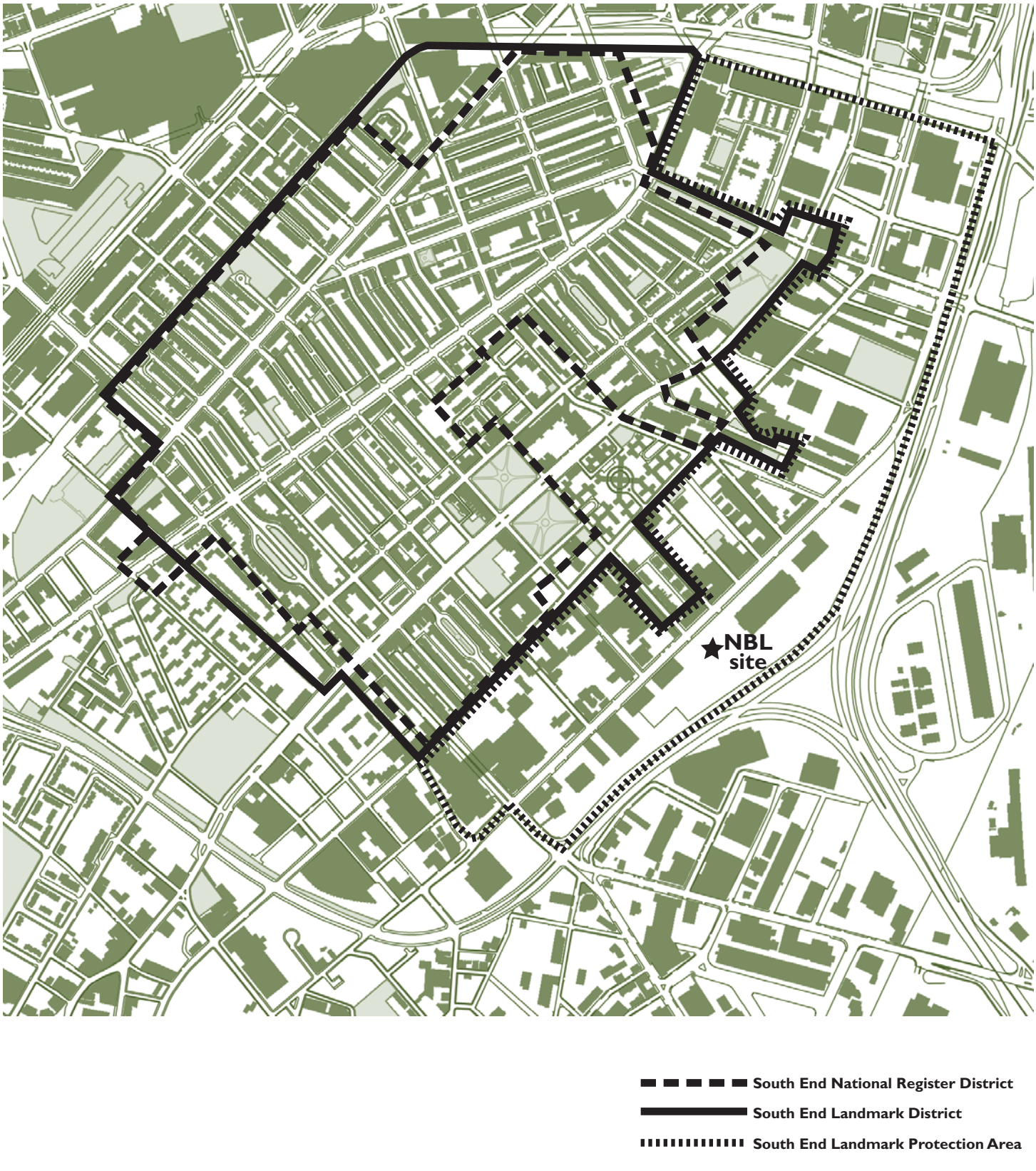


FIGURE 3-7
South End Historic Resources
source: Boston Landmarks Commission

District, but would be consistent with the architecture of surrounding commercial and institutional buildings and would have no direct effect on the District.

The Boston Landmarks Commission established standards and criteria for the South End Harrison/Albany Protection Area "to protect views of the adjacent Landmark District, to ensure that new development of major alteration adjacent to the District is architecturally compatible in massing, setback, and height, and to protect light and air circulation within the District."

3.10 RESOURCES NOT AFFECTED

3.10.1 SOIL

The Project site consists of urban fill and is currently used for surface parking to support the BUMC and the BioSquare Research Park. Roughly 50% of the site is asphalt-paved and 50% is compacted gravel. There are no buildings on the site. Soil in general consists of fine sand, silt and clay with small amounts of cobbles and red brick. Soil density generally ranges from loose to medium dense with isolated areas of dense and very dense soil. Ground water is present at depths ranging from 5-11 feet below ground surface.

RATIONALE FOR NO FURTHER DISCUSSION

Soil resource would not be affected by operation of the Boston-NBL facility. During construction, soil excavation and displacement would occur in the area under and immediately adjacent to the proposed building.

Soil erosion controls would be used to minimize impacts during construction. Following construction, the areas outside of the building footprint would be landscaped and/or paved. No material generated by operation of the Boston-NBL facility would be released to the soil.

3.10.2 GEOLOGY

Based on observations made during subsurface investigation activities conducted to date, subsurface conditions at the site include urban fill material with significant quantities of subsurface wood and lumber that were likely the remnants of the former wharfs or piers or other buildings. Large, subsurface void spaces characteristic of urban fill are also present. Starting from the bedrock and extending upward the soil generally consists of a variable thickness of glacial till, stiff to medium gray clay, varying in thickness from 40 feet to over 100 feet, a relatively thin and discontinuous deposit of sand, overlain by peat and organic silt, which in turn is overlain by the granular fill.

RATIONALE FOR NO FURTHER DISCUSSION

The Project site consists of urban fill underlain by coastal deposits and marine clay. The building foundation would be designed to provide structural support for the Boston-NBL facility.

3.10.3 FLOODPLAINS

Executive Order 11988 requires that the Project be assessed to determine if activities would occur within a floodplain.

RATIONALE FOR NO FURTHER DISCUSSION

According to the Federal Emergency Management Agency (FEMA) National Flood Insurance Program Flood Insurance Rate Map (FEMA, 1983), the site is not located within a 100-year flood zone and therefore no impacts to such resources would result from the Project. The proposed Boston-NBL facility would not be located within a 100-year flood plain and therefore requirements of Executive Order 11988 do not apply. No additional analysis of impacts is required.

3.10.4 WETLAND AND RIPARIAN AREAS

The DHHS General Administration Manual (U.S. DHHS, 2000) defines wetlands as those areas inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support and, that under normal circumstances do support, a prevalence of vegetation or aquatic life that require such conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs and similar areas.

Executive Order 11990, Protection of Wetlands, 42 CFR 2691 (1977) as amended by Executive Order 12608, 52 F 34617 (1987), and 42 U.S. Code 4321 direct each federal agency to minimize destruction, loss or degradation of wetlands and to preserve and enhance such wetlands in carrying out their program responsibilities. Consideration must include a variety of factors such as water supply, erosion, and flood prevention, maintenance of natural systems and potential scientific benefits.

The Project site is located in a developed area and there are no surface water bodies or wetland areas in the general vicinity.

RATIONALE FOR NO FURTHER DISCUSSION

The site does not contain any wetland resources and therefore no impacts to such resources would result from the Project.

3.10.5 VEGETATION

Of the open space on the site, roughly 50% is asphalt-paved and 50% is hard-packed gravel. The site is currently used for vehicle parking. The site's limited vegetation consists of weeds.

RATIONALE FOR NO FURTHER DISCUSSION

The Project would have no adverse impacts on vegetation.

3.10.6 FISH

RATIONALE FOR NO FURTHER DISCUSSION

The Project site is not located near any surface waters and thus would have no impact on fish resources.

3.10.7 WILDLIFE

The Project site is located in an urban area and does not contain any natural vegetation or landforms.

RATIONALE FOR NO FURTHER DISCUSSION

The Project site does not contain any natural vegetation or landforms and therefore, no impact to wildlife resources would result from the Project.

3.10.8 THREATENED AND ENDANGERED SPECIES

According to the Massachusetts Natural Heritage Atlas, 11th Edition (Commonwealth of Massachusetts Division of Fisheries and Wildlife, 2003) there are no habitats of rare or endangered wildlife species and no certified vernal pools on the Project site.

RATIONALE FOR NO FURTHER DISCUSSION

The Project site is located in a developed area and does not contain any threatened or endangered species and therefore, no impact to such resources would result from the Project.

3.10.9 SURFACE WATER

The Project is not located in proximity to any surface water bodies. Fort Point Channel, a coastal water body, is located approximately 0.9 miles west of the project site. The Project stormwater will be pretreated and discharged into the Boston Water and Sewer Commission's storm drainage system which ultimately discharges into Fort Point Channel.

RATIONALE FOR NO FURTHER DISCUSSION

The Project site does not contain nor is located near any surface water bodies. The construction of the facility would not affect any surface water resources. The construction work would fall under a federal National Pollution Discharge Elimination System (NPDES) General Permit for construction related stormwater and dewatering discharges and would require the installation of erosion and sedimentation control devices during construction. Post construction stormwater runoff from the site would be designed in compliance with the state DEP stormwater guidelines.

3.10.10 GROUNDWATER QUALITY

Groundwater is present on the site at depths 5 to 11 feet below ground surface. Based on local topography, the groundwater at the site is expected to flow generally northeasterly toward the Fort Point Channel which is nearly 1 mile away from the site. The Project area is heavily urbanized and there are no known drinking water wells or resource areas in the Project vicinity. The grade at the site would be increased by 1 to 2 feet above existing grade. Because the proposed building does not have a basement but would consist of a concrete slab foundation constructed to a depth of 4 to 8 feet below the finished grade of the site, there would be no penetration of the groundwater table.

Based on recent groundwater chemical analyses results, it has been concluded that groundwater at the site contains low levels of contaminants below the applicable standards and poses no significant risk to human health, safety, public welfare or the environment. Thus, no remediation on groundwater is required. Based on the soil chemical analyses results and the completion of a Method I Risk Characterization, there is a condition of No Significant Risk of soil outside the footprint of the proposed Boston-NBL building. Soils excavated during construction would be handled and disposed of in accordance with a Release Abatement Measure (RAM) Plan filed with the state Department of Environmental Protection.

RATIONALE FOR NO FURTHER DISCUSSION

No discharge to groundwater is proposed by the Project; therefore, no impacts to this resource would result from the Project.

3.10.11 COASTAL ZONE

The Project site is located outside of the Massachusetts Coastal Zone.

RATIONALE FOR NO FURTHER DISCUSSION

Project activities would not adversely affect any resources located in the coastal zone and therefore no impacts to this resource would result from the Project.

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4.0 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

The potential direct, indirect and cumulative effects of the Proposed Action and Alternatives to the Proposed Action are discussed in this Chapter. This Chapter also includes a summary of the quantitative risk assessment analysis addressing the public health impacts of a "worst case scenario" involving loss of containment systems of the BSL-4 laboratory. Direct and indirect impacts are those which may result from Project implementation. Cumulative impacts are those that may result from Project implementation combined with past, present and reasonably foreseeable actions. Reasonably foreseeable actions, which are currently underway or planned at the BioSquare Research Park where the Boston-NBL is proposed and the adjacent Boston University Medical Center (BUMC), are identified in Section 4.10.

4.2 SOCIAL RESOURCES

4.2.1 DIRECT AND INDIRECT EFFECTS

4.2.1.1 PROPOSED ACTION

POPULATION AND DEMOGRAPHIC TRENDS

The current economic, racial and ethnic diversity of the South End is not expected to change as a result of this Project. It is anticipated that new employees would be recruited mainly from throughout the City, including the South End, as well as from the larger metropolitan area. No impact is expected on the existing ethnic or gender make-up of the South End population.

HOUSING

In recent years, the South End has emerged as a desirable residential neighborhood and has experienced an increase in sales and home values. This trend is not expected to change as a result of locating the Boston-NBL facility at the BioSquare Research Park.

Temporary impacts during construction are expected to have a minimal effect on the existing residential neighborhoods. The Boston-NBL site is bounded by a regional commercial wholesale florist market on the east, a highway on the south, the Boston University Medical Center (BUMC) on the north and the BioSquare Phase 1 Research Park on the west. Residential neighborhoods are found north of the site on two side streets off of Albany Street and one block north of the site off of Harrison Avenue. Construction traffic would avoid residential areas and rely on Albany Street for access.

Should the Frontage Road connection to the site be in place at the time of construction, this route would also be used.

The Project would create 660 new jobs. New employees are anticipated to reside in patterns similar to the existing BUMC labor force, which, according to BUMC records on employees, would result in 37% of the total or 244 persons residing in the City of Boston and the balance living in the metropolitan area. With over 250,000 housing units in the City of Boston, the Project would have no adverse impact on housing stocks. There would be no detectable impact from the other 420 employees dispersed throughout the metropolitan area.

As required by local ordinance, the Project would participate in the City of Boston's Affordable Housing Program through a contribution to the City's Neighborhood Housing Trust in the amount of approximately $920,000 to be used for the creation of new affordable housing. NIH funds will not be used for this contribution.

EDUCATION

The current public school capacity in the South End would be adequate to accommodate the expected minimal growth caused by the Boston-NBL facility. The employment-related population growth is expected to be small, only 244 persons in the City of Boston as a whole.

TRANSPORTATION AND PARKING

The results of a traffic analysis conducted for the BioSquare Phase II Final Environmental Impact Report/Project Impact Report (EIR/PIR) demonstrate that the transportation infrastructure is adequate to support the Project (Fort Point Associates, Inc. 2004). The 70 trips entering and leaving the site during each of the A.M. and P.M. peak hours that are specifically attributed to the NBL represent only 15–16 percent of the additional peak-hour traffic; they are not sufficient in and of themselves to change operations significantly at any of the study area locations. The potential introduction of new access to and from the regional highway system would remove existing and future vehicle trips from the congested corridors of Massachusetts Avenue and Albany Street. Traffic flow on the Massachusetts Avenue Connector (MAC) is limited by the signalized intersections at Massachusetts Avenue/Southampton Street/Melnea Cass Boulevard/MAC and Massachusetts Avenue/Albany Street, which are presently at capacity. By creating an access point to BioSquare from the highway system, the Project would reduce existing and future site-generated traffic from these critical intersections. Transportation of select agents to the Boston-NBL would meet the requirements specified in Chapter 2.

Overall, parking would be supplied for the entire BUMC/BioSquare Research Park area at a ratio of 0.78 spaces/1,000 square feet of floor space, within the range

recommended by the Boston Transportation Department (BTD) for this area of the City. Employee parking turnover is estimated at 1.3 per day (to account for shift workers) and visitor/patient parking turnover at 2.67 per day. Currently, 48% of institution employees arrive in single occupancy vehicles and the remainder walk, take transit or participate in car pools. Sufficient parking for the Boston-NBL employees will be provided through the overall institutional parking management program.

TRANSPORTATION DEMAND STRATEGIES

As described in Chapter 2, Transportation Demand Management strategies will be implemented to ensure that the Project does not result in any adverse effects on transportation and parking.

COMMUNITY SAFETY AND RISK

As mentioned in Chapter 3, the existing BioSquare Research Park has BUMC Security Officers on site at all times and is patrolled by Boston University police officers on a regular basis. Construction of the Boston-NBL facility would not create any extraordinary demands on the existing BUMC public safety functions, nor would it create adverse impacts in the Project area. BUMC would hire and train at least 25 new BUMC security officers as well as systems and management staff to continuously staff the facility. BUMC would manage the security and safety programs affiliated with the building, monitoring and responding to life safety, building automation, and security access systems. Development of the Project site would include safety design features that benefit BUMC and its surrounding community including additional emergency phones, additional perimeter staffing and security patrols, enhanced external security camera systems and increased open space. These improvements would benefit the community, BUMC security and safety staff, and public safety officials responsible for responding to incidents within the area and would also ensure that the Project does not create community safety impacts.

Further, the existing law enforcement and fire protection services provided by the City of Boston public safety officials are outstanding. As mentioned in Chapter 3, the health care services in the City of Boston are more than adequate, and Boston Medical Center, located directly across the street from the Project site, provides the highest caliber Level 1 Trauma facilities. Both the health care and fire protection services described in Chapter 3 are adequate for the Proposed Action.

WORST-CASE RELEASE SCENARIO RISK ASSESSMENT

To ensure that the Project does not create any adverse public health risks, an analysis was prepared to address the public health risk of a "worst-case scenario" involving loss of containment systems at a BSL-4 laboratory that coincides with a release within the facility (see also Appendix 9, Risk Assessment Report).

A quantitative risk assessment was performed with regard to a theoretical infectious agent release to the surrounding community from the Boston-NBL. The risk assessment examined a laboratory accident within the BSL-4 Laboratory that coincided with potential catastrophic failure of containment equipment.

In order to address the concerns about community safety that were raised in public comments, the NIH prepared an additional risk assessment. An additional exposure modeling strategy was applied to the proposed Boston University site to supplement the conclusions reached in the original risk assessment that the proposed Boston-NBL poses negligible risk to the community. The "Maximum Possible Risk" or MPR model was developed by the NIH with the input of concerned citizen advocates. The model was developed using the CDC report entitled Public Health Assessment of Potential Biological Terrorism Agents; "weight of evidence" or WOE methodology; conservative estimates at each decision point; and was based on laboratory data generated in simulated "drop" studies. The report containing the modeling data and results can be found in Appendix 12.

The MPR model uses a highly conservative, aerosol-delivered dose to estimate risk to individuals who inhabit space, walk or reside in areas surrounding the proposed BU site. Based on work done by Brachman and co-workers (Brachman, et.al.1966) a conservative estimate of 500 spores over an 8-hr period was utilized as the pathogenic dose in the MPR model. The MPR model utilized 15 scenarios and was flexibly applied across the urban environment surrounding the site. In the MPR model, simplifying assumptions are made that are more unfavorable than analogous "credible" assumptions. The MPR model assumes that the spores, once released, disperse in simple but restrictive geometric patterns. In reality, spores released in the scenarios would disperse in a far more complex pattern (impacted by wind-speed, direction, environmental condition, etc.) resulting in significant dilution. The simple MPR model represents the concentrated eddy situation, thereby representing a maximized, though highly unlikely, risk. This approach makes calculations easier to understand by eliminating complex turbulence/dispersion models. It gives extra confidence that the actual risks to the community are less than the calculated risks presented in the analysis.

Upon a review of the possible known agents to be studied within the Boston–NBL, anthrax was selected to be the agent modeled in the worst-case release scenario based on its public health impact and dissemination potential (Rotz, et al. 2002). Anthrax, although an agent that may be studied in BSL–3 laboratories due to known treatments, has many properties that warrant its selection. Because Anthrax is a spore, it is highly resistant to adverse environmental conditions including sunlight, temperature and lack of humidity. Additionally, a single anthrax spore is of a size, shape and weight that can remain airborne for extended periods of time.

Other BSL-4 agents pose lower community risk than Anthrax due to the lack of environmental stability and the known methods of transmission. Such agents are extremely susceptible to both temperature and humidity, and can only survive outside of a host under very specific ranges of conditions. An equally important environmental factor is sunlight; most agents are destroyed under prolonged exposure to natural ultra-violet light. Mathematical predictions of the potential survival of microorganisms in the environment estimate that approximately 0.01% are able to resist the chemical or physical inactivation found in the outside environment (USDOE 2002). These factors contribute significantly to the primary transmission methods of these infectious diseases. Infection through airborne dissemination, although possible, is not the documented primary method of exposure. Other select agents require direct cutaneous contact with the agent and thus pose less of a risk of transmission. For example, BSL-4 agents such as Ebola and Marburg virus require a host in order to survive, and it has been documented that these viruses are principally transmitted by direct physical contact with an ill person or their body fluids.

There has been community discussion related to the amount of spores that represent an infectious dose of inhalation of anthrax. The 9 spores that some have cited as the infectious dose was derived from a computer model of the Sverdlovsk Anthrax Outbreak of 1979 (Meselson et al., 1994). Experimental models however, indicate that thousands of spores are needed to establish infection.

The 9 spore minimal infectious dose reported by M. Meselson resulted from a computational model of the Sverdlovsk release of weaponized *Bacillus anthracis* spores from a biologic weapons production facility. While the Meselson analysis of the Sverdlovsk release factored in environmental conditions (*e.g.*, wind speed and direction from the local airport), putative size of the release, and the epidemiologic profile of patients who succumbed to infection, several points should be noted.
First, the Meselson analysis of 9 spores as the LD_2 dose (lethal dose for 2% of the exposed individuals) is based on an estimated release of 4 billion spores; however, the size of the release was not known. As a consequence, the authors concede that were the release 150 times larger, then the LD_{50} (lethal dose for 50% of the exposed individuals) would be in the range of 45,000 spores. This latter number is consistent with the experimentally determined LD_{50} for rhesus monkeys.

In the case of human exposure, it has been estimated by the Department of Defense that between 8,000 - 10,000 spores are required to reach an LD_{50}, based on non-human primate studies (DIA 1986). While the precise dose of *Bacillus anthracis* spores required to cause human pulmonary anthrax is not known, documented evidence suggests the pathogenic level is greater than 500 spores over an 8 hour period (Brachman et. al. 1966).

The quantity of agent being studied for release in the quantitative risk assessment is the result of a laboratory accident involving 10 Billion ($1 X10^{10}$) spores. Preliminary range finding studies were performed simulating accidental laboratory releases to determine the number of particles that become airborne. Approximately 400,000 ($4 X 10^{5}$) particles were produced in the range finding studies of simulated laboratory accidents and were available to become airborne (Wilson, 2004).

It is important to note the worst-case scenario assumes a laboratory accident involving 10 Billion spores. This assumed quantity is estimated to be approximately 10 times larger than the actual amount of Anthrax expected to be used in experiments within the Boston NBL. In addition, the samples used in the range finding studies were in a dry powder form, while those which would be used in the Boston–NBL would be in a liquid solution. Furthermore, the manipulation of samples in the liquid form minimizes the ability for the sample to become airborne in the event of an actual laboratory accident.

The exposure is calculated in the risk assessment based on an elevated breathing rate, 30 liters per minute (Ditmer, 1958), and would be representative of a person undertaking strenuous activities for the entire event duration. This breathing was selected as a conservative upper bound, and is expect to be unachievable given the expected duration of the event (30 Minutes).

Methodology and Approach

The risk assessment was performed to evaluate the potential dispersion of accidentally released Anthrax generated within the Boston-NBL facility through a laboratory accident. The analysis evaluated the potential exposure to the community at the location of the most-dense dispersion.

A three stage quantitative risk assessment was performed by RWDI Inc., of Guelph Canada for an infectious agent release from the Boston-NBL. The risk assessment evaluated the potential community exposure due to a laboratory accident resulting in Anthrax being dispersed through the atmosphere. A total of three models were used in performing the assessment.

In the first phase a screening-level assessment was initially performed using SLAB, a U.S. EPA-approved dispersion model. The model predicted maximum ground-level concentrations under a variety of environmental conditions. The second phase analysis involved a series of wind tunnel tests on a scale model of the Boston-NBL facility. The wind tunnel simulation accounted for the complex interaction between buildings and airflows, and considered the effects of the down wash of laboratory exhaust plumes from the Boston-NBL. The time weighted averages and the peak concentrations due to emissions from the laboratory exhausts on the Boston-NBL were

measured at a wide range of sensitive locations (24 in total) around the site. The most sensitive (highly impacted) locations were analyzed for the risk assessment.

In the third phase of the quantitative risk assessment, the impact of emissions from the facility's laboratory exhausts was analyzed using ISC-Prime, a U.S. EPA-approved dispersion model. This use of this model was recommended by the U.S. EPA to analyze localized effects in proximity to the facility to account for the effect of plume down wash. The ISC-Prime model analyzed the atmospheric dispersion under a range of environmental conditions. The maximum concentrations were estimated at receptor locations both at elevated and ground levels.

The results presented in the worst-case scenario identify the receptor location that the models predict would experience the highest concentrations of exposure. The model that calculated the highest predicted exposure was the wind tunnel testing and the location that this model predicts would experience the highest concentration of exposure is the roof level of the proposed adjacent BioSquare Phase 2 Building G located east of the Boston-NBL site.

Event Description

The quantitative risk assessment was based on the following assumed worst case scenario. A laboratory worker is manipulating a 15 cc conical tube containing 10 Billion Anthrax spores within the BSL–4 facilities. The researcher drops the sample while attempting to fasten the cap, and the sample falls out of the Biosafety cabinet to the floor of the laboratory. A visible cloud of Anthrax is seen as the sample hits the floor.

During the release event the room air is assumed to remain perfectly mixed as a result of the ventilation system wherein incoming air mixes immediately with the room air to create a homogenous mixture. With this assumption the exiting spore concentration decays exponentially with the lapse of time even as all spores are evacuated from the laboratory (Ventilation for the Control of the Work Environment, Burgess, Ellenbecker and Treitman). The entire event is assumed to take place over approximately a half hour.

The worst-case scenario assumes the laboratory accident coincides with a catastrophic and total failure of the facility's double HEPA filtration within the laboratory exhaust system and that the HVAC system continues to operate despite multiple monitoring, alarming, and automated safety sequences. The entire airborne release within the laboratory is assumed to be available to be released from the facility based on the following assumptions:

1. No reduction of spore concentration due to precipitation or impaction within the laboratory or the ventilation system and
2. No reduction of spore concentration associated with the HEPA filtration of the functional BSC(s) within the laboratory.

The results are presented in terms of number of spores that may be inhaled by an individual standing at the location of predicted maximum exposure. The exposure is calculated based on an elevated breathing rate of 30 liters per minute (Ditmer, 1958), which is representative of a person undertaking strenuous activities for the entire event duration.

Results

The predicted maximum exposure to any member of the community from the worst-case scenario is 0.29 spores over the entire duration of the event. As the exposure to a partial spore is not feasible, the risk of public harm is so minute that it may be described as negligible (see also Appendix 9, Risk Assessment Report). It is important to note that due to the pressure monitoring, maintenance, testing and HEPA filtration programs the probability of the release described in the worst-case scenario is practically zero. What is a more probable scenario is the same release scenario with the double HEPA filtration properly installed, certified, and fully operational. Under this scenario, representing normal operational conditions, the total release into the environment is calculated as 0.036 spores. As the release of a partial spore is not feasible, the risk of public harm is so minute it could be described as zero.

OTHER POTENTIAL RISK SCENARIOS

Theoretically, accidental release of biological materials could occur through human error, mechanical failures or other reasons. The Boston-NBL facility would be designed to ensure that such a risk is insignificant. The mechanical and electrical equipment would be designed with redundant systems and the building security systems would ensure that only security-cleared personnel are allowed to enter the building. Access to select agents would require that two persons are present at all times. Staff within the facility would only have access to areas that they are authorized to work within.

Direct Transmission

The highest risk of exposure concerns accidental laboratory exposure of a researcher, not to the community. Due to this risk, BSL-4 agents are studied under intense engineering, administrative and work practice controls. Proper design, construction and operation of the proposed Boston-NBL facility would reduce the potential risk for direct transmission of infectious agents to workers. Engineering controls include an impermeable airtight building design, working within biological safety cabinets and isolatable laboratory zones designed to be readily decontaminated. A researcher

within BSL-4 is protected by a one-piece, air supplied positive pressure personnel suit protected by HEPA filtration. To prevent possible exposure due to punctures/tears in protective suites, glass and most sharp objects would not be permitted in BSL-4 laboratories. Administrative controls would include intense hands-on training for all BSL-4 researchers. Work practice controls would include requirements for chemical and body showers upon each exit from the BSL-4 laboratory. Therefore, the likelihood of a worker inhaling or otherwise becoming exposed (e.g. through cuts in the skin or ingestions) of an infectious agent would be remote.

While it is highly unlikely that a worker would be exposed to an infectious disease agent, if exposure did occur at a sufficient dose, it would be possible for the exposed worker to become a carrier and, through direct contact, expose others. The potential for direct transmission to others would be reduced through the intervention of effective vaccine and therapeutic measures. Workers exposed to infectious agents for which there are no licensed vaccines would be isolated, treated and observed at the existing isolation areas at the Boston Medical Center. The plan of care would involve collaboration with the Boston Public Health Commission, the Centers for Disease Control and Prevention and other experts in the field of infectious diseases. These controls for work at BSL-4 level would maintain a safe work environment.

In an effort to verify the potential exposure to a researcher a qualitative risk assessment was undertaken including a review of safety records of three BSL-4 laboratories with 20 or more years of combined operating experience (Johnson, 2004) as well as reviewing the safety record of biocontainment laboratories at BUMC. Appendix 4 includes a summary of these reviews. The qualitative risk assessment demonstrates that not only is the community risk resulting from the potential release of infectious agents negligible, the risk to a researcher working within a BSL-4 laboratory is negligible as well.

The results of these assessments, as well as BUMC's laboratory experiences, lead to the conclusions found in the following paragraphs (a) through (e) below

a) Laboratory acquired infections

BUMC currently includes approximately 268 BSL-2 laboratories and five BSL-3 laboratories and considers the maintenance of a safe and healthy work environment to be one of its highest priorities. All laboratories are inspected by the Office of Environmental Health and Safety (OEHS) and the Office of Facilities Management on a regular basis to assure compliance with institutional policies and procedures as well as all related local, state and federal regulations.

OEHS requires initial orientation and annual laboratory safety training for all research staff including training in biosafety, chemical safety, blood-borne pathogens,

regulatory requirements, spill response, fire safety, waste management, disaster response, employee injury protocols, and security policy. Specialized training for appropriate staff includes mandatory annual BSL-3 laboratory training, shipping training, safety and infection control training.

BUMC has a strong history of constructing and managing safe biomedical laboratories, similar to existing facilities at the CDC. Researchers at BUMC work with a variety of BSL-2 agents, including bacteria, viruses, and toxins. The main toxins that are studied at BUMC include Botulinum neurotoxin, Ricin, Tetrodotoxin, and Conotoxin. Bacterial agents include: *Brucella abortus, Brucella melitensis, Staphylococcal enterotoxin, Anthrax,* and *M. tuberculosis*. The main virus work at BUMC is on HIV research. BSL-3 research agents include the HIV virus, and the bacteria: *Brucella melitensis, Francisella tularensis,* and *M. tuberculosis*.

The BUMC employee accident records from the last ten years covering some 14 million hours of laboratory personnel exposure have been thoroughly reviewed and it has been confirmed that, with one exception, no laboratory-acquired infections from research work in BSL-2 and BSL-3 laboratories have occurred**.** BUMC has reported that last year, three research laboratory workers at Boston University Medical Center (BUMC) were accidentally infected with tularemia bacteria in their lab while seeking to develop a vaccine for the disease. This tularemia incident occurred in a laboratory that operated at BSL-2 safety precautions. See Appendix 4, Safety Record of Biocontainment Laboratories at BUMC and at NIAID's Intramural Facilities.

All accidents and injuries are reported to the OEHS which compiles a database of all employee accidents and potential injuries including an OSHA 300 log of all OSHA-reportable employee injuries, as required by the Occupational Safety and Health Administration. The information reported on individual exposures is followed up with safety training and education to prevent reoccurrences. Corrective actions which have been taken in the past and which would be implemented in the future include:

- Increased safety training and procedures for lab workers;
- Strengthened laboratory safety procedures;
- Unannounced safety inspections of BUMC laboratories;
- Applying additional tests and safeguards to infectious material sent to BUMC for research purposes;
- Outside, expert review of BUMC research controls and procedures; and,
- Working with the Boston Public Health Commission to improve the notification process regarding exposures to infectious agents.

The numbers of laboratory-acquired infections are extremely low worldwide, and with the development of new design and construction standards the number has been even lower in the last few years. In the history of BSL-4 laboratories, no laboratory-acquired infection has caused a secondary infection to surrounding workers or posed a risk to the community. With the longest running experience with a BSL-4 (33 years), Ft. Detrick, Maryland has an outstanding safety record. Recently however, in February of 2004, the U.S. Army Medical Research Institute for Infectious Diseases (USAMRIID) BSL-4 laboratory reported that a civilian staff member had been exposed to Ebola virus through a needle stick. The staff member was isolated and treated through proper protocols at USAMRIID, and again, never posed any danger to fellow staff or the community as a result of this personal exposure. Previous documented exposures at Ft. Detrick in their original lab facilities mention one laboratory-acquired infection between 1959-1969 and no clinical or other infections in the more recently constructed USAMRIID facility. In total, with a combined 344,000 BSL-4 research hours logged over a period of 33 years, there have been no infections, environmental releases, or community risk from the BSL-4 facilities at Ft. Detrick, MD. In summary, these laboratories have exceptional safety records and would serve as a model for worker safety at BUMC's National Biocontainment Laboratory.

b) Release from Decontamination of Exhaust Air

The BSL-4 laboratories would be designed to have air exhausted through a series of HEPA filters prior to release. Because two HEPA filters are used in series in BSL-4 labs with active monitoring, alarming, and automated safety protocols, the likelihood of infectious microorganisms being exhausted from a BSL-4 lab in an amount that would cause harm to the public or the environment is negligible. HEPA filters acceptable for biological safety installations routinely give collection efficiencies greater than 99.97% when tested with 0.3 μm diameter particles (Edwards, 2002). This is the most difficult particle size to capture, aerodynamically. The filters are even more efficient above and below this size range for a variety of technical reasons related to interception of the particle, the effect of inertial forces and capture by diffusion. Therefore they capture a full size range of organisms, from very tiny viruses to much larger bacteria (approximately 20 nm- 200 μm).

HEPA filter installations, whether in containment equipment such as biological safety cabinets or in building mechanical systems, are tested in place at least once per year using National Sanitation Foundation (NSF) Standard 49 procedures that provide quantitative assurance that the installations do not contain defects that reduce microbiological safety. HEPA filters are known to have long functional lives; however age can play a factor in decreasing tensile strength of the filter media. For this reason, the Boston-NBL would use a conservative service life of five years for HEPA filters in biological safety cabinets and other ventilation system applications. Perhaps the best and most practical proof that HEPA filters are effective is that they are used in

respirators worn by researchers working with high concentrations of infectious organisms (bacteria and viruses). These HEPA filtered respirators are uniformly protective in the laboratory and in field applications.

c) Escape of an Infected Animal

Both the facility design and standard operating procedures for animal caretakers and researchers at BUMC are designed to minimize the likelihood of an escape of an infected animal from the containment facility. The controls can be classified into both engineering and operational controls. They begin with construction of the facility and follow through to daily operating procedures.

The proposed Boston-NBL facility and systems would be designed to significantly reduce the potential for possible vector-borne transmission through insects and rodents. The design of BSL-2, BSL-3, and BSL-4 containment laboratories and BSL-2, BSL-3, and BSL-4 animal containment laboratories would comply with recommendations and requirements of the 4th Edition Biosafety in Microbiological and Biomedical Laboratories (U.S. DHHS 1999), NIH Design Policy and Guidelines – Animal Research Facilities (U.S. DHHS 2003c), and the current Guide for the Care and Use of Laboratory Animals (National Research Council 1996).

Insects would be housed in specialized insectarium rooms. There would be complete segregation of uninfected insects from those insects that contain vector borne pathogens. Different insect species would be kept segregated.

The construction and operation of the Arthropod Containment Level laboratory would comply with the recommendations and requirements of the Arthropod Containment Guidelines, Version 3.1 by the American Committee of Medical Entomology of the American Society of Tropical Medicine and Hygiene (ASTMH 2002). Infected arthropod work would be conducted in the innermost rooms under negative pressure conditions and all air supply and exhaust terminal devices would be screened to prevent arthropod escape. In insectary manipulation areas, cooler temperatures would be maintained to slow arthropod movement to reduce the potential for escape. Surfaces in all insectary spaces would be white to allow for quick identification of arthropods that escape primary containment. In addition, implementation of a pest management program would limit the potential for transmission of infectious agents from animals to humans.

There would be multiple barriers from the insectaria designed to prevent the escape of any insects. Primary containment in the room would include at least 3 barriers including filtered containers, screens and doors. Additional room barriers would depend on the types of insects. For example an oil filled moat would be installed in locations where non-flying insects would be contained since they move by crawling.

Multiple additional barriers would be in place outside of the primary containment rooms including multiple additional doors, sealed windows, filtered air intakes and exhausts. In addition, all insects would be inventoried before and after each experiment to ensure that no insects are unaccounted for.

The primary engineering controls or physical barrier to be used at the Boston-NBL is the containment laboratory itself. The construction and finish of the animal facility at the BSL-3 and BSL-4 facilities would maintain a uniform seamless construction with all penetrations sealed. Infected animals would always be separated from exterior spaces by an at least an air lock with a series of two interlocked inward swinging doors. The interlocking doors allow only one side of the airlock to be opened at a time which would accommodate visual inspection prior to sequencing the operation of the second door.

The doors of the animal laboratories would be designed to swing inward, thus minimizing the ability of an escaped animal from passing the handler. The doors would be equipped with sweeps, eliminating the opportunity of even small animals such as mice from escaping through a closed door. The perimeter isolation doors of a BSL-4 laboratory would include positive pressure gasket doors creating an airtight laboratory environment.

All materials within the BSL-3 and BSL-4 laboratories would require decontamination prior to removal from the containment suite. This protocol of sterilizing all materials leaving the suite allows for even the unlikely event a rodent being accidentally left in the bedding during a cage change, as the animal would not survive the sterilization process and the carcass would no longer be considered infectious. The possibility of a simultaneous breakdown of multiple engineering and operational controls for the escape of any live infectious animal is so minimal it can be described as negligible.

d) Biological Material Shipment

The packaging, labeling and transport of etiologic agents are highly regulated by several federal agencies and associations. Recent legislation (the U.S. PATRIOT Act, and the Public Health Preparedness and Bioterrorism Response Act of 2001) have further strengthened the regulations controlling transport of certain etiologic agents, referred to as select agents, to include controls over possession and use. BUMC would implement stringent protocols to ensure safe and secure transport of select agents to and from the facility. Transporters of any select agents to the Boston-NBL must be registered for possession, use and transportation of agents with the CDC and U.S. Department of Agriculture (USDA), under the select agent rule. A Responsible Official would be designated at the facility and approved by the regulating agencies to oversee and approve all shipping, receipt and use of any select agent. Packing requirements would be strictly implemented in accordance with U.S. Department of

Transportation (DOT) and International Civil Aviation Organization (ICAO) regulations. See Appendix 7, for a copy of BUMC's High Hazard Material Management (HHMM) Policy.

According to the World Health Organization, worldwide, there have never been any cases of illness attributable to the release of infectious materials during transportation (WHO, 1997). There have been reports of damage to outer packaging. The risk to the community from transport of infections agents or other biological derived material is negligible.

e) Unauthorized Removal of Biological Material from Containment Area

The systems that would be designed for access to, and egress from, the Boston-NBL containment areas would minimize the opportunity for an individual to intentionally or unintentionally remove any biological materials from the containment areas without authorization.

BUMC would utilize a combination of proximity and biometric access controls, closed circuit television systems, mandatory two-person rule systems, ongoing scheduled and unscheduled audits and drills, background checks and security/safety staffing plans to ensure that opportunities for unauthorized activities of this type do not occur.

Security systems that provide access to different areas and storage containers would be utilized as audit tools and would be programmed to ensure that all areas or storage containers accessed prior to work within containment areas are used to replicate access steps at the conclusion that work. Failure to comply with these protocols would result in immediate notification to security staff within the building who would secure the area remotely until all protocols are complied with or other actions are taken.

Other Threats

The public has questioned terrorist-related bombing of the proposed Boston-NBL facility. BUMC continues to meet with local, state and federal law enforcement agencies to collect, share and interpret information related to threats that could be initiated by individuals or groups on a local, national and international scale. The assessment of risk, as it relates to threats and vulnerabilities would be applied, as necessary, to the design and construction of the building, the types of access control and personnel/bag screening equipment as well as the construction of the building and design of the site. The Boston-NBL is being constructed to meet federal guidelines for blast protection, which include a 150-foot setback from unchecked vehicles. Security officers would enforce this setback at both the vehicle and the pedestrian entrances to the site.

Paths of potential release have been in the forefront throughout the design of the facility, as highlighted by the security and the redundant mechanical, electrical and plumbing systems previously described. Many design concepts are being incorporated into this facility that would not normally be considered for a private facility. The building as a whole has been designed to resist progressive collapse by sustaining structural integrity with the total loss of key structural elements.

The BSL-4 "Containment Block" is designed as a box within a box concept. A non-containment corridor would serve as a buffer to the facility and would encircle the BSL-4 facilities. This first physical barrier or outer box would be a combination of building façade and internal partition walls. The containment structure or primary box would be a composite structure, or multi part. The containment barrier, which would be applied to a concrete substrate, is a monolithic material such as an epoxy resin, that is intrinsically smooth, easily cleaned and disinfected. The substrate would be eight-inch thick concrete specified and rigorously tested for strength, shrinkage, and density standards specific to the Boston-NBL facility.

These physical measures would be implemented not in response to any known or anticipated threat, but in response to the inability to rule out such an event with absolute certainty. In the event, however unlikely, that both the inner and outer boxes were breached, the release would be limited to an amount of agent being used in an ongoing experiment, as all other agents would be stored in sealed containers within locked freezers. The agent being used in an experiment would be manipulated within an operating biological safety cabinet, which would contain the spill, and work to filter the air of any aerosolized agent. These factors, combined with an operational HVAC system maintaining directional airflow with HEPA filtration, would have a potential impact of less than the "worst case scenario" previously described.

4.2.1.2 NO ACTION

POPULATION AND DEMOGRAPHIC TRENDS

Under the No Action Alternative, the population would not change and the economic benefits associated with the Proposed Action would not occur.

HOUSING

Similar to the population and demographics trends, temporary construction impacts in the adjacent residential neighborhoods would not occur and no additional demand for housing would result. In addition, the $920,000 contribution to the housing fund would not occur.

EDUCATION

Under the No Action Alternative, the addition of new Boston-NBL employees' school age children to the existing school system would not occur.

COMMUNITY SAFETY AND RISK

Currently levels of community services, emergency response training and programs and infrastructure would not change under the No Action Alternative. The negligible risks associated with the construction of the BSL-4 laboratories would not occur.

TRANSPORTATION AND PARKING

The current use of streets by neighborhood residents and existing business and industries in the Project vicinity would occur under the No Action Alternative. The new vehicle trips associate with the Proposed Action would not be generated. There would be no parking demand generated by the Project. Parking would continue to be supplied at the Project site within the existing at-grade parking lot.

4.3 ECONOMIC RESOURCES

4.3.1 DIRECT AND INDIRECT EFFECTS

An organization's economic impact on a region results from a complex combination of inter-industry relationships involving both corporate and consumer spending. Contributing to the total economic impact are the salaries that the organization pays to its employees, and the dollars that it spends to purchase goods and services from local vendors.

4.3.1.1 PROPOSED ACTION

EMPLOYMENT

The Boston-NBL facility would create approximately 1,300 temporary construction jobs and 660 new permanent positions. These new positions include all types and levels including environmental services, lab technicians, scientists and administrative staff; the majority would require skilled and experienced workers.

During construction, the Project would comply with the City of Boston Jobs Policy through the creation of a Boston Residents Construction Plan, establishing goals for the recruitment of local residents for construction employment.

BUMC is committed to working with City agencies to ensure that Boston residents have the opportunity to benefit from the new employment generated at the facility. Toward this end, there would be opportunities for local residents to obtain training for various positions, such as laboratory staff, which would in turn benefit the local

economy. The Boston-NBL facility would contribute approximately $185,000 to the City of Boston's Neighborhood Jobs Trust for job training purposes.

The anticipated 660 new positions represent only 0.1% of the total work force (657,000 persons) working in the City of Boston. Based upon existing employment patterns, it is expected that approximately 244 employees or 37% of the 660 Boston-NBL employees would be City of Boston residents.

Because of the specialized nature of the work of Boston-NBL employees, some of the work force would likely be recruited at the national level and from existing research facilities including current BUMC employees (which would create replacement employment opportunities) as well as area colleges and universities.

INCOME

The Boston-NBL facility, like other BUMC facilities, would bring large infusions of outside money to the area to finance the laboratory's work. The mere presence of a laboratory of this level in an expanding field of bioscience research would create an environment that would attract bioscience-related business associated with the laboratory's work, similar to presence of the existing facilities at BUMC and the BioSquare Research Park. The scientific sophistication of research to be undertaken at the Boston-NBL requires that such businesses have high quality and highly trained workers. This would create an opportunity for expansion of jobs at all levels, including higher-paying, higher-quality jobs and support workers.

The Proposed Action would have positive economic impacts on the South End and surrounding neighborhoods throughout the construction and operational phases. When the facility is fully operational, up to 660 new positions would be created. The total direct wages to be paid per year at the Boston-NBL is projected to be $33,000,000, of which 21.4%, or a total of $7,062,000, is expected to go to Boston residents Total direct spending (based on the calculation of total economic impact using regional input and output multipliers provided by the Regional Input-Output Modeling System (RIMS II) of the U.S. Department of Commerce), including non-salary expenses and indirect expenses, including fringe benefits, overhead, building expenses and insurance is estimated to be $72 million annually, of which $19.7 million would be within the City of Boston. Total economic impact of the facility, including direct, indirect and induced activity, is projected to be $130.5 million annually.

GOVERNMENT AND PUBLIC FINANCE

The Boston-NBL facility would make a positive contribution to the City of Boston and its economy. The Proposed Action capitalizes on previous infrastructure investment in the area and on the planning and development of the existing BioSquare Research

Park. The new facility would not overburden current infrastructure or social services in the area, and its location provides a "smart growth" alternative to undeveloped sites. It would bring increased economic activity in the form of new jobs and investment to the City of Boston and its metropolitan economy.

The City of Boston, similar to other large cities, is currently experiencing fiscal challenges in meeting the growing demand for the basic services, especially education. While the facility would place little or no new demand on City services, the facility would provide substantial financial contributions to the City treasury. As required by local ordinance, approximately $1 million would be contributed to the City's Housing and Jobs Trust Funds. NIH funds will not be used for this contribution.

The Boston-NBL facility would provide increased state taxes to the Commonwealth of Massachusetts from payroll and income taxes. Boston University would continue its Payment in Lieu of Taxes (PILOT) and other tax payments to the City of Boston. Currently these payments are $3.2 million in PILOT payments and $3 million in other taxes.

Overall, the Proposed Action has no requirements for new public infrastructure investment. Adequate housing, education, health care, water, wastewater, first response, fire, and police services are in place to serve the Project area once the construction of the Boston-NBL facility is complete and the facility is operational. Any new infrastructure needed to serve the Project Area, such as construction and transportation services, would be privately funded and therefore not adversely affect government fiscal resources.

4.3.1.2 NO ACTION

EMPLOYMENT

Under the No Action Alternative, the creation of construction-related and new employment opportunities would occur.

INCOME

Under the No Action Alternative, no direct economic benefits to the City of Boston or State of Massachusetts would occur.

GOVERNMENT AND PUBLIC FINANCE

A No Action Alternative would not generate income taxes for the State of Massachusetts or payments in lieu of taxes to the City of Boston.

4.4 ENVIRONMENTAL JUSTICE

4.4.1 DIRECT AND INDIRECT EFFECTS

4.4.1.1 PROPOSED ACTION

As discussed in Section 3.4, the Project area is considered an Environmental Justice (EJ) area because its population on average is made up of more than 25% minorities. It should be noted that while the communities in the Project area are designated an EJ community, the South End neighborhood is not an economically stressed area. As discussed in Chapter 3, the median household income in the South End is greater than the median household income of the City of Boston and is close to the statewide average.

The Boston-NBL facility is a compatible land use with the surrounding community and similar to the already existing research facilities. As previously described, the site is located within the BioSquare Research Park which was specifically planned and zoned by the City of Boston for the development of biomedical research use to serve the needs of the medical services industry, educational institutions, and hospitals in the area. The Project complies with the use, dimensional, design and other requirements of the City's South End EDA/South District and conforms with the Biosquare Phase II Planned Development Area Master Plan. Further development of the BioSquare Research Park would bring many benefits to the surrounding community, including enhancing the local economy and bringing increased employment opportunities and tax revenues to the area. Furthermore, the South End was developed as a residential area with commercial, industrial and institutional uses and sufficient precedent in the South End exists for the development of large institutional and/or commercial properties.

The minority population and existing asthma rates of the EJ area are not expected to change with the Proposed Action. The Project would not displace any minority populations or facilities and housing that service such populations nor will it exacerbate the existing asthma rates found in some of the communities. It is unlikely that the Proposed Action would have proportionately greater impact on the disadvantaged (e.g. minority) population than any other population in the area.

ANALYSIS OF THE POTENTIAL FOR DISPROPORTIONATE EFFECTS

CONSTRUCTION IMPACTS

During the construction phase of the Project, neighborhoods immediately abutting the Project site, including EJ communities, may experience temporary impacts from construction because of their location and proximity. Thus there is no disproportionate effect on EJ communities. Furthermore, as described in Chapter 2,

the Project will develop a Construction Management Plan to minimize construction related transportation impacts.

ENVIRONMENTAL AND HUMAN HEALTH HAZARDS

A worst-case analysis is presented in Section 4.2.1 of Chapter 4 which details the public risk of exposure due to a worst-case loss of containment systems of the BSL-4 laboratory. This analysis demonstrates that there is negligible health risk to the community. The analyses presented in this Chapter provide documentation that the Project would not create any undue adverse impact on health, traffic, noise, air quality, wastewater, water supply, visual or historical resources. For this reason, potential environmental and health effects of the Project would not adversely affect the neighborhood populations in the EJ area.

A cumulative impact analysis was performed for all state Department of Environmental Protection (DEP)-registered sources within a one-mile radius of the proposed site, using an EPA refined dispersion model to predict air concentrations for both criteria and non-criteria pollutants at receptors. The results of the dispersion modeling demonstrate that air concentrations from Boston-NBL operations and construction will be insignificant for all pollutants in the EJ area and are also far below the maximum levels that would occur on the site property line. It should be noted that even the maximum property line levels are safely in compliance with state and federal air quality health criteria. Operation of the Boston-NBL would not result in adverse human health effects or negative environmental consequences in any of the EJ areas near the proposed Boston-NBL site. None of the extremely low air concentrations of particulate matter or VOC compounds predicted in the analysis of Boston-NBL operations and construction outlined in Section 4.7 would aggravate asthma in persons living near the site.

The proposed Boston-NBL therefore does not create disproportionately high and adverse human health effects on minority populations.

4.4.1.2 NO ACTION

There would be no impact on minority populations from the No Action Alternative

4.5 VISUAL QUALITY

4.5.1 DIRECT AND INDIRECT EFFECTS

4.5.1.1 PROPOSED ACTION

The Project has been designed to complement the existing urban design context of the Project Area. The proponent and its architects have considered carefully the views to

and from adjacent South End streets and regional highway system. By virtue of its location, the Project establishes an "edge condition" between the South End and the Southeast Expressway (see "Figure 4-1, Photographs of Project Vicinity"). The scale, massing, materials and architectural detail of neighboring South End institutional buildings inform the architectural design of the proposed Project.

Additionally, the site plan and massing of the proposed Project would help to mend the irregular urban edge that now exists along Albany Street. By developing the existing underutilized lots, the proposed Project helps give definition to the southern section of the South End while screening the major negative effect of the Southeast Expressway.

The site design and building massing have been reviewed with the Boston Redevelopment Authority (BRA) urban design staff as part of the design review process to assure compliance with BRA guidelines and recommendations. The building's placement on the site and treatment of the façade has projected the image of three "front doors": Albany Street to the north, the expressway to the south, and the BioSquare Research Park to the west. In addition, the facility has been configured to maximize the open space on the site and future development potential (see "Figure 4-2, Building Perspective", "Figure 4-3 Elevation View from Albany Street" and "Figure 4-4, Elevation View from BioSquare Phase I"). Thus, the Project will improve the visual quality of the area.

4.5.1.2 NO ACTION

Under the No Action alternative, the Boston-NBL facility and its associated public realm improvements would not be constructed. The site would remain as an at grade parking lot.

FIGURE 4-1
Photographs of Project Vicinity
source: Fort Point Associates, Inc

FIGURE 4-2
Building Perspective
source: CUH2A, Inc.

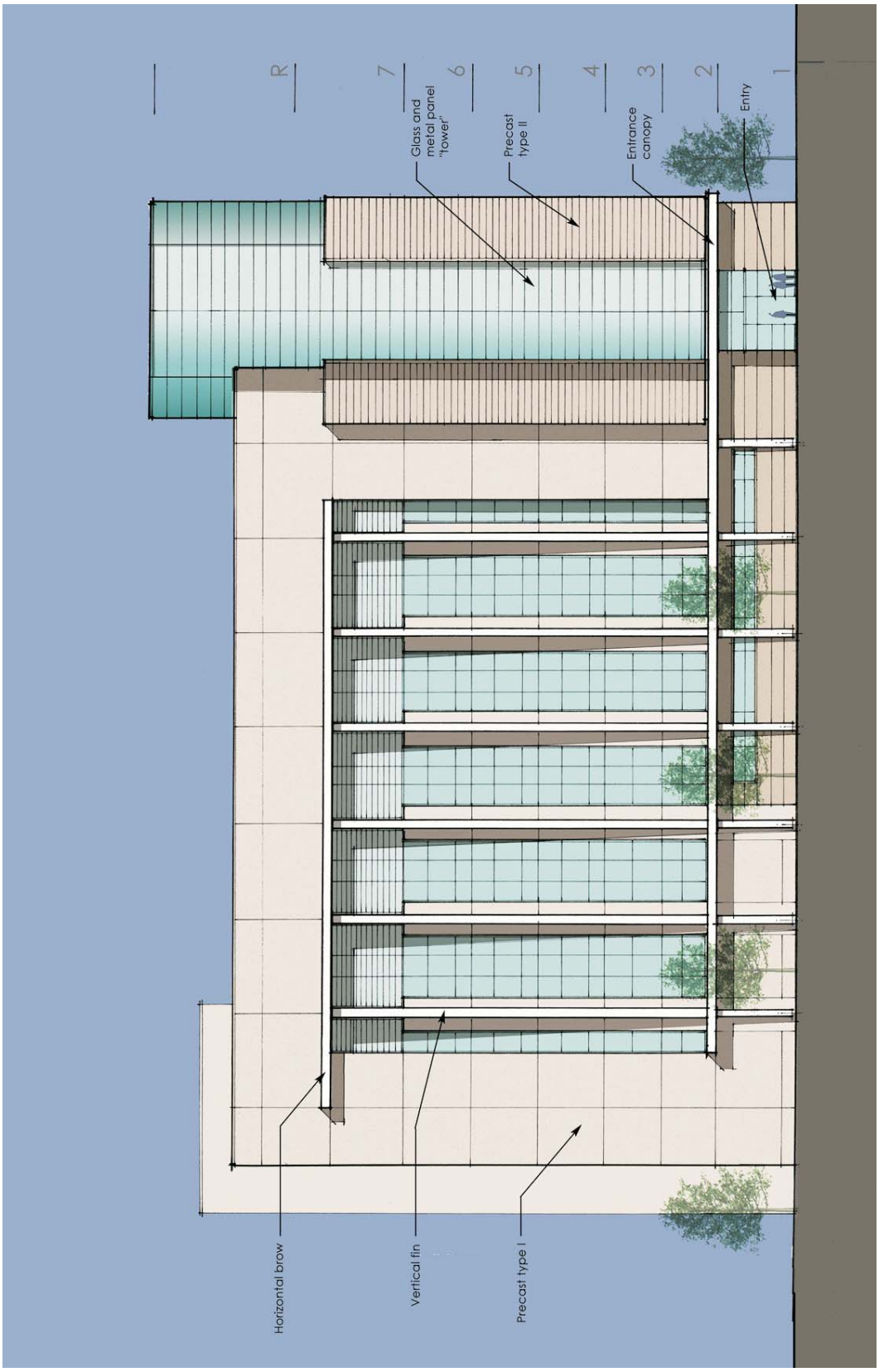

FIGURE 4-3
Elevation View from Albany Street
source: CUH2A, Inc.

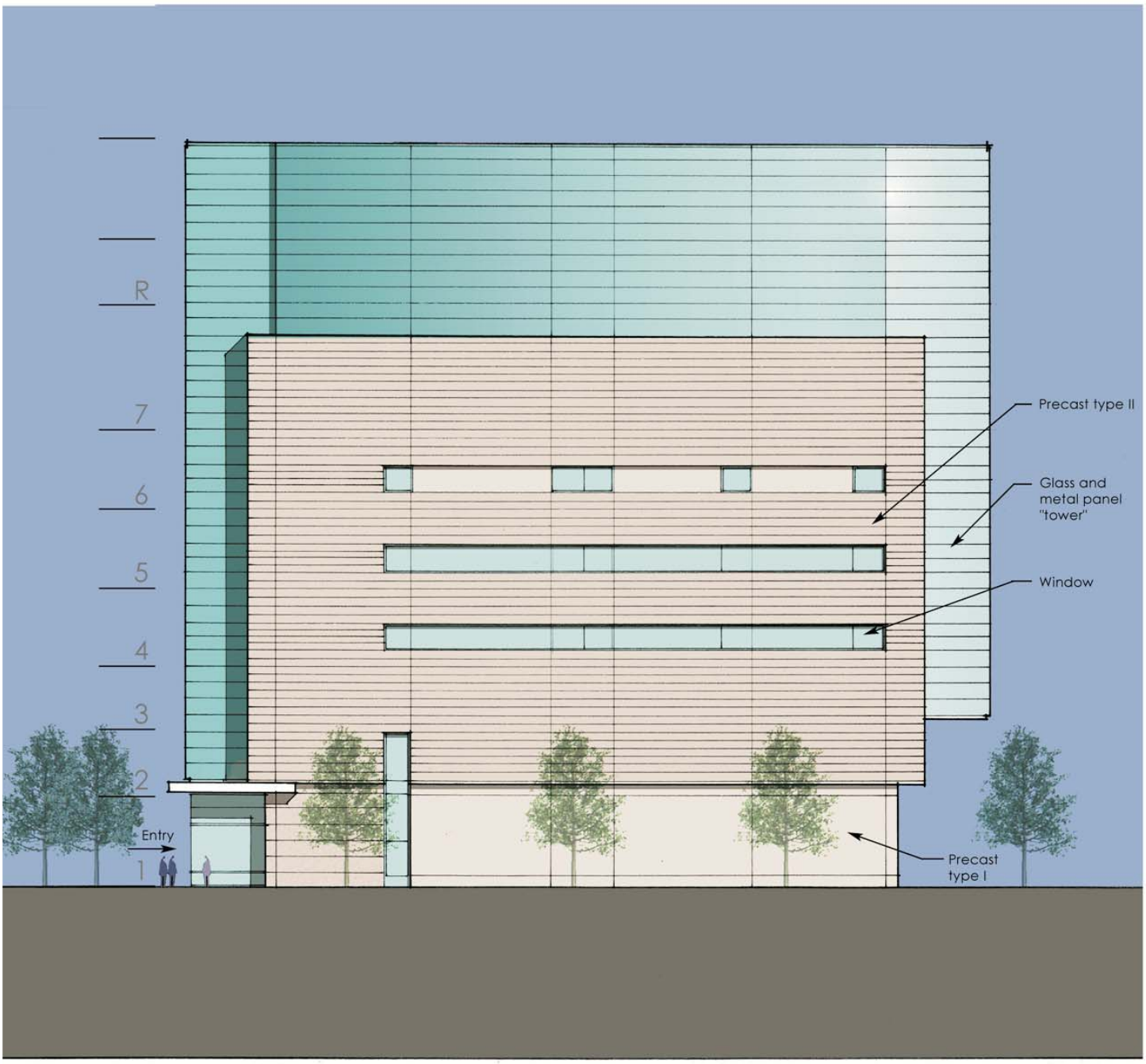

FIGURE 4-4
Elevation View from BioSquare Phase I
source: CUH2A, Inc.

4.6 NOISE

4.6.1 DIRECT AND INDIRECT EFFECTS

4.6.1.1 PROPOSED ACTION

Construction of the Project would result in a temporary increase in daytime sound levels near the site. The maximum L_{10} (Sound level exceeded 10% of the time) during construction is estimated to be 71 dBA, which complies with City of Boston Noise Control Regulation that permits L_{10} levels from construction operations not to exceed 75 dBA. This noise level was predicted for the closest location to the site, the Boston Flower Exchange. The peak noise impacts estimated for the Project would only occur for brief periods during pile driving and during the excavation period of the Project, when it is conservatively estimated that two heavy-duty vehicles would be operating simultaneously on the site. Mitigation measures such as hours of operation, pre-augering of piles and monitoring and maintaining mufflers on noise generating equipment would be employed as necessary to minimize the potential impact of noise generated by construction operations on all locations surrounding the Project site. Construction activities at the Project site would comply with state DEP Regulations that forbid unnecessary emissions of sound due to neglect or through failure to provide the necessary equipment or maintenance (310 CMR 7.10: U Noise).

Construction activities would also comply with the City of Boston's Noise Regulation which sets quantitative limits on noise from construction devices, applicable at the lot line of the construction site, but no closer than 50 feet from the nearest active construction device.

An operational noise analysis was conducted as part of the BioSquare Phase II Draft PIR/EIR. The analysis included two research laboratory buildings, the Boston-NBL building, and another medical research facility, (Building K, located on Albany Street), as well as a naturally ventilated, above ground parking garage structure (Building H). The details of the noise calculation are summarized in Tables 4-1 and 4-2.

These predictions are worst-case sound levels that are assumed to apply for all hours of the daytime or nighttime, although actual sound levels from the mechanical equipment may be reduced during late night periods and on holidays.

Table 4-1: Summary of Predicted Noise Impacts Compared To City Of Boston Noise Limits

Receptor	Maximum Predicted Sound Level Impacts from the Proposed Project (dBA)	City of Boston Residential Noise Limits [daytime/nighttime] (dBA)
Worst-Case Property Line – Northwest Side of the Project, at Ground Level, on Albany Street Sidewalk	33	60/50
Worst-Case Residence – Top Floor of 109 E. Canton Street	33	60/50
Worst-Case Hospital – Top Floor of the Newton Pavilion Building, at the Boston Medical Center	30	60/50

Table 4-2: Summary of Predicted Sound Level Impacts Compared To Massachusetts DEP Criteria (For the Period with Minimum Background Noise)

Receptor	Measured Background Sound Level (L_{90}) (dBA)	Maximum Predicted Sound Level Impact from Project (dBA)	Total Predicted Sound Level (dBA)	Predicted Sound Level Increase (dBA)
Worst-Case Property Line – Northwest Side of the Project, at Ground Level, on Albany Street Sidewalk	54	33	54	No Change
Worst-Case Residence – Top Floor of 109 E. Canton Street	54	33	54	No Change
Worst-Case Hospital – Top Floor of the Newton Pavilion Building, at the Boston Medical Center	54	30	54	No Change

The primary sources of external mechanical noise would be the cooling towers, the laboratory ventilation fans and the emergency generators; therefore, this equipment was included in the sound level impact analysis. The chillers and Air Handling Units (AHUs) are not expected to have a significant sound level impact, compared to

equipment to be included in the sound impact analysis, due to their location inside the buildings.

The sound level impact analysis, presented in Table 4-1, shows that the sound level impact at the worst-case property line (Albany Street sidewalk) would be 33 decibels (dBA). The largest sound level impact at any of the two worst-case sensitive locations (the residences at 109 E. Canton Street) was also predicted to be 33 dBA. Sound level impacts predicted at all three locations are in compliance with the City of Boston's nighttime noise limit (50 dBA) for a residential area. The predicted sound level impacts at the worst-case property line and the worst-case residences were added to an L_{90} value measured during the daily period with the least amount of background noise to test compliance with DEP's noise criteria. As shown in Table 4-2, a zero increase in sound level is predicted for all three modeled locations. These results indicate that the Project would be easily in compliance with the state DEP allowed noise increase of 10 dBA, during the quietest nighttime periods.

As described in Section 2.2.3 of Chapter 2, during the final design of the Project, appropriate low noise equipment and noise control measures would be selected, as necessary, to ensure compliance with the City of Boston and the state DEP noise regulations at all nearby sensitive locations.

To reduce noise from construction, the following measures would be used to mitigate for temporary construction noise:

- Install high-grade mufflers on the diesel-powered construction equipment and generators;
- Combine noisy operations to occur for short durations during the same time periods; and
- Construction activities would only occur from 7:00 am to 5:00 pm.

4.6.1.2 NO ACTION

Under the No Action alternative, the noise associated with the operation of the Boston–NBL facility would not occur however, the noise associated with the existing parking lot use would continue to exist.

4.7 AIR QUALITY

4.7.1 DIRECT AND INDIRECT EFFECTS

4.7.1.1 PROPOSED ACTION

The preferred plan for the Project has the laboratory exhaust vented through vertical stacks located on the top of the building.

The laboratory exhaust system would be designed to avoid any air quality impacts inside or outside the building under normal operations or in the event of a major chemical spill inside one of the laboratories. .

The potential air quality effects from the laboratories would be minimized with the following procedures:

- The exhaust vents from the internal laboratory hoods would be ganged (combined) into groups before connecting to rooftop exhaust fans (one for each stack). Ganging the exhaust vents would provide enhanced dilution of any laboratory chemical emissions before they reach the ambient air.
- The rooftop stacks would be designed to have exit velocities of at least 3,000 feet per minute. Stack exit velocities of this magnitude would be sufficient to avoid stack tip downwash, a phenomenon where the emissions from the stack are drawn downward as strong winds blow by the stack. These stack velocities would also increase the height of exhaust above the building.
- Carefully controlling and limiting the storage of all chemicals within the building would minimize chemical emissions. Liquid chemicals would not be left exposed to the air and would always be contained and transferred within closed glassware. Valves, fittings, and tubing for any gaseous chemicals would be checked for leaks periodically.
- Liquid chemicals would be stored and handled in small quantities to reduce the potential air quality impacts in the event of an accidental spill.
- Filters or scrubbers would be used to trap emissions of any contaminants in the laboratory vents, if appropriate.

The DEP requires a Limited Plan Approval Application for any laboratory with air emissions of 2,000 pounds (one ton) of volatile organic compounds (VOC) per year. As discussed below, the potential VOC emissions from the laboratory operations would be below this threshold; therefore a Plan Approval Application would not be required for the laboratory operations.

DISPERSION MODELING

An air quality dispersion modeling analysis was performed for the proposed generators, boilers, and laboratory vents at the Boston-NBL in accordance with the U.S. EPA and state Department of Environmental Protection (DEP) modeling guidelines. The EPA ISC-PRIME model was used for the analysis with downwash parameters calculated with Building Profile Input Program- Prime. Modeling of criteria air pollutants from the Boston-NBL sources, and other interacting sources identified by the Massachusetts DEP, were modeled for locations within one mile of the Project. The maximum cumulative air quality effects were added to background concentrations and the total concentrations were compared to the Massachusetts and National Ambient Air Quality Standards (NAAQS). Maximum cumulative 24-hour and annual VOC concentrations were compared to Massachusetts Threshold Exposure Limits (TELs) and Allowable Ambient Limits (AALs) for existing and proposed sources immediately surrounding the Project. See Appendix 10 for additional detailed analysis.

The dispersion modeling results demonstrate that the maximum cumulative concentrations of criteria air pollutants from the proposed boilers and generators, modeled with the existing interactive sources, and with background air pollutant concentrations added, will be safely in compliance with the NAAQS for all of the criteria air pollutants analyzed including nitrogen dioxide (NO_2), sulfur dioxide (SO_2), coarse particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and carbon monoxide (CO) (see Appendix 10). The NAAQS were established to protect public health and welfare, with a margin for safety.

The dispersion modeling results demonstrate that the maximum cumulative concentrations of VOC from the laboratory exhaust stacks, modeled with the existing and proposed laboratories in the BioSquare Research Park, will be safely in compliance with the Massachusetts DEP 24-hour average TELs and annual average AALs (see Appendix 10). The TELs and AALs were established by the Massachusetts DEP as concentrations that an individual source of air pollution should not exceed to protect public health, with a margin for safety.

During the construction period, the project will comply with the state DEP Diesel Retrofit Program to reduce emissions from construction-related vehicle exhaust.

4.7.1.2 NO ACTION

Under the No Action alternative, the air emissions associated with the operation of the Boston–NBL facility would not be generated.

4.8 WASTEWATER/WATER SUPPLY

4.8.1 DIRECT AND INDIRECT EFFECTS

4.8.1.1 PROPOSED ACTION

The peak sewage flows are estimated at 45,825 gpd based on existing flows at similar BUMC labs. The Project does not require improvements to existing sewerage infrastructure. Sanitary sewage for the proposed Project would be carried by the New Albany Street Interceptor, which is designed to carry a theoretical flow of 16 mgd. This Project anticipates a total new daily flow of 45,825 gpd**,** or approximately 0.29% of the theoretical capacity of the interceptor. Based on a peaking factor of 3, the estimated peak sewage flow of 137,475 gpd would be approximately 0.86% of the system capacity. At the time the New Albany Street Interceptor was designed, much larger flows were expected from this area. Accordingly, there is more than sufficient capacity in the system to accommodate the additional flows from this Project and the Project will have no adverse effects on existing wastewater systems.

The Boston-NBL would have a segregated plumbing system that would carry laboratory wastewater from every non-BSL-4 area to mixing tanks in the basement where pH adjustment and compliance sampling would occur prior to discharge to the sanitary system. The BSL-4 areas of the Boston-NBL building would feature a sterilization system designed to use heat sterilization to kill any biological agents that might exist in the wastewater from these BSL-4 areas. At a minimum the sterilized effluent from the BSL-4 areas must be cooled before it can be discharged. It is estimated that 4,800 gallons of this waste stream would be produced over each 8-hour operating period. Thus, the discharges from the facility will have no adverse effect on the wastewater treatment system.

As discussed in Section 3.8 of Chapter 3, existing public water supply system has been significantly upgraded in the past several years and has more than adequate capacity to service the Boston-NBL facility. Thus the Project will have no adverse effect on water supply.

4.8.1.2 NO ACTION

Under the No Action Alternative, water consumption and sewage generation would be supported by existing infrastructure. Under the No Action alternative, the water consumption and additional flows to the sewage system would not occur.

4.9 HISTORIC RESOURCES

4.9.1 DIRECT AND INDIRECT EFFECTS

4.9.1.1 PROPOSED ACTION

The proposed Project would be sited in an area of large commercial, industrial and institutional uses near the South End Landmark District and National Register District. The Project is located within the South End Harrison/Albany Protection Area, which covers a transitional area adjacent to the above districts. The proposed Project meets the goals of the Protection Area and all of the specific standards and criteria for projects located within the Protection Area and thus has no adverse effects on historic resources.

The Project would be designed to provide first-class research and development facilities in a building which is compatible with the existing context of the area. The Project design would complement the context of the South End Landmark District in a manner that respects the street patterns, landscaping, amenities such as benches and lighting, building materials, and opportunities for pedestrian use of the site.

The architectural design of the proposed Project would be informed by the scale, massing, materials and architectural detail of neighboring South End institutional buildings at BUMC and BioSquare Research Park.

Additionally, the site plan and massing of the proposed Project would help to mend the irregular urban edge that now exists along Albany Street. By developing the existing underutilized lots, the Project would define the southern section of the South End and screen the major negative effect of the Southeast Expressway.

The Project compliance with the specific standards and criteria of the South End Harrison/Albany Protection Area is detailed below.

DEMOLITION

No demolition would be required in association with the proposed Project, as the site is currently vacant. Most of the buildings that previously occupied the site were demolished in the 1970's.

LAND COVERAGE

To comply with federal safety requirements, the Boston-NBL building would be set back approximately 150 feet from Albany Street. The open space created between the building and the street would be adequately landscaped, in compliance with the Protection Area standards and criteria. The building design and massing have been

reviewed with the Boston Redevelopment Authority's design staff to ensure that the urban design goals for the area are met.

HEIGHT OF STRUCTURES

The Boston-NBL building would be 111 feet high with a 15-foot high screen wall for rooftop equipment, which is well below the 150-foot building height maximum allowed under the Protection Area standards and criteria.

TOPOGRAPHY

The site is nearly flat, resulting from mid-19th century landfill activities. No substantial change in topography is proposed, resulting in no effect on topography.

LANDSCAPE

Landscape elements would not obstruct views of the elements of the adjacent South End Landmark District from public ways. Landscaping would be designed to soften building, sidewalk and vehicular circulation areas.

4.9.1.2 NO ACTION

Under the No Action Alternative, there would be no impact on historic resources.

4.10 REASONABLY FORESEEABLE ACTIONS

The reasonably foreseeable actions that are underway or planned in proximity to the Project site include the buildout of the BioSquare Phase I and Phase II Projects, completion of the Moakley Building at the adjacent BUMC and the Crosstown Center Project located at the corner of Melnea Cass Boulevard and Massachusetts Avenue. These actions are described below and shown on "Figure 4-5".

BUILD OUT OF THE BIOSQUARE PHASE I AND PHASE II PROJECTS

The BRA and the state Executive Office of Environmental Affairs (EOEA) originally approved the BioSquare Phase I project in 1991. The Phase I project is the first phase of the BioSquare Research Park, and is comprised of a 5.2-acre site and includes an existing 1,000 car parking garage, the 160,000 square foot (sf) Evans Biomedical Research Center and the 180,000 sf Center for Advanced Biomedical Research. Two additional medical research buildings are also proposed, including Building D, a 160,000 sf building, which is currently under construction and Building E, an 180,000 sf building which will be constructed based on market demand. The Boston-NBL facility is located in the BioSquare Phase II site immediately adjacent to and east of the BioSquare Phase I site. The BioSquare Phase II build out also includes a 234,700 sf medical research building and a freestanding 1,400 space parking garage.

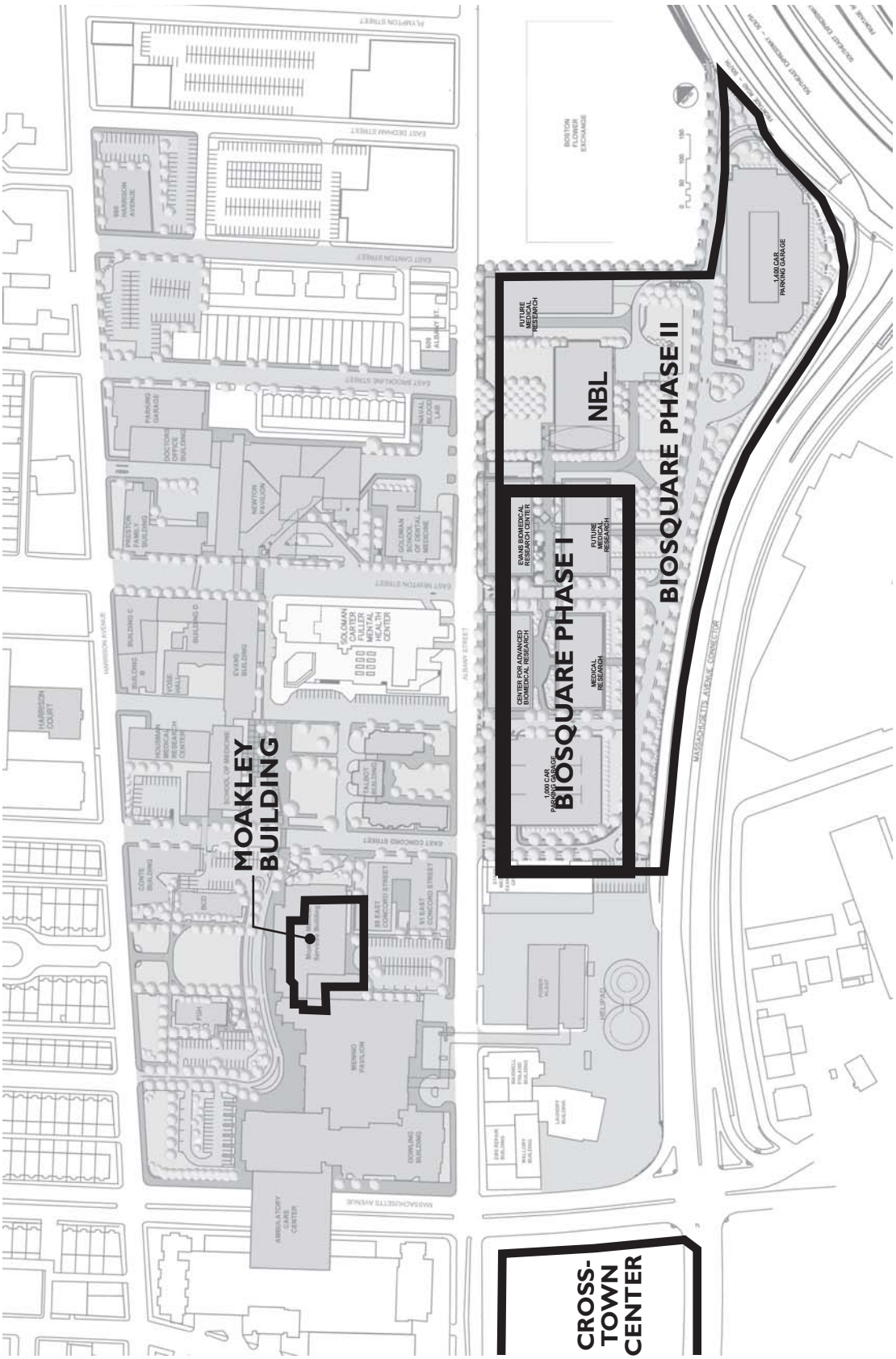

FIGURE 4-5
Proposed Action and Reasonably Foreseeable Actions
source: Stubbins Associates, Fort Point Associates, Inc.

MOAKLEY MEDICAL SERVICES BUILDING

The Moakley building is a three-story 105,205 sf outpatient cancer care center currently under construction at BUMC. The building is expected to be completed in the summer of 2006 and will house an array of cancer care services.

The BioSquare and Moakley projects were contemplated in the Master Plan developed by BUMC and approved by the BRA.

CROSSTOWN CENTER

The Crosstown Center Project is a brownfield redevelopment with four buildings including a 173 room hotel (90,589 sf) with 70,000 sf of retail space, a 3,200 seat Cineplex, a 160,000 sf office building and a 1,200 car parking garage.

TUFTS UNIVERSITY REGIONAL BIO-CONTAINMENT LABORATORY (RBL)

In September, 2005, the National Institute of Allergy and Infectious Disease (NIAID), a component of the National Institutes of Health, announced that it had given a grant to construct a 31,000 square foot RBL at Tufts University School of Veterinary Medicine campus. The purpose of the proposed facility would be to develop vaccines, diagnostics, and therapeutics against emerging and re-emerging infectious diseases. The proposed Tufts RBL project will undergo a separate NEPA review.

The proposed facility would be located in the Grafton Science Park, Grafton Massachusetts. The science park is a 106 acre parcel located on the western portion of the Tufts University School of Veterinary Medicine campus. The proposed site is approximately 50 miles west of Boston.

The facility would be developed on Tufts University owned land designated and approved on the campus master plan as the "Grafton Science Park". As part of an overall Tufts Grafton Campus Master Plan approval process, Grafton Science Park has received overall site plan approval from the town's planning board. The proposed facility would require individual site plan zoning from the Town of Grafton.

4.11 CUMULATIVE EFFECTS

The regulations of the Council on Environmental Quality (CEQ) at 40 CFR 1508.25(c) require analysis of direct, indirect and cumulative impacts The reasonably foreseeable actions in the vicinity include the build out of BioSquare Phases I and II (excluding the Boston-NBL), the Moakley Medical Services Building, and the Crosstown Center Project and completion of the Central Artery/Tunnel highway system improvements. A discussion of cumulative impacts of these actions along with the Boston-NBL is provided below. In the event that the cumulative impacts of the reasonably foreseeable actions, including the

proposed RBL at Tufts University, are greater than currently expected, the NIH will evaluate any significant new circumstances or information relevant to the proposed Boston-NBL and take any actions necessary to ensure compliance with NEPA and the CEQ regulations.

4.11.1 SOCIAL RESOURCES

4.11.1.1 PROPOSED ACTION

The proposed Boston-NBL project and the five identified reasonably foreseeable actions would not result in any direct or indirect adverse impacts on housing, education or community safety and risk. The City of Boston has an adequate housing supply to accommodate current and future residents who may be employed at these facilities. Similarly, the existing school system has adequate capacity to accommodate any increase in school age children resulting from these facilities. The City of Boston has adequate Police and Fire Protection services in the areas where the build out of the BioSquare Phase I and II projects, the Moakley Medical Services Building, and the Crosstown Center would be located. These projects would maintain their own safety and security staff which would be enlarged to accommodate any security needs of the project. The proposed facility at Tufts University would not rely on Police or Fire Protection services from the City of Boston, and would have its own independent safety and security staff. Since there are no direct or indirect effects from the five reasonably foreseeable actions, the proposed Boston-NBL project would have no cumulative impacts.

4.11.1.2 NO ACTION

Since there are no direct or indirect effects, the No Action) alternative would have no cumulative effects.

4.11.2 TRANSPORTATION

4.11.2.1 PROPOSED ACTION

A joint Final Environmental Impact Report/Project Impact Report (EIR/PIR) was prepared for the BioSquare Phase II Project and filed with the state MEPA Office and the BRA on July 30, 2004. This document, together with the Draft EIR/PIR which preceded it, addresses the environmental impacts of the build out of the entire BioSquare Phase I and BioSquare Phase II projects, along with other planned development projects in the vicinity including the Moakley Project and the Crosstown Center. The transportation analysis, which was based on the total impact of the proposed Boston-NBL, combined with other existing and proposed development, indicates there would be no unacceptable adverse impacts, given proposed mitigation.

The proposed Tufts University project location is approximately 50 miles west of Boston. It is anticipated that there would be no direct or indirect effect on transportation in Boston from the proposed Tufts University RBL. Since there are no impacts from the proposed Boston-NBL and the four reasonably foreseeable actions located in the City of Boston, there would be no accumulation of impacts from the proposed Tufts University RBL

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The Final EIR/PIR analyzed traffic impacts for BioSquare Phase I development elements not yet built, as well as BioSquare Phase II, including the proposed NBL. The NBL accounts for 21 percent of proposed floor space and only 15–16 percent of A.M. and P.M. peak-hour vehicular traffic of the additional development, as shown in Table 4-3, BioSquare Development Phases and Vehicle Trips.

NO-BUILD (2008) CONDITIONS

No-Build peak-hour traffic volumes were calculated by increasing existing volumes by a 0.5 percent growth rate over 5 years to account for background traffic, plus adding specific volume estimates from Crosstown Center and the Moakley Medical Services Building. The effects on traffic of the new Central Artery/Tunnel (CA/T) Ramps AS and FL were also taken into account and the CA/T's TRANPLAN traffic forecasting model, Version HA5 (2020 Full Build), was used as the basis for the estimates.

BUILD (2008) CONDITIONS

Build Conditions were developed for the un-built Phase I plus Phase II development program shown in Table 4-3, of which the NBL is a part**.** Several site access alternatives were analyzed. Following discussions with the Massachusetts Highway Department (MHD) and the BTD, the access alternative chosen for the Build analysis assumed a site driveway at Southbound Frontage Road that would allow only right turns in and out, in addition to site drives on Albany Street at East Newton Street, East Concord Street, and the former Stoughton Street, now a parking lot driveway. Existing vehicle site access at Albany Street/East Brookline Street would be discontinued.

Table 4-3: BioSquare Development Phases and Vehicle Trips

Phase	Square Footage	Percent	Vehicle Trips			
			A.M. Peak	Percent	P.M. Peak	Percent
Proposed Action	194,000	21%	70	15%	70	16%
Phase I additional build-out	340,000	58%	228	50%	219	50%
Phase II additional build-out	234,700	21%	161	35%	151	34%
Total	**768,700**	**100%**	**459**	**100%**	**440**	**100%**

LEVEL OF SERVICE COMPARISON

No-Build and BioSquare Build traffic operations for 2008 are compared in Table 4-4. As coordinated with BTD and MHD, 24 surrounding intersections, covering local streets and regional roadways, are included in the analysis. Overall intersection Level of Service (LOS) is provided for signalized intersections; LOS by approach is provided for unsignalized intersections. It should be noted that the impact analysis was based on total un-built BioSquare Phase I and proposed BioSquare Phase II vehicle trips, as presented in Table 4-3. The 70 trips entering and leaving the site during each of the A.M. and P.M. peak hours that are specifically attributed to the NBL represent only 15–16 percent of the additional peak-hour traffic; they are not sufficient in and of themselves to change operations significantly at any of the study area locations.

As shown in the table below, the only changes from No-Build to Build operations occur during the P.M. peak hour. During this time period, the overall level of service for two intersections at Albany Street/Massachusetts Avenue and Southbound Frontage Road/South Bay Service Road worsens from LOS D to LOS E under Build Conditions. The Moakley Building parking lot driveway at Albany Street also worsens from LOS D to LOS E, however, this affects primarily patrons leaving the parking lot and not through traffic on Albany Street.

The Union Park Street approach at Albany Street goes from LOS B to LOS C, and the Southbound Frontage Road/South Boston Bypass Road intersection goes from LOS A to LOS B. The section below presents a mitigation plan for Albany Street intersections.

Table 4-4: Comparison of No-Build and Build Conditions Intersection Level of Service

Intersection		No-Build		Build	
		(A.M.)	(P.M.)	(A.M.)	(P.M.)
1.	Harrison Ave./Massachusetts Ave.	C	C	C	C
2.	Harrison Ave./E. Springfield St./BMC Driveway (in only)				
	EB E. Springfield left/thru/right	C	D	C	D
	NB Harrison thru/right	A	A	A	A
	SB Harrison left/thru	A	A	A	A
3.	Harrison Ave./E. Concord St.	B	B	B	B
4.	E. Concord Mid-block				
	EB E. Concord thru	A	A	A	A
	NB Driveway right	B	B	B	B
5.	Albany St./Massachusetts Ave.	D	D	D	E
6.	Albany St./Moakley Lot				
	EB Moakley left/right	D	D	D	E
	NB Albany thru	A	A	A	A
	SB Albany thru	A	A	A	A
7.	Albany St./E. Concord St.	D	D	D	C
8.	Albany St./East Newton St./Site Exit	B	C	A	D
9.	Albany St./East Brookline St./Parking Lot				
	EB East Brookline left/thru	F	F	F	F
	EB East Brookline right	B	C	B	C
	WB Parking Lot left	F	F	*	*
	WB Parking Lot right	C	E	*	*
	NB Albany thru/right	A	A	A	A
	SB Albany left	B	B	*	*
	SB Albany thru	A	A	A	A
10.	Albany St./Malden St.				
	EB Malden left/right	F	F	F	F
	NB Albany left/thru	A	A	A	A
	SB Albany thru/right	A	A	A	A
11.	Albany St./Union Park St.				
	EB Union Park right	C	B	C	C
	NB Albany thru | thru/right	A	A	A	A
	SB Albany thru	A	A	A	A
12.	Albany St./Frontage Rd./MBTA Dr.	B	B	B	B
13.	MAC/Massachusetts Ave./Melnea Cass Blvd./Southampton St.	D	D	D	D
14.	**				
15.	SB Frontage Rd./I-93 Off-ramp/MAC	B	B	B	B
16.	SB Frontage Rd./Site Drive				
	Site Drive right	N/A	N/A	B	B
	SB Frontage thru | thru/right	N/A	N/A	A	A
17.	SB Frontage Rd./MAC	***	***	***	***
18.	SB Frontage Rd./S. Boston Bypass Rd.	A	A	A	B
19.	Southampton St./South Bay	B	B	B	B
20.	SB Frontage Rd./South Bay/Service Rd.	B	D	B	E
21.	Southampton St./NB Frontage Rd./ Driveway	C	C	C	C
22.	NB Frontage Rd./Widett Circle	A	A	A	A
23.	NB Frontage Rd./S. Boston Bypass Rd.	A	B	A	B
24.	NB Frontage Rd./MAC	C	B	C	B

* = Movement eliminated in Build Condition.
** = Intersection 14 represents a proposal not included in final access alternative
*** = LOS not calculated; no vehicle conflicts.

TRANSPORTATION SYSTEM IMPROVEMENTS

The BUMC is working with BTD to finalize a package of transportation improvements to be implemented as part of the traffic mitigation for the BioSquare Project. At this time, the Proponent has committed to the following measures, subject to BTD and MHD approval:

- Right-turn-in, right-turn-out site driveway at Southbound Frontage Road;
- Modification of the East Newton Street/Albany Street intersection as a four-way intersection, including associated traffic signal upgrades;
- Improvements at East Concord Street/Albany Street, including any required traffic signal upgrades;
- A traffic and parking management plan for Albany Street between East Newton Street and Union Park Street. Subject to BTD approval, the plan would convert Albany Street to a 3-lane cross-section that typically consists of a single travel lane in each direction and a center left-turn lane. No widening of the street is proposed. The plan would also include recommendations for changes to the existing on-street parking regulations.
- Installation of fiber optic communications cable and conduit within the Albany Street sidewalks that are scheduled to be rebuilt as part of the BioSquare Project;
- Directional signage for employees, hospital patients, and visitors on and near the campus;
- The provision of up to 2 variable message boards in the area to provide opportunities for real-time traffic information.

TRANSPORTATION DEMAND MANAGEMENT

Additionally, the Project has committed to implement Transportation Demand Management measures as described in Section 2.2.9 of Chapter 2 which, when combined with the transportation system improvements described above, will ensure that the project does not result in adverse effects on transportation.

The effects of the cumulative impacts on transportation have been described above. There are some intersections with limited but acceptable increases in traffic.

4.11.2.2 NO ACTION

The No Action alternative would result in the Boston-NBL Project not being constructed, which represents about 16% of the total build out considered in the cumulative traffic impacts. Therefore, the traffic impacts would be proportionately reduced and still remain within acceptable limits.

4.11.3 ECONOMIC

4.11.3.1 PROPOSED ACTION

The proposed action would create positive effects on employment, income, and government finance as does the build out of the BioSquare Phase I and Phase II project, the Moakley Medical Services Building project, and the Crosstown Center project. These four projects considered in terms of cumulative impacts will provide both construction-period and permanent employment opportunities (see Table 4-5, Cumulative Effects- Employment). Based on the estimated average of $50,000 per job, the cumulative effect of income generated from the identified projects would be in excess of $100 million annually. These projects would also pay, as required, real estate taxes to the City of Boston and sales tax to the Commonwealth of Massachusetts.

The proposed Tufts University project would possibly have a slight positive impact on the City of Boston. It is possible that some people will choose to live in Boston and work in Grafton, the site of the proposed Tufts University RBL. Since there are no impacts from the proposed Boston-NBL and the four reasonably foreseeable action located in the City of Boston, there will be no accumulation of impacts from the proposed Tufts University RBL.

Table 4-5: Cumulative Effects - Employment

	Employment	
Project	**Construction**	**Permanent (2008)**
Proposed Action	1,300	660
Phase 1	N/A	N/A
Phase II	800	740
Moakley Medical Services	150	N/A*
Crosstown Center	300	740
Total	>2,500	>2,140

* N/A – Not available

4.11.3.2 NO ACTION

The positive impacts of the No Action alternative on employment, income and government and public finance would be similar to, but proportionately reduced from the Proposed Action. Construction employment would be reduced by 48% and permanent employment would be reduced by 30%.

4.11.4 ENVIRONMENTAL JUSTICE

4.11.4.1 PROPOSED ACTION

An environmental justice analysis was performed for the proposed Boston-NBL using a one-mile radius. This area includes all the reasonably foreseeable actions within the City of Boston. The proposed Boston-NBL project and the four identified reasonably foreseeable actions, located within the City of Boston, would not result in any direct or indirect adverse health effects on the minority populations located within a one mile radius of the Project.

The proposed facility at Tufts University is located approximately 50 miles west of the City of Boston and would not have any direct or indirect environmental justice impacts to the City of Boston. Since there are no impacts from the proposed Boston-NBL and the four reasonably foreseeable actions located in the City of Boston, there will be no accumulation of impacts from the proposed Tufts University RBL. Tufts University would prepare an environmental assessment to study the area surrounding the proposed RBL for any potential environmental justice impacts.

4.11.4.2 NO ACTION

Since there are no direct or indirect effects, the No Action alternative would have no cumulative effects.

4.11.5 VISUAL QUALITY

4.11.5.1 PROPOSED ACTION

The proposed Boston-NBL project and the four identified reasonably foreseeable actions, within the City of Boston, would improve the visual quality of the surrounding area. The Project would redevelop an existing surface parking lot and create a new building along Albany Street with public works improvements including public sidewalks, lighting and landscaping. The build out of BioSquare Phase I and Phase II would also redevelop existing surface parking lots into new buildings with similar public realm improvements. The buildings in the BioSquare Phase I and Phase II would be designed to complement the existing urban design features of the area. The proposed Moakley Buildings would improve the visual quality of the Boston University Medical Center Complex by developing a new medical research building that would create a visual terminus to the historic Worcester Square landscape and block the view of the existing Power Plant on Albany Street. The Moakley Project would also create and reinforce pedestrian connections through the BUMC campus and provide an improved landscaped area and pedestrian path along East Concord Street. The Crosstown Center Project would be a "Gateway Project" sited on

Massachusetts Avenue and Melnea Cass Boulevard along the edges of Roxbury, the South End, and the BUMC. Crosstown Center would be located along major arterials in an area that has minimal pedestrian activity with poor lighting. Construction of the Crosstown Center would redevelop an existing brownfield site into a new mixed use development which would enliven the pedestrian environment and create a new public realm. The cumulative visual effect of these four projects is overwhelmingly positive.

The proposed facility at Tufts University would be located in Grafton, Massachusetts, approximately 50 miles west of the City of Boston. There would be no direct or indirect impact from the proposed Tufts University RBL on the visual quality of the City of Boston.

4.11.5.2 NO ACTION

The No Action alternative would have similar positive effects on visual quality, save for the specific Boston–NBL Project location.

4.11.6 NOISE

4.11.6.1 PROPOSED ACTION

The proposed Boston-NBL project and the four identified reasonably foreseeable actions within the City of Boston would not result in any direct or indirect adverse noise effects. None of the projects would generate sound levels that would violate the City of Boston or the state DEP noise criteria, which establish maximum allowable sound levels and allowable increases (see Table 4-6 Cumulative Effects- Anticipated Nighttime Noise). The City of Boston's nighttime noise limit for a residential area is 50 dBA while the state DEP allows an increase of 10dBA over existing levels.

Table 4-6: Cumulative Effects - Anticipated Nighttime Noise

	Anticipated Nighttime Noise
Proposed Action	33 dBA with zero increase over existing levels
Phase 1	30 dBA
Phase II	28 -46 dBA with zero to one dBA increase over existing levels
Moakley	Below 50 dBA threshold
Crosstown	Below 50 dBA threshold
Total	

The proposed facility at Tufts University is located approximately 50 miles west of the City of Boston. It is not anticipated that any noise would be generated of a significant frequency to be heard in Boston. Since there are no impacts from the proposed

Boston-NBL and the four reasonably foreseeable actions located in the City of Boston, there will be no accumulation of impacts from the proposed Tufts University RBL.

4.11.6.2 NO ACTION

Since there are no direct or indirect effects, the No Action alternative would have no cumulative effects

4.11.7 AIR QUALITY

4.11.7.1 PROPOSED ACTION

The proposed Boston NBL project and the four identified reasonably foreseeable actions, within the City of Boston, would comply with the state DEP air quality limits. A cumulative air quality analysis was conducted for the Proposed Action which included emission sources within a one mile radius of the project site. This area includes all the reasonably foreseeable actions within the City of Boston. The dispersion modeling results demonstrate that the maximum cumulative concentrations of VOC from the laboratory exhaust stacks, modeled with the existing and proposed laboratories in the BioSquare Research Park, will comply with the Massachusetts DEP 24 hour average Threshold Exposure Limits (TEL) and annual average Allowable Ambient Limits (AALs). The TELs and AALs were established by the Massachusetts DEP as concentrations that an individual source of air pollution should not exceed to protect public health, with a margin for safety.

The proposed facility at Tufts University is located approximately 50 miles west of the City of Boston. The facility would comply with all local and state regulations pertaining to air quality and air emissions. Any emissions from the proposed facility, Grafton Science Park, would not have any direct or indirect effect on the City of Boston. Since there are no impacts from the proposed Boston-NBL and the four reasonably foreseeable actions located in the City of Boston, there will be no accumulation of impacts from the proposed Tufts University RBL.

4.11.7.2 NO ACTION

Since there are no direct or indirect effects, the No Action would have no cumulative effects.

4.11.8 WASTEWATER/WATER SUPPLY

4.11.8.1 PROPOSED ACTION

The existing municipal wastewater and water supply systems are more than adequate to support the Project and the four identified reasonably foreseeable actions, within

the City of Boston (see Table 4-7, Cumulative Effect- Wastewater Generation). Sanitary sewage for all projects within Boston would be carried by the New Albany Street Interceptor, which is designed to carry a theoretical flow of 16 mgd, much greater than what is projected. As discussed in Section 3.8 of Chapter 3, the existing public water supply system has been significantly upgraded in the past several years and has more than adequate capacity to service the Boston-NBL facility. Thus, the Project will have no adverse effect on wastewater or water supply.

Table 4-7: Cumulative Effects - Wastewater Generation

	Wastewater Generation (gallons per day)	Water Consumption (gallons per day)
Proposed Action	45,825	50,000*
Phase 1	121,000	135,000*
Phase 2	17,527	20,200
Moakley	18,000	22,000
Cross-town	56,500	62,000*
Total	258,852	287,200

- Estimated based on wastewater generation.

The proposed facility at Tufts University is located approximately 50 miles west of the City of Boston and would not be using the wastewater and water supply system in the City of Boston. The proposed facility would be served by the available water and public sewer near the Grafton Science Park campus. Therefore the proposed facility at Tufts University would have no direct or indirect impact on the City of Boston.

4.11.8.2 NO ACTION

Since there are no direct or indirect effects, the No Action would have no cumulative effects.

4.11.9 HISTORIC RESOURCES

4.11.9.1 PROPOSED ACTION

The project and the four identified reasonably foreseeable actions, within the City of Boston, would not result in any direct or indirect adverse effects on historic resources. None of the projects are located within existing historic districts or propose the demolition of any historic structures. Three of the four projects within the City of Boston are located within the South End Harrison/Albany Protection Area which was established in 1975 by the Boston Landmarks Commission as a buffer to the South End Historic District. Each of these three projects has been designed to comply with the standards and criteria specified in the South End Protection District and has been approved by the South End Landmarks Commission. Therefore there are no direct or

indirect impacts on historic resources from the proposed Boston NBL or the four reasonably foreseeable actions, located within the City of Boston.

The proposed facility at Tufts University is located approximately 50 miles west of the City of Boston, and therefore will have no direct or indirect impact on historic resources in Boston.

4.11.9.2 NO ACTION

Since there are no direct or indirect effects, the No Action would have no cumulative effects.

4.12 UNAVOIDABLE ADVERSE EFFECTS

Unavoidable adverse effects are undesirable effects that cannot be avoided if the Proposed Action or any alternative is implemented. Based on the foregoing analyses, the Proposed Action and the No Action do not result in any unavoidable adverse effects.

4.13 RELATIONSHIP BETWEEN SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

The facility is being constructed in an area planned and programmed for medical and research uses. The short-term use of the site would create construction jobs and would generate some construction related transportation impacts. The Proposed Action would likely result in long-term benefit to the quality of human life based on the scientific research that would be conducted at the facility, including the development of vaccines, diagnostics, and treatments of infectious diseases.

4.14 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The Project would result in irreversible commitment of resources in the form of building materials used to construct the building.

5.0 RESPONSE TO COMMENTS

DEIS Comment Period

The Draft Environmental Impact Statement (DEIS) was issued on October 15, 2004, with a Notice of Availability published in the Federal Register on October 22, 2004. A 75 day comment period was allowed. A public meeting was held on November 10, 2004. In response to comments on the DEIS, NIH decided to issue a Supplemental Draft EIS (SDEIS), which provided more information and more clearly displayed how scoping comments and comments on the DEIS were addressed.

SDEIS Comment Period

The SDEIS was issued on April 1, 2005, with a Notice of Availability that appeared in the Federal Register. A 48 day comment period was allowed. Comments postmarked (or e-mailed or faxed) by May 18, 2005, appear in this chapter. Comments postmarked or received after May 18, 2005 were considered, but no formal response appears in this chapter. Comments contained in the late responses were similar to the comments included below. A public meeting was held on April 25, 2005, where oral comments were taken. Comment from the public meeting can be found in the Meeting Transcript following comment letter #115.

Response to Comments

Each comment letter, email or fax submitted on the SDEIS was given a document number and electronically scanned. Substantive comments within the letters were marked with a bracket and assigned a number corresponding to a response found on the right side of the page.

Responses to individual comments reflect why no change was made or where changes have been made to address the comment. Many comments had already been addressed in the EIS and the responses to such comments point to the location in the FEIS where those comments were addressed.

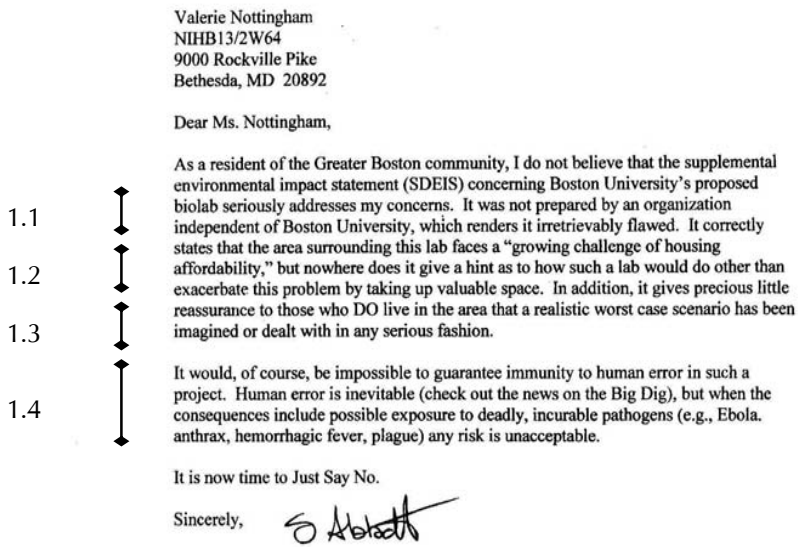
Several comments were made that require no specific response but which will be considered by the NIH in its final decision. These comments generally show support for or opposition to the project, provide personal background information, or contain other information to which a response is not required.

A list of acronyms used in the response to comments may be found at the end of this chapter.

Comment Letters

Letter 41 Robert H. Friedman
Letter 42 George T. Gallagher
Letter 43 Timothy S. Gardner
Letter 44 Elizabeth G. B. Gealach
Letter 45 Barbara A. Gilchrest
Letter 46 Patricia Glynn
Letter 47 Alexandra Gorman
Letter 48 Susan Gracey
Letter 49 Gregory A. Grillone
Letter 50 Paul Guzzi
Letter 51 Amy Hendricksen
Letter 52 Almarita Hendrix
Letter 53 Sherwood S. Hughes
Letter 54 Gretchen Klotz
Letter 55 J. Thomas Lamont
Letter 56 Elisabeth Leonard
Letter 57 Edward L. Loech
Letter 58 Eve Lyman
Letter 59 Thomas D. Mann, Jr.
Letter 60 C. Martinez
Letter 61 Peter A. Merkel
Letter 62 Phyllis J. Miller
Letter 63 Thomas P. Monath
Letter 64 David S. Mundel
Letter 65 Carolyn Nikkal
Letter 66 Pat O'Brien
Letter 67 George T. O'Connor
Letter 68 Kenneth Olken
Letter 69 Marc Pelletier
Letter 70 Bill Perkins
Letter 71 Kevin C. Peterson
Letter 72 Ana Peria
Letter 73 Eujenie Pires
Letter 74 Maria Pires
Letter 75 Carolyn Poiselli
Letter 76 Virginia Pratt
Letter 77 Andrew L. Raddant
Letter 78 Monica Raymond
Letter 79 Ian Rifkin
Letter 80 Col M. Riley
Letter 81 Julio Vega Rivera
Letter 82 Manuel Rodrigues
Letter 83 J.H. Rooks

Letter 84 Marguerite Rosenthal
Letter 85 David J. Salant
Letter 86 John C. Samuelson
Letter 87 Paul C. Schroy, III
Letter 88 Jeremy Schug
Letter 89 Jeff Shearstone
Letter 90 Alisha Lilly Sieminski
Letter 91 Helaine Simmonds and Cinda Stoner
Letter 92 Paul R. Skolnik
Letter 93 William N. Sloan
Letter 94 Lawrence R. Smith
Letter 95 Pauline Solomon
Letter 96 Thomas J. Sommer
Letter 97 Martin S. Steffen
Letter 98 Elizabeth Bell Stengel
Letter 99 John L. Sullivan
Letter 100 William G. Touret
Letter 101 Philip C. Trackman
Letter 102 Saul Tzipori
Letter 103 Thomas E. Van Dyke
Letter 104 Gregory Viglianti
Letter 105 Watertown Citizens for Environmental Safety
Letter 106 Gary W. Walker
Letter 107 Beth Walsh
Letter 108 Celia Wcislo
Letter 109 Donald A. Weiner
Letter 110 Paul Wiers
Letter 111 James Williamson
Letter 112 Dr. Nancy Lee Wood
Letter 113 Linda Woodbury
Letter 114 Vassilis I. Zannis
Letter 115 Zhihui Zhao
Comments at SDEIS Hearing – April 25, 2005



Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

It is now time to Just Say No.

Sincerely, S Abbott

1.1
1.2
1.3
1.4

LETTER 1

S. Abbott

1.1 The SDEIS is an NIH document. The Council on Environmental Quality's regulations implementing the National Environmental Policy Act permit the preparation of EISs by contractors selected by the agency responsible for the EIS. 40 C.F.R. § 1506.5(c). The fact the private consultants participated in the preparation of the SDEIS does not render the EIS flawed. These consultants have no financial or other interest in the decision that the NIH will make in NIH's Record of Decision (ROD) or otherwise in the outcome of the proposed Boston-NBL project. The NIH will make an independent, objective decision on whether to proceed with the Proposed Action and report it in the NIH's ROD.

1.2 The proposed Boston-NBL is not expected to have an impact on housing prices. As noted in Section 4.2.1.1 of the FEIS, "With over 250,000 housing units in the City of Boston, the Project would have no adverse impact on housing stocks." However, the project would contribute approximately $920,000 in non NIH funds for the creation of affordable housing.

1.3 An additional exposure modeling strategy was applied to the proposed Boston University site. The "Maximum Possible Risk" or MPR model was developed by the NIH with the input of concerned citizen advocates. The model was developed using the CDC report entitled *Public Health Assessment of Potential Biological Terrorism Agents* (U.S. DHHS 2002a); "weight of evidence" or WOE methodology; conservative estimates at each decision point; and was based on laboratory data generated in simulated "drop" studies. See Section 4.2.1.1 and Appendix 12 of the FEIS.

1.4 The worst case scenario recognizes the potential for human error and concludes that under the worst case an individual could be exposed to less than one *B. anthracis* spore. This dose of organisms is not infectious for normal or immuno-compromised individuals. Therefore, the risk, even assuming human error, is negligible. See

LETTER 1

S. Abbott

Section 4.2.1.1 "Community Safety and Risk – Worst-Case Release Scenario Risk Assessment" and Appendix 12 of the FEIS.

LETTER 2
Albany LLC

ALBANY LLC
P.O. Box 157
Wayland, MA 01778

Ms. Valerie Nottingham
Environmental Quality Branch
Division of Environmental Protection
National Institutes of Health, B13, Room 2W64
9000 Rockville Pike
Bethesda, MD 20892

RE: National Level 4 Emerging Infectious Disease Laboratory
Albany Street, Boston, MA

Dear Ms. Nottingham,

I am writing to you in support of the Level 4 research laboratory proposed for the Biosquare site on Albany Street in Boston, Massachusetts. My business owns and manages a commercial building across the street from the site of the proposed laboratory. Over the past ten years, I have attended many meetings of the Biosquare Public Advisory Committee formed under the auspices of the Boston Redevelopment Authority and, since its inception last year, I have attended several meetings held by the B-LAG Advisory Group formed by the Boston University Medical Center. These groups have provided answers to many questions about the laboratory construction, security and operations as well as about the research planned to take place in the laboratory. Both of these advisory groups are expected to continue after the Level 4 lab is built. 2-9

While I continue to have many concerns about the site access, parking, and traffic patterns for the proposed development and about the positioning of other buildings within the security perimeter of the level 4 laboratory, I fully support the development of the level 4 laboratory on this site at this time. It is a tremendous opportunity for the City of Boston and New England to host this state of the art research facility. The nearby scientific talent that will be able to use this facility when it is completed will finally have the proper environment to do the necessary research to develop vaccines and treatments for dangerous diseases of the 21st century. I consider this use of the site to be fully compatible with the zoning of the site and with commercial uses that surround the site. We look forward to having the lab and its workers as neighbors.

If you have any questions, please do not hesitate to call me at (508) 358-4654.

Sincerely,

Bonnie L. Gossels, Manager

Bonnie L. Gossels, Manager

Rec'd 5/16/05 mane

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab at BUMC.

When I first heard about the laboratory, I must admit I was a bit apprehensive. However, the staff at Boston University Medical Center took the time to address my concerns and answer all my questions about the project.

I feel that this lab is important to find cures for infectious diseases. We need to have the appropriate facilities to do this important research. I believe that this lab will be built safely and that the redundant systems and the security plans will ensure that we are all safe.

Also, the development of this laboratory will create 1,300 construction jobs and 660 permanent jobs—jobs at all levels. This lab will have a positive economic impact at all levels in our community.

Sincerely,

Alexander J. Allen

LETTER 3

Alexander J. Allen

LETTER 4

Alternatives for Community and Environment

ACE
alternatives for community & environment
Building Power for Environmental Justice
2181 Washington Street, Suite 301 • Roxbury, MA 02119
Tel 617-442-3343 • Fax 617-442-2425 • www.ace-ej.org

May 18, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Comment on the Supplemental Draft Environmental Impact Statement for the National Emerging Infectious Diseases Laboratories, Boston, Massachusetts; EIS No. 040491

Dear Ms. Nottingham:

These are the comments of Alternatives for Community & Environment, Inc., (ACE) on the Supplemental Draft Environmental Impact Statement (SDEIS) for the National Emerging Infectious Diseases Laboratories (bioterrorism laboratory[1] or National Biocontainment Laboratory (NBL)) planned for Boston, Massachusetts.

ACE is part of the Stop the BU Bioterrorism Lab campaign, a coalition of many persons and groups, both within and outside Boston, that believe that the proposed laboratory, which would be owned by Boston University, presents too many environmental, health, and safety risks to be located safely on Albany Street in Boston's densely populated South End/Roxbury neighborhood.

We are disappointed that NIH choose not to list or discuss how the SDEIS differs from the Draft Environmental Impact Statement (DEIS), and to which DEIS comments the SDEIS responds, thus requiring all interested parties to take much additional time in review. It appears that the SDEIS responds to only a few of the comments we submitted on the DEIS. Thus, our comments on the SDEIS, with a few exceptions, are similar to our comments on the DEIS. We also request that our comments on the DEIS be considered comments on the SDEIS.

As we explain below, we believe that the SDEIS inadequately and incorrectly describes the potential impact of the proposed bioterrorism laboratory and fails to comply with requirements of the National Environmental Policy Act (NEPA). As an initial matter, we will repeat the point we made in our March 1, 2004, comments on the scope of the EIS and in our December 23,

[1] 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 toxic biological agents that cause 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.

2004, comments on the DEIS: the National Institutes of Health (NIH) has failed to complete an EIS of appropriate scope. We will then discuss the problems with the SDEIS as presented by NIH.

I. A PROGRAMMATIC EIS IS REQUIRED

NIH must withdraw its decision to place an NBL in Boston because it failed to complete an EIS of appropriate scope.

4.1 NEPA requires NIH to have completed a Programmatic EIS for its biodefense research agenda **before** initiating a program to fund the construction of new laboratory space for bioterrorism research at numerous locations throughout the country. That includes completing a Programmatic EIS to evaluate its laboratory agenda before publishing the Request for Proposals and Applications for a specific NBL. Regulations of the Council on Environmental Quality (CEQ) require preparation of a Programmatic EIS for "systematic and connected agency decisions allocating agency resources to implement a specific statutory program or executive directive." 40 CFR § 1508.18(b)(3). Furthermore, for federally assisted research such as that at issue here, a Programmatic EIS "shall be prepared…and shall be available before the program has reached a stage of investment or commitment to implementation likely to determine subsequent development or restrict later alternatives." 40 CFR § 1502.4(c)(3). NIAID's decision to fund 2 NBLs and 9 RBLs, pursuant to its Homeland Security-directed "biodefense research agenda," epitomizes a systematic and connected agency decision that has committed substantial funding that will restrict future alternatives. Thus, NIH should have created a Programmatic EIS before initiating the program under which it now intends to fund the construction of an NBL at BioSquare in the South End/Roxbury section of Boston.

4.2 In addition, NEPA requires NIH to have completed an EIS and the NEPA process before choosing Boston University (BU)'s proposal to construct an NBL in the South End/Roxbury section of Boston. NEPA unequivocally mandates as a prerequisite to such federal action that the agency undertake a rigorous environmental review before making any decision that could significantly impact the environment. NEPA, 42 U.S.C. § 4321 et seq., and its implementing regulations, 40 CFR § 1500 et seq. Because NIH's decision to grant $127 million to construct an NBL could significantly impact Boston's environment through physical impacts such as increased traffic in the BioSquare area and airborne release of deadly pathogens, NEPA requires NIH to have completed an EIS prior to making the funding decision. NIH should have completed an EIS after it received the applications for NBL funding and before choosing which applicants to fund and the sites for the NBLs.

In promulgating NEPA in 1969, Congress intended that the EIS requirement fully and fairly inform decision makers of a project's potential adverse environmental impacts and reasonable alternatives **before** that body reached a decision. The Council on Environmental Quality's implementing regulations reflect this purpose by requiring that agencies abstain from committing resources that could prejudice the selection of alternatives until after making a final decision. 40 CFR § 1502.2(f). These regulations further state that "[e]nvironmental impact statements shall serve as the means of assessing the environmental impact of proposed agency actions, rather than justifying decisions already made." 40 CFR § 1502.2(g). Moreover, for a proposal initiated by a

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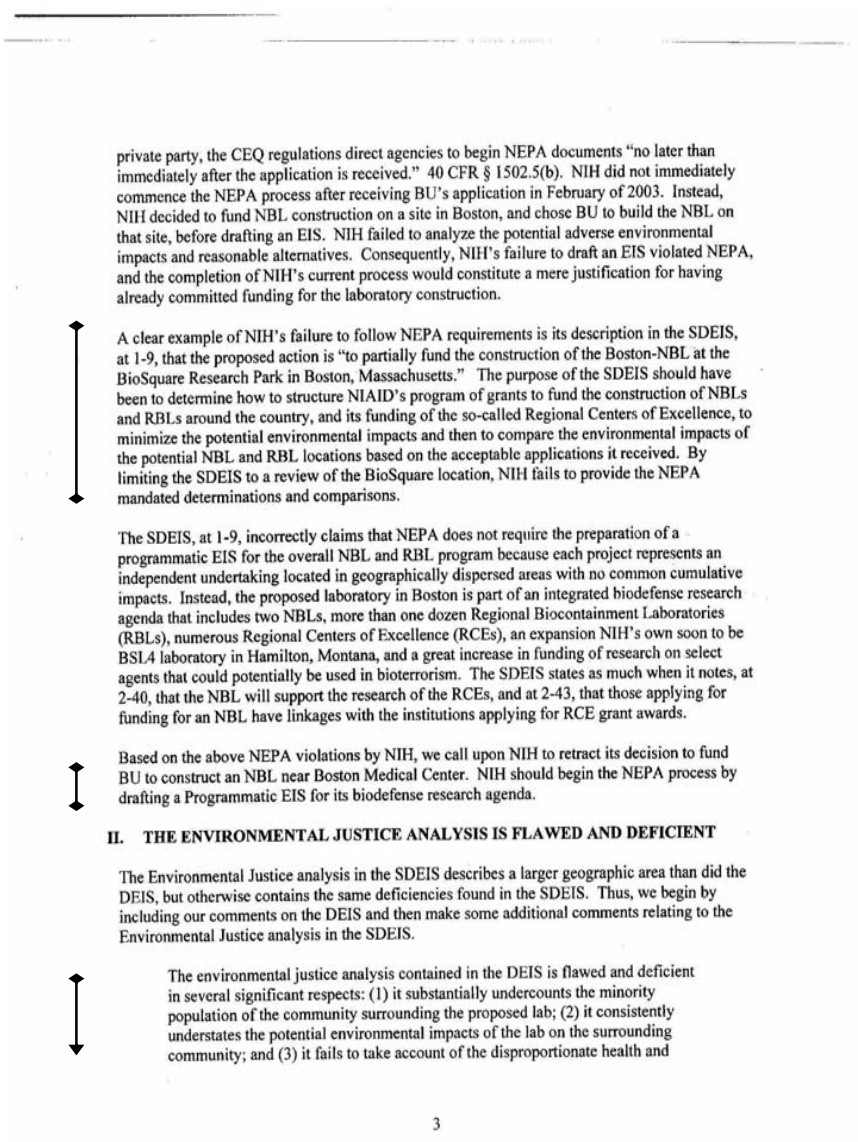
LETTER 4

Alternatives for Community and Environment

4.1 A Programmatic Environmental Impact Statement is not necessary to assess the potential environmental impacts of the various biocontainment facilities proposed to be either constructed by the NIH itself or partly funded by the NIH. The various proposed biocontainment facility projects are not located in the same geographic region, and the proposed projects' potential impacts are neither synergistic nor cumulative. The various projects are not so interrelated or connected that their possible environmental impacts cannot be considered independently. Moreover, the NIH's approval of one project does not commit the agency to approve the other projects. As required by NEPA, the NIH is conducting an environmental review for the various biocontainment facilities.

Additionally, the regulation cited first in the comment, 40 C.F.R. § 1508.18(b)(3), says nothing about programmatic EISs; this regulation simply lists types of Federal actions. The other regulation cited in this comment, 40 C.F.R.§ 1502.4(c)(3), is not applicable to the NIH's decision to prepare a separate EIS assessing the environmental impact of partially funding a National Biocontainment Laboratory at Boston University. The decision to fund the proposed Boston-NBL has not reached "a stage of investment or commitment to implementation likely to determine subsequent development or restrict later alternatives". 40 C.F.R. § 1502.4(c)(3). The NIH's decision to partly fund the proposed Boston-NBL remains subject to the completion of the NIH's NEPA review for the project and the selection of a course of action in the NIH's ROD.

4.2 Any decision by NIH to partly fund the proposed Boston-NBL remains subject to the completion of the NIH's NEPA review for the project and the selection of a course of action in the NIH's ROD.



private party, the CEQ regulations direct agencies to begin NEPA documents "no later than immediately after the application is received." 40 CFR § 1502.5(b). NIH did not immediately commence the NEPA process after receiving BU's application in February of 2003. Instead, NIH decided to fund NBL construction on a site in Boston, and chose BU to build the NBL on that site, before drafting an EIS. NIH failed to analyze the potential adverse environmental impacts and reasonable alternatives. Consequently, NIH's failure to draft an EIS violated NEPA, and the completion of NIH's current process would constitute a mere justification for having already committed funding for the laboratory construction.

4.3 A clear example of NIH's failure to follow NEPA requirements is its description in the SDEIS, at 1-9, that the proposed action is "to partially fund the construction of the Boston-NBL at the BioSquare Research Park in Boston, Massachusetts." The purpose of the SDEIS should have been to determine how to structure NIAID's program of grants to fund the construction of NBLs and RBLs around the country, and its funding of the so-called Regional Centers of Excellence, to minimize the potential environmental impacts and then to compare the environmental impacts of the potential NBL and RBL locations based on the acceptable applications it received. By limiting the SDEIS to a review of the BioSquare location, NIH fails to provide the NEPA mandated determinations and comparisons.

The SDEIS, at 1-9, incorrectly claims that NEPA does not require the preparation of a programmatic EIS for the overall NBL and RBL program because each project represents an independent undertaking located in geographically dispersed areas with no common cumulative impacts. Instead, the proposed laboratory in Boston is part of an integrated biodefense research agenda that includes two NBLs, more than one dozen Regional Biocontainment Laboratories (RBLs), numerous Regional Centers of Excellence (RCEs), an expansion NIH's own soon to be BSL4 laboratory in Hamilton, Montana, and a great increase in funding of research on select agents that could potentially be used in bioterrorism. The SDEIS states as much when it notes, at 2-40, that the NBL will support the research of the RCEs, and at 2-43, that those applying for funding for an NBL have linkages with the institutions applying for RCE grant awards.

4.4 Based on the above NEPA violations by NIH, we call upon NIH to retract its decision to fund BU to construct an NBL near Boston Medical Center. NIH should begin the NEPA process by drafting a Programmatic EIS for its biodefense research agenda.

II. THE ENVIRONMENTAL JUSTICE ANALYSIS IS FLAWED AND DEFICIENT

The Environmental Justice analysis in the SDEIS describes a larger geographic area than did the DEIS, but otherwise contains the same deficiencies found in the SDEIS. Thus, we begin by including our comments on the DEIS and then make some additional comments relating to the Environmental Justice analysis in the SDEIS.

4.5 The environmental justice analysis contained in the DEIS is flawed and deficient in several significant respects: (1) it substantially undercounts the minority population of the community surrounding the proposed lab; (2) it consistently understates the potential environmental impacts of the lab on the surrounding community; and (3) it fails to take account of the disproportionate health and

3

LETTER 4

Alternatives for Community and Environment

4.3 The EIS for the proposed Boston-NBL addresses and analyzes fully the potential environmental impacts of any decision by the NIH to partially fund the construction of the building. The proposed Boston-NBL project is clearly an action distinct from the other proposed biocontainment facilities referenced in the comment. This comment appears to request the preparation of a Programmatic EIS for the various biocontainment projects being either partly funded by the NIH or considered for partial funding by the NIH. A Programmatic EIS for these facilities is not necessary to assess the potential environmental impacts of the various biocontainment facilities proposed to be either constructed by the NIH itself or partly funded by the NIH, including the proposed Boston-NBL. The various proposed biocontainment facility projects are not located in the same geographic region, and the proposed projects' potential impacts are neither synergistic nor cumulative. The various projects are not so interrelated or connected that their possible environmental impacts cannot be considered independently. Moreover, the NIH's approval of one project does not commit the agency to approve the other projects. As required by NEPA, the NIH is conducting an environmental review for the various biocontainment facilities. See Section 1.8 of the FEIS.

4.4 A Programmatic Environmental Impact Statement is not necessary to assess the potential environmental impacts of the various biocontainment facilities proposed to be either constructed by the NIH itself or partly funded by the NIH. The various proposed biocontainment facility projects are not located in the same geographic region, and the proposed projects' potential impacts are neither synergistic nor cumulative. The various projects are not so interrelated or connected that their possible environmental impacts cannot be considered independently. Moreover, the NIH's approval of one project does not commit the agency to approve the other projects. As required by NEPA, the NIH is conducting an environmental review for the various biocontainment facilities. The

4.5

environmental burdens that are already being borne by the surrounding community.

While acknowledging in section 3.4 that the community surrounding the proposed lab meets federal criteria for an area of environmental justice concern, the DEIS significantly undercounts the minority population of that community. The DEIS defines the relevant community as consisting of two census tracts, numbered 711 and 712, which have minority populations of 31.5% and 42.5% respectively. A much more realistic assessment, that takes account of the significant minority neighborhood of Roxbury immediately to the south of the laboratory, would incorporate all the census tracts around tracts 711 and 712. This would include tracts 801, 804, and 805 to the south as well as tracts 704, 705 and 712 to the north and east. The total population of this larger area is 23,747, of which the minority population (not including Latinos/Hispanics) is 14,794 or 62.3%.

Moreover, the DEIS utilizes census data that does not include a category for Latinos/Hispanics, although such data is available from the Census Bureau. If Latinos/Hispanics are considered, the minority population of census tract 711 is 54.5% and the minority population of census tract 712 is 64.4%. Considering all of the surrounding census tracts, which as noted above is a far more accurate portrayal of the community's demographics, the minority population of the community surrounding the proposed lab is 68.4%.

The DEIS also significantly understates the environmental burdens posed by the proposed lab to the surrounding community. The DEIS bases its assessment of the environmental justice burden on a single worst-case scenario for the release of aerosolized anthrax spores, and then concludes that there is no burden. Putting aside the deficiencies in that analysis (discussed later in these comments), there are other obvious risks posed by bringing highly infectious substances into a densely populated area. These include the risks posed by other infectious agents (besides anthrax), some of which do not even exist today and whose risks to health and the environment are not known. There are also risks posed by the transportation of infectious agents to the proposed lab through densely populated neighborhood streets, and a potential escape of an infected animal or insect from the lab. While there may, to date, be no reported history of releases of infectious substances while they are being transported, there is a long history of accidental releases of conventional hazardous substances during the course of transportation and at least one recent incident of an escape of a laboratory animal. Environmental impact statements are expected to assume there *will* be such releases and to weigh the environmental effect of such releases on the surrounding community. The DEIS is deficient because it assumes there will be no such releases and then wishfully concludes that this assumption is all that must be considered.

The DEIS is also deficient because it fails to consider the disproportionate burden on health and the environment that is already being borne by the surrounding

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environmental reviews for several of these actions have already been completed, including those for a National Biocontainment Laboratory at the University of Texas Medical Branch in Galveston, Texas, and for two Integrated Research Facilities at which intramural NIH research will be conducted.

4.5 Information provided in the SDEIS was based on the most current, available US Census data on population and income. As described in Section 4.4.1.1, the SDEIS showed that the facility poses no significant environmental or public health impacts. There is no disproportionate impact on minorities due to the fact that the analysis of the potential effects indicates that the project is not a dangerous undertaking.

community. Section 4.4.1 of the DEIS blithely states that "the neighborhood is not an area that currently has a disproportionate number of undesirable land uses." That is simply untrue. Roxbury, the area immediately to the south of the proposed lab, has a disproportionate number of environmentally hazardous sites and facilities. According to a statewide study by Professors Daniel Faber and Eric Krieg, Roxbury is the eighth most intensively overburdened community in Massachusetts, when one takes account of the number of hazardous waste sites, trash transfer stations, polluting industrial facilities, power plants, and incinerators per square mile in the area. *See* D. Faber & E. Krieg, *Unequal Exposure to Ecological Hazards* 36 (Northeastern University 2001). Roxbury has ten times the average number of environmental burdens per square mile as the average Massachusetts community. *Id.* For example, according to current statistics maintained by the Massachusetts Department of Environmental Protection, the area has 269 listed hazardous waste sites.

Likewise, Roxbury already bears a disproportionate public health burden. According to data collected by the Boston Public Health Commission, Roxbury has the highest hospitalization rate of all the communities in Boston – 209.9 hospitalizations per 1,000 population, which is more than 50% more than the city as a whole. It has the highest rate of hospitalization for asthma in the city – 14.6 asthma hospitalizations per 1,000, which is 64% higher than the city as a whole and over four times the rate for several Boston neighborhoods. Roxbury also has the third highest number of emergency room visits – 10.3%, as compared to 2.0% for Charlestown and 2.7% for West Roxbury (both predominantly white communities). *See* www.bphc.org./reports/pdfs/report_188.

All of these statistics are, regrettably, consistent with the disproportionate environmental and health burden borne by minorities in Massachusetts. Communities of color have more than four times the number of hazardous waste sites and nearly the five times the volume of industrial chemical emissions as predominantly white communities (communities that are over 95% white). *See* Faber & Krieg, at 25. Similarly, African Americans and Hispanics are far more likely than whites to suffer from health conditions such as diabetes, high blood pressure, hypertension or asthma. *See* Massachusetts Department of Public Health, Minority Health Status Indicator Risk Ratios, www.mass.gov/dph/bhsre/resdep/hisp/99/ hsi99.pdf.

Despite Boston University's aggressive public relations' claims, the proposed lab would do nothing to address any of these public health problems. Instead, the lab would simply add to the disproportionate burdens already being borne by the predominantly minority community where it would be built. The DEIS does not consider these existing burdens at all; it falsely claims that they do not exist. The FEIS must contain a redone environmental justice analysis that is consistent with the actual composition of the surrounding community and that recognizes the additional burden that the laboratory will place on that community.

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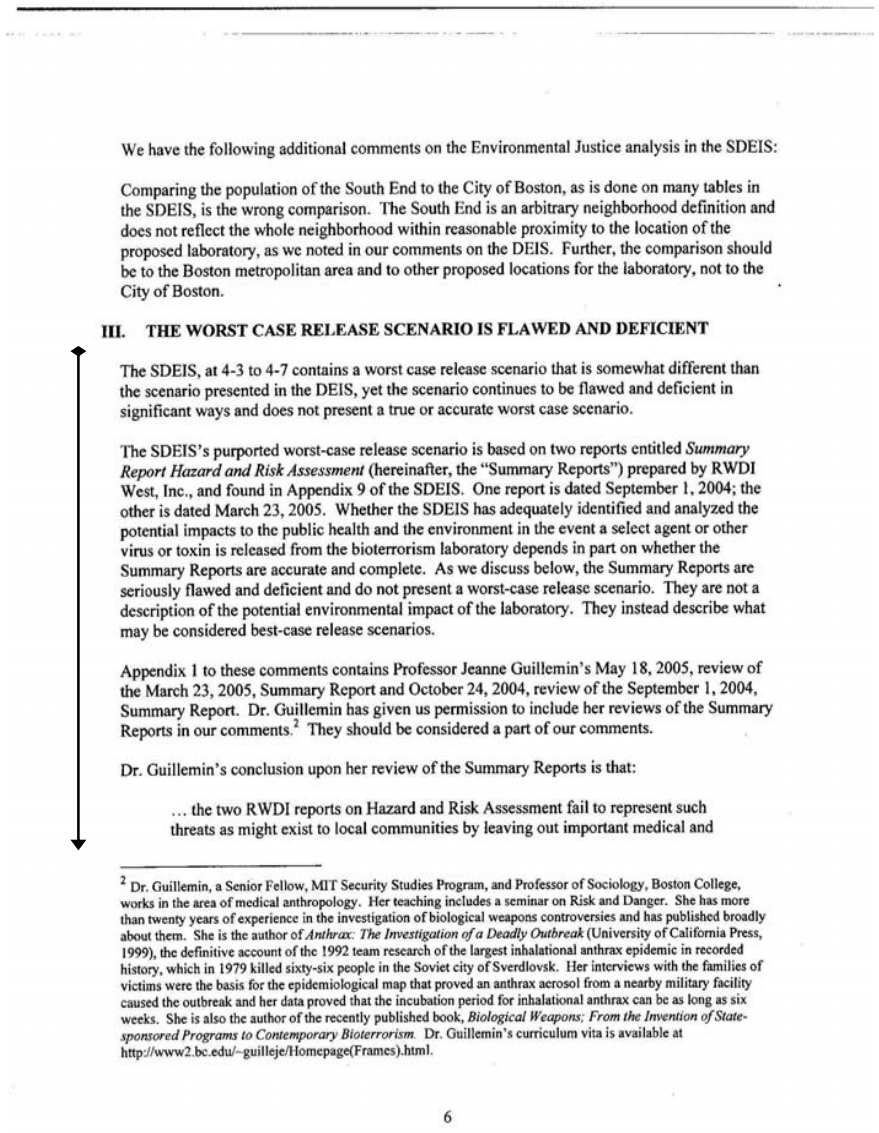

We have the following additional comments on the Environmental Justice analysis in the SDEIS:

Comparing the population of the South End to the City of Boston, as is done on many tables in the SDEIS, is the wrong comparison. The South End is an arbitrary neighborhood definition and does not reflect the whole neighborhood within reasonable proximity to the location of the proposed laboratory, as we noted in our comments on the DEIS. Further, the comparison should be to the Boston metropolitan area and to other proposed locations for the laboratory, not to the City of Boston.

III. THE WORST CASE RELEASE SCENARIO IS FLAWED AND DEFICIENT

The SDEIS, at 4-3 to 4-7 contains a worst case release scenario that is somewhat different than the scenario presented in the DEIS, yet the scenario continues to be flawed and deficient in significant ways and does not present a true or accurate worst case scenario.

4.6

The SDEIS's purported worst-case release scenario is based on two reports entitled *Summary Report Hazard and Risk Assessment* (hereinafter, the "Summary Reports") prepared by RWDI West, Inc., and found in Appendix 9 of the SDEIS. One report is dated September 1, 2004; the other is dated March 23, 2005. Whether the SDEIS 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 in part on whether the Summary Reports are accurate and complete. As we discuss below, the Summary Reports are seriously flawed and deficient and do not present a worst-case release scenario. They are not a description of the potential environmental impact of the laboratory. They instead describe what may be considered best-case release scenarios.

Appendix 1 to these comments contains Professor Jeanne Guillemin's May 18, 2005, review of the March 23, 2005, Summary Report and October 24, 2004, review of the September 1, 2004, Summary Report. Dr. Guillemin has given us permission to include her reviews of the Summary Reports in our comments.[2] They should be considered a part of our comments.

Dr. Guillemin's conclusion upon her review of the Summary Reports is that:

> ... the two RWDI reports on Hazard and Risk Assessment fail to represent such threats as might exist to local communities by leaving out important medical and

[2] 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 1992 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 recently published 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.

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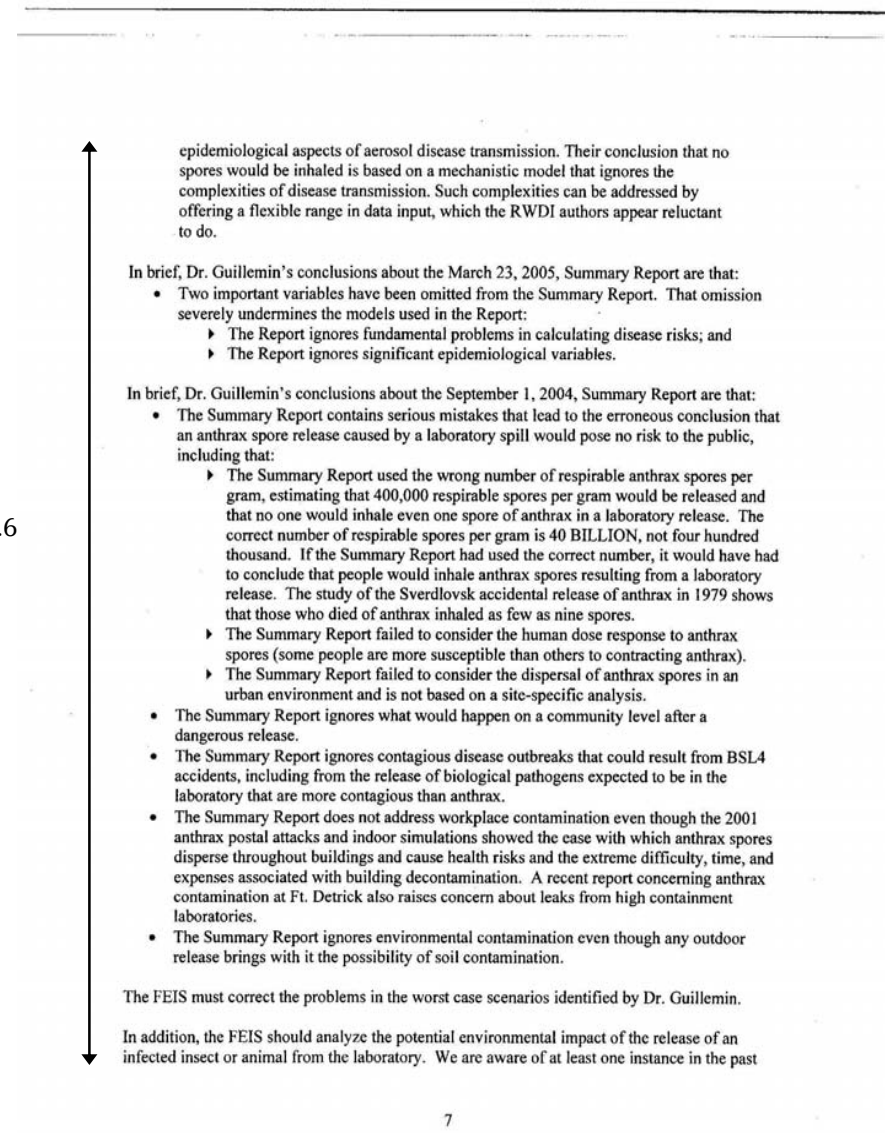
4.6 An additional exposure modeling strategy was applied to the proposed Boston University site. The "Maximum Possible Risk" or MPR model was developed by the NIH with the input of concerned citizen advocates. The model was developed using information from the CDC report entitled *Public Health Assessment of Potential Biological Terrorism Agents*; utilizing "weight of evidence" or WOE methodology and conservative estimates at each decision point; and was based on laboratory data generated in simulated "drop" studies. The report containing the modeling data and results can be found in Appendix 12. The MPR model uses a highly conservative, aerosol-delivered dose to estimate risk to individuals who inhabit space, walk or reside in areas surrounding the proposed BU site. Based on work done by Brachman and co-workers (Brachman, et al.1966) a conservative estimate of 500 spores over an 8-hr period was utilized as the pathogenic dose in the MPR model. The MPR model utilized 15 scenarios and was flexibly applied across the urban environment surrounding the site. In the MPR model, simplifying assumptions are made that are more unfavorable than analogous "credible" assumptions. The MPR model assumes that the spores, once released, disperse in simple but restrictive geometric patterns. In reality, spores released in the scenarios would disperse in a far more complex pattern (impacted by wind-speed, direction, environmental condition, etc.) resulting in significant dilution. The simple MPR model represents the concentrated eddy situation, thereby representing a maximized, though highly unlikely, risk. This approach makes calculations easier to understand by eliminating complex turbulence/dispersion models. It gives extra confidence that the actual risks to the community are less than the calculated risks presented in the analysis.

With regard to environmental contamination of soil, Turnbull and co-workers conducted tests for airborne movement of anthrax spores down wind from three heavily contaminated carcass sites (soil) under a variety of wind conditions (Turnbull 1998). Studies of the relationship between a contaminated site and the risks of humans or animals contracting pulmonary anthrax from that site show that even with highly



epidemiological aspects of aerosol disease transmission. Their conclusion that no spores would be inhaled is based on a mechanistic model that ignores the complexities of disease transmission. Such complexities can be addressed by offering a flexible range in data input, which the RWDI authors appear reluctant to do.

In brief, Dr. Guillemin's conclusions about the March 23, 2005, Summary Report are that:

- Two important variables have been omitted from the Summary Report. That omission severely undermines the models used in the Report:
  - The Report ignores fundamental problems in calculating disease risks; and
  - The Report ignores significant epidemiological variables.

In brief, Dr. Guillemin's conclusions about the September 1, 2004, 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, including that:
  - The Summary Report used the wrong number of respirable anthrax spores per gram, estimating that 400,000 respirable spores per gram would be released and that no one would inhale even one spore of anthrax in a laboratory release. The correct number of respirable spores per gram is 40 BILLION, not four hundred thousand. If the Summary Report had used the correct number, it would have had to conclude that people would inhale anthrax spores resulting from a laboratory release. The study of the Sverdlovsk accidental release of anthrax in 1979 shows that those who died of anthrax inhaled as few as nine spores.
  - The Summary Report failed to consider the human dose response to anthrax spores (some people are more susceptible than others to contracting anthrax).
  - The Summary Report failed to consider the dispersal of anthrax spores in an urban environment and is not based on a site-specific analysis.
- 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, including from the release of biological pathogens expected to be in the laboratory that are more contagious than anthrax.
- 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.

The FEIS must correct the problems in the worst case scenarios identified by Dr. Guillemin.

In addition, the FEIS should analyze the potential environmental impact of the release of an infected insect or animal from the laboratory. We are aware of at least one instance in the past

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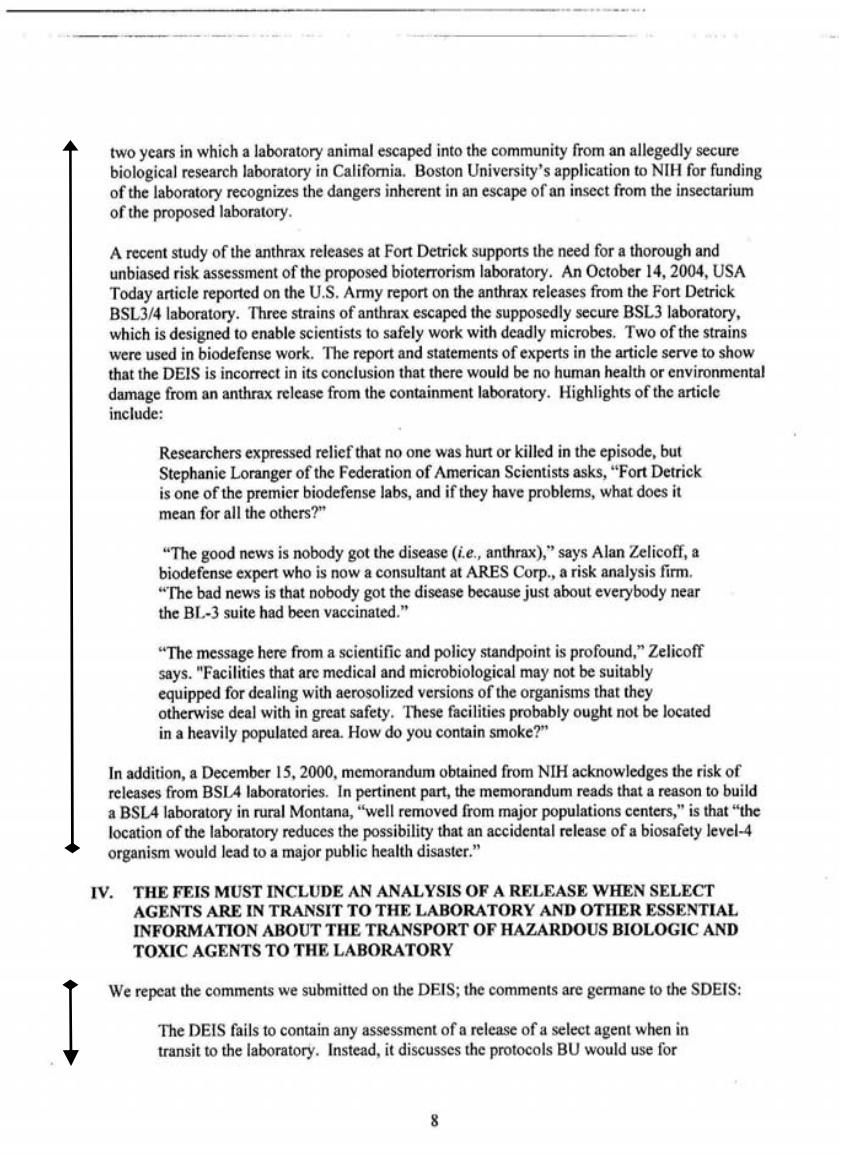
contaminated soil sites, the risks are very low. The small number of spores released to the environment in highly conservative MPR modeling scenarios would remain airborne over long distances and times. The likelihood of significant soil contamination would be extremely small resulting in no human exposures at a pathogenic level (aerogenic or cutaneous).



two years in which a laboratory animal escaped into the community from an allegedly secure biological research laboratory in California. Boston University's application to NIH for funding of the laboratory recognizes the dangers inherent in an escape of an insect from the insectarium of the proposed laboratory.

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. An October 14, 2004, USA Today article reported 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 DEIS 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:

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> 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?"

In addition, a December 15, 2000, memorandum obtained from NIH 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."

IV. THE FEIS MUST 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

We repeat the comments we submitted on the DEIS; the comments are germane to the SDEIS:

4.7

> The DEIS fails to contain any assessment of a release of a select agent when in transit to the laboratory. Instead, it discusses the protocols BU would use for

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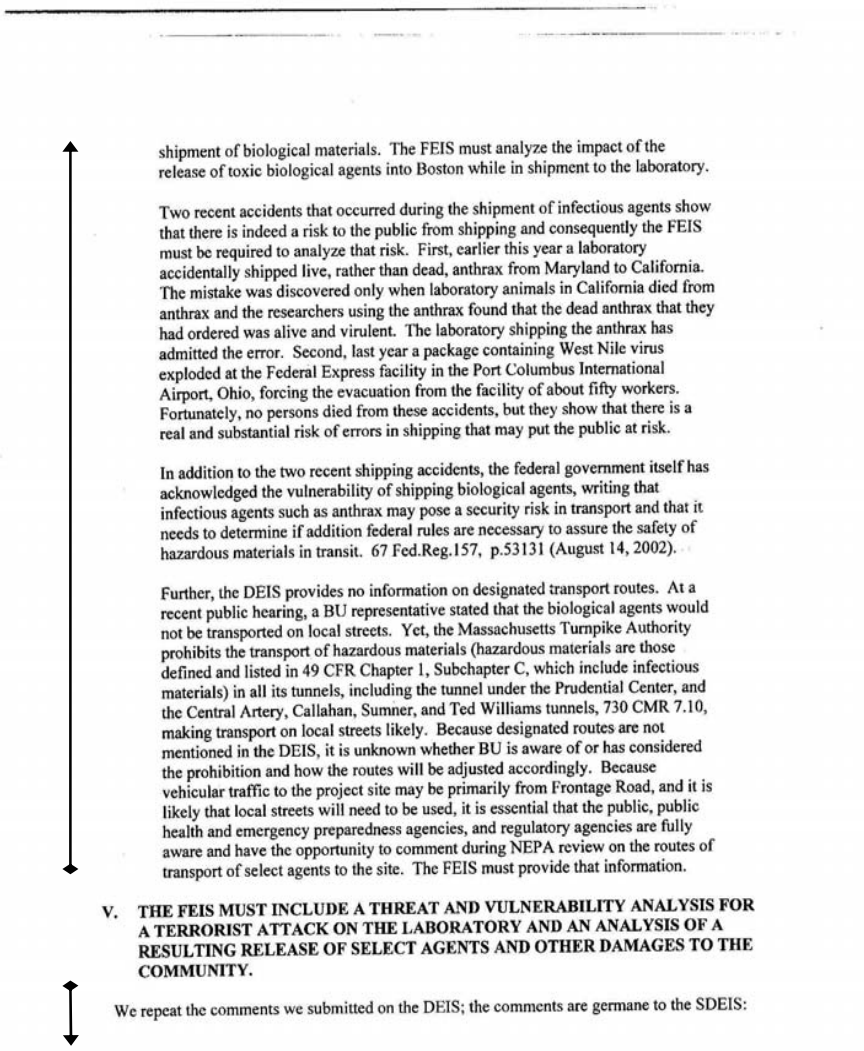
4.7 For security reasons, the specific routes to be utilized would not be identified. However, transportation of select agents to and from the Boston-NBL would be managed in accordance with all applicable local, state and federal regulations and guidelines and BUMC policy. These regulations and policies address appropriate notification, packaging, routing, and delivery protocols including delivery personnel screening, predetermination of routes, date and time of travel and delivery, and GPS monitoring to allow for vehicle tracking and response to incidents during travel time. See Appendix 7, High Hazard Material Management Policy. The requirements set forth for the proper packaging and shipping of select agents are inherently designed to make the shipment of these agents safe. After reviewing the DOT required packaging and the limited quantity of agent that would be shipped, it is expected that a vehicular accident would present a lesser potential exposure than that described in the worst-case scenario.



shipment of biological materials. The FEIS must analyze the impact of the release of toxic biological agents into Boston while in shipment to the laboratory.

Two recent accidents that occurred during the shipment of infectious agents show that there is indeed a risk to the public from shipping and consequently the FEIS 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.

4.7

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 addition federal rules are necessary to assure the safety of hazardous materials in transit. 67 Fed.Reg.157, p.53131 (August 14, 2002).

Further, the DEIS provides no information on designated transport routes. At a recent public hearing, a BU representative stated that the biological agents would not be transported on local streets. Yet, the Massachusetts Turnpike Authority prohibits the transport of hazardous materials (hazardous materials are those defined and listed in 49 CFR Chapter 1, Subchapter C, which include infectious 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, making transport on local streets likely. Because designated routes are not mentioned in the DEIS, it is unknown whether BU 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, and it is likely that local streets will need to be used, it is essential that the public, public health and emergency preparedness agencies, and regulatory agencies are fully aware and have the opportunity to comment during NEPA review on the routes of transport of select agents to the site. The FEIS must provide that information.

V. THE FEIS MUST 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 COMMUNITY.

4.8

We repeat the comments we submitted on the DEIS; the comments are germane to the SDEIS:

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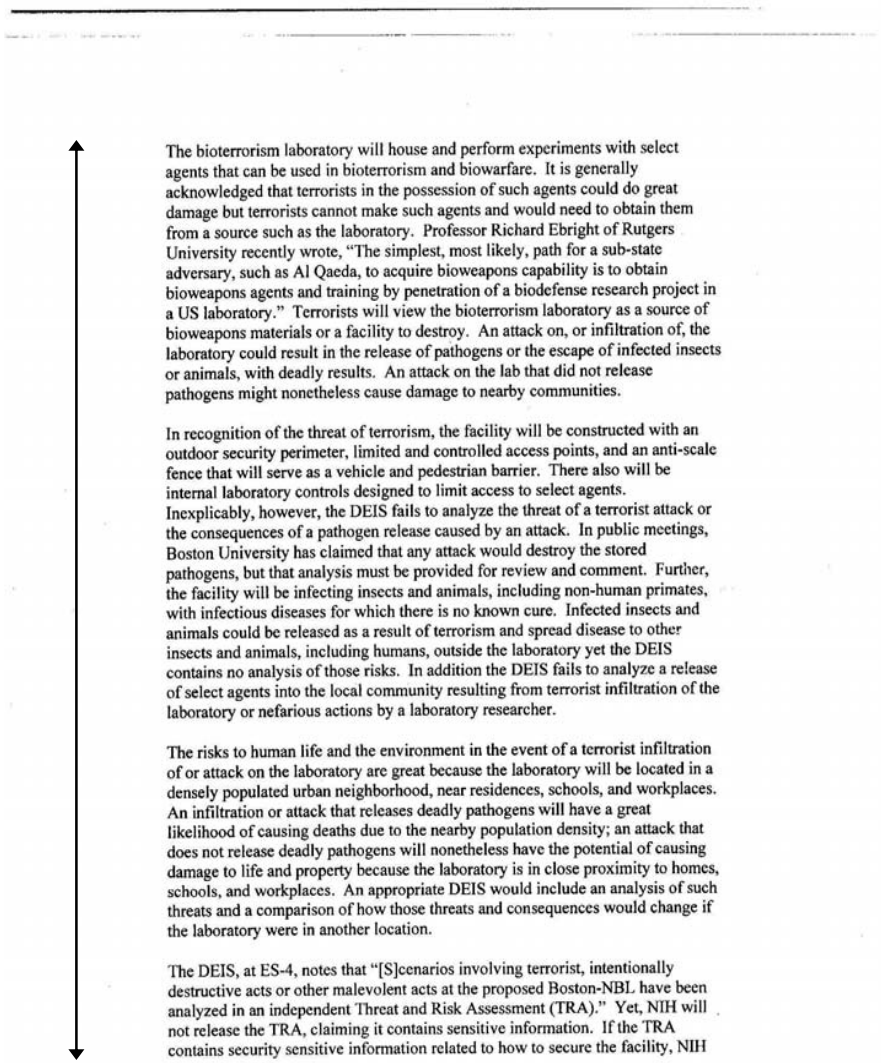
4.8 A Threat and Vulnerability Analysis has been prepared for the proposed Boston-NBL facility. The document includes analysis and countermeasures, both overt and covert, to mitigate potential threats. Due to security concerns, this information will not be released to the public. However, an executive summary of the report can be found in Appendix 11.



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. Professor 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.

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 DEIS fails to analyze the threat of a terrorist attack or the consequences of a pathogen release caused by an attack. In public meetings, Boston University has claimed that any attack would destroy the stored pathogens, but that analysis must be provided for review and comment. Further, 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 DEIS contains no analysis of those risks. In addition the DEIS fails to analyze a release of select agents into the local community resulting from terrorist infiltration of the laboratory or nefarious actions by a laboratory researcher.

The risks to human life and the environment in the event of a terrorist infiltration of or attack on the laboratory are great because the laboratory will be located in a densely populated urban neighborhood, near residences, schools, and workplaces. An infiltration or attack that releases deadly pathogens will have a great likelihood of causing deaths due to the nearby population density; an attack that does not release deadly pathogens will nonetheless have the potential of causing damage to life and property because the laboratory is in close proximity to homes, schools, and workplaces. An appropriate DEIS would include an analysis of such threats and a comparison of how those threats and consequences would change if the laboratory were in another location.

The DEIS, at ES-4, notes that "[S]cenarios involving terrorist, intentionally destructive acts or other malevolent acts at the proposed Boston-NBL have been analyzed in an independent Threat and Risk Assessment (TRA)." Yet, NIH will not release the TRA, claiming it contains sensitive information. If the TRA contains security sensitive information related to how to secure the facility, NIH

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4.8

should delete that portion of the TRA and release a redacted TRA. NIH must release the TRA so that there can be public review and comment on the potential impact of malevolent acts on the laboratory and how that impact might be mitigated by changes in the design or location of the facility. For example, would siting the laboratory in a more secure location, not near a major thoroughfare, not on a highly used city street, and not near an area of helicopter overflights, make a terrorist strike less likely to occur or succeed? Would siting the laboratory in a less populated location mitigate the potential impact of a malevolent act? NIH's failure to release the TRA undermines the goal and requirement of NEPA that there be a full and fair review of the potential impacts of the laboratory.

VI. THE FEIS MUST INCLUDE AN ANALYSIS OF ALTERNATIVE LOCATIONS FOR THE LABORATORY

The SDEIS does not include a detailed analysis of alternative locations for the laboratory. Instead it briefly discusses and dismisses alternative locations owned by Boston University. Our comments on the DEIS were that NEPA requires a detailed analysis of various alternative locations, not only other locations owned by Boston University. The SDEIS does not consider or discuss any of the comments we made on the DEIS. Thus, we begin by including our comments on the DEIS; they are germane to the SDEIS. Then we make comments relating to the alternatives analysis discussion in the SDEIS.

4.9

Our comments on the DEIS were as follows:

The DEIS analyzed a no build alternative, but failed to analyze alternative locations outside of Massachusetts or in less densely populated areas within Massachusetts, including on current and former military bases. NIH notes that it failed to analyze other alternative locations because NIAID's objective is to fund construction of the laboratory at BioSquare and alternative locations would not meet that objective. NIH predicates its decision on its determination that the BioSquare location is a "unique setting."

NIH's rationale for not studying alternative locations for the laboratory is deeply flawed and inconsistent with NEPA. First, as we noted in Section I., above, NEPA mandates that NIH start the process with a programmatic EIS. NEPA does not allow NIH to choose a laboratory location and then limit its NEPA review to options for that location, based on the justification it used to choose the location.

Second, as we noted in Section V, above, the impact of a release due to terrorism or other malevolent acts might be mitigated or eliminated if the laboratory were located in a more secure or less densely populated location. It is incumbent on NIH to analyze other locations for the laboratory and to compare the impact of terrorism and other malevolent acts at each location.

Third, NIH must compare the Boston University proposal for the BioSquare location to each of the other NBL applications that it received. That analysis

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4.9 The SDEIS was a new document that incorporated the DEIS into it. All comments received during the DEIS comment period were used as scoping comments in the preparation of the SDEIS.

would include the ranking of each applicant, a discussion of the advantages and disadvantages of each location, and whether the potential environmental impacts differ from one location to another. The BioSquare location may be a "unique setting," with some specific advantages, but it also has significant disadvantages due to its urban location. Other applicants likely provide unique advantages and disadvantages also, and perhaps there would be less environmental impact at another location. To comply with NEPA, the FEIS must include such comparison.

Fourth, NIH should compare the Boston University proposal for the BioSquare location to an expansion of the laboratories at existing BSL4 locations as well as the Rocky Mountain Laboratories location. Each of those locations is also a "unique setting where established teams of researchers already work side-by-side on medical research." DEIS at 2-32. Thus, as similarly unique settings, a comparison of environmental impacts is appropriate and consistent with NIH's rationale for choosing the BioSquare location.

Fifth, locations within an hour's drive of Boston, including some current and former military bases, would meet NIH's rationale for choosing the BioSquare location and should be analyzed as alternative locations. Those locations are easily accessible to local teams of researchers. Some of those researchers live closer to those locations than they do to BioSquare. Those other locations have the advantages of higher levels of security and lower population densities than BioSquare. There may be less of an environmental impact and more economic benefit in locating the laboratory at one of those locations.[3]

Sixth, as discussed in Section VII, below, Boston regulations prohibit recombinant DNA use that requires BSL4 containment. NIH appears to have failed to determine the effect of the Boston regulation on the BioSquare location or to determine whether other locations would be more advantageous without such prohibition.

We have the following additional comments on the SDEIS discussion of alternative locations. The SDEIS states (ES-2) that the purpose

> is to provide a highly contained and secure laboratory dedicated to studying emerging and re-emerging infectious diseases, many of which have potential as bioterrorism agents.

Section 1.3, entitled *Purpose and Need for Action*, does **not** define the purpose and need for the project (which is the construction of the NBL in Boston). Instead, it states that:

[3] The DEIS, at 2-33, claims that the worst case scenario shows that locating the laboratory in a lower density area would not reduce the risk to the public. As we explain in Section III, the worst case scenario is deeply flawed. A correct analysis would show that locating the laboratory in a lower density area would reduce the risk.

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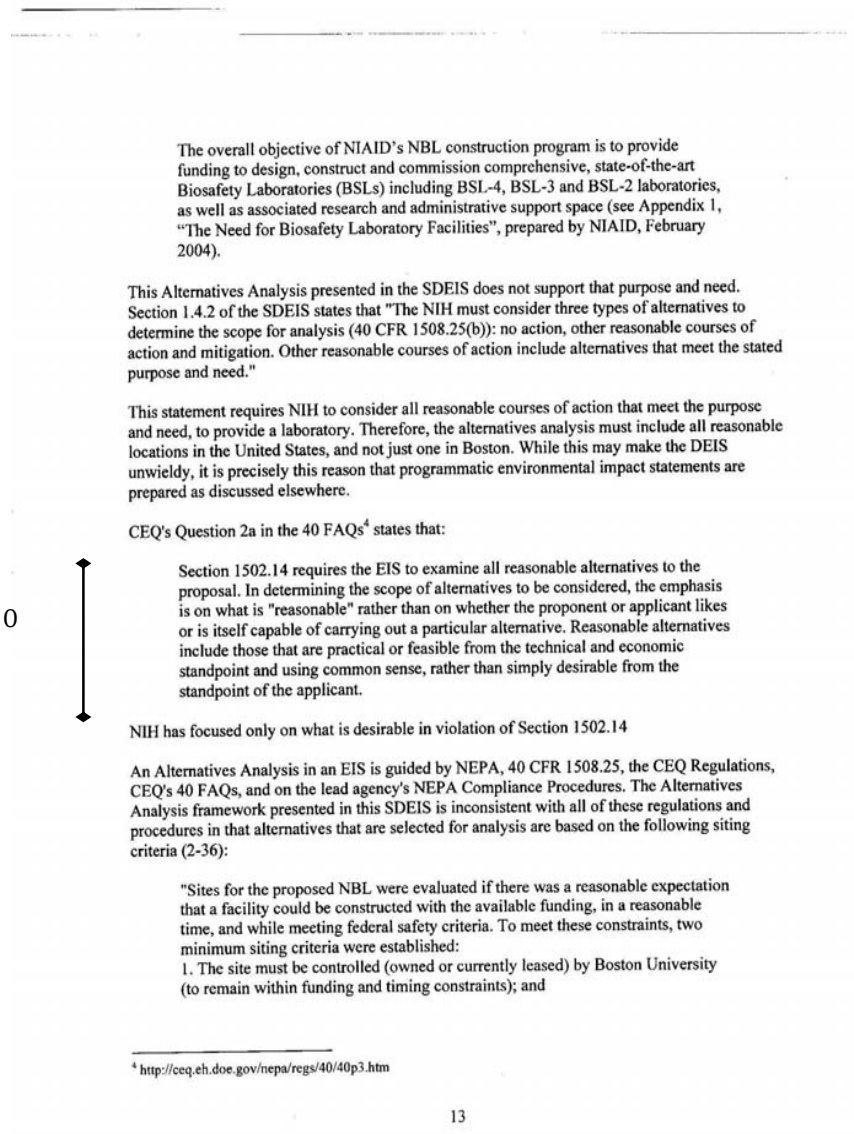

> The overall objective of NIAID's NBL construction program is to provide funding to design, construct and commission comprehensive, state-of-the-art Biosafety Laboratories (BSLs) including BSL-4, BSL-3 and BSL-2 laboratories, as well as associated research and administrative support space (see Appendix 1, "The Need for Biosafety Laboratory Facilities", prepared by NIAID, February 2004).

This Alternatives Analysis presented in the SDEIS does not support that purpose and need. Section 1.4.2 of the SDEIS states that "The NIH must consider three types of alternatives to determine the scope for analysis (40 CFR 1508.25(b)): no action, other reasonable courses of action and mitigation. Other reasonable courses of action include alternatives that meet the stated purpose and need."

This statement requires NIH to consider all reasonable courses of action that meet the purpose and need, to provide a laboratory. Therefore, the alternatives analysis must include all reasonable locations in the United States, and not just one in Boston. While this may make the DEIS unwieldy, it is precisely this reason that programmatic environmental impact statements are prepared as discussed elsewhere.

CEQ's Question 2a in the 40 FAQs[4] states that:

> Section 1502.14 requires the EIS to examine all reasonable alternatives to the proposal. In determining the scope of alternatives to be considered, the emphasis is on what is "reasonable" rather than on whether the proponent or applicant likes or is itself capable of carrying out a particular alternative. Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.

4.10

NIH has focused only on what is desirable in violation of Section 1502.14

An Alternatives Analysis in an EIS is guided by NEPA, 40 CFR 1508.25, the CEQ Regulations, CEQ's 40 FAQs, and on the lead agency's NEPA Compliance Procedures. The Alternatives Analysis framework presented in this SDEIS is inconsistent with all of these regulations and procedures in that alternatives that are selected for analysis are based on the following siting criteria (2-36):

> "Sites for the proposed NBL were evaluated if there was a reasonable expectation that a facility could be constructed with the available funding, in a reasonable time, and while meeting federal safety criteria. To meet these constraints, two minimum siting criteria were established:
> 1. The site must be controlled (owned or currently leased) by Boston University (to remain within funding and timing constraints); and

[4] http://ceq.eh.doe.gov/nepa/regs/40/40p3.htm

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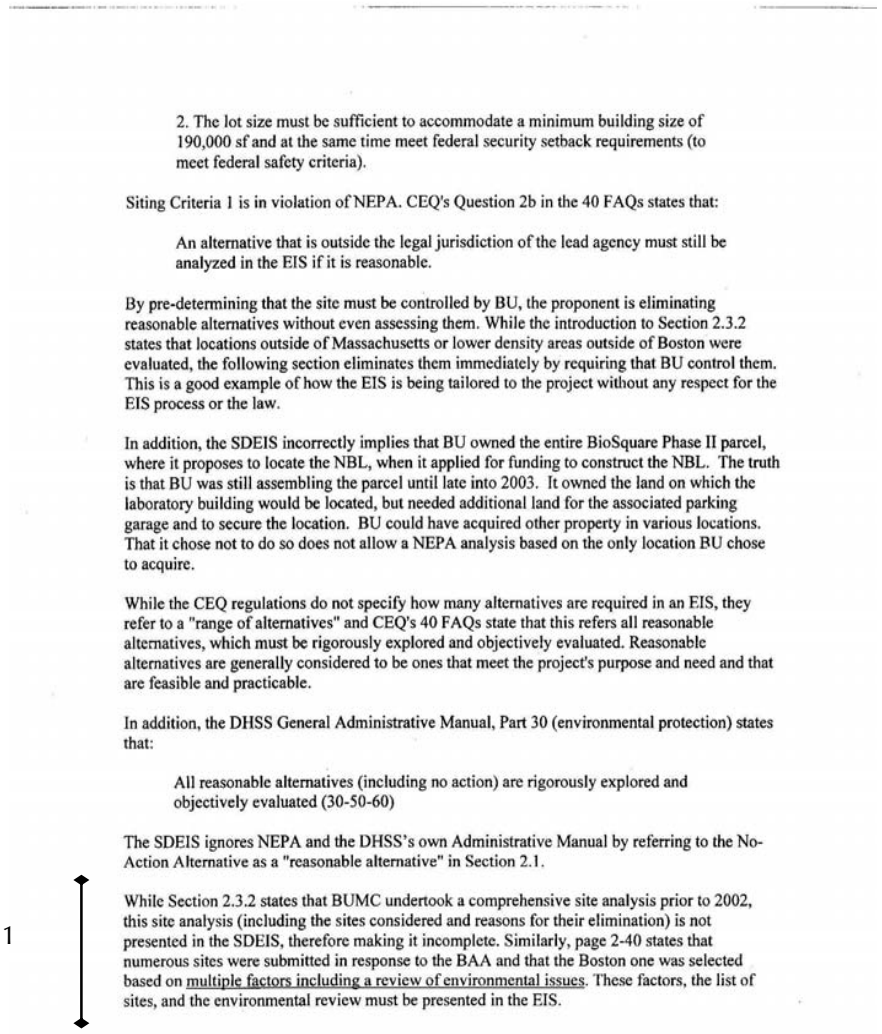
4.10 As required under the NEPA regulations, the FEIS includes an analysis of alternatives to the Proposed Action, which is to partially fund the construction of the Boston-NBL facility at the BioSquare Research Park. The alternative analyzed is the No Action Alternative. As noted, Section 2.3 includes a summary of an alternative siting analysis undertaken by BUMC prior to making its decision to site the proposed NBL facility at the BioSquare site. As described in Section 2.3.2, the distance of the Tyngsborough and Peterborough sites from the City of Boston were not the only determining factors in their removal from the universe of sites for location of the facility. Other factors include lack of infrastructure and medical trauma facilities; increased costs and lack of efficiencies gained by ability to use existing BSL-2 and BSL-3 laboratories at the BioSquare Research Park; and inefficiencies in personnel costs.



2. The lot size must be sufficient to accommodate a minimum building size of 190,000 sf and at the same time meet federal security setback requirements (to meet federal safety criteria).

Siting Criteria 1 is in violation of NEPA. CEQ's Question 2b in the 40 FAQs states that:

> An alternative that is outside the legal jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable.

By pre-determining that the site must be controlled by BU, the proponent is eliminating reasonable alternatives without even assessing them. While the introduction to Section 2.3.2 states that locations outside of Massachusetts or lower density areas outside of Boston were evaluated, the following section eliminates them immediately by requiring that BU control them. This is a good example of how the EIS is being tailored to the project without any respect for the EIS process or the law.

In addition, the SDEIS incorrectly implies that BU owned the entire BioSquare Phase II parcel, where it proposes to locate the NBL, when it applied for funding to construct the NBL. The truth is that BU was still assembling the parcel until late into 2003. It owned the land on which the laboratory building would be located, but needed additional land for the associated parking garage and to secure the location. BU could have acquired other property in various locations. That it chose not to do so does not allow a NEPA analysis based on the only location BU chose to acquire.

While the CEQ regulations do not specify how many alternatives are required in an EIS, they refer to a "range of alternatives" and CEQ's 40 FAQs state that this refers all reasonable alternatives, which must be rigorously explored and objectively evaluated. Reasonable alternatives are generally considered to be ones that meet the project's purpose and need and that are feasible and practicable.

In addition, the DHSS General Administrative Manual, Part 30 (environmental protection) states that:

> All reasonable alternatives (including no action) are rigorously explored and objectively evaluated (30-50-60)

The SDEIS ignores NEPA and the DHSS's own Administrative Manual by referring to the No-Action Alternative as a "reasonable alternative" in Section 2.1.

4.11 While Section 2.3.2 states that BUMC undertook a comprehensive site analysis prior to 2002, this site analysis (including the sites considered and reasons for their elimination) is not presented in the SDEIS, therefore making it incomplete. Similarly, page 2-40 states that numerous sites were submitted in response to the BAA and that the Boston one was selected based on multiple factors including a review of environmental issues. These factors, the list of sites, and the environmental review must be presented in the EIS.

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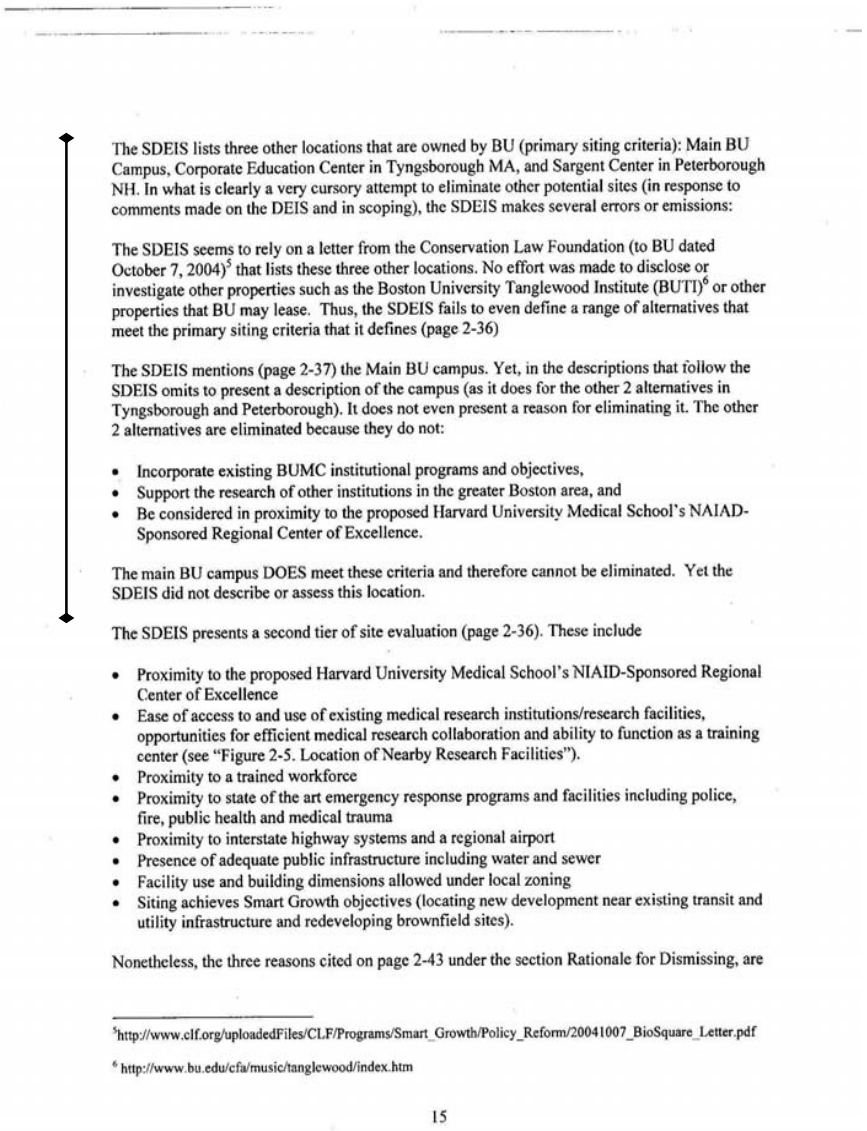
4.11 The EIS fully considers the reasonable alternatives to the proposed action and explains the reasons for eliminating other possible alternatives from further study. The preliminary site analysis performed by BU was similar to the analysis contained in the EIS. Section 2.3.2 of the EIS describes sites that were considered as alternative locations for the proposed NBL and the reasons for eliminating these sites from further study. The site analysis in section 2.3.2 of the EIS was prepared in order to determine whether any sites would be feasible for the proposed NBL. This analysis demonstrated that other sites considered were not feasible, and those sites were eliminated from further study. As described in Chapter 2, several factors were the basis for eliminating possible alternatives from further review, including the distance of the sites from the City of Boston, the lack of infrastructure and medical trauma facilities, increased costs and lack of efficiencies gained by ability to use existing BSL-2 and BSL-3 laboratories at the BioSquare Research Park, and inefficiencies in personnel costs. Additionally, a primary reason for rejecting other alternatives is that they failed to enable the NIH to satisfy the purpose and need of the proposed action.



The SDEIS lists three other locations that are owned by BU (primary siting criteria): Main BU Campus, Corporate Education Center in Tyngsborough MA, and Sargent Center in Peterborough NH. In what is clearly a very cursory attempt to eliminate other potential sites (in response to comments made on the DEIS and in scoping), the SDEIS makes several errors or emissions:

The SDEIS seems to rely on a letter from the Conservation Law Foundation (to BU dated October 7, 2004)[5] that lists these three other locations. No effort was made to disclose or investigate other properties such as the Boston University Tanglewood Institute (BUTI)[6] or other properties that BU may lease. Thus, the SDEIS fails to even define a range of alternatives that meet the primary siting criteria that it defines (page 2-36)

4.12

The SDEIS mentions (page 2-37) the Main BU campus. Yet, in the descriptions that follow the SDEIS omits to present a description of the campus (as it does for the other 2 alternatives in Tyngsborough and Peterborough). It does not even present a reason for eliminating it. The other 2 alternatives are eliminated because they do not:

- Incorporate existing BUMC institutional programs and objectives,
- Support the research of other institutions in the greater Boston area, and
- Be considered in proximity to the proposed Harvard University Medical School's NAIAD-Sponsored Regional Center of Excellence.

The main BU campus DOES meet these criteria and therefore cannot be eliminated. Yet the SDEIS did not describe or assess this location.

The SDEIS presents a second tier of site evaluation (page 2-36). These include

- Proximity to the proposed Harvard University Medical School's NIAID-Sponsored Regional Center of Excellence
- Ease of access to and use of existing medical research institutions/research facilities, opportunities for efficient medical research collaboration and ability to function as a training center (see "Figure 2-5. Location of Nearby Research Facilities").
- Proximity to a trained workforce
- Proximity to state of the art emergency response programs and facilities including police, fire, public health and medical trauma
- Proximity to interstate highway systems and a regional airport
- Presence of adequate public infrastructure including water and sewer
- Facility use and building dimensions allowed under local zoning
- Siting achieves Smart Growth objectives (locating new development near existing transit and utility infrastructure and redeveloping brownfield sites).

Nonetheless, the three reasons cited on page 2-43 under the section Rationale for Dismissing, are

[5] http://www.clf.org/uploadedFiles/CLF/Programs/Smart_Growth/Policy_Reform/20041007_BioSquare_Letter.pdf

[6] http://www.bu.edu/cfa/music/tanglewood/index.htm

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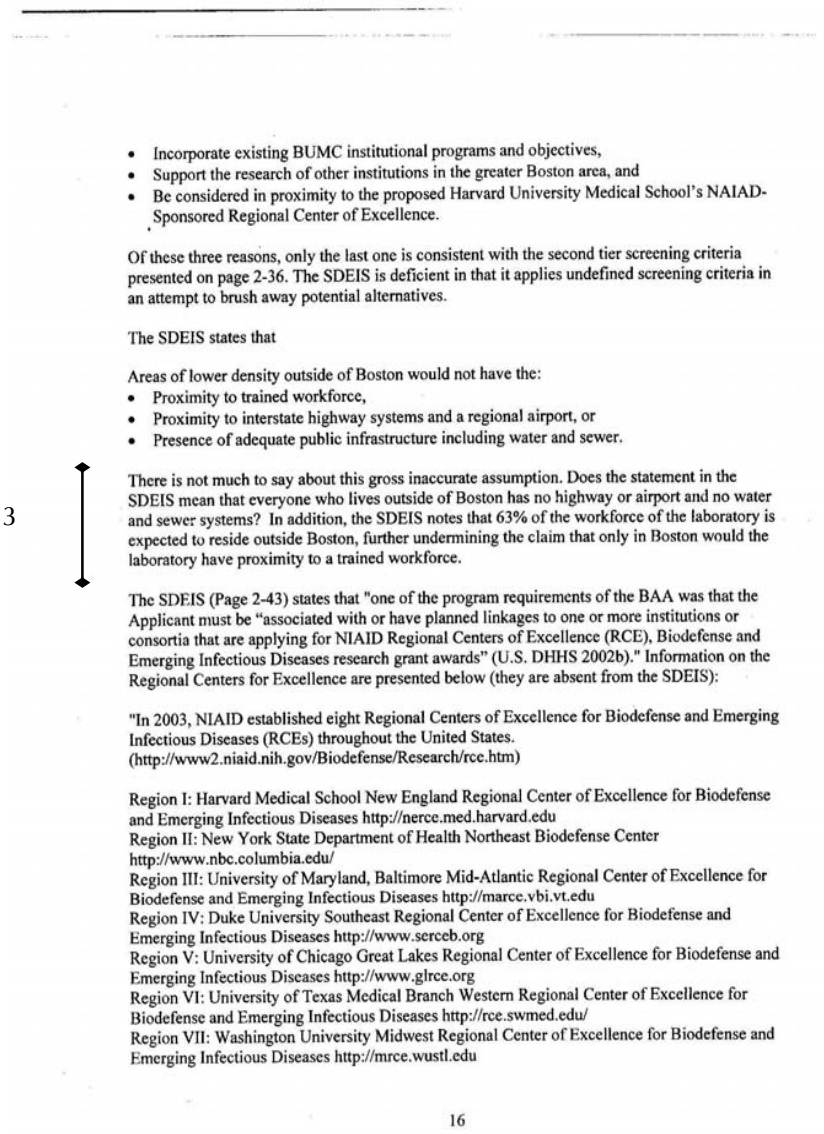
4.12 The public scoping process identified "alternative locations outside Massachusetts or lower density areas outside of Boston" as an alternative to be considered. Section 2.3.2 addresses alternative sites owned by Boston University outside of Boston. As the Boston University Charles River Campus is located in the City of Boston and is a densely populated area, it was not addressed as an alternative to the proposed location.

The FEIS describes the criteria used to evaluate alternative locations and applies them to the relevant alternative sites in Section 2.3.2. As stated in Section 2.3.2.1 of the FEIS, alternative locations were dismissed as they did not meet one or more of the following: (1) the purpose and need for the project, (2) the programmatic criteria, (3) the minimum siting criteria, and/or (4) the second tier siting criteria.



- Incorporate existing BUMC institutional programs and objectives,
- Support the research of other institutions in the greater Boston area, and
- Be considered in proximity to the proposed Harvard University Medical School's NAIAD-Sponsored Regional Center of Excellence.

Of these three reasons, only the last one is consistent with the second tier screening criteria presented on page 2-36. The SDEIS is deficient in that it applies undefined screening criteria in an attempt to brush away potential alternatives.

The SDEIS states that

Areas of lower density outside of Boston would not have the:

- Proximity to trained workforce,
- Proximity to interstate highway systems and a regional airport, or
- Presence of adequate public infrastructure including water and sewer.

4.13

There is not much to say about this gross inaccurate assumption. Does the statement in the SDEIS mean that everyone who lives outside of Boston has no highway or airport and no water and sewer systems? In addition, the SDEIS notes that 63% of the workforce of the laboratory is expected to reside outside Boston, further undermining the claim that only in Boston would the laboratory have proximity to a trained workforce.

The SDEIS (Page 2-43) states that "one of the program requirements of the BAA was that the Applicant must be "associated with or have planned linkages to one or more institutions or consortia that are applying for NIAID Regional Centers of Excellence (RCE), Biodefense and Emerging Infectious Diseases research grant awards" (U.S. DHHS 2002b)." Information on the Regional Centers for Excellence are presented below (they are absent from the SDEIS):

"In 2003, NIAID established eight Regional Centers of Excellence for Biodefense and Emerging Infectious Diseases (RCEs) throughout the United States.
(http://www2.niaid.nih.gov/Biodefense/Research/rce.htm)

Region I: Harvard Medical School New England Regional Center of Excellence for Biodefense and Emerging Infectious Diseases http://nerce.med.harvard.edu
Region II: New York State Department of Health Northeast Biodefense Center http://www.nbc.columbia.edu/
Region III: University of Maryland, Baltimore Mid-Atlantic Regional Center of Excellence for Biodefense and Emerging Infectious Diseases http://marce.vbi.vt.edu
Region IV: Duke University Southeast Regional Center of Excellence for Biodefense and Emerging Infectious Diseases http://www.serceb.org
Region V: University of Chicago Great Lakes Regional Center of Excellence for Biodefense and Emerging Infectious Diseases http://www.glrce.org
Region VI: University of Texas Medical Branch Western Regional Center of Excellence for Biodefense and Emerging Infectious Diseases http://rce.swmed.edu/
Region VII: Washington University Midwest Regional Center of Excellence for Biodefense and Emerging Infectious Diseases http://mrce.wustl.edu

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4.13 The consideration of alternative locations for the Boston-NBL included a number of programmatic and siting criteria which were deemed necessary to achieve the purpose and need for the project. Among those criteria were trained workforce, transportation infrastructure and utility infrastructure. Remote, rural areas of lower population density areas were found to lack the transportation and utility infrastructure necessary to support the project. The trained workforce needed to undertake the project was found to exist in the City of Boston and surrounding municipalities in the Greater Boston area and not in more remote areas. Many of the new employees for the proposed Boston-NBL facility would be recruited internally at BUMC which has an existing highly skilled work force of medical research staff. See Section 2.3.2 of the FEIS.

Region X: University of Washington WWAMI (WA, WY, AK, MT, ID) Regional Center of Excellence for Biodefense and Emerging Infectious Diseases
http://depts.washington.edu/wwamirce/

4.14 While on one hand the SDEIS states that the NBL must be linked to one or more institutions that are part of the RCE, it on the other hand states that it has to be in Boston. That is surely a violation of the environmental review process. As evidence, the primary siting criteria (page 2-36) singles out Boston University and not any institution in an RCE.

Furthermore, the SDEIS fails to mention that there are a number of institutions that are already linked to the Harvard University RCE as listed on the RCE website (http://nerce.med.harvard.edu/). These are:
Harvard Medical School, Boston, MA
Boston Medical Center, Boston, MA
Brigham and Women's Hospital, Boston, MA
The CBR Institute for Biomedical Research, Boston, MA
Dartmouth Medical School, Hanover, NH
Massachusetts General Hospital, Boston, MA
New England Regional Primate Research Center, Southborough, MA
University of Massachusetts - Dartmouth, Dartmouth, MA
University of Massachusetts Medical Center, Worcester, MA

Again, the SDEIS's elimination of all alternatives except Boston University is a violation of NEPA and the DHHS General Administrative Manual, Part 30 (environmental protection).

VII. THE FEIS MUST DISCUSS HOW THE LABORATORY WILL OPERATE CONSIDERING THE BOSTON PROHIBITION ON RDNA USE REQUIRING BSL4 CONTAINMENT

4.15 We repeat the comments we submitted on the DEIS for the comments are equally germane to the SDEIS:

> The Recombinant DNA Technology: Use Regulations of the City of Boston contain the following prohibition at section 3.01:
>
> > RDNA use requiring containment defined by the Guidelines[7] as "BL4" shall not be permitted in the City of Boston.
>
> The regulations contain no exception or limitation to the prohibition. It is an absolute prohibition.

[7] The Boston regulations define the Guidelines as the NIH Guidelines for Research Involving recombinant DNA molecules as published in the Federal Register of May 7, 1986, and later amendments, revisions, or substitutions to the NIH Guidelines.

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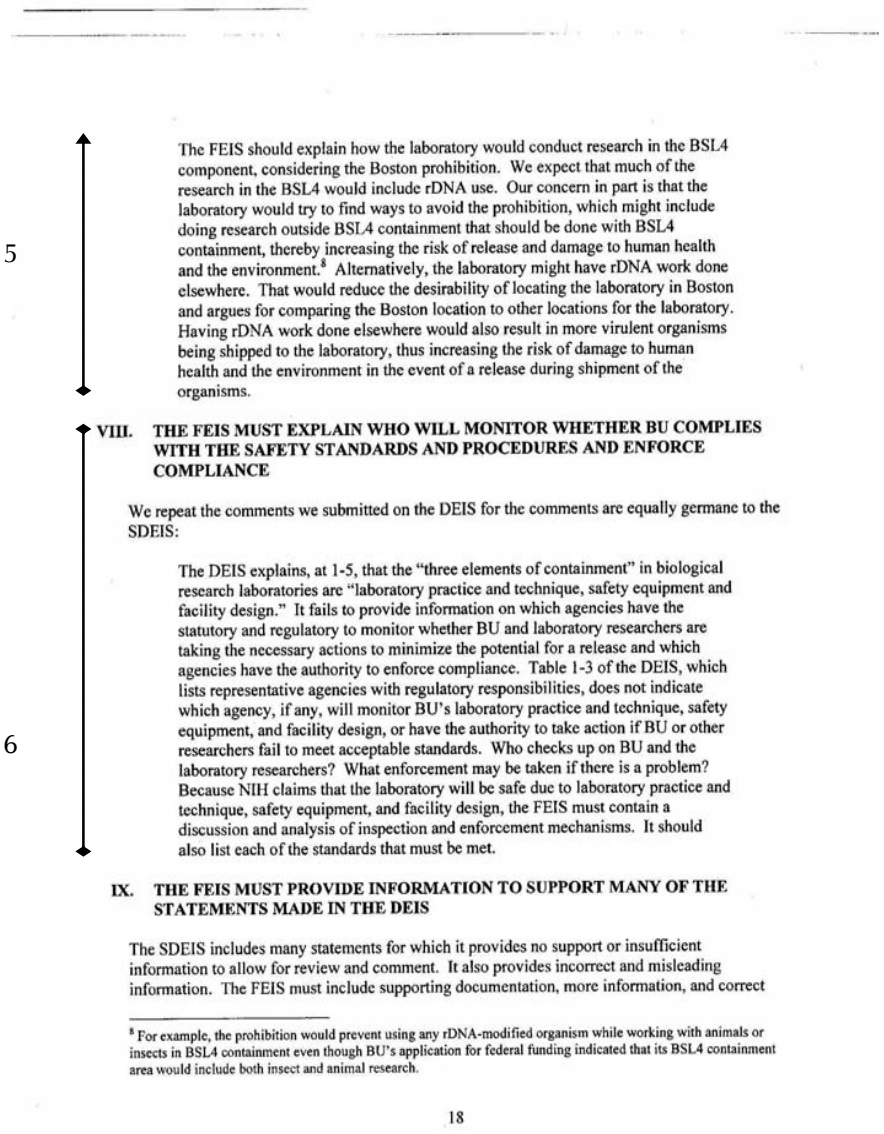
4.14 As required under the NEPA regulations, the FEIS includes an analysis of reasonable alternatives to the Proposed Action, which is to partially fund the construction of the Boston NBL facility at the BioSquare Research Park. The alternative sites described in Section 2.3.2 were considered but eliminated from further study. NEPA does not require that an EIS include a full analysis of every possible alternative. As also described in Section 2.3.2, several factors were the basis for eliminating possible alternatives from further review, including the distance of the sites from the City of Boston, the lack of infrastructure and medical trauma facilities, increased costs and lack of efficiencies gained by ability to use existing BSL-2 and BSL-3 laboratories at the BioSquare Research Park, and inefficiencies in personnel costs.

4.15 As stated in Section 2.2.2.2 of the FEIS, any research that may be conducted in the proposed Boston-NBL would comply with all applicable federal, state and local laws, including laws governing the use of recombinant DNA (rDNA).



4.15

The FEIS should explain how the laboratory would conduct research in the BSL4 component, considering the Boston prohibition. We expect that much of the research in the BSL4 would include rDNA use. Our concern in part is that the laboratory would try to find ways to avoid the prohibition, which might include doing research outside BSL4 containment that should be done with BSL4 containment, thereby increasing the risk of release and damage to human health and the environment.[8] Alternatively, the laboratory might have rDNA work done elsewhere. That would reduce the desirability of locating the laboratory in Boston and argues for comparing the Boston location to other locations for the laboratory. Having rDNA work done elsewhere would also result in more virulent organisms being shipped to the laboratory, thus increasing the risk of damage to human health and the environment in the event of a release during shipment of the organisms.

VIII. THE FEIS MUST EXPLAIN WHO WILL MONITOR WHETHER BU COMPLIES WITH THE SAFETY STANDARDS AND PROCEDURES AND ENFORCE COMPLIANCE

We repeat the comments we submitted on the DEIS for the comments are equally germane to the SDEIS:

4.16

The DEIS explains, at 1-5, that the "three elements of containment" in biological research laboratories are "laboratory practice and technique, safety equipment and facility design." It fails to provide information on which agencies have the statutory and regulatory to monitor whether BU and laboratory researchers are taking the necessary actions to minimize the potential for a release and which agencies have the authority to enforce compliance. Table 1-3 of the DEIS, which lists representative agencies with regulatory responsibilities, does not indicate which agency, if any, will monitor BU's laboratory practice and technique, safety equipment, and facility design, or have the authority to take action if BU or other researchers fail to meet acceptable standards. Who checks up on BU and the laboratory researchers? What enforcement may be taken if there is a problem? Because NIH claims that the laboratory will be safe due to laboratory practice and technique, safety equipment, and facility design, the FEIS must contain a discussion and analysis of inspection and enforcement mechanisms. It should also list each of the standards that must be met.

IX. THE FEIS MUST PROVIDE INFORMATION TO SUPPORT MANY OF THE STATEMENTS MADE IN THE DEIS

The SDEIS includes many statements for which it provides no support or insufficient information to allow for review and comment. It also provides incorrect and misleading information. The FEIS must include supporting documentation, more information, and correct

[8] For example, the prohibition would prevent using any rDNA-modified organism while working with animals or insects in BSL4 containment even though BU's application for federal funding indicated that its BSL4 containment area would include both insect and animal research.

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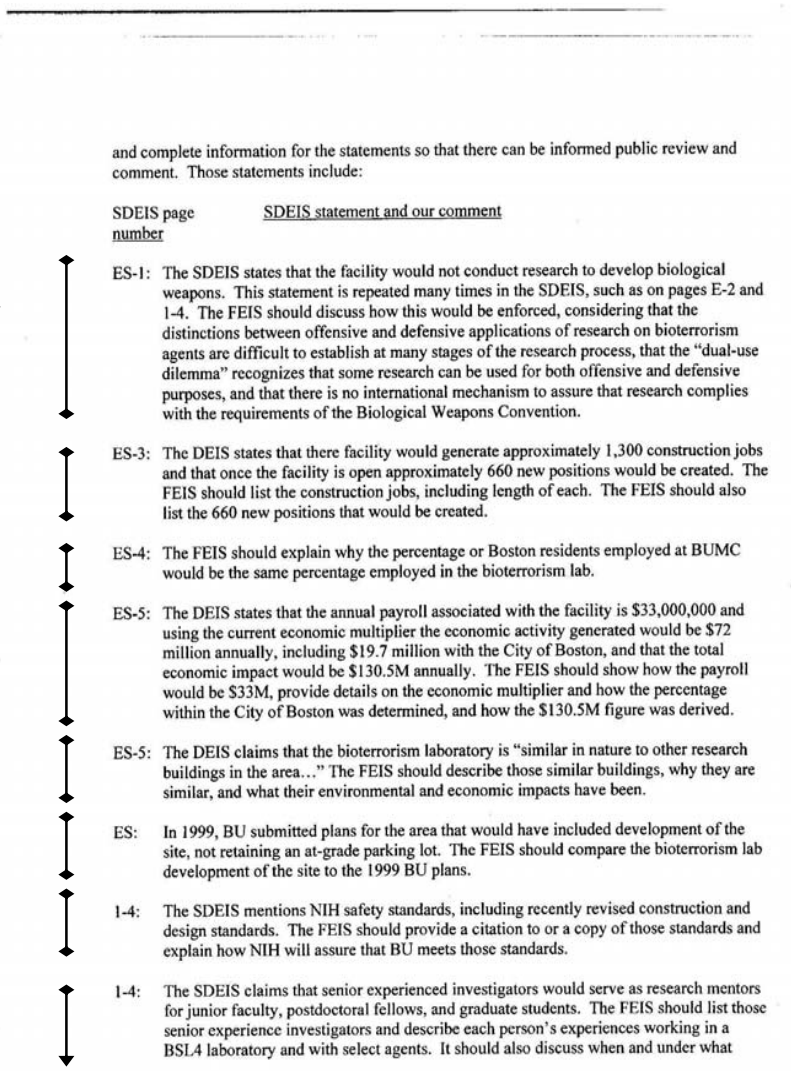
4.16 Compliance with the many environmental health and safety regulations and internal policies and procedures is a shared responsibility. The Principal Investigator, researchers, lab workers, OEHS staff, radiation protection staff, and occupational medicine staff are all involved in monitoring compliance. A variety of approaches are taken to monitor compliance. For example, regular lab inspections are conducted by professional safety experts from the Office of Environmental Health and Safety and the Radiation Protection Office. The Lab Safety Committee, Institutional Biosafety Committee and Radiation Safety Committee monitor compliance, review inspection results and address any issues identified. External government agencies provide additional monitoring of compliance. These local, state and federal agencies monitor compliance by conducting inspections, issuing permits, licenses and approvals and if necessary, issuing penalties or even closing down unsafe lab operations. See Table 1-4 of the FEIS for a listing of the relevant regulatory authorities.



and complete information for the statements so that there can be informed public review and comment. Those statements include:

	SDEIS page number	SDEIS statement and our comment
4.17	ES-1:	The SDEIS states that the facility would not conduct research to develop biological weapons. This statement is repeated many times in the SDEIS, such as on pages E-2 and 1-4. The FEIS should discuss how this would be enforced, considering that the distinctions between offensive and defensive applications of research on bioterrorism agents are difficult to establish at many stages of the research process, that the "dual-use dilemma" recognizes that some research can be used for both offensive and defensive purposes, and that there is no international mechanism to assure that research complies with the requirements of the Biological Weapons Convention.
4.18	ES-3:	The DEIS states that there facility would generate approximately 1,300 construction jobs and that once the facility is open approximately 660 new positions would be created. The FEIS should list the construction jobs, including length of each. The FEIS should also list the 660 new positions that would be created.
4.19	ES-4:	The FEIS should explain why the percentage or Boston residents employed at BUMC would be the same percentage employed in the bioterrorism lab.
4.20	ES-5:	The DEIS states that the annual payroll associated with the facility is $33,000,000 and using the current economic multiplier the economic activity generated would be $72 million annually, including $19.7 million with the City of Boston, and that the total economic impact would be $130.5M annually. The FEIS should show how the payroll would be $33M, provide details on the economic multiplier and how the percentage within the City of Boston was determined, and how the $130.5M figure was derived.
4.21	ES-5:	The DEIS claims that the bioterrorism laboratory is "similar in nature to other research buildings in the area…" The FEIS should describe those similar buildings, why they are similar, and what their environmental and economic impacts have been.
4.22	ES:	In 1999, BU submitted plans for the area that would have included development of the site, not retaining an at-grade parking lot. The FEIS should compare the bioterrorism lab development of the site to the 1999 BU plans.
4.23	1-4:	The SDEIS mentions NIH safety standards, including recently revised construction and design standards. The FEIS should provide a citation to or a copy of those standards and explain how NIH will assure that BU meets those standards.
4.24	1-4:	The SDEIS claims that senior experienced investigators would serve as research mentors for junior faculty, postdoctoral fellows, and graduate students. The FEIS should list those senior experience investigators and describe each person's experiences working in a BSL4 laboratory and with select agents. It should also discuss when and under what

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4.17 As discussed in Section 1.1 of the FEIS, the facility would not develop offensive or defensive biological weapons, as this is forbidden by a national security directive and international law. President Nixon issued National Security Decision Memorandum in November 1969 which renounced the use of lethal methods of bacteriological/biological warfare and ordered the destruction of all stockpiled agents. In addition, the United States signed the Convention on the Prohibition of the Development, Production, Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction, which became effective March 26, 1975 (signed by President Ford and ratified by Congress) and remains in effect today.

4.18 The estimate of construction jobs created includes all of the various building trades utilized for construction of the facility. No breakdown of jobs by trade is available at this time, but the estimate represents 1,300 construction jobs over the course of the facility construction period. The new 660 permanent jobs would include positions at all levels from janitorial and maintenance services to building security to lab technicians, scientific researchers and principal investigators.

4.19 As described in Section 4.3.1.1, many of the new employees for the proposed Boston-NBL facility would be recruited internally at BUMC which has an existing highly skilled work force of medical research staff. Hence the existing current employee profile at BUMC is believed to be representative of the likely employee profile of the new facility based on the types of positions to be created.

4.20 The projected annual direct payroll is based on an estimate of the amount of research to be conducted in the building on an annual basis. The multipliers used to create the total annual economic impact and the impact within the City of Boston are from the U.S. Bureau of Economic Analysis, Regional Input-Output Modeling System - RIMS II (U.S. Department of Commerce 1997). See Section 4.3.1.1.

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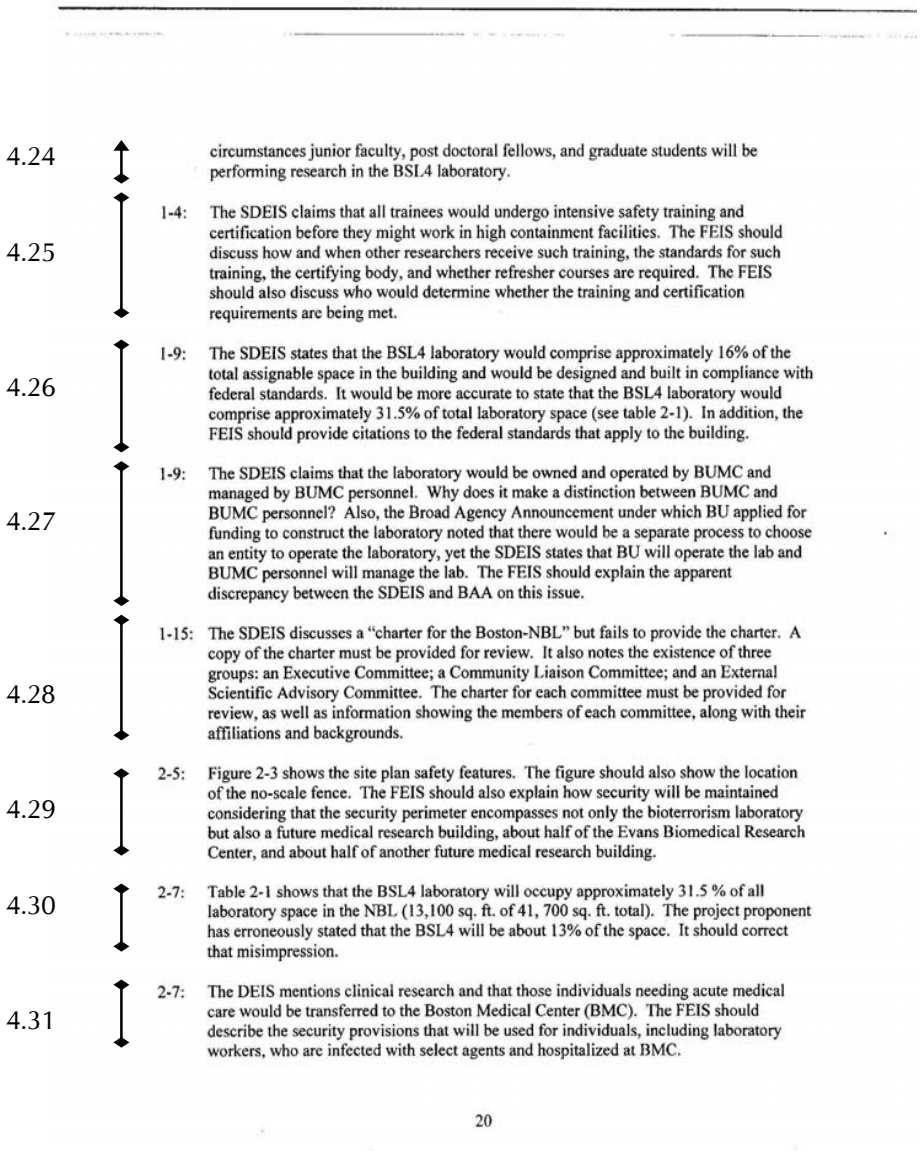
4.21 The project is proposed to be located in the BioSquare Research Park as part of the BioSquare Phase II development. The BioSquare Phase I project which was approved by the state and the City of Boston several years ago, includes an existing 1,000 car parking garage and three medical research buildings including the 160,000 square foot (sf) Evans Research Building, the 180,000 sf Center for Advanced Biomedical Research Building and the 160,000 sf 670 Albany Street Research building. There is a fourth, 180,000 sf medical research building planned for the site. These other BioSquare research buildings are not part of the proposed action by NIH and thus are outside the scope of the FEIS.

4.22 The Proposed Action is for NIH to partially fund the construction of the Boston-NBL facility and therefore, the No Action alternative is to not construct the Boston-NBL facility. If the NIH decides to choose the no-action alternative, that would be the end of NIH's participation in developing this particular site.

4.23 The standards include all applicable local, state, and federal standards, in addition to compliance with the NIH Design and Policy Guidelines (U.S. DHHS 2003b), the CDC / NIH Biosafety in Microbiological and Biomedical Laboratories standards is applicable (U.S. DHHS 1999). The NIH has set in place a group of professionals design experts to monitor BU's design documents for compliance with the above standards.

4.24 At this time, no senior investigators have been assigned to a specific duty at the laboratory and thus, they cannot be identified. As described in Section 2.2.5.1, all personnel would be required to demonstrate proficiency in performing experiments in the BSL-4 laboratory prior to initiating such work.



circumstances junior faculty, post doctoral fellows, and graduate students will be performing research in the BSL4 laboratory.

1-4: The SDEIS claims that all trainees would undergo intensive safety training and certification before they might work in high containment facilities. The FEIS should discuss how and when other researchers receive such training, the standards for such training, the certifying body, and whether refresher courses are required. The FEIS should also discuss who would determine whether the training and certification requirements are being met.

1-9: The SDEIS states that the BSL4 laboratory would comprise approximately 16% of the total assignable space in the building and would be designed and built in compliance with federal standards. It would be more accurate to state that the BSL4 laboratory would comprise approximately 31.5% of total laboratory space (see table 2-1). In addition, the FEIS should provide citations to the federal standards that apply to the building.

1-9: The SDEIS claims that the laboratory would be owned and operated by BUMC and managed by BUMC personnel. Why does it make a distinction between BUMC and BUMC personnel? Also, the Broad Agency Announcement under which BU applied for funding to construct the laboratory noted that there would be a separate process to choose an entity to operate the laboratory, yet the SDEIS states that BU will operate the lab and BUMC personnel will manage the lab. The FEIS should explain the apparent discrepancy between the SDEIS and BAA on this issue.

1-15: The SDEIS discusses a "charter for the Boston-NBL" but fails to provide the charter. A copy of the charter must be provided for review. It also notes the existence of three groups: an Executive Committee; a Community Liaison Committee; and an External Scientific Advisory Committee. The charter for each committee must be provided for review, as well as information showing the members of each committee, along with their affiliations and backgrounds.

2-5: Figure 2-3 shows the site plan safety features. The figure should also show the location of the no-scale fence. The FEIS should also explain how security will be maintained considering that the security perimeter encompasses not only the bioterrorism laboratory but also a future medical research building, about half of the Evans Biomedical Research Center, and about half of another future medical research building.

2-7: Table 2-1 shows that the BSL4 laboratory will occupy approximately 31.5 % of all laboratory space in the NBL (13,100 sq. ft. of 41, 700 sq. ft. total). The project proponent has erroneously stated that the BSL4 will be about 13% of the space. It should correct that misimpression.

2-7: The DEIS mentions clinical research and that those individuals needing acute medical care would be transferred to the Boston Medical Center (BMC). The FEIS should describe the security provisions that will be used for individuals, including laboratory workers, who are infected with select agents and hospitalized at BMC.

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4.25 BUMC provides annual laboratory training as a minimum standard and increases training frequencies depending upon the type of work being done in each specific laboratory. BUMC would determine the levels of training necessary to ensure that all employees are compliant with and fully knowledgeable of all regulations. Regulatory authorities would ask for training rosters and levels of competency and would interview employees to determine if training, education and knowledge are appropriate. See Section 2.2.5.1.

4.26 The BSL-4 laboratory would comprise approximately 16% of the total assignable space of the new facility. The concept of total assignable space allows for a visualization of each element of the facility independent from the other elements of the facility. Also, total assignable space allows for an easier understanding of the spatial relationship between the individual elements and the overall facility. The facility would be designed and built following all applicable federal, state and local regulations. Table 1-4 provides a list of the federal, state and local regulations that would apply to the facility.

4.27 As stated in Section 1.1, the Boston-NBL facility would be owned, operated and managed by BUMC. There was no intent to make a distinction between BUMC and BUMC personnel. A solicitation for a limited-competition cooperative agreement operations grant was issued by NIH during the summer of 2005.

4.28 In the winter of 2005, the Boston-NBL was adopted by charter as an Institute at Boston University. The National Emerging Infectious Diseases Laboratories Institute would be housed at the Boston University Medical Campus and headed by a Director. The governance structure for the facility would include several committees, including those that provide external scientific and community oversight of the operations at the lab. The Executive Committee would advise the Director of the Institute on the

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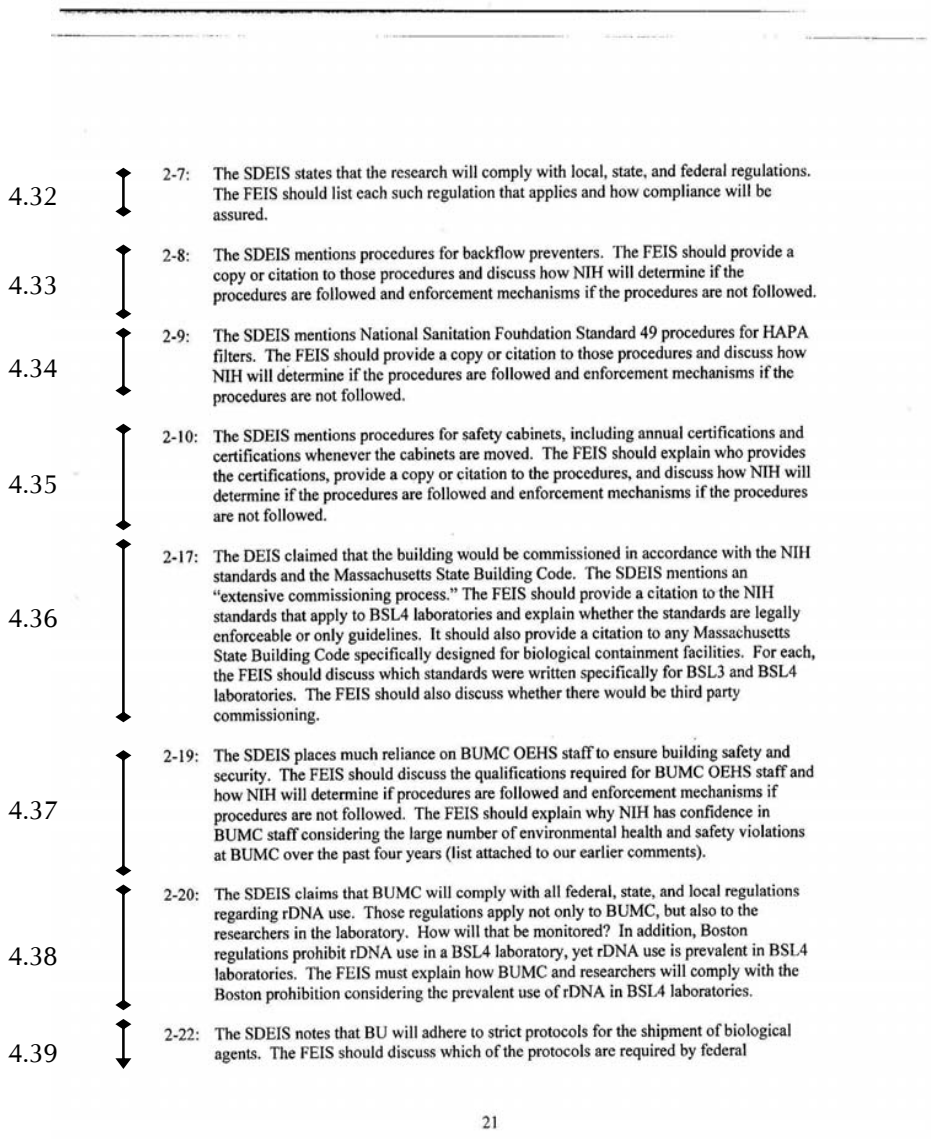
scientific research and operational activities of the Boston-NBL. In addition, a Community Liaison Committee (CLC) comprised of six committee members who are not employed by Boston University or Boston Medical Center would review projects and activities of the Boston-NBL and assist the Director and other committees as needed to ensure effective communication on programs and activities involving the Boston-NBL and the community. BUMC would solicit nominations for membership on the CLC.

4.29 As described in Section 2.2.1, site security would be maintained by utilizing a 150 foot unchecked vehicle set back and a 100 foot unchecked pedestrian setback. Structures that are within these setbacks would be designed to comply with the setbacks by designing fire egress and loading facilities so that there is no impact and by undergoing risk assessments as building projects in the area are initiated. Figure 2-3 has been updated to indicate the location of the security fencing.

4.30 See Response to Comment 4.26.

4.31 Boston Medical Center has a number of protocols designed to address concerns surrounding patient confidentiality, patients with infectious conditions and patients who require isolated areas for both clinical and non-clinical reasons. These protocols are in place and would be utilized in the event that laboratory workers, or others, were exposed to infectious diseases and were determined to be in need of secure clinical facilities for treatment. Specific protocols are being developed to address the transport of infected individuals from the Boston-NBL facility to the existing isolation facilities at Boston Medical Center, should that be necessary.



4.32 2-7: The SDEIS states that the research will comply with local, state, and federal regulations. The FEIS should list each such regulation that applies and how compliance will be assured.

4.33 2-8: The SDEIS mentions procedures for backflow preventers. The FEIS should provide a copy or citation to those procedures and discuss how NIH will determine if the procedures are followed and enforcement mechanisms if the procedures are not followed.

4.34 2-9: The SDEIS mentions National Sanitation Foundation Standard 49 procedures for HAPA filters. The FEIS should provide a copy or citation to those procedures and discuss how NIH will determine if the procedures are followed and enforcement mechanisms if the procedures are not followed.

4.35 2-10: The SDEIS mentions procedures for safety cabinets, including annual certifications and certifications whenever the cabinets are moved. The FEIS should explain who provides the certifications, provide a copy or citation to the procedures, and discuss how NIH will determine if the procedures are followed and enforcement mechanisms if the procedures are not followed.

4.36 2-17: The DEIS claimed that the building would be commissioned in accordance with the NIH standards and the Massachusetts State Building Code. The SDEIS mentions an "extensive commissioning process." The FEIS should provide a citation to the NIH standards that apply to BSL4 laboratories and explain whether the standards are legally enforceable or only guidelines. It should also provide a citation to any Massachusetts State Building Code specifically designed for biological containment facilities. For each, the FEIS should discuss which standards were written specifically for BSL3 and BSL4 laboratories. The FEIS should also discuss whether there would be third party commissioning.

4.37 2-19: The SDEIS places much reliance on BUMC OEHS staff to ensure building safety and security. The FEIS should discuss the qualifications required for BUMC OEHS staff and how NIH will determine if procedures are followed and enforcement mechanisms if procedures are not followed. The FEIS should explain why NIH has confidence in BUMC staff considering the large number of environmental health and safety violations at BUMC over the past four years (list attached to our earlier comments).

4.38 2-20: The SDEIS claims that BUMC will comply with all federal, state, and local regulations regarding rDNA use. Those regulations apply not only to BUMC, but also to the researchers in the laboratory. How will that be monitored? In addition, Boston regulations prohibit rDNA use in a BSL4 laboratory, yet rDNA use is prevalent in BSL4 laboratories. The FEIS must explain how BUMC and researchers will comply with the Boston prohibition considering the prevalent use of rDNA in BSL4 laboratories.

4.39 2-22: The SDEIS notes that BU will adhere to strict protocols for the shipment of biological agents. The FEIS should discuss which of the protocols are required by federal

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4.32 The proposed laboratory facility would be subject to many local, state and federal regulations. A list of agencies with regulatory responsibility may be found in Table 1-4. Compliance with these regulations would be ensured through proper personnel training and orientation measures, routine audit and oversight activities by supervisory personnel, and through routine testing and reporting of results. In addition, unannounced agency inspections may be conducted by many of these agencies including EPA, NIH, USDA, DEP, DPH, MWRA, BPHC, BWSC and the Boston Fire Department.

4.33 The NIH grant agreement for the Boston-NBL facility requires compliance with NIH design guidelines. The NIH guidelines on Backflow Prevention devices can be found at http://orf.od.nih.gov/policy/volume4-plumbing.htm#h10. BUMC would own and operate the lab and ensure compliance with all NIH guidelines during commissioning and operation of the building as described in Section 2.2.4.

4.34 Biological Safety Cabinets provide personnel, product, and environmental protection. To ensure proper function each cabinet must be certified at installation and annually thereafter. The recognized standard is the National Sanitation Foundation's Standard 49 (NSF-49). The NSF-49 certification method ensures that air balance is correct and filters leak free. NSF-49 consists of primary, secondary and adjustment/repair procedures. The complete standard can be purchased at http://www.nsf.org. BUMC would be responsible for the operation and maintenance of the laboratory. The Office of Environmental Health and Safety (OEHS) would be responsible for maintaining and servicing the HEPA filters in the facility.

4.35 BUMC requires annual recertification of Biosafety Cabinets, as well as additional certification for new cabinets or cabinets that have been relocated. This process of certifying cabinets is validated through

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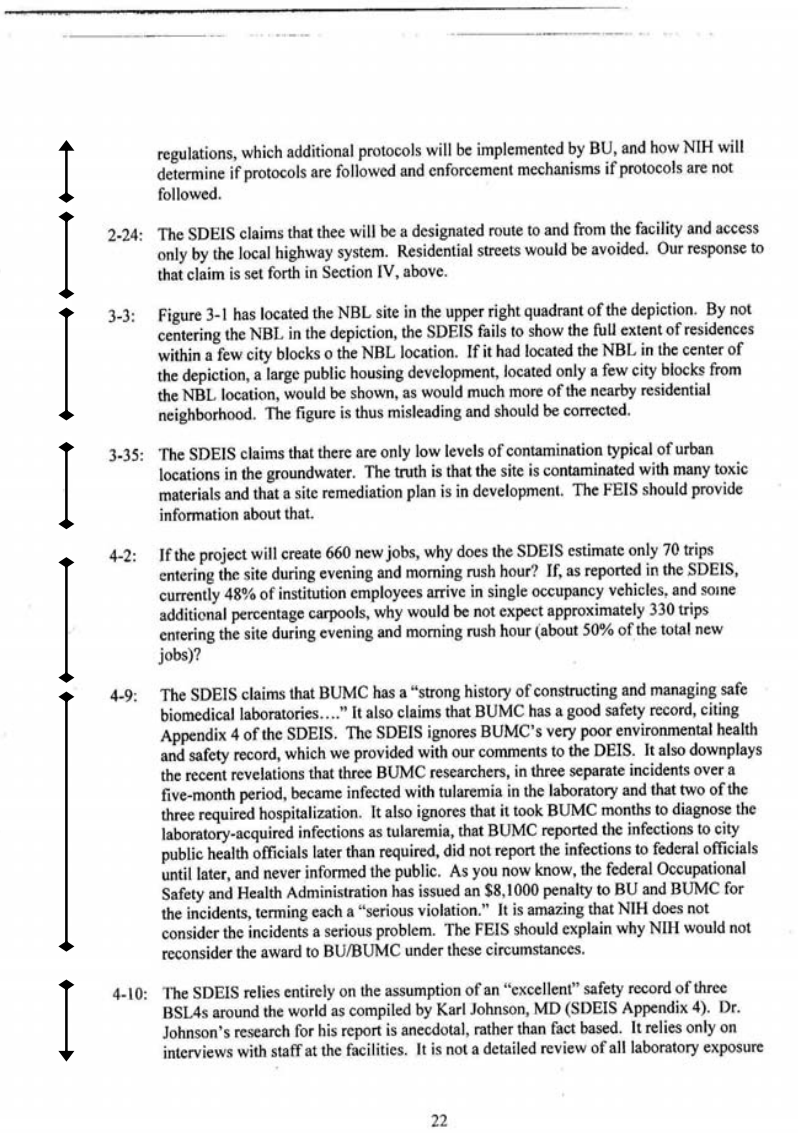
certified, trained, outside vendors in Biosafety and Laboratory Safety that have a long standing record with the university. These vendors follow all application regulations for the NSF-49. All Biosafety cabinets are inspected and enforcement of recertification is completed through general laboratory inspections, unannounced inspections, and Institutional Biosafety Committee review. See Section 2.2.4 and Appendix 6.

4.36 The building's commissioning plan is being developed specifically for this facility. A third party engineering firm would perform as the commissioning agent for the facility. The plan incorporates building components and systems and is not limited to the containment laboratory facilities. The NIH commissioning guidelines address issues directly related to laboratory facilities (http://orf.od.nih.gov/commissioning_tool.htm). The Massachusetts State Building Code addresses general building systems. Performance of the necessary inspections, operational testing to meet the building code and compliance with the required testing are legally enforceable, through, for example, the failure to issue an occupancy permit. The NIH is not an enforcement agency but can administratively enforce adherence to the NIH design guidelines, by stopping the funding to construct the facility (U. S. DHHS 2003b).

4.37 BUMC OEHS staff represents a number of specialized areas including industrial hygiene, health physics and biosafety. These specialized areas require specific credentials and certifications that may be checked by regulatory authorities at any time. BUMC has a staff of 23 such professionals in the Environmental Health and Safety Office who interface with regulatory agencies on a regular basis and attend multiple competency-based training programs annually.

4.38 In accordance with current policies and procedures, the Institutional Biosafety Committee (IBC) would review all proposed experiments for compliance with applicable DNA rules and regulations.



regulations, which additional protocols will be implemented by BU, and how NIH will determine if protocols are followed and enforcement mechanisms if protocols are not followed.

4.39

2-24: The SDEIS claims that thee will be a designated route to and from the facility and access only by the local highway system. Residential streets would be avoided. Our response to that claim is set forth in Section IV, above.

4.40

3-3: Figure 3-1 has located the NBL site in the upper right quadrant of the depiction. By not centering the NBL in the depiction, the SDEIS fails to show the full extent of residences within a few city blocks o the NBL location. If it had located the NBL in the center of the depiction, a large public housing development, located only a few city blocks from the NBL location, would be shown, as would much more of the nearby residential neighborhood. The figure is thus misleading and should be corrected.

4.41

3-35: The SDEIS claims that there are only low levels of contamination typical of urban locations in the groundwater. The truth is that the site is contaminated with many toxic materials and that a site remediation plan is in development. The FEIS should provide information about that.

4.42

4-2: If the project will create 660 new jobs, why does the SDEIS estimate only 70 trips entering the site during evening and morning rush hour? If, as reported in the SDEIS, currently 48% of institution employees arrive in single occupancy vehicles, and some additional percentage carpools, why would be not expect approximately 330 trips entering the site during evening and morning rush hour (about 50% of the total new jobs)?

4.43

4-9: The SDEIS claims that BUMC has a "strong history of constructing and managing safe biomedical laboratories...." It also claims that BUMC has a good safety record, citing Appendix 4 of the SDEIS. The SDEIS ignores BUMC's very poor environmental health and safety record, which we provided with our comments to the DEIS. It also downplays the recent revelations that three BUMC researchers, in three separate incidents over a five-month period, became infected with tularemia in the laboratory and that two of the three required hospitalization. It also ignores that it took BUMC months to diagnose the laboratory-acquired infections as tularemia, that BUMC reported the infections to city public health officials later than required, did not report the infections to federal officials until later, and never informed the public. As you now know, the federal Occupational Safety and Health Administration has issued an $8,1000 penalty to BU and BUMC for the incidents, terming each a "serious violation." It is amazing that NIH does not consider the incidents a serious problem. The FEIS should explain why NIH would not reconsider the award to BU/BUMC under these circumstances.

4.44

4-10: The SDEIS relies entirely on the assumption of an "excellent" safety record of three BSL4s around the world as compiled by Karl Johnson, MD (SDEIS Appendix 4). Dr. Johnson's research for his report is anecdotal, rather than fact based. It relies only on interviews with staff at the facilities. It is not a detailed review of all laboratory exposure

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Such approval would be required prior to initiating such experiments.

4.39 The High Hazard Material Management Policy, in Appendix 7, describes how BUMC plans to ensure strict compliance with all applicable federal shipping regulations. This includes specific roles and responsibilities of departments, including the Offices of General Services, Environmental Health and Safety, Mail Services, and Purchasing. The federal and international shipping protocols of the U.S. Department of Transportation and the International Air Transport Authority, along with any new standards for the transport of dangerous goods, will be strictly followed by BUMC. BUMC will ensure compliance through the Office of General Services audit and investigation responsibilities, including initiating, conducting, and/or participating in audits and investigations. The Office of Environmental Health and Safety will schedule all packages and initiate its own tracking methods. The DHHS has a role in regulating shipping of select agents under the Department of Health and Human Services Select Agent rule 42 CFR 73.0, part 73.16. Select agents must be properly shipped and are regulated by DHHS. See Response to Comment 4.32.

4.40 See Response to Comment 4.7.

4.41 Figure 3-1 has been changed to center the NBL site.

4.42 Based on recent groundwater chemical analyses results, it has been concluded that groundwater at the site contains low levels of contaminants below the applicable standards and poses no significant risk to human health, safety, public welfare or the environment. Thus, no remediation on groundwater is required. Based on the soil chemical analyses results and the completion of a Method I Risk Characterization, there is a condition of No Significant Risk of soil outside the footprint of the proposed Boston-NBL building. Soils excavated during construction would be handled and disposed of in

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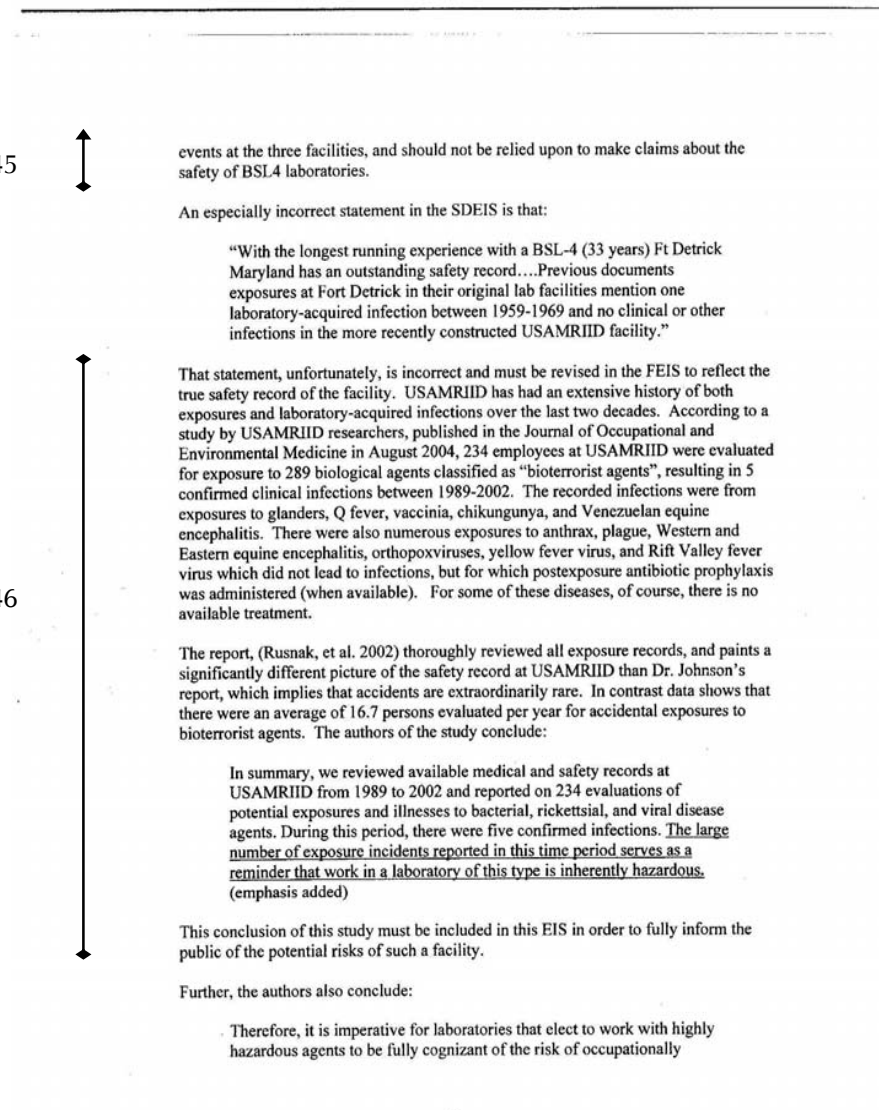
accordance with a Release Abatement Measure (RAM) Plan filed with the state Department of Environmental Protection.

4.43 While a total of 660 new jobs would be created by the project, not all 660 persons would be working in the building at the same time, nor would all persons working in the building arrive or depart during the peak hour of traffic. The building would be occupied 24 hours a day, 7 days a week and most work shifts would begin and end outside the peak hours for traffic. The estimate of peak hour trips is based on the number of persons working in the building who are expected to arrive/depart via automobile during the peak hour only.

4.44 Appendix 4 of the EIS is a study specific to NIAID-supported laboratory facilities operating at BSL-3 and BSL-4 levels. As soon as confirmed cases of tularemia were identified, BUMC officials notified all appropriate authorities as required including the Boston Public Health Commission (BPHC), the Massachusetts Department of Public Health and the CDC. The BPHC's report on these exposures recommended that stronger procedures be put in place to monitor lab personnel and report suspected cases. BUMC concurred with these recommendations in its public Statement of Responsibility. BUMC has already implemented additional procedures including a mandatory notice to the Occupational Medicine Department after missing one day with any sickness and a medical alert card carried by all tularemia lab workers. BUMC has begun to implement the following procedures: increased safety training and procedures for lab workers; strengthened laboratory safety procedures; unannounced safety inspections of BUMC laboratories; applying additional tests and safeguards to infectious material sent to BUMC for research purposes; outside, expert review of BUMC research controls and procedures; and, working with the Boston Public Health Commission to improve the notification process.



events at the three facilities, and should not be relied upon to make claims about the safety of BSL4 laboratories.

An especially incorrect statement in the SDEIS is that:

> "With the longest running experience with a BSL-4 (33 years) Ft Detrick Maryland has an outstanding safety record….Previous documents exposures at Fort Detrick in their original lab facilities mention one laboratory-acquired infection between 1959-1969 and no clinical or other infections in the more recently constructed USAMRIID facility."

That statement, unfortunately, is incorrect and must be revised in the FEIS to reflect the true safety record of the facility. USAMRIID has had an extensive history of both exposures and laboratory-acquired infections over the last two decades. According to a study by USAMRIID researchers, published in the Journal of Occupational and Environmental Medicine in August 2004, 234 employees at USAMRIID were evaluated for exposure to 289 biological agents classified as "bioterrorist agents", resulting in 5 confirmed clinical infections between 1989-2002. The recorded infections were from exposures to glanders, Q fever, vaccinia, chikungunya, and Venezuelan equine encephalitis. There were also numerous exposures to anthrax, plague, Western and Eastern equine encephalitis, orthopoxviruses, yellow fever virus, and Rift Valley fever virus which did not lead to infections, but for which postexposure antibiotic prophylaxis was administered (when available). For some of these diseases, of course, there is no available treatment.

The report, (Rusnak, et al. 2002) thoroughly reviewed all exposure records, and paints a significantly different picture of the safety record at USAMRIID than Dr. Johnson's report, which implies that accidents are extraordinarily rare. In contrast data shows that there were an average of 16.7 persons evaluated per year for accidental exposures to bioterrorist agents. The authors of the study conclude:

> In summary, we reviewed available medical and safety records at USAMRIID from 1989 to 2002 and reported on 234 evaluations of potential exposures and illnesses to bacterial, rickettsial, and viral disease agents. During this period, there were five confirmed infections. The large number of exposure incidents reported in this time period serves as a reminder that work in a laboratory of this type is inherently hazardous. (emphasis added)

This conclusion of this study must be included in this EIS in order to fully inform the public of the potential risks of such a facility.

Further, the authors also conclude:

> Therefore, it is imperative for laboratories that elect to work with highly hazardous agents to be fully cognizant of the risk of occupationally

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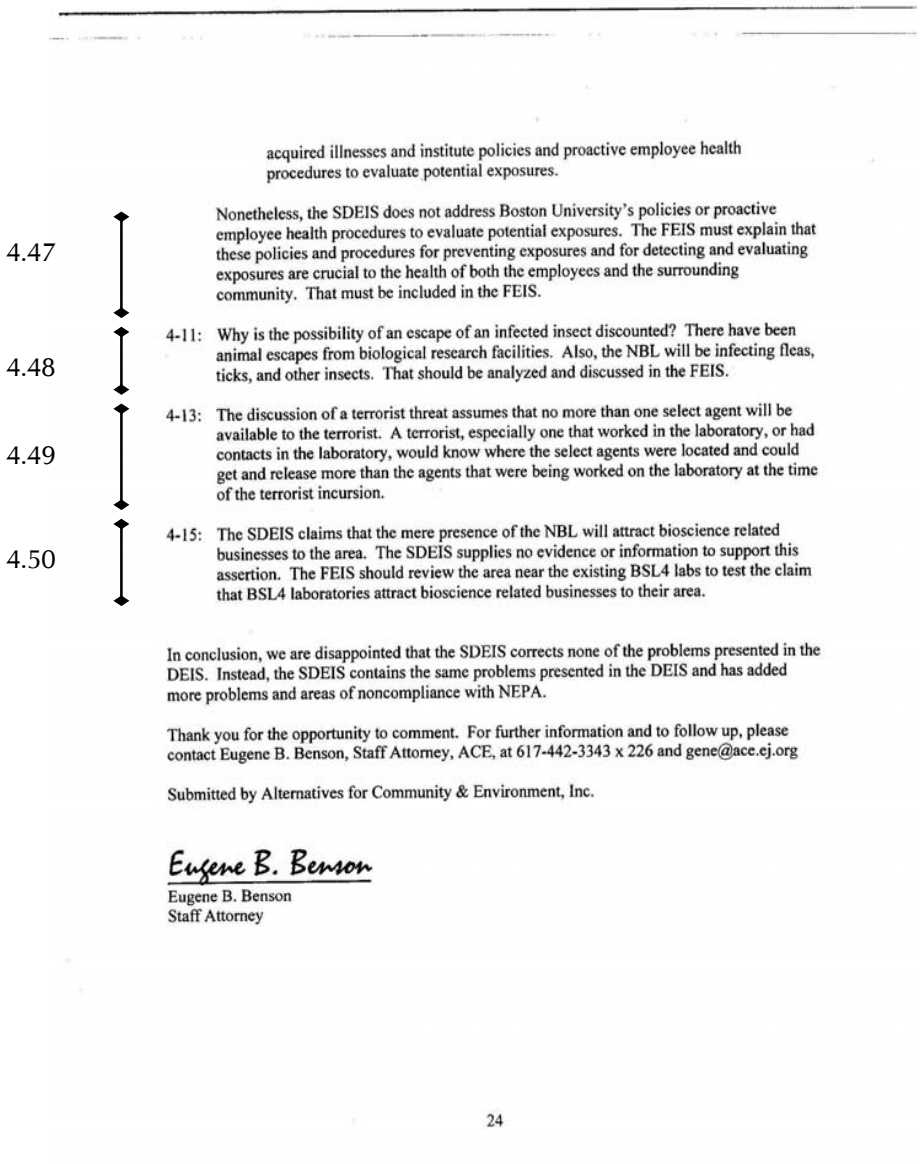
4.45 The portion of Dr. Johnson's report that addresses the exposure and clinical infection record of those three laboratories during the past 20 years is not anecdotal; it represents the facts, and particularly in the case of USAMRIID, it is based on written records from that Institute supplied to Dr. Johnson by the Principal Scientific Advisor to USAMRIID. Nobody working in the BSL-4 at USAMRIID suffered a clinical infection. The statement in Section 4.2.1.1 "Community Safety and Risk – Other Potential Risk Scenarios (a)" in the FEIS is correct with just one caveat. BSL-4 containment did not exist as such until 1984 when the first edition of Biosafety in Microbiological and Biomedical Laboratories came out. That's why Dr. Johnson covered a 20 year period through most of 2003. No clinical infections occurred in BSL-4 work at USAMRIID in that 20 year interval.

4.46 All the agents listed in the published article referenced in the comment are either BSL-2 agents or BSL-3 agents. No clinical infections occurred in BSL-4 work at USAMRIID during the period of time in Dr. Johnson's study.



acquired illnesses and institute policies and proactive employee health procedures to evaluate potential exposures.

4.47 Nonetheless, the SDEIS does not address Boston University's policies or proactive employee health procedures to evaluate potential exposures. The FEIS must explain that these policies and procedures for preventing exposures and for detecting and evaluating exposures are crucial to the health of both the employees and the surrounding community. That must be included in the FEIS.

4.48 4-11: Why is the possibility of an escape of an infected insect discounted? There have been animal escapes from biological research facilities. Also, the NBL will be infecting fleas, ticks, and other insects. That should be analyzed and discussed in the FEIS.

4.49 4-13: The discussion of a terrorist threat assumes that no more than one select agent will be available to the terrorist. A terrorist, especially one that worked in the laboratory, or had contacts in the laboratory, would know where the select agents were located and could get and release more than the agents that were being worked on the laboratory at the time of the terrorist incursion.

4.50 4-15: The SDEIS claims that the mere presence of the NBL will attract bioscience related businesses to the area. The SDEIS supplies no evidence or information to support this assertion. The FEIS should review the area near the existing BSL4 labs to test the claim that BSL4 laboratories attract bioscience related businesses to their area.

In conclusion, we are disappointed that the SDEIS corrects none of the problems presented in the DEIS. Instead, the SDEIS contains the same problems presented in the DEIS and has added more problems and areas of noncompliance with NEPA.

Thank you for the opportunity to comment. For further information and to follow up, please contact Eugene B. Benson, Staff Attorney, ACE, at 617-442-3343 x 226 and gene@ace.ej.org

Submitted by Alternatives for Community & Environment, Inc.

Eugene B. Benson
Eugene B. Benson
Staff Attorney

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4.47 BUMC currently has policies and procedures in place to monitor and prevent worker exposure. These include a detailed medical surveillance training program, serum banking, and other procedures effective at prevention and monitoring of worker exposures. The Boston-NBL would have a comprehensive medical surveillance program which would be integrated into the current medical monitoring system. See Section 2.2.5.1 of the FEIS.

4.48 The proposed Boston-NBL facility and systems would be designed to significantly reduce the potential for possible vector-borne transmission through insects and rodents. The design of BSL-2, BSL-3, and BSL-4 containment laboratories and BSL-2, BSL-3, and BSL-4 animal containment laboratories would comply with recommendations and requirements of the *4th Edition Biosafety in Microbiological and Biomedical Laboratories* (U.S. DHHS 1999), *NIH Design Policy and Guidelines - Animal Research Facilities* (U.S. DHHS 2003c), and the current *Guide for the Care and Use of Laboratory Animals* (National Research Council 1996). The construction and operation of the Arthropod Containment Level laboratory would comply with the recommendations and requirements of the *Arthropod Containment Guidelines, Version 3.1* by the American Committee of Medical Entomology of the American Society of Tropical Medicine and Hygiene (ASTMH 2002). Infected arthropod work would be conducted in the innermost rooms under negative pressure conditions and all air supply and exhaust terminal devices would be screened to prevent arthropod escape. In insectary manipulation areas, cooler temperatures would be maintained to slow arthropod movement to reduce the potential for escape. Surfaces in all insectary spaces would be white to allow for quick identification of arthropods that escape primary containment. In addition, implementation of a pest management program would limit the potential for transmission of infectious agents from animals to humans. See Section 4.2.1.1 "Community Safety and Risk – Other Potential Risk Scenarios (c)" in the FEIS.

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4.49 The safety and security systems in the building would include strict controls and audit requirements on all select agents at all times. These initiatives are directed at those working in the lab, who have already undergone a background check. The security protocols also require a series of checks and balances to access space and storage containers and require a minimum of two authorized persons being present at any time there is a risk involving a release.

4.50 The Boston-NBL is anticipated to foster additional bioscience research activity in the City and the region. Much as Cambridge and Boston have become a "cluster" center for the life sciences industry, the presence of a national biosafety research laboratory would attract researchers and businesses seeking to capitalize on the additional synergy create. Other BSL-4 research laboratories in San Antonio and Atlanta have similarly generated expanded interest in life sciences research activities. San Antonio is a growing biotech research location. Atlanta as the home of the U.S. Centers for Disease Control and Prevention has over 200 bioscience companies as well as multiple research universities.

APPENDIX 1

Comments from Jeanne Guillemin
Professor of Sociology, Boston College
Senior Advisor, MIT Security Studies Program
Author, *Anthrax: the Investigation of a Deadly Outbreak* and *Biological Weapons: From the Invention of State-Sponsored Programs to Contemporary Bioterrorism*

A good deal is known about the physical dispersion of aerosols but medical uncertainties still trouble attempts to predict risk with absolute conviction. This is especially so for outdoor emissions that cause disease on which, for obvious public health reasons, little research has been done and few events have been chronicled. For this reason, much importance has been attached to the 1992 study of the 1979 Sverdlovsk (USSR) epidemic in the USSR (Guillemin, 1999), which proved that an emission of spores from a military facility had killed some 70 local residents.

The emphasis in my comments is going to be on important variables that the RWDI West team *has left out* of its two reports (September 1, 2004 and March 23, 2005). These missing aspects severely undermine the credibility of their models. Sometimes people who are at ease with modeling the physical dispersal of particulates have difficulty with the complexities inherent in disease transmission and the general fact of medical uncertainty. Select agents can compound this problem because they rarely now cause epidemics and knowledge about them became esoteric. For example, we would all like to believe that we knew the dose response for anthrax spores, but human subjects are simply not available for research on such a dangerous disease as inhalation anthrax. The US Army spent years trying to determine dose response, in order to calculate munitions. The best it did was a study of a thousand monkeys conducted by Joseph Jemski in the 1960s, the details of which are lost to history, and some smaller, recent animal research. *If those composing models of dispersion are unfamiliar with medicine and epidemiology, they are likely to leave out or ignore important variables or strive for oversimplified, mechanistic results.*

I believe this unfamiliarity has undermined the several attempts that RWDI West Inc. has made to present credible models of the risk of anthrax to people in the area near the proposed BU NEIDL facility. Just as one example of medical ignorance, the authors of the 2005 summary report (Arulanadam et al.) assert on page 2 that the initial symptoms of anthrax infection resemble those of "a common cold." The initial symptoms for inhalational anthrax are actually flu-like, and can proceed to high fever and respiratory distress before terminal toxic shock. The difference is a crucial one from a medical screening point of view. Since the symptoms of anthrax are described in an article they cite (the 1994 *Science* article that I co-authored with Matthew Meselson), one becomes further convinced that the RWDI authors have insufficient medical knowledge to model disease risks from outdoor aerosol dispersion.

I. *Calculating Disease Risks: The Accident Scenarios*

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In the current RWDI rendition of worst case scenarios, choices were made to ignore fundamental problems in calculating disease risks.

1) A fundamental problem is what I would call the fallacy of the single vial scenario. Accidental spillage from a single vial of virulent anthrax spores is not at all the worst anthrax case scenario imaginable, although it could do real damage. A more credible worst-case scenario is the release of already aerosolized anthrax being used for tests of large non-human primates. In that event, the pathogenic quality of the emission would be at its maximum level and also invisible and scentless. To suggest that the worst that could happen in a major BSL-4 research facility is minor pathogen spillage misleads the public about the risks that advanced biodefense work entails. To test defenses against aerosolized germ weapons means creating germ aerosols. *Unless BUMC is willing to forego pathogenic aerosol experiments, the single vial scenario cannot be accepted as the basis for a worst case scenario.*

2) In previous comments on RWDI scenarios, I questioned the lack of a contagious disease model. Any of the contagious diseases represented by the select agent list (pneumonic plague, the hemorrhagic fevers) could be released through human or animal or even insect vectors, not just aerosols, with repercussions far beyond the current limited single vial spillage scenario presented in this report. *A worst-case model of a contagious disease accident should be constructed and presented to the Boston-area public for its assessment.*

3) Even if one accepts a lower-risk single spillage scenario, why leave out the higher range of numbers of respirable spores that might conceivable be released? The authors' rigid adherence to just 400,000 spores being released in a laboratory accident predetermines their no-risk conclusion. Since a single gram of anthrax can contain a trillion spores, the addition of a zero or two to the 400,000 spores would be realistic and it would also shift the risk of exposure from none towards some. *The higher ranges of spore numbers should be incorporated to produce more realistic models.*

4) The authors have represented a variety of atmospheric conditions that might affect release, but, in their fixation on 400,000 spores, they have bypassed one of the most important findings of the study of the 1979 anthrax epidemic, namely, that virulent anthrax spores can be deadly as far as 50 kilometers from the source of a release. *The long-range virulent impact of anthrax should be included in models.*

5) I mention above the uncertainties regarding human dose response for inhalational anthrax. In contrast, the dose response for tularemia was successfully researched by the US Army, in the famous Project Whitecoat project of the 1960s and early 1970s. Although less lethal than anthrax, tularemia bacteria are highly infective, which is why it was the preferred biological weapon at Fort Detrick during the days of the US offensive program. Since BUMC has a recent history with the agent for this disease, it should rank among the worst-case scenarios that the pubic and government officials review. *A model of an accidental dispersal of tularemia should be developed, using current dose response data.*

II. *Including Epidemiological Variables*

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Computer models of outdoor pathogen release and disease transmission can be helpful only if they comprehend certain significant epidemiological variables and are open to a range of possibilities. The authors' limited understanding of disease transmission in an urban environment has led them to leave out important aspects that otherwise would have made their models more realistic and less dogmatic about their "no-risk" conclusion.

1) *Target aggregation and mobility*. The RWDI physical release models unrealistically presume that the select agent is mobile through space and over time and that the target population is both isolated as individuals and also stationary. It is only by presuming fixed individual immobility that a model would attempt to gauge the impact of anthrax pathogens on a single, immobilized person in the center of a plume, as if the release were in a wind tunnel. The reality is that collectivities of people make daily use of city space, indoors and outdoors.

The epidemiological reality of plume dispersal in an urban area was shown in the study of the 1979 Sverdlovsk epidemic. In that case, the victims were either aggregated at work (in a ceramics factory in particular) or they were in their homes or circulating in the affected neighborhood. A competent model of a potential aerosol release from the proposed BUMC facility would factor in at least nodes of aggregation (workers in present adjacent BU facilities, local hospitals, factories, schools, restaurants, bars, etc.) and, to be more refined, estimate patterns of sidewalk and street traffic, by day and night. My point here is that urban spaces have discernible patterns of aggregation and mobility that, in the case of a dangerous pathogen release, would be crucial to understanding health risks. If the disease were contagious, these patterns would be all the more important. *Realistic patterns of population aggregates and mobility should be included in any model of aerosol dispersion.*

2) *Medical Uncertainty*. The problem of human susceptibility to disease is also a challenge for computer models of outdoor release. In remarks made on an earlier RW draft, I suggested that consideration should be given to the demographics of the communities that might be downwind of an anthrax aerosol release. What we know about inhalational anthrax, for example, suggests that older people are more vulnerable than others. The focus on the individual in the RWDI models ignores this important fact. The people who would be exposed in an anthrax aerosol event do not come in standardized packages and it is misleading to suggest that a single standardized individual as opposed to a range credibly predicts outcome. For example, a breathing rate of 30 liters per minute is standard reckoning for an active young male of average build with normal lungs. What about other people with different profiles and vulnerabilities?

Regarding the different contagious diseases, the usual demographic factors would predict likely targets: children, especially those under two years of age, the elderly, pregnant women, and people already sick or with compromised immune systems. The Massachusetts Department of Public Health has most of the relevant statistics for the BUMC area. Calculating simply the number of elderly would have been helpful for the anthrax model and, of course, the demographic profiles of local communities would have been essential for the missing contagious disease model. *Demographic data should be included in any models of aerosol pathogen dispersal.*

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To summarize, the two RWDI reports on Hazard and Risk Assessment fail to represent such threats as might exist to local communities by leaving out important medical and epidemiological aspects of aerosol disease transmission. Their conclusion that no spores would be inhaled is based on a mechanistic model that ignores the complexities of disease transmission. Such complexities can be addressed by offering a flexible range in data input, which the RWDI authors appear reluctant to do.

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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

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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:

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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

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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.

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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.

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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.

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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)

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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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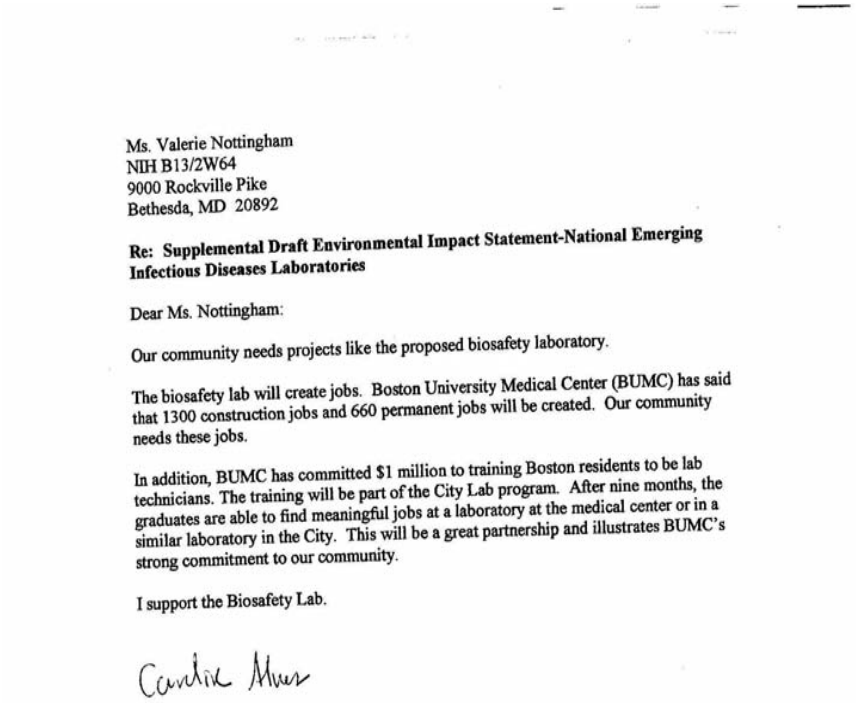

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

Our community needs projects like the proposed biosafety laboratory.

The biosafety lab will create jobs. Boston University Medical Center (BUMC) has said that 1300 construction jobs and 660 permanent jobs will be created. Our community needs these jobs.

In addition, BUMC has committed $1 million to training Boston residents to be lab technicians. The training will be part of the City Lab program. After nine months, the graduates are able to find meaningful jobs at a laboratory at the medical center or in a similar laboratory in the City. This will be a great partnership and illustrates BUMC's strong commitment to our community.

I support the Biosafety Lab.

Caroline Alves

LETTER 5

Caroline Alves

Massachusetts Biologic Laboratories
University of Massachusetts Medical School
305 South Street, Jamaica Plain, MA 02130
UMASS. Telephone: 617-983-6400 Facsmile: 617-983-9081

May 2, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I am writing to express support for the National Emerging Infectious Diseases Laboratories at Boston University Medical Center (BUMC).

As you are aware, biomedical research laboratories operate under strict procedures and protocols at BUMC and at other academic and private laboratories throughout the Greater Boston region. This research is done safely and makes important medical contributions to the nation and the world. I am familiar with the design of the proposed laboratory at BUMC and believe that it is being designed and built using sophisticated and state-of-the-art safety and security systems. I firmly believe that BUMC has a deep commitment to ensuring the safety of the laboratory, the researchers and the community. Despite some discussion concerning its location, I believe this facility should be located in the greater Boston area, which functions as a hub for medical research activities due to a significant base of resident medical research scientists. By placing the facility in such close proximity to this rich research community, scientists are assured of their ability to share research and knowledge through direct collaboration with other institutions in the greater Boston area.

The Biosasfety Level 4 Laboratories in North America have a very good safety record. With more than 77 years of combined operations, there has never been a community incident or an environmental release.

A BSL-4 laboratory will provide much needed capacity to study emerging infectious diseases and will be very beneficial for scientists and researchers throughout the region who are looking for cures and vaccines for some of the world's deadliest diseases. This laboratory will safely conduct research on infectious diseases that threaten the safety and security of our city, of the nation and indeed, of the world.

I support BUMC's research efforts and its plans to build the NEIDL.

Sincerely,

Donna M. Ambrosino, M.D.
Director and Professor
Massachusetts Biologic Laboratories
University of Massachusetts Medical SChool

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Donna M. Ambrosino, M.D.

LETTER 7

Dunia Andreadi

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

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I support the Biosafety Lab.

Dunia Andreadi

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

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I support the Biosafety Lab.

Maria Andreadi

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Maria Andreadi

CBEP *Center for Biodefense and Emerging Pathogens*
111 Brewster Street • Pawtucket, RI 02860 • 401-729-3857

3 May 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

The Center for Bidoefense and Emerging Pathogens (CBEP) is writing to express support for the National Emerging Infectious Diseases Laboratories at Boston University Medical Center (BUMC). There is an urgent need in this country to create facilities to conduct research aimed at finding causes, diagnoses, and therapeutics for the alarming number of recently emerging and re-emerging infectious diseases, including those that may occur as the result of a bioterrorism attack. The mission of CBEP involves research, education, training and consultation in the arena of biodefense; our mission and that of other scientific groups invested in the public health would benefit greatly from the presence of the NEIDL in Boston.

Our organization would like to comment on two very important issues raised in the document - the appropriateness of the proposed location of the facility and the safety of the proposed Biosafety Level 4 laboratory.

As discussed in the document, prior to making a determination to site the proposed NEIDL facility at the BioSquare Research Park, Boston University undertook an alternatives siting analysis that evaluated existing sites under its control to determine the best location for the facility. The study concluded, and CBEP concurs, that the best location for this facility is exactly where it is proposed in the BioSquare Research Park in the City of Boston, MA. BioSquare Research Park is a state of the art medical research park which contains medical research facilities including Biosafety Level 1, 2 and 3 laboratories that the proposed facility will be able to take advantage of. BioSquare Research Park is also located directly across the street from the Boston University Medical Center campus which also houses hospital and medical research facilities and is the largest Level 1 Trauma Center in New England.

Affiliated with Memorial Hospital of Rhode Island

LETTER 9

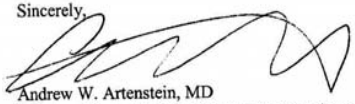
Andrew W. Artenstein, MD

While it is clear that some community members feel that such a facility should be located in a more rural location, CBEP feels strongly that the facility should be located in an urban area which functions as a hub for medical research activities and which has a significant base of resident medical research scientists. This would facilitate the use of shared research facilities and knowledge via direct collaboration among the various institutions located in the greater Boston area.

In regards to concerns regarding the safety of the proposed facility and in particular, the Biosafety Level 4 laboratory, CBEP believes that the facility will be safe. There are several federal and state programs which require the facility to be constructed and operated at extremely high safety standards. Similar laboratories throughout the United States have operated safely for decades.

In closing, we urge you to proceed with the funding to construct this much needed national resource at the BioSquare Research Park in Boston.

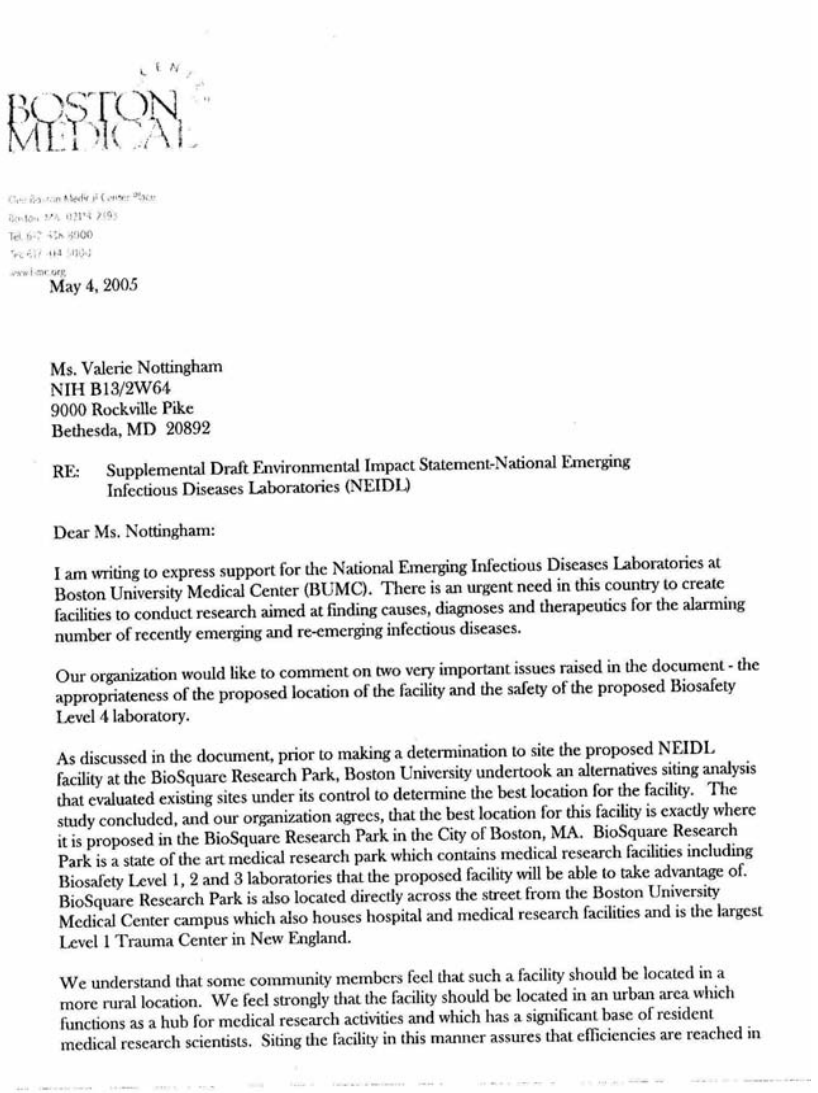
Sincerely,



Andrew W. Artenstein, MD
Director, Center for Biodefense and Emerging Pathogens
Associate Professor of Medicine and Community Health,
Brown Medical School

LETTER 9

Andrew W. Artenstein, MD



BOSTON MEDICAL

May 4, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

RE: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I am writing to express support for the National Emerging Infectious Diseases Laboratories at Boston University Medical Center (BUMC). There is an urgent need in this country to create facilities to conduct research aimed at finding causes, diagnoses and therapeutics for the alarming number of recently emerging and re-emerging infectious diseases.

Our organization would like to comment on two very important issues raised in the document - the appropriateness of the proposed location of the facility and the safety of the proposed Biosafety Level 4 laboratory.

As discussed in the document, prior to making a determination to site the proposed NEIDL facility at the BioSquare Research Park, Boston University undertook an alternatives siting analysis that evaluated existing sites under its control to determine the best location for the facility. The study concluded, and our organization agrees, that the best location for this facility is exactly where it is proposed in the BioSquare Research Park in the City of Boston, MA. BioSquare Research Park is a state of the art medical research park which contains medical research facilities including Biosafety Level 1, 2 and 3 laboratories that the proposed facility will be able to take advantage of. BioSquare Research Park is also located directly across the street from the Boston University Medical Center campus which also houses hospital and medical research facilities and is the largest Level 1 Trauma Center in New England.

We understand that some community members feel that such a facility should be located in a more rural location. We feel strongly that the facility should be located in an urban area which functions as a hub for medical research activities and which has a significant base of resident medical research scientists. Siting the facility in this manner assures that efficiencies are reached in

LETTER 10

Cheryl S. Barbanel, MD, MBA, MPH, FACOEM

terms in the ability to share research facilities and knowledge through direct collaboration among the various institutions located in the greater Boston area.
In regards to concerns regarding the safety of the proposed facility and in particular, the Biosafety Level 4 laboratory, our organization has no question that the facility will be safe. There are several federal and state programs which require the facility to be constructed and operated at extremely high safety standards. Similar laboratories throughout the United States have operated safely for decades.

In closing, we urge you to proceed with the funding to construct this much needed national resource at the BioSquare Research Park in Boston.

Sincerely,

Cheryl S. Barbanel, MD, MBA, MPH, FACOEM
Chief, Occupational & Environmental Medicine
Boston Medical Center

LETTER 10

Cheryl S. Barbanel, MD, MBA, MPH, FACOEM

LETTER 11

Florintina Barbosa

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab at BUMC.

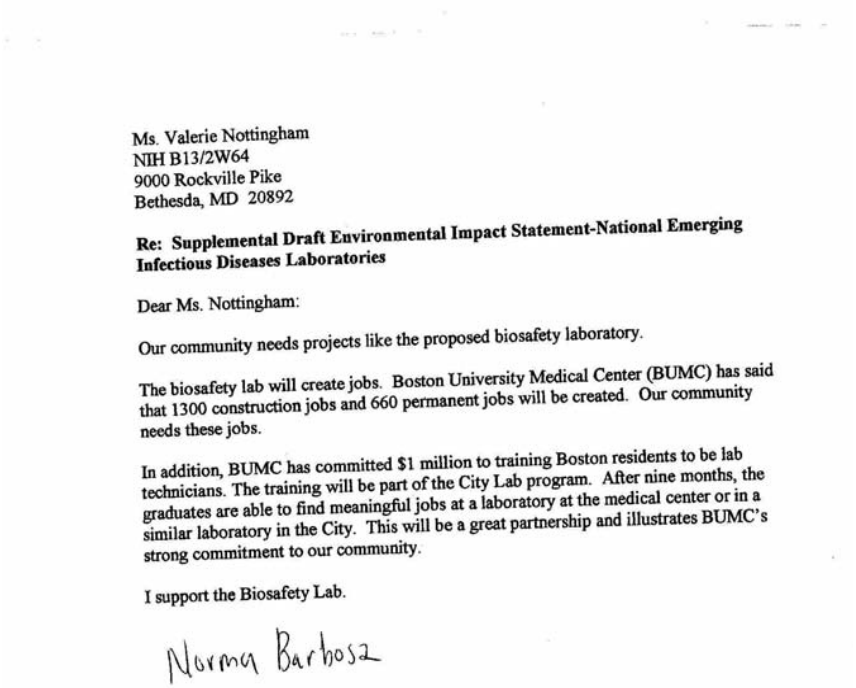
When I first heard about the laboratory, I must admit I was a bit apprehensive. However, the staff at Boston University Medical Center took the time to address my concerns and answer all my questions about the project.

I feel that this lab is important to find cures for infectious diseases. We need to have the appropriate facilities to do this important research. I believe that this lab will be built safely and that the redundant systems and the security plans will ensure that we are all safe.

Also, the development of this laboratory will create 1,300 construction jobs and 660 permanent jobs—jobs at all levels. This lab will have a positive economic impact at all levels in our community.

Sincerely,

Florintina Barbosa



Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

Our community needs projects like the proposed biosafety laboratory.

The biosafety lab will create jobs. Boston University Medical Center (BUMC) has said that 1300 construction jobs and 660 permanent jobs will be created. Our community needs these jobs.

In addition, BUMC has committed $1 million to training Boston residents to be lab technicians. The training will be part of the City Lab program. After nine months, the graduates are able to find meaningful jobs at a laboratory at the medical center or in a similar laboratory in the City. This will be a great partnership and illustrates BUMC's strong commitment to our community.

I support the Biosafety Lab.

Norma Barbosa

LETTER 12

Norma Barbosa

LETTER 13

Broderick Bass

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

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I support the Biosafety Lab.

Broderick Bass

James M. Becker, M.D.

Boston Medical Center
One Boston Medical Center Place/C500
Boston, MA 02118-2393
Tel: 617 638-8600
Fax: 617 638-8607

BOSTON UNIVERSITY SCHOOL OF MEDICINE
James Utley Professor and Chairman
Division of Surgery

BOSTON MEDICAL CENTER
Surgeon-in-Chief

Center for Digestive Disorders
BOSTON MEDICAL CENTER

May 4, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab also known as the National Emerging Infectious Diseases Laboratory (NEIDL) proposed at Boston University Medical Center (BUMC).

As you are aware, biomedical research laboratories operate under strict procedures and protocols at BUMC and at other academic and private laboratories throughout the Greater Boston region. This research is done safely and makes important medical contributions to the nation and the world.

I believe that the NEIDL at BUMC will be one of the safest laboratories in the world. I have been briefed on the systems and the design and am familiar with operations in biomedical research laboratories. I am impressed by the building's safety and security features and by the team BUMC has assembled to build this important project.

I should also note that there are some who have incorrectly raised the city of Boston's rDNA regulations, as a reason the laboratory should not be built. This is simply misinformation. rDNA research is conducted in Boston under the Boston Public Health Commission's regulations. On numerous occasions, BUMC authorities have stated that they will do all research in compliance with the Health Commission's guidelines.

This laboratory will be an important project for the research community and those interested in finding cures for emerging infectious diseases and I fully support it.

Sincerely,

James M. Becker, M.D.
James Utley Professor and Chairman of Surgery
Surgeon-in-Chief

LETTER 14

James M. Becker, M.D.

May 3, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

RE: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab also known as the National Emerging Infectious Diseases Laboratory (NEIDL) proposed at Boston University Medical Center (BUMC).

As you are aware, biomedical research laboratories operate under strict procedures and protocols at BUMC and at other academic and private laboratories throughout the Greater Boston region. This research is done safely and makes important medical contributions to the nation and the world.

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I should also note that there are some who have incorrectly raised the city of Boston's rDNA regulations, as a reason the laboratory should not be built. This is simply misinformation. rDNA research is conducted in Boston under the Boston Public Health Commission's regulations. On numerous occasions, BUMC authorities have stated that they will do all research in compliance with the Health Commission's guidelines.

This laboratory will be an important project for the research community and those interested in finding cures for emerging infectious diseases and I fully support it.

Sincerely,

Emelia J. Benjamin, M.D., Sc.M.
Professor of Medicine
Boston University School of Medicine
The Framingham Heart Study
73 Mount Wayte Ave. Suite 2
Framingham, MA 01702-5827

LETTER 15

Emelia J. Benjamin, M.D., Sc.M.

Nottingham, Valerie (NIH/OD/ORF)

From: Abenton1@aol.com
Sent: Wednesday, May 11, 2005 1:24 PM
To: NIH NEPA Comments
Subject: Letter of support - BUMC BioSafety Lab - Boston Massachusetts

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab at BUMC.

I live in the community where the proposed lab is being built and I have the utmost confidence in BUMC. When I first heard about the laboratory, I must admit I was a bit apprehensive. However, the staff at Boston University Medical Center took the time to address my concerns and answer all my questions about the project.

I feel that this lab is important to find cures for infectious diseases. We need to have the appropriate facilities to do this important research. I believe that this lab will be built safely and that the redundant systems and the security plans will ensure that we are all safe.

I am further pleased that the development of this laboratory will create 1,300 construction jobs and 660 permanent jobs—jobs at all levels. This lab will have a positive economic impact at all levels in our community.

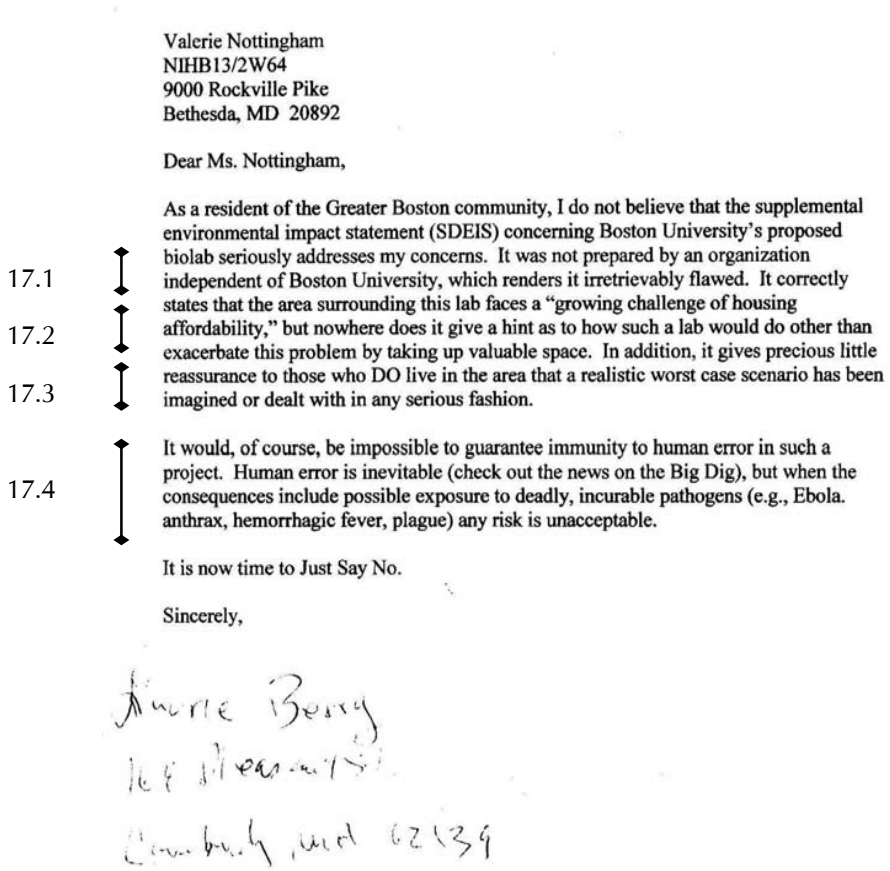
Sincerely,

Adrienne Benton

5/11/2005

LETTER 16

Adrienne Benton



Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

It is now time to Just Say No.

Sincerely,

Laurie Berry
[illegible]
[illegible] MA 02139

17.1
17.2
17.3
17.4

LETTER 17

Laurie Berry

17.1 See Response to Comment 1.1.

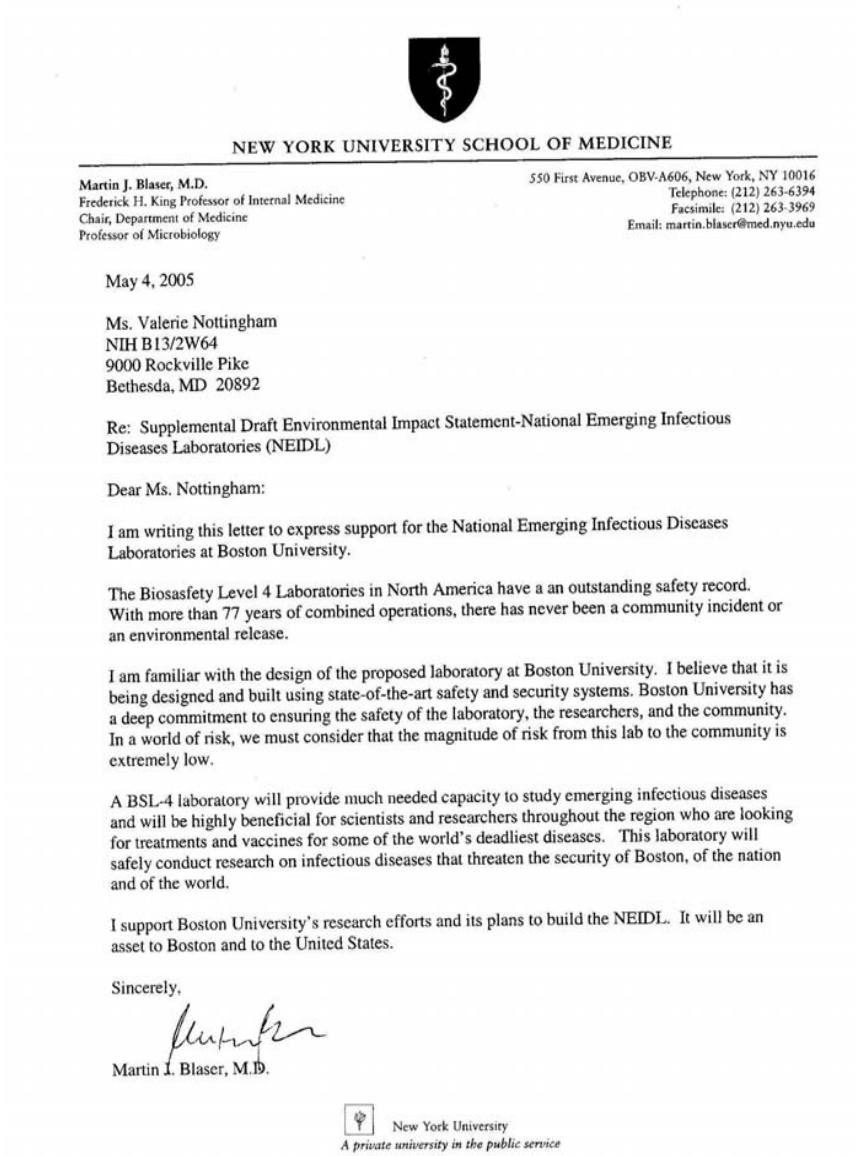
17.2 See Response to Comment 1.2.

17.3 See Response to Comment 1.3.

17.4 See Response to Comment 1.4.

LETTER 18

Martin J. Blaser, M.D.



NEW YORK UNIVERSITY SCHOOL OF MEDICINE

Martin J. Blaser, M.D.
Frederick H. King Professor of Internal Medicine
Chair, Department of Medicine
Professor of Microbiology

550 First Avenue, OBV-A606, New York, NY 10016
Telephone: (212) 263-6394
Facsimile: (212) 263-3969
Email: martin.blaser@med.nyu.edu

May 4, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I am writing this letter to express support for the National Emerging Infectious Diseases Laboratories at Boston University.

The Biosasfety Level 4 Laboratories in North America have a an outstanding safety record. With more than 77 years of combined operations, there has never been a community incident or an environmental release.

I am familiar with the design of the proposed laboratory at Boston University. I believe that it is being designed and built using state-of-the-art safety and security systems. Boston University has a deep commitment to ensuring the safety of the laboratory, the researchers, and the community. In a world of risk, we must consider that the magnitude of risk from this lab to the community is extremely low.

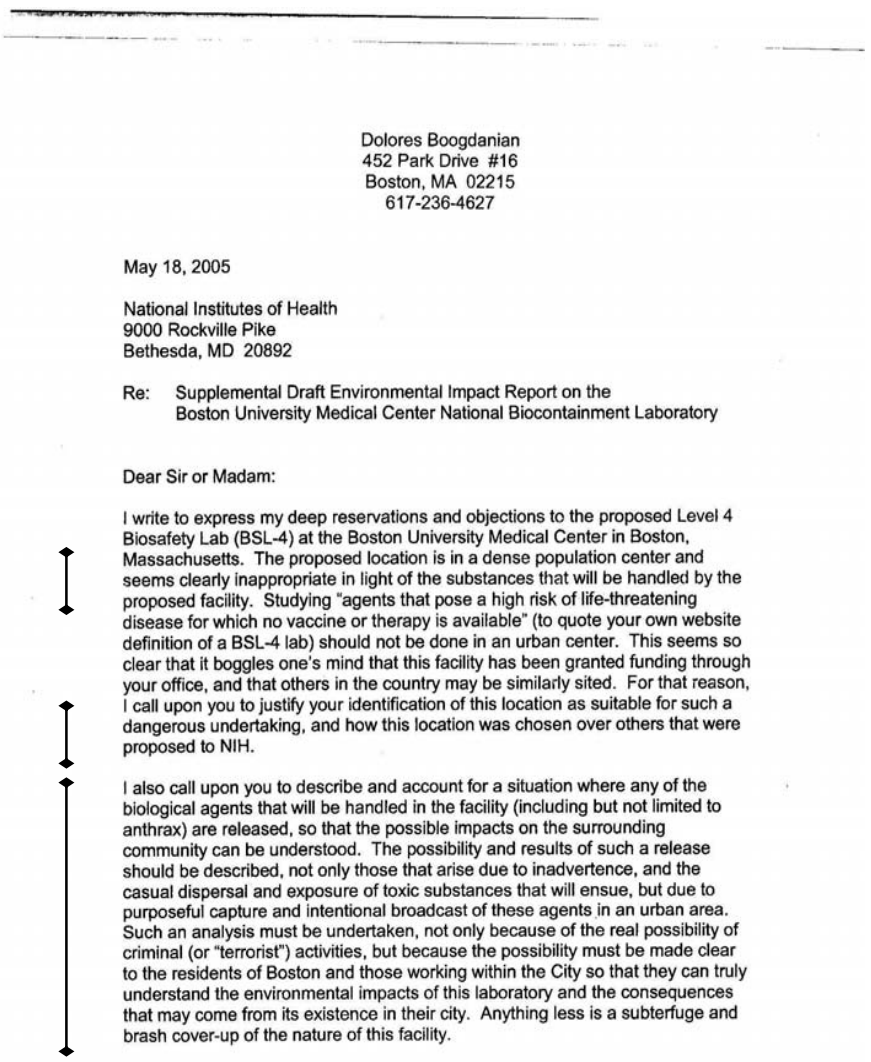
A BSL-4 laboratory will provide much needed capacity to study emerging infectious diseases and will be highly beneficial for scientists and researchers throughout the region who are looking for treatments and vaccines for some of the world's deadliest diseases. This laboratory will safely conduct research on infectious diseases that threaten the security of Boston, of the nation and of the world.

I support Boston University's research efforts and its plans to build the NEIDL. It will be an asset to Boston and to the United States.

Sincerely,

Martin J. Blaser, M.D.

New York University
A private university in the public service



Dolores Boogdanian
452 Park Drive #16
Boston, MA 02215
617-236-4627

May 18, 2005

National Institutes of Health
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Report on the
Boston University Medical Center National Biocontainment Laboratory

Dear Sir or Madam:

19.1 I write to express my deep reservations and objections to the proposed Level 4 Biosafety Lab (BSL-4) at the Boston University Medical Center in Boston, Massachusetts. The proposed location is in a dense population center and seems clearly inappropriate in light of the substances that will be handled by the proposed facility. Studying "agents that pose a high risk of life-threatening disease for which no vaccine or therapy is available" (to quote your own website definition of a BSL-4 lab) should not be done in an urban center. This seems so clear that it boggles one's mind that this facility has been granted funding through your office, and that others in the country may be similarly sited. For that reason,

19.2 I call upon you to justify your identification of this location as suitable for such a dangerous undertaking, and how this location was chosen over others that were proposed to NIH.

19.3 I also call upon you to describe and account for a situation where any of the biological agents that will be handled in the facility (including but not limited to anthrax) are released, so that the possible impacts on the surrounding community can be understood. The possibility and results of such a release should be described, not only those that arise due to inadvertence, and the casual dispersal and exposure of toxic substances that will ensue, but due to purposeful capture and intentional broadcast of these agents in an urban area. Such an analysis must be undertaken, not only because of the real possibility of criminal (or "terrorist") activities, but because the possibility must be made clear to the residents of Boston and those working within the City so that they can truly understand the environmental impacts of this laboratory and the consequences that may come from its existence in their city. Anything less is a subterfuge and brash cover-up of the nature of this facility.

LETTER 19

Dolores Boogdanian

19.1 The Maximum Possible Risk (MPR) model scenarios found in Appendix 12 apply an extremely conservative modeling algorithm over the proposed Boston University site taking into consideration the urban nature of the site. The model evaluates risks at a variety of points across this urban setting. Results of release scenarios subjected to maximum possible risk modeling reveal that public health risk resulting from the proposed siting of the BU laboratory is negligible.

19.2 The analysis of the potential effects indicates that the project is not a dangerous undertaking. Section 2.3, particularly the Siting Criteria in Section 2.3.2, explains how Boston University decided this location was appropriate.

19.3 It is impossible to determine all of the agents that potentially may be worked with in the proposed BSL-4 facility over time because laboratory personnel will be engaged in emerging infectious disease research as well as civilian biodefense research. However, the Centers for Disease Control and Prevention has evaluated microbial agents for potential use as agents of bioterrorism (Rotz, et al. 2002). Since several characteristics of civilian populations differ from those of a military population including a wider range of age groups and health conditions, previous lists of military biological threats cannot be adopted for civilian use. Second to smallpox, the possession of which is limited by international agreement and therefore will not be worked with at the proposed BU site, *Bacillus anthracis* is the agent that poses the greatest real and perceived public health risk if used as a weapon or through an accidental release. Thus, anthrax spores were chosen as the "worst case" modeling agent.

19.4 The analyses regarding the possibility and consequences of release must also include those that arise by virtue of the agents' transport to, from and within Boston on the streets and highways leading to and from the proposed laboratory.

19.5 It is essential that the analyses to be undertaken account for mistake, because mistakes occur. Boston University staff in a BSL-3 lab recently made a mistake, and the possibility of a release of tularemia occurred. Although the agent sickened the exposed workers, it was by sheer luck that the exposed workers did not cause others with whom they came in contact to sicken. That will not be the case if the agents to which workers are exposed at the proposed facility, and who may inadvertently expose others, are those typically handled in a BSL-4.

19.6 Lastly, the City of Boston has banned rDNA research. It must be revealed how the research that would be conducted at a BSL-4 will comply with this ban.

I urge you to ensure a thorough analysis of the impacts of a release of these agents in an urban setting, as is now suggested, so that you as well as the trusting public understand what the possible consequences are, and to truly understand whether they can ever be sufficiently mitigated or avoided.

Thank you for the opportunity to comment.

Signed:

Dolores Boogdanian

LETTER 19

Dolores Boogdanian

19.4 See Response to Comment 4.7.

19.5 See Response to Comment 4.44.

19.6 As noted in the FEIS, any research that may be conducted in the proposed Boston-NBL would comply with all applicable Federal, state and local laws, including laws governing the use of recombinant DNA. See Section 2.2.5.1.

LETTER 20

Maria Bossa

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab at BUMC.

When I first heard about the laboratory, I must admit I was a bit apprehensive. However, the staff at Boston University Medical Center took the time to address my concerns and answer all my questions about the project.

I feel that this lab is important to find cures for infectious diseases. We need to have the appropriate facilities to do this important research. I believe that this lab will be built safely and that the redundant systems and the security plans will ensure that we are all safe.

Also, the development of this laboratory will create 1,300 construction jobs and 660 permanent jobs—jobs at all levels. This lab will have a positive economic impact at all levels in our community.

Sincerely,

Maria Bossa

LETTER 21

Christopher Brayton

Valerie Nottingham, Chief, Environmental Protection
National Institutes of Health, B13 RM. 2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham,

I write to you of the Biosafety Lab at BUMC.

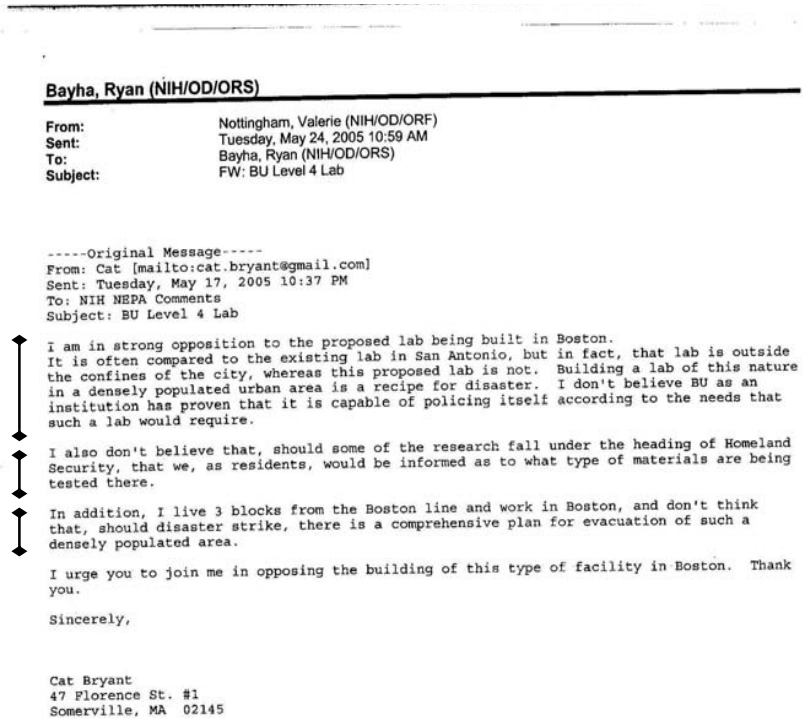
I have attended most of the meeting held by BUMC in their efforts to tell us about the laboratory and to answer questions from the community covering our concerns. After attending the meeting and visiting University of Georgia in Atlanta and their level 4 lab.

I have reached the conclusion that this lab is important to find cures for infectious diseases. I believe there is a need for this facility to do this research. And from what I have heard I believe BUMC has put together a plan that will provide a safe and secure lab for this research.

I have a ¼ mile from the proposed site for this lab and I feel comfortable BUMC will operate will all the controls needed to insure our safety.

Sincerely,

Christopher Brayton
3 Haven Street
Boston, MA 02118



Bayha, Ryan (NIH/OD/ORS)

From: Nottingham, Valerie (NIH/OD/ORF)
Sent: Tuesday, May 24, 2005 10:59 AM
To: Bayha, Ryan (NIH/OD/ORS)
Subject: FW: BU Level 4 Lab

-----Original Message-----
From: Cat [mailto:cat.bryant@gmail.com]
Sent: Tuesday, May 17, 2005 10:37 PM
To: NIH NEPA Comments
Subject: BU Level 4 Lab

22.1 I am in strong opposition to the proposed lab being built in Boston. It is often compared to the existing lab in San Antonio, but in fact, that lab is outside the confines of the city, whereas this proposed lab is not. Building a lab of this nature in a densely populated urban area is a recipe for disaster. I don't believe BU as an institution has proven that it is capable of policing itself according to the needs that such a lab would require.

22.2 I also don't believe that, should some of the research fall under the heading of Homeland Security, that we, as residents, would be informed as to what type of materials are being tested there.

22.3 In addition, I live 3 blocks from the Boston line and work in Boston, and don't think that, should disaster strike, there is a comprehensive plan for evacuation of such a densely populated area.

I urge you to join me in opposing the building of this type of facility in Boston. Thank you.

Sincerely,

Cat Bryant
47 Florence St. #1
Somerville, MA 02145

LETTER 22

Cat Bryant

22.1 The Southwest Foundation for Biomedical Research BSL-4 is located within the confines of northwest San Antonio, Texas, within the city limits. The risk assessment that appears in Section 4.2.1.1 "Community Safety and Risk" in the FEIS shows that the risk of the facility to the surrounding population is negligible. The risk would be negligible whether the facility was in an urban environment or a rural environment.

22.2 The purpose of the Boston-NBL is to provide a highly contained and secure laboratory dedicated to studying emerging and re-emerging infectious diseases, many of which have potential as bioterrorism agents. The laboratory would not develop offensive or defensive biological weapons, as this is forbidden by a national security directive and international law. The facility would be partially funded by the National Institutes of Health, a part of the Department of Health and Human Services. The laboratory would be owned and operated by Boston University. The Homeland Security Department is not involved with this project. There would be no classified research undertaken at the Boston-NBL facility. See Section 1.1.

22.3 In the event of an emergency, the decision to evacuate or contain and shelter in place is one that is made by the City of Boston emergency response agencies. BUMC has and would continue to fully cooperate with these public safety agencies in emergency response planning for unforeseen events.

LETTER 23

Phyllis L. Carr, MD

B O S T O N U N I V E R S I T Y M E D I C A L C E N T E R

BOSTON UNIVERSITY SCHOOL OF MEDICINE • SCHOOL OF PUBLIC HEALTH • BOSTON UNIVERSITY GOLDMAN SCHOOL OF DENTAL MEDICINE • BOSTON MEDICAL CENTER

Boston University
School of Medicine

Office of
Student Affairs
715 Albany Street, L-109
Boston, Massachusetts
02118-2526
Tel: 617 638-4166 or 4194
Fax: 617 638-4491
E-mail: plcarr@bu.edu

Phyllis L. Carr, M.D.
Associate Dean
for Student Affairs

May 11, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab also known as the National Emerging Infectious Diseases Laboratory (NEIDL) proposed at Boston University Medical Center (BUMC).

As you are aware, biomedical research laboratories operate under strict procedures and protocols at BUMC and at other academic and private laboratories throughout the Greater Boston region. This research is done safely and makes important medical contributions to the nation and the world.

I believe that the NEIDL at BUMC will be one of the safest laboratories in the world. I have been briefed on the systems and the design and am familiar with operations in biomedical research laboratories. I am impressed by the building's safety and security features and by the team BUMC has assembled to build this important project.

I should also note that there are some who have incorrectly raised the city of Boston's rDNA regulations, as a reason the laboratory should not be built. This is simply misinformation. rDNA research is conducted in Boston under the Boston Public Health Commission's regulations. On numerous occasions, BUMC authorities have stated that they will do all research in compliance with the Health Commission's guidelines.

This laboratory will be an important project for the research community and those interested in finding cures for emerging infectious diseases and I fully support it.

Sincerely,

Phyllis L. Carr, MD

Phyllis L. Carr, MD
Associate Dean for Student Affairs

Nottingham, Valerie (NIH/OD/ORF)

From: subrata@bu.edu
Sent: Tuesday, May 03, 2005 7:04 PM
To: NIH NEPA Comments
Subject: National Infectious Diseases Laboratory (NEIDL)

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging

Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I am writing to express support for the National Emerging Infectious Diseases
Laboratories at Boston University Medical Center (BUMC).

The Biosasfety Level 4 Laboratories in North America have a very good safety
record. With more than 77 years of combined operations, there has never been
a community incident or an environmental release.

I am familiar with the design of the proposed laboratory at BUMC and believe
that it is being designed and built using some of the most sophisticated and
state-of-the-art safety and security systems. I firmly believe that BUMC has a
deep commitment to ensuring the safety of the laboratory, the researchers and
the community.

A BSL-4 laboratory will provide much needed capacity to study emerging
infectious diseases and will be very beneficial for scientists and researchers
throughout the region who are looking for cures and vaccines for some of the
world's deadliest diseases. This laboratory will safely conduct research on
infectious diseases that threaten the safety and security of our city, of the
nation and indeed, of the world.

I support BUMC's research efforts and its plans to build the NEIDL.

Sincerely,

Subrata Chakrabarti, Ph.D
Instructor in Medicine
Boston University School of Medicine
700 Albany Street
CABR, Rm W533
Boston, MA-02118
Ph: (617)6384260
Boston, MA

LETTER 24

Subrata Chakrabarti, Ph.D

Nottingham, Valerie (NIH/OD/ORF)

From: David Cheimets [dcheimets@excite.com]
Sent: Friday, May 13, 2005 5:09 PM
To: NIH NEPA Comments

Gentlemen:

This letter will make clear my strong and continuing support for the creation of a bio-safety laboratory on the campus of Boston Medical Center in Boston to initiate research on emerging and evolving diseases.

I, along with many others, have testified in support repeatedly at the many hearings and meetings held to discuss this issue. Each person's reasons differ: mine are as follows.

- corporate research will continue to focus on problems with huge economic pay-offs, diseases and conditions that will result in widely used and profitable medications
- diseases that primarily affect third-world populations will not in any forseeable future fit that description and therefore will continue to be ignored by the private sector
- International air travel makes it impossible to contain diseases on any one continent; we are all at risk for all diseases
- Boston needs to re-create itself as an international bio research center to continue its crucial role as the economic engine of the whole New Englad area. Textile manufacturing left as did shoe manufacturing and computers; back room operations for money management is sliding away now.
- Boston keeps in the area a good percentage of those who graduate from our prestigious universities; this facility will not only keep scientists here but bring many from elsewhere, enriching our workforce again. The present economic world values and rewards only a highly educated workforce.

Those of us old enough to remember the frightening and destructive polio epidemics of the past must stand witness to the need for this facility. Neither baseless fear nor stubborn ignorance should be allowed to prevent this facility from providing the solutions, cures and preventions that the world needs.

Thank you for your interest.

Sincerely,

Sheila Cheimets
540 Massachusetts AVenue
Boston, Massachusetts 02118
617-536-3281

5/16/2005

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Sheila Cheimets

LETTER 26

Michael A. Cohen

5/18/2005 11:27 AM FROM: Fax 617-734-8828 Boston University TO: 1,301,480,8056 PAGE: 002 OF 003

Ms. Valarie Nottinghaum, Chief
Environmental Quality Branch
Division of Environmental Protection
Office of Research Facilities
National Institutes of Health
DHHS, B13/2W64
Bethesda, MD 20892

Re: Boston National Emerging Infectious Diseases Laboratories Facility—Scoping for Supplimental Environmental Impact State

Dear Ms Nottingham:

Enclosed as an attachment to this letter is my comments to the NIH Supplemental Draft Environmental Impact Statement. My detailed comments are contained in the attachment. While this document provides a worse case scenario not only is it deeply flawed, it fails to give sufficient information to justify an opinion one way or another. For an example, it asserts that the sewage system in Boston is adequate to handle the waste of the Baobabs but fails to provide any information to support the claim. Similarly it fails to discuss failures of the HEPA filtration system. Neither of these claims are academic as Plum Island filtration system was secured by duct tape in 1992 and has been for years the first or second major polluter in Long Island Sound. Plum Island is one of the high security Biolabs in existence since the end of World War II and provides ample evidence of what a failure of security could bring to New England. There was no indication of the frequency of transportation of hazardous materials along with their sources and destinations so one could not even begin to assess risk. The documents assertion that the preparers Kevin Tuohey the chief safety officer of the project and Jack Murphy a manager of one of the core facilities have no financial or other interest in this project is about as likely a claim as an assertion that George Bush had no "financial or other interest in his reelection campaign".

I act as an action editor on a Scientific Journal and I would not even send this piece out to review if I had received it, it would be returned, rejected, with notes as to what an adequate piece would be.. Finally, the issue of accountability, transparency and democracy never has been raised. Should there be a release and or a transmission of disease through the insects colonies contained in the BSL4 lab or through negligence or intent how will responsibility be established? Who will pay for any cleanups that might occur, bear in mind the anthrax cleanup of the Washington Post Offices cost several hundred millions of dollars, what would a mosquito release of Dengue Fever cost? Why aren't the citizens of the area involved given a chance to vote on this issue? We say we believe in democracy but of matters of great importance to the well being of the areas of citizens we don't even both to take a vote.

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I thank you for the opportunity to comment on this NIH draft and would in the future like to be put on any email or other distribution lists.

Respectfully yours,

Michael A. Cohen
25 Stearns Road, Unit 3
Brookline, Mass 02446
Sent via Email: nihnepa@mail.nih.gov
Sent via Fax: Fax (301) 480-8056

LETTER 26

Michael A. Cohen

Michael Cohen
25 Stearns Road #3
Brookline, Mass 02446

Phone: (617) 734-8828
Fax: (617) 353-9484
E-mail: mike@cns.bu.edu

COMMENTS ON THE NIH SUPPLIMENTAL DRAFT IMPACT STATEMENT

Why this does not pass scientific muster as a serious justification for BSL4 Lab in Boston.

LETTER 26

Michael A. Cohen

5/18/2005 11:37 AM FROM: Fax 617-734-8828 Boston University TO: 1,,301,480,8056 PAGE: 004 OF 024

ABSTRACT **THE NIH SUPPLIMENTAL DRAFT ENVIRONMENTAL INPACT STATEMENT**

ABSTRACT

The draft environmental impact statement is flawed in many respects. The process conducted is virtually incapable of producing objective assessments of the lab costs and benefits.
The NIH process for constructing the Impact Statements is almost virtually precludes an objective assessment. There is no attempt to deal seriously with the risk of many alternative scenarios. While one certain instance of a breach of security is analyzed, the analysis appears flawed. None of the other scenarios are seriously addressed. As for issues of the environmental justice, the BU treatment is a travesty since it does not seriously address the issues and gives no evidence that the low income residents of the area will benefit from this project in any significant

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SECTION I | CREDIBILITY

The National Institute of Health wants us to believe that this lab is entirely safe even though in their memo written in December 2000, the NIAID notes that the "Rocky Mountain BSL4 Lab is located in Western Rural Montana, well removed from major population centers. The location reduces the possibility that a release of a BSL4 organism would lead to a public health disaster. Evidently, the NIH is aware of this risk in Boston. It is interesting that reportedly the NIH cannot operate the BSL4 laboratory on its own campus due to the opposition of the local residents of Bethesda. It was interesting that this very same memorandum spoke of joint operations of the Bethesda Lab on the NIH campus and the lab.

As a means of comparison of different Universities I take the number of papers in refereed Journals on microbiology, the subject which study of emerging infectious diseases as indexed in Pub Med the National Library of Medicine Database. Of course this is far from a perfect measure, but it correlations highly with the University activity and the distinctions draw will not be fine.

Of course the premier new site for a BSL4 lab is the home of the NIH from the standpoint of availability of scientific talent interested in this endeavor. For example the last year the NIH wrote 113 papers in Microbiology many of which involve the agents to be studied under this program. Another wonderful site from this standpoint would be Harvard University which could upgrade the already existing unused biolab on the Cambridge, Alston border, saving a great deal of construction costs. The close proximity of the RCE at Harvard with National Center would be a clear plus. Furthermore the Distinguished Biology Departments at Harvard University and Harvard Medical School with 139 papers on the subject shows great scientific strength In contrast all of BU has 17 papers published last year on Microbiology which includes the study of emerging infections diseases (as measured by a Search in Pub Med) . However, Harvard did not apply perhaps because it felt that the more stringent public control necessitated by Cambridge ordinance or they agreed with the NIH's earlier memo and its actions in Bethesda which suggests they are aware of the dangers of a site placed in a City. Its pretty clear that First Rate Biological // Medical Campuses like say Harvard, Berkeley, Stanford, Cornell, John's Hopkins have stayed away from competitively applying for NCEEID's . Second Tier schools looking to increase their medical research capacity have applied for this. While this may be laudable from their administration's desire to strengthen their research capacity, it is hardly a conducive arrangement for conducting the best research.

In short the NIH would have a lot more credibility in their claims if they operated and expanded the Bethesda BSL4 facility which is the most natural site for expansion, neglecting of course threats to an Urban population.

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SECTION II | PROCESS

PROCESS

It is perhaps useful to have the primary preparers of this document be affiliated with Boston University. After all it is they have a strong financial interest and will naturally bias their account in favor of proceeding with the process. However, to have no outside competent review of the claims is irresponsible. To quote Page 171 of the SDEIS, "The following personnel provided technical assistance to the NIH. None of these persons have a financial or other interest in the outcome of this project". The list of names and associations are presented herein.

Table I

Name	Position	Place of Employment	Relationship with BU
Sara Arulanandam	Senior Technical Coordinator	RWDI	No Apparent Relationship
Ellen Berlin	Director Communications	Boston University Medical Center	Medical Center Employee
Paul Avery	President, P. E.	Oak Engineers, Newburyport Mass	No Apparent Relationship
Scott Butler, P.E.	Architect, Project Director	CUH2A, Princeton New Jersey	Scott is currently leading CUH2A's design team on the Boston University Medical Center's National Biocontainment Laboratory in Boston.
Jamie M. Fay	President, A.I.C.P	Fort Point Associates	BU's chief consultant for this and other projects
Cameo Flood	NEPA Specialist	Maxim Technologies, Missoula Montana	Prepared EIS for the NIH
Charles Haytner RLA	Senior Associate	Stubbins, Associates	Help design many buildins for Boston University Including, Dental School Renovations and Biosquare Lab Buildings
Jane Howard	Transportation Engineer/Planner	Howard Stein Hudson	Routinely does transportation planning for Boston University.I
Karyn Lincoln	EJ Justice Specialist	Maxim Technologies,	No direct connection

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		Helena Montana	to BU.
Jack Murphy, PHd	Professor of Medicine and Microbology	BMC Employee	BSL4 Containment Core Director
Stephen Ransom	Environmental Engineer	Ransom Environmental Newburyport	No immediate connection
Carla Richards	Director, Community Relations	Boston University Medical Center	In charge of community relations for this BU project
Robert Rossi CCM	Senior Atmospheric Scientist	Tech Environmental, Inc.	No Apparent Relationship
Rebecca Ryan MPH	Biosafety Officer	BUMC	BU Medical Center Employee
Peter Schneider	Director of Environmental Safety	BUMC	BU Medical Center Employee
Felipe Schwartz	Planner, Architectural Associates	Fort Point Associates	BU's general City Planning and Consulting Firm
Susan St. Pierre	A.I.CP, Senior Associate	Fort Point Associate	Chief BU Consulting firm for the BSL4 Project
Kevin Tuohey, C.H.P.A. Executive Director Operations and Public Security	Executive Director, Operations and Public Safety, B.A. Criminal Justice	BUMC	Chief Security Officer, for BSL4 project , responsible for security Planning
Kara Wilber	Planner BA Environmental Studies	Fort Point Associates	Chief BSL4 lab consulting firm and planner for Boston University.

Out of the 19 acknowledged preparers for this project 13 out of the 19 are either personnel employed by BU or its consultants or have a substantial stake or play an integral part in the project. Individuals which the NIH claimed had no stake in the project include one of its chief scientists and its director of security. The more **accurate statement is that key personnel with a substantial interest in the granting of this project prepared this document. Such transparent and blatant falsehoods** about lack of interest in this project further undermine any confidence one has in this report.

26.1

While of course the best advocates and often the individuals who know the project best including its warts are the developers, it is a great deal to ask given the substantial financial stake that this group has in the project that to expect any form of objectivity. A much better approach would have all NIH extramural projects of this size reviewed by an outside authority, one unrelated to the project. A suitable blue ribbon panel of people are not hard to find. "The committee on research standards and practices to prevent the Destructive Application of Biology" of the National Research Council should be reactivated to see if security concerns, regulation and location of this BSL4 project are adequately addressed. **Voluntary review by outsider observers and revisions if necessary of the entire project is necessary if security concerns are to be met.**

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26.1 The list of preparers indicates those who participated in the preparation of the EIS. The statement that none of these persons have a financial interest in the outcome of the project is accurate, even though some of those persons may be employed by BUMC. The NIH will make an independent, objective decision on whether to proceed with the Proposed Action in the NIH's ROD.

26.2 The DEIS, SDEIS, and FEIS for the proposed Boston-NBL have been made available to the public for comment. The distribution list may be found prior to the Appendices in the FEIS. Moreover, the document has been reviewed by the NIH's Division of Physical Security Management.

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Michael A. Cohen

5/18/2005 11:37 AM FROM: Fax 617-734-6828 Boston University TO: 1,,301,480,8056 PAGE: 008 OF 024

SECTION III **ALTERNATIVE LOCATION FOR THE BIOLABS**

While there is extreme fear of nuclear weapons due to their ability to incinerate large numbers of people instantaneously infectious agents during pandemics have killed huge numbers of people with much suffering in short periods of time. The bubonic plague has killed 30 to 35% of the population in Europe over a period as short as five years. Smallpox eradicated some American Indian and Latin Indian populations with no immunity with up to 90% mortality. The influenza epidemic of 1918-1919 killed from 20 to 40 million people worldwide and 500,000 people in the US within a year. In contrast the death toll from Hiroshima and Nagasaki combined is approximately 340,000 considerably less than by these infectious disease pandemics. Not to minimize the dangers due to nuclear weapons, infectious diseases under the right circumstances can be both highly lethal and lead to painful and unpleasant death. For this reason serious infectious agents should be treated with the utmost caution and their engineering while studying cures or defending against attacks should be done conservatively.

On the other hand, the threat of emerging infectious diseases is real. 250 people just died of the Marburg virus and all experts believe that a serious flu epidemic is a disaster waiting to happen. In fact, it is not clear why a major pandemic due to flu virus mutation hasn't happened already. The Asian Avian flu with a 60% mortality is already jumping from chickens to people in Vietnam but so far we have been spared human to human transition. The aids pandemic is devastating Africa and killing very substantial portions of their population. It is not human nature to wait for diseases to kill off substantial parts of the population, its important to act now.

The compromise of the last generation was instructive, rather than attempt to build nuclear facilities for testing and wait till the Nazi's built them first, the Manhattan project under General Leslie Grove was set up in Los Alamos New Mexico an unpopulated area and a nuclear weapon was eventually detonated. One did not set up the facility in New York, Boston, San Francisco, Princeton where most of the scientific talent was and build nuclear devices because of "the natural synergy that existed between scientists". No doubt given the level of risk if the scientists were asked whether the wanted to do this experimentation in the middle of cities they would be horrified. However, these are different times and the Government understandably wants to get the most bank for the least capital, since there is not uniform agreement as to the risk from not acting. Moving the New England Center and the Regional Center for Excellence to a lightly populated area would indeed be more may costly in the short term. This is not certain however, because construction costs could possibly be less in a low demand isolated area. If on the other hand there is a "public-health" disaster as the NIH puts it in their own memo, the cost would be astronomical and this approach would look exceedingly short sighted a textbook case an example of externalizing risk . Thus the intuitive approach is to move the Center to a geographically stable site in an unpopulated area. The NIH argues that the risk of one of these BSL4 labs is negligible and thus it doesn't matter from the standpoint of public safety where the labs are put. The argument is first that the safety record of the BSL4 labs in existence is exemplary and second that a calculation of risk under the worst case is so negligible to be unimportant. It's the evaluation of these two arguments which we now turn. Then we will turn to discuss the public health value of the New Research.

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Section IV	The History of Safety in Biological Laboratories

The NIH study of intramural BSL4 labs suffers from at least three types of sampling bias. The first has to do with underreporting of incidents within these facilities itself. Every external incentive for these labs is to keep all health incidents unreported. Any report of an incident leads to unwanted outside scrutiny and possible disciplinary action. For example the resent Tularemia incident at BUMC was not reported to the public until an anonymous whistleblower leaked the information to the press. OSHA has found the BU system during this incident to be so deficient that it felt compelled to levy a $8100 fine. Neither the Boston Public Health Commission, nor BU felt the need to publicly report this incident. Indeed current CDC regulations suggest that such incidents be kept secret. Hidden key records establishing culpability may be destroyed by the offending institution itself as these institutions have control of this information.

Secondly, the NIH has studied the published and internal safety record at its elite facilities in which career officials have devoted their life and careers to establish safety. The performance of these institutions represents a best case of what might occur and may not be typical. Even here we will see some lapses. Performance at other laboratories at Universities, abroad and other government labs are not surveyed. is often far less rosy. Since the NIH claims not to be running this new Lab as a BSL4 Intramural Lab, and there is no reason to believe that they can magically transfer the performance at the best labs to these new University Labs. A blanket assertion that this is the case is unsubstantiated hubris.

Finally, no review of cases where the evidence is speculative but suggestive is discussed. It is noteworthy that we are certain of the origins of **none** of the emerging infectious diseases. Table II discusses some of this more speculative but suggestive evidence which at least raises the possibility that some of the spread of is caused by humans. In some cases, these claims cannot be evaluated largely because of the destruction of records at of the lapse of time.

TABLE II
EMERGING INFECTIOUS DISEASES WHOSE ORIGINS MIGHT BE CAUSED BY HUMAN INTERVENTION

Disease	Social Cost	Suggested Human Facilitation	Source
HIV/Aids	20 million dead since 1981, 40 million living with aids	The testing of oral polio vaccine in Africa using monkey sera contaminated with SIV occurred at 75% of the locations where the earliest cases of aids occurred.	Edward Hooper, London Review of Books
SARS	600+ individuals dead	The origin and cause of the current SARS outbreak was caused by the contamination of food related to the feeding, processing and slaughter of animals, meat products, and other elements in the surrounding environment. This was directly caused by a location where food products and people are	www.trv.com/news/tsl_051303.htm

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		contained and working. There is contamination by a liquid containing microorganisms, animal fluids, and feces. The location is a rural farm-like operation in China that could possibly be a forced labor camp similar to the Shayang Farm in the Hubei province.	
		Over two month period, two graduate students working BL 3 laboratory acquired SARS, leading to transmission to seven other people outside the lab, one death, and quarantining of over 200 people in two province	www.gene-watch.org
Lyme Disease	142,000 cases total 24,000, originally observed in Lyme Conneticut 1975	There were large-scale tick experiments conducted on Plum Island contemporaneously with the initial outbreak of Lyme Disease in 1975, on the heels of a proven virus outbreak that occurred on Plum Island in 1978. Lyme disease	Lab 257, Michael Carroll and others
West Nile Virus	12300 Cases for last two years	West Nile Virus first appears in horses close to Plum Island	Circumstantial evidence that virus stored at Plum Island two years earlier. See Lab 257

These inconclusive but suggestive accounts suggest that some of the most recent and deadly diseases resulted from human action and were not man made. The suggestion that these and other emerging infectious diseases results from the human actions most commonly in biolabs need to be taken seriously. **It is the height of arrogance to assume that the future will not bring surprises like the past and the Boston lab unlike earlier labs will be immune from consequential human error.** Table III taken from www.gene-watch.org below shows recorded well documented cases of recent accidents and there are documented earlier cases. We will see that the NIH accounts suffer from heavy selection bias.

Table III a more complete account of Accidents and Problems at US and other Biolabs

Mistakes Happen: Accidents and Security Breaches at Biocontainment Facilities *last updated on 1/27/2005*

Category	Date	Location	Accident Type	Agent	Description	Reference
Environmental Release	01/01/02	USAMRID (Fort Detrick, MD)	Accidental Release, Exposure of Personnel	Anthrax (Biosafety Levels 2, 3 and 4)	Retain one tested positive for exposure to anthrax spores, which were also detected into airplane, hallway and office.	David Brennan, "Fort Detrick worker tests positive for anthrax exposure," Associated Press 4/19/2002
	04/02/02	USAMRID (Fort Detrick, MD)	Accidental Release, Exposure of Personnel	Anthrax (Biosafety Levels 3, 3 and 4)	One worker tests positive for anthrax exposure after second leak at USAMRID.	Rick Weiss & David Snyder, "Anthrax Leaks a 2nd Time at Army Lab," Washington Post, 4/24/2002, A1.
	02/01/03	Federal Express (Columbus, OH)	Environmental Release	West Nile Virus (Biosafety Levels 2 and 3)	A package containing the West Nile virus exploded in Federal Express building, exposing workers to possible infection & causing offices to be evacuated.	"Package Carrying West Nile Explodes at Columbus Airport," Associated Press 3/20/2003
	06/01/03	USAMRID (Fort Detrick, MD)	Environmental Release	Brucellosis (Biosafety Levels 2 and 3), Anthrax (Biosafety Levels 2,3, and 4), Ebola (Biosafety Level 4) and others.	U.S. Army unearthed 1 ½ bacteria-containing vials during an excavation to eliminate toxic chemicals & hazardous waste (including live anthrax and ebola) buried between 1956 and 1970.	Lois Ember, "Fort Detrick Cleans Up," Chemical & Engineering News, 6/9/2003, p. 12
Intentional Release	11/26/03	(suspected) U.S. Army laboratories or Battelle Memorial Institute (Columbus, OH)	Intentional Release	Anthrax (Biosafety Levels 2, 3 and 4)	Anthrax spores used in 2001 mail attacks, killing five people, contained properties that could only be manufactured in one of a small number of sophisticated government or corporate laboratories.	Gary Matsumoto, "Anthrax Powder: State of the Art?" Science, Vol. 302, November 28, 2003, p.1492-97
	08/11/01	USAMRID (Fort Detrick, MD)	Intentional Release	Anthrax (Biosafety Levels 2, 3 and 4)	Dry anthrax spores derived from USAMRID were used in the Sep 2001 mail attacks that resulted in 5 deaths.	Timothy D. Read, et al. "Comparative Genome Sequencing for Discovery of Novel Polymorphisms in Bacillus Anthracis," Science, 4/14/2002, Vol. 296, pp. 2028-33
Containment and Security Failure	12/02/03	Ram Nerot Animal Disease Laboratory, USDA (Plum Island, NY)	Containment / Security Failure	None Reported	3 Hour power failure underscores containment systems, leading workers to seal windows & doors with duct tape, as cougrasures failed.	Nora Santora, "Power Fails for Three Hours at Plum Island Infectious Disease Lab," New York Times, December 20, 2002, p. B1
	06/18/97	National Institute of Infectious Diseases (NID), Tayama, Japan	Facility deemed a risk to public health and safety	Various, at a Biosafety Level 3 facility	A 1997 inspection of the Biosafety Level 3 facilities at NID conducted by a biosafety consultant to the World Health Organization concluded that there was a "strong possibility that NID, through its locales and activities, could be an unacceptable risk to public health and safety".	Dr. Christopher Collins and Dr. David Kennedy, "Report of an Inspection Carried Out at the National Institute of Infectious Diseases, Toyama, 1-23-1, Shingishu-ku, Tokyo 162, on 19 June, 1997" http://toxicology.usuhs.mil/biobeta/Inspection.pdf
	08/03/02	U.S. Department of Agriculture (various sites)	Containment / Security Failure	None Reported	FBI investigation finds many USDA laboratories that handle select agents are vulnerable to theft, permit unauthorized visitors, and cannot completely account for their pathogen holdings.	"Report Finds Many Lab Access to Deadly Pathogens," Reuters, May 7, 2002
Missing Samples	01/01/95	Texas Tech University (Lubbock, TX)	Missing Samples	Plague (Biosafety Levels 2 and 3)	Scientist Thomas Butler reports the loss of several vials containing plague.	"Scientist Says FBI Tricked Him Charges Filed Over Report of Missing Plague Bacteria," Washington Post, 10/19/2003, p.A13

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Michael A. Cohen

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Category	Date	Location	Accident Type	Agent	Description	Reference
	Early 1990s	USAMRID (Fort Detrick, MD)	Missing Samples	Anthrax, Ebola, and others not listed.	Over ten dozen dangerous agents including anthrax and Ebola go missing in the early 1990s at USAMRID. Agents subject to removal without authorization.	Pat Wallis and Judy Warnick, "Army Lost Track of Anthrax Bacteria," Washington Post, 1/21/2002, p. A1
Exposures and Infections of Personnel	5/15/04-6/15/04	Boston University Medical Center, Clinical Microbiology and Molecular Diagnostics Laboratory (Decline, MA)	Infection of Personnel	Tularemia (Biosafety Level 2 and 3)	Three scientists infected with tularemia over five-month period, while dozens more exposed. Incidents not discovered or reported for over six months.	Stephen Smith, "BU Delayed Reporting Potentially Lethal Exposure," Boston Globe, January 20, 2005.
	04/11/04	Children's Hospital and Research Center (Oakland, CA)	Exposure of Personnel	Anthrax (Biosafety Levels 2, 3 and 4)	Southern Research Institute inadvertently sends live (rather than dead) anthrax samples to researchers in Oakland, resulting in exposure of seven scientists. Problem detected after 48 of 50 mice quickly died after inoculation with anthrax samples. No human infections reported.	John Dudley Miller, "US Lab in Stunt Live Anthrax," The Scientist, June 11, 2004.
	05/03/04	State Research Center of Virology and Biotechnology (Russia)	Infection of Personnel	Ebola virus (Biosafety level 4)	Scientist researching Ebola vaccine at a US-funded facility is infected with Ebola and dies. Infection not reported for several weeks, preventing prompt and effective treatment.	Judith Miller, "Russian Scientist Dies in Ebola Accident at Former Weapons Lab," New York Times, May 25, 2004.
	03/28/04	National Institute of Virology (Beijing, China)	Environmental Release, Infection of Personnel	SARS (Biosafety Levels 3 and 4)	Over two month period, two graduate students working BL 3 laboratory acquired SARS, leading to transmission to seven other people outside the lab, one death, and quarantining of over 200 people in two provinces.	David Brown, "SARS Cases in Asia Show Labs' Risks," Washington Post, May 24, 2004.
	02/19/04	USAMRID (Fort Detrick, MD)	Exposure of Personnel	Ebola virus (Biosafety level 4)	Civilian Army researcher possibly exposed to Ebola virus after accidentally pricking herself with a needle that contained the virus while injecting mice with the virus as part of a research effort.	http://www.cnn.com/2004/HEALTH/02/19/ebola.exposure/index2.html, Barbara Hall "Researcher Isolated After Possible Ebola Exposure," CNN, 2/19/2004
	12/01/03	Institute of Preventive Medicine, National Defense University (Taiwan)	Infection of Personnel	SARS (Biosafety Levels 3 and 4)	Military researcher in a Biosafety Level 4 lab was infected while studying the SARS virus, leading to the quarantining of 34 people with whom he came in contact. No additional cases of SARS were reported.	"SARS Alert Likely to be Eased in New Year," China Post, 12/20/2003; Center for Disease Control, Taiwan, "A Report on the Laboratory-Acquired SARS Case in Taiwan," 1/7/2004.
	08/03/03	Environmental Health Institute (Singapore)	Infection of Personnel	SARS (Biosafety Levels 3 and 4)	Doctoral student handling SARS-contaminated West Nile virus sample in BL 3 facility is infected with SARS and hospitalized. Laboratory was found to not meet BL 3 safety standards.	David Brown, "SARS Cases in Asia Show Labs' Risks," Washington Post, May 24, 2004.
	04/05/02	University of Texas Health Science Center (Houston, TX)	Infection of Personnel	Anthrax (Biosafety Levels 2, 3 and 4)	Laboratory worker with primary responsibility of handling anthrax specimens was diagnosed with cutaneous anthrax.	"Suspected Cutaneous Anthrax in a Laboratory Worker--Texas, 2002," Morbidity and Mortality Weekly Report, 4/5/2002, p. 279.
	12/20/02	Unknown	Infection of Personnel	West Nile Virus (Biosafety Levels 2 and 3)	Microbiologist in U.S. laboratory contracted WNV after cutting finger with a scalpel used to perform a necropsy on lab animal.	G. Campbell, et. al, "Laboratory-Acquired West Nile Virus Infections--United States, 2002," Morbidity and Mortality Weekly Report, 12/20/2002, p. 1133.

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Category	Date	Location	Accident Type	Agent	Description	Reference
	09/01/02	Unknown	Infection of Personnel	West Nile Virus (Biosafety Levels 2 and 3)	Microbiologist in U.S. laboratory contracts WNV after puncturing skin with a contaminated needle.	G. Campbell, et al "Laboratory-Acquired West Nile Virus Infections--United States, 2002," *Morbidity and Mortality Weekly Report*, 11/20/2002, p. 1133.
	04/01/01	Rocky Mountain Laboratories (Hamilton, MT)	Infection of Personnel	Plague (Biosafety Levels 2 and 3)	Unknown number of researchers were infected with plague in during lab research.	Carlotta Grandstaff, "Hamilton's Health not 'Major' Concern," *Missoula Independent*. Vol. 14, no. 45.
	03/01/00	USAMRIID (Fort Detrick, MD)	Infection of Personnel	Glanders (Biosafety Levels 2 and 3)	Microbiologist contracted glanders in lab after accidental exposure.	Arjun Srinivasan et al., "Glanders in a Military Research Microbiologist," 345 *New England Journal of Medicine* 256, 256 (2001); Steve Vogel, "Army Studies Safety at Fort Detrick Lab; Scientists Contracted Potentially Fatal Disease at Biological Defense Center," *Washington Post*, 04/14/00, p.B3
	06/01/98	Yerkes Primate Center (Atlanta, GA)	Infection of Personnel	Simian Herpesvirus (Biosafety Levels 3 and 4)	Research Assistant at the Yerkes Primate Center, (Part of NIH Primate Research Program) died 6 weeks after being exposed in lab.	"Fatal Cercopithecine Herpesvirus 1(B Virus) Infection following a mucocutaneous exposure," *Morbidity and Mortality Weekly Report*, 47:1073-6, 1083. 1998.
	06/01/98	Yerkes Primate Center (Atlanta, GA)	Exposure of Personnel	Simian Herpesvirus (Biosafety Levels 3 and 4)	A second researcher was exposed to possible infection three weeks after first case (see above) at Yerkes Primate Center.	"Second researcher may have been exposed to deadly herpes B virus." *Star Tribune*, Minneapolis, MN. 1/1/1998, p.23A
	08/01/94	Yale University (New Haven, CT)	Infection of Personnel	Sabia Virus (currently Biosafety Level 4, though not designated as such in 1994)	Yale Virologist contracted sabia virus and subsequently exposed 76 coworkers in the laboratory.	M. Barry, M. Russi, L. Armstrong, et al. "Brief report: treatment of a laboratory acquired Sabia virus infection." *New England Journal of Medicine*. 1995; 333:294-6
	1985-87	Washington, DC	Infection of Personnel	HIV (Biosafety Level 2 and 3)	Two researchers who contracted virus in D.C. laboratories became infected after using defective gloves. Exposed through cuts on hands.	"New AIDS Infection in a Lab," *Chicago Tribune*. 10/10/1987, p. 5
	04/01/87	Unknown	Infection of Personnel	HIV (Biosafety Level 2 and 3)	A Researcher became infected with HIV after exposure through "unapparent abode in gloves" (speculation), no definite cause was identified.	Chase, Marilyn. "Worker Gets AIDS Virus from Lab Job," *Wall Street Journal* 1/4/1998, p.1

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The selection bias in the NIH reports is evident. Notice the security breach at Fort Detrick, Maryland where anthrax responsible for 5 of the mail anthrax deaths may have come. Notice the exposure and death of a worker due to Monkey virus at the Yerkes Primate Center in Georgia. The primate center is at Emory University, very close to the CDC. In addition in 1978 there was a documented outbreak of Foot and Mouth Disease which caused the destruction of all the animals on the Island (Carroll p. 100). In short by casting a narrow net and only using "official reports" the NIH seriously underestimates the amount of accidents in these facilities. Since the NIH fails to report documented accidents at facilities throughout the US including its own, the Credibility of this report is further weakened. The lack of agreement between the broader set of data and the Official Records casts considerable doubt on the value of the NIH recording methods.

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Security at Universities is particularly suspect, there have been numerous report questioning the viability of University Security. the USDA inspector General found security lax at the 104 institutions with no standardized methodology. The Sunshine project in a recent executive report found Instututional Biosafety Committees (http://www.sunshineproject.org/biodefense/tspibc.pdf), the University Committees responsible for biosafety woefully inadequate with most of the committees entirely inactive with no public records. Boston University had substandard results consistent with the results at many other Universities. It appears that up until the present Universities have not taken security and biosafety very seriously. This is not a surprise, as is well known security impedes the free exchange of ideas characteristic of a University environment. Furthermore students, and postdoctoral fellows the largest source of Labor at a University have no permanent career ties to their institutions, the stress is on obtaining publishable results fast and Universities cut corners on "unnecessary expenses". These reasons together suggest the University is a poor institution for maintaining security unless extraordinary other measures are instituted such as requiring students who work at these labs to take a job at these institutions for a significant period after they graduate.

Section V	Category A, Diseases, what BU Proposes to Study

26.3 BU lab is called that National Emerging Infectious disease lab. Actually the program is interest in biodefense which is by most authorities think to be dual use for offense. The agents studied are health problems but generally fairly minor. Surprisingly, some of the most dangerous infectious diseases from a standpoint of spread, mortality, or severity of public problem are at lower priority for this group. Hence the official name of this program National Emerging Infectious Disease Lab is largely a misnomer. Category A agents (BSL4) are described in Table IV which concentrates on the public health value of the study.

Table IV: The Value of Public Health for Research on Category A Agents

Infectious Agent	First Discovered	Size of Public Health Problem	Reasons for Category A
Anthrax	First named in 1800's thought to be plague of boils of the old testament 200 BC	1950-1978 500 reported cases in US	Not Contagious but inhalation anthrax i.e. enough in lungs generally fatal. No cure.
Botulism	1793, Named for German Sausage, first	1950 – 1996 1056 Total exposures	Very small number of molecules necessary for fatal exposure
Tularemia	First described 90 years ago. In the Czech republic tularemia was first identified in 1936. north-west and east of Bohemia	Between 1985 and 1992, 1409 cases and 20 deaths were reported in the United States, for a	Very High Level of Infectivity, 10 Organisms or Less

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26.3 The purpose of the Boston-NBL is to provide a highly contained and secure laboratory dedicated to studying emerging and re-emerging infectious diseases, many of which have potential as bioterrorism agents. The laboratory would not develop offensive or defensive biological weapons, as this is forbidden by a national security directive and international law.

		mean of 171 cases per year and a case-fatality rate of 1.4%.	
Smallpox	Very serious disease 100 years ago. Now eradicated a triumph of medicine and sanitation.	Entirely eradicated. Two stores exists one in the CDC, the other in Russia	Easily translated from person to person, no effective therapy, and people generally lack immunity
Plague	Known since the Middle ages when a form of the bacteria wiped out 30% of the population	10 to 20 cases in the US. Mostly eradicated 56 deaths in India 1994	Aerosolized bacteria or occasionally spread directly person to person. Effectively treated by antibiotics without antibiotics near 100% mortality
Viral Hemorrhagic Fever	Significant Public Health Problem, variants of VHF are highly debilitating or lethal and result in significant deaths which are quite unpleasant. Originally discovered in 1779	1800 cases of Ebola since 1992 and 1200 fatalities, in contrast Dengue Hemorrhagic Fever has about 100,000 cases a year with approximately 1% Mortality.	These viruses pose a risk from intentional exposure because, with very few exceptions, no vaccines or proven treatments exist, and many of the diseases are highly fatal. Natural infections occur when people come in contact with rodents or insects that are infected or act as vectors. After human infection occurs, some VHFs can be transmitted from person to person through close contact or contaminated objects, such as syringes and needles.

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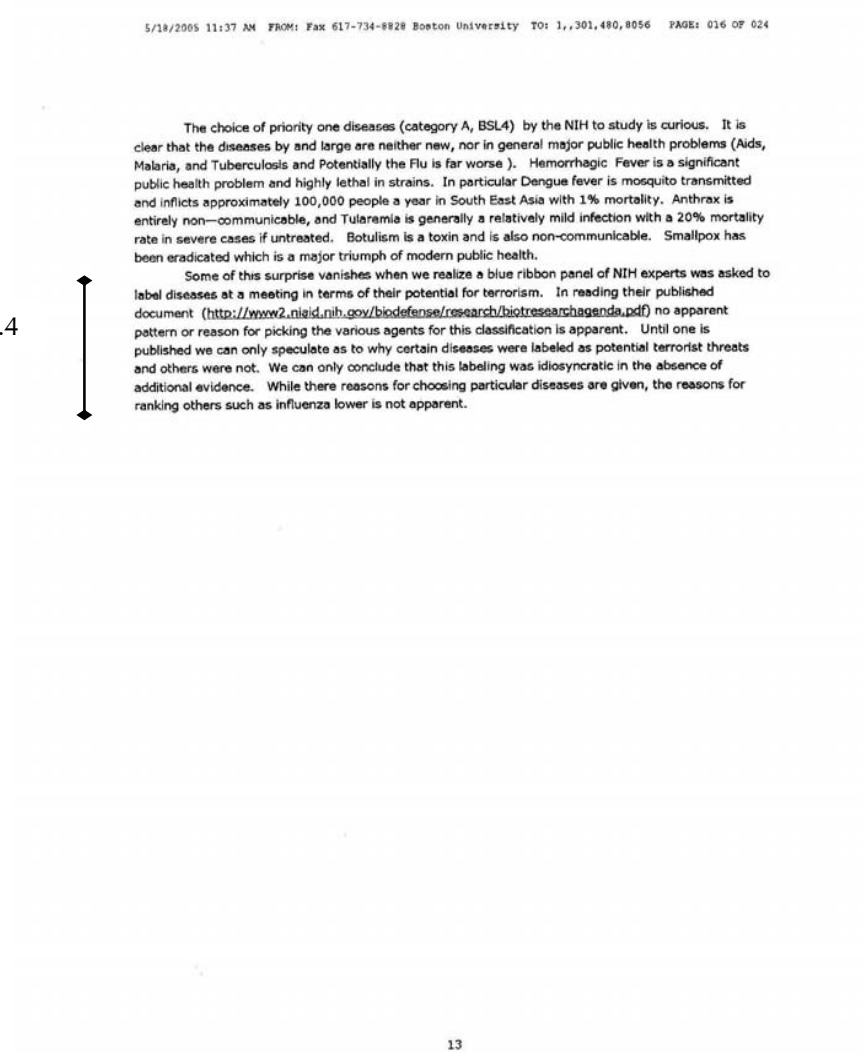

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The choice of priority one diseases (category A, BSL4) by the NIH to study is curious. It is clear that the diseases by and large are neither new, nor in general major public health problems (Aids, Malaria, and Tuberculosis and Potentially the Flu is far worse). Hemorrhagic Fever is a significant public health problem and highly lethal in strains. In particular Dengue fever is mosquito transmitted and inflicts approximately 100,000 people a year in South East Asia with 1% mortality. Anthrax is entirely non—communicable, and Tularamia is generally a relatively mild infection with a 20% mortality rate in severe cases if untreated. Botulism is a toxin and is also non-communicable. Smallpox has been eradicated which is a major triumph of modern public health.

Some of this surprise vanishes when we realize a blue ribbon panel of NIH experts was asked to label diseases at a meeting in terms of their potential for terrorism. In reading their published document (http://www2.niaid.nih.gov/biodefense/research/biotresearchagenda.pdf) no apparent pattern or reason for picking the various agents for this classification is apparent. Until one is published we can only speculate as to why certain diseases were labeled as potential terrorist threats and others were not. We can only conclude that this labeling was idiosyncratic in the absence of additional evidence. While there reasons for choosing particular diseases are given, the reasons for ranking others such as influenza lower is not apparent.

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26.4 The classification of agents was not decided by the NIH, but by the Centers for Disease Control and Prevention (CDC). The rationale of this classification can be found in a paper by Rotz, et al. (Rotz , et al. 2002). Category A agents are defined as being easily disseminated or transmitted from person to person; resulting in high mortality rates and having the potential for major public health impact; causing public panic and social disruption; and requiring special action for public health preparedness, thus giving them research priority.

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SECTION VI	THE NIH WORST CASE SCENARIO -- NOT EVEN WRONG

First I would like to commend the NIH for taking my earlier comments to heart involving scientific rigor. However rigorous simulations and quantitative analysis are worse then useless if the measurements necessary to support the model are highly indeterminate. In this case the normal approach in science is do further experiments. However rather than do this the consultants hired by BU chose to argue by assertion.

At this juncture, it will be useful to sketch what a "worst--case scenario" would entail and second outline the deficiencies of the BU argument. It is of course hypothetically possible that the BU argument is correct. We will show that insufficient evidence is provided to evaluate this or any claim so that the BU/NIH argument is not even wrong i.e. we have learned little or nothing from it.

The idea behind a worst case scenario is that a particular event is chosen which the most detrimental process which could possible happening is. If the risk from such an event is small then this bounds the risk from any one event. That being said it itself dodges the critical issue which is over time whether the union of a multiple of unlikely but catastrophic events occur. If this likelihood is too high then the biolabs project needs to be reevaluated.

Even granting that we are considering "worst case", two things need to be done to establish this. The first is to argue that all the other mishaps have lesser risk; the second is to argue that "worst case" has acceptably small risk. The way the argumentation needs to proceed is first justify all other intuitively probable events have lower risk second that the "worst case" has negligible risk. We will treat the NIH argued case first and then we will sketch argumentation for what is necessary for all the other cases.

Section VIIa – THE BU WORST CASE ARGUMENT

Its worthwhile citing the Guillenin of the worst case scenario prepared by RWDI.

"In discussing a "range of exposure," the authors of the report make reference to the US Army's conclusion from monkey studies in the 1950s that the lethal dose for half the exposed population was 8,000-10,000 spores.2 This conclusion was never meant to suggest a threshold for anthrax infection, below which an exposed individual is safe. Half the animals in the study died of doses much less than 8,000-10,000 spores.
The report's reference to a 2% fatality rate in the 1979 Sverdlovsk epidemic in the USSR also needs explanation. Sverdlovsk, a closed Soviet city 900 miles east of Moscow, had a military facility for testing and producing anthrax spores for aerosol dispersal. On April 2, an accidental release of spores blew over the city and killed around 70 people and sickened another 15 or so, of some 5000 people exposed. The spores also killed sheep and cattle as far as 30 miles from the source of the release. In a ceramics factory directly in the path of the plume, some 450 workers in a pipe shop were exposed and of these 10 died of inhalational anthrax. Again, a 2% fatality or, in military terms, "attack" rate was suggested. A single gram of anthrax (around a trillion spores) is reckoned to have caused the total number of Sverdlovsk fatalities.3 Two percent fatality may seem a low rate, but not when one considers the small amount of lethal material, about half of what was in any of the recovered anthrax letters of 2001.

Records from the Sverdlovsk outbreak also indicated that infection can be delayed for up to six weeks following inhalation of the spores. In some individuals, the lung can apparently maintain the spore in a dormant state for a protracted period. Based on this finding and animal studies, those at risk from the anthrax letters were advised to take

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antibiotics for as long as three months."

It seems that the number of spores necessary for release in an anthrax experiment is disputed to range from 10 billion to 1 trillion 3 orders of magnitude and the numbers for a fatal infection are estimated to be one (Guillemin to a few thousand RWDI) . Furthermore, Guillemin evaluates the risk over an integrated area (which can be quite large) which seems reasonable whereas RWDI chosen the risk at a single point. Since there is dispute over source and reception data, which ranges over orders of magnitude, scientific experiment needs to be conducted on a formal basis using animal models to resolve this and no conclusion can be drawn from the RWDI analysis. In short roughly 11 orders of magnitude of disagreement on the input and output characteristics of the data (3 for source, 2 for transmission, and 3 for surface area considered) and this renders the rather pretty simulation modeling and win tunnel analysis useless. It is interesting that in practice the NIH and the government seem to agree in practice with the Guillemin conclusions as:

"During the crisis surrounding the 2001 anthrax postal attacks, the Centers for Disease Control and the US Postal Service (USPS) underestimated the vulnerability of postal workers to low levels of exposure to anthrax spores and consequently failed to shut down postal facilities immediately on discovering evidence of anthrax dispersal. Most of the fatalities and illnesses resulting from the letters were among postal workers. The result has been a series of "criminal neglect" law suits against the USPS and the US and local Governments by postal employees in Washington, DC, New Jersey, and Florida. The clean-up of more than 20 postal facilities and offices, in addition to the Hart Senate Office Building and other federal buildings in Washington, turned out to be much more difficult and cost hundreds of millions of dollars. The Brentwood facility in Washington, for example, took two years to decontaminate and even then did not return to full operation."

Presumably if the dispersion was so great, this cleanup was an entire waste of the taxpayer's money and a total waste of time. Evidently the Government reacts to real evidence and acts conservatively to their credit when lives are directly at stake. The same standards need to be upheld for academic and research facilities when the risk is high.

Section VIIb – Establishing that the Anthrax is Worst Case

It is well known that anthrax is not an infectious agent in humans and death from anthrax exposure results from the intake of anthrax spores from the outstanding environment. Biological diseases are unique in that they can reproduce and spread between hosts. Some diseases like West Nile virus called zoonotics may commonly jump from animals to humans via some vector like a mosquito. To argue that passive transmission such as by anthrax is the worst case, one must rule out infections between animals and humans and between humans. Its not enough to state that the spill of a vial on a lab floor will not cause harm because of sensitivity to air and natural UV radiation other methods of transmission need to be carefully considered. First we will discuss rare events which could cause catastrophic problems. Next we discuss the agents studied and indicate problems which could result from this handling and show the risk is low. Without serious analysis the risk remains indeterminate.

Rare Events

Transportation

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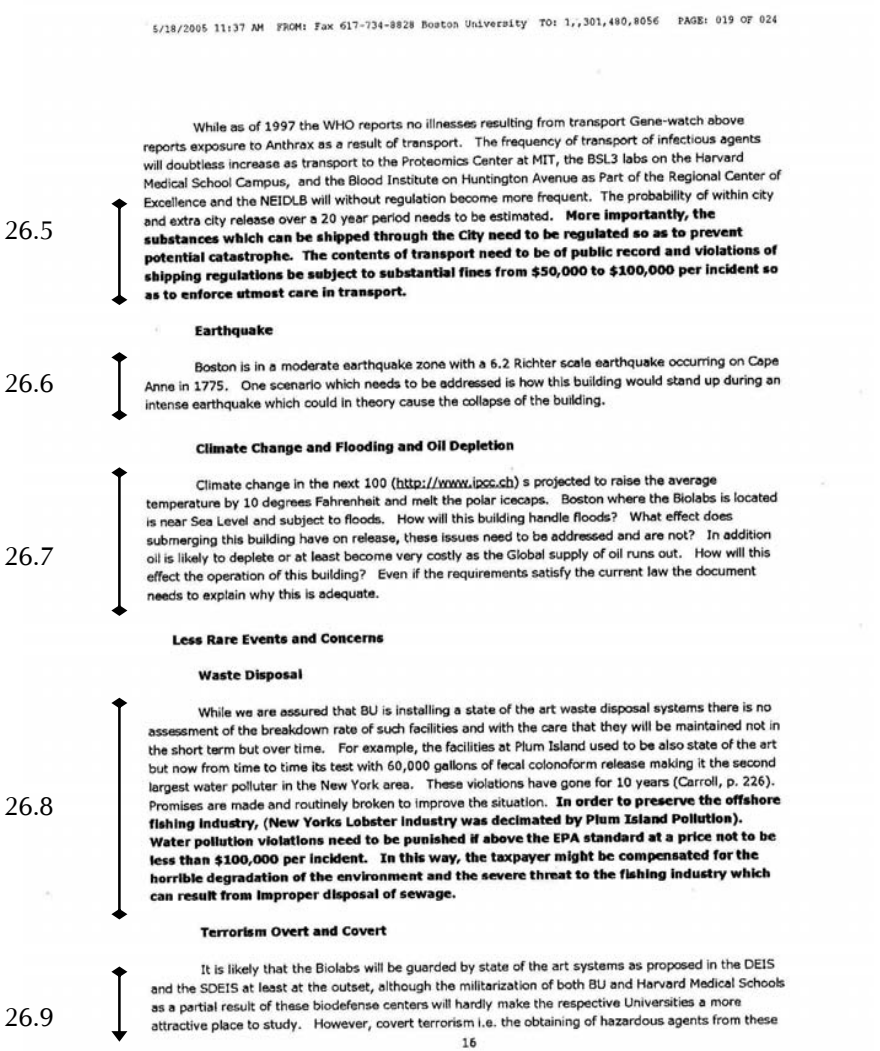

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While as of 1997 the WHO reports no illnesses resulting from transport Gene-watch above reports exposure to Anthrax as a result of transport. The frequency of transport of infectious agents will doubtless increase as transport to the Proteomics Center at MIT, the BSL3 labs on the Harvard Medical School Campus, and the Blood Institute on Huntington Avenue as Part of the Regional Center of Excellence and the NEIDLB will without regulation become more frequent. The probability of within city and extra city release over a 20 year period needs to be estimated. **More importantly, the substances which can be shipped through the City need to be regulated so as to prevent potential catastrophe. The contents of transport need to be of public record and violations of shipping regulations be subject to substantial fines from $50,000 to $100,000 per incident so as to enforce utmost care in transport.**

26.5

Earthquake

Boston is in a moderate earthquake zone with a 6.2 Richter scale earthquake occurring on Cape Anne in 1775. One scenario which needs to be addressed is how this building would stand up during an intense earthquake which could in theory cause the collapse of the building.

26.6

Climate Change and Flooding and Oil Depletion

Climate change in the next 100 (http://www.ipcc.ch) s projected to raise the average temperature by 10 degrees Fahrenheit and melt the polar icecaps. Boston where the Biolabs is located is near Sea Level and subject to floods. How will this building handle floods? What effect does submerging this building have on release, these issues need to be addressed and are not? In addition oil is likely to deplete or at least become very costly as the Global supply of oil runs out. How will this effect the operation of this building? Even if the requirements satisfy the current law the document needs to explain why this is adequate.

26.7

Less Rare Events and Concerns

Waste Disposal

While we are assured that BU is installing a state of the art waste disposal systems there is no assessment of the breakdown rate of such facilities and with the care that they will be maintained not in the short term but over time. For example, the facilities at Plum Island used to be also state of the art but now from time to time its test with 60,000 gallons of fecal colonoform release making it the second largest water polluter in the New York area. These violations have gone for 10 years (Carroll, p. 226). Promises are made and routinely broken to improve the situation. **In order to preserve the offshore fishing industry, (New Yorks Lobster industry was decimated by Plum Island Pollution). Water pollution violations need to be punished if above the EPA standard at a price not to be less than $100,000 per incident. In this way, the taxpayer might be compensated for the horrible degradation of the environment and the severe threat to the fishing industry which can result from improper disposal of sewage.**

26.8

Terrorism Overt and Covert

It is likely that the Biolabs will be guarded by state of the art systems as proposed in the DEIS and the SDEIS at least at the outset, although the militarization of both BU and Harvard Medical Schools as a partial result of these biodefense centers will hardly make the respective Universities a more attractive place to study. However, covert terrorism i.e. the obtaining of hazardous agents from these

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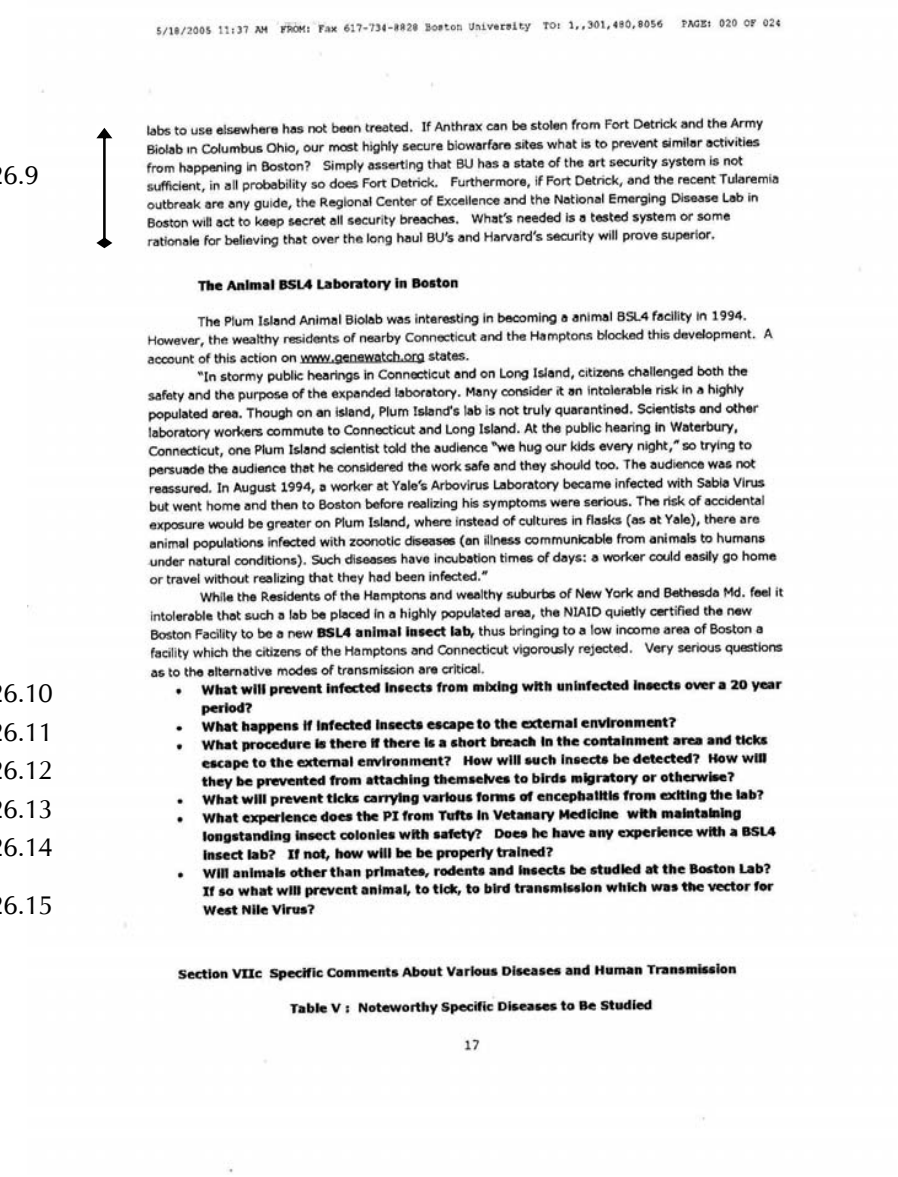
26.5 There are regulations in place governing shipment of select agents. Transportation of select agents to and from the Boston-NBL would be managed in accordance with all applicable local, state and federal regulations and guidelines and BUMC policy. These regulations and policy address appropriate notification, packaging, routing and delivery protocols including delivery personnel screening, predetermination of routes, date/time of travel and delivery and GPS monitoring to allow for vehicle tracking and response to incidents during travel time. See Appendix 7, High Hazard Material Management Policy.

26.6 As noted in Section 2.2.3.9, the building is designed to meet the stringent seismic design criteria of the Massachusetts State Building Code, sixth edition.

26.7 As noted in Section 3.10.3, the project site is located outside the 100 year floodplain and thus is not subject to flooding. NIH cannot comment on issues such as global climate change and oil supply levels over the next 100 years. These issues are not reasonably foreseeable and are outside the scope of the EIS.

26.8 The systems being installed in the facility would be incorporated into the preventative maintenance program, which shall follow the manufacturers' recommended service requirements. The operation of the systems would be validated and re-validated periodically to test the efficacy of the process. All wastewater discharge from this facility ultimately is treated in the Massachusetts Water Resources Authority's treatment plant. The waste disposal system and procedures are fully described in Sections 2.2.3.2, 2.2.8, and 3.8. Discharges to the sewer system are regulated by the BWSC, DEP and MWRA, each of which has the authority to issue fines for violations of permits and regulations, and to shut down laboratory discharges, if required. The correlation of the buildings systems proposed for this facility to the failure of the Plum Island wastewater treatment system is inappropriate.



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labs to use elsewhere has not been treated. If Anthrax can be stolen from Fort Detrick and the Army Biolab in Columbus Ohio, our most highly secure biowarfare sites what is to prevent similar activities from happening in Boston? Simply asserting that BU has a state of the art security system is not sufficient, in all probability so does Fort Detrick. Furthermore, if Fort Detrick, and the recent Tularemia outbreak are any guide, the Regional Center of Excellence and the National Emerging Disease Lab in Boston will act to keep secret all security breaches. What's needed is a tested system or some rationale for believing that over the long haul BU's and Harvard's security will prove superior.

The Animal BSL4 Laboratory in Boston

The Plum Island Animal Biolab was interesting in becoming a animal BSL4 facility in 1994. However, the wealthy residents of nearby Connecticut and the Hamptons blocked this development. A account of this action on www.genewatch.org states.

"In stormy public hearings in Connecticut and on Long Island, citizens challenged both the safety and the purpose of the expanded laboratory. Many consider it an intolerable risk in a highly populated area. Though on an island, Plum Island's lab is not truly quarantined. Scientists and other laboratory workers commute to Connecticut and Long Island. At the public hearing in Waterbury, Connecticut, one Plum Island scientist told the audience "we hug our kids every night," so trying to persuade the audience that he considered the work safe and they should too. The audience was not reassured. In August 1994, a worker at Yale's Arbovirus Laboratory became infected with Sabia Virus but went home and then to Boston before realizing his symptoms were serious. The risk of accidental exposure would be greater on Plum Island, where instead of cultures in flasks (as at Yale), there are animal populations infected with zoonotic diseases (an illness communicable from animals to humans under natural conditions). Such diseases have incubation times of days: a worker could easily go home or travel without realizing that they had been infected."

While the Residents of the Hamptons and wealthy suburbs of New York and Bethesda Md. feel it intolerable that such a lab be placed in a highly populated area, the NIAID quietly certified the new Boston Facility to be a new **BSL4 animal insect lab,** thus bringing to a low income area of Boston a facility which the citizens of the Hamptons and Connecticut vigorously rejected. Very serious questions as to the alternative modes of transmission are critical.

- **What will prevent infected insects from mixing with uninfected insects over a 20 year period?**
- **What happens if infected insects escape to the external environment?**
- **What procedure is there if there is a short breach in the containment area and ticks escape to the external environment? How will such insects be detected? How will they be prevented from attaching themselves to birds migratory or otherwise?**
- **What will prevent ticks carrying various forms of encephalitis from exiting the lab?**
- **What experience does the PI from Tufts in Vetanary Medicine with maintaining longstanding insect colonies with safety? Does he have any experience with a BSL4 insect lab? If not, how will be be properly trained?**
- **Will animals other than primates, rodents and insects be studied at the Boston Lab? If so what will prevent animal, to tick, to bird transmission which was the vector for West Nile Virus?**

Section VIIc Specific Comments About Various Diseases and Human Transmission

Table V : Noteworthy Specific Diseases to Be Studied

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26.9
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26.11
26.12
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26.15

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26.9 The Boston-NBL would be owned, operated and managed by BUMC and therefore BUMC is responsible for all operations. Staffing plans include 24 hour a day, seven day a week staffing of points of entry and building patrols. Individuals working in the Boston-NBL would undergo significant background checks and would be mandated to work with other approved individuals. Concerns over the staff with access to select agents have been addressed though careful screening, mandatory two-person rule protocols, layers of access that must be replicated for egress and surveillance by closed circuit television. This system of audits and check and balances on approved personnel is intended to mitigate risks associated with approved staff. Incidents of non-compliance or systems malfunctions would be reported immediately to responsible officials.

26.10 Insects would be housed in specialized insectarium rooms. There would be complete segregation of uninfected insects from those insects that contain vector borne pathogens. Different insect species would be kept segregated. See Section 4.2.1.1 "Community Safety and Risk – Other Potential Risk Scenarios (c)" in the FEIS.

26.11 There would be multiple barriers from the insectaria designed to prevent the escape of any insects. Primary containment in the room would include at least 3 barriers including filtered containers, screens and doors. Additional room barriers would depend on the types of insects. For example an oil filled moat would be installed in locations where non-flying insects would be contained since they move by crawling. Multiple additional barriers would be in place outside of the primary containment rooms including multiple additional doors, sealed windows, filtered air intakes and exhausts. In addition, all insects would be inventoried before and after each experiment to ensure that no insects are unaccounted for. See Section 4.2.1.1 "Community Safety and Risk – Other Potential Risk Scenarios (c)" in the FEIS.

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26.12 Monitoring systems accounting for each insect would be in place. The barriers to escape are discussed in Section 4.2.1.1 "Community Safety and Risk – Other Potential Risk Scenarios (c)" in the FEIS.

26.13 See Response to Comment 26.11.

26.14 All personnel would be required to demonstrate proficiency in the operating procedures of the BSL-4 laboratory prior to working in the BSL-4 laboratory.

26.15 Animal models would be developed to meet the research needs of the proposed experiments. Rodents and non-human primates would be the principal animal species housed in the Boston-NBL. Housing is separate for insects and mammalian species. The building would include design features to preclude the escape of animals from the laboratory.

Disease	Transmission	Reason For Study	Significant Public Health Problem Mortality	Carrier
Glanders	Areosal, horse secretions	Few organisms for transmission	No, usually fatal if blood infection	No
Smallpox	Body fluids, sneezing etc	High mortality	No eradicated except for Russian and American stores	No, yes?
Hendra Virus	Exposure to Horse Fluids infected. As no natural transmission can be weaponized	High Mortality > 40%	Extremely sparse cases. One outbreak of related NIPAH virus in 1994	Unknon
Rift Valley Fever	Mosquito bites	1997 Large Loss of Cattle 300 Human deaths, A Hemorrhagic fever in severe cases. Permanent loss of central vision is suffered by some 50 per cent of those affected; there may be permanent unilateral or bilateral blindness	Recurring endemic problem in Middle East. Studied as Germ Warware agent at Plum Island	No
Q Fever	Airborne dust containing organisms from animals	Initally debilitating 1 % morality	Highly reistant to drying or heating. Highly Infectious	No
Rocky Mountain Spotted Fever	Ticks	approximately 3% to 5% of individuals who become ill with Rocky Mountain spotted fever still die from the infection. 30% w.o. anitbiotics	Still debilitating disease with no vaccine. Can bue used in Germ warfare.	No
Viral Hemmoragic Fevers	Ticks, Contact with Human Blood and Secretions	Mortality can be as high as 80% or more, complications commonly include blindness	Lethality and extreme unpleasantness of symptoms make for good weapon. Very high mortality but not high incidence with the exception of Dengue fever which has low mortality	No carrier state.

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Herpes B Virus	**Monkey Bite**	**100% Morality if cone down with disease**	**Not yet, but if mutates to be a pure human virus a total disaster**	**Not to anyones knoledge**
Various Tick Borne Encephalitis	**Tick Bite**	**Little death but 20% permanent neurosphychologtical** effectrs	**No cure**	**No**

The various tick borne diseases if disease ticks ever escape to be carried by birds could lead to chronic endemic disease in the Boston area, and similarly for mosquitoes. Thus the ticks and the mosquitoes which breed rapidly and are very small require perfect filtration system with no gaps in the biocontainment system. Herpes B if it is engineered to be transmitted between people could be a weapon as lethal as any nuclear device and could easily become the "Andromeda Strain".

In short, doing this work with this combination of diseases in the middle of Boston is terrifying. The number of places this work should be done is minimal and preferably in a lifeless desert, far from a habitat which any of these insects can naturally breed. That being said, it is clear that at least some diseases, especially those like avian Flu, some variants of Hemorrhagic fever or perhaps Herpes B need to be studied somewhere if for no other reasons to prevent disasters in the rest of the world. A significant number of these diseases if spread could be the next AIDS only worse.

26.16 We now turn to the compensation offered to the lower income communities of color for placing the study of the most incurable infectious agents in the world in their community. Compensation to this community needs be substantial whatever the NIH's thought about the risk as comparable communities in Bethesda Md., the Hamptons, and Davis California who evaluated the risk differently than the NIH chose by protest to keep the NIH from doing BSL4 construction.

CHAPTER VIII	Environmental Justice

The EPA defines environmental justice through the attainment of the following two goals.

1. EPA's first goal is to ensure that no segment of the population, regardless of race, color, national origin, or income, suffers disproportionately from ***adverse human health or environmental effects*** [emphasis added] as a result of EPA's policies, programs and activities.

2. EPA's second goal is to ensure that those who must live with environmental decision must have every opportunity for public participation in the making of those decisions.

Table VI below describes the specific contributions to environmental justice made by Boston University in their current proposal.

Table VI, BU's Contribution to the Minority Community for This Project

Contributed	Program	Requirement for Project	Beneficiaries
$920,000	Cities Neighborhood Housing Trust, for affordable housing	Yes	Low cost Housing fund Boston Housing Authority

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26.16 There is no need to compensate "lower income communities of color" specifically. BUMC would contribute to jobs and housing creation trust funds as described in Section 4.3.1.1.

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$185,000	Neighborhood Job Trust Program	Not mentioned	Job training for residents to participate in the program
$1,000,000	Training in Biomedical and Biotechnolgy Fields	No	107 Residents who are trained for the job.
...	Additional Emergency Phones	No	Residents
	Sundy Traffic Improvements including, turn signs, traffic signal upgrades	Required by the Boston Transportation Department	Workers at the Project.

Aside from the $2,000,000 offered by BU of which $1,000,000 is required by Law. There is virtually no contribution to the lower income residents of Boston. The contribution appears generous but compared to the approximately $1.5bn which is anticipated will flow to BU for various services over 20 years the amount is a paltry .13% of the entire project. **A more serious commitment to environmental justice would be to hire a fixed percentage of the low income residents to jobs at average biolab pay, training them to assume jobs for the project. In this reviewers view a commitment to lower income housing and job training an order of magnitude larger would start to look less like a pittance.**

The no action alternative is not likely to occur simply because the property on which the Biolabs exist is valuable commercial property. The no action alternative needs to be replaced by a standard commercial development say a hotel and the benefits to the lower income residents need to be compared **with this alternative.**

Finally we turn to the second point of made by the EPA. If participation in decisions intimately affecting people's life means that the color of traffic sign posts is chosen to respect local wishes or transport is by BU chosen drivers rather than by UPS then the bar is meant. If participation means the community has the ability to control decisions which might intimately impinge on their own lives then these "concessions" are woefully inadequate. It's worthwhile at this point to state that the process by which the NEIDL was placed in Boston was entirely bureaucratic and authoritarian. First the president and his advisors met with HHS advisors to discuss the bioterrorism threat. Next a blue ribbon panel got together and decided what diseases need to be given priority. Then a competition was held the winners of which were chosen by another bureaucracy. In no part of this process did the residents have any say in its outcome. **The natural method to chose the placement of this lab should be largely the choice of the people who live in the area. A referendum should be held which asks the people of the towns within a 10 mile radius of the site whether they want this built in the area. The willingness to abide by the will of the people on an important matter such as this will do as much to fight terrorist attacks on the US in this reviewers opinion as the entire bioterrorism program.**

Summary of Recommendations and Further Recommendations.

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1. **That this lab be set up in an area with very low population density**
2. **That major potential public health problems like avian flu, aids, and SARS be given priority with hemorrhagic fever be given lower priority.**
3. **All experimentation carried out at such a lab and reviews by the Institutional Review Boards be made public and posted on the BU Website for all to see.**
4. **That Both an independent team of scientific experts, and a committee of laypeople have the power to shut the lab down be chosen by an outside authority to prevent potential problems from occurring.**

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LETTER 26

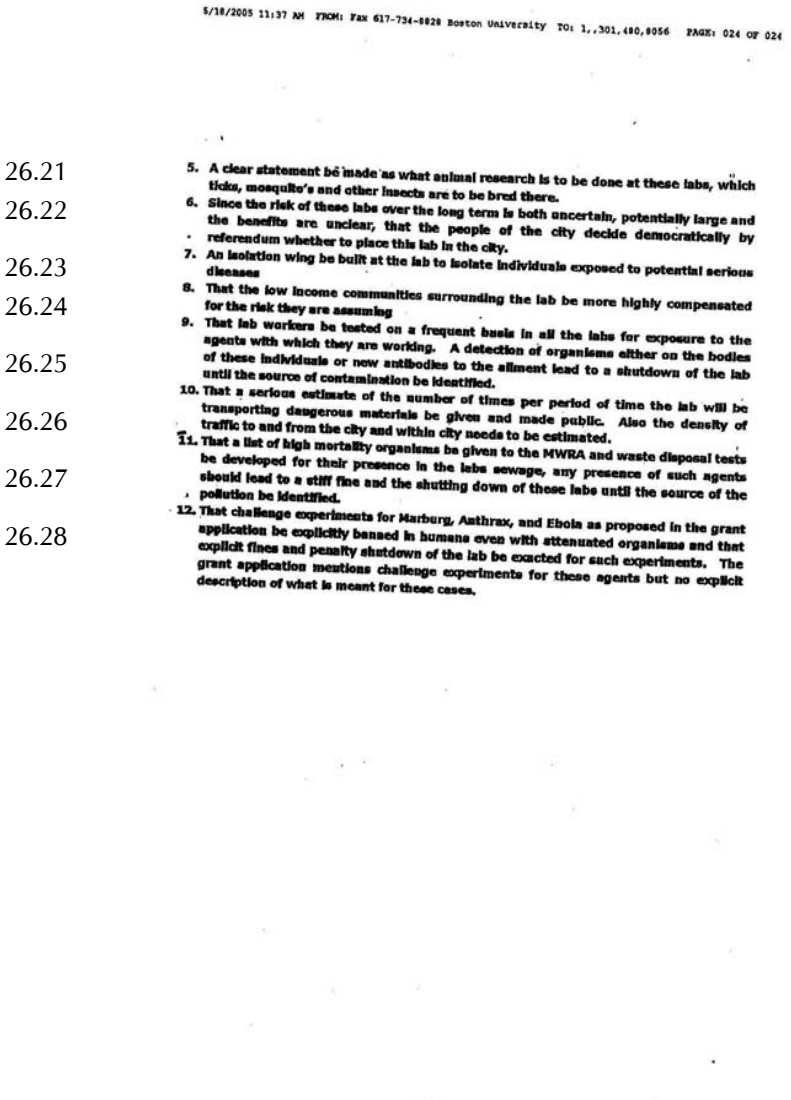
Michael A. Cohen

26.17 See Response to Comment 19.2.

26.18 See Response to Comment 26.4.

26.19 All research protocols involving biohazardous agents would be reviewed by the Institutional Biosafety Committee (IBC). Minutes of the meetings of the IBC are available for public review.

26.20 The facility would be owned and operated by Boston University. Oversight of facility operations is discussed in Table 1-4 and Sections 2.2.5 and 2.2.7.



5/18/2005 11:37 AM FROM: Fax 617-734-8828 Boston University TO: 1,,301,480,8056 PAGE: 024 OF 024

5. A clear statement be made as what animal research is to be done at these labs, which ticks, mosquito's and other insects are to be bred there.
6. Since the risk of these labs over the long term is both uncertain, potentially large and the benefits are unclear, that the people of the city decide democratically by referendum whether to place this lab in the city.
7. An isolation wing be built at the lab to isolate individuals exposed to potential serious diseases
8. That the low income communities surrounding the lab be more highly compensated for the risk they are assuming
9. That lab workers be tested on a frequent basis in all the labs for exposure to the agents with which they are working. A detection of organisms either on the bodies of these individuals or new antibodies to the ailment lead to a shutdown of the lab until the source of contamination be identified.
10. That a serious estimate of the number of times per period of time the lab will be transporting dangerous materials be given and made public. Also the density of traffic to and from the city and within city needs to be estimated.
11. That a list of high mortality organisms be given to the MWRA and waste disposal tests be developed for their presence in the labs sewage, any presence of such agents should lead to a stiff fine and the shutting down of these labs until the source of the pollution be identified.
12. That challenge experiments for Marburg, Anthrax, and Ebola as proposed in the grant application be explicitly banned in humans even with attenuated organisms and that explicit fines and penalty shutdown of the lab be exacted for such experiments. The grant application mentions challenge experiments for these agents but no explicit description of what is meant for these cases.

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LETTER 26

Michael A. Cohen

26.21 A number of the NIAID priority category A, B and C infectious diseases are vector born diseases. Animal models for these infectious diseases are currently being developed and are possible research projects that may be conducted in the Boston-NBL**.** See Response to Comment 26.19.

26.22 The public has been given full opportunity to be involved in the environmental review of the proposed action. Whether the citizens of Boston should vote on the proposed action is outside the scope of NEPA and of this EIS.

26.23 BUMC is the designated clinical care facility for individuals that might be exposed to potentially serious infectious diseases. Plans are in place for the care of such individuals. Part of the care plan involves keeping exposed individuals in isolation for the duration of the incubation period following exposure. The Boston-NBL is not designed as a clinical care facility.

26.24 See Response to Comment 26.16.

26.25 The Occupational Health Department will be responsible for the testing of employees as it relates to ability to perform functions of their job and in response to potential exposures. Occupational Health and the Office of Environmental Health and Safety will manage employee orientation and education programs, will institute scheduled and unscheduled inspections of areas including reviews of protocols and will expand protocols involving medical surveillance of employees. The Office of Public Safety will manage access and audit control systems to assist in the management of protocols and the security of materials and individuals. Incidents involving contamination or exposure will involve a coordinated response by these three departments to isolate and contain the incident, to appropriately treat the employee, to notify appropriate agencies and to close the laboratory if necessary. See Section 4.2.1.1 "Community Safety and Risk – Other Potential Risk Scenarios (a)" in the FEIS.

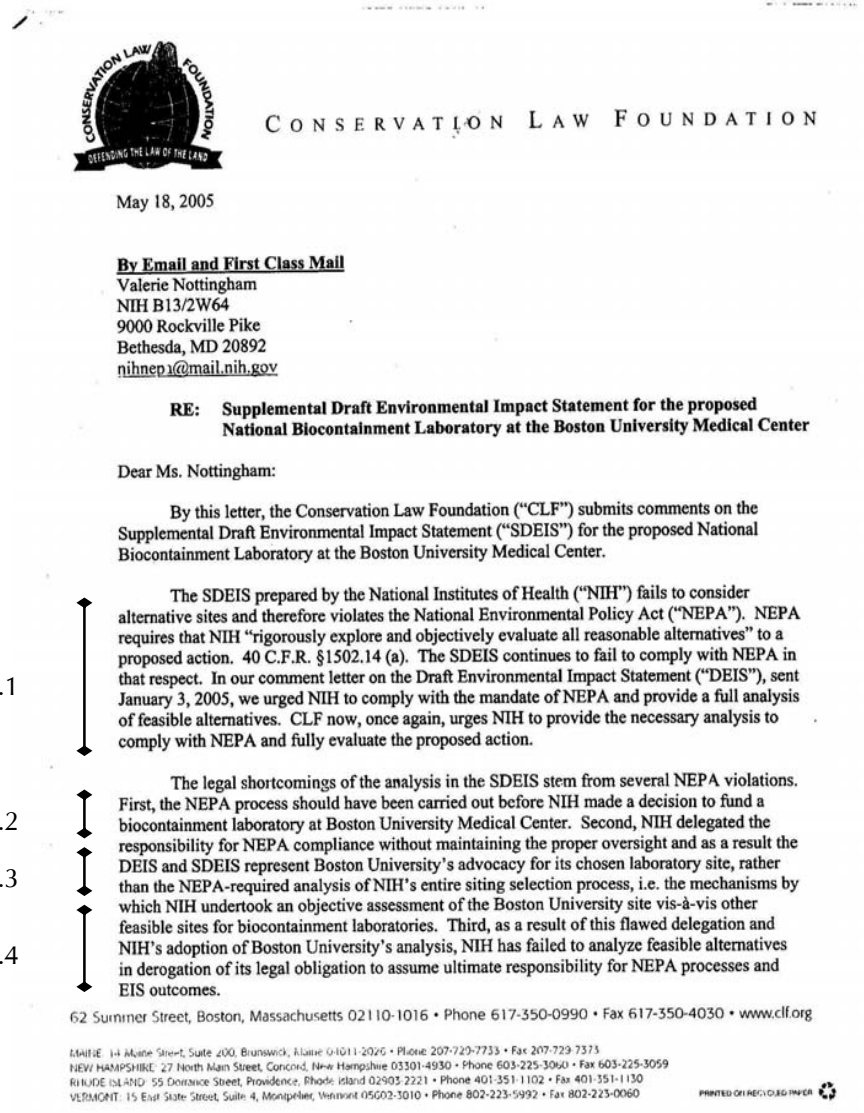
LETTER 26

Michael A. Cohen

26.26 Approximately 1-2 deliveries per month of pathogenic microorganisms are anticipated for the laboratory. All such deliveries would be pre-scheduled and meet all local, state and federal guidelines pertaining to registration, packaging and transportation. As discussed in Section 4.11.2, there would be no unacceptable adverse impacts on existing traffic conditions caused by the proposed facility.

26.27 All wastewater from the BSL-4 area (including water from showers, floor drains, autoclaves and sinks) would be chemically decontaminated prior to reaching the BSL-4 drain. Chemically disinfected wastewater would be plumbed directly into large cook tanks for thermal disinfection. The cook tanks are designed to pressurize and superheat the BSL-4 wastewater to ensure complete destruction of any organism that might be present. BUMC is in discussions with MWRA to determine exactly how they would like to see the Boston-NBL wastewater plumbed, tested and discharged. MWRA would need to be satisfied that the wastewater decontamination process is thorough, failsafe, and redundant. See Section 4.8.1.1 of the FEIS.

26.28 Studies of this nature will not be allowed in this facility. The facility design does not support these studies. The proposed BSL-3 clinic was not approved and is no longer part of this design.



CONSERVATION LAW FOUNDATION

May 18, 2005

By Email and First Class Mail
Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892
nihnepa@mail.nih.gov

RE: Supplemental Draft Environmental Impact Statement for the proposed National Biocontainment Laboratory at the Boston University Medical Center

Dear Ms. Nottingham:

By this letter, the Conservation Law Foundation ("CLF") submits comments on the Supplemental Draft Environmental Impact Statement ("SDEIS") for the proposed National Biocontainment Laboratory at the Boston University Medical Center.

27.1 The SDEIS prepared by the National Institutes of Health ("NIH") fails to consider alternative sites and therefore violates the National Environmental Policy Act ("NEPA"). NEPA requires that NIH "rigorously explore and objectively evaluate all reasonable alternatives" to a proposed action. 40 C.F.R. §1502.14 (a). The SDEIS continues to fail to comply with NEPA in that respect. In our comment letter on the Draft Environmental Impact Statement ("DEIS"), sent January 3, 2005, we urged NIH to comply with the mandate of NEPA and provide a full analysis of feasible alternatives. CLF now, once again, urges NIH to provide the necessary analysis to comply with NEPA and fully evaluate the proposed action.

27.2 The legal shortcomings of the analysis in the SDEIS stem from several NEPA violations. First, the NEPA process should have been carried out before NIH made a decision to fund a biocontainment laboratory at Boston University Medical Center.

27.3 Second, NIH delegated the responsibility for NEPA compliance without maintaining the proper oversight and as a result the DEIS and SDEIS represent Boston University's advocacy for its chosen laboratory site, rather than the NEPA-required analysis of NIH's entire siting selection process, i.e. the mechanisms by which NIH undertook an objective assessment of the Boston University site vis-à-vis other feasible sites for biocontainment laboratories.

27.4 Third, as a result of this flawed delegation and NIH's adoption of Boston University's analysis, NIH has failed to analyze feasible alternatives in derogation of its legal obligation to assume ultimate responsibility for NEPA processes and EIS outcomes.

62 Summer Street, Boston, Massachusetts 02110-1016 • Phone 617-350-0990 • Fax 617-350-4030 • www.clf.org

MAINE: 14 Maine Street, Suite 200, Brunswick, Maine 04011-2026 • Phone 207-729-7733 • Fax 207-729-7373
NEW HAMPSHIRE: 27 North Main Street, Concord, New Hampshire 03301-4930 • Phone 603-225-3060 • Fax 603-225-3059
RHODE ISLAND: 55 Dorrance Street, Providence, Rhode Island 02903-2221 • Phone 401-351-1102 • Fax 401-351-1130
VERMONT: 15 East State Street, Suite 4, Montpelier, Vermont 05602-3010 • Phone 802-223-5992 • Fax 802-223-0060

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LETTER 27

Conservation Law Foundation

27.1 See Section 2.3, where alternative sites are considered and rationale provided.

27.2 Any decision by NIH to partially fund the proposed Boston-NBL remains subject to the completion of the NIH's NEPA review for the project and the selection of a course of action in the NIH's ROD. In accordance with the CEQ regulations implementing NEPA, the NIH has not taken any action during the preparation of the environmental review that would either "have an adverse environmental impact" or that would "limit the choice of reasonable alternatives" to the proposed action. See 40 C.F.R. § 1506.1(a).

27.3 The NIH did not delegate the authority for the NEPA process to Boston University. The Council on Environmental Quality's regulations implementing the National Environmental Policy Act permit the preparation of EISs by contractors selected by the agency responsible for the EIS. 40 C.F.R. § 1506.5(c). NIH is the responsible agency for ensuring NEPA compliance for the proposed project. The SDEIS contains an objective analysis of the potential environmental impacts that could occur under the proposed action and the no action alternative. Furthermore, any decision by NIH to partially fund the proposed Boston-NBL remains subject to the completion of the NIH's NEPA review for the project and the selection of a course of action in the NIH's ROD.

27.4 The FEIS contains an analysis of all reasonable alternatives identified and, in Section 2.3, the rationale for the elimination from further study of other alternatives that were considered. The NIH did not delegate the authority for the NEPA process to Boston University, and NIH is the responsible agency for ensuring NEPA compliance for the proposed project. The NIH will make an independent, objective decision on whether to proceed with the Proposed Action in the NIH's ROD.

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27.5 I. NIH must stay its decision to fund a biocontainment laboratory at Boston University until it has complied with NEPA and assessed the Boston University proposal in light of the ROD of that analysis.

NIH failed to prepare an EIS early enough to inform its decision to fund the Boston University biocontainment laboratory and thereby violated the fundamental legal requirement that NEPA analysis and its EIS outcome must be completed early enough to inform and contribute to the decision-making process and must not be used to rationalize or justify decisions already made. See Metcalf v. Daley, 214 F.3d 1135, 1142 (9th Cir. 2000). NEPA analysis must be pursued "at the earliest possible time to insure that planning and decisions reflect environmental values." Andrus v. Sierra Club, 442 U.S. 347, 351 (1979).

Environmental review pursuant to NEPA should have been prepared well in advance of the decision to fund a biocontainment laboratory at Boston University. NIH prepared its DEIS and SDEIS after making its decision to fund a biocontainment laboratory at the Boston University site. Even where it purports to discuss alternative sites in the SDEIS, NIH fails to evaluate these sites with respect to the environmental factors at issue and instead puts forth non-environmental reasons for rejecting alternative options and defending its prior decision to fund the Boston University project. This *ex post facto* and self-serving rejection of any alternative sites follows from NIH's failure to undertake any environmental review of its program prior to approving the Boston project. NIH cannot evade its statutory responsibilities by hiding behind the interests and justifications of a particular program contractor. Such an approach would obviate the decision-forcing aspects of NEPA that courts have long and widely recognized.

27.6 II. NIH failed to oversee delegated NEPA responsibility to ensure good faith and objective analysis.

NIH also violated NEPA because it failed to properly oversee NEPA compliance in the environmental review process. The lead agency on a proposal for federal action may delegate the preparation of environmental impact statements but retains responsibility for its scope and contents. 40 C.F.R. § 1506.5. Responsibility for environmental impact statements includes the requirement to ensure good faith and objectivity. Isle of Hope Historical Ass'n v. U. S. Army, 646 F2d 215, 220 (5th Cir. 1981); Brooks v. Volpe, 380 F supp 1287, 1291 (W.D. Wash. 1974). Oversight by the responsible agency is essential because, where an agency delegates a significant part of its responsibility by substituting statements and perspectives of a private applicant for its own, there is a danger that the applicant's environmental review analysis will be based on self serving assumptions. See Greene County Planning Board v. Federal Power Commission, 455 F.2d 412, 420 (2nd Cir. 1972).

That danger has been realized in the DEIS and SDEIS for the biocontainment laboratory. Due to NIH's failure to properly oversee the NEPA process, the DEIS and SDEIS have adopted and limited the scope of their environmental review to the narrow bounds of Boston University's project justification. NIH, however, has a broader responsibility to the public under NEPA law to oversee preparation of environmental impact statements to ensure a good faith objective analysis. The environmental review here fails to meet that responsibility with the result that no objective analysis of the proposed action and alternatives has been undertaken.

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27.5 See Response to Comment 27.2. Additionally, the reasons for eliminating other alternatives from detailed analysis were not "non-environmental", as characterized in the comment. These reasons are related to the purpose and need for the proposed action and careful analysis of the reasonableness of alternatives.

27.6 The NIH recognizes its responsibility to comply with NEPA and to provide a full and objective review of the potential environmental impacts of the proposed action, as well as to examine reasonable alternatives to the proposed action and reasonable mitigation measures to any potentially significant impacts. The NIH has fulfilled this responsibility. The comment offers no evidence of how NIH allegedly "failed to properly oversee NEPA compliance in the environmental process."

CONSERVATION LAW FOUNDATION

27.7

III. NIH failed to analyze feasible alternatives and the justifications they provide for failing to do so are all flawed.

The requirement to analyze alternatives is the "heart of the environmental impact statement" required by NEPA. 40 C.F.R. § 1502.14. As stated in our letter of January 3, 2005 on the DEIS, agencies are required to "rigorously explore and objectively evaluate all reasonable alternatives" and "devote substantial treatment to each alternative in detail." 40 C.F.R. § 1502.14 (a)-(b). "The requirement for a thorough study and detailed description of alternatives… is the linchpin of the entire impact statement." Monroe County Conservation Council v. Volpe, 472 F2d 693, 697-98 (2nd Cir. 1972). Until the analysis of alternatives mandated by NEPA is completed, NIH cannot make a decision to fund a biocontainment laboratory at Boston University or at any other alternative site or setting.

Several feasible alternatives were mentioned in the scoping process on the EIS. The DEIS and SDEIS, however, both rely on flawed arguments to dismiss the feasible alternatives identified. In our letter of January 3, 2005, CLF refuted the flawed argumentation. We were disappointed to see the same arguments in the SDEIS against analyzing alternatives rather than the necessary analysis itself. The failure to evaluate alternatives is inexcusable given both the mandate of NEPA and the potential environmental impacts of significant federal investment in a level four biocontainment laboratory in the heart of Boston.

While our letter of January 3, 2005 discusses the significant flaws in the justifications for failing to analyze alternatives, we summarize that discussion below.

27.8

a. The alternatives may provide an environmental advantage over the proposed action.

The SDEIS claims that alternative locations would not "alter, reduce, or mitigate the environmental impacts." However, risk to the public and the surrounding community may be decreased if the biocontainment laboratory were located in lower density areas outside of Boston. Because alternatives may provide environmental advantages, they must be analyzed in the SDEIS.

NIH cannot make a legally-defensible finding that alternatives to the proposed action provide no environmental benefit when the alternatives themselves have not been analyzed. Indeed, an agency cannot avoid the NEPA mandate to analyze alternatives even if a proposal is environmentally beneficial. U.S. Army v. Environmental Defense Fund, 492 F.2d 1123, 1135 (5th Cir. 1974) ("The congressional mandate to develop alternatives would be thwarted by ending the search for other possibilities at the first proposal which establishes an ecological plus, even is such a positive value could be demonstrated with some certainty"). It is wholly inappropriate to refuse to analyze feasible alternatives on the basis of the perceived lack of risk from the proposed action. Alternatives must be analyzed to inform decision-making about the most beneficial alternative and that decision-making must follow, not precede, full environmental review.

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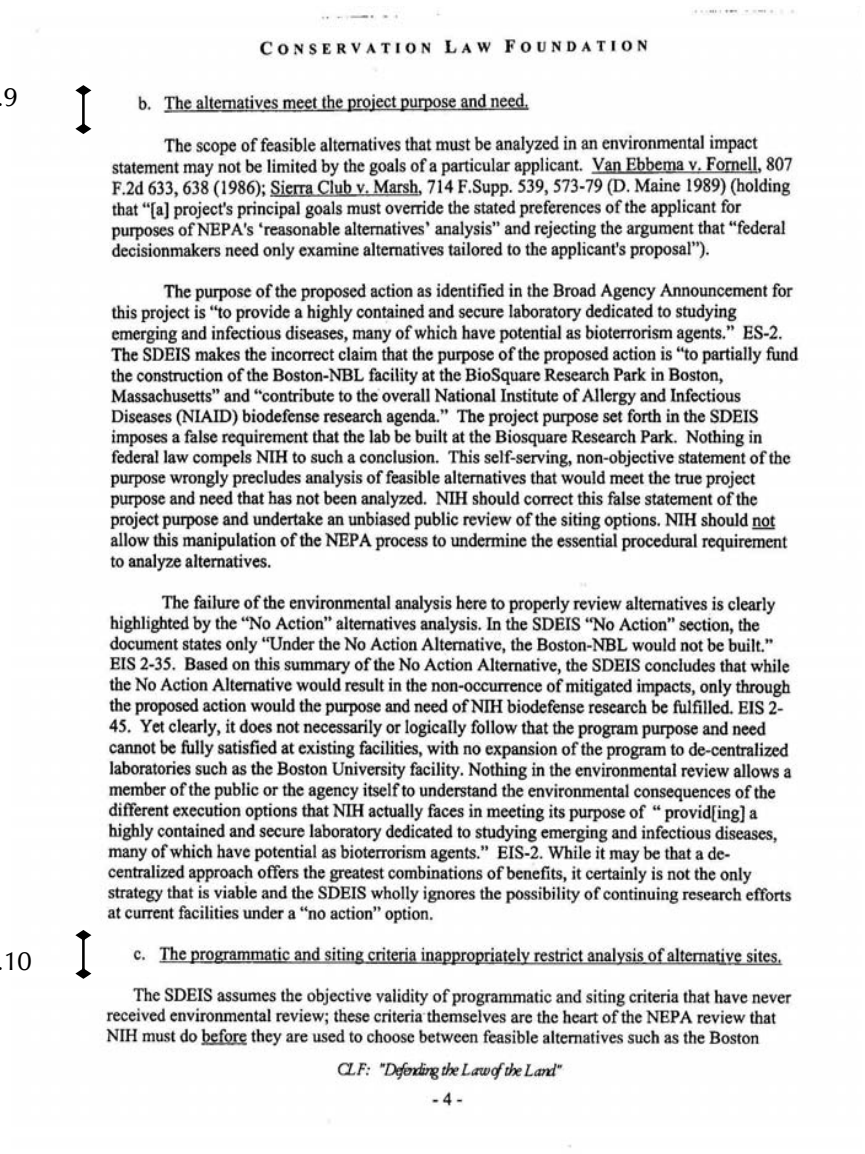
27.7 The NIH has considered and examined fully the range of reasonable alternatives to the proposed action. In the FEIS, the NIH explains the reasons for eliminating other possible alternatives from further study. A primary reason for rejecting other alternatives is that they failed to enable the NIH to satisfy the purpose and need of the proposed action. Alternatives considered in an EIS must satisfy the needs of the proposed Federal action. Environmental Defense Fund v. Corps of Engineers, 492 F.2d 1123 (5th Cir. 1974). It is unclear from the comment how many alternatives the commenter would have the NIH consider. As noted by the Supreme Court, a "'detailed statement of alternatives' cannot be found wanting simply because the agency failed to include every alternative device and thought conceivable by the mind of man. Time and resources are simply too limited to hold that an impact statement fails because the agency failed to ferret out every possible alternative . . . " Vermont Yankee Nuclear Power Corp. v Natural Resources Defense Council, Inc., 435 U.S. 519, 551 (1978).

27.8 The NIH has fully considered and examined the range of reasonable alternatives to the proposed action. Additionally, NEPA does not require that an agency select the "most beneficial alternative". The EIS demonstrates that the "lack of risk from the proposed action" is not merely "perceived", as noted in the comment. The NIH has thoroughly assessed the potential risk to the public posed by the proposed action and determined that the risk is so negligible as to be nonexistent. Additionally, the NIH's analysis of the potential environmental impacts of the proposed action, as well as all comments from the public, in the EIS would enable the agency to make an informed decision in the ROD.



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27.9

b. The alternatives meet the project purpose and need.

The scope of feasible alternatives that must be analyzed in an environmental impact statement may not be limited by the goals of a particular applicant. Van Ebbema v. Fornell, 807 F.2d 633, 638 (1986); Sierra Club v. Marsh, 714 F.Supp. 539, 573-79 (D. Maine 1989) (holding that "[a] project's principal goals must override the stated preferences of the applicant for purposes of NEPA's 'reasonable alternatives' analysis" and rejecting the argument that "federal decisionmakers need only examine alternatives tailored to the applicant's proposal").

The purpose of the proposed action as identified in the Broad Agency Announcement for this project is "to provide a highly contained and secure laboratory dedicated to studying emerging and infectious diseases, many of which have potential as bioterrorism agents." ES-2. The SDEIS makes the incorrect claim that the purpose of the proposed action is "to partially fund the construction of the Boston-NBL facility at the BioSquare Research Park in Boston, Massachusetts" and "contribute to the overall National Institute of Allergy and Infectious Diseases (NIAID) biodefense research agenda." The project purpose set forth in the SDEIS imposes a false requirement that the lab be built at the Biosquare Research Park. Nothing in federal law compels NIH to such a conclusion. This self-serving, non-objective statement of the purpose wrongly precludes analysis of feasible alternatives that would meet the true project purpose and need that has not been analyzed. NIH should correct this false statement of the project purpose and undertake an unbiased public review of the siting options. NIH should not allow this manipulation of the NEPA process to undermine the essential procedural requirement to analyze alternatives.

The failure of the environmental analysis here to properly review alternatives is clearly highlighted by the "No Action" alternatives analysis. In the SDEIS "No Action" section, the document states only "Under the No Action Alternative, the Boston-NBL would not be built." EIS 2-35. Based on this summary of the No Action Alternative, the SDEIS concludes that while the No Action Alternative would result in the non-occurrence of mitigated impacts, only through the proposed action would the purpose and need of NIH biodefense research be fulfilled. EIS 2-45. Yet clearly, it does not necessarily or logically follow that the program purpose and need cannot be fully satisfied at existing facilities, with no expansion of the program to de-centralized laboratories such as the Boston University facility. Nothing in the environmental review allows a member of the public or the agency itself to understand the environmental consequences of the different execution options that NIH actually faces in meeting its purpose of " provid[ing] a highly contained and secure laboratory dedicated to studying emerging and infectious diseases, many of which have potential as bioterrorism agents." EIS-2. While it may be that a de-centralized approach offers the greatest combinations of benefits, it certainly is not the only strategy that is viable and the SDEIS wholly ignores the possibility of continuing research efforts at current facilities under a "no action" option.

27.10

c. The programmatic and siting criteria inappropriately restrict analysis of alternative sites.

The SDEIS assumes the objective validity of programmatic and siting criteria that have never received environmental review; these criteria themselves are the heart of the NEPA review that NIH must do before they are used to choose between feasible alternatives such as the Boston

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Conservation Law Foundation

27.9 Alternatives considered in an EIS must satisfy the needs of the proposed federal action. Environmental Defense Fund v. Corps of Engineers, 492 F.2d 1123 (5th Cir. 1974). An agency's decision on the range of alternatives considered needs to be reasonable. As one court explained, "No purpose would be served by requiring [an agency] to study exhaustively all environmental impacts at each alternative site considered once it has reasonably concluded that none of the alternatives would be substantially preferable to the proposed site." Roosevelt Campobello International Park Comm'n v. Environmental Protection Agency, 684 F.2d 1041 (1st Cir. 1982). The range of alternatives addressed in the SDEIS is justified by reasonable analysis of the scientific, security, and other factors related to the proposed action and its potential impacts. Additionally, this comment misrepresents the NIH's explanation of the purpose and need for the proposed action and why the proposed location for the NBL was analyzed. Contrary to an assertion in this comment, the NIH does not state that any legal authority restricts the construction of the proposed Boston-NBL to the Biosquare Research Park.

27.10 The NIH recognizes its responsibility to comply with NEPA and to provide a full and objective review of the potential environmental impacts of the proposed action, as well as to examine reasonable alternatives to the proposed action and reasonable mitigation measures to any potentially significant impacts. The NIH has fulfilled this responsibility. The comment offers no evidence of how NIH allegedly "failed to properly oversee NEPA compliance in the environmental process."

University proposal. The programmatic and siting criteria relied on in the DEIS and SDEIS as the basis for dismissing the feasibility of alternatives include highly restrictive, location specific requirements such as mandatory proximity to Harvard University Medical School's Regional Center for Excellence and the existing Boston University Medical Center facilities and programs. Proximity to these institutions may provide benefits and should appropriately be considered in the discussion of the proposed action. Alternatives to that proposal, however, must be also considered. Analysis of these criteria and alternatives to these criteria should have preceded selection of Boston University for this program and Boston University's site selection criteria may not be used by NIH to avoid the NEPA requirement to analyze feasible alternatives.

V. Conclusion

We are disappointed that the SDEIS utterly fails again to correct the earlier review's failures to analyze alternative locations in violation of NEPA. In order to comply with the mandate of NEPA, the Final Environmental Impact Statement must include a full analysis of all feasible alternative locations. When adhered to, the NEPA process ensures that the public and decision-makers are informed about all options so that environmentally sound decisions can be made. Here, where the siting of a laboratory to study diseases for which there is no known cure is being considered and a very large governmental investment is being made, all of the siting options should be on the environmental review table. There is no reason or authority to bypass the NEPA process. Indeed, there is every reason to take the time and fully analyze all of the options—to comply with NEPA, to foster an educated dialogue about risks and benefits, and to inform this important decision about public health and safety.

Sincerely,

Peter Shelley, Esq.
Vice President

Carrie Schneider, Esq.
Staff Attorney

LETTER 27

Conservation Law Foundation

CONSERVATION LAW FOUNDATION

Cc:
Senator Edward M. Kennedy
Senator John F. Kerry
Congressman Michael E. Capuano
Congressman Stephen Lynch
Governor Mitt Romney
Speaker Salvatore DiMasi
State Senator Diane Wilkerson
State Representative Byron Rushing
State Representative Gloria Fox
Douglas I. Foy, Chief, Office for Commonwealth Development
Ellen Roy Herzfelder, Secretary, Executive Office of Environmental Affairs
The Honorable Thomas M. Menino, Mayor of Boston
Boston City Councilor Chuck Turner
Mark Maloney, Boston Redevelopment Authority
Richard J. Towle, Senior Vice President, Boston University
Mark S. Klempner, M.D., Associate Provost for Research, BUMC
Jamie Fay, Fort Point Associates
Alternatives for Community and Environment

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- 6 -

LETTER 27

Conservation Law Foundation

Message

Bayha, Ryan (NIH/OD/ORS)

From: Nottingham, Valerie (NIH/OD/ORF)
Sent: Tuesday, May 24, 2005 10:59 AM
To: Bayha, Ryan (NIH/OD/ORS)
Subject: FW: National Emerging Infectious Diseases Laboratories

From: rbcorley@bu.edu [mailto:rbcorley@bu.edu]
Sent: Wednesday, May 18, 2005 10:40 AM
To: NIH NEPA Comments
Cc: klempner@bu.edu
Subject: National Emerging Infectious Diseases Laboratories

May 18, 2005
Ms Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892
Re: Supplemental Draft Environmental Impact Statement-
National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms Nottingham:

I am writing to you in support of the Biosafety Lab also known as the National Emerging Infectious Diseases Laboratory (NEIDL) proposed at Boston University Medical Center (BUMC).

As you are aware, biomedical research laboratories operate under strict procedures and protocols at BUMC and at other academic and private laboratories throughout the Greater Boston region. This research is done safely and makes important medical contributions to the nation and the world.

I believe that the NEIDL at BUMC will be one of the safest laboratories in the world. I have been briefed on the systems and the design and am familiar with operations in biomedical research laboratories. I am impressed by the building's safety and security features and by the team BUMC has assembled to build this important project. While I understand that there are some who have incorrectly raised the city of Boston's rDNA regulations as a reason the laboratory should not be built , this is simply misinformation. rDNA research is conducted in Boston under the Boston Public Health Commission's regulations. On numerous occasions, BUMC authorities have stated that they will do all research in compliance with the Health Commission's guidelines.

As a scientist working on developing new strategies for enhancing immunity to pathogens, I strongly support the proposed laboratory. Obviously, the federal government has recognized that there is a critical need for such facilities. There is

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Ronald B. Corley, Ph.D.

not enough biosafety Level 3 or Level 4 laboratory space to accommodate the work that needs to be performed if we are to understand the pathogens that cause new emerging infectious diseases and develop treatments and vaccines to deal with them.

Our public health system is continually being challenged as new diseases emerge. Some examples from our recent history include West Nile virus, SARS, and the annual outbreaks of influenza with the real fear of a global pandemic in the near future. This laboratory will be an important project for the research community and those interested in finding cures for emerging infectious diseases , and I fully support it.

Yours sincerely,

Ronald B. Corley, Ph.D.

Ronald B. Corley, Ph.D.
Professor and Chair
Department of Microbiology
Boston University School of Medicine
715 Albany Street
Boston, MA 02118
Tel: 617-638-4284
Fax: 617-638-4180
Email: rbcorley@bu.edu

5/24/2005

LETTER 28

Ronald B. Corley, Ph.D.

Bayha, Ryan (NIH/OD/ORS)

From: Nottingham, Valerie (NIH/OD/ORF)
Sent: Tuesday, May 24, 2005 11:00 AM
To: Bayha, Ryan (NIH/OD/ORS)
Subject: FW: Fnal Comments to NIH concerning the proposed Boston University BSL-4 Laboratory in Boston
Importance: High

From: Mary Crotty [mailto:mcrotty@mnarn.org]
Sent: Wednesday, May 18, 2005 2:42 PM
To: NIH NEPA Comments
Cc: Julie Pinkham; David Schildmeier; Karen Higgins; Dorothy McCabe; Charles Stefanini; Sandy Eaton
Subject: Fnal Comments to NIH concerning the proposed Boston University BSL-4 Laboratory in Boston
Importance: High

To: Valerie Nottingham, Division of Environmental Protection

The National Institutes of Health, B13 Rm. 2W64

900 Rockville Pike, Bethesda, MD 20892

I am writing on behalf of the Massachusetts Nurses Association, which opposes the proposed citing of a Biosafety level-4 laboratory in the heart of Boston, next to Boston Medical Center.

I have attached both the formal position statement of the Massachusetts Nurses Association and a copy of the testimony I delivered to the NIH hearing at Faneuil Hall in Boston on Aril 25, 2005. Both documents are also pasted below.

Thank you.

Mary Crotty, RN, MBA, JD
Associate Director, Nursing
Massachusetts Nurses Association
340 Turnpike Street
Canton, MA 02021-2711
mcrotty@mnarn.org
www.massnurses.org
Tel: 781 821-4625 x743
Tel (Direct): 781 830-5743
Toll free (MA only): 800 882-2056 x 743
Fax: 781 821-4445

LETTER 29

Mary Crotty, RN, MBA, JD

NIH Supplemental Review
Faneuil Hall
Boston, MA

April 25, 2005

Massachusetts Nurses Association
Position Statement
On the Proposed BU Biosafety Level 4 Lab

CANTON, Mass. -- The Massachusetts Nurses Association is the professional association for registered nurses in the Commonwealth and is committed under our professional ethics to advance public policy that protects the health and safety of all residents of our communities. It is with this mission in mind that we register our opposition to the placement of any Biosafety Level 4 laboratory (BSL-4 lab) in an urban, densely populated area, where the accidental or deliberate release of a deadly biological agent could have a devastating impact on a large population of residents.

29.1

Therefore, we believe the BSL-4 lab proposed for a site located very near and directly between Boston Medical Center and the I-93 on-ramp should not be built in inner-city Boston.

While the stated purpose of enhancing public health is commendable, a number of questions arise concerning the decision to build this facility in this place at this time. Among the areas of concern are the following:

Safety

While it is true that those working within the facility will be at the greatest risk of exposure, any breach would potentially infect those living and working nearby, as well as those at some distance, through known or unknown human vectors.

29.2 **Are nearby hospital emergency departments prepared to contain, and treat victims of, such an outbreak?** Indications are that they are not. Congressman Barney Frank testified last year that Massachusetts hospitals are not prepared for the "average Friday night," referring to overcrowding and frequent diversion of emergency patients.

29.3 **Is evacuation of the community possible?** Massachusetts was recently ranked as one of the states least prepared to respond to a disaster in the entire country. While this proposed laboratory is cited as a means of enabling the country to better respond to terrorist threats, the threat posed by the laboratory does not appear designed to resolve Massachusetts' disaster preparedness deficiencies.

29.4 **What will be done with the waste products of this laboratory?** Will waste be adequately processed prior to disposal? Will adequate care be taken to maintain the efficiency of this equipment? It takes 48 hours to verify these tests. Will waste products be held long enough for the completion of tests to confirm decontamination of the load? Where? Will any organisms or parts of organisms be chemically disinfected and poured down the drain? Is incineration or transportation to another site the last stage in decontamination of waste products? What is the environmental impact of the total disposal process?

LETTER 29

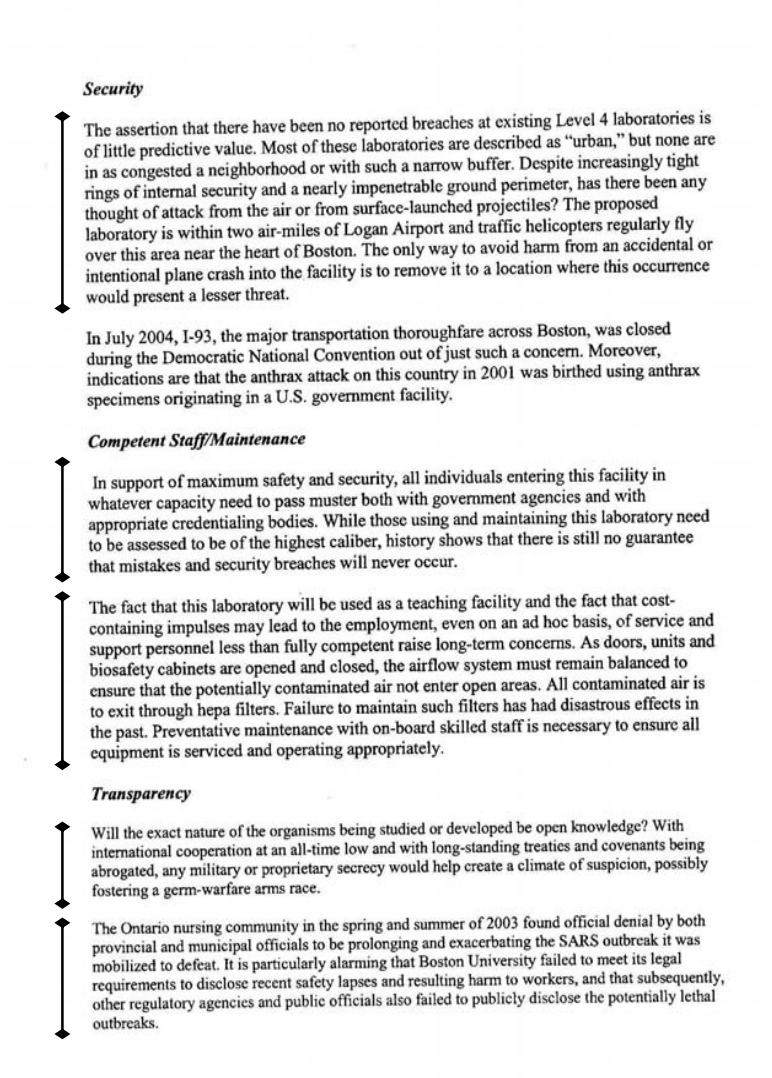
Mary Crotty, RN, MBA, JD

29.1 See Response to Comment 19.2.

29.2 Boston Medical Center has a robust emergency response plan as part in anticipation of its role in responding to emergency situations. This response plan was in place prior to any consideration being given to the construction of a biosafety lab. The Boston-NBL would provide more expertise to issues of emerging and re-emerging infectious diseases and the construction of the building would not increase the level of risk that these diseases present. Massachusetts has the intellectual and scientific infrastructure to do the research necessary to create vaccines, therapeutics and treatments for these diseases. Boston has the emergency response skills to respond to issues throughout the city. BUMC has the facilities and utilities infrastructure to operate the Boston-NBL without failure. The Boston-NBL does not create a risk; rather it addresses a need to deal with an existing risk that is prevalent in urban environments.

29.3 See Response to Comment 22.3.

29.4 As described in Section 2.2.8.2, the use, storage, and disposal of all solid and special waste would be performed in accordance with state and local regulations. All contaminated solid wastes would be treated prior to disposal. Pre-disposal treatment would include alkaline hydrolysis. Multi sterilization systems (autoclaves) would be used for biological wastes and tissue digesters would be used for animal wastes. A dedicated liquid effluent decontamination system would treat all liquid wastewater including autoclave drains and chemical disinfectants wash waste.



Security

29.5 The assertion that there have been no reported breaches at existing Level 4 laboratories is of little predictive value. Most of these laboratories are described as "urban," but none are in as congested a neighborhood or with such a narrow buffer. Despite increasingly tight rings of internal security and a nearly impenetrable ground perimeter, has there been any thought of attack from the air or from surface-launched projectiles? The proposed laboratory is within two air-miles of Logan Airport and traffic helicopters regularly fly over this area near the heart of Boston. The only way to avoid harm from an accidental or intentional plane crash into the facility is to remove it to a location where this occurrence would present a lesser threat.

In July 2004, I-93, the major transportation thoroughfare across Boston, was closed during the Democratic National Convention out of just such a concern. Moreover, indications are that the anthrax attack on this country in 2001 was birthed using anthrax specimens originating in a U.S. government facility.

Competent Staff/Maintenance

29.6 In support of maximum safety and security, all individuals entering this facility in whatever capacity need to pass muster both with government agencies and with appropriate credentialing bodies. While those using and maintaining this laboratory need to be assessed to be of the highest caliber, history shows that there is still no guarantee that mistakes and security breaches will never occur.

29.7 The fact that this laboratory will be used as a teaching facility and the fact that cost-containing impulses may lead to the employment, even on an ad hoc basis, of service and support personnel less than fully competent raise long-term concerns. As doors, units and biosafety cabinets are opened and closed, the airflow system must remain balanced to ensure that the potentially contaminated air not enter open areas. All contaminated air is to exit through hepa filters. Failure to maintain such filters has had disastrous effects in the past. Preventative maintenance with on-board skilled staff is necessary to ensure all equipment is serviced and operating appropriately.

Transparency

29.8 Will the exact nature of the organisms being studied or developed be open knowledge? With international cooperation at an all-time low and with long-standing treaties and covenants being abrogated, any military or proprietary secrecy would help create a climate of suspicion, possibly fostering a germ-warfare arms race.

29.9 The Ontario nursing community in the spring and summer of 2003 found official denial by both provincial and municipal officials to be prolonging and exacerbating the SARS outbreak it was mobilized to defeat. It is particularly alarming that Boston University failed to meet its legal requirements to disclose recent safety lapses and resulting harm to workers, and that subsequently, other regulatory agencies and public officials also failed to publicly disclose the potentially lethal outbreaks.

LETTER 29

Mary Crotty, RN, MBA, JD

29.5 BUMC has addressed risks identified by NIH and BUMC staff as well as the community. These risks, including a complete mechanical failure and subsequent release, an attack on the facility, the removal of agents from the building, employee injuries and transportation related risks have been addressed at a variety of meetings and are included in public documents. An attack on the facility from the air would result in damage that would primarily impact the BioSquare Research Park, and would result in no release as the agents in the building are destroyed by fire. The location of the Boston-NBL is in an area that provides response infrastructure for major incidents and creates no more or less risk than it would in a rural area. See Section 4.2.2.1 "Community Safety and Risk", and also Appendices 11 and 12.

29.6 Individuals working in the Boston-NBL would undergo significant background checks and would be mandated to work with other approved individuals as a safety and security risk mitigation measure. Concerns over the staff with access to select agents have been addressed though careful screening, mandatory two-person rule protocols, layers of access that must be replicated for egress and surveillance by closed circuit television. This system of audits and check and balances on approved personnel is intended to mitigate risks associated with approved staff. BUMC would institute protocols to minimize the opportunity for the removal of unauthorized materials from the Boston-NBL. See Section 4.2.1.1 "Community Safety and Risk – Other Potential Risk Scenarios (e)" in the FEIS.

29.7 BUMC will promote and hire appropriate in-house personnel to manage and maintain systems within the Boston-NBL. The selection of personnel will include appropriate background screening, relevant education and experience and willingness to work in a complex environment. BUMC will include specialized in-house employees in the commissioning process and will minimize reliance on external

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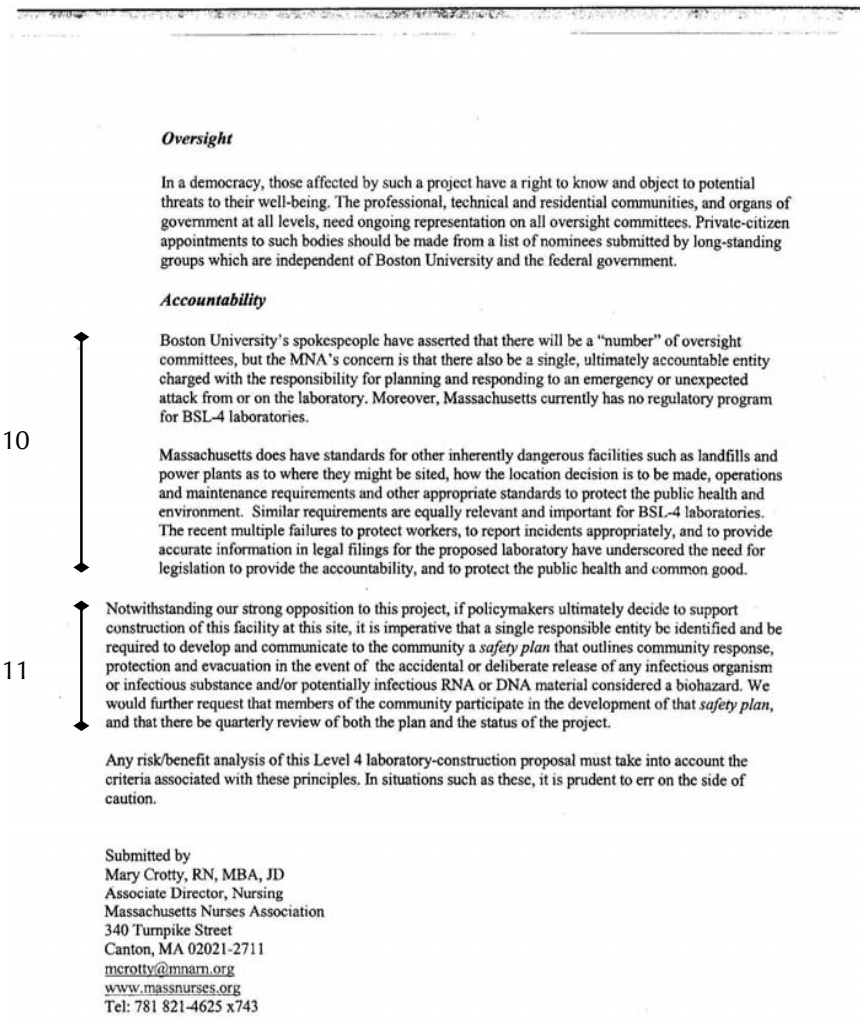
Mary Crotty, RN, MBA, JD

contracted services to address concerns over inappropriate personnel being provided access to the Boston-NBL.

29.8 A list of agents that may potentially be studied by BUMC at the laboratory appears in Appendix 2. The purpose of the Boston-NBL is to provide a highly contained and secure laboratory dedicated to studying emerging and re-emerging infectious diseases, many of which have potential as bioterrorism agents. The laboratory would not develop offensive or defensive biological weapons, as this is forbidden by a national security directive and international law.

29.9 As soon as confirmed cases of tularemia were identified BUMC officials notified all appropriate authorities as required including the Boston Public Health Commission (BPHC), the Massachusetts Department of Public Health and the CDC. The BPHC's report on these exposures recommended that stronger procedures be put in place to monitor lab personnel and report suspected cases. BUMC concurred with these recommendations in its public Statement of Responsibility. BUMC has already implemented procedures including a mandatory notice to the Occupational Medicine Department after missing one day with any sickness and a medical alert card carried by all tularemia lab workers. BUMC has begun to implement the following procedures: increased safety training and procedures for lab workers; strengthened laboratory safety procedures; unannounced safety inspections of BUMC laboratories; applying additional tests and safeguards to infectious material sent to BUMC for research purposes; outside, expert review of BUMC research controls and procedures; and, working with the Boston Public Health Commission to improve the notification process. See Section 4.2.1.1 "Community Safety and Risk – Other Potential Risk Scenarios (a)".



Oversight

In a democracy, those affected by such a project have a right to know and object to potential threats to their well-being. The professional, technical and residential communities, and organs of government at all levels, need ongoing representation on all oversight committees. Private-citizen appointments to such bodies should be made from a list of nominees submitted by long-standing groups which are independent of Boston University and the federal government.

Accountability

Boston University's spokespeople have asserted that there will be a "number" of oversight committees, but the MNA's concern is that there also be a single, ultimately accountable entity charged with the responsibility for planning and responding to an emergency or unexpected attack from or on the laboratory. Moreover, Massachusetts currently has no regulatory program for BSL-4 laboratories.

29.10

Massachusetts does have standards for other inherently dangerous facilities such as landfills and power plants as to where they might be sited, how the location decision is to be made, operations and maintenance requirements and other appropriate standards to protect the public health and environment. Similar requirements are equally relevant and important for BSL-4 laboratories. The recent multiple failures to protect workers, to report incidents appropriately, and to provide accurate information in legal filings for the proposed laboratory have underscored the need for legislation to provide the accountability, and to protect the public health and common good.

29.11

Notwithstanding our strong opposition to this project, if policymakers ultimately decide to support construction of this facility at this site, it is imperative that a single responsible entity be identified and be required to develop and communicate to the community a *safety plan* that outlines community response, protection and evacuation in the event of the accidental or deliberate release of any infectious organism or infectious substance and/or potentially infectious RNA or DNA material considered a biohazard. We would further request that members of the community participate in the development of that *safety plan*, and that there be quarterly review of both the plan and the status of the project.

Any risk/benefit analysis of this Level 4 laboratory-construction proposal must take into account the criteria associated with these principles. In situations such as these, it is prudent to err on the side of caution.

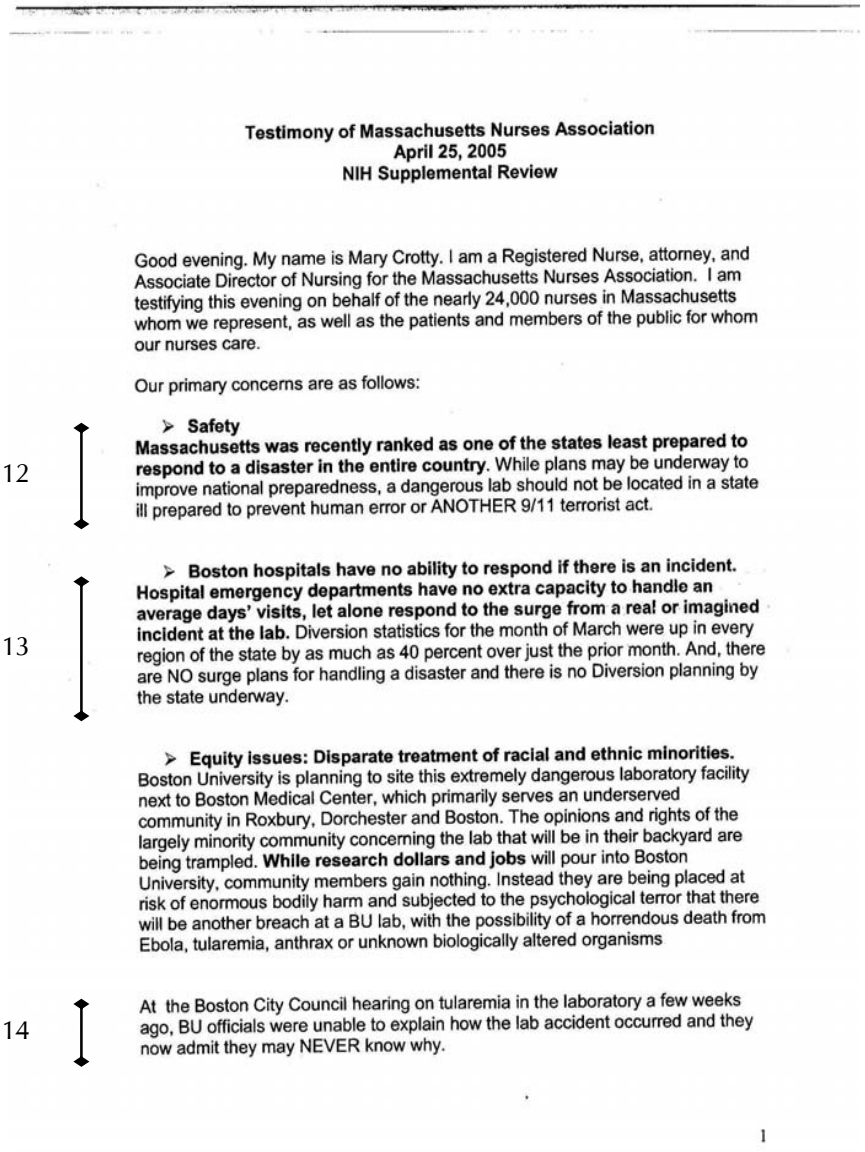
Submitted by
Mary Crotty, RN, MBA, JD
Associate Director, Nursing
Massachusetts Nurses Association
340 Turnpike Street
Canton, MA 02021-2711
mcrotty@mnarn.org
www.massnurses.org
Tel: 781 821-4625 x743

LETTER 29

Mary Crotty, RN, MBA, JD

29.10 BUMC would have several measures in place to ensure oversight of laboratory operations. See Response to Comment 4.28. While BUMC would be involved in emergency response planning, the ultimate authority for response lies with public emergency response agencies. See Response to Comment 29.2. The siting of the proposed laboratory has been reviewed and approved by many local, state and federal agencies and thus there is no need for additional regulation of the siting process.

29.11 The Boston-NBL would be owned, operated, and managed by BUMC and therefore BUMC is responsible for all operations. In addition to other agencies that regulate the operations of the Boston-NBL, the Boston Public Health Commission would be involved in all aspects of safety within the building and would be represented on oversight committees set up by BUMC. These oversight committees would include an executive committee with representatives of the public, a community oversight committee and both internal and external scientific committees. The oversight committees would have access to all research being performed in the building and all safety protocols in place.



Testimony of Massachusetts Nurses Association
April 25, 2005
NIH Supplemental Review

Good evening. My name is Mary Crotty. I am a Registered Nurse, attorney, and Associate Director of Nursing for the Massachusetts Nurses Association. I am testifying this evening on behalf of the nearly 24,000 nurses in Massachusetts whom we represent, as well as the patients and members of the public for whom our nurses care.

Our primary concerns are as follows:

29.12 ➢ **Safety**
Massachusetts was recently ranked as one of the states least prepared to respond to a disaster in the entire country. While plans may be underway to improve national preparedness, a dangerous lab should not be located in a state ill prepared to prevent human error or ANOTHER 9/11 terrorist act.

29.13 ➢ **Boston hospitals have no ability to respond if there is an incident. Hospital emergency departments have no extra capacity to handle an average days' visits, let alone respond to the surge from a real or imagined incident at the lab.** Diversion statistics for the month of March were up in every region of the state by as much as 40 percent over just the prior month. And, there are NO surge plans for handling a disaster and there is no Diversion planning by the state underway.

➢ **Equity issues: Disparate treatment of racial and ethnic minorities.** Boston University is planning to site this extremely dangerous laboratory facility next to Boston Medical Center, which primarily serves an underserved community in Roxbury, Dorchester and Boston. The opinions and rights of the largely minority community concerning the lab that will be in their backyard are being trampled. **While research dollars and jobs** will pour into Boston University, community members gain nothing. Instead they are being placed at risk of enormous bodily harm and subjected to the psychological terror that there will be another breach at a BU lab, with the possibility of a horrendous death from Ebola, tularemia, anthrax or unknown biologically altered organisms

29.14 At the Boston City Council hearing on tularemia in the laboratory a few weeks ago, BU officials were unable to explain how the lab accident occurred and they now admit they may NEVER know why.

1

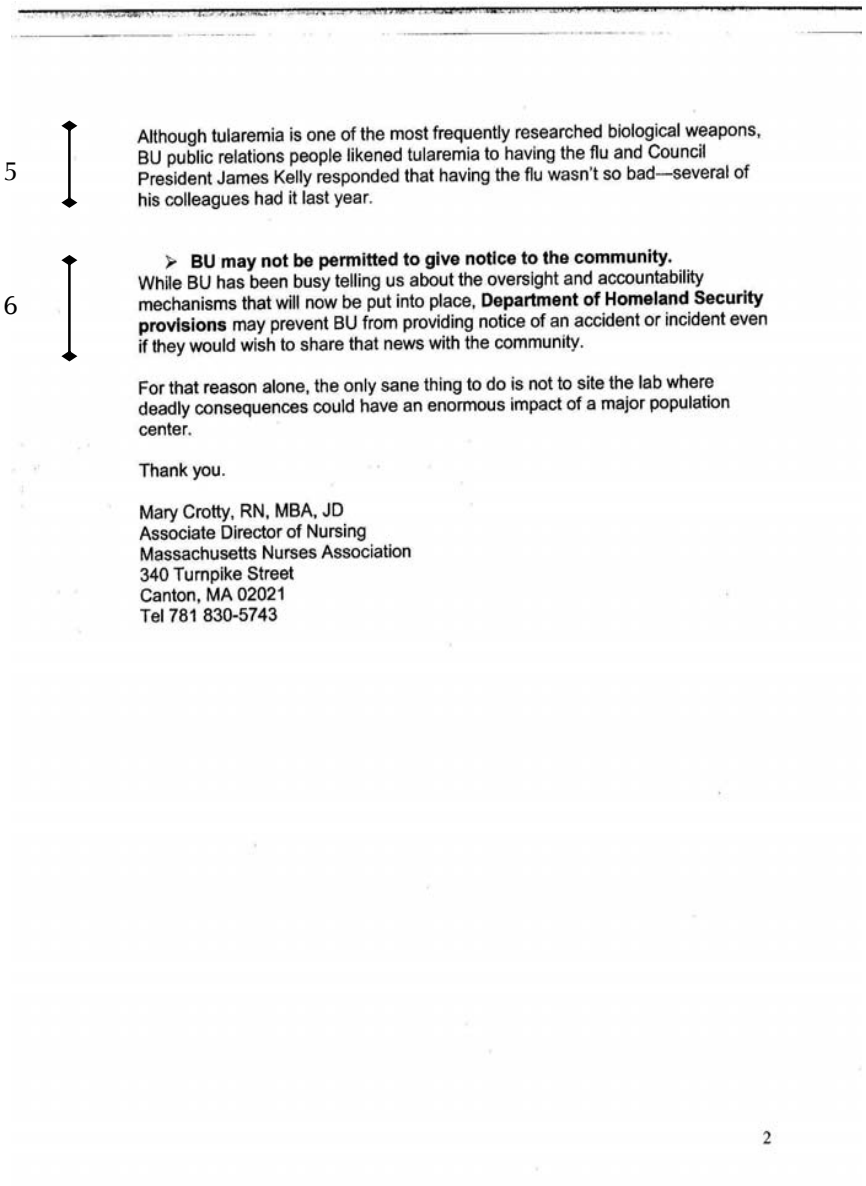
LETTER 29

Mary Crotty, RN, MBA, JD

29.12 BUMC is prepared to respond to any and all city, state or national emergency situations and provide assistance as a Level 1 trauma center and as an academic medical center with multiple areas of clinical expertise. The City of Boston and the Commonwealth of Massachusetts have hospital surge plans, evacuation plans and disaster plans. These plans are tested regularly.

29.13 Boston hospitals have a surge plan developed by the Public Health Commission, The Conference of Boston Teaching Hospitals, Boston Emergency Medical Services and the Boston Emergency Management Agency. This surge plan has been tested, works and resulted in the freeing up of 1,000 hospital beds in Boston on September 11, 2001.

29.14 The federal Centers for Disease Control and Prevention is currently making efforts to determine the sources of the contaminated culture.



Although tularemia is one of the most frequently researched biological weapons, BU public relations people likened tularemia to having the flu and Council President James Kelly responded that having the flu wasn't so bad—several of his colleagues had it last year.

29.15

➢ **BU may not be permitted to give notice to the community.**
While BU has been busy telling us about the oversight and accountability mechanisms that will now be put into place, **Department of Homeland Security provisions** may prevent BU from providing notice of an accident or incident even if they would wish to share that news with the community.

29.16

For that reason alone, the only sane thing to do is not to site the lab where deadly consequences could have an enormous impact of a major population center.

Thank you.

Mary Crotty, RN, MBA, JD
Associate Director of Nursing
Massachusetts Nurses Association
340 Turnpike Street
Canton, MA 02021
Tel 781 830-5743

2

LETTER 29

Mary Crotty, RN, MBA, JD

29.15 See Response to Comment 19.5.

29.16 The comment does not provide a citation to any Department of Homeland Security regulation that would prohibit either NIH or BUMC from notifying the public of a release of infectious agents from the proposed NBL or other accident. Nothing in the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 ("Bioterrorism Act") prohibits a facility from voluntarily releasing information to the public about any accident, release, theft, or infection involving select agents. Further, the Bioterrorism Act requires that a facility that handles select agents must notify the Secretary of the Department of Health and Human Services about any release so that the Centers for Disease Control and Prevention (CDC), acting on the Secretary's behalf, can take appropriate action to notify the public and local authorities. CDC's notification is in addition to any actions the facility may take. The facility is not prevented from directly notifying the public about any accident, release, theft, or infection.

Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

It is now time to Just Say No.

Sincerely,

Marge Dieter

Marge Dieter
10 Claflin Rd
Brookline, Ma 02445

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LETTER 30

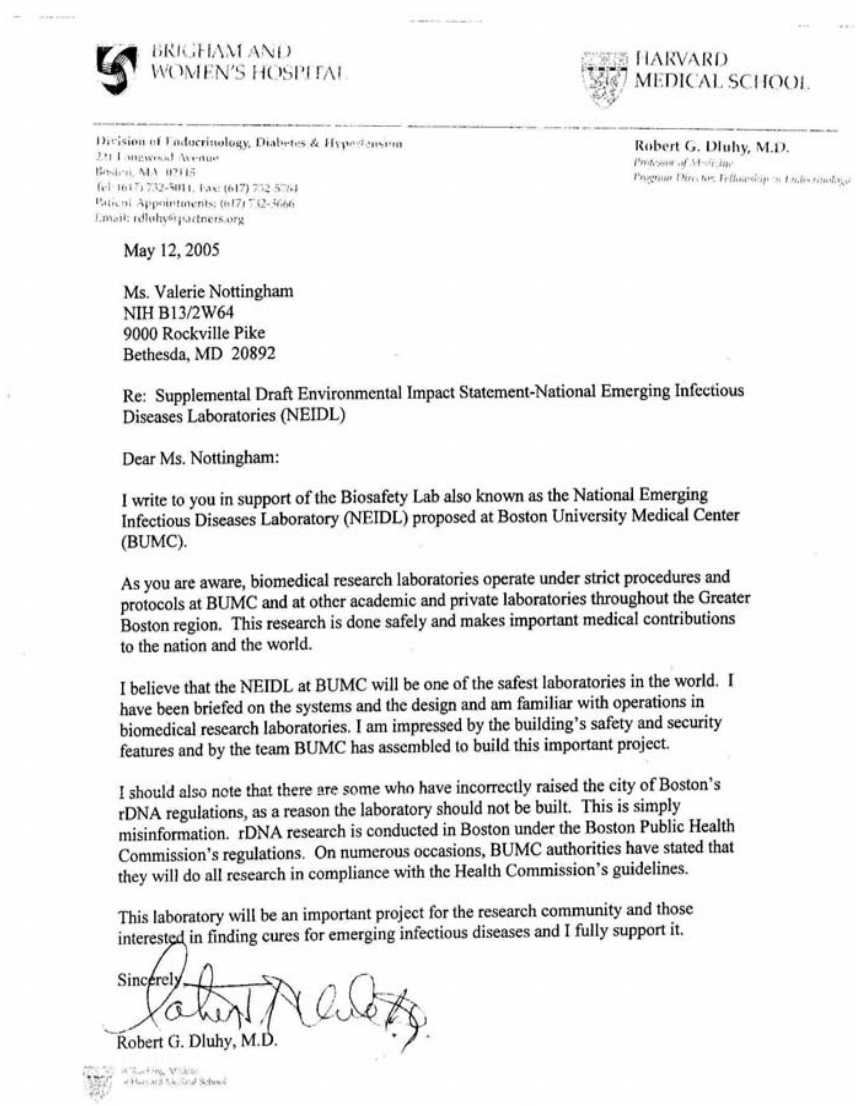
Marge Dieter

30.1 See Response to Comment 1.1.

30.2 See Response to Comment 1.2.

30.3 See Response to Comment 1.3.

30.4 See Response to Comment 1.4.



BRIGHAM AND WOMEN'S HOSPITAL

HARVARD MEDICAL SCHOOL

Division of Endocrinology, Diabetes & Hypertension
221 Longwood Avenue
Boston, MA 02115
Tel: (617) 732-5011, Fax: (617) 732-5764
Patient Appointments: (617) 732-5666
Email: rdluhy@partners.org

Robert G. Dluhy, M.D.
Professor of Medicine
Program Director, Fellowship in Endocrinology

May 12, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab also known as the National Emerging Infectious Diseases Laboratory (NEIDL) proposed at Boston University Medical Center (BUMC).

As you are aware, biomedical research laboratories operate under strict procedures and protocols at BUMC and at other academic and private laboratories throughout the Greater Boston region. This research is done safely and makes important medical contributions to the nation and the world.

I believe that the NEIDL at BUMC will be one of the safest laboratories in the world. I have been briefed on the systems and the design and am familiar with operations in biomedical research laboratories. I am impressed by the building's safety and security features and by the team BUMC has assembled to build this important project.

I should also note that there are some who have incorrectly raised the city of Boston's rDNA regulations, as a reason the laboratory should not be built. This is simply misinformation. rDNA research is conducted in Boston under the Boston Public Health Commission's regulations. On numerous occasions, BUMC authorities have stated that they will do all research in compliance with the Health Commission's guidelines.

This laboratory will be an important project for the research community and those interested in finding cures for emerging infectious diseases and I fully support it.

Sincerely,

Robert G. Dluhy, M.D.

LETTER 31

Robert G. Dluhy, M.D.

Nottingham, Valerie (NIH/OD/ORF)

From: Drapkin, Mark S.,M.D. [MDRAPKIN@PARTNERS.ORG]
Sent: Tuesday, May 03, 2005 12:12 PM
To: NIH NEPA Comments

Mark S. Drapkin MD
(Residence) 129 Clark Road
Brookline, MA 02445

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

As a physician in infectious diseases practice in the Boston area for 30 years and as a resident of Brookline, MA, I am writing to express support for the National Emerging Infectious Diseases Laboratories at Boston University Medical Center (BUMC). There is an urgent need in this country to create facilities to conduct research aimed at finding causes, diagnoses and therapeutics for the alarming number of recently emerging and re-emerging infectious diseases.

I would like to comment on two very important issues raised in the document - the appropriateness of the proposed location of the facility and the safety of the proposed Biosafety Level 4 laboratory.

As discussed in the document, prior to making a determination to site the proposed NEIDL facility at the BioSquare Research Park, Boston University undertook an alternatives siting analysis that evaluated existing sites under its control to determine the best location for the facility. The study concluded, and I agree, that the best location for this facility is exactly where it is proposed in the BioSquare Research Park in the City of Boston, MA.
BioSquare Research Park is a state of the art medical research park which contains medical research facilities including Biosafety Level 1, 2 and 3 laboratories that the proposed facility will be able to take advantage of.
BioSquare Research Park is also located directly across the street from the Boston University Medical Center campus which also houses hospital and medical research facilities and is the largest Level 1 Trauma Center in New England.

I understand that some community members feel that such a facility

LETTER 32

Mark S. Drapkin, M.D.

should be
located in a more rural location. As one who lives within three miles of the
proposed facility, I feel strongly that the facility should be located in an
urban area which functions as a hub for medical research activities and which
has a significant base of resident medical research scientists. Siting the
facility in this manner assures that efficiencies are reached in terms in the
ability to share research facilities and knowledge through direct collaboration
among the various institutions located in the greater Boston area.

In regards to concerns regarding the safety of the proposed facility and in
particular, the Biosafety Level 4 laboratory, I have no question that the
facility will be safe. There are several federal and state programs which
require the facility to be constructed and operated at extremely high safety
standards. Similar laboratories throughout the United States have operated
safely for decades.

In closing, as one who lives and works close to the proposed facility, I urge
you to proceed with the funding to construct this much needed national resource
at the BioSquare Research Park in Boston.

Sincerely,

Mark S. Drapkin, M.D.
Associate Chief, Infectious Diseases Service, Newton-Wellesley Hospital
Professor of Medicine, Tufts University School of Medicine
2000 Washington Street Suite 122
Newton, MA 02462

LETTER 32

Mark S. Drapkin, M.D.

Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

It is now time to Just Say No.

Sincerely,

Joan Eckler - Prof. of Sociology (retired) Human/Bio
14 Sterling St
Newton, MA 02465

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33.4

LETTER 33

Joan Eckler

33.1 See Response to Comment 1.1.

33.2 See Response to Comment 1.2.

33.3 See Response to Comment 1.3.

33.4 See Response to Comment 1.4.

Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

34.1

34.2

34.3

It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

34.4

It is now time to Just Say No.

Sincerely,

Reita G. Ennis
3 Copland Road
Brookline, MA 02445

LETTER 34

Reita G. Ennis

34.1 See Response to Comment 1.1.

34.2 See Response to Comment 1.2.

34.3 See Response to Comment 1.3.

34.4 See Response to Comment 1.4.

MAY-18-2005 08:58 P.02

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
1 CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

OFFICE OF THE
REGIONAL ADMINISTRATOR

May 17, 2005

Valerie Nottingham
National Institutes of Health
NIH B13/2W64
9000 Rockville Pike
Bethesda, Maryland 20892

Re: Supplemental Draft Environmental Impact Statement for National Emerging Infectious Diseases Laboratories Boston, Massachusetts, CEQ # 20050138

Dear Ms. Nottingham:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, we have reviewed the National Institutes of Health's (NIH) Supplemental Draft Environmental Impact Statement (SDEIS) for the National Emerging Infectious Diseases Laboratory (NEIDL) at the Boston University Medical Center Campus in Boston, Massachusetts.

The SDEIS describes the same proposed action detailed in the October 2004 DEIS. The proposed action includes the construction of a 194,000 square foot biosafety lab facility at the BioSquare Research Park in Boston. EPA commented on the DEIS for this project in January 2005. At that time we identified concerns related to air quality, cumulative impacts and environmental justice. A copy of our comments are provided again for your reference.

While the SDEIS was responsive to many of the comments and concerns we raised on the DEIS, the attachment to this letter describes issues and questions that we believe need to be addressed in the FEIS. We have rated the SDEIS "EC-2-Environmental Concerns–Insufficient Information" in accordance with EPA's national rating system, a description of which is attached to this letter. Please contact Timothy Timmermann (617-918-1025) of EPA's Office of Environmental Review with any questions.

Sincerely,

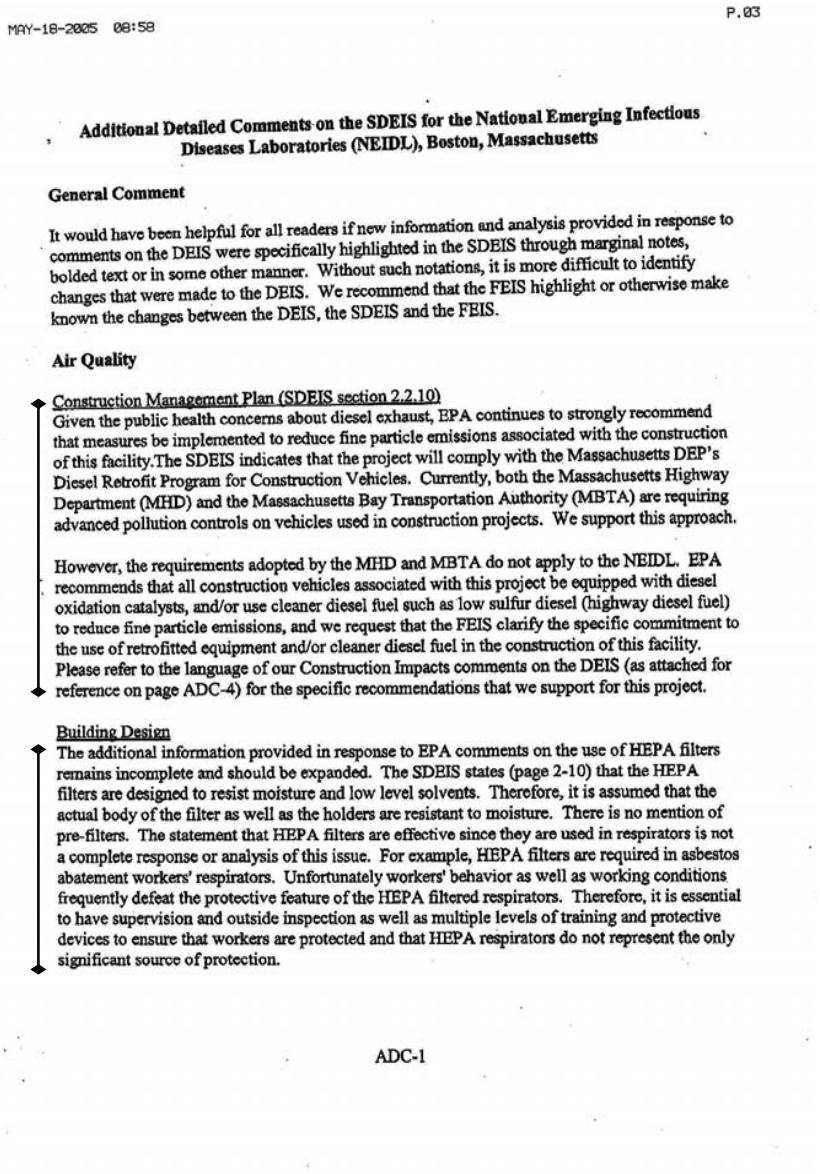
Robert W. Varney
Regional Administrator

attachment

617-918-1010
Internet Address (URL) • http://www.epa.gov/region1
Recycled/Recyclable • Printed with Vegetable Oil Based Inks on Recycled Paper (Minimum 30% Postconsumer)

LETTER 35

U.S. Environmental Protection Agency



MAY-18-2005 08:58 P.03

Additional Detailed Comments on the SDEIS for the National Emerging Infectious Diseases Laboratories (NEIDL), Boston, Massachusetts

General Comment

It would have been helpful for all readers if new information and analysis provided in response to comments on the DEIS were specifically highlighted in the SDEIS through marginal notes, bolded text or in some other manner. Without such notations, it is more difficult to identify changes that were made to the DEIS. We recommend that the FEIS highlight or otherwise make known the changes between the DEIS, the SDEIS and the FEIS.

Air Quality

Construction Management Plan (SDEIS section 2.2.10)

35.1 Given the public health concerns about diesel exhaust, EPA continues to strongly recommend that measures be implemented to reduce fine particle emissions associated with the construction of this facility.The SDEIS indicates that the project will comply with the Massachusetts DEP's Diesel Retrofit Program for Construction Vehicles. Currently, both the Massachusetts Highway Department (MHD) and the Massachusetts Bay Transportation Authority (MBTA) are requiring advanced pollution controls on vehicles used in construction projects. We support this approach.

However, the requirements adopted by the MHD and MBTA do not apply to the NEIDL. EPA recommends that all construction vehicles associated with this project be equipped with diesel oxidation catalysts, and/or use cleaner diesel fuel such as low sulfur diesel (highway diesel fuel) to reduce fine particle emissions, and we request that the FEIS clarify the specific commitment to the use of retrofitted equipment and/or cleaner diesel fuel in the construction of this facility. Please refer to the language of our Construction Impacts comments on the DEIS (as attached for reference on page ADC-4) for the specific recommendations that we support for this project.

Building Design

35.2 The additional information provided in response to EPA comments on the use of HEPA filters remains incomplete and should be expanded. The SDEIS states (page 2-10) that the HEPA filters are designed to resist moisture and low level solvents. Therefore, it is assumed that the actual body of the filter as well as the holders are resistant to moisture. There is no mention of pre-filters. The statement that HEPA filters are effective since they are used in respirators is not a complete response or analysis of this issue. For example, HEPA filters are required in asbestos abatement workers' respirators. Unfortunately workers' behavior as well as working conditions frequently defeat the protective feature of the HEPA filtered respirators. Therefore, it is essential to have supervision and outside inspection as well as multiple levels of training and protective devices to ensure that workers are protected and that HEPA respirators do not represent the only significant source of protection.

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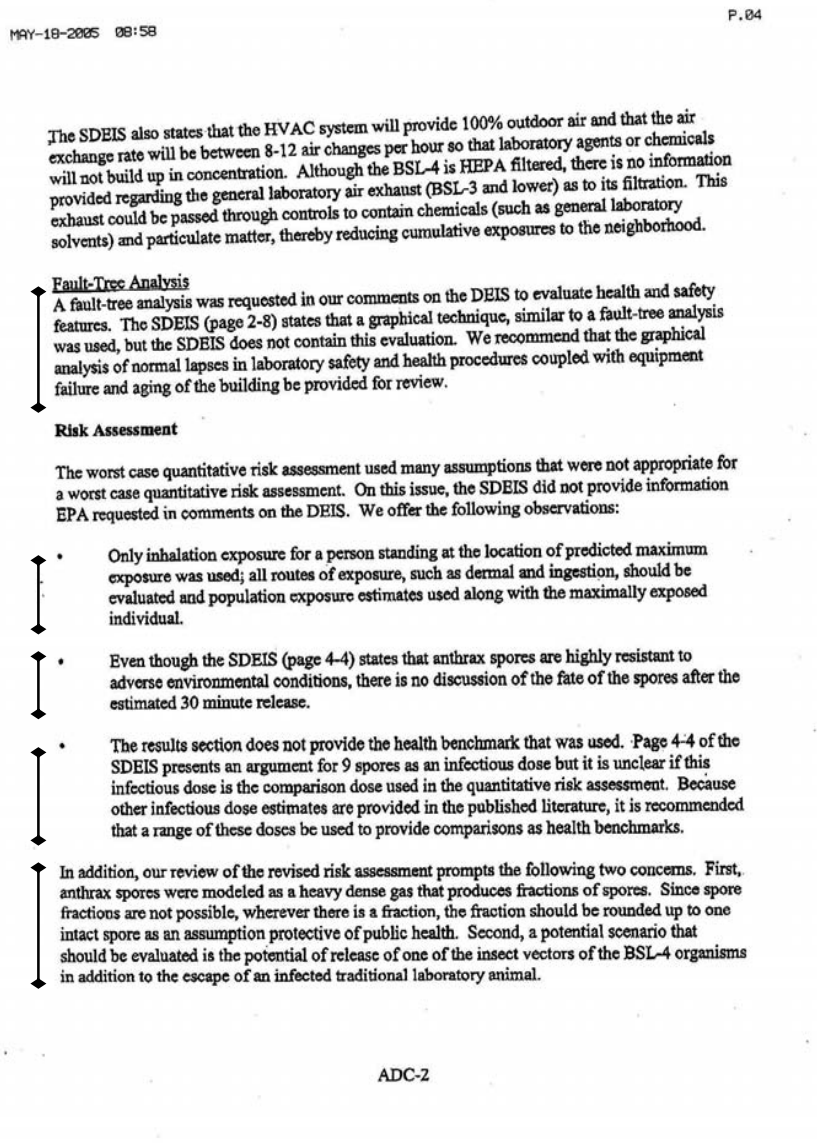
35.1 As noted in Section 2.2.10 of the FEIS, the project is committed to the DEP Diesel Retrofit Program for Construction Vehicles, which would include the use of retrofitted equipment and/or cleaner diesel fuel. Electric welders would be used and no diesel powered generators would be used unless for emergency reasons. The exhaust system of all heavy equipment including excavators and cranes would be modified with scrubbers if they were to remain on site for more than two months. All diesel equipment would utilize low sulfur fuel. All diesel equipment would be equipped with a mufflers and sound shrouds / shields.

35.2 With regard to building design, pre-filters are used in-line prior to supply HEPA filters to prevent premature loading of the supply HEPA filters. Laboratory air exhausted through HEPA filters is not subjected to pre-filtration because laboratory environments do not generate large numbers of particulates which may prematurely load filters. Additionally, static pressure drops are measured across HEPA filter installations as a real time measurement of filter efficiency and operation. These installations are tested and certified by National Sanitation Foundation (NSF) certified technicians against NSF Standard 49 requirements. HEPA filter installations are re-certified annually and are provided with full redundancy. See Section 2.2.3.4 of the FEIS.



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The SDEIS also states that the HVAC system will provide 100% outdoor air and that the air exchange rate will be between 8-12 air changes per hour so that laboratory agents or chemicals will not build up in concentration. Although the BSL-4 is HEPA filtered, there is no information provided regarding the general laboratory air exhaust (BSL-3 and lower) as to its filtration. This exhaust could be passed through controls to contain chemicals (such as general laboratory solvents) and particulate matter, thereby reducing cumulative exposures to the neighborhood.

35.3 Fault-Tree Analysis
A fault-tree analysis was requested in our comments on the DEIS to evaluate health and safety features. The SDEIS (page 2-8) states that a graphical technique, similar to a fault-tree analysis was used, but the SDEIS does not contain this evaluation. We recommend that the graphical analysis of normal lapses in laboratory safety and health procedures coupled with equipment failure and aging of the building be provided for review.

Risk Assessment

The worst case quantitative risk assessment used many assumptions that were not appropriate for a worst case quantitative risk assessment. On this issue, the SDEIS did not provide information EPA requested in comments on the DEIS. We offer the following observations:

35.4 • Only inhalation exposure for a person standing at the location of predicted maximum exposure was used; all routes of exposure, such as dermal and ingestion, should be evaluated and population exposure estimates used along with the maximally exposed individual.

35.5 • Even though the SDEIS (page 4-4) states that anthrax spores are highly resistant to adverse environmental conditions, there is no discussion of the fate of the spores after the estimated 30 minute release.

35.6 • The results section does not provide the health benchmark that was used. Page 4-4 of the SDEIS presents an argument for 9 spores as an infectious dose but it is unclear if this infectious dose is the comparison dose used in the quantitative risk assessment. Because other infectious dose estimates are provided in the published literature, it is recommended that a range of these doses be used to provide comparisons as health benchmarks.

35.7 In addition, our review of the revised risk assessment prompts the following two concerns. First, anthrax spores were modeled as a heavy dense gas that produces fractions of spores. Since spore fractions are not possible, wherever there is a fraction, the fraction should be rounded up to one intact spore as an assumption protective of public health. Second, a potential scenario that should be evaluated is the potential of release of one of the insect vectors of the BSL-4 organisms in addition to the escape of an infected traditional laboratory animal.

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35.3 The design of the facility has been reviewed multiple times throughout the design development. These reviews would continue throughout the design and construction process. The operation of the facility would only occur after the formal commissioning process is successfully completed; with failure mode tests have been performed based on the review of the final as built design of the facility. The operation of the BSL-4 laboratory with select agents can only be authorized upon submission review and approval of the standard operating procedures for laboratory protocols by the CDC (the authority approving the use of Select Agents). See Section 2.2.4 for information on commissioning.

35.4 Inhalation exposures to anthrax spores represent the worst case exposure scenario in terms of public health impact (See Rotz, 2002). Cutaneous anthrax is easily treated with antibiotics and is not considered an outcome of accidental release from this building. Gastrointestinal (G.I.) anthrax outbreaks do occur but are related to handling and consuming meat from infected cattle in African, Asia and the former Soviet Union where anthrax is an endemic disease. Gastrointestinal anthrax would not be the most likely outcome of an accidental release of the agent from a BSL-4 facility and therefore is inappropriate for the inclusion in worst case scenario modeling.

35.5 Spores released in the modeling scenarios (1-10 μ in size) will remain in the air for extended periods of time. After the 30 minute release the small numbers of spores released will further dissipate with regard to concentration.

35.6 In the appended Maximum Possible Risk model (see Appendix 12), 500 spores over an 8 hour period was used as the pathogenic bench mark (Brachman 1966).

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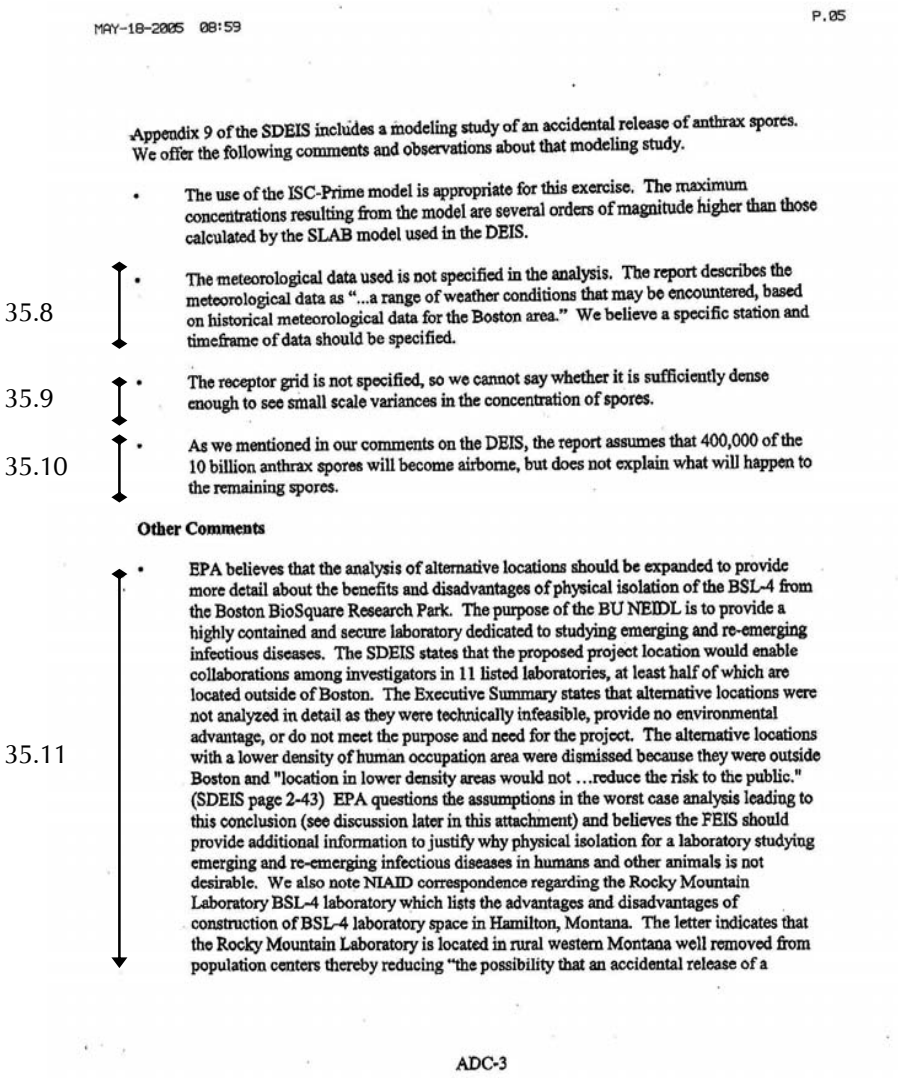
35.7 In Section 4.2.1.1 "Community Safety and Risk – Worst-Case Release Scenario Risk Assessment", the summary of results for the worst case examined (i.e., no HEPA filter case), the calculated maximum number of spores that may be inhaled is 0.2925 spores. Instead of expressing the maximum number of spores as a spore fraction, the above results are equivalent to an estimate of a single spore in a volume of 3.4 m^3 of air. Assuming a breathing rate of 30 litres per minute, it would take approximately 1.9 hours to inhale this volume of air.



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Appendix 9 of the SDEIS includes a modeling study of an accidental release of anthrax spores. We offer the following comments and observations about that modeling study.

- The use of the ISC-Prime model is appropriate for this exercise. The maximum concentrations resulting from the model are several orders of magnitude higher than those calculated by the SLAB model used in the DEIS.
- The meteorological data used is not specified in the analysis. The report describes the meteorological data as "...a range of weather conditions that may be encountered, based on historical meteorological data for the Boston area." We believe a specific station and timeframe of data should be specified.
- The receptor grid is not specified, so we cannot say whether it is sufficiently dense enough to see small scale variances in the concentration of spores.
- As we mentioned in our comments on the DEIS, the report assumes that 400,000 of the 10 billion anthrax spores will become airborne, but does not explain what will happen to the remaining spores.

Other Comments

- EPA believes that the analysis of alternative locations should be expanded to provide more detail about the benefits and disadvantages of physical isolation of the BSL-4 from the Boston BioSquare Research Park. The purpose of the BU NEIDL is to provide a highly contained and secure laboratory dedicated to studying emerging and re-emerging infectious diseases. The SDEIS states that the proposed project location would enable collaborations among investigators in 11 listed laboratories, at least half of which are located outside of Boston. The Executive Summary states that alternative locations were not analyzed in detail as they were technically infeasible, provide no environmental advantage, or do not meet the purpose and need for the project. The alternative locations with a lower density of human occupation area were dismissed because they were outside Boston and "location in lower density areas would not …reduce the risk to the public." (SDEIS page 2-43) EPA questions the assumptions in the worst case analysis leading to this conclusion (see discussion later in this attachment) and believes the FEIS should provide additional information to justify why physical isolation for a laboratory studying emerging and re-emerging infectious diseases in humans and other animals is not desirable. We also note NIAID correspondence regarding the Rocky Mountain Laboratory BSL-4 laboratory which lists the advantages and disadvantages of construction of BSL-4 laboratory space in Hamilton, Montana. The letter indicates that the Rocky Mountain Laboratory is located in rural western Montana well removed from population centers thereby reducing "the possibility that an accidental release of a

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35.8
35.9
35.10
35.11

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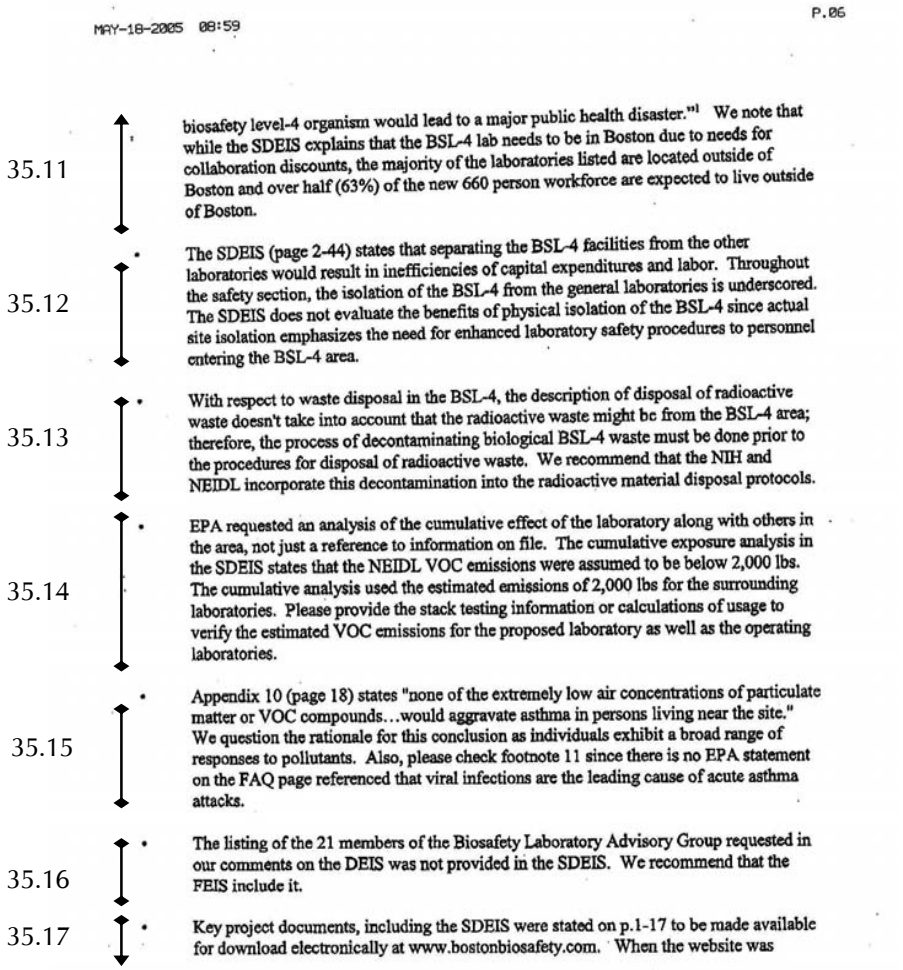
35.8 In Section 4.2.2.1 "Community Safety and Risk – Worst-Case Release Scenario Risk Assessment", modeling was completed using two computer models (SLAB and ISC PRIME) and using wind tunnel tests. For the SLAB and wind tunnel results, the meteorological conditions used were screening-level conditions that were compared to actual Boston area data to confirm that the conditions modeled are conditions that may occur in the Boston area. The ISC PRIME modeling was completed using long-term hourly surface data from Logan (Boston) International Airport.

35.9 As explained in Appendix 9 "Risk Assessment Report March 23, 2005 – Appendix A", for the wind tunnel assessment of the Boston-NBL, a model was built to a scale of 1:200. The model consisted of the Boston-NBL and any surroundings within an 800 foot radius. This included many Boston University Medical Campus (BUMC) buildings (existing and future), and the surrounding commercial and residential areas. Because of the height of the penitentiary south of the Boston-NBL, an extension was also added to include this in the model. Receptor locations in the wind tunnel were connected to tracer gas meters and are tested for multiple wind speeds and wind directions for each source in order to capture the worst-case impact.

Receptor locations included Boston-NBL air intakes and pedestrian locations, BUMC building air intakes and pedestrian locations, and off-site locations such as commercial buildings and residential areas. They were chosen based on RWDI's experience and input from Boston University, CUH2A, and Hemisphere Engineering. They include locations where the highest exhaust concentrations are expected to occur.

35.10 The remaining anthrax in the scenario that is not released into the environment remains in the laboratory. The sample either remains in the sample tube, or spills over on to the laboratory floor. In either case the spill is cleaned under laboratory standard procedures and the surfaces are decontaminated.



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biosafety level-4 organism would lead to a major public health disaster."[1] We note that while the SDEIS explains that the BSL-4 lab needs to be in Boston due to needs for collaboration discounts, the majority of the laboratories listed are located outside of Boston and over half (63%) of the new 660 person workforce are expected to live outside of Boston.

35.11

- The SDEIS (page 2-44) states that separating the BSL-4 facilities from the other laboratories would result in inefficiencies of capital expenditures and labor. Throughout the safety section, the isolation of the BSL-4 from the general laboratories is underscored. The SDEIS does not evaluate the benefits of physical isolation of the BSL-4 since actual site isolation emphasizes the need for enhanced laboratory safety procedures to personnel entering the BSL-4 area.

35.12

- With respect to waste disposal in the BSL-4, the description of disposal of radioactive waste doesn't take into account that the radioactive waste might be from the BSL-4 area; therefore, the process of decontaminating biological BSL-4 waste must be done prior to the procedures for disposal of radioactive waste. We recommend that the NIH and NEIDL incorporate this decontamination into the radioactive material disposal protocols.

35.13

- EPA requested an analysis of the cumulative effect of the laboratory along with others in the area, not just a reference to information on file. The cumulative exposure analysis in the SDEIS states that the NEIDL VOC emissions were assumed to be below 2,000 lbs. The cumulative analysis used the estimated emissions of 2,000 lbs for the surrounding laboratories. Please provide the stack testing information or calculations of usage to verify the estimated VOC emissions for the proposed laboratory as well as the operating laboratories.

35.14

- Appendix 10 (page 18) states "none of the extremely low air concentrations of particulate matter or VOC compounds…would aggravate asthma in persons living near the site." We question the rationale for this conclusion as individuals exhibit a broad range of responses to pollutants. Also, please check footnote 11 since there is no EPA statement on the FAQ page referenced that viral infections are the leading cause of acute asthma attacks.

35.15

- The listing of the 21 members of the Biosafety Laboratory Advisory Group requested in our comments on the DEIS was not provided in the SDEIS. We recommend that the FEIS include it.

35.16

- Key project documents, including the SDEIS were stated on p.1-17 to be made available for download electronically at www.bostonbiosafety.com. When the website was

35.17

[1]January 9, 2003 letter from Paul A. Marshall, Freedom of Information Coordinator, NIAID, to James Miller, President, Friends of the Bitteroot.

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35.11 NIH analyzed the alternatives determined to be feasible. One of the main considerations in determining whether an alternative is reasonable is its ability to meet the purpose and need of the project in its entirety. There is no benefit to locating the facility elsewhere to reduce risk because the risk is negligible. The Rocky Mountain Laboratory memo referred to in the comment was never officially signed or sent, and its author is unknown. NIH does not support the content of the memo as rationale for the location of any laboratory. NIH would have to believe that the proposed facility was unsafe, which it does not. Where the staff lives is not as important as where they work to facilitate collaboration. All the facilities listed are within a close distance, and not far removed from the city.

35.12 Separation refers to a great physical distance between laboratories. Isolation means barriers to entry and exit, and does not refer to the distance from one another. In this way, laboratories can be isolated and safe, while being close enough to create efficiencies due to co-location.

35.13 The use of any radioactive isotope in research at the Boston-NBL would first need to be reviewed and approved by BUMC's Radioisotope Committee. Part of the approval process would be a review of the disposal requirements. Any radioactive wastes would be deactivated biologically (through the process described in Section 2.2.8.2 – Biological Waste) prior to treatment as a radioactive waste. Short-lived radioactive wastes would be held in the laboratory until complete decay of the isotope. Long-lived radioactive wastes would require disposal off-site. For further information on biological and radioactive waste, see Section 2.2.8.2 of the FEIS.

35.14 The air quality analysis in Appendix 10 of the SDEIS was performed to predict the cumulative effects of the proposed Boston-NBL and other nearby proposed and existing air pollutant sources in Boston. Besides the proposed Boston-NBL, other modeled laboratory sources

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included the existing Evans Research Building and the proposed BioSquare Buildings E and G. Boston University performed a study of the emissions from its wet chemistry laboratory on the Charles River Campus, which would have higher VOC emissions than a biological laboratory such as the proposed Boston-NBL. Estimated annual VOC emissions from the Charles River Campus laboratory were less than 1,000 pounds of VOC per year, as most of the chemicals are either used in reactions or disposed of. Therefore, the assumption that the Boston-NBL, the Evans Research Building, and the other two proposed laboratories at the BioSquare facility will have emissions of 2,000 pounds of each VOC per year is a very conservative approach. Nevertheless, the maximum predicted cumulative VOC impacts are safely in compliance with the Massachusetts DEP air toxics TEL and AALs and show that the Boston-NBL will not have an adverse health effect on the community.

35.15 The results of the air quality analysis showed maximum predicted cumulative concentrations of particulate matter (PM10 and PM2.5) that are safely in compliance with the NAAQS, and cumulative VOC concentration safely in compliance with Massachusetts DEP 24-hour average Threshold Exposure Limits (TELs) and annual average Allowable Ambient Limits (AALs) for air toxics. The NAAQS were designed to protect the most sensitive members of the population from adverse health effects, with a margin for safety. The NAAQS for particulates were designed to include protection from increased respiratory symptoms for persons with asthma. Similarly, the Massachusetts DEP TEL and AAL criteria are health-based standards established by the DEP to protect all individuals from adverse health effects, including asthma, with a margin for safety. Footnote 11 on page 18 of Appendix 10 of the SDEIS should read as: http://env1.kangwon.ac.kr/project/sdwr2004/litsurv/intwebsites/epa-ost/www.epa.gov/asthma/introduction.html. This reference clearly states that "Viral infections are the leading cause of acute asthma attacks."

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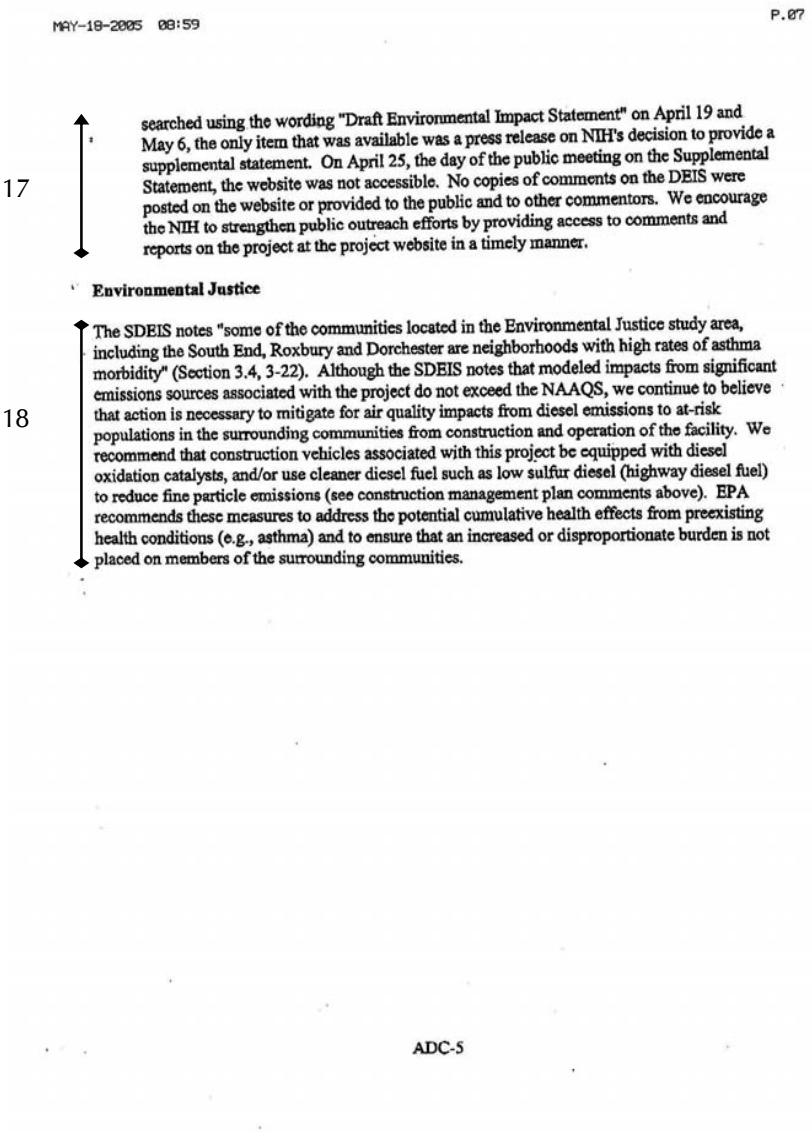
35.16 Membership of community advisory groups can be obtained from the BUMC Office of Community Relations.



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35.17 searched using the wording "Draft Environmental Impact Statement" on April 19 and May 6, the only item that was available was a press release on NIH's decision to provide a supplemental statement. On April 25, the day of the public meeting on the Supplemental Statement, the website was not accessible. No copies of comments on the DEIS were posted on the website or provided to the public and to other commentors. We encourage the NIH to strengthen public outreach efforts by providing access to comments and reports on the project at the project website in a timely manner.

Environmental Justice

35.18 The SDEIS notes "some of the communities located in the Environmental Justice study area, including the South End, Roxbury and Dorchester are neighborhoods with high rates of asthma morbidity" (Section 3.4, 3-22). Although the SDEIS notes that modeled impacts from significant emissions sources associated with the project do not exceed the NAAQS, we continue to believe that action is necessary to mitigate for air quality impacts from diesel emissions to at-risk populations in the surrounding communities from construction and operation of the facility. We recommend that construction vehicles associated with this project be equipped with diesel oxidation catalysts, and/or use cleaner diesel fuel such as low sulfur diesel (highway diesel fuel) to reduce fine particle emissions (see construction management plan comments above). EPA recommends these measures to address the potential cumulative health effects from preexisting health conditions (e.g., asthma) and to ensure that an increased or disproportionate burden is not placed on members of the surrounding communities.

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35.17 Due to technical issues, the SDEIS was not available on the web for download. However, the document was made available for review in a timely and public manner. Copies of the SDEIS were placed at the Boston, South End, Dorchester and Roxbury branches of the Boston Public Library. In addition, paper and/or electronic copies of the SDEIS were mailed to nearly 100 individuals who either provided public comment on the DEIS or requested a copy. See Distribution List prior to Appendices.

35.18 NIH believes that the EPA's National Ambient Air Quality Standards (NAAQS) are sufficient to protect human health and therefore, further mitigation is not necessary. In most cases, the emissions would be well below the standards. There is a commitment to reduce construction vehicle emissions as well. See Responses to Comments 35.1 and 35.14.

MAY-18-2005 09:59 P.08

Summary of Rating Definitions and Follow-up Action

Environmental Impact of the Action

LO--Lack of Objections
The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC--Environmental Concerns
The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO--Environmental Objections
The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU--Environmentally Unsatisfactory
The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1--Adequate
EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2--Insufficient Information
The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3--Inadequate
EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

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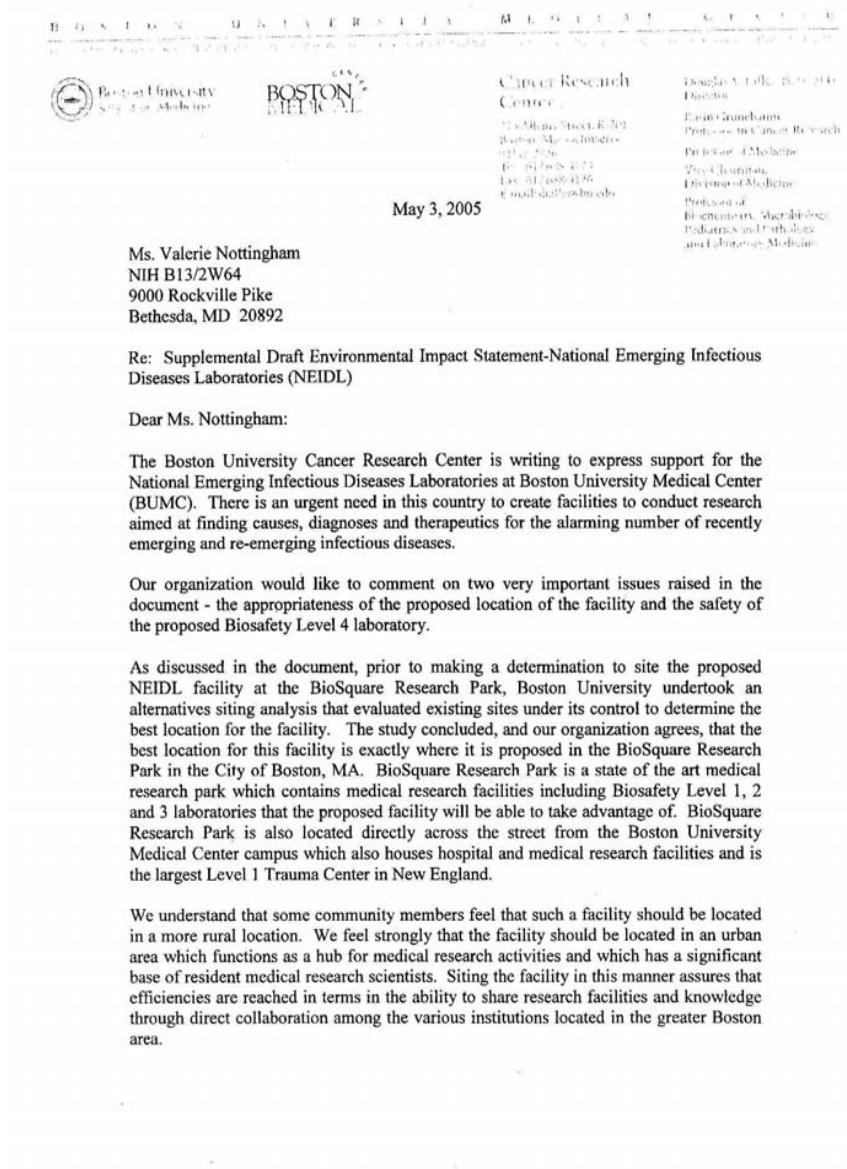


BOSTON UNIVERSITY MEDICAL CENTER

Boston University School of Medicine

BOSTON MEDICAL CENTER

Cancer Research Center

Douglas V. Faller, M.D.
Director

Professor of Medicine
Vice Chairman
Division of Medicine

Professor of
Biochemistry, Microbiology,
Pediatrics and Pathology
and Laboratory Medicine

May 3, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

The Boston University Cancer Research Center is writing to express support for the National Emerging Infectious Diseases Laboratories at Boston University Medical Center (BUMC). There is an urgent need in this country to create facilities to conduct research aimed at finding causes, diagnoses and therapeutics for the alarming number of recently emerging and re-emerging infectious diseases.

Our organization would like to comment on two very important issues raised in the document - the appropriateness of the proposed location of the facility and the safety of the proposed Biosafety Level 4 laboratory.

As discussed in the document, prior to making a determination to site the proposed NEIDL facility at the BioSquare Research Park, Boston University undertook an alternatives siting analysis that evaluated existing sites under its control to determine the best location for the facility. The study concluded, and our organization agrees, that the best location for this facility is exactly where it is proposed in the BioSquare Research Park in the City of Boston, MA. BioSquare Research Park is a state of the art medical research park which contains medical research facilities including Biosafety Level 1, 2 and 3 laboratories that the proposed facility will be able to take advantage of. BioSquare Research Park is also located directly across the street from the Boston University Medical Center campus which also houses hospital and medical research facilities and is the largest Level 1 Trauma Center in New England.

We understand that some community members feel that such a facility should be located in a more rural location. We feel strongly that the facility should be located in an urban area which functions as a hub for medical research activities and which has a significant base of resident medical research scientists. Siting the facility in this manner assures that efficiencies are reached in terms in the ability to share research facilities and knowledge through direct collaboration among the various institutions located in the greater Boston area.

LETTER 36

Douglas V. Faller, Ph.D., M.D.

In regards to concerns regarding the safety of the proposed facility and in particular, the Biosafety Level 4 laboratory, our organization has no question that the facility will be safe. There are several federal and state programs which require the facility to be constructed and operated at extremely high safety standards. Similar laboratories throughout the United States have operated safely for decades.

In closing, we urge you to proceed with the funding to construct this much needed national resource at the BioSquare Research Park in Boston.

Sincerely,

DVF

Douglas V. Faller, Ph.D., M.D.
Director, Cancer Research Center

LETTER 36

Douglas V. Faller, Ph.D., M.D.

Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

37.1

37.2

37.3

It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

37.4

It is now time to Just Say No.

Sincerely,

The Rev. Dr. Norman Farranelli
29 Harris St.
Waltham, MA 02452

LETTER 37

Norman Farranelli

37.1 See Response to Comment 1.1.

37.2 See Response to Comment 1.2.

37.3 See Response to Comment 1.3.

37.4 See Response to Comment 1.4.

LETTER 38

Robina E. Folland

Robina E. Folland
9 Perry Street
Brookline, Massachusetts 02445

May 18, 2005

Valerie Nottingham
Division of Environmental Protection
The National Institutes of Health
B13, 2W64
9000 Rockville Pike
Bethesda, Maryland 20892

Re: Boston University National Emerging Infectious Diseases Laboratory
UC6 AI058618

Dear Ms. Nottingham,

Once again, I am writing in support of Boston University Medical Center's National Emerging Infectious Diseases Laboratory project.

It is my understanding that project opponents felt that alternative laboratory sites were not sufficiently described in the original Environmental Impact Statement and that a less densely populated site should have been chosen for safety reasons. Although Boston University does owns land in more rural areas, Tyngsborough, Massachusetts and Peterborough, New Hampshire, neither of these sites offers the proximity to the resources and infrastructure of the greater Boston scientific community or easy access to public transportation. Locating the Laboratory in Biosquare, the BU Medical Center Research Park solves both the infrastructure and transportation problem.

Boston University has made every effort to address community safety and environmental issue in its environmental impact statement documents. As part of its commitment to the local community, Boston University is providing one million dollars in scholarship aid for local residents to attend its CitiLab program to retrain for a research career. Many inner city residents who will avail themselves of this educational opportunity do not own an automobile and rely on public transportation.

Infectious Disease research is of vital importance for all of us and I continue to support Boston University Medical Center and its efforts to make this laboratory a reality.

Sincerely,

Robina E. Folland

Robina E. Folland

9 Clinton Path Apt 1
Brookline MA 024445-4207
May 1, 2005

Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda MD 20892

Dear Ms. Nottingham:

As a resident of the Greater Boston community, I do not believe that the Supplemental Environmental Impact Statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere else does it give a hint as to what such a lab would do other than to exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who now live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

39.1

39.2

39.3

It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly pathogens (e,g,, ebola, anthrax, hemorrhagic fever, plague) any risk is unacceptable.

39.4

It is time to Just Say No.

Sincerely,
M L Foxhall
Mary Linda Foxhall

CC:
Senator Ted Kennedy
Senator John Kerry
Congressman Barney Frank
Representative Frank Smizik
Senator Cynthia Creem

LETTER 39

Mary Linda Foxhall

39.1 See Response to Comment 1.1.

39.2 See Response to Comment 1.2.

39.3 See Response to Comment 1.3.

39.4 See Response to Comment 1.4.

LETTER 40

Spencer N. Frankl, D.D.S., M.S.D

BOSTON UNIVERSITY MEDICAL CENTER

Boston University
Goldman School of
Dental Medicine

Office of the Dean
100 East Newton Street
Boston, Massachusetts 02118-2308
617/638-4780 tel
617/638-4490 fax

May 3, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

As Dean of the Boston University School of Dental Medicine, I am writing to express support for the National Emerging Infectious Diseases Laboratories at Boston University Medical Center (BUMC). There is an urgent need in this country to create facilities to conduct research aimed at finding causes, diagnoses and therapeutics for the alarming number of recently emerging and re-emerging infectious diseases.

Our organization would like to comment on two very important issues raised in the document - the appropriateness of the proposed location of the facility and the safety of the proposed Biosafety Level 4 laboratory.

As discussed in the document, prior to making a determination to site the proposed NEIDL facility at the BioSquare Research Park, Boston University undertook an alternatives siting analysis that evaluated existing sites under its control to determine the best location for the facility. The study concluded, and our organization agrees, that the best location for this facility is exactly where it is proposed in the BioSquare Research Park in the City of Boston, MA. BioSquare Research Park is a state of the art medical research park which contains medical research facilities including Biosafety Level 1, 2 and 3 laboratories that the proposed facility will be able to take advantage of. BioSquare Research Park is also located directly across the street from the Boston University Medical Center campus which also houses hospital and medical research facilities and is the largest Level 1 Trauma Center in New England.

We understand that some community members feel that such a facility should be located in a more rural location. We feel strongly that the facility should be located in an urban area which functions as a hub for medical research activities and which has a significant

base of resident medical research scientists. Siting the facility in this manner assures that efficiencies are reached in terms in the ability to share research facilities and knowledge through direct collaboration among the various institutions located in the greater Boston area.

In regards to concerns regarding the safety of the proposed facility and in particular, the Biosafety Level 4 laboratory, our organization has no question that the facility will be safe. There are several federal and state programs which require the facility to be constructed and operated at extremely high safety standards. Similar laboratories throughout the United States have operated safely for decades.

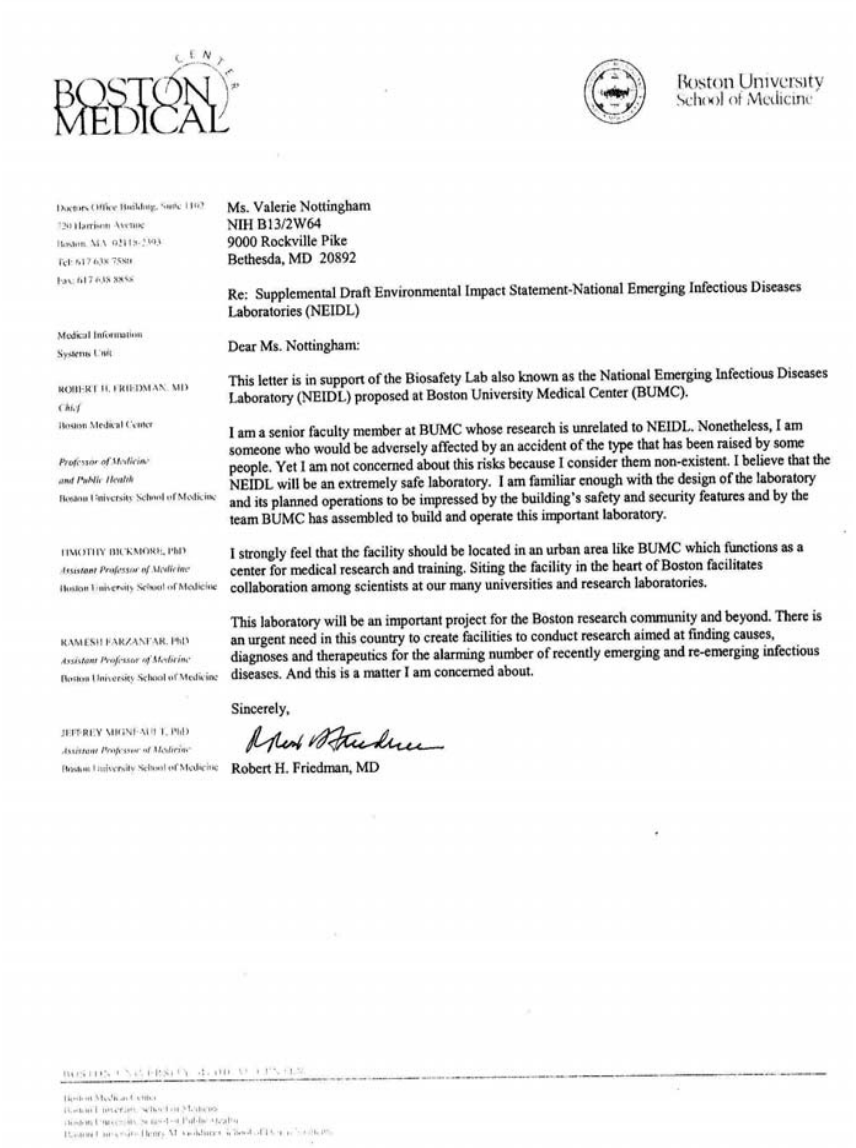
In closing, we urge you to proceed with the funding to construct this much needed national resource at the BioSquare Research Park in Boston.

Sincerely,

Spencer N. Frankl, D.D.S., M.S.D.
Professor and Dean

LETTER 40

Spencer N. Frankl, D.D.S., M.S.D



BOSTON MEDICAL CENTER

Boston University School of Medicine

Doctors Office Building, Suite 1107
720 Harrison Avenue
Boston, MA 02118-2393
Tel: 617 638 7580
Fax: 617 638 8858

Medical Information Systems Unit

ROBERT H. FRIEDMAN, MD
Chief
Boston Medical Center

Professor of Medicine and Public Health
Boston University School of Medicine

TIMOTHY BICKMORE, PhD
Assistant Professor of Medicine
Boston University School of Medicine

RAMESH FARZANFAR, PhD
Assistant Professor of Medicine
Boston University School of Medicine

JEFFREY MIGNAULT, PhD
Assistant Professor of Medicine
Boston University School of Medicine

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

This letter is in support of the Biosafety Lab also known as the National Emerging Infectious Diseases Laboratory (NEIDL) proposed at Boston University Medical Center (BUMC).

I am a senior faculty member at BUMC whose research is unrelated to NEIDL. Nonetheless, I am someone who would be adversely affected by an accident of the type that has been raised by some people. Yet I am not concerned about this risks because I consider them non-existent. I believe that the NEIDL will be an extremely safe laboratory. I am familiar enough with the design of the laboratory and its planned operations to be impressed by the building's safety and security features and by the team BUMC has assembled to build and operate this important laboratory.

I strongly feel that the facility should be located in an urban area like BUMC which functions as a center for medical research and training. Siting the facility in the heart of Boston facilitates collaboration among scientists at our many universities and research laboratories.

This laboratory will be an important project for the Boston research community and beyond. There is an urgent need in this country to create facilities to conduct research aimed at finding causes, diagnoses and therapeutics for the alarming number of recently emerging and re-emerging infectious diseases. And this is a matter I am concerned about.

Sincerely,

Robert H. Friedman, MD

LETTER 41

Robert H. Friedman, MD

Nottingham, Valerie (NIH/OD/ORF)

From: G Gallagher [ggalla@bu.edu]
Sent: Monday, May 02, 2005 4:14 PM
To: NIH NEPA Comments
Cc: Klempner@bu.edu
Subject: NEIDLSupport

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab also known as the National Emerging Infectious Diseases Laboratory (NEIDL) proposed at Boston University Medical Center (BUMC).

As you are aware, biomedical research laboratories operate under strict procedures and protocols at BUMC and at other academic and private laboratories throughout the Greater Boston region. This research is done safely and makes important medical contributions to the nation and the world.

I believe that the NEIDL at BUMC will be one of the safest laboratories in the world. I have been briefed on the systems and the design and am familiar with operations in biomedical research laboratories. I am impressed by the building's safety and security features and by the team BUMC has assembled to build this important project.

I should also note that there are some who have incorrectly raised the city of Boston's rDNA regulations, as a reason the laboratory should not be built. This is simply misinformation. rDNA research is conducted in Boston under the Boston Public Health Commission's regulations. On numerous occasions, BUMC authorities have stated that they will do all research in compliance with the Health Commission's guidelines.

This laboratory will be an important project for the research community and those interested in finding cures for emerging infectious diseases and I fully support it.

Sincerely,

George T. Gallagher, D.M.D., D.M.Sc.
Professor of Oral and Maxillofacial Pathology
Department of Oral Diagnostic Sciences and Patient Services
Boston University Goldman School of Dental Medicine
100 East Newton Street, Rm. G-04
Boston, MA 02118-2392

LETTER 42

George T. Gallagher, D.M.D., D.M.Sc.

LETTER 43

Timothy S. Gardner

BUEngineering

Boston University
Biomedical Engineering
44 Cummington St.
Boston, MA 02215

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I am writing to express support for the National Emerging Infectious Diseases Laboratories at Boston University Medical Center (BUMC). There is an urgent need in this country to create facilities to conduct research aimed at finding causes, diagnoses and therapeutics for the alarming number of recently emerging and re-emerging infectious diseases.

Our organization would like to comment on two very important issues raised in the document - the appropriateness of the proposed location of the facility and the safety of the proposed Biosafety Level 4 laboratory.

As discussed in the document, prior to making a determination to site the proposed NEIDL facility at the BioSquare Research Park, Boston University undertook an alternatives siting analysis that evaluated existing sites under its control to determine the best location for the facility. The study concluded, and our organization agrees, that the best location for this facility is exactly where it is proposed in the BioSquare Research Park in the City of Boston, MA. BioSquare Research Park is a state of the art medical research park which contains medical research facilities including Biosafety Level 1, 2 and 3 laboratories that the proposed facility will be able to take advantage of. BioSquare Research Park is also located directly across the street from the Boston University Medical Center campus which also houses hospital and medical research facilities and is the largest Level 1 Trauma Center in New England.

We understand that some community members feel that such a facility should be located in a more rural location. We feel strongly that the facility should be located in an urban area which functions as a hub for medical research activities and which has a significant base of resident medical research scientists. Siting the facility in this manner assures that efficiencies are reached in terms in the ability to share research facilities and knowledge through direct collaboration among the various institutions located in the greater Boston area.

In regards to concerns regarding the safety of the proposed facility and in particular, the Biosafety Level 4 laboratory, our organization has no question that the facility will be safe. There are several federal and state programs which require the facility to be

constructed and operated at extremely high safety standards. Similar laboratories throughout the United States have operated safely for decades.

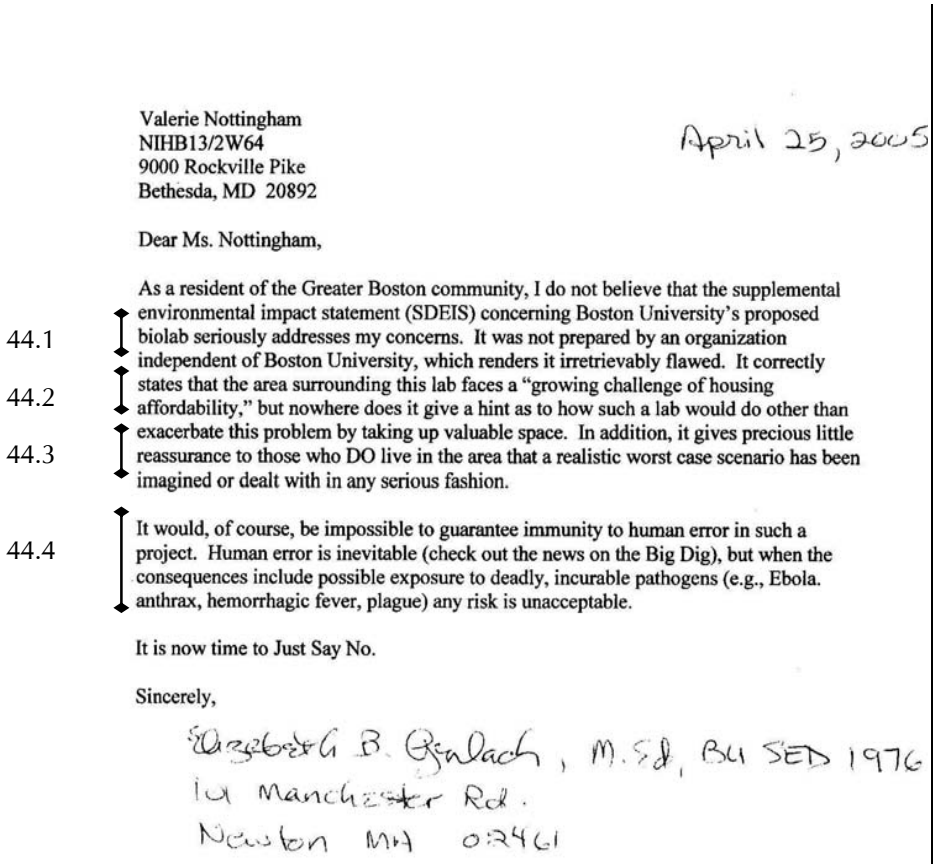
In closing, we urge you to proceed with the funding to construct this much needed national resource at the BioSquare Research Park in Boston.

Sincerely,

Timothy S. Gardner
Assistant Professor
tgardner@bu.edu
Ph: 617-358-0745

LETTER 43

Timothy S. Gardner



Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

April 25, 2005

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

It is now time to Just Say No.

Sincerely,

Elizabeth B. Gealach, M.Ed, BU SED 1976
101 Manchester Rd.
Newton MA 02461

44.1
44.2
44.3
44.4

LETTER 44

Elizabeth G. B. Gealach

44.1 See Response to Comment 1.1.

44.2 See Response to Comment 1.2.

44.3 See Response to Comment 1.3.

44.4 See Response to Comment 1.4.

Nottingham, Valerie (NIH/OD/ORF)

From: Barbara A. Gilchrest, M.D. [bgilchre@bu.edu]
Sent: Wednesday, May 04, 2005 11:50 AM
To: NIH NEPA Comments
Subject: BU National Emerging Infectious Diseases Laboratory

5/4/05

To: Ms. Valerie Nottingham

Dear Ms. Nottingham:

I was unable to attend the April 25 public hearing to obtain further input regarding the above from the Boston community. At this time, however, as a department chair and senior member of the Boston University School of Medicine faculty, as well as immediate neighbor to the intended new Laboratory, I wish to offer my strongest support for this project. I believe there is an urgent need to create facilities to conduct research aimed at understanding, diagnosing and treating the alarming number of emerging and re-emerging infectious diseases in the world, including in the United States.

I would like to comment on two important issues raised in the Supplemental Draft Environmental Impact Statement: the appropriateness and safety of the facility.

As a researcher who is very familiar with laboratory procedures generally and those at BU particularly, I believe the potential for good far far outweighs any conceivable risk of having this facility on the BU Medical Center's urban campus. Federal and state standards will require the facility to be constructed and operated at extremely high safety standards. The comparable laboratories already operating throughout the United States have a superb safety record. Moreover, there is an enormous need to study emerging infectious diseases. The proposed Laboratory will benefit not only the Boston research community, but the Boston and American populations at large.

In conclusion, I strongly urge that the proposed construction of the National Emerging Infectious Disease Laboratories be allowed to continue as planned.

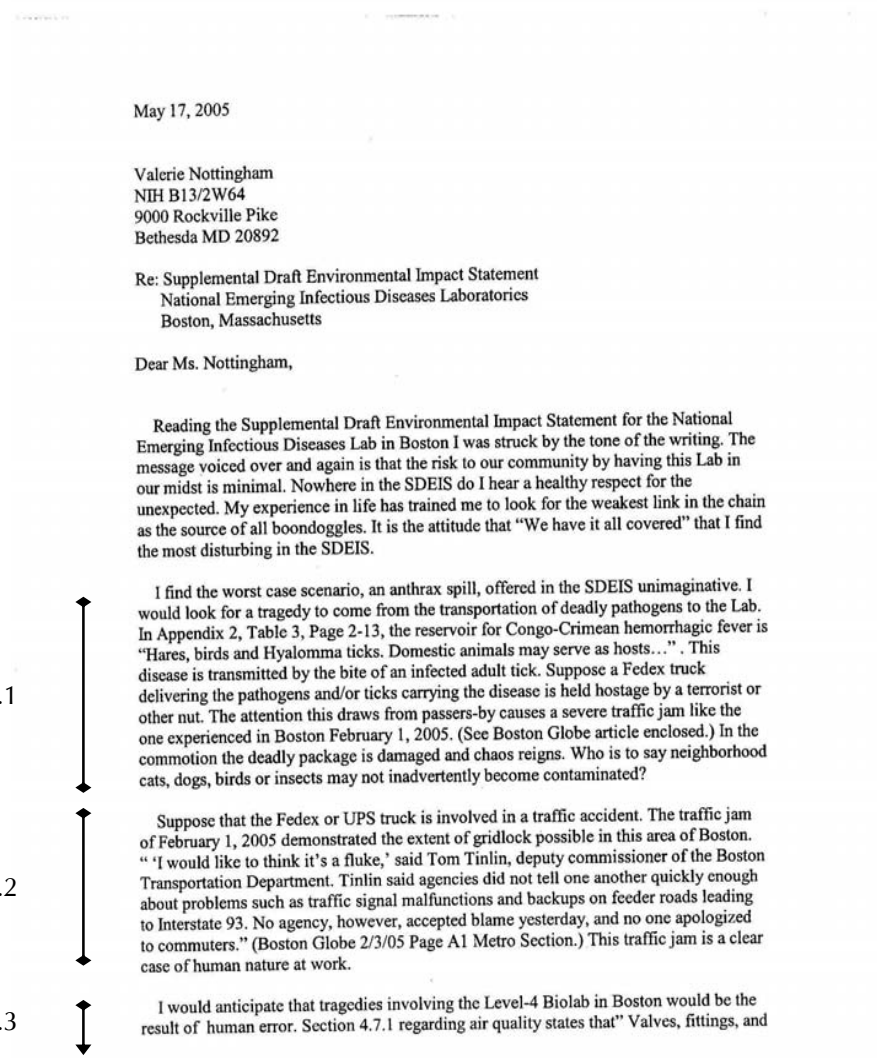
Sincerely yours,

Barbara A. Gilchrest, M.D.

Department of Dermatology
609 Albany Street - J507
Boston, MA 02118
Tel: 617-638-5538
Fax: 617-638-5550

LETTER 45

Barbara A. Gilchrest, M.D.



May 17, 2005

Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda MD 20892

Re: Supplemental Draft Environmental Impact Statement
National Emerging Infectious Diseases Laboratories
Boston, Massachusetts

Dear Ms. Nottingham,

Reading the Supplemental Draft Environmental Impact Statement for the National Emerging Infectious Diseases Lab in Boston I was struck by the tone of the writing. The message voiced over and again is that the risk to our community by having this Lab in our midst is minimal. Nowhere in the SDEIS do I hear a healthy respect for the unexpected. My experience in life has trained me to look for the weakest link in the chain as the source of all boondoggles. It is the attitude that "We have it all covered" that I find the most disturbing in the SDEIS.

46.1 I find the worst case scenario, an anthrax spill, offered in the SDEIS unimaginative. I would look for a tragedy to come from the transportation of deadly pathogens to the Lab. In Appendix 2, Table 3, Page 2-13, the reservoir for Congo-Crimean hemorrhagic fever is "Hares, birds and Hyalomma ticks. Domestic animals may serve as hosts…" . This disease is transmitted by the bite of an infected adult tick. Suppose a Fedex truck delivering the pathogens and/or ticks carrying the disease is held hostage by a terrorist or other nut. The attention this draws from passers-by causes a severe traffic jam like the one experienced in Boston February 1, 2005. (See Boston Globe article enclosed.) In the commotion the deadly package is damaged and chaos reigns. Who is to say neighborhood cats, dogs, birds or insects may not inadvertently become contaminated?

46.2 Suppose that the Fedex or UPS truck is involved in a traffic accident. The traffic jam of February 1, 2005 demonstrated the extent of gridlock possible in this area of Boston. " 'I would like to think it's a fluke,' said Tom Tinlin, deputy commissioner of the Boston Transportation Department. Tinlin said agencies did not tell one another quickly enough about problems such as traffic signal malfunctions and backups on feeder roads leading to Interstate 93. No agency, however, accepted blame yesterday, and no one apologized to commuters." (Boston Globe 2/3/05 Page A1 Metro Section.) This traffic jam is a clear case of human nature at work.

46.3 I would anticipate that tragedies involving the Level-4 Biolab in Boston would be the result of human error. Section 4.7.1 regarding air quality states that" Valves, fittings, and

LETTER 46

Patricia Glynn

46.1 In the evaluation of potential scenarios, the agent, its quantity, form and dissemination potential are all considered. The worst case scenario was chosen as it presented a culmination of these factors. Removing or limiting any of these factors reduces the impacts of potential scenarios. In the event of a vehicular accident, the quantity and dissemination potential are extremely limited. BUMC will manage all transportation related issues to minimize risk as described in Appendix 7, High Hazard Material Management Policy. Scenarios involving transportation do not disseminate materials with the type of risk potential presented in the worst case scenario.

46.2 BUMC, as evidenced in Appendix 7, High Hazard Material Management Policy, has plans in place to address risk associated with the transportation of materials. While these plans do not specifically address traffic accidents or traffics jams, they do address the ability to track, the ability to communicate and the ability to respond to such incidents as necessary. Packaging requirements will be in place as required by law and there have been no known environmental releases when the proper shipping procedures have been followed.

46.3 The reference is to the maintenance and operational protocols that would be incorporated into this facility, in regard to periodic visual inspection of trained maintenance personnel. The overall program to be implemented in the facility would be a comprehensive system of inspections and planned preventative maintenance. The operational effort would be centered on identifying potential issues prior to component failures.

46.3 tubing for any gaseous chemicals would be checked for leaks periodically." There is margin for error here.

46.4 Section 4.8.1.1 regarding waster water states that the building would "feature a sterilization system designed to use heat sterilization to kill and biological agents…" What if the heat system fails? What if it is not discovered until contaminated wastewater is discharged into the sewer system? I want this system explained further and I want to be convinced that it is failure-proof.

46.5 Appendix 5: Boston –NBL Security Program and Emergency Response is so general that it is obvious it has not been thoroughly thought-through. It is frightening. "The BUMC Public Safety Staff is supported by the Boston University Police Department's fifty-five sworn police officers. Within these two operations there is ongoing coordination related to technology by systems experts, investigations by trained and experienced investigators and *joint coordination with local, state and federal law enforcement agencies."* **Who is in charge?** Is there going to be finger-pointing for blame here too? The Perimeter Vehicular entry/exit point and the Loading Dock will be staffed only 12 hours a day during the business week and monitored by closed circuit television over the weekend. That is horrifying! This facility should be completely patrolled 24 hours a day 7 days a week. This is a weak link in the chain!

I am convinced that this facility should not be sited in such a densely populated area.

Sincerely,

Patricia Glynn

Patricia Glynn
6 Fort Ave. Terr.
Roxbury MA 02119

LETTER 46

Patricia Glynn

46.4 As noted throughout the FEIS, the project is being designed and constructed with redundant utility and mechanical systems to avoid system failure. The effluent decontamination system is operated by an active control system. The operational parameters required to maintain efficacy would be continuously monitored. The variation of any of these parameters outside of tolerances would cause the system to restart the entire cycle. That being stated, the system would be validated through thermal means only. In actual operations, the decontamination system would be operationally a secondary process. The primary decontamination would occur at the laboratory level. Any agent being disposed of through the system would first be exposed to chemical disinfection. An aqueous based chemical disinfection would be used for inactivation of agent prior to disposal, and similarly the facility and APR suits would be cleansed with an aqueous disinfection agent.

46.5 The Director of Operations and Public Safety at Boston University Medical Center would be responsible for coordination with local, state, and federal law enforcement agencies

LETTER 46

Patricia Glynn

*
This article is about human nature and the very real potential for disaster from unexpected traffic congestion in the neighborhood of the Lab.

TAKING DETOUR THROUGH FRUSTRATION

Author: By Mac Daniel, Globe Staff

Date: 02/02/2005 **Page:** B1 **Section:** Metro/Region

Globe correspondent Emma Stickgold contributed to this report. Thousands of motorists spent hours in ***traffic*** in and around Boston yesterday, some crawling barely 15 feet a minute for much of the afternoon. Hospitals, especially Massachusetts General Hospital, dealt with delayed ambulances, and doctors and nurses worked hours into extra shifts until co-workers arrived. Parents picked up their children late from school.

"It's hell," Ryan McManus, 32, of Hingham, said as he waited at a stoplight just past Boston Medical Center, with only 15 minutes to get to his child's day-care center in Braintree.

While there was no single reason for the gridlock, one apparent trigger was a Massachusetts Highway Department crew patching potholes along the Southeast Expressway. The crew worked from about 10 a.m. to 2 p.m. in the left southbound lane in spots between Dorchester and Braintree.

Even after city transportation officials ordered the crew off the highway, ***traffic*** snarled throughout the city, resulting in what ***traffic*** watchers say was one of the worst commutes in recent memory.

To escape the gridlock, drivers clogged city streets, Storrow Drive, and the Leverett Connector, said Tom Tinlin, deputy commissioner of the Boston Transportation Department.

The tie-ups were compounded by another work crew filling potholes on the Longfellow Bridge, combined with construction around Charles Circle. The recent closure of an onramp to Interstate 93 south from the Massachusetts Avenue connector and a new and often clogged merge to I-93 south in front of the South Bay Shopping Center also worsened congestion.

"Volumes were so huge that surface streets quickly got mired," Tinlin said.

State, city, MBTA, and Massachusetts Turnpike officials plan an emergency meeting today to discuss what went wrong.

The situation clearly frustrated commuters. Lines of cars stretched 5 miles in

LETTER 46

Patricia Glynn

and out of the city, largely along I-93 and nearby feeder roads. Drivers reported that trips from Cambridge to Dorchester took two hours. Jamaica Plain to Dorchester was an hour.

Cars snaked down Melnea Cass Boulevard in Roxbury on a one-hour drive to the Southeast Expressway that normally would take 10 minutes. Along Massachusetts Avenue, fed-up motorists made sudden U-turns or darted down side streets.

It got so bad late yesterday afternoon on I-93 south that State Police closed Exit 15 (Columbia Road/JFK-UMass) as a safety precaution as frustrated drivers sought shortcuts wherever they could. Cars on the exit ramp were backing up into the highway. Problems persisted for southbound cars into the night.

Jon Carlisle, spokesman for the Massachusetts Highway Department, denied that the pothole crew created the jam and instead blamed other agencies and problems with ***traffic*** signals.

"We talked to a member of the crew on the ground who told us there weren't any backups behind them," he said. "The issues were associated with ***traffic***-signal timing on local roadways and the [Massachusetts] Turnpike funneling ***traffic*** onto Frontage Road. There were no backups behind our pothole crews."

But Tinlin said the MassHighway crew started the jam, saying he based that conclusion on his review of video feeds of city streets and the I-93 corridor and reports from Boston police.

"What we're focused on right now is not who is at fault, but how to fix it," he said.

Jeff Larson, general manager of SmartRoutes, which monitors ***traffic***, said there is probably no one to blame. More drivers returned to the roads yesterday after a week of bad weather and frigid temperatures, he said.

"Whenever you get into a situation where you have this much volume, ***traffic*** signals don't matter that much," he said.

"All the time I was on the road, there was no police officer, no sign of response," he said. "It was beyond frustrating. It all stopped and fell apart."

Mac Daniel can be reached at mdaniel@globe.com.

LETTER 46

Patricia Glynn

Your story is listed below. To refine or expand your search, you can search again.

April 26, 2005

WORDS OF BLAME AND RESOLVE AFTER GRIDLOCK

Author: By Mac Daniel, Globe Staff **Date:** 02/03/2005
Page: A1 **Section:** Metro/Region

After an emergency meeting about Tuesday's massive gridlock in Boston, state and local officials said yesterday they will keep using daytime pothole crews, despite the problems and public anger they generated, and went as far as to blame drivers for helping cause the mess.

Transportation officials pledged to prevent a repeat of the worst congestion in recent memory by starting hourly communication between agencies, closely monitoring six trouble spots, and stationing more police officers at those choke points.

They said Tuesday's jams, which stranded thousands of commuters for hours on local roads, resulted from a number of factors.

The causes included more cars returning to the roads with better weather, a midday pothole crew on the Southeast Expressway, the tedious merge of four lanes into one from Frontage Road to the expressway, roads narrowed by snowbanks, and a key ***traffic*** light malfunction. The problems rippled across much of South Boston and Dorchester.

"i would like to think it's a fluke," said Tom Tinlin, deputy commissioner of the Boston Transportation Department.

Tinlin said agencies did not tell one another quickly enough about problems such as ***traffic*** signal malfunctions and backups on feeder roads leading to Interstate 93. No agency, however, accepted blame yesterday, and no one apologized to commuters.

"We had a great meeting with these folks," said Tinlin, who 12 hours prior was blaming a Massachusetts Highway Department pothole crew for triggering the gridlock. "It was . . . about teamwork, moving forward, and making sure that this doesn't happen again."itor the predicted ***traffic*** nightmare surrounding last summer's Democratic National Convention, a weeklong jam that never materialized.

The hourly communication between agencies during commuting hours will enable them to spot problems quicker and dispatch police to try to fix them, officials said.

LETTER 46

Patricia Glynn

Despite the promises of stricter ***traffic*** management and better communication, problems continued on the Mass. Pike yesterday morning, as a bridge-inspection crew set up east of the Prudential Tunnel around 9:30, closing the eastbound left lane and backing up ***traffic***.

"Turnpike policy is to not do ***traffic*** setups earlier than 9:30 a.m., and we don't do them if there is existing ***traffic*** [congestion] on the roadway," Doug Hanchett, spokesman for the Turnpike Authority, wrote in an e-mail. "While we are not aware of any ***traffic*** problems associated with this morning's setup, we apologize for any inconvenience it may have caused."

Tinlin said city, state, and Turnpike Authority crews would continue to repair potholes during the day.

"If folks are out there repairing potholes, they're doing so because that is also a public safety issue," Tinlin said. "Frankly, if somebody had been hurt or injured, or a car crashed because they hit a pothole, some folks out there would have been saying that people should have been doing more."

MassHighway spokesman Jon Carlisle said pothole repairs at night are less safe and more complicated because the rolling crews have more difficulty spotting the cracks. He said daytime work doesn't cause problems if crews watch for backups.

"If you do it responsibly, you shouldn't have significant impacts on ***traffic***," he said.

Carlisle denied that the MassHighway paving crew played any role in the backups.

He said that the crew members never saw any backup behind them as they worked on both sides of Interstate 93 yesterday from 10 a.m. to 2 p.m. between Dorchester and Braintree.

Officials said some drivers, including many using unfamiliar roads to escape the gridlock, worsened the situation by blocking intersections, making U-turns, jumping curbs, and violating other ***traffic*** rules.

"But in fairness to the drivers . . . they had every right to be frustrated," Tinlin said.

While officials said they were satisfied with yesterday's meeting and solutions, some drivers were not.

"Oh, that really makes it better," Anne Novak, 52, of East Bridgewater, said sarcastically. "More police? Every time people see a flashing light, they stop." between garage levels. She and her carpool mate gave up, called home, left the car, and went to get a bowl of soup.

Tinlin said six trouble spots largely caused Tuesday's gridlock, and police monitored yesterday afternoon's commute at those locations:

The Columbia Road- Interstate 93 interchange (Exit 15) where faulty ***traffic*** lights caused backups on to I-93 south. The exit was eventually closed for several hours Tuesday afternoon.

The intersection of Dorchester Avenue and Columbia Road, where leftover snow and an NSTAR crew caused further standstills.

The intersection of Melnea Cass Boulevard and Massachusetts Avenue,

where ***traffic*** jammed Tuesday night headed to I-93 south.

The Frontage Road-I-93 southbound merge at the South Bay Shopping Center, where four lanes now merge to one rather than two after a month-old Big Dig change.

The Frontage Road-Southampton Street merge, which was affected in part by the I-93 merge at South Bay.

Another probable factor in the jam, though Turnpike officials dispute it, was the new interchange near the Massachusetts Avenue exit (Exit 18).

"We didn't overnight reconfigure the geometry of Exit 18," said Michael Swanson, chief operating officer for the Big Dig who attended the meeting, "and we haven't had gridlock.

"Clearly something happened south of Interchange 18 that caused it to gridlock," Swanson said.

South of that interchange, officials blamed the failure of ***traffic*** signals at the Columbia Road-I-93 interchange and a pothole crew, both controlled by MassHighway.

Snow removal on city streets, more than a week after the record-setting blizzard, was also a factor.

SIDEBAR;
ANATOMY OF GRIDLOCK
PLEASE REFER TO MICROFILM FOR CHART DATA.

LETTER 46

Patricia Glynn

Nottingham, Valerie (NIH/OD/ORF)

From: Alexandra Gorman [alex@womenandenvironment.org]
Sent: Friday, May 13, 2005 12:17 PM
To: NIH NEPA Comments
Subject: Comments on SDEIS, Boston University Laboratory

May 13, 2005

Valerie Nottingham
NIH
B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

Thank you for the opportunity to comment on the Supplemental Draft EIS for the proposed National Emerging Infectious Diseases Laboratory at the Boston University Medical Center.

As you may remember, I was integrally involved in the EIS process for the Integrated Research Facility at Rocky Mountain Laboratories (RML) in Hamilton, MT. To no surprise, I found several sections of this SDEIS very similar to the EIS written for RML.

47.1

It appears that several of the same concerns and problems with the RML EIS exist with this SDEIS. Specifically this SDEIS omits any true risk assessment to the community of a laboratory-acquired infection. And similar to the RML EIS, this document relies entirely on the assumption of an 'excellent' safety record of three BL-4s around the world as compiled by Karl Johnson, MD. I have met Dr. Johnson, and while I hold his life's work on infectious disease in very high regard, I am not especially assured by his report. It should be made very clear in this EIS, that Dr. Johnson's research for his report is anecdotal, rather than data-based - relying on interviews with several key staff at these facilities. It was not in fact a detailed review

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47.1 The portion of Dr. Johnson's report that addresses the exposure and clinical infection record of those three laboratories during the past 20 years is not anecdotal; it represents the facts, and particularly in the case of USAMRIID, it is based on written records from that Institute supplied to Dr. Johnson by Dr. Peter Jahrling, Principal Scientific Aadvisor to USAMRIID. Nobody working in the BSL-4 at USAMRIID suffered a clinical infection. The statement in Section 4.2.1.1 "Community Safety and Risk - Other Potential Risk Scenarios (a)" of the FEIS is correct with just one caveat. BSL-4 containment did not exist as such until 1984 when the first edition of Biosafety in Microbiological and Biomedical Laboratories (BMBL) came out. That is why Dr. Johnson covered a 20 year period through most of 2003. No clinical infections occurred in BSL-4 work at USAMRIID in that 20 year interval.

47.1 of all laboratory exposure events at these three facilities, and should not be relied upon to make claims about the safety of BL-4 facilities.

Most troubling is a statement on p 4-10 of the SDEIS which states:

"*With the longest running experience with a BSL-4 (33 years) Ft Detrick Maryland has an outstanding safety recordŠ.Previous documents exposures at Fort Detrick in their original lab facilities mention one laboratory-acquired infection between 1959-1969 and no clinical or other infections in the more recently constructed USAMRIID facility*."

47.2 This is, unfortunately, incorrect - and must be revised in the next version of this EIS to reflect the true safety record of this facility. USAMRIID has had an extensive history of both exposures and laboratory-acquired infections over the last two decades. According to a study by USAMRIID researchers, published in the Journal of Occupational and Environmental Medicine in August 2004, 234 employees at USAMRIID were evaluated for exposure to 289 biological agents classified as "bioterrorist agents", resulting in 5 confirmed clinical infections between 1989-2002. The recorded infections were from exposures to glanders, Q fever, vaccinia, chikungunya, and Venezuelan equine encephalitis. There were also numerous exposures to anthrax , plague, Western and Eastern equine encephalitis, orthopoxviruses, yellow fever virus, and Rift Valley fever virus which did not lead to infections, but for which postexposure antibiotic prophylaxis was administered (when available). For some of these diseases, of course, there is no available treatment.
This report, (Rusnak, et al. 2004, which is attached to this message) did thoroughly review all exposure records, and paints a significantly different picture of the safety record at USAMRIID than Dr. Johnson's report which implies that accidents are extraordinarily rare. In contrast this data shows that there were an average of 16.7 persons evaluated per year for accidental exposures to bioterrorist agents. In fact the authors of the study conclude:

"*In summary, we reviewed available medical and safety records at USAMRIID from 1989 to 2002 and reported on 234 evaluations of potential exposures and illnesses to bacterial, rickettsial, and viral disease agents. During this period, there were five confirmed infections. The large number of exposure incidents reported in this time period serves as a reminder that work in a laboratory of this type is inherently hazardous.*" (emph. added)
This conclusion of this study must be included in this EIS in order to fully inform the public of the potential risks of such a facility. And, specifically, the incorrect claim in the SDEIS (p4-10) that no clinical or other infections were reported at USAMRIID must be deleted and replaced with the correct information that no less than 5 clinical infections were identified

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47.2 All the agents listed in the published article referenced in the comment are either BSL-2 organisms or BSL-3 agents. No clinical infections occurred in BSL-4 work at USAMRIID during the period of time in Dr. Johnson's study.

47.2 **between 1989 and 2002.**

Furthermore,. The authors of Rusnak et 2004 also conclude :

"*Therefore, it is imperative for laboratories that elect to work with highly hazardous agents to be fully cognizant of the risk of occupationally acquired illnesses and institute policies and proactive employee health procedures to evaluate potential exposures.*"

47.3 However, the SDEIS does not address Boston University's policies or proactive employee health procedures to evaluate potential exposures. **A section clearly explained these policies and procedures not only for preventing exposures, but for detecting and evaluating exposures are crucial to the health of both the employees and the surrounding community. This must be included in the EIS.**

Thank you for the opportunity to express my concerns about this project. I would appreciate a written response to these comments.

Sincerely,

Alexandra Gorman
Director of Science and Research
Women's Voices for the Earth
P.O Box 8743
Missoula, MT 59807

Enclosure: JOEM 804 2.doc (Rusnak, et al, 2004)

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47.3 See Response to Comment 4.47.

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Experience in the Medical Management of Potential Laboratory Exposures to Agents of Bioterrorism on the Basis of Risk Assessment at the United States Army Medical Research Institute of Infectious Diseases (USAMRIID)

Rusnak, Janice M. MD; Kortepeter, Mark G. MD; Aldis, John MD; Boudreau, Ellen MD
From the Special Immunizations Clinic (Drs Rusnak, Aldis, and Boudreau) and Medical Division (Dr Kortepeter); United States Army Medical Research Institute of Infectious Diseases (USAMRIID), Fort Detrick, Maryland.

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Address correspondence to: Janice M. Rusnak, MD, Special Immunizations Clinic; Medical Division, USAMRIID, 1425 Porter Street, Fort Detrick, MD 21702; E-mail: Janice.Rusnak@det.amedd.army.mil.

Outline

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Abstract

Experience in managing laboratory exposures to potential agents of bioterrorism is limited. The United States Army Medical Research Institute of Infectious Diseases reviewed laboratory exposures involving these agents (1989 to 2002) to assess the effectiveness of medical management. The evaluation of 234 persons (78% vaccinated) for exposure to 289 infectious agents revealed 5 confirmed infections (glanders, Q fever, vaccinia, chikungunya, and Venezuelan equine encephalitis). Postexposure antibiotic prophylaxis was given for most moderate-or high-risk bacterial exposures (41/46; 89%); most unvaccinated minimal-risk (7/10; 70%), and subsets of vaccinated minimal-risk exposures (18/53; 34%) but generally not negligible-risk exposures (6/38; 16%). Vaccine "breakthroughs" were not unexpected (enzootic Venezuelan equine encephalitis, localized vaccinia) or presented with mild symptoms (Q fever). A multifaceted policy of personal protective measures, vaccination, early assessment, and postexposure antibiotic prophylaxis was effective in minimizing morbidity and mortality in at-risk laboratory workers.

As research on the agents of bioterrorism becomes more widespread, an increase in occupational exposures to bioterrorist agents may be expected.1 However, many institutions working with these agents may have limited clinical experience or procedures in place for the medical management of exposures to these agents.

Although information on preventing laboratory exposures to potentially high-risk agents is available,2-15 literature on medical management of these exposures is sparse. This is the second in a series of articles on the medical management of laboratory exposures to agents considered bioterrorism threats. The first

article focused on United States Army Medical Research Institute of Infectious Diseases (USAMRIID's) methods for evaluating potential exposures and provided risk assessment and management guidelines for institutions to consult in the development of their occupational exposure policies (submitted for publication).

USAMRIID, and in particular the Special Immunization Program (SIP), has extensive experience in managing and preventing exposures and disease in at-risk laboratory workers. In addition to engineering controls and personal protective measures, the vaccination of at-risk laboratory personnel and immediate evaluation of all potential exposures are key risk reduction measures. This analysis of our potential exposures provided us with the opportunity to evaluate the success of our risk-management program. Although every attempt is made to eliminate hazards, we recognize that work in containment laboratories is inherently hazardous because of the need to work with sharp objects (ie, needles) and animals, which can be unpredictable. In addition, personal protective equipment may inadvertently increase the potential for incidents by limiting the field of vision, tactile sensation, and communication. We reviewed all exposure incidents to assess our program between 1989 and 2002. This information may be beneficial to other institutions involved in bioterrorist agent research and management.

Methods

Policy

Research laboratories at USAMRIID range from biosafety levels (BSLs) 1 through 4. The specific vaccination requirements or recommendations (including investigational vaccines) with documented acceptable antibody titer levels before employees may enter the research suites are listed in Table 1.16-24 USAMRIID policy requires that a physician immediately evaluate all (1) potential occupational exposures that occur within a containment suite or laboratory, (2) breaches in laboratory technique, and (3) febrile illnesses with temperatures greater than 100.4[degrees]F in individuals who recently worked in a laboratory containment suite.

TABLE 1 Special Immunizations Program Vaccines, Vaccine Dosage Schedules, and Post-vaccination Clearance Prior to Laboratory Entry [16-24]

Review

Exposure incident reports on file with the Safety Office and Medical Division of potential exposures to infectious agents of bioterrorism (bacterial, viral, or rickettsial agents) from 1989 to 2002 were reviewed, and data were abstracted on the following: agent of exposure, route of exposure, assessed risk of exposure and disease, vaccination status, medical management, and outcome.

Results

A total of 448 individuals were evaluated in the SIP clinic for potential exposure to both bioterrorist and nonbioterrorist agents. Of these, 214 records involved potential exposures to nonbioterrorist agents (ie, herpes B exposures), potential toxin exposures, febrile illness determined to be community acquired infection on initial evaluation, no agent of exposure, or records with incomplete documentation (16 persons only). These were excluded from further review, resulting in a final sample of 234 records.

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The number of persons evaluated per year varied (average of 16.7 per year; median of 14 per year; range 6 to 50), with the upper limit resulting generally from potential aerosol exposures involving multiple persons. However, the number of exposure incidents remained relatively constant, with an average of 13 exposure events per year (median 11 per year; range 6-40). The number of percutaneous needlestick exposures also remained relatively constant at an average of 1.7 per year.

Individuals evaluated for a potential exposure incident were generally evaluated for exposure to one agent and occasionally evaluated for exposure to two or more agents, resulting in 234 persons being evaluated for potential exposure to 289 agents, occurring mainly by aerosol and percutaneous routes (Fig. 1). Potential bacterial exposures were more likely to have resulted from aerosolized events (59%), whereas viral exposures more commonly resulted from percutaneous Events (64%). Percutaneous exposures occurred mainly by needlesticks or razors, animal bites and scratches, and cuts on edges or glass (Fig. 2). A total of 44 of 234 (19%) exposures occurred while working with animals.

Fig. 1. Bacterial, viral, and rickettsial laboratory exposures by Exposure route.

Fig. 2. Methods of percutaneous exposure.

Initial risk assessment involved two steps: first, the assessment of the risk associated with the exposure itself, and second, given an exposure, and the vaccination and health status of the exposed worker, the risk of actual infection. The risk of disease was generally downgraded if (1) the individual had received a prior vaccination against the agent, (2) the agent was a nonpathogenic strain, or (3) prophylactic antibiotics were prescribed (Fig. 3). The actual dose of exposure could not be determined in most cases and thereby was not a major factor in the assessment of disease risk in this review. Vaccination against the infectious agent had been given to 182 of 234 (78%) individuals prior to the exposure.

Fig. 3. Initial assessment of risk of exposure and risk of disease of potential laboratory exposures (N = 234).

Only 67 of 234 (29%) persons evaluated were assessed as moderate- (exposure likely) or high-risk (exposure highly likely), with the majority of persons (162 of 234; 70%) having exposure risk assessed as minimal (exposure unlikely), negligible (exposure highly unlikely), or no risk (Fig. 3). The risk of disease was assessed to be moderate or greater in 12 of 234 (5.5%) persons (Fig. 3).

Most moderate or high-risk percutaneous exposures were associated with (1) sharps that had been in contact with a viable infectious agent; (2) direct contact (or indirect by a needle or cage) with an ill, infected animal; or (3) from cuts on objects likely to be contaminated, such as centrifuges or culture flasks. Minimal risk percutaneous exposures were commonly associated with (1) direct contact (or indirect by a needle or cage) with a recently infected, non-ill animal or (2) from cuts on objects unlikely to be contaminated with viable agent. Negligible-risk exposures were

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commonly associated with percutaneous injuries resulting from contact with an object highly unlikely to be contaminated with a viable agent, such as a sterile needle or a desk corner.

Aerosolized exposures determined to be of high or moderate risk were commonly associated with splashes of the agent outside the biological safety cabinet (BSC) or during centrifugation, without wearing proper respiratory protection. Minimal-risk aerosolized exposures were often associated with (1) liquid spills of cultures within the BSC, (2) liquid spills outside the BSC of Materials unlikely to contain viable agent, or (3) dropping culture plates outside the BSC with the loss of the plate cover, in the absence of proper respiratory protection. Negligible-risk exposures were generally exposures to a solution highly unlikely to have viable organisms.

Five of 234 (2%) potential exposures to agents of bioterrorism resulted in confirmed disease (glanders,25 Q fever, vaccinia, chikungunya, and Venezuelan equine encephalitis infections), with four of these five cases presenting initially to the SIP clinic as per Institute protocol with symptoms of disease.

Bacterial Agents

Of 150 individuals with potential exposures to 172 bacterial agents, 132 (88%) individuals had been vaccinated prior to the exposure, and 75/150 (50%) individuals received postexposure antibiotic prophylaxis (Tables 2 and 3).

TABLE 2 Postexposure Antibiotic Prophylaxis Regimens

TABLE 3 Bacterial and Rickettsial Exposures: Vaccination Status Before Exposure and Number of Persons Receiving Postexposure Antibiotics

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Recommendation of postexposure antibiotic prophylaxis was determined mainly by the risk of exposure but also was influenced by vaccination status and virulence of the organism. Postexposure antibiotic prophylaxis was initiated in nearly all moderate- or high-risk bacterial exposures (41 of 46; 89%), regardless of vaccination status, except for exposures to nonpathogenic strains (eg, Sterne strain of Bacillus anthracis; Table 4).

TABLE 4 Individuals Receiving Postexposure Antibiotic Prophylaxis after Potential Exposures to Bacterial Agents based on Vaccination Status and Exposure Risk

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Vaccinated individuals with minimal-risk exposures were less likely to have received antibiotic prophylaxis (18 of 53; 34%) than unvaccinated individuals with minimal-risk exposures (7 of 10 persons; 70%; P = 0.042). Two of the unvaccinated individuals not given postexposure prophylaxis were minimal-risk exposures to Brucella sp. Institute policy was to observe (with follow-up serologies) minimal-risk exposures to Brucella, as the prophylaxis regimen involved prolonged (3 weeks) therapy with both doxycycline and rifampin. Individuals with minimal-risk exposures who routinely received antibiotic prophylaxis included those who had sustained percutaneous exposures to needles that had been in contact with recently infected animals that were not ill (or direct contact with these animals) or those who had dropped culture plates onto

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bench tops or floors resulting in loss of the lids.

Postexposure prophylaxis in vaccinated individuals with negligible risk exposures was generally not recommended, and given in only 4 of 32 (12.5%) cases. No individuals evaluated for postexposure antibiotic prophylaxis developed infection.

B. anthracis.

Postexposure antibiotic prophylaxis was recommended in 36 of 41 (88%) persons evaluated for moderate- to high-risk exposures to B. anthracis, 15 of 49 (31%) minimal risk, 3 of 30 (10%) negligible to no risk, and 3 undetermined risk exposures. The four individuals with moderate-risk exposures who were not given antibiotics were exposed to nonpathogenic strains of B. anthracis, and a fifth person had been vaccinated and their potential exposure involved a dose of less than 200 spores of B. anthracis.

Nares cultures to confirm B. anthracis exposures were not performed routinely but were performed on occasion, mostly for high-risk inhalational exposure events and for epidemiological purposes. In the fall of 2001, USAMRIID received the anthrax letters for analysis that were sent to the offices of Senators Tom Daschle (D-SD) and Patrick Leahy (D-VT). Seventeen individuals who were involved in the analysis of the powdered substance in the Daschle letter were evaluated at the time. Even though the letter was opened within a BSC, the SIP proactively evaluated all 17 persons involved in the letter handling who were considered at potentially significant risk for exposure due to the readily aerosolizable spores.

Initial evaluation of persons in contact with the letters identified eight persons to be at moderate or high risk of exposure, one at minimal-risk, six persons at negligible or no risk of exposure, and two evaluations without a determined risk of exposure. Nares cultures were performed on 16 of the 17 persons, and all were negative. Antibiotic prophylaxis (30 days) was recommended to the eight individuals (all vaccinated) assessed to have a moderate- or high-risk exposure. Antibiotics were discontinued at 14 and 21 days in two individuals as the result of side effects. The six individuals assessed to have negligible or no risk exposure only handled the biohazard bag containing the letter (had no direct contact with the letter). Although three of these individuals received antibiotic prophylaxis for 1 to 3 days until the situation could be fully assessed, continued antibiotic prophylaxis was not recommended for these negligible or no-risk exposures as well as the vaccinated minimal risk exposures.

One of the two individuals with an undetermined risk of exposure received postexposure antibiotic prophylaxis because she had photographed the anthrax letter within the BSC, with her face approximately 6 inches from the opening of the BSC, thus meeting criteria for a moderate-risk exposure. This individual also had no prior anthrax vaccination and completed a 30-day course of ciprofloxacin in addition to the primary series of six doses of the anthrax vaccine. The other individual with an undetermined risk of exposure had received the anthrax vaccine and wore a respirator while working with the organism within a BSC, consistent with criteria of a negligible or no risk exposure. This person was not recommended to receive postexposure prophylaxis.

In a separate incident, an exposure to B. anthracis was confirmed by nares culture in one researcher in 2002.26 B. anthracis spores from a 250-mL liquid culture of B. anthracis in a 2-L flask had crusted on the mouth of the flask and also the paper towels covering the mouth of the flasks (mouth of flask was covered with paper towels with the screw top loosely screwed to allow for aeration of the culture) during incubation on a rotating incubator. Based on

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environmental cultures, the exposure most likely occurred after the paper towel was removed from the flask within the BSC and deposited into the waste container outside the BSC. As the towel was carried through the BSC's air curtain, the air turbulence could have aerosolized dried spores on the paper towel. The individual had received three injections of the anthrax vaccine primary series, with his last injection given 3 months prior. As a precautionary measure, an anthrax booster was administered to ensure anthrax antibody titers remained adequate for the next 2 months prior to his 6-month dose of vaccine. The researcher and a vaccinated coworker who had negative nares cultures both received postexposure prophylaxis with ciprofloxacin for 30 days.

Environmental cultures were obtained periodically when needed to evaluate the presence and extent of exposure and for subsequent documentation of successful decontamination. For example, in 1999 environmental cultures were obtained to evaluate contamination from a flood in a laboratory suite as a result of a water main break, where Petri dishes within a biohazard bag were found in the flood waters. Cultures from the biohazard bag containing the Petri dishes and from the hallway where the water had flooded grew B. anthracis, as did a pair of shoes of one laboratory worker in the suite during the flood. Cultures of socks or from benchtops or walls where the water had not been in contact did not grow B. anthracis- documenting that the risk of aerosolization of spores was low orunlikely. Postdecontamination cultures were negative for B. anthracis. Further analysis by polymerase chain reaction testing on a small sample of the culture demonstrated one strain of contamination was from a nonpathogenic delta Ames-type (attenuated) B. anthracis, with amplification of the origin of replication of pXO2 and for capsular genes but negative tests for protective antigen and lethal factor. As the presence of pathogenic strains could not be entirely excluded, all nine individuals in the laboratory during the flood received postexposure antibiotic prophylaxis.

Yersinia pestis.

Thirteen inhalational and 25 percutaneous potential exposures to Y. pestis were evaluated. Antibiotic prophylaxis was administered to all 4 moderate- To high-risk exposures, 13 of 17 (76%) minimal-risk exposures, and 3 of 17 (18%) negligible-risk exposures. A previously vaccinated individual with a puncture from a needle contaminated with Y. pestis (syringe had contained a high concentration of organisms) presented 6 h after the incident with a 4 cm by 2.5 cm area of swelling, erythema, and induration at the puncture site on her hand. Symptoms resolved within 48 h after doxycycline prophylaxis. Although the etiology of the cellulitis was suspected to represent a vaccine "breakthrough" from a high percutaneous inoculum of Y. pestis, culture was not performed, and therefore the infection could not be confirmed.

Burkholderia mallei.

A case of glanders occurred in an individual with type I diabetes mellitus who initially presented to a health care facility outside USAMRIID with a febrile illness and tender axillary adenopathy and was subsequently diagnosed with hepatic and splenic abscesses as the result of B. mallei.25 The individual, after a diagnostic liver biopsy, subsequently went into respiratory failure, necessitating intubation. The individual was treated initially with imipenem and doxycycline for 2 weeks, followed by imipenem and azithromycin, and finally received long-term oral therapy with azithromycin and doxycycline to complete a 6-month course of treatment. The route of exposure was assumed to be percutaneous, as laboratory exposures to B. mallei have been most commonly acquired by the organism entering through microabrasions of the skin.25 This individual admitted to not wearing latex protective gloves at times while working in the laboratory. Three individuals evaluated at other times for potential exposure to B. mallei were given postexposure antibiotic

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prophylaxis and remained asymptomatic.

Rickettsial agents (Coxiella burnetii).

One confirmed case of Q fever was diagnosed in an individual who worked with high concentrations of C. burnetii, who had been vaccinated 5 months before exposure. He initially presented with a nonspecific flu-like illness. Diagnosis of Q fever was confirmed by a rise in serological titers. The route of exposure was probably inhalational as the result of a malfunction (leak) of the filter in the BSC that was subsequently discovered. Symptoms resolved on doxycycline. This case represents our only "breakthrough" of symptoms from Q fever infection after the receipt of the Q fever vaccine.17 Serologies of a vaccinated coworker who also worked with high concentrations of the organism using the same BSC showed no evidence of infection.

Viral Agents

There were 77 individuals evaluated for potential exposures to 107 viral agents (Table 5). Because no vaccine existed for many of the viral agents, only 46 of 77 (60%) individuals had vaccination before their exposure. Nearly all individuals with exposures to Venezuelan equine encephalitis (VEE), Western and Eastern equine encephalitis, orthopoxviruses, yellow fever virus, and Rift Valley fever virus were vaccinated before exposure as a result of institute policy for receipt of these vaccines prior to working with the agents (submitted for publication; Table 5). Laboratory work with Ebola, Marburg, and Lassa fever viruses were conducted in BSL 4 laboratory conditions, and work with yellow fever, Junin, and TBE viruses was performed under BSL 3 laboratory conditions. Because no postexposure prophylaxis was available for most viral agents, the risk assessment of exposure and disease was less critical to determining the need for postexposure prophylaxis. However, investigational uses of antiviral agents were considered in significant exposures to highly virulent viral agents in unvaccinated individuals and given to two individuals. No individuals required level 4 patient isolation during this period.27 Three confirmed viral infections were diagnosed: Venezuelan equine encephalitis virus, Chikungunya virus, and vaccinia infections.

TABLE 5 Viral Exposures: Vaccination Status of 77 Individuals with Potential Exposures to 107 Viral Agents

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Confirmed Infections

VEE.

A vaccinated individual who had worked with animals infected with enzootic IE and IIIA strains of VEE during the previous 5 days developed symptoms Consistent with VEE infection. Viral culture of the pharynx was positive for VEE strain IIIA. However, acute and convalescent serologies did not show a fourfold rise in titer to VEE IIIA, with plaque-reduction neutralization (PRNT80) titers remaining less than 1:10. The individual's symptoms resolved within 10 days. The individual had previously received the investigational VEE TC-83 vaccine and had demonstrated an adequate PRNT80 titer of 1:80. However, the VEE TC-83 vaccine is more antigenically related to the epizootic Trinidad strains IA, IB and IC, and is known to have poor cross-protection against the enzootic strains such as IE and IIIA.28

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Chikungunya.

One of two needlestick exposures to chikungunya virus resulted in a confirmed infection. The individual developed symptoms within 2 days of a needlestick, with an estimated dose of exposure to 10,000 to 100,000 PFU of chikungunya virus strain IBH 35 (Nigerian isolate). Symptoms consisted of fever, headache, arthralgias, fatigue, and blurred vision. The diagnosis was confirmed by replication of chikungunya virus from blood cultures on days 2 and 5 of illness, by serological titers (rise in chikungunya IgM and neutralizing antibody levels), and by electron micrographs showing viral particles consistent with chikungunya virus from cells inoculated with serum from days 3 and 4 of illness. The individual had a full recovery after a slow convalescence with intermittent joint pains, headaches, and blurred vision over the ensuing months. The individual had received an inactivated chikungunya vaccine 13 years earlier, but use of this vaccine was discontinued in early clinical trials due to poor vaccine immunogenicity. The individual did not develop antibody titers after this vaccine. Also, the individual had received vaccination to other alphaviruses (VEE, Western and Eastern equine encephalitis), which may have potentially offered crossprotection or decreased the immune response to other alphaviruses.29 Subsequently, an investigational live attenuated chikungunya vaccine became available and was given to individuals at-risk of exposure to chikungunya virus.22

Vaccinia.

Three days after sustaining a splash of IHD-J-strain of vaccinia onto abrasions of the hand, a researcher noted 3 localized erythematous pruritic papules at the site of the splash. He presented 3 days later (day 6) with two 3-mm pustules with central crusting within a 1.5-cm erythematous lesion on his index finger, and a crusted papule on his thumb that was consistent with localized vaccinia. The individual was afebrile, without adenopathy, and the abrasions on the hand were still present. Medical records confirmed a "take" from his last vaccinia booster given 7 months before the exposure. The lesions resolved without treatment.

Postexposure Antiviral Prophylaxis

Ribavirin.

Oral ribavirin was given to an individual who had a high risk exposure to 7 mL of cell culture supernatant from Sin Nombre virus (strain cc107) at a concentration of 105 PFU/mL. While she was expressing the supernatant through a filter inside a BSC, the filter cracked and the liquid sprayed out of the BSC onto her scrub tops, which she immediately sprayed with Lysol and removed. Prophylaxis with ribavirin (1200 mg a day) was initiated.30 Therapy was discontinued at day 21 of a planned 30 day regimen due a hemoglobin decrease from 14 to 10.3g, a known side effect of ribavirin. The anemia resolved readily with discontinuation of the drug. Reverse-transcription polymerase chain reaction and enzyme-linked immunosorbent assay tests for the virus performed twice weekly for 3 weeks and then every 2 weeks for another 2 months remained negative for Sin Nombre virus.

Cidofovir.

A laboratory worker was evaluated for a potential ocular exposure to orthopox viruses resulting from a splash of condensate from a cord of an incubator where orthopox viruses were incubated. The individual failed to decontaminate his eye at the time of the exposure. Cidofovir with probenecid was administered prophylactically without sequelae.31

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Discussion

In recent years, especially since the anthrax letters of 2001, the civilian public health and medical research and development communities have developed an increasing interest in research on defensive measures against agents of biowarfare. However, Fort Detrick has maintained an active research program on potential biowarfare agents for more than 60 years, initially for offensive purposes but solely for defense against these agents since 1969. Before the 1960s, numerous occupationally acquired infections involving these agents occurred, but the availability of vaccines in the 1960s; improvements in engineering controls (ie, biological safety cabinets); and advances in biosafetyequipment, awareness, and site laboratory practices (ie, needleless systems) greatly contributed to the decrease in exposures and infections. In this review of exposure incidents from 1989 to 2002, 5 infections resulted from the 234 potential exposures to bioterrorist agents.

A decrease in laboratory-acquired infections resulting from vaccination with investigational vaccines such as the live, NDBR 101 Tularemia, Q fever, and VEE TC-83 vaccines, as well as with Food and Drug Administration-approved vaccines such as anthrax and yellow fever vaccines, has been noted.3 Vaccine "breakthroughs" with an enzootic strain of VEE, localized lesions from vaccinia virus, or chikungunya virus infection (from the earlier poorly immunogenic chikungunya vaccine) were not unexpected. No infections with epizootic strains of VEE have been documented at USAMRIID since the usage of the live, attenuated VEE TC-83 vaccine in 1963. All "breakthrough" infections to the vaccine evaluated were with enzootic strains, to which the vaccine has demonstrated relatively poor persistence of antibody titers in both horses and humans.28 Breakthroughs with localized vaccinia in vaccinated individuals have been previously reported, and are not unexpected.32-34 And although a vaccinated individual had a "breakthrough" infection with Q fever, it is quite possible that the vaccine may have provided a protective effect in that symptoms may have been worse without prior vaccination. The individual with chikungunya infection had received a vaccine that in early trials was deemed poorly immunogenic, did not result in antibody titers in the person, and therefore was not expected to be protective. It is unclear whether prior vaccination against other alphaviruses, which may inhibit or potentiate antibody responses to chikungunya, affected his response To chikungunya virus.

However, vaccination should not be considered a substitute for personal protective measures, education of employees on laboratory safety practices, and safety monitoring of the laboratories. The wearing of gloves "at all times" would have most likely prevented two of the five infections in our review. Also, vaccine "breakthroughs" may occur, as occurred with our case of Q fever after exposure to high doses the organism.

Postexposure antibiotic prophylaxis after moderate- or high-risk exposures has been the policy and practice at USAMRIID both before and after the availability of vaccines. Early evaluation of potential occupational exposures allowed for early intervention with postexposure prophylaxis, without failures of the postexposure prophylaxis policy based on risk assessment (Fig. 4). In addition, aggressive management of potential exposures has a risk-benefit ratio leaning toward benefit, with only slight risk from the use of antibiotics. This proactive approach makes sense not only from the standpoint of preventing infection for the individual, but also for minimizing the risk of introducing communicable illnesses into the community at large.

Fig. 4. Flow chart of policy of postexposure antibiotic prophylaxis in potential bacterial exposures based on assessment of disease risk and vaccination

Status and organism.

Our duration of postexposure prophylaxis before October 2001 ranged from 7 to 14 days in vaccinated persons after aerosol exposure to B. anthracis (as opposed to 30 to 60 days currently recommended).35-38 However, there were no "confirmed" exposures to provide data to support effectiveness of this shorter duration of prophylaxis for aerosolized exposures in vaccinated individuals.

Although it has been our policy to provide postexposure prophylaxis for moderate- and high-risk percutaneous exposures with B. anthracis, the Centers for Disease Control and Prevention does not currently recommend Postexposure prophylaxis for preventing cutaneous B. anthracis.38 Anthrax vaccine alone has been effective in preventing cutaneous anthrax in wool sorters using an older protective antigen-based anthrax vaccine similar to the current licensed vaccine but is grown under aerobic conditions with an alum precipitate instead of microaerophilic conditions with an alum-adsorbed vaccine.39 However, percutaneous exposures in the laboratory to cultures may involve exposures to higher concentrations of the organism and potentially not be prevented by the vaccine.
This was demonstrated by two at-risk laboratory workers with vaccine "breakthroughs" of cutaneous anthrax with the older antigen-based anthrax vaccine, occurring during the period of the offensive biological warfare program (unpublished data). One case occurred a day before the time of his scheduled 6-month booster (dose 4 of vaccine), and the other case occurred in a person who had only received two doses of vaccine. There have been no "breakthroughs" with the current licensed anthrax vaccine. However, individuals are now required to have a minimum of three doses of anthrax vaccine before they enter the laboratory containment suite, and occasionally physicians have elected to give an early booster for higher risk exposures if within 1 to 2 months of a due dose of anthrax, in addition to postexposure antibiotic prophylaxis if indicated. Our proactive approach to managing "known" potential exposures with postexposure prophylaxis may have reduced our ability to detect whether the vaccine alone was protective. However, historically the majority of individuals, over 80% in one report, diagnosed with laboratory-acquired infections, could not identify a known incident or breach in laboratory policy responsible for their infection.15 Our review did identify a case of cellulitis after a high-risk needlestick exposure that was likely secondary to Y. pestis that responded while on doxycycline.40,41 This case represents a probable vaccine "breakthrough" and thus raises concern of the possibility of breakthrough infections with other agents, such as anthrax, even in vaccinated individuals.

Prophylaxis with tetracycline 2 g daily for 14 days was demonstrated to be highly effective for preventing tularemia in humans after aerosolized exposure to 25,000 F. tularensis SCHU-S4 when given within 24 h of exposure.42 Although the added effect of postexposure prophylaxis to vaccination is unknown, the failure of the vaccine to protect against ulceroglandular tularemia supports the practice of postexposure prophylaxis after higher-risk percutaneous exposures with this organism. In addition, retrospective diagnosis of two possible cases of mild typhoidal tularemia in vaccinated individuals during the time of the offensive biological warfare program was made by serological and skin testing. Both individuals had recent febrile illnesses treated with antibiotics by their family physician (USAMRIID, unpublished data).

Antibiotic prophylaxis with Q fever has been demonstrated to be effective if administered 8 to 12 days after exposure but may only prolong the onset Of disease if given within 7 days of exposure.43 It is not known whether the vaccine alone is adequate for preventing disease in a laboratory setting with high-risk exposures or the effect of immediate postexposure prophylaxis

LETTER 47

Alexandra Gorman

(within 7 days of exposure) in vaccinated individuals. Again, the development of symptoms after a high-dose aerosolized exposure supports the continuation of postexposure prophylaxis in moderate- or high-risk exposures.

Currently there is no literature concerning the efficacy of postexposure prophylaxis for glanders. Trimethoprim-sulfamethoxazole and quinolones Have antimicrobial activity against B. mallei, but their efficacy as postexposure prophylaxis in preventing disease is not known. However, antibiotic Prophylaxis for melioidosis has been demonstrated to be effective in 100% of white rats against subcutaneous exposure with a 10-day course of either trimethoprim-sulfamethoxazole or quinolones.44

Safer needle systems were introduced in some laboratories starting in 1990. Because the number of needlestick exposures per year was already low, no effect from this intervention could be determined with an average of 1.7 needlesticks per year remaining constant. Similar to a medical center, one might expect that needlesticks will occur at a certain frequency as long as needles are used in research involving animals. Therefore, laboratories must have a method in place to evaluate such potential exposures. We postulate that even if a laboratory does not have any known needlesticks, they should not assume that they are not occurring. It is more likely that they are occurring but are not being reported.3

In summary, we reviewed available medical and safety records at USAMRIID from 1989 to 2002 and reported on 234 evaluations of potential exposures and illnesses to bacterial, rickettsial, and viral disease agents. During this period, there were five confirmed infections. The large number of exposure incidents reported in this time period serves as a reminder that work in a laboratory of this type is inherently hazardous. Therefore, it is imperative for laboratories that elect to work with highly hazardous agents to be fully cognizant of the risk of occupationally acquired illnesses and institute policies and proactive employee health procedures to evaluate potential exposures. Other reviews have noted that some infections are identified only through employee medical surveillance. Evaluation of potential exposures must be openly encouraged by senior leadership and be non-punitive, lest the exposures be driven "underground" and not reported at all. Much of our knowledge about biosafety has come from investigations into the mechanisms and activities that caused workers to become infected. Future improvements in protecting workers will likely come from similar evaluations.

Conclusions

Our review of exposure incidents involving potential bioterrorism threat agents indicates that vaccination and proactive occupational exposure evaluation are important elements in minimizing the risk of exposure, disease, and fatalities among at-risk laboratory workers. However, these medical interventions are not a substitute for ongoing continued safety training, laboratory practices and procedures, and personal protective measures to reduce the morbidity and mortality in at-risk laboratory workers.

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LETTER 47

Alexandra Gorman

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Alexandra Gorman

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LETTER 47

Alexandra Gorman

Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

48.1 As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly

48.2 states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little

48.3 reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

48.4 It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

It is now time to Just Say No.

Sincerely,

Susan Gracey
18 Monmouth Court
Brookline

LETTER 48

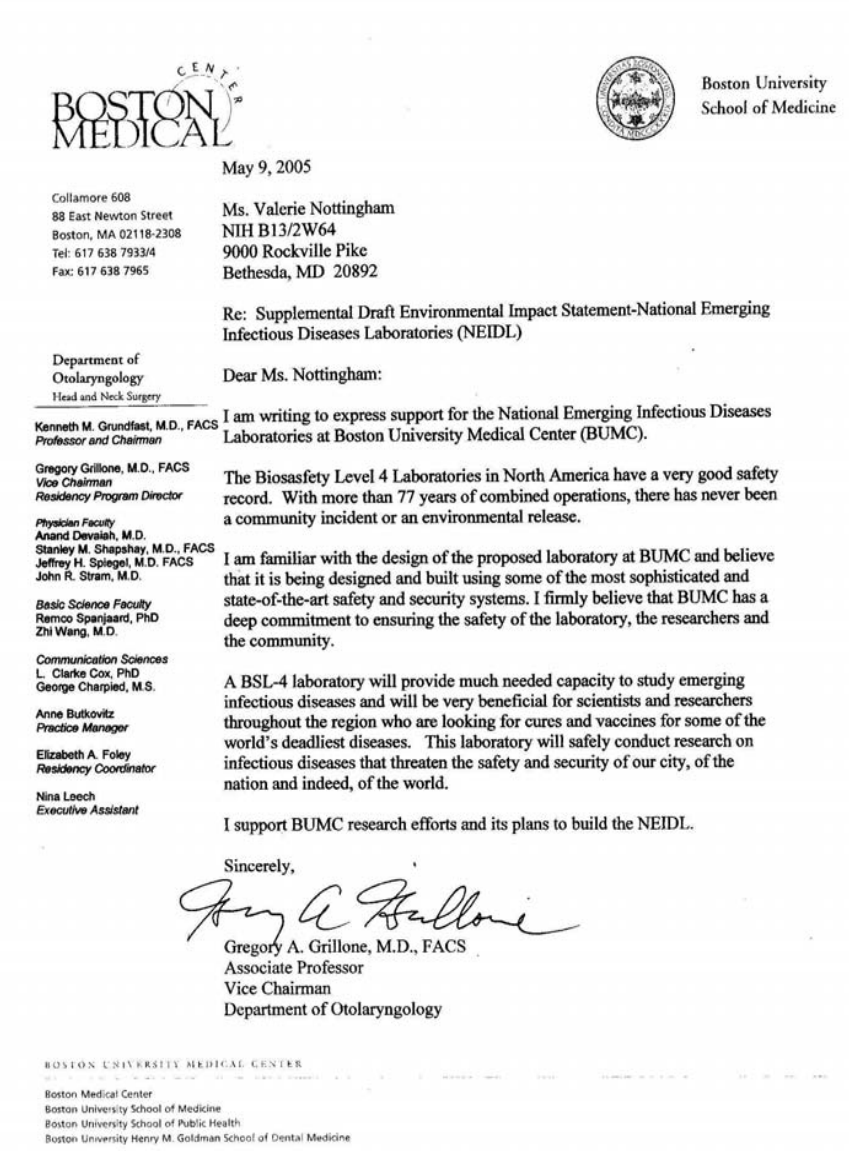
Susan Gracey

48.1 See Response to Comment 1.1.

48.2 See Response to Comment 1.2.

48.3 See Response to Comment 1.3.

48.4 See Response to Comment 1.4.



BOSTON MEDICAL CENTER

Boston University School of Medicine

May 9, 2005

Collamore 608
88 East Newton Street
Boston, MA 02118-2308
Tel: 617 638 7933/4
Fax: 617 638 7965

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Department of Otolaryngology
Head and Neck Surgery

Kenneth M. Grundfast, M.D., FACS
Professor and Chairman

Gregory Grillone, M.D., FACS
Vice Chairman
Residency Program Director

Physician Faculty
Anand Devaiah, M.D.
Stanley M. Shapshay, M.D., FACS
Jeffrey H. Spiegel, M.D. FACS
John R. Stram, M.D.

Basic Science Faculty
Remco Spanjaard, PhD
Zhi Wang, M.D.

Communication Sciences
L. Clarke Cox, PhD
George Charpied, M.S.

Anne Butkovitz
Practice Manager

Elizabeth A. Foley
Residency Coordinator

Nina Leech
Executive Assistant

Dear Ms. Nottingham:

I am writing to express support for the National Emerging Infectious Diseases Laboratories at Boston University Medical Center (BUMC).

The Biosasfety Level 4 Laboratories in North America have a very good safety record. With more than 77 years of combined operations, there has never been a community incident or an environmental release.

I am familiar with the design of the proposed laboratory at BUMC and believe that it is being designed and built using some of the most sophisticated and state-of-the-art safety and security systems. I firmly believe that BUMC has a deep commitment to ensuring the safety of the laboratory, the researchers and the community.

A BSL-4 laboratory will provide much needed capacity to study emerging infectious diseases and will be very beneficial for scientists and researchers throughout the region who are looking for cures and vaccines for some of the world's deadliest diseases. This laboratory will safely conduct research on infectious diseases that threaten the safety and security of our city, of the nation and indeed, of the world.

I support BUMC research efforts and its plans to build the NEIDL.

Sincerely,

Gregory A. Grillone, M.D., FACS
Associate Professor
Vice Chairman
Department of Otolaryngology

BOSTON UNIVERSITY MEDICAL CENTER

Boston Medical Center
Boston University School of Medicine
Boston University School of Public Health
Boston University Henry M. Goldman School of Dental Medicine

LETTER 49

Gregory A. Grillone, M.D., FACS

LETTER 50

Paul Guzzi

GREATER BOSTON CHAMBER
75 STATE STREET, BOSTON, MA 02109-1814
617.227.4500 FAX 617.227.7505 bostonchamber.com

Greater Boston Chamber
The Hub of Business

May 5, 2005

Ms. Valerie Nottingham
National Institutes of Health
B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

RE: Supplemental Draft Environmental Impact Statement for the National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

The City of Boston is the ideal location for the BioSafety laboratory because of our city's preeminence in biomedical research, world-renowned hospitals, scientists and researchers and its reputation as a desirable location for visiting scientists. Boston University Medical Center has long been a driving force behind biomedical innovation and advancement made in the region and has cultivated the necessary partnerships between academia and industry to take the lead in this critical facet of our nation's fight against infectious diseases.

The Greater Boston Chamber of Commerce believes that BioSquare is a uniquely qualified site on which to locate this facility due to its offerings and environment. In addition this facility will serve as an economic engine for the region spurring job creation and capital investment for years to come. The $128 million NIH grant for construction and future operational monies are expected to generate an additional $1.7 billion in federal research and spending over the next 20 years. This dramatic infusion of federal dollars into our city will be a boon for the local economy.

The lab is expected to create 1,200 construction jobs and 660 permanent jobs ranging from scientists to laboratory technicians to security to environmental services. There will be opportunities for community residents to secure training and well paying positions with the lab.

The Chamber is confident that the stringent safety standards employed in the design, construction and operation of this facility will ensure that both researchers and community residents alike will be safe and secure. The superior safety records exhibited by the other BSL-4 Labs in North America help substantiate the effectiveness of the security measures this facility will employ.

The Chamber is grateful for the opportunity to express its support for the Biosafety Laboratory at Boston University Medical Center.

Sincerely,

Paul Guzzi
President & CEO

Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

It is now time to Just Say No.

Sincerely,

Amy Hendricksen

LETTER 51

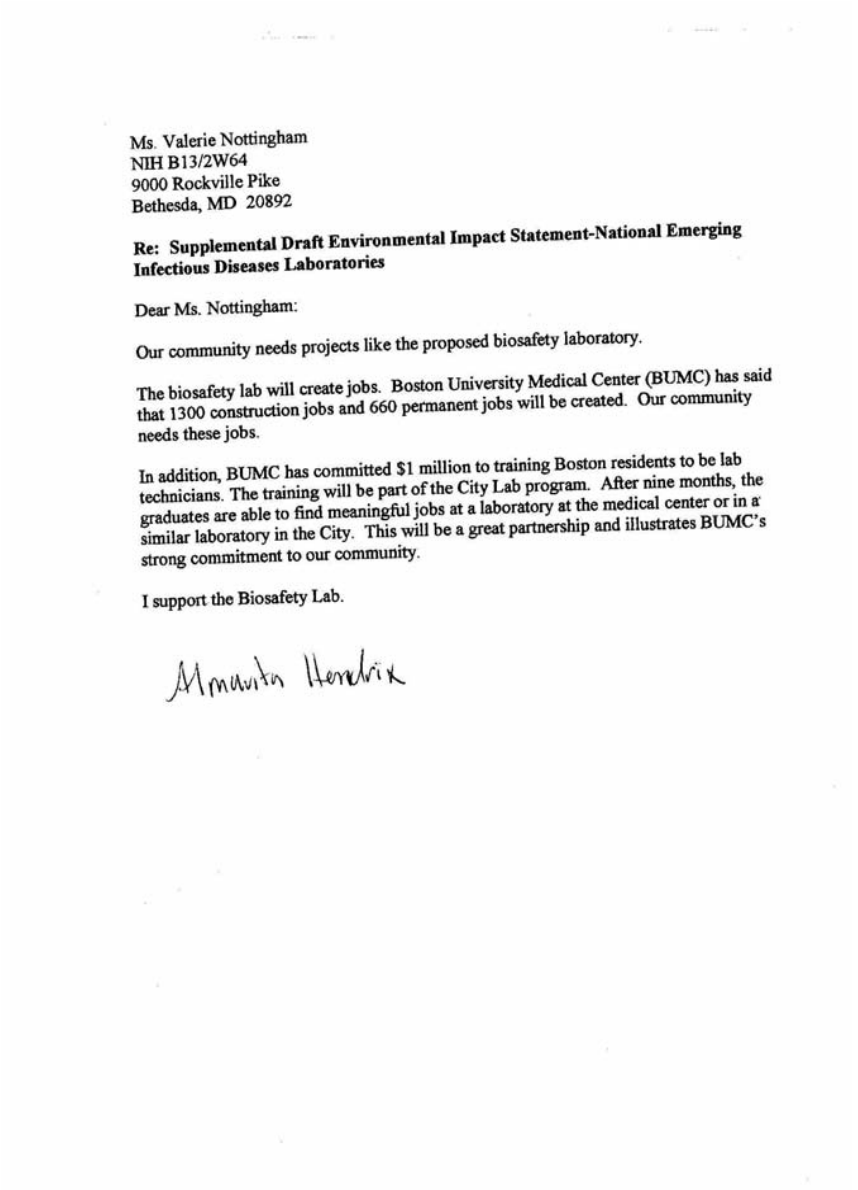
Amy Hendricksen

51.1 See Response to Comment 1.1.

51.2 See Response to Comment 1.2.

51.3 See Response to Comment 1.3.

51.4 See Response to Comment 1.4.



Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

Our community needs projects like the proposed biosafety laboratory.

The biosafety lab will create jobs. Boston University Medical Center (BUMC) has said that 1300 construction jobs and 660 permanent jobs will be created. Our community needs these jobs.

In addition, BUMC has committed $1 million to training Boston residents to be lab technicians. The training will be part of the City Lab program. After nine months, the graduates are able to find meaningful jobs at a laboratory at the medical center or in a similar laboratory in the City. This will be a great partnership and illustrates BUMC's strong commitment to our community.

I support the Biosafety Lab.

Almarita Hendrix

LETTER 52

Almarita Hendrix

Nottingham, Valerie (NIH/OD/ORF)

From: Hughes, Sherwood [SHUGHES2@PARTNERS.ORG]
Sent: Sunday, May 08, 2005 9:20 AM
To: NIH NEPA Comments
Subject: Support Letter for BUMC Bio Lab Level 4

Valerie Nottingham

Division of Environmental Protection

The National Institutes of Health

B13 RM 2W64, 9000

Rockville Park

Bethesda, MD 20892

Dear Valerie:

I am a resident from Saint George Street, two blocks from where the BUMC is proposing to build the Bio Lab Level 4. I am also the President of the Blackstone/Franklin Square Neighborhood Association.

The purpose of my letter is to let you know that I am in support of having the Bio Lab level 4 in the South End. I have had the opportunity to attend many of the public and private meetings that BUMC and the BRA have held to address questions, concerns and issues that the community has brought to the forefront. BUMC has spent a great deal of time and effort making sure that the area residents have answers to the questions they are concerned about by speaking at public meetings, holding breakfasts, holding office hours and supplying packages of information to anybody who has asked.

Additionally, BUMC officials and BRA officials also met with me to answer a list of difficult questions last year. Their answers reassured me that the Bio Lab will be operated in a responsible and safe manner. BUMC has also promised to keep area community groups apprised of their ongoing quality and safety reporting which is an important component of accountability to area residents. I've also been lucky to confer with my neighbor Chris Brayton who took a trip to Atlanta, Georgia to see the facility at Emory. Chris met with and toured the Georgia State University Bio Labs and with the neighborhood civic association which surrounds the Emory University CDC facility.

LETTER 53

Sherwood S. Hughes

Finally, as a member of the medical community in Boston, I believe this facility
is absolutely necessary to ensure important research into potential cures for
deadly diseases.

If you have any questions, please feel free to contact me at 617-429-9934.

Sherwood S. Hughes
1 Saint George Street #3C
Boston, MA 02118
617-429-9934

President
Blackstone/Franklin Square Neighborhood Association

LETTER 53

Sherwood S. Hughes

Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

54.1

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It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

54.4

It is now time to Just Say No.

Sincerely,

Gretchen Klotz
19 Dennison st
Wrentham MA 02453

LETTER 54
Gretchen Klotz

54.1 See Response to Comment 1.1.

54.2 See Response to Comment 1.2.

54.3 See Response to Comment 1.3.

54.4 See Response to Comment 1.4.

LETTER 55

J. Thomas Lamont, MD

Beth Israel Deaconess Medical Center

Harvard Medical Schoo

Chief, Division of Gastroenterology

J. Thomas LaMont, M.D.

Beth Israel Deaconess Medical Center
330 Brookline Avenue • Boston, MA 02215 USA
617 667-8377 • Fax 617 667-2767
Internet: jlamont@caregroup.harvard.edu

Charlotte F. & Irving W. Rab
Professor of Medici

March 02, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab also known as the National Emerging Infectious Diseases Laboratory (NEIDL) proposed at Boston University Medical Center (BUMC). I am a federally –funded researcher carrying out basic and clinical research on an infectious pathogen. Our laboratory routinely handles human and animal pathogenic bacteria and their toxins. We are very familiar with the safety issues recommended for the safe handling of infectious agents.

As you are aware, biomedical research laboratories operate under strict procedures and protocols at BUMC and at other academic and private laboratories throughout the Greater Boston region. This research is done safely and makes important medical contributions to the nation and the world.

I believe that the NEIDL at BUMC will be one of the safest laboratories in the world. I have been briefed on the systems and the design and am familiar with operations in biomedical research laboratories. I am impressed by the building's safety and security features and by the team BUMC has assembled to build this important project.

I should also note that there are some who have incorrectly raised the city of Boston's rDNA regulations, as a reason the laboratory should not be built. This is simply misinformation. rDNA research is conducted in Boston under the Boston Public Health

Commission's regulations. On numerous occasions, BUMC authorities have stated that they will do all research in compliance with the Health Commission's guidelines.

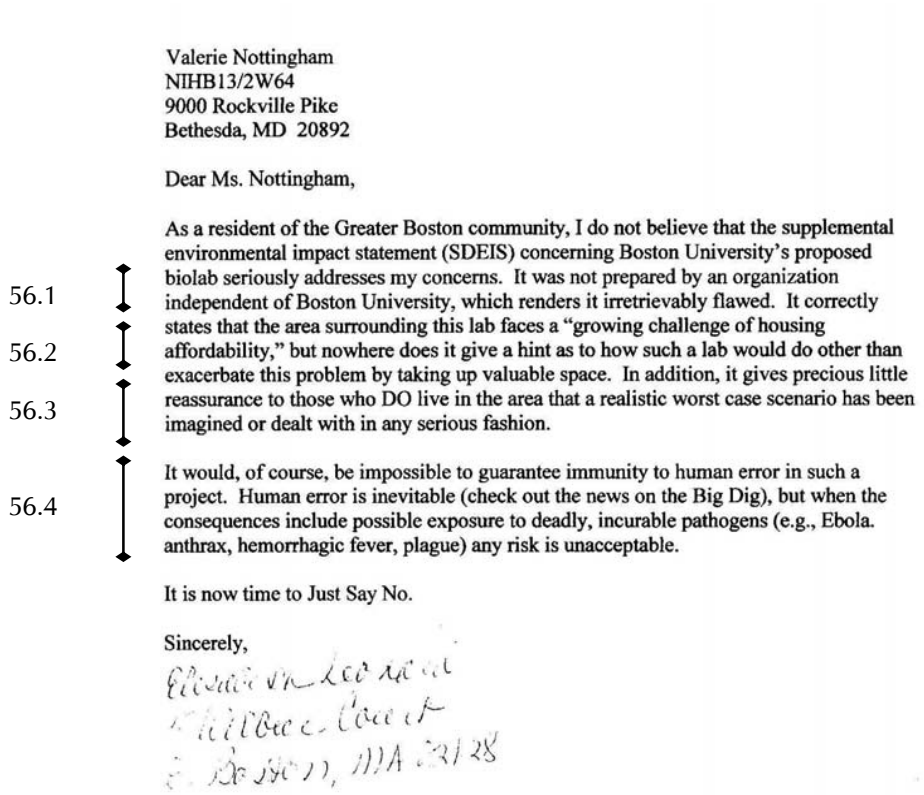
This laboratory will be an important project for the research community and those interested in finding cures for emerging infectious diseases and I fully support it.

Sincerely,

J. Thomas Lamont, MD, Chief
Division of Gastroenterology

LETTER 55

J. Thomas Lamont, MD



Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

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It is now time to Just Say No.

Sincerely,

56.1
56.2
56.3
56.4

LETTER 56

Elisabeth Leonard

56.1 See Response to Comment 1.1.

56.2 See Response to Comment 1.2.

56.3 See Response to Comment 1.3.

56.4 See Response to Comment 1.4.

Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

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It is now time to Just Say No.

Sincerely,

Edward L. Loech
Brookline, MA

LETTER 57

Edward L. Loech

57.1 See Response to Comment 1.1.

57.2 See Response to Comment 1.2.

57.3 See Response to Comment 1.3.

57.4 See Response to Comment 1.4.

Bayha, Ryan (NIH/OD/ORS)

From: Nottingham, Valerie (NIH/OD/ORF)
Sent: Tuesday, May 24, 2005 11:01 AM
To: Bayha, Ryan (NIH/OD/ORS)
Subject: FW: Comments on the Supplemental Draft Environmental Impact Statement (SDEIS) for the BU Lab

From: Eve Lyman [mailto:evelyman@gmail.com]
Sent: Wednesday, May 18, 2005 7:49 PM
To: NIH NEPA Comments
Subject: Comments on the Supplemental Draft Environmental Impact Statement (SDEIS) for the BU Lab

Comments on the Supplemental Draft Environmental Impact Statement (SDEIS) for the BU BSL4 Lab

I feel that the environmental impact statement (SDEIS) for Boston University's BSL4 Lab has the following problems:

- I oppose locating the lab in the South End/Roxbury;
- 58.1 There should be a thorough analysis of other locations for the lab, including other locations in Massachusetts and the locations of the other applicants;
- 58.2 The worst case scenario should include all the select agents that might be in the lab, not only anthrax;
- The worst case scenario should include a terrorist causing a release from the lab;
- 58.3 The analysis of terrorism threats to the lab must be made public;
- 58.4 there must be an analysis of a release of an agent within Boston during transport to the lab; and
- 58.5 How will the research comply with the Boston ban on rDNA research in a BSL4 lab?

- 58.6 13 out of 19 preparers were either hired consultants or members of the BU medical center despite claims of lack of interest in the problem.
- 58.7 Transportation accidents from the regional centers to the national center between Harvard, MIT and Roxbury/South End are not discussed they can lead to problems
- 58.8 There is no serious treatment in the SDEIS of all the alternative scenarios including insect release, the formation of carriers, scratches in the lab upon decontamination
- 58.9 There is no discussion as to how infiltration into this system from within is to be prevented. The Anthrax used in the postal attacks is likely to have come from Fort Detrick Maryland and the Batelle Army Center in Columbus. How is security breaches from within from staff who intimately know the security system to be prevented.
- 58.10 There is no discussion as in the event of an accident, how is fault going to be established and how people are to be held accountable, in the light of the tuleremia outbreak why should we believe that the public will ever be told about the problem

LETTER 58

Eve Lyman

58.1 See Response to Comment 19.2.

58.2 See Response to Comment 78.2

58.3 See Appendix 11, Executive Summary Threat and Vulnerability Analysis.

58.4 See Appendix 11, Executive Summary Threat and Vulnerability Analysis.

58.5 As stated in Section 2.2.5.1, any research that may be conducted in the proposed Boston-NBL would comply with all applicable Federal, state, and local laws, including laws governing the use of recombinant DNA.

58.6 The EIS is an NIH document. Some of the preparers are affiliated with Boston University since they were needed to provide information about the proposed project and its potential environmental impacts. The fact that some of the preparers are affiliated with Boston University does not affect the NIH's ability to make an informed, independent, and objective decision on the proposed action.

58.7 Transportation of select agents to and from the Boston-NBL would be managed in accordance with all applicable local, state, and federal regulations and guidelines and BUMC policy. These regulations and policies address appropriate notification, packaging, routing, and delivery protocols including delivery personnel screening, predetermination of routes, date and time of travel and delivery, and GPS monitoring to allow for vehicle tracking and response to incidents during travel time. See Section 2.2.6 of the FEIS.

LETTER 58

Eve Lyman

58.8 Insect release and inventory precautions are described in Section 4.2.1.1 "Community Safety and Risk – Other Potential Risk Scenarios (c)" and in Response to Comment 26.11. It is unclear what is meant by "formation of carriers". All personnel with potential exposures to infectious agents that pose a risk to other individuals because of possible person to person transmission would be quarantined for the duration of the incubation period of the agent in question. Individuals who are exposed to potentially infectious agents through "scratches in lab" would be evaluated to determine their risk of acquiring the infectious agent and for the risk of person to person transmission. Quarantine of the individual would depend on the nature of the agent and the exposure.

58.9 Concerns over the staff with access to select agents have been addressed though careful screening, mandatory two-person rule protocols, layers of access that must be replicated for egress and surveillance by closed circuit television. This system of audits and check and balances on approved personnel is intended to mitigate risks associated with approved staff. Incidents of non-compliance or systems malfunctions would be reported immediately to responsible officials. Checks and balances includes researchers having access to and information about research areas only, security personnel having access to and information about security areas and protocols only and facilities personnel having access to and information about facilities areas and protocols only. Individuals with access to select agents would not have knowledge of or access to security access and audit systems. See Sections 2.2.5, and 2.2.6 of the FEIS.

58.10 Any breach in security or safety procedures would be thoroughly investigated by the appropriate responsible parties and reported to the Executive Committee as well as appropriate local, state and/or federal agencies.

58.11 • The NIH security classifications are capricious so that Avian Flu can be investigated now at BSL3 labs even though it has potentially very high potential spread possibilities and has 60% mortality in humans.

58.12 • Who is going to pay for damages in the event of an accident is not clear. In particular it took a few hundred million dollars to clear the Post Offices in Washington of Anthrax.is Harvard, BU and other members of the research consortium willing to assume the risk of paying for the cleanup.

58.13 • The Waste disposal system is not adequately described. What recorse does that State and City Have if pollution problems are not solved. This is not academic Plum Island off long Island is a Major Polluter and local citizens the EPA and others cannot stop it.

58.14 • Why don't we abide by democracy and ask the citizens of Boston to vote on this issue? Why do we let beaurocrats decide on all issues of importance to the population and the innocent bystanders allowed to bear the cost of the "leaders decisions".

Sincerely,
Eve Lyman

--
We Are One World
Eve Lyman
Director
Boston Mobilization
971 Commonwealth Ave #20
Boston, MA, 02215
617.782.2313
www.bostonmobilization.org

LETTER 58

Eve Lyman

58.11 The BMBL provides guidelines and risk assessment information. It does not attempt to provide a biosafety level for every organism. The 4th edition (1999) as referenced does not provide guidance on avian influenza. The draft 5th edition does. USDA also regulates work with this agent because it is considered an agricultural select agent or high consequence pathogen.

58.12 The worst possible case does not indicate there would be an accident that requires payment for damages.

58.13 The waste disposal system and procedures are fully described in the Sections 2.2.3.2, 2.2.8 and 3.8. Discharges to the sewer system are regulated by the BWSC, DEP and MWRA, each of which has the authority to issue fines for violations of permits and regulations, and to shut down laboratory discharges, if required. The correlation of the buildings systems proposed for this facility to the failure of the Plum Island wastewater treatment system is inappropriate. All waste discharged from this facility ultimately would be treated in the MWRA's treatment plant.

58.14 The public has been given full opportunity to be involved in the environmental review of the proposed action. Whether the citizens of Boston should vote on the proposed action is outside the scope of NEPA and of this EIS.

Nottingham, Valerie (NIH/OD/ORF)

From: tdmann@att.net
Sent: Thursday, April 21, 2005 5:10 PM
To: NIH NEPA Comments
Subject: commnets on BUMC NEIDLF - Boston, Draft EIS

82 Montgomery Street
Boston, Massachusetts 02116

April 21, 2005

Ms. Valerie Nottingham
Chief, Environmental Quality Branch
Division of Environmental Protection
National Institutes of Health
B13 - Room 2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft EIS
National Emerging Infectious Diseases Laboratory
Boston University Medical Center Campus
600-620 Albany Street, Boston

Dear Ms. Nottingham:

59.1 I have reviewed the above captioned EIS and determined that inadequate consideration was given to the fact that the proposed site of the facility is located on the extended centerline of Runway 9-27 at Boston-Logan International Airport and within 2 1/2 miles of the end of that runway. As such, it lies within a Potential Aircraft Impact Zone (PAIZ) if there were to be an emergency involving an aircraft departing from the airport on Runway 27.

59.2 In the event such an emergency were to occur, the severity of the potential disaster would be magnified immensely if an impact were to affect the site of this proposed facility. Therefore, the proximity of the proposed site to this well-used departure path is a critical factor to consider when determining whether the facility meets applicable site evaluation criteria.

I suggest the proposed cite must be rejected because of this conflict and that an alternate location be required for the facility location which is farther away from any existing PAIZ created by arrivals or departures from Boston-Logan International Airport.

Sincerely,

Thomas D. Mann, Jr.

5/4/2005

LETTER 59

Thomas D. Mann, Jr.

59.1 Based on discussions with the Federal Aviation Administration (FAA) and Massport, there are no identified "Potential Aircraft Impact Zones" for the site. There is a protected surface zone that emanates in a trapezoidal shape, terminating 10,000 feet from the end of the runway. The location of the proposed project is beyond the limits of this zone. FAA has determined that this project poses no hazard to air navigation.

59.2 In compliance with the FAA Advisory Circular 70/7460.2k, a Notice of Proposed Construction or Alteration was filed with the FAA. On May 10, 2005, the FAA issued a Determination of No Hazard To Air Navigation and would not require any marking or lighting of the building for safe navigation.

Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

60.1

60.2

60.3

It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

60.4

It is now time to Just Say No.

Sincerely,

Martinez
20 Ware St
Cambridge MA
02138

LETTER 60

C. Martinez

60.1 See Response to Comment 1.1.

60.2 See Response to Comment 1.2.

60.3 See Response to Comment 1.3.

60.4 See Response to Comment 1.4.

LETTER 61

Peter A. Merkel, M.D., M.P.H.

BOSTON UNIVERSITY MEDICAL CENTER

Boston University School of Medicine

BOSTON

DEPARTMENT OF VETERANS AFFAIRS
VA Boston Healthcare System

The Arthritis Center

715 Albany Street, E5
Boston, Massachusetts
02118-2526
Tel. 617 638-4310
Fax: 617 638-4226

May 5, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

I am writing to strongly support the proposed Biosafety Laboratory scheduled to be built on the Boston University Medical Center Campus. In particular, I reference the detail plans in the Final Project Impact Report/Environmental Impact Report filled with the Boston Redevelopment Authority in July of this year.

As a biomedical scientist working in the field of complex autoimmune diseases and as a practicing internist and rheumatologist, I strongly support this important new laboratory. There is a critical need for such facilities since there are not enough Level 4 laboratories in the nation to accommodate the work that needs to be done in emerging infectious diseases. Such devastating infections as HIV, SARS, and even but common, but still deadly influenza viruses, all require more research to help us control, and, hopefully, eventually eradicate these infections from human populations. It is only with this type of sophisticated laboratory, that can take advantage of the tremendous scientific knowledge and expertise in the Boston area, will further advances be made.

Additionally, it should not be underestimated the collateral knowledge benefit that can come from the types of infectious disease research planned for this center. In my own field of autoimmune diseases there has long been a feeling that some of these diseases are infectious in origin and bio-discovery projects that could be performed at this laboratory could have profound impact on many members of society.

I am familiar with Boston University Medical Center's proposal for the Biosafety Laboratory and know it to be adherent to the highest safety standards and under expert and responsible leadership. This laboratory will be a benefit to Boston's medical centers, our Boston community, and quite literally all people.

Thank you for your consideration in this matter.

Sincerely,

Peter A. Merkel, M.D., M.P.H.
Associate Professor Medicine
Boston University School of Medicine

PAM/jtc

April 24, 2005

Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

62.1

62.2

62.3

It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

62.4

It is now time to Just Say No.

Sincerely,

Phyllis J. Miller

Phyllis J. Miller
417 Marlborough St. #4
Boston, MA 02115

LETTER 62

Phyllis J. Miller

62.1 See Response to Comment 1.1.

62.2 See Response to Comment 1.2.

62.3 See Response to Comment 1.3.

62.4 See Response to Comment 1.4.

Acambis Inc.
38 Sidney Street Cambridge MA 02139 USA
T +1 (617) 761 4200 F +1 (617) 494 1741
www.acambis.com

Acambis

May 4, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

We support the National Emerging Infectious Diseases Laboratories at Boston University Medical Center (BUMC), which establishes a state-of-the-art facility for research on emerging and re-emerging infectious diseases that threaten national security and the health of nations around the world.

BUMC conducted exhaustive studies on the selection of proposed site for the NEIDL facility. We agree with the conclusion of these studies that the best location for this facility is the BioSquare Research Park in Boston. In this location, the new NEIDL becomes a part of a large medical research complex and draws on many strengths of an integrated multi-disciplinary research environment. This aspect would be undermined by locating the facility in another location.

In regards to concerns regarding the safety of the proposed facility and in particular, the Biosafety Level 4 laboratory, there is no question that the facility will be safe. Similar laboratories throughout the United States have operated safely for decades, and new BSLK4 laboratories are being established in similar proximity to urban centers. The safeguards build into the design and operations of NEIDL are more than sufficient to ensure that there is no risk to residents in the surrounding area.

Sincerely,

Thomas P. Monath, MD
Chief Scientific Officer

Adjunct Professor,
Dept. of Molecular Biology & Immunology
Harvard School of Public Health

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LETTER 63

Thomas P. Monath, MD

David S. Mundel
36 Gray Street
Boston MA 02116

May 18, 2005

Mr. Leonard Taylor, Jr.
Acting Director, Office of Research Facilities
Development and Operations
National Institutes of Health

c/o Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda MD 20892

(sent by e-mail to nihnepa@mail.nih.gov)

Dear Mr. Taylor,

This letter responds to the request for comments regarding the Supplemental Draft Environmental Impact Statement (SDEIS, dated March 2005) for the National Emerging Infectious Diseases Laboratory and National Biocontainment Laboratory proposed to be built by University Associates Limited Partnership at the Boston University Medical Center (BUMC) campus in Boston.

The proposed operation of this laboratory raises many concerns that need to be addressed prior to approving the building of this project in Boston's South End neighborhood. In assessing this proposed project and preparing the Final Environmental Impact Statement, I urge you and your colleagues at the NIH (and your colleagues at the Boston University Medical Center and its consultants) to carefully consider the potential environmental and health effects on the residents of Boston's nearby neighborhoods, the inmates incarcerated in the nearby South Bay correctional facilities, and the vulnerable patients served at the Boston University Medical Center, itself.

Regrettably, these concerns were not adequately addressed in the DEIS and remain inadequately addressed in the SDEIS.

This comment letter addresses two issues that deserve substantial additional attention and review.

64.1 1. Can we expect the leaders of the BUMC and the NIH -- the proponents, eventual operators, and financial supporters of the laboratory -- to be responsive to the important concerns, issues, and questions raised by residents of the neighborhoods that surround the proposed facility?

LETTER 64

David S. Mundel

64.1 BUMC is committed to safety of its workers and the general population. The proposed lab would be operated in conformance with all applicable federal, state and local regulations many of which pertain to safety. See Response to Comment 4.28.

64.2

2. Can we expect that the operations of the proposed biocontainment laboratory will not create a threat to the safety of the surrounding residential neighborhoods?

In summary, the answer to the first question is "no" – although the repeated promises and statements of both BUMC and NIH personnel suggest that responsiveness to neighborhood concerns is one of their important goals, their actions indicate that their likely performance will fall far short of what is required.

In summary, the answer to the second question is unclear – the so-called "worst case hazard and risk assessments" included in the DEIS and the SDEIS are so incomplete and seriously flawed that they provide no credible basis for establishing the level of anticipated or expected threat or risk.

Issue 1 -- Responsiveness to Neighborhood Concerns, Issues, and Questions

The SDEIS contains numerous statements suggesting a high concern for responsiveness to issues facing residents of the surrounding neighborhoods. For example, the SDEIS states that "BUMC has made an institutional commitment to informing and educating the public about the proposed Boston-NBL facility" (see SDEIS page 1-15). The SDEIS also states that "small group meetings have been held to **ensure** that the community is able to obtain information about the project" (see SDEIS page 1-17, emphasis added). In addition, the SDEIS reports that "more than 130 community meeting have been held in the Dorchester, Roxbury, and South End Neighborhoods to provide factual information, answer questions and respond to concerns."

But the actions of the BUMC and NIH personnel do not indicate that responsiveness to neighborhood residents has been a high priority during the last several months, while the DEIS and SDEIS were being prepared and reviewed.

64.3

Throughout several months following the exposure of BUMC research personnel to a highly infectious strain of Tularemia bacteria, no one from the Medical Center communicated anything about this incident to members of the community.

In the summer of 2004, I contacted RWDI (the consultant responsible for the "worst case risk and hazard assessments" included in both the DEIS and the SDEIS) to discuss their modeling efforts. I was told (by e-mail, dated September 9, 2004) that "RWDI is not authorized to speak directly with members of the public" and that RWDI had forwarded my request to its client and asked BUMC to contact me directly to answer my questions.

The questions that I discussed with RWDI have never been answered.

On December 13, 2004, I and other members of the Ellis South End Neighborhood Association met with BUMC representatives to discuss our neighborhood's concerns. In advance of this meeting, I sent BUMC representatives a brief memorandum outlining a small number of issues and questions that we would like to discuss (see Attachment A). During this meeting and subsequent conversations and e-mail communications, BUMC representatives repeatedly promised to promptly provide us with information that was responsive to our concerns – e.g., the BUMC Executive Director of Operations and Public Safety wrote that "we will continue to share information and analyses." Later, in

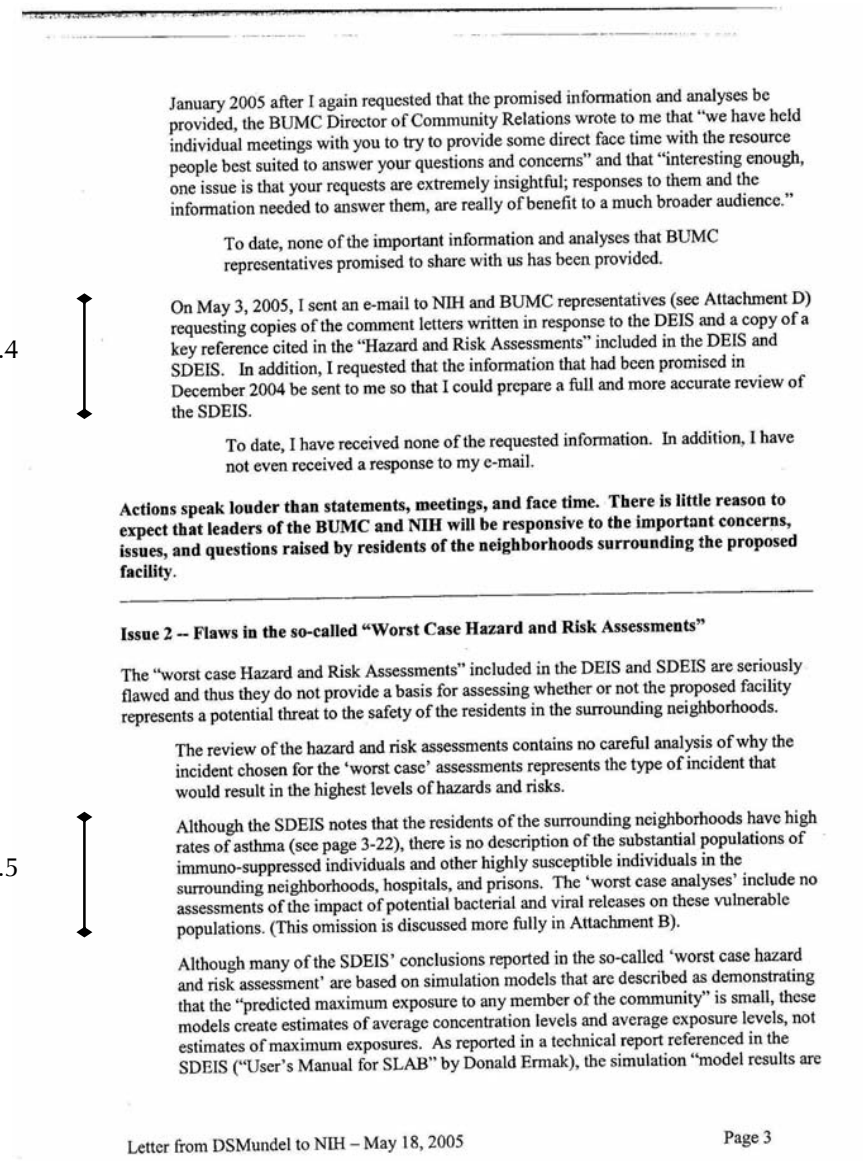
Letter from DSMundel to NIH – May 18, 2005 Page 2

LETTER 64

David S. Mundel

64.2 See Response to Comment 19.1.

64.3 As soon as confirmed cases of tularemia were identified BUMC officials notified all appropriate authorities as required including the Boston Public Health Commission (BPHC), the Massachusetts Department of Public Health and the CDC.



January 2005 after I again requested that the promised information and analyses be provided, the BUMC Director of Community Relations wrote to me that "we have held individual meetings with you to try to provide some direct face time with the resource people best suited to answer your questions and concerns" and that "interesting enough, one issue is that your requests are extremely insightful; responses to them and the information needed to answer them, are really of benefit to a much broader audience."

To date, none of the important information and analyses that BUMC representatives promised to share with us has been provided.

64.4

On May 3, 2005, I sent an e-mail to NIH and BUMC representatives (see Attachment D) requesting copies of the comment letters written in response to the DEIS and a copy of a key reference cited in the "Hazard and Risk Assessments" included in the DEIS and SDEIS. In addition, I requested that the information that had been promised in December 2004 be sent to me so that I could prepare a full and more accurate review of the SDEIS.

To date, I have received none of the requested information. In addition, I have not even received a response to my e-mail.

Actions speak louder than statements, meetings, and face time. There is little reason to expect that leaders of the BUMC and NIH will be responsive to the important concerns, issues, and questions raised by residents of the neighborhoods surrounding the proposed facility.

Issue 2 -- Flaws in the so-called "Worst Case Hazard and Risk Assessments"

The "worst case Hazard and Risk Assessments" included in the DEIS and SDEIS are seriously flawed and thus they do not provide a basis for assessing whether or not the proposed facility represents a potential threat to the safety of the residents in the surrounding neighborhoods.

The review of the hazard and risk assessments contains no careful analysis of why the incident chosen for the 'worst case' assessments represents the type of incident that would result in the highest levels of hazards and risks.

64.5

Although the SDEIS notes that the residents of the surrounding neighborhoods have high rates of asthma (see page 3-22), there is no description of the substantial populations of immuno-suppressed individuals and other highly susceptible individuals in the surrounding neighborhoods, hospitals, and prisons. The 'worst case analyses' include no assessments of the impact of potential bacterial and viral releases on these vulnerable populations. (This omission is discussed more fully in Attachment B).

Although many of the SDEIS' conclusions reported in the so-called 'worst case hazard and risk assessment' are based on simulation models that are described as demonstrating that the "predicted maximum exposure to any member of the community" is small, these models create estimates of average concentration levels and average exposure levels, not estimates of maximum exposures. As reported in a technical report referenced in the SDEIS ("User's Manual for SLAB" by Donald Ermak), the simulation "model results are

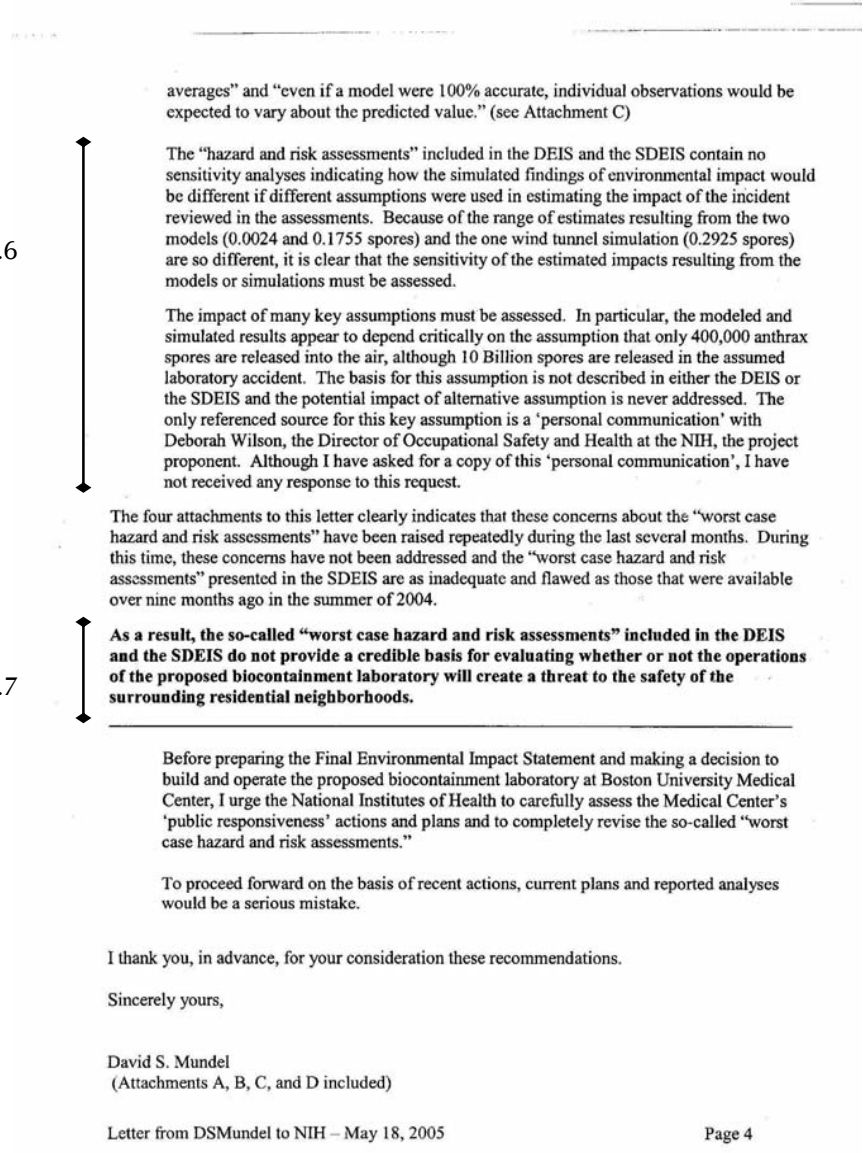
Letter from DSMundel to NIH – May 18, 2005 Page 3

LETTER 64

David S. Mundel

64.4 BUMC, in accordance with instructions from NIH, responded to public requests for information to the entire interested public in documents that have been distributed to requestors and placed in public libraries in Boston. Individual requests for information were not addressed until they could be included in the comprehensive responses as described above.

64.5 The assessment reviewed the potential release of agent as compared to known health benchmarks. The universally accepted benchmarks are 8,000 – 10,000 Anthrax spores for inhalation exposure per event (U. S. DIA 1986), and over 500 spores as a time weighted average over an eight hour period (Brachman et al. 1966). The total predicted exposure over the event is less than a spore and there is no documented evidence of any infection caused by inhalation of a single anthrax spore. The worst case scenario concludes that under the worst case an individual could be exposed to less than one *B. anthracis* spore. This dose of organisms is not infectious for normal or immuno-compromised individuals.



averages" and "even if a model were 100% accurate, individual observations would be expected to vary about the predicted value." (see Attachment C)

64.6

The "hazard and risk assessments" included in the DEIS and the SDEIS contain no sensitivity analyses indicating how the simulated findings of environmental impact would be different if different assumptions were used in estimating the impact of the incident reviewed in the assessments. Because of the range of estimates resulting from the two models (0.0024 and 0.1755 spores) and the one wind tunnel simulation (0.2925 spores) are so different, it is clear that the sensitivity of the estimated impacts resulting from the models or simulations must be assessed.

The impact of many key assumptions must be assessed. In particular, the modeled and simulated results appear to depend critically on the assumption that only 400,000 anthrax spores are released into the air, although 10 Billion spores are released in the assumed laboratory accident. The basis for this assumption is not described in either the DEIS or the SDEIS and the potential impact of alternative assumption is never addressed. The only referenced source for this key assumption is a 'personal communication' with Deborah Wilson, the Director of Occupational Safety and Health at the NIH, the project proponent. Although I have asked for a copy of this 'personal communication', I have not received any response to this request.

The four attachments to this letter clearly indicates that these concerns about the "worst case hazard and risk assessments" have been raised repeatedly during the last several months. During this time, these concerns have not been addressed and the "worst case hazard and risk assessments" presented in the SDEIS are as inadequate and flawed as those that were available over nine months ago in the summer of 2004.

64.7

As a result, the so-called "worst case hazard and risk assessments" included in the DEIS and the SDEIS do not provide a credible basis for evaluating whether or not the operations of the proposed biocontainment laboratory will create a threat to the safety of the surrounding residential neighborhoods.

Before preparing the Final Environmental Impact Statement and making a decision to build and operate the proposed biocontainment laboratory at Boston University Medical Center, I urge the National Institutes of Health to carefully assess the Medical Center's 'public responsiveness' actions and plans and to completely revise the so-called "worst case hazard and risk assessments."

To proceed forward on the basis of recent actions, current plans and reported analyses would be a serious mistake.

I thank you, in advance, for your consideration these recommendations.

Sincerely yours,

David S. Mundel
(Attachments A, B, C, and D included)

Letter from DSMundel to NIH – May 18, 2005 Page 4

LETTER 64

David S. Mundel

64.6 The Maximum Possible Risk, or MPR model, was used to further evaluate risks associated with siting and operation of the proposed BSL-4 laboratory at Boston University. In order to provide quantitative data for input into the model, laboratory studies simulating accidental releases of anthrax spores were conducted. A modified Henderson Apparatus, operated in a static mode, was used to model accidental release of a *B. subtilis* spore preparation (1011 cfu/gm) as a surrogate for *B. anthracis*. The spore concentration was verified by titer on tryptic soy agar. In a biological safety cabinet, the static aerosol chamber was oriented so that the sampling ports and main hatch entry were parallel to the laboratory bench; the chamber exhaust was attached to house vacuum protected by a HEPA filter. The aerosol generator port and annular ring were sealed and not used in this set of experiments. The pressure relief port on the apparatus was also protected by a HEPA filter, to provide make up air when the chamber was placed under vacuum to clear aerosols from the chamber in between experimental runs and between releases of spore preparations. In between each accidental aerosol release experiment, the chamber was washed, decontaminated with bleach solution, and dried with an alcohol wash.

Procedure for Release of Aerosols within the Chamber:
Sampling ports on either side of the main chamber hatch were used to insert the sampling probes from particle counters. One counter was calibrated to count and determine the total number of particles within the respirable range of man (0.3 – 10 microns). The other port was fitted with a probe sampling total particles generated. Background measurements were obtained prior to "accidental" release of the spores. A spore preparation contained in a 15 cc conical bottom Falcon tube with the cap loosened and simply sitting on the tube was held parallel to the bench and dropped into the chamber from a height of 15 inches, just at the height of the open hatch. The gasketed hatch was fitted into place as soon as the drop was accomplished. Particle counting was begun prior to the "drop" to establish background, and continued for as long as it took to stabilize at, or close to, zero particle counts after the "drop".

LETTER 64

David S. Mundel

The chamber was held static during background and test sampling. The drop experiment was performed 19 times. The average number of respirable particles generated in accidental release experiments, over the 19 trials, was 319,701. The standard deviation was 155,950 particles. Six standard deviations ("six sigma") were added to the mean number of respirable particles generated equaling 1,255,396 For use in the MPR model, the respirable number of spores was 1,255,396 P (1,255,396 $<$.000000001). See Section 3 in Appendix 12.

64.7 The NIH performed a third risk assessment using the Maximum Possible Risk Model for the proposed BSL-4 facility at Boston University. Fifteen release scenarios were evaluated to investigate the impact of the laboratory and its operation on the surrounding urban environment. The assessment is attached in Appendix 12. See Responses to Comments 4.6 and 64.6.

-- Attachment A --

Issues and questions for the 12/13/2004
discussion of the hazard and risk assessment

The following is a preliminary set of issues and questions for our discussion. Some of these issues and questions were discussed with RWDI representatives in July and early September, prior to RWDI describing its lack of authorization to speak directly with members of the public.

1. **Agent selection** – Appendix 3 of the "Final Project Impact Report – Final Environmental Impact Report" and Appendix 2 of the "Draft Environmental Impact Statement" describe over 50 diseases that may be studied at the proposed laboratory. But the "Summary Report – Hazard and Risk Assessment" only addresses Anthrax and provides only a summary of a "screening-level assessment."

   What is the basis for the selection of Anthrax as the agent for the "worst-case scenario"?

   What other scenarios were considered, and rejected, in selecting the particular scenario that was summarized?

   What are the environmental risks and hazards to residents and employees present in the surrounding residential and commercial communities that may result from other agents that "may be studied" in the proposed facility?

2. **Population vulnerabilities** – The "Draft Environmental Impact Statement" states that the "relationship of smoking and drinking to susceptibility to pulmonary anthrax is unknown, but it would be reasonable to conclude that these factors would increase sensitivity to infection (page 4-10)." But this report and others distributed to the public do not include analyses of the potential sensitivity to infection and the potential severity of the results of infection for the other diseases that "may be studied" in the proposed facility. In addition, the various reports do not include any assessment of the numbers and distribution of potentially susceptible populations in the surrounding neighborhoods.

   What are the characteristics of the at-risk populations that are most susceptible to the agents that "may be studied" in the proposed facility?

   How many individuals with these characteristics reside, work, and are hospitalized or incarcerated in the surrounding neighborhoods?

3. **Sensitivity of the "worst-case scenario" results to alternative assumptions** – The report describes a series of scenarios but does not assess the sensitivity of the results to alternative assumptions and the reasonableness of the alternative assumptions chosen for study.

   For example:

   The RWDI Report states that although the "worst-case scenario" involved 10 billion spores, the analysis (based on simulations by NIH) "determined that of the 10 Billion anthrax spores only 400,000 spores (0.004%) would become airborne and respirable (RWDI, page 3)".

Letter from DSMundel to NIH – May 18, 2005 Page 5

LETTER 64

David S. Mundel

How reliable are the NIH simulations? What range of results did these simulations produce?

What would be the results and implications of the various event simulations if a larger percent (above the level simulated by NIH) of the spores became airborne and respirable?

The "dispersion modeling was conducted from the top of the building exhaust stack (page 3, RWDI)" assuming that the density of the spore cloud dissipates as the cloud mixes with the air brought into the laboratory space assuming a ventilation rate of 12 air exchanges per hour (see pages 5 and 6, RWDI).

How would a change in the ventilation rate (potentially caused by a simultaneous failure of the building ventilation system) alter the concentration of the spores released (as presented in Figure 3.1) and the results of the various simulations?

The various modeling or simulations were "conducted using a range of weather conditions that may be encountered (page 4, RWDI)".

How would the results differ in other weather conditions that may be encountered – e.g., lower wind speeds and temperature inversions?

What are the probabilities of various types and ranges of weather conditions that are likely to be encountered given the historical weather patterns occurring in Boston?

4. **Interpretation of the results of the various simulations** – The various figures and the summary section of the RWDI report and the descriptions of the RWDI findings in other reports suggest that the simulations provide an estimate of the "maximum number of inhaled spores." Based on this interpretation, RWDI summarized its findings as follows "since the release and inhalation of a partial spore is not feasible, this number may practically be considered zero (RWDI page 10)."

   I believe that this interpretation is incorrect. On the face of it, to assume that given a release of 400,000 spores that no one would inhale any of them seems illogical and unrealistic. By analogy, imagine 400,000 piranhas in a pool of muddy water where the likelihood of a single piranha being at any particular point is less than one. When a child asks you if she can go into the pond to retrieve a small ball, would you say "no, it's not safe" or would you reply "since a partial live piranha is not feasible, the number of piranhas near the ball may practically be considered zero, so it's perfectly okay for you to go into the pond."

   I believe that simulations and models like those used by the RWDI analysts allow one to estimate (under a set of chosen assumptions) the "expected number of spores that an individual would inhale" not the maximum number. Using the "expected number of inhaled spores" estimate and an estimate of the number of individuals breathing while the plume passes by, one could (but the RWDI analysts did not) estimate the likely number of individuals who would inhale 0, 1, 2, 3, 4, or more spores.

   What is the basis for the interpretation of the simulations results that have been presented in the publicly available reports?

   Have alternative interpretations been considered?

LETTER 64

David S. Mundel

LETTER 64

David S. Mundel

-- Attachment B --

David S. Mundel
36 Gray Street
Boston MA 02116

January 2, 2005

Mr. Leonard Taylor, Jr.
Acting Director, Office of Research Facilities
Development and Operations
National Institutes of Health

c/o Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda MD 20892

(sent by e-mail to nihnepa@mail.nih.gov and by FAX to 301.480.8056)

Dear Mr. Taylor,

This letter responds to the request for comments regarding the Draft Environmental Impact Statement (DEIS) for the National Emerging Infectious Diseases Laboratory and National Biocontainment Laboratory proposed to be built by University Associates Limited Partnership at the Boston University Medical Center campus in Boston.

The proposed operation of the laboratory raises many concerns that need to be addressed prior to locating this project within Boston's South End residential neighborhood and close to several other residential communities in the City. In assessing this proposed project and preparing the Final Environmental Impact Statement, I urge you and your colleagues at the NIH (and your colleagues at the Boston University Medical Center) to carefully consider the potential environmental and health effects on the residents of Boston's nearby neighborhoods, the inmates incarcerated in the nearby South Bay correctional facilities, and the vulnerable patients being served at the Boston University Medical Center, itself.

Regrettably, many of these concerns are not addressed adequately in the Draft Environmental Impact Statement. In fact, four additional alternatives were eliminated from detailed study during the preparation of the DEIS (see page A-1) and thus it is impossible to subject the proposed project to a careful, comparative review.

The DEIS clearly mentions the convenience that the proposed location would provide to the researchers who would use the facility:

> "The proposed Boston-NBL would be located in very close proximity to proposed Principal Investigators and is conveniently accessible to all the Principal Investigators of the other RCEs" (page 2-33).

LETTER 64

David S. Mundel

But the potential environmental and health risks to the residents, patients, workers, inmates, and others are reviewed almost dismissively. Although the DEIS states that "as demonstrated in the "worst case" analysis included in Chapter 4, locating the facility in a lower density area would not in any way reduce the risk to the public" (see page 2-33), the 11 page "worst case" analysis (summarized in Chapter 4 and reprinted in full in Appendix 6) does not address the changes in risk associated with locating the proposed facility in a lower density area. In fact, as stated in the DEIS, the potential impacts of locating the proposed laboratory at other possible locations were not subjected to detailed study.

In preparing the Final Environmental Impact Statement, I urge you to fully consider the potential environmental risks associated with the proposed project and to fully address the potential impacts (on both convenience and risk) of alternative locations for the proposed facility.

The following detailed issues should be addressed in the Final Environmental Impact Statement:

- The Final Statement should fully assess all of the potential environmental risks and impacts (to the adjacent residential and other communities) associated with the diseases that may be studied at the proposed facility. Appendix 2 of the Draft Statement lists 57 diseases "which may be studied" at the laboratory but the current environmental risk and hazard analysis only addresses one of these diseases.
- The Final Statement should contain a full and completely revised "worst case analysis", addressing the woefully inadequate and unconvincing analysis contained in the September 1, 2004 Summary Report - Hazard and Risk Assessment included in the DEIS. The current analysis contains no sensitivity analysis indicating how the simulated findings of environmental impact would be different if different assumptions were used in examining the nature of the incident leading to the release. The current analysis contains no assessment regarding whether the range of weather conditions considered is representative of the full range of weather conditions occurring in Boston. The statistical component of the current analysis is naïve and incorrect – the reported data do not portray the 'maximum number of inhaled spores', they portray the expected number of spores that would be inhaled by a single individual. The data included in the current report actually suggest that some individuals may inhale zero spores, some may inhale one spore, and some may inhale more spores.

  In addition, the current 'worst case analysis' includes no assessment of the impact of a potential release on the vulnerable populations living, working, hospitalized, and incarcerated in nearby neighborhoods and facilities. In previous reports, Boston University Medical Center has noted that the "precise dose of Bacillus anthracis (anthrax) spores required to cause human pulmonary anthrax is not known" and that "this number would vary considerably from person to person depending upon age (and) overall medical history" but, these issues of population sensitivity are not addressed anywhere in the so-called 'worst case analysis.'

I thank you, in advance, for your consideration these recommendations and look forward to receiving and reviewing the revised Final Environmental Impact Statement.

Sincerely yours,

David S. Mundel

LETTER 64

David S. Mundel

-- Attachment C --

Comments on the Supplemental Draft Environmental Impact Statement (SDEIS) for the proposed Boston University Medical Center Biocontainment Laboratory

--

Prepared for presentation at the NEPA SDEIS Public Meeting on April 25, 2005

My comments briefly address two questions:

1. Does the Supplemental Draft Environmental Impact Statement (SDEIS) address the issues raised in the public comments received by the National Institutes of Health (NIH) and the Boston University Medical Center (BUMC)?

2. Does the SDEIS demonstrate that "the risk of public harm is so minute it could be described as zero"?

The brief answer to both questions is … NO

Does the draft SDEIS address the public comments and concerns?

The cover letter accompanying the Impact Statement (dated March 25, 2005) states that "the SDEIS addresses concerns …and comments received during the comment period." In addition, the SDEIS states that "small group meetings have been held to ensure that the community is able to obtain inform information about the Project" (see page 1-17).

But the comments that were submitted by the public are not included in the Impact Statement and thus it is impossible to assess whether or not they have been addressed. I have written to representatives of both the NIH and the BU Medical Center asking for copies of the public and questions. To-date, I have not received any response to these requests.

Based on my experience with the comments that I submitted to NIH and the questions that I have raised with BUMC representatives, I believe the SDEIS does not address the public comments and the community has not been provided with needed information. In early December 2004, I met with several BU representatives and shared with them a brief memorandum outlining several concerns and issues regarding the risk assessment that had been included in the Draft Environmental Impact Statement. During this meeting, the BU representatives promised that they would provide me with information and analyses that addressed these concerns and issues. Subsequently (later in December), I received an e-mail from a senior BU representative stating the "we will continue to share information and analyses"

- But, none of the promised information or analyses has been provided to me

In response to my continued requests for the promised information and analyses, another BU representative sent me an e-mail, with the following message -- "Interestingly enough, one issue is that your information requests are extremely insightful (and) responses to them and the information needed to answer them are really of benefit to a much broader audience. This is

Letter from DSMundel to NIH – May 18, 2005 Page 9

precisely why (a later Impact Statement) is the best mechanism to address some of your more technical issues as they are grounded in some very fundamental concerns you and others may have with the draft EIS"

- But, the promised information and analyses have not been included in the SDEIS and the SDEIS does not adequately address the issues and concerns that I raised in December.

Does the SDEIS provides convincing evidence that "the risk of public harm is so minute it could be described as zero"

First, although many of the SDEIS' conclusions reported in the so-called 'worst case risk assessment' are based on simulation models that are described as demonstrating that the "predicted maximum exposure to any member of the community" is small.

> But these models do not estimate the maximum exposure levels, they estimate average concentration levels and average exposure levels. As reported in a technical report referenced in the SDEIS – "User's Manual for SLAB" by Donald Ermak – the simulation "model results are averages" and "even if a model were 100% accurate, individual observations would be expected to vary about the predicted value"

Second, the results of these simulation models depend significantly on many assumptions, for example the authors of the 'worst case risk assessment' base all of their predictions on the assumption that only 400,000 anthrax spores are released into the air, although 10 Billion spores are released in the assumed laboratory accident. This assumption assumes that only 1 out of every 25,000 spores is released into the air.

> But the basis for this assumption is never described, although the source of the assumption is noted in a list of literature found at the back of the SDEIS. The only referenced source for this key assumption is a 'personal communication' with Deborah Wilson, the Director of Occupational Safety and Health at the NIH, the project proponent.

Third, the SDEIS statement of minimal impact also appears to directly contradict other NIH statements.

> In December 2000, the Director of the Division of Intramural Research of the NIH National Institute of Allergy and Infectious Diseases (the agency proposing the BUMC biocontainment laboratory) wrote in describing the advantages of a proposed level-4 laboratory in rural Western Montana – the rural site is "well removed from major population centers (and this) 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." (This memorandum was released to the public by NIH on January 9, 2003 in response to Freedom of Information Case No. 27890)

LETTER 64

David S. Mundel

LETTER 64

David S. Mundel

-- Attachment D –

May 3, 2005 e-mail

From: David Mundel

To: Valerie Nottingham
Kevin Tuohey
Carla Richards

Subject: request for information related to full review of SDEIS

In October 2004, the NIH issued a Draft Environmental Impact Statement (DEIS) for a proposed National Emerging Infectious Diseases Laboratory at the Boston University Medical Center, Boston, Massachusetts.

With this e-mail, I am again requesting copies of all comments received by the NIH from individuals, private for-profit and not-for-profit organizations, labor unions, and government agencies in response to this Draft Environmental Impact Statement.

In December 2004, I met with senior Boston University Medical Center representatives and was promised that I would promptly be provided with analyses and information related to a series of issues and questions that I shared with the University representatives in writing. To-date, I have not received any of the promised information and analyses.

With this e-mail, I am again asking for the promised information and analyses.

In March 2004, the NIH released a Supplemental Draft Environmental Impact Statement (SDEIS). On page 4 of a section entitled "Literature Cited", a reference is made to a communication with Deborah Wilson, the Director of Occupational Safety and Health, NIH, dated September 2, 2004. This communication appears to be the source of a key assumption that was used in the so-called 'worst case hazard analysis' included in the SDEIS.

With this e-mail, I am requesting that you provide me with a full copy of this communication.

Given that the public comment period for the SDEIS is scheduled to end within two weeks, I request that you respond quickly and fully to these three requests and that you extend the public comment period to a date 30 days after you have provided the requested comments, information, analyses, and correspondence.

Thank you, in advance, for your prompt and thorough response to these requests

David S. Mundel
36 Gray Street
Boston MA 02116

Letter from DSMundel to NIH – May 18, 2005 Page 11

LETTER 64

David S. Mundel

Comments on the Supplemental Draft Environmental Impact Statement (SDEIS) for the proposed Boston University Medical Center Biocontainment Laboratory

prepared for presentation at the NEPA SDEIS Public Meeting on April 25, 2005

My comments briefly address two questions:

1. Does the Supplemental Draft Environmental Impact Statement (SDEIS) address the issues raised in the public comments received by the National Institutes of Health (NIH) and the Boston University Medical Center (BUMC)?

2. Does the SDEIS demonstrate that "the risk of public harm is so minute it could be described as zero"?

The brief answer to both questions is … NO

Does the draft SDEIS address the public comments and concerns?

The cover letter accompanying the Impact Statement (dated March 25, 2005) states that "the SDEIS addresses concerns …and comments received during the comment period." In addition, the SDEIS states that "small group meetings have been held to ensure that the community is able to obtain inform information about the Project" (see page 1-17).

But the comments that were submitted by the public are not included in the Impact Statement and thus it is impossible to assess whether or not they have been addressed. I have written to representatives of both the NIH and the BU Medical Center asking for copies of the public and questions. To-date, I have not received any response to these requests.

Based on my experience with the comments that I submitted to NIH and the questions that I have raised with BUMC representatives, I believe the SDEIS does not address the public comments and the community has not been provided with needed information. In early December 2004, I met with several BU representatives and shared with them a brief memorandum outlining several concerns and issues regarding the risk assessment that had been included in the Draft Environmental Impact Statement. During this meeting, the BU representatives promised that they would provide me with information and analyses that addressed these concerns and issues. Subsequently (later in December), I received an e-mail from a senior BU representative stating the "we will continue to share information and analyses"

- But, none of the promised information or analyses has been provided to me

In response to my continued requests for the promised information and analyses, another BU representative sent me an e-mail, with the following message -- "Interestingly enough, one

LETTER 64

David S. Mundel

issue is that your information requests are extremely insightful (and) responses to them and the information needed to answer them are really of benefit to a much broader audience. This is precisely why (a later Impact Statement) is the best mechanism to address some of your more technical issues as they are grounded in some very fundamental concerns you and others may have with the draft EIS"

- But, the promised information and analyses have not been included in the SDEIS and the SDEIS does not adequately address the issues and concerns that I raised in December.

Does the SDEIS provides convincing evidence that "the risk of public harm is so minute it could be described as zero"

First, although many of the SDEIS' conclusions reported in the so-called 'worst case risk assessment' are based on simulation models that are described as demonstrating that the "predicted maximum exposure to any member of the community" is small.

> But these models do not estimate the maximum exposure levels, they estimate average concentration levels and average exposure levels. As reported in a technical report referenced in the SDEIS – "User's Manual for SLAB" by Donald Ermak – the simulation "model results are averages" and "even if a model were 100% accurate, individual observations would be expected to vary about the predicted value"

Second, the results of these simulation models depend significantly on many assumptions, for example the authors of the 'worst case risk assessment' base all of their predictions on the assumption that only 400,000 anthrax spores are released into the air, although 10 Billion spores are released in the assumed laboratory accident. This assumption assumes that only 1 out of every 25,000 spores is released into the air.

> But the basis for this assumption is never described, although the source of the assumption is noted in a list of literature found at the back of the SDEIS. The only referenced source for this key assumption is a 'personal communication' with Deborah Wilson, the Director of Occupational Safety and Health at the NIH, the project proponent.

Third, the SDEIS statement of minimal impact also appears to directly contradict other NIH statements.

> In December 2000, the Director of the Division of Intramural Research of the NIH National Institute of Allergy and Infectious Diseases (the agency proposing the BUMC biocontainment laboratory) wrote in describing the advantages of a proposed level-4 laboratory in rural Western Montana – the rural site is "well removed from major population centers (and this) 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." (This memorandum was released to the public by NIH on January 9, 2003 in response to Freedom of Information Case No. 27890)

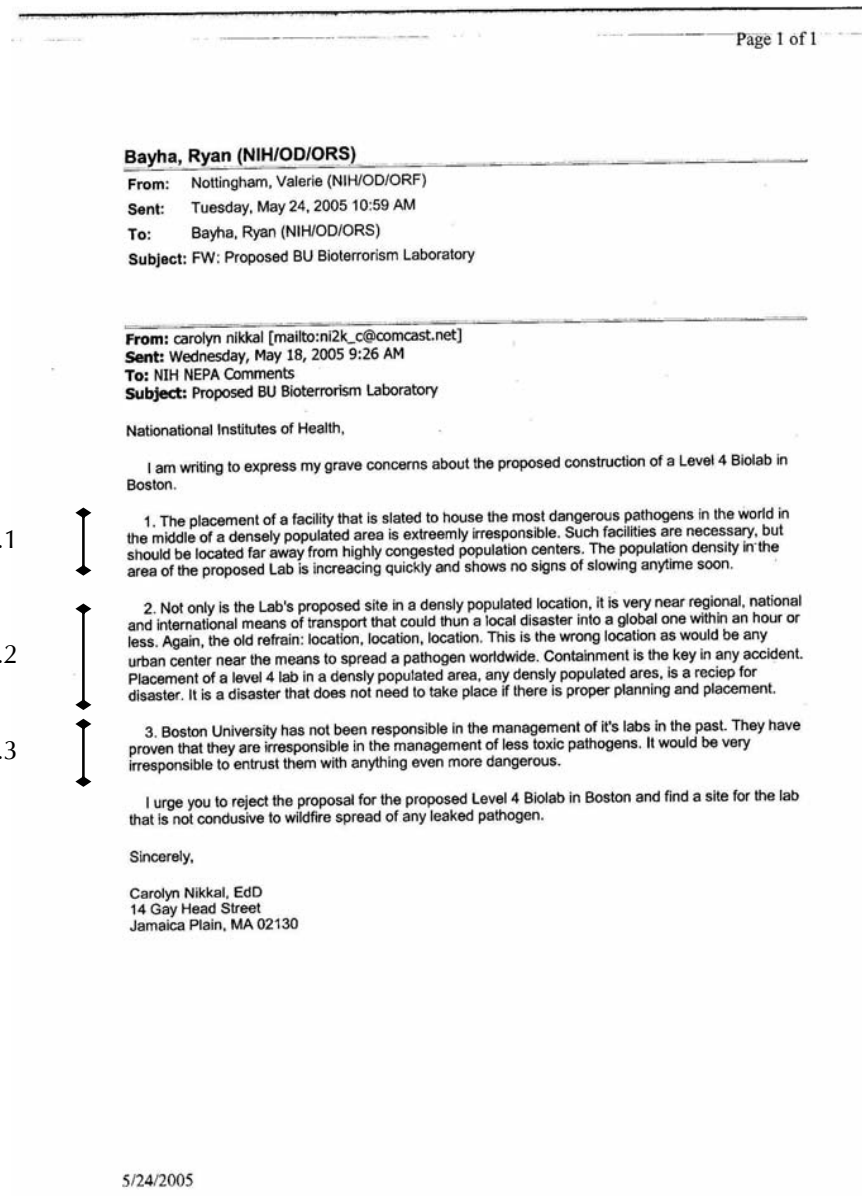
In summary,

- The Draft Environmental Impact Statement (released in October 2004) and the Supplemental Draft Environmental Impact Statement (released in March 2005) do not contain complete, convincing, or accurate assessments of the potential environmental impacts of the proposed level-4 biocontainment laboratory.

- I urge the NIH and the BU Medical Center to address these concerns prior to moving forward with the preparation of a final environmental review

LETTER 64

David S. Mundel



Page 1 of 1

Bayha, Ryan (NIH/OD/ORS)

From: Nottingham, Valerie (NIH/OD/ORF)
Sent: Tuesday, May 24, 2005 10:59 AM
To: Bayha, Ryan (NIH/OD/ORS)
Subject: FW: Proposed BU Bioterrorism Laboratory

From: carolyn nikkal [mailto:ni2k_c@comcast.net]
Sent: Wednesday, May 18, 2005 9:26 AM
To: NIH NEPA Comments
Subject: Proposed BU Bioterrorism Laboratory

Nationalinstitutes of Health,

I am writing to express my grave concerns about the proposed construction of a Level 4 Biolab in Boston.

65.1 1. The placement of a facility that is slated to house the most dangerous pathogens in the world in the middle of a densely populated area is extreemly irresponsible. Such facilities are necessary, but should be located far away from highly congested population centers. The population density in the area of the proposed Lab is increacing quickly and shows no signs of slowing anytime soon.

65.2 2. Not only is the Lab's proposed site in a densly populated location, it is very near regional, national and international means of transport that could thun a local disaster into a global one within an hour or less. Again, the old refrain: location, location, location. This is the wrong location as would be any urban center near the means to spread a pathogen worldwide. Containment is the key in any accident. Placement of a level 4 lab in a densly populated area, any densly populated ares, is a reciep for disaster. It is a disaster that does not need to take place if there is proper planning and placement.

65.3 3. Boston University has not been responsible in the management of it's labs in the past. They have proven that they are irresponsible in the management of less toxic pathogens. It would be very irresponsible to entrust them with anything even more dangerous.

I urge you to reject the proposal for the proposed Level 4 Biolab in Boston and find a site for the lab that is not condusive to wildfire spread of any leaked pathogen.

Sincerely,

Carolyn Nikkal, EdD
14 Gay Head Street
Jamaica Plain, MA 02130

5/24/2005

LETTER 65

Carolyn Nikkal, EdD

65.1 See Response to Comment 19.2.

65.2 See Response to Comment 19.1.

65.3 BUMC has a strong and well managed laboratory safety program. There are over two dozen environmental health and safety professionals including environmental engineers, industrial hygienists, health physicists and biosafety professionals providing training, inspection and overall safety services. As is typical of any large complicated campus, BUMC has received regulatory notices, orders and violations. Nonetheless, BUMC has an excellent safety record, receives strong support from senior management, and enjoys a solid reputation with government regulators.

Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

66.1

66.2

66.3

It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

66.4

It is now time to Just Say No.

Sincerely,

Pat O'Brien
24 Chestnut St
Cambridge MA 02139

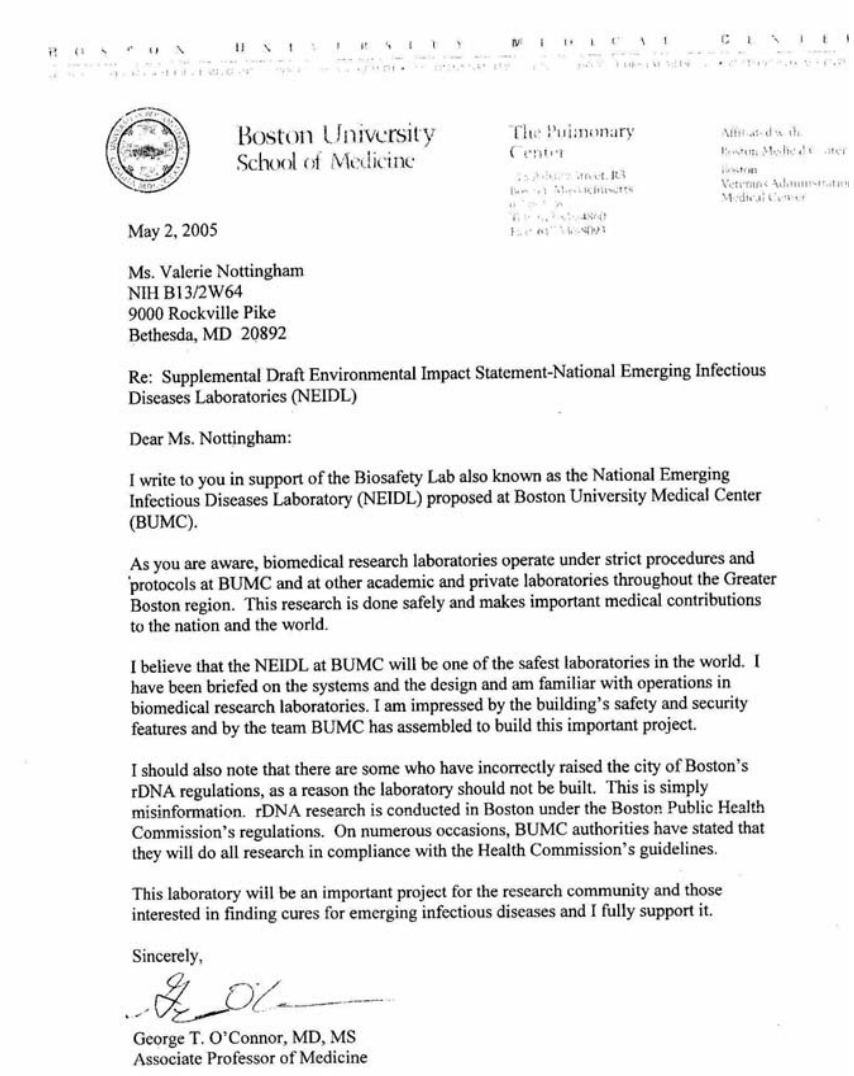
LETTER 66
Pat O'Brien

66.1 See Response to Comment 1.1.

66.2 See Response to Comment 1.2.

66.3 See Response to Comment 1.3.

66.4 See Response to Comment 1.4.



BOSTON UNIVERSITY MEDICAL CENTER

Boston University
School of Medicine

The Pulmonary Center

Affiliated with Boston Medical Center, Boston Veterans Administration Medical Center

May 2, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab also known as the National Emerging Infectious Diseases Laboratory (NEIDL) proposed at Boston University Medical Center (BUMC).

As you are aware, biomedical research laboratories operate under strict procedures and protocols at BUMC and at other academic and private laboratories throughout the Greater Boston region. This research is done safely and makes important medical contributions to the nation and the world.

I believe that the NEIDL at BUMC will be one of the safest laboratories in the world. I have been briefed on the systems and the design and am familiar with operations in biomedical research laboratories. I am impressed by the building's safety and security features and by the team BUMC has assembled to build this important project.

I should also note that there are some who have incorrectly raised the city of Boston's rDNA regulations, as a reason the laboratory should not be built. This is simply misinformation. rDNA research is conducted in Boston under the Boston Public Health Commission's regulations. On numerous occasions, BUMC authorities have stated that they will do all research in compliance with the Health Commission's guidelines.

This laboratory will be an important project for the research community and those interested in finding cures for emerging infectious diseases and I fully support it.

Sincerely,

George T. O'Connor, MD, MS
Associate Professor of Medicine

LETTER 67

George T. O'Connor, MD, MS

LETTER 68

Kenneth Olken

Nottingham, Valerie (NIH/OD/ORF)

From: NEKLO@aol.com
Sent: Thursday, May 12, 2005 12:54 PM
To: NIH NEPA Comments
Cc: Carla.Richards@bmc.org
Subject: Re: Supplemental Draft Environmental Impact Statement-National Emerging Infecti

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab at BUMC.

When I first heard about the laboratory, I must admit I was a bit apprehensive. However, the staff at Boston Universi Medical Center took the time to address my concerns and answer all my questions about the project.

I feel that this lab is important to find cures for infectious diseases. We need to have the appropriate facilities to do tl important research. I believe that this lab will be built safely and that the redundant systems and the security plans w ensure that we are all safe.

Also, the development of this laboratory will create 1,300 construction jobs and 660 permanent jobs—jobs at all level This lab will have a positive economic impact at all levels in our community.

Sincerely,
Kenneth Olken, South End Resident

5/12/2005

Nottingham, Valerie (NIH/OD/ORF)

From: m pellet [mpellet@hotmail.com]
Sent: Sunday, May 15, 2005 10:04 PM
To: NIH NEPA Comments
Subject: comment on proposed BSL4 at Boston University

Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement for the National Emerging Infectious Diseases Laboratory, Boston, MA

Dear Dr. Nottingham:

I am writing these comments to Boston University Medical Center's (BUMC) Supplemental Draft Environmental Impact Statement (SDEIS). I write these comments with the experience of 20 years working in biomedical research labs. My degrees are in biochemistry, microbiology and biology.

69.1 1) The infection in 2004 of three BU researchers with tularemia revealed a total collapse of biosecurity in a BUMC lab. This incident is very informative of what could happen with BUMC's proposed BSL4. Their system failed on many levels. One of the most disturbing failures was that researchers did not realize that they were working with an infectious strain of the bacterium when they thought they were working with an avirulent strain. This is especially troubling since these are exactly the type of experiments that BU is planning on carrying out in their proposed BSL4 laboratory, but with much deadlier and more contagious bioterrorism agents. In a letter to the Boston Public Health Commission in July 2004, Dr. Mark Klempner states that BU will be moving select agents from BSL4 labs to BSL3 at their discretion, when they believe that they have attenuated such organisms. This tularemia outbreak has shown that BU is not capable to make this judgement.
BU claims that they will follow all federal, state and local laws when working with select agents. However, B.U. failed to comply with state regulations that required them to report any suspicion of any infection with specified bioterrorism agents. B.U. intentionally broke the law because they did not want to risk approval of their new lab. B.U. estimates that this lab will bring them $3 billion over the next 20 years. B.U. has shown that they are more interested in their financial interests than they are in public safety.
BU has had 8 months to determine the source of the contaminating bacteria that led to the infection of its workers. Using modern DNA analysis, BU should have easily determined the source of the contamination in that amount of time. Either improper procedures have left them unable to trace their contamination, or the results of their analysis is too embarrassing for BU to reveal. BU's responsibility extends to determining how this accident has happened, to ensure that it is not repeated.

69.2 2) BUMC states that they will abide by all existing local regulations on recombinant DNA research. Boston has an existing regulation the bans the use of RDNA. In the aforementioned letter to the BPHC from Dr. Mark Klempner, he admits that this regulation is in place but that this does not apply to their self-described "legitimate" research. This comment, as well as the fact that BUMC's SDEIS does not even mention that this ban is in place in Boston, leads one to conclude that BU holds this city regulation in total disregard.

69.3 3) BUMC claims that if this lab is sited away from the center of Boston, there will be no interest or use from the scientific community. However, experience shows otherwise. Los Alamos drew the greatest physicists in the country to the middle of the desert. Cyclotrons also draw scientists from many far-flung areas. We are currently building a lab in orbit over earth and no one is complaining of the commute.

69.4 4) Their assessment of a worst-case release is extremely superficial at best. RWDI West Partners have chosen anthrax as their released organism. Study of the anthrax release in Sverdlovsk showed that

5/16/2005

LETTER 69

Marc Pelletier

69.1 As soon as confirmed cases of tularemia were identified, BUMC officials notified all appropriate authorities as required including the Boston Public Health Commission (BPHC), the Mass. Department of Public Health and the CDC. The BPHC's report on these exposures recommended that stronger procedures be put in place to monitor lab personnel and report suspected cases. BUMC concurred with these recommendations in its public Statement of Responsibility. BUMC has already implemented procedures including a mandatory notice to the Occupational Medicine Department after missing one day with any sickness and a medical alert card carried by all tularemia lab workers. BUMC has begun to implement the following procedures: increased safety training and procedures for lab workers; strengthened laboratory safety procedures; unannounced safety inspections of BUMC laboratories; applying additional tests and safeguards to infectious material sent to BUMC for research purposes; outside, expert review of BUMC research controls and procedures; and, working with the Boston Public Health Commission to improve the notification process.

69.2 See Response to Comment 4.33.

69.3 The purpose of siting the laboratory at the proposed location in the Bio Square Research Park is to allow for dynamic collaborations among investigators at multiple research entities such as Boston University School of Medicine, Harvard Medical School, Massachusetts Institute of Technology, Massachusetts General Hospital, Brigham and Women's Hospital, University of Massachusetts Medical Center, the Massachusetts Biological Laboratories, Tufts University, New England Medical Center, Brandeis University, and others. Section 2.3.2 describes the alternatives considered but eliminated from detailed study.

69.4

localized wind patterns can lead to concentrations of anthrax spores in discreet spots within the neighborhood. This fact has been neglected in their assessment. The danger posed to community depends not only on the nature of the released organism, but also on the health and available healthcare of the resident population. It is known that the population around the proposed site suffers abnormally high incidences of asthma and other respiratory diseases. The population is also under-insured and may not have access to medical care. These factors have once again been ignored in this SDEIS.
The SDEIS does not take into account the much greater danger posed by a true contagion. Accidental or intentional release of an organism that is spread from person to person poses a very different set of very serious health risks. This must also be included in a true assessment of a worst-case release. The tularemia infections in 2004 went undetected by BUMC for over 6 months, allowing researchers to traffic through the densely populated Boston neighborhoods while infected, highlighting what BU had previously said was "impossible".

69.5

5) B.U. claims that they have held many sought public input in the wide array of public meetings that they have held. I attended one of their highly-touted breakfast meetings. To attend this "public meeting", I had to take time away from work, since it was scheduled from 8-9am on a Tuesday. Once there, I had to pass two locked doors and two uniformed guards who asked for ID and whether I had been "invited" to this "public" meeting. Once in the meeting, I found that we were squeezed into a tiny room that was already half-filled with BU employees. My experience is that BU has been invited to take part in many public discussions on this issue and has never accepted an invitation to an event that I have attended. This includes events on the radio, on television and in public meetings. BU is only interested in meetings that they can control. BU is more interested in spreading propaganda about their project than they are in an honest discussion.

69.6

6) In Jan. 2005, BU has hosted their first job/training fair for the community. Since BUMC has been in this community for decades without making this kind of outreach, one has to question the sincerity of this sudden effort.

In this SDEIS, BUMC has not sufficiently answered questions of safety and impact that their proposed lab would have on the community. The potential dangers from the bioterrorism laboratory are too real and too serious to allow the laboratory to complete the approval process on the basis of the seriously flawed and inadequate DEIS. Thank you very much for the opportunity to comment.

Sincerely,
Marc Pelletier
8 Glade Ave. #2
Boston, MA 02130

5/16/2005

LETTER 69

Marc Pelletier

69.4 As explained in Appendix 9 "Risk Assessment Report March 23, 2005 – Appendix A", for the wind tunnel assessment of the Boston-NBL, a model was built to a scale of 1:200. The model consisted of the Boston-NBL and any surroundings within 800 feet radius. This included many Boston University Medical Campus (BUMC) buildings (existing and future), and the surrounding commercial and residential areas. Because of the height of the penitentiary south of the Boston-NBL, an extension was also added to include this in the model. Receptor locations in the wind tunnel were connected to tracer gas meters and are tested for multiple wind speeds and wind directions for each source in order to capture the worst-case impact. See Response to Comment 90.2.

69.5 BUMC has utilized several mechanisms, outside the NEPA process, to respond to requests for information and address community concerns. In addition to attendance and participation at more than 150 community meetings to provide an overview of the project, address specific issues and answer questions on the Boston-NBL, BUMC has set up information repositories that include key documents and materials at four local public libraries in neighborhoods near the project; some documents have been translated into Spanish to facilitate access for non-English and bilingual speakers. In addition, members of BUMC's Biosafety Laboratory Advisory Group comprised of community members from various Boston neighborhoods serve as focal points for community information exchange on the Boston-NBL.

69.6 Historically, Boston Medical Center and Boston University's Medical and Charles River campuses have participated in job and training and other outreach activities to showcase programs and best practices. In the past, each institution has done so separately and distinctly. BUMC's 1st Annual Boston University Campus Wide Fair held in January 2005 was an effort to coordinate resources in order to provide residents of the Greater Boston area with maximum access and exposure to the employment and educational opportunities available across the Boston University campus.

Bayha, Ryan (NIH/OD/ORS)

From: Nottingham, Valerie (NIH/OD/ORF)
Sent: Tuesday, May 24, 2005 10:58 AM
To: Bayha, Ryan (NIH/OD/ORS)
Subject: FW: Boston University Bioterrorism Lab

-----Original Message-----
From: Bill Perkins [mailto:wsperkins@igc.org]
Sent: Tuesday, May 17, 2005 10:35 PM
To: NIH NEPA Comments
Subject: Boston University Bioterrorism Lab

To Whom It May Concern;

I would like to record my opposition to the Boston University Bioterrorism Laboratory planned for construction in our city. If it is needed at all, and I would contend that it is not, then the last place you want it is in an urban center, certainly not in the largest urban center in New England.

Given Boston University's sordid record handling even modestly infectious pathogens, this lab should not be built against the wishes of the people who will be forced to live in its shadows.

Respectfully,

Bill Perkins
3 Chestnut Terrace
Jamaica Plain, MA 02130

1

LETTER 70

Bill Perkins

LETTER 71

Kevin C. Peterson

LETTER OF SUPPORT

May 10, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

I write to you with enthusiastic support of the Biosafety Lab at BUMC.

Boston University has always showed itself to be a good neighbor and has consistently shown a willingness to add value to the city of Boston.

When I first heard about the laboratory, I must admit I was a bit apprehensive. However, the staff at Boston University Medical Center took the time to address my concerns and answer all my questions about the project. Those concerns were quickly resolved with the information and clarity provided on this issue.

I feel that this lab is important to find cures for infectious diseases. We need to have the appropriate facilities to do this important research. I believe that this lab will be built safely and that the redundant systems and the security plans will ensure that we are all safe.

Also, I am especially supportive because the project will bring about economic opportunities. As I understand it, the development of this laboratory will create 1,300 construction jobs and 660 permanent jobs—jobs at all levels. Given this, the lab will have a positive economic impact at all levels in our community.

Sincerely,
Kevin C. Peterson
Community Resident and Activist
City of Boston

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

Our community needs projects like the proposed biosafety laboratory.

The biosafety lab will create jobs. Boston University Medical Center (BUMC) has said that 1300 construction jobs and 660 permanent jobs will be created. Our community needs these jobs.

In addition, BUMC has committed $1 million to training Boston residents to be lab technicians. The training will be part of the City Lab program. After nine months, the graduates are able to find meaningful jobs at a laboratory at the medical center or in a similar laboratory in the City. This will be a great partnership and illustrates BUMC's strong commitment to our community.

I support the Biosafety Lab.

Ana Peria

LETTER 72

Ana Peria

LETTER 73

Eujenie Pires

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

Our community needs projects like the proposed biosafety laboratory.

The biosafety lab will create jobs. Boston University Medical Center (BUMC) has said that 1300 construction jobs and 660 permanent jobs will be created. Our community needs these jobs.

In addition, BUMC has committed $1 million to training Boston residents to be lab technicians. The training will be part of the City Lab program. After nine months, the graduates are able to find meaningful jobs at a laboratory at the medical center or in a similar laboratory in the City. This will be a great partnership and illustrates BUMC's strong commitment to our community.

I support the Biosafety Lab.

Eujenie Pires

LETTER 74

Maria Pires

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab at BUMC.

When I first heard about the laboratory, I must admit I was a bit apprehensive. However, the staff at Boston University Medical Center took the time to address my concerns and answer all my questions about the project.

I feel that this lab is important to find cures for infectious diseases. We need to have the appropriate facilities to do this important research. I believe that this lab will be built safely and that the redundant systems and the security plans will ensure that we are all safe.

Also, the development of this laboratory will create 1,300 construction jobs and 660 permanent jobs—jobs at all levels. This lab will have a positive economic impact at all levels in our community.

Sincerely,

Maria Pires

Carolyn Poinelli
316 Prince St #12
Boston MA 02113
May 18, 2005

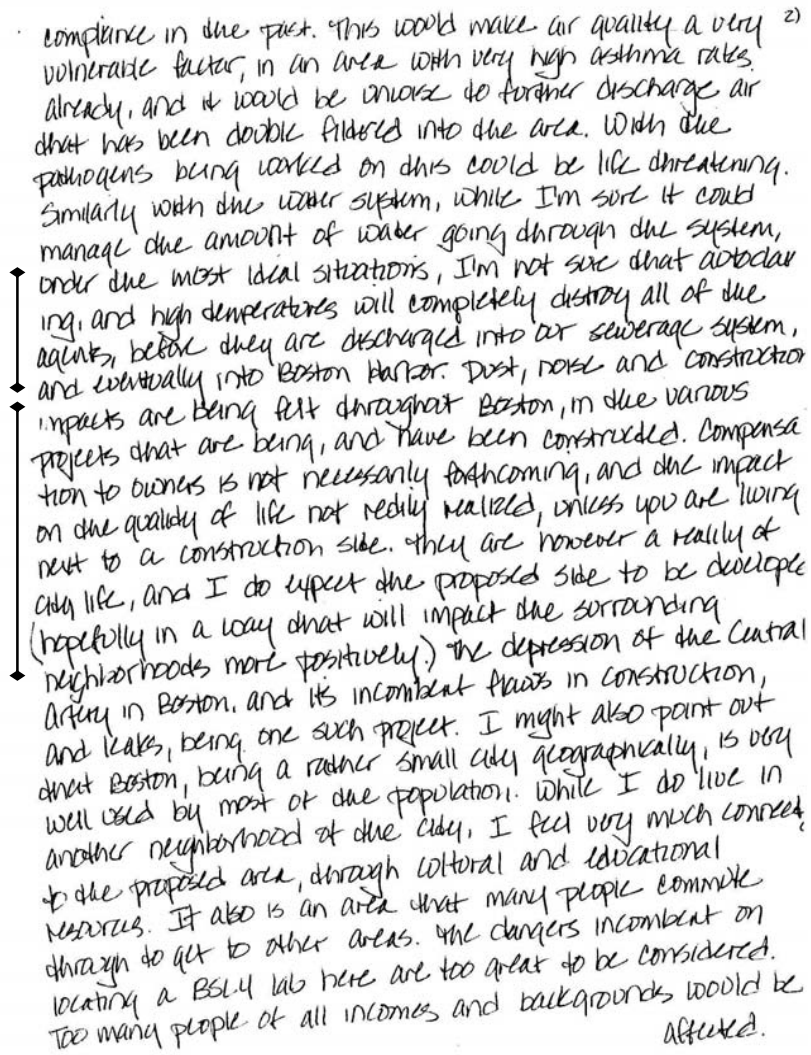
Ms. Valerie Nottingham
NIH B13/2W04
9000 Rockville Pike
Bethesda, MD. 20892

Dear Ms Nottingham,

Having reviewed the Supplemental Draft Environmental Impact statement, for the National Emerging Infectious Diseases Laboratories for the Biosquare II site in the South End of Boston, I am even more convinced that a BSL4 Lab not be located in Boston, Ma., or indeed at any of the other proposed sites owned by Boston University.

In reviewing the composition of the neighborhood, (ie. the diversity of people living in close proximity to the project, the income and quantity of people currently being serviced by the Medical Center), I do not think it advisable to locate a facility dedicated to the research, and development of vaccines, for such incredibly dangerous viruses and pathogens, this close to such a vulnerable population. The area has many children, and elderly, and low income individuals, who would especially be vulnerable and affected by even minute adverse changes to their environment. While the study is designed to show how air, water, noise, and waste treatment facilities are all in compliance with standards, I feel as if laboratories of this nature present, not only a danger in themselves, but a potential overload to facilities. Air quality standards seem to be stable for the last 3 years, but in saying that, it implies that they had not been in

LETTER 75
Carolyn Poiselli



compliance in the past. This would make air quality a very 2)
vulnerable factor, in an area with very high asthma rates
already, and it would be unwise to further discharge air
that has been double filtered into the area. With the
pathogens being worked on this could be life threatening.
Similarly with the water system, while I'm sure it could
manage the amount of water going through the system,
under the most ideal situations, I'm not sure that autoclav
ing, and high temperatures will completely destroy all of the
agents, before they are discharged into our sewerage system,
and eventually into Boston Harbor. Dust, noise and construction
impacts are being felt throughout Boston, in the various
projects that are being, and have been constructed. Compensa
tion to owners is not necessarily forthcoming, and the impact
on the quality of life not really realized, unless you are living
next to a construction site. They are however a reality of
city life, and I do expect the proposed site to be developed
(hopefully in a way that will impact the surrounding
neighborhoods more positively.) The depression of the Central
Artery in Boston, and its incumbent flaws in construction,
and leaks, being one such project. I might also point out
that Boston, being a rather small city geographically, is very
well used by most of the population. While I do live in
another neighborhood of the city, I feel very much connected
to the proposed area, through cultural and educational
resources. It also is an area that many people commute
through to get to other areas. The dangers incumbent on
locating a BSL4 lab here are too great to be considered.
Too many people of all incomes and backgrounds would be
affected.

75.1

75.2

LETTER 75

Carolyn Poiselli

75.1 The use of autoclaves to treat pathological wastes is regulated by the state Department of Public Health. Pursuant to 105 CMR 480.500, the DPH has approved the use of certain autoclave models for such purposes. The Project would utilize autoclave devices approved by the Department.

75.2 As noted in Sections 4.6 and 4.7, the project would create temporary construction related air and noise impacts. To offset temporary air quality impacts, the project has committed to participating in the state Department of Environmental Protection's (DEP) diesel retrofit program for construction vehicles. Mitigation measures would be employed as necessary to minimize potential impacts of noise operations. Construction activities at the project site would comply with state DEP regulations that forbid unnecessary emissions of sound due to neglect or through failure to provide the necessary equipment or maintenance. Construction activities would also comply with the City of Boston's Noise Regulation which sets quantitative limits on noise from construction devices, applicable at the lot line of the construction site, but not closer than 50 feet from the nearest active construction device.

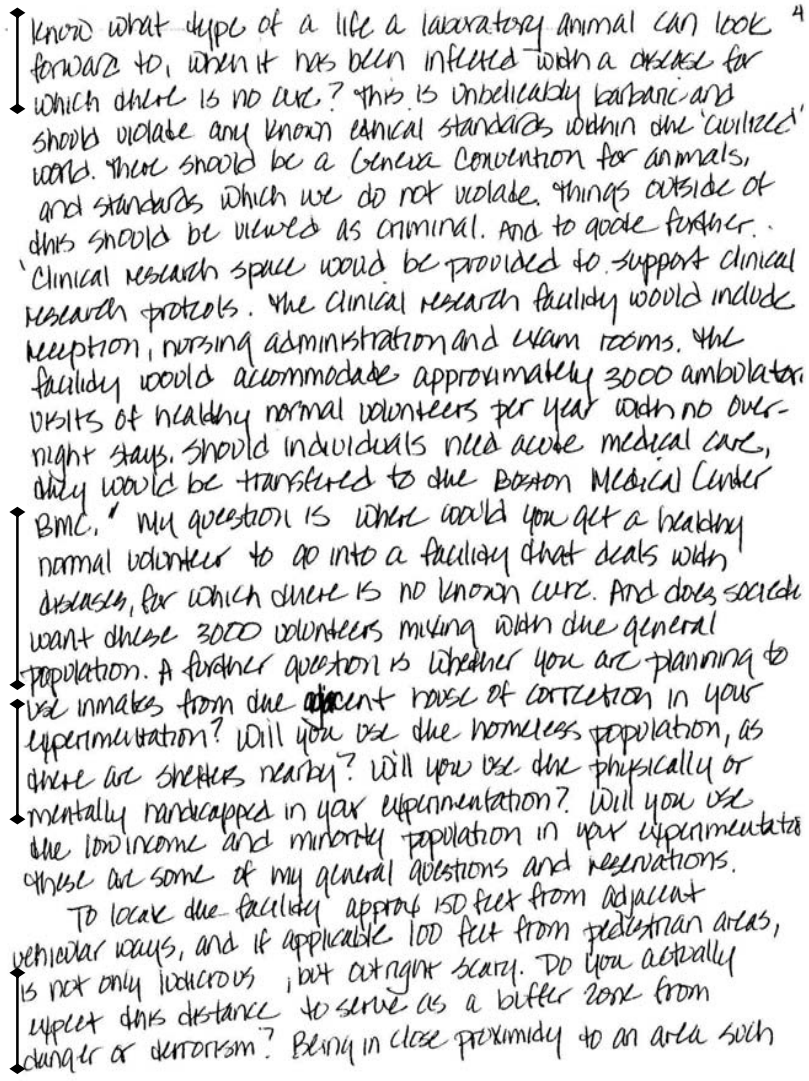
75.3

And the types of agents being worked on in a BSL4 lab, are not found or native to the area. They would have to be imported. The viral hemoragic fevers, Ebola, Congo-Crimean hemorrhagic fever, Marburg, Lassa fever etc. are totally unknown to us. Indeed in reviewing the list, there are viruses from Central America, Africa, Central Asia including India and Asia itself. Babies, the born encephalitcks, herpes, strep, staph the STD's and tuberculosis are found locally. But even diseases like Hantaviros are not found locally. And I don't think we should be importing them. We don't want, what happened to our orginal native population to happen to us. Even with all of your protections and safety measures if you look at major disasters worldwide, they were never designed to happen. Disasters in the nuclear industry, disasters in the Chemical Industry and I feel as if it is just a matter of time with the Biological Sciences. This facility would operate 7 days a week 24 hours a day. There is no rest built into the system In the Judeo Christian tradition even God had a day of rest, and called for one. I feel as if this is not only creating a highly unnatural environment, but that it goes against nature itself. To quote, 'Biosafety level 4 is required for work with dangerous and exotic agents that pose a high individual risk of laboratory infections and life threatening diseases and for which there is no vaccine and no cure." = hadn't realized before I read the book, that animals including mice, possibly hamsters, guinea pigs, non human primates, wild rodents or other animals such as lambs are used, to test the vaccines. In spite of all the reassurances of the cleanliness and humane treatment do the animals being tested, I would like to

LETTER 75

Carolyn Poiselli

75.3 While diseases such as Crimean-Congo Hemorrhagic fever and Marburg Hemmorrhagic fever have not been seen in the United States, other diseases such as Lassa fever and Ebola have been reported in the United States. Hantavirus has been especially prevalent in areas in the desert southwest. International travel and intentional release can make these tropical diseases local very quickly, which is why it is vital to study these agents in the effort to develop vaccines, diagnostics, and therapeutics to protect the public health from emerging infectious diseases and acts of bioterrorism.



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75.4 know what type of a life a laboratory animal can look forward to, when it has been infected with a disease for which there is no cure? This is unbelievably barbaric and should violate any known ethical standards within the 'civilized' world. There should be a Geneva Convention for animals, and standards which we do not violate. Things outside of this should be viewed as criminal. And to quote further: 'Clinical research space would be provided to support clinical research protocols. The clinical research facility would include reception, nursing administration and exam rooms. The facility would accommodate approximately 3000 ambulatory visits of healthy normal volunteers per year with no overnight stays. Should individuals need acute medical care, they would be transferred to the Boston Medical Center BMC.' My question is where would you get a healthy normal volunteer to go into a facility that deals with diseases, for which there is no known cure. And does society want these 3000 volunteers mixing with the general

75.5 population. A further question is whether you are planning to use inmates from the adjacent house of correction in your experimentation? Will you use the homeless population, as there are shelters nearby?

75.6 Will you use the physically or mentally handicapped in your experimentation? Will you use the low income and minority population in your experimentation? These are some of my general questions and reservations.

To locate the facility approx 150 feet from adjacent vehicular ways, and if applicable 100 feet from pedestrian areas, is not only ludicrous, but outright scary. Do you actually expect this distance to serve as a buffer zone from

75.7 danger of terrorism? Being in close proximity to an area such

LETTER 75

Carolyn Poiselli

75.4 Animal research is an essential element of defining the pathogenesis of infectious diseases and such knowledge is essential for finding diagnostic tests, treatments, therapies, and vaccines for these infectious diseases. All animals are treated according to the rules set forth by the Institutional Animal Care and Use Committee, the USDA Animal Welfare Act regulations, 9 CFR Subchapter A, and the Guide for the Care and Use of Laboratory Animals (National Research Council 1996).

75.5 There is a detailed mechanism for the recruitment of subjects, both normal volunteers and individuals with particular conditions, that complies with regulations of the Human Investigation Review Committee. This institutional committee functions under the authority of the Office for Human Research Protections at the DHHS. All protocols which involve human subjects are reviewed prior to approval. Part of the materials that are reviewed includes how subjects would be recruited. All flyers and advertisements would be approved by the Institutional Review Board before posting. In virtually all cases adult individuals are required to give informed consent prior to enrollment in an approved study. The risks and benefits of all protocols are thoroughly explained to each potential participant prior to their informed consent. BUMC does not intend to solicit any individuals who are unable to provide informed consent. Federal Regulations (45 CFR 46 Subpart C) require that an IRB must be constituted with at least one member who participates in reviews who is a prisoner or prisoner representative in order for the IRB to review research involving prisoners as subjects. The BUMC IRB does not currently review research involving prisoners as subjects. Homeless people that would like to volunteer for a study would need to give informed consent in order to participate in any study at the NEIDL; this is true of any volunteer regardless of their housing situation.

75.6 See Response to Comment 75.5.

LETTER 75

Carolyn Poiselli

75.7 BUMC has addressed risks identified by NIH and BUMC staff as well as the community. These risks, including a complete mechanical failure and subsequent release, an attack on the facility, the removal of agents from the building, employee injuries and transportation related risks have been addressed at a variety of meetings and are included in public documents. The risk to the public has been found to be negligible. See Section 4.2.2.1 "Community Safety and Risk", and also Appendices 11 and 12.

as a highway could also serve as an agent for transportation of disease, and infection to an outlining population. Being in 3.
close proximity to other Universities could serve to reduce the replication of services, but it could also threaten the most educated, leadership of our society. Some of the most educated critic of the BSL4 project come from our local universities. David Ozonoff from Boston University, who deplores the cuts to Public Health, while we fund laboratories such as this one which would research disease, that not only do not affect our population, but also proportionally do not affect the majority of the worlds population. Jonathan King from MIT who regularly gives compeling arguement against the construction of such a laboratory, himself a microbiologist. Sheldon Krimsky from TUFTS who has also spoken out. And many others. A list of signers to the "No Place to Hide letter." If they coming from a place of education and knowing have such a connected opposition to this project, how do you think the general population feels toward this project, which will make guinea pigs of us all in subjecting us and our environment to your incurable diseases. Yes our elected officials are salivating over the money they stand to make on this project and the taxes that accure. But I'm sure this site will be developed, and with a Medical consideration, whether it be for less lethal testing or for additional clinical services to be used by the neighborhoods and outlining areas. Even more jobs could be generated, and people would definately feel safer were such a project initiated. Indeed the community has felt that Boston University has ignored community concerns and requests for information inspite of all

75.8

LETTER 75

Carolyn Poiselli

75.8 See Response to Comment 69.5.

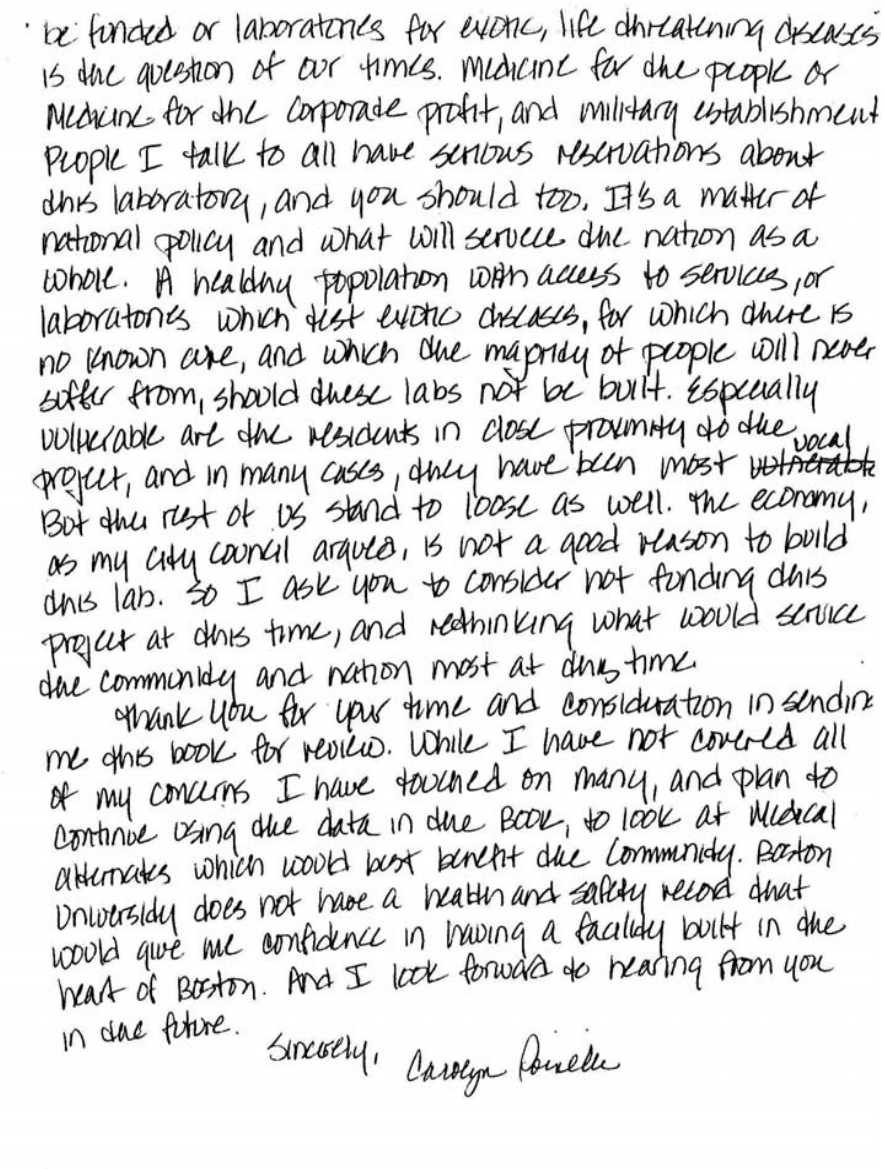
the meetings they have called. Professionals on both sides have never been called together, to debate eachother. This and the feeling that the project, has lacked transparency with no change to this policy. Just alot of offical rhetoric.

I haven't addressed the threat of terrorism, which I feel could be significant. Haven't addressed the lack of compensation to the neighborhood, which I feel is insignificant. Haven't addressed the waste of money, and resources which I feel as if this project ignores, at the expense of public health. Haven't addressed the lack of good jobs for the neighborhood which this project will not address. Haven't addressed the publics right to know and lack of oversight over the laboratories activities.

I will say that this laboratory does not belong in a residential neighborhood, where so many people are left vulnerable. No other BSL4 lab is located within a population center, and it is unfair to place one here. The city of Boston has not come up with an evacuation plan for the city should a worse case scenario be created. Further I attended a city of Boston city council meeting, entitled the, 82 violations of Boston University since 2000. 82 violations from a variety of laboratories run by Boston University, is alot of violations in 4 or 5 years. Examples such as dumping mercury into our sewerage system are not minor offenses to be dealt with by a fine. In a situation such as a BSL4 lab, such oversight could be catastrophic for the neighborhood and the city. It is for these reasons that I request that Boston Universities request for this facility be denyed. It is being pushed by the developers, not the people. We don't want it. Whether Public Health should

LETTER 75

Carolyn Poiselli



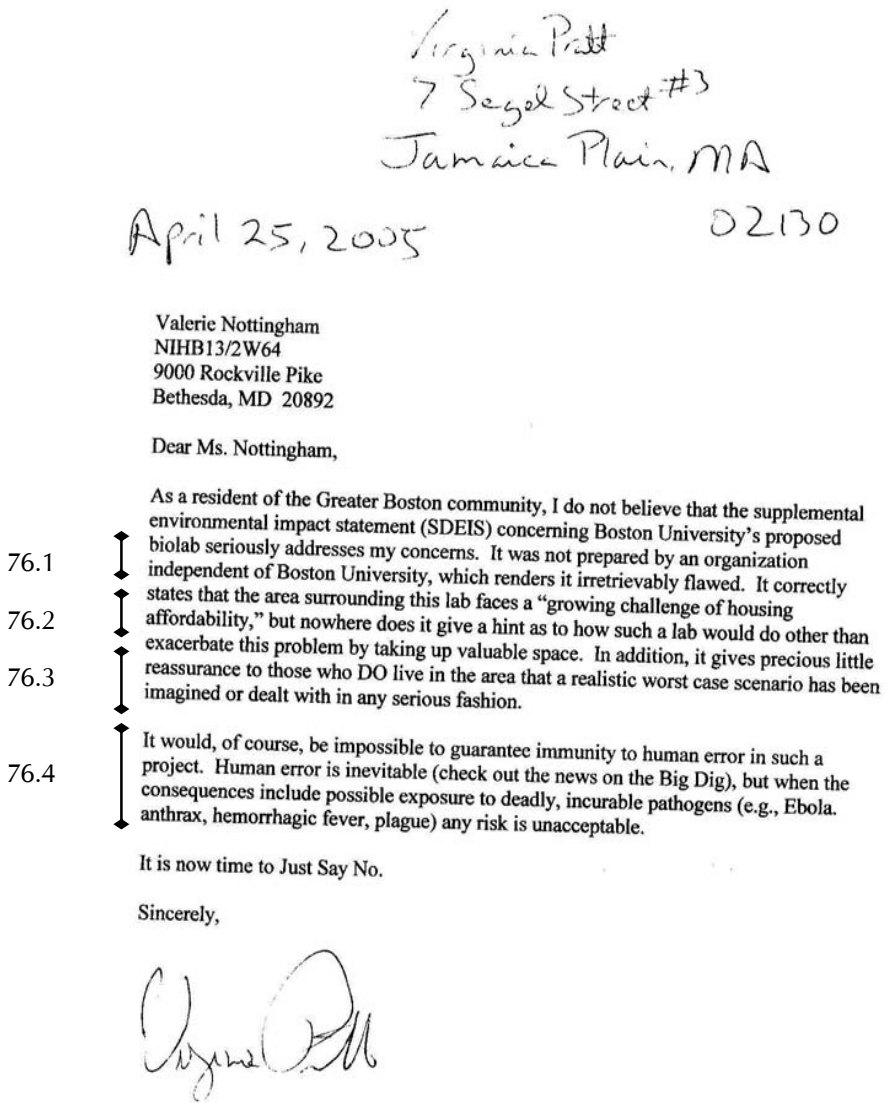
be funded or laboratories for exotic, life threatening diseases is the question of our times. Medicine for the people or Medicine for the corporate profit, and military establishment People I talk to all have serious reservations about this laboratory, and you should too. It's a matter of national policy and what will service the nation as a whole. A healthy population with access to services, or laboratories which test exotic diseases, for which there is no known cure, and which the majority of people will never suffer from, should these labs not be built. Especially vulnerable are the residents in close proximity to the local project, and in many cases, they have been most ~~vulnerable~~ But the rest of us stand to loose as well. The economy, as my city council argues, is not a good reason to build this lab. So I ask you to consider not funding this project at this time, and rethinking what would service the community and nation most at this time.

Thank you for your time and consideration in sending me this book for review. While I have not covered all of my concerns I have touched on many, and plan to continue using the data in the Book, to look at Medical alternates which would best benefit the Community. Boston University does not have a health and safety record that would give me confidence in having a facility built in the heart of Boston. And I look forward to hearing from you in the future.

Sincerely, Carolyn Poiselli

LETTER 75

Carolyn Poiselli



Virginia Pratt
7 Segal Street #3
Jamaica Plain, MA 02130

April 25, 2005

Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

It is now time to Just Say No.

Sincerely,

76.1
76.2
76.3
76.4

LETTER 76

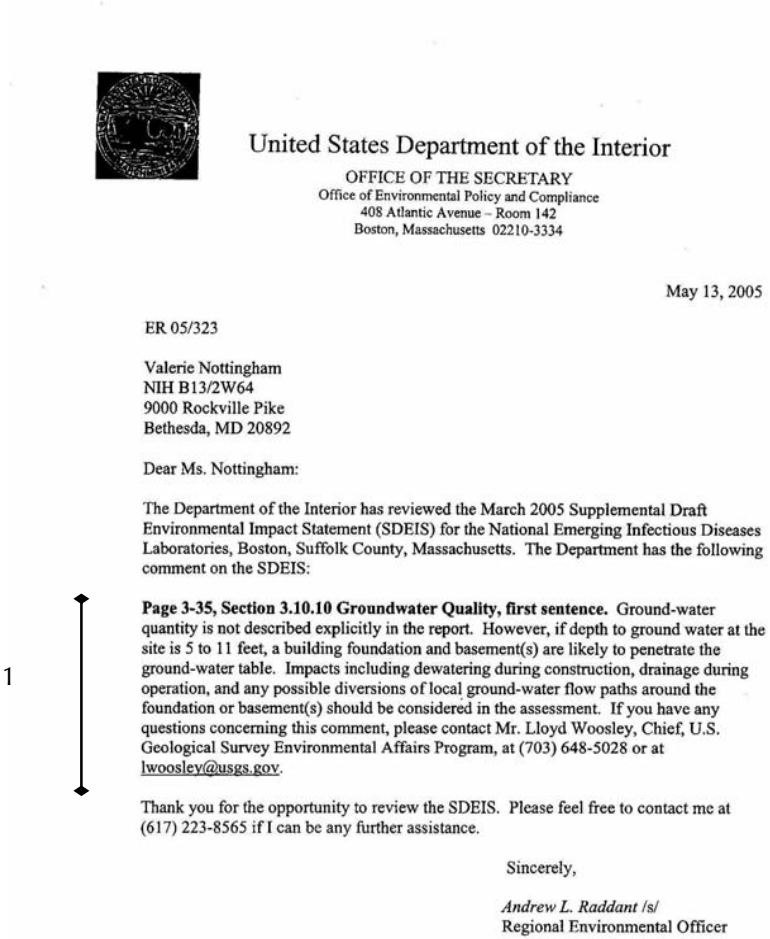
Virginia Pratt

76.1 See Response to Comment 1.1.

76.2 See Response to Comment 1.2.

76.3 See Response to Comment 1.3.

76.4 See Response to Comment 1.4.



United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
408 Atlantic Avenue – Room 142
Boston, Massachusetts 02210-3334

May 13, 2005

ER 05/323

Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham:

The Department of the Interior has reviewed the March 2005 Supplemental Draft Environmental Impact Statement (SDEIS) for the National Emerging Infectious Diseases Laboratories, Boston, Suffolk County, Massachusetts. The Department has the following comment on the SDEIS:

77.1

Page 3-35, Section 3.10.10 Groundwater Quality, first sentence. Ground-water quantity is not described explicitly in the report. However, if depth to ground water at the site is 5 to 11 feet, a building foundation and basement(s) are likely to penetrate the ground-water table. Impacts including dewatering during construction, drainage during operation, and any possible diversions of local ground-water flow paths around the foundation or basement(s) should be considered in the assessment. If you have any questions concerning this comment, please contact Mr. Lloyd Woosley, Chief, U.S. Geological Survey Environmental Affairs Program, at (703) 648-5028 or at lwoosley@usgs.gov.

Thank you for the opportunity to review the SDEIS. Please feel free to contact me at (617) 223-8565 if I can be any further assistance.

Sincerely,

Andrew L. Raddant /s/
Regional Environmental Officer

LETTER 77

Andrew L. Raddant

77.1 The depth to groundwater at the project site is between 5 and 11 feet. The grade at the site would be increased by 1 to 2 feet above existing grade. Because the proposed building does not have a basement but would consist of a concrete slab foundation constructed to a depth of 4 to 8 feet below the finished grade of the site, there would be no penetration of the groundwater table.

Bayha, Ryan (NIH/OD/ORS)

From: Nottingham, Valerie (NIH/OD/ORF)
Sent: Tuesday, May 24, 2005 11:00 AM
To: Bayha, Ryan (NIH/OD/ORS)
Subject: FW: BU bioterrorism lab

-----Original Message-----
From: monica raymond [mailto:tiferet@postmark.net]
Sent: Wednesday, May 18, 2005 10:18 AM
To: NIH NEPA Comments
Subject: BU bioterrorism lab

Dear NIH--

I'm writing to express my profound concern about siting the D4 bioterorism lab in the South End/Roxbury area of Boston.

78.1 This is a far more populous area than other D4 labs around the country, and BU (notably in the recent tularemia scandal) has shown in the past that it is capable of a level of carelessness that would be absolutely inappropriate for a lab containing toxins like the ones proposed for research here.

78.2 The worst case scenario should include the other toxins that might be worked on at this lab, not only anthrax; it should include the possibility of a release during transport through the streets of Boston, and it should be made public.

I live in Cambridge, just across the river from BU, but I cannot expect that disease causing agents will be any resector of civic boundaries. Morevoer, there has already been substantial objection from those living in the immediate vicinity of the lab. That there has not been more has less to do with people's faith in BU's safety precautions, and more with the onsluaght of things that confront us all daily, and, perhaps, people's inability to really envision the disastrous outcome of an accident at this proposed lab.

It makes so little sense to me to site a lab dealing with such toxic substances in the middle of a highly populated and intellectually crucial area that I wonder why you are even considering this choice.

Thank you for your attention to these objnections, and your consdideration of alternative sites.

Yours sincerely,

Monica Raymond

monica raymond
tiferet@postmark.net

LETTER 78

Monica Raymond

78.1 See Responses to Comments 29.9 and 19.2.

78.2 Anthrax was chosen for use in the worst case scenario evaluations because the Centers for Disease Control and Prevention determined that second to smallpox (possession is restricted under international agreement), anthrax has the greatest potential for public health harm. The 2002 report, *Public Health Assessment of Potential Biological Terrorism Agents* (Rotz, et al. 2002) outlines the overall selection and prioritization process used to determine the biological agents for public health preparedness activities. This report was used as a basis for using anthrax in worst case modeling.

LETTER 79

Ian Rifkin, MD, PhD

BOSTON MEDICAL CENTER

Renal Section

Boston University School of Medicine

Evans Biomedical Research Center
Renal Section, Room 504
650 Albany Street
Boston, MA 02118-2393
Tel: 617-638-7330
Fax: 617-638-7326

16 May, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I am writing to express support for the National Emerging Infectious Diseases Laboratories at Boston University Medical Center (BUMC).

The Biosasfety Level 4 Laboratories in North America have a very good safety record. With more than 77 years of combined operations, there has never been a community incident or an environmental release.

I am familiar with the design of the proposed laboratory at BUMC and believe that it is being designed and built using some of the most sophisticated and state-of-the-art safety and security systems. I firmly believe that BUMC has a deep commitment to ensuring the safety of the laboratory, the researchers and the community.

A BSL-4 laboratory will provide much needed capacity to study emerging infectious diseases and will be very beneficial for scientists and researchers throughout the region who are looking for cures and vaccines for some of the world's deadliest diseases. This laboratory will safely conduct research on infectious diseases that threaten the safety and security of our city, of the nation and indeed, of the world.

I support BUMC's research efforts and its plans to build the NEIDL.

Sincerely,

Ian Rifkin

Ian Rifkin MD, PhD
Assistant Professor of Medicine
Boston University School of Medicine

LETTER 80

Col M. Riley

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab at BUMC.

When I first heard about the laboratory, I must admit I was a bit apprehensive. However, the staff at Boston University Medical Center took the time to address my concerns and answer all my questions about the project.

I feel that this lab is important to find cures for infectious diseases. We need to have the appropriate facilities to do this important research. I believe that this lab will be built safely and that the redundant systems and the security plans will ensure that we are all safe.

Also, the development of this laboratory will create 1,300 construction jobs and 660 permanent jobs—jobs at all levels. This lab will have a positive economic impact at all levels in our community.

Sincerely,

LETTER 81

Julio Vega Rivera

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

Our community needs projects like the proposed biosafety laboratory.

The biosafety lab will create jobs. Boston University Medical Center (BUMC) has said that 1300 construction jobs and 660 permanent jobs will be created. Our community needs these jobs.

In addition, BUMC has committed $1 million to training Boston residents to be lab technicians. The training will be part of the City Lab program. After nine months, the graduates are able to find meaningful jobs at a laboratory at the medical center or in a similar laboratory in the City. This will be a great partnership and illustrates BUMC's strong commitment to our community.

I support the Biosafety Lab.

Julio Vega Rivera

LETTER 82

Manuel Rodrigues

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab at BUMC.

When I first heard about the laboratory, I must admit I was a bit apprehensive. However, the staff at Boston University Medical Center took the time to address my concerns and answer all my questions about the project.

I feel that this lab is important to find cures for infectious diseases. We need to have the appropriate facilities to do this important research. I believe that this lab will be built safely and that the redundant systems and the security plans will ensure that we are all safe.

Also, the development of this laboratory will create 1,300 construction jobs and 660 permanent jobs—jobs at all levels. This lab will have a positive economic impact at all levels in our community.

Sincerely,

Manuel Rodrigues

Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

It is now time to Just Say No.

Sincerely,

J. H. Rooks
704 Windsor St
Cambridge, MA 02141

LETTER 83

J. H. Rooks

83.1 See Response to Comment 1.1.

83.2 See Response to Comment 1.2.

83.3 See Response to Comment 1.3.

83.4 See Response to Comment 1.4.

Bayha, Ryan (NIH/OD/ORS)

From: Nottingham, Valerie (NIH/OD/ORF)
Sent: Tuesday, May 24, 2005 11:01 AM
To: Bayha, Ryan (NIH/OD/ORS)
Subject: FW: Oppose BioLab in Boston

-----Original Message-----
From: Marguerite Rosenthal [mailto:mrosenth@verizon.net]
Sent: Wednesday, May 18, 2005 4:50 PM
To: NIH NEPA Comments
Subject: Oppose BioLab in Boston

I am writing to add my voice to the many others who are opposed to the development of a Level 4 Biohazard Laboratory at the Boston University Medical School. This lab would be located in the very heart of a crowded Boston neighborhood that is characterized by traffic congestion and a high density of residents (not coincidentally largely non-Caucasion. Such a laboratory threatens the health and safety of this neighborhood and beyond.

84.1 As you must be aware, Boston University has recently been severely criticized for failing to adhere to standard safety procedures in one of its biological research labs, with the consequence that a number of lab workers became seriously ill. How can such an institution be trusted to keep their employees and those with whom these employees will come in contact safe when they will be working with highly contagious and very dangerous biological agents?

84.2 We have been assured that there is no intent to use this lab for research related to biological agents to be used as weapons, but many of us are dubious about the true purpose for the proposed laboratory.

Again, I urge you to deny the application for the construction of this laboratory in the heart of Boston.

Very truly yours,

Marguerite Rosenthal, Ph.D.
12 Enfield St.
Boston, MA 02130

LETTER 84

Marguerite Rosenthal, Ph.D.

84.1 See Response to Comment 19.5.

84.2 See Response to Comment 4.17.

BOSTON MEDICAL CENTER

Renal Section
DAVID J. SALANT, M.D.
Chief, Renal Section
Boston Medical Center

Professor of Medicine
Boston University School of Medicine

Boston University School of Medicine

Evans Biomedical Research Center
Renal Section, Room 504
650 Albany Street
Boston, MA 02118-2393
Tel.: 617-638-7330
Fax: 617-638-7326
Email: djsalant@bu.edu

May 2, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I am writing in support of the National Emerging Infectious Diseases Laboratories (NEIDL) at Boston University Medical Center (BUMC).

I believe that research into the causes, treatment and prevention of serious infectious diseases is of paramount importance and the BSL-4 laboratory will provide much needed capacity to study emerging infectious diseases. The laboratory will greatly benefit scientists and researchers throughout the region who are looking for cures and vaccines for some of the world's deadliest diseases.

I am familiar with the design of the proposed laboratory at BUMC and believe that it is being designed and built using some of the most sophisticated and state-of-the-art safety and security systems. My own office and laboratory are immediately adjacent to the site identified for the new facility, and I firmly believe that BUMC has a deep commitment to ensuring the safety of the laboratory, the researchers who will work in it, those of us who work close by, and those who live in the surrounding neighborhood.

In brief, I support BUMC's research efforts and its plans to build the NEIDL.

Sincerely,

David J. Salant

LETTER 85

David J. Salant

Nottingham, Valerie (NIH/OD/ORF)

From: John Samuelson [jsamuels@bu.edu]
Sent: Monday, May 02, 2005 5:44 PM
To: NIH NEPA Comments
Subject: National Emerging Infectious Diseases Laboratories at Boston University Medical Cente

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

May 2, 2005

Dear Ms. Nottingham:

I am writing to express the strongest support for the National Emerging Infectious Diseases Laboratories (NEIDL) at Boston University Medical Center (BUMC). I am writing with considerable knowledge of the proposed laboratories as I have been studying human pathogens including *Entamoeba*, *Giardia*, and *Schistosoma* with NIH support for 28 years and have been a member of the Boston University Institutional Biosafety Committee (IBC) for the past two years. I will focus on three points.

First, Boston University is an excellent place for the NEIDL, because there is so much expertise in infectious diseases and microbial pathogenesis. In addition to Jack Murphy and Mark Klempner, who are experts in bacterial pathogenesis, there are experts in viral pathogenesis (e.g. Paul Skolnik), fungal pathogenesis (e.g. Stu Levitz), and immunology (e.g. Ron Corley and Ann Marshak-Rothstein). In addition, collaborating experts in microbial pathogenesis are just a couple of miles away at Harvard Medical School (e.g. John Mekelanos and John Collier), Tufts Medical School (e.g. Matt Waldor and Ralph Isberg), or Massachusetts General Hospital (e.g. Martin Hirsch). If Boston is the Hub of the Universe, Boston University is at the Hub of the microbial pathogenesis universe. Because it is in Boston, it will be easier to recruit first-rate investigators to the NEIDL, and it will be easier for these investigators to consult with experts at BU and adjacent institutions.

Second, it is optimal to have NEIDL in a medical center moments from a terrific hospital (BUMC) rather than in a rural location, which is distant from any hospital if, God forbid, there was a medical emergency. Having worked for many years in both places, I know that hospitals are constantly dealing with infectious diseases and are much more dangerous places than research laboratories. In addition, the BUMC has a very conscientious and cautious IBC, which tightly regulates work with infectious agents and closely monitors recombinant DNA experiments. This is a senior rather than a junior group of reviewers, many of whom are physician scientists, who typically have 20+ years experience studying human pathogens. In addition to meeting once per month, the IBC is constantly working with investigators to make sure there proposals are well-written and are safe.

Third, it is optimal that the NEIDL be placed in a lively, thoughtful community, which is present in Boston. Important medical research should be in a place that is seen and penetrated (intellectually if not physically) rather than behind fences in an obscure and possibly neglected location. While it might be easier to place a research facility someone where no one asks any questions, it is better in the long run that questions about safety, purpose, and management of the NEIDL be aggressively discussed and answered before the facility is built. With regards to efforts to understand, prevent, and treat infectious with significant potential morbidity and mortality, the work must be transparent rather than hidden.

Sincerely,

John C. Samuelson, MD.-Ph.D.
Professor
5/4/2005

LETTER 86

John C. Samuelson, MD., Ph.D.

Department of Molecular and Cell Biology
Boston University Goldman School of Dental Medicine
715 Albany St, Evans 426
Boston MA 02118
Phone 617 414 1054
FAX 617 414 1041
email: jsamuels@bu.edu

5/4/2005

LETTER 86

John C. Samuelson, MD., Ph.D.

BOSTON MEDICAL CENTER

Section of Gastroenterology

PAUL C. SCHROY III, M.D., M.P.H.
Director of Clinical Research
Section of Gastroenterology
Boston Medical Center

Professor of Medicine
Boston University School of Medicine

Professor of Epidemiology
Boston University School of Public Health

Boston University School of Medicine

85 East Concord Street, Suite 7715
Boston, MA 02118-2393
Tel: 617-638-6525 (#3)
Fax: 617-638-6529
E-mail: Paul.Schroy@bmc.org

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab also known as the National Emerging Infectious Diseases Laboratory (NEIDL) proposed at Boston University Medical Center (BUMC).

As you are aware, biomedical research laboratories operate under strict procedures and protocols at BUMC and at other academic and private laboratories throughout the Greater Boston region. This research is done safely and makes important medical contributions to the nation and the world.

I believe that the NEIDL at BUMC will be one of the safest laboratories in the world. I have been briefed on the systems and the design and am familiar with operations in biomedical research laboratories. I am impressed by the building's safety and security features and by the team BUMC has assembled to build this important project.

I should also note that there are some who have incorrectly raised the city of Boston's rDNA regulations, as a reason the laboratory should not be built. This is simply misinformation. rDNA research is conducted in Boston under the Boston Public Health Commission's regulations. On numerous occasions, BUMC authorities have stated that they will do all research in compliance with the Health Commission's guidelines.

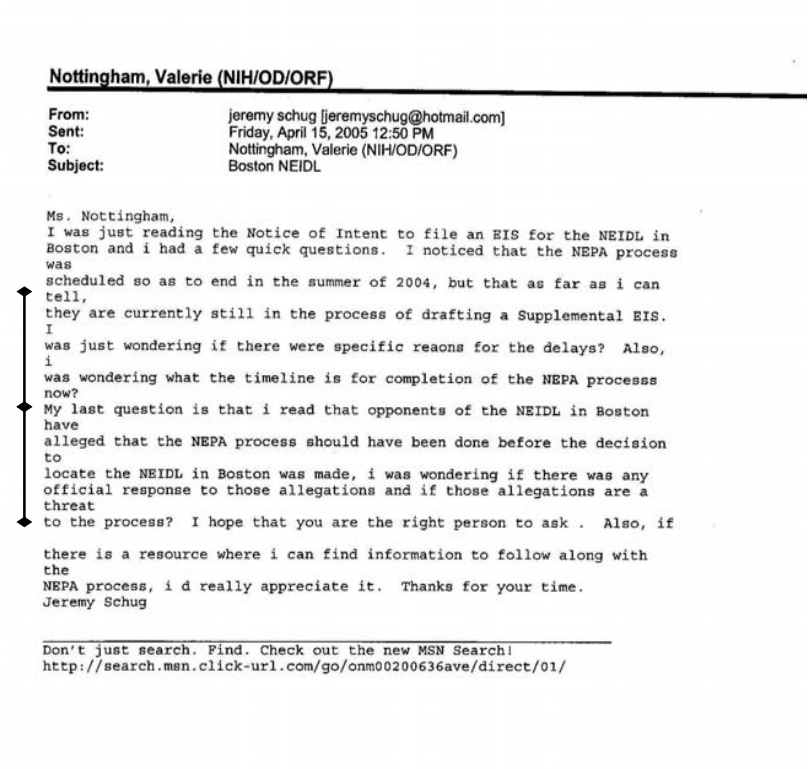
This laboratory will be an important project for the research community and those interested in finding cures for emerging infectious diseases and I fully support it.

Sincerely,

Paul C. Schroy III, MD, MPH

LETTER 87

Paul C. Schroy III, MD



Nottingham, Valerie (NIH/OD/ORF)

From: jeremy schug [jeremyschug@hotmail.com]
Sent: Friday, April 15, 2005 12:50 PM
To: Nottingham, Valerie (NIH/OD/ORF)
Subject: Boston NEIDL

Ms. Nottingham,
I was just reading the Notice of Intent to file an EIS for the NEIDL in Boston and i had a few quick questions. I noticed that the NEPA process was
scheduled so as to end in the summer of 2004, but that as far as i can tell,
they are currently still in the process of drafting a Supplemental EIS. I
88.1 was just wondering if there were specific reaons for the delays? Also, i
was wondering what the timeline is for completion of the NEPA processs now?
My last question is that i read that opponents of the NEIDL in Boston have
88.2 alleged that the NEPA process should have been done before the decision to
locate the NEIDL in Boston was made, i was wondering if there was any official response to those allegations and if those allegations are a threat
to the process? I hope that you are the right person to ask . Also, if

there is a resource where i can find information to follow along with the
NEPA process, i d really appreciate it. Thanks for your time.
Jeremy Schug

Don't just search. Find. Check out the new MSN Search!
http://search.msn.click-url.com/go/onm00200636ave/direct/01/

LETTER 88

Jeremy Schug

88.1 There was no delay in the publication of the Supplemental Draft EIS. NIH followed the procedures for drafting a Supplemental Draft EIS and did not issue the SDEIS until all elements of the SDEIS were in accordance in with applicable laws and regulations.

88.2 The decision on whether to partially fund the Boston-NBL has not been made. The final decision on this project will be issued in a Record of Decision once the NEPA process is finished and all public comments have been taken into account.

May 1, 2005

Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892
Fax (301) 480-8056
nihnepa@mail.nih.gov

Dear Dr. Nottingham:

I am writing to voice my concern over the Supplemental Draft Environmental Impact Statement (SDEIS) for the proposed National Biocontainment Laboratory (NBL) on the Boston University Medical Campus (BUMC). I have reservations about the Project as a resident, living just 2 miles away from the proposed site. More importantly, I have serious concerns about the Project because I am familiar with the proposed science and how accidents occur in the laboratory environment. I have a B.S. and M.S. in Chemical Engineering as well as 6 years of research experience as a genomic scientist and molecular biologist. As a resident and scientist, I feel that the DEIS and SDEIS does not provided the public with sufficient information to make an educated decision concerning the citing of this laboratory in the densely populated South End neighborhood of Boston. I offer the following comments and concerns to all parties involved in reviewing the SDEIS:

89.1

1. In Appendix 4-3 of the SDEIS, a dismissive reference to the recent Tularemia exposures at the BUMC is included. The series of events surrounding these infections has been grossly under-emphasized. Key dates, events, and explanations involving these infections need to be elucidated, including.

    a. May 22, 2004 – First researcher becomes ill in Dr. Peter Rice lab.
    b. May 24, 2004 – Second researcher becomes ill in the same lab.
    c. September 20, 2004 – Third researcher becomes ill in the same lab.
    d. October 28, 2004 – BUMC tests samples being used by the researchers and university occupational health is notified.
    e. November 4, 2004 – BUMC orders Rice lab to stop all tularemia vaccine research.
    f. November 8, 2004 – The public comment period for the Final Environmental Impact Report (FEIR) under the Massachusetts Environmental Policy Act (MEPA) ends.
    g. November 9, 2004 – BUMC informs the Massachusetts Department of Public Health (MDPH) of the three possible tularemia infections.
    h. November 10, 2004 – Public hearing for the federal DEIS. BUMC informs Boston Public Health Commission of the infections.
    i. January 19, 2005 – Boston Globe article about tularemia infections provides the first public report of the infections.

    First and foremost, it should be noted that BUMC broke the law. Tularemia is a reportable disease in Massachusetts, and state law requires cases or suspected cases of this disease to be reported to public health authorities immediately, but in no case more than 24 hours after being identified. The DNA tests of October 28, 2004 should have triggered reports to health authorities. Instead, BUMC waited at least 11 days before contacting the MDPH. Secondly, the reason for this delay appears to be rooted in the timing of state MEPA and federal DEIS public comment periods. Clearly, the tularemia exposures should have been included in both of these documents and by not doing so the BUMC has deliberately deceived the residents of Massachusetts.

    This incident sets a dark precedent on BUMC's capacity to safely manage a BSL-4 facility. Full disclosure of the tularemia incident is necessary for the public (as well as city, state, and federal officials) to assess the BUMC's ability to operate the proposed NBL with the necessary level of integrity, safety, transparency, and accountability.

89.2

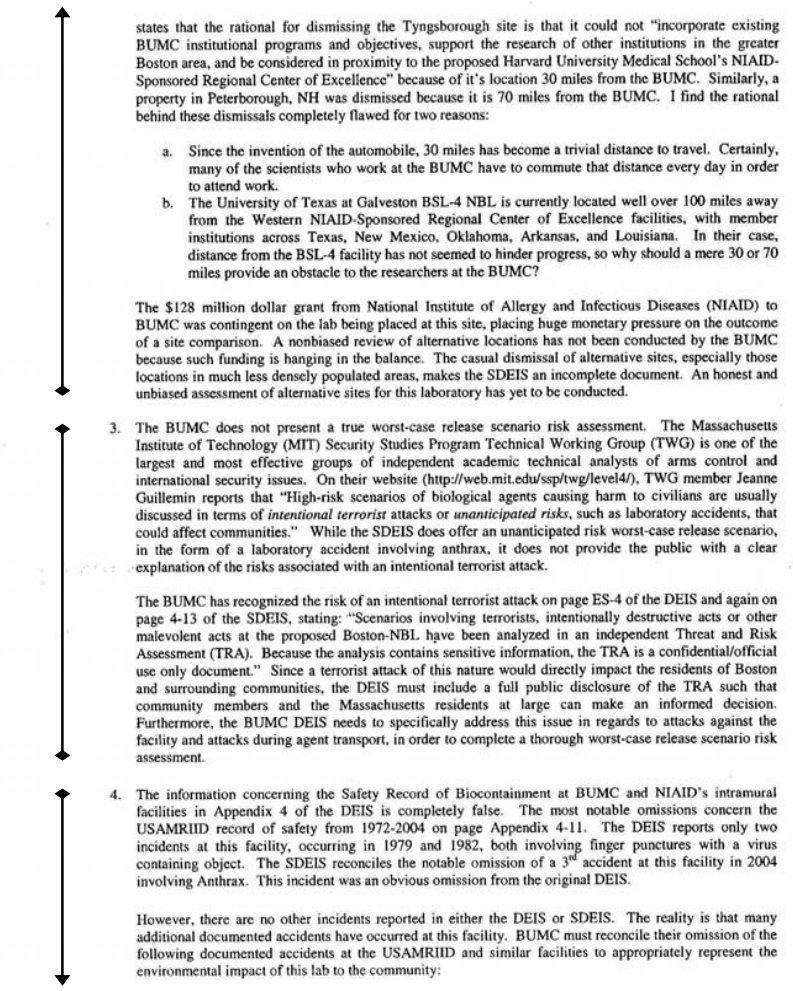
2. In chapter 2-3 of the SDEIS, a discussion of alternative locations for the NBL is presented. One location is a Boston University property 30 miles from downtown Boston in the town of Tyngsborough. The SDEIS

LETTER 89

Jeff Shearstone

89.1 See Response to Comment 29.9.

89.2 As described in Chapter 2, the distance of the Tyngsborough and Peterborough sites from the City of Boston was not the only determining factor in their removal from the universe of sites for location of the facility. Other factors include lack of appropriate zoning; lack of infrastructure and medical trauma facilities; increased costs and lack of efficiencies gained by ability to use existing BSL-2 and BSL-3 laboratories at the BioSquare Research Park; and inefficiencies in personnel costs.



states that the rational for dismissing the Tyngsborough site is that it could not "incorporate existing BUMC institutional programs and objectives, support the research of other institutions in the greater Boston area, and be considered in proximity to the proposed Harvard University Medical School's NIAID-Sponsored Regional Center of Excellence" because of it's location 30 miles from the BUMC. Similarly, a property in Peterborough, NH was dismissed because it is 70 miles from the BUMC. I find the rational behind these dismissals completely flawed for two reasons:

a. Since the invention of the automobile, 30 miles has become a trivial distance to travel. Certainly, many of the scientists who work at the BUMC have to commute that distance every day in order to attend work.
b. The University of Texas at Galveston BSL-4 NBL is currently located well over 100 miles away from the Western NIAID-Sponsored Regional Center of Excellence facilities, with member institutions across Texas, New Mexico, Oklahoma, Arkansas, and Louisiana. In their case, distance from the BSL-4 facility has not seemed to hinder progress, so why should a mere 30 or 70 miles provide an obstacle to the researchers at the BUMC?

The $128 million dollar grant from National Institute of Allergy and Infectious Diseases (NIAID) to BUMC was contingent on the lab being placed at this site, placing huge monetary pressure on the outcome of a site comparison. A nonbiased review of alternative locations has not been conducted by the BUMC because such funding is hanging in the balance. The casual dismissal of alternative sites, especially those locations in much less densely populated areas, makes the SDEIS an incomplete document. An honest and unbiased assessment of alternative sites for this laboratory has yet to be conducted.

3. The BUMC does not present a true worst-case release scenario risk assessment. The Massachusetts Institute of Technology (MIT) Security Studies Program Technical Working Group (TWG) is one of the largest and most effective groups of independent academic technical analysts of arms control and international security issues. On their website (http://web.mit.edu/ssp/twg/level4/), TWG member Jeanne Guillemin reports that "High-risk scenarios of biological agents causing harm to civilians are usually discussed in terms of *intentional terrorist* attacks or *unanticipated risks*, such as laboratory accidents, that could affect communities." While the SDEIS does offer an unanticipated risk worst-case release scenario, in the form of a laboratory accident involving anthrax, it does not provide the public with a clear explanation of the risks associated with an intentional terrorist attack.

The BUMC has recognized the risk of an intentional terrorist attack on page ES-4 of the DEIS and again on page 4-13 of the SDEIS, stating: "Scenarios involving terrorists, intentionally destructive acts or other malevolent acts at the proposed Boston-NBL have been analyzed in an independent Threat and Risk Assessment (TRA). Because the analysis contains sensitive information, the TRA is a confidential/official use only document." Since a terrorist attack of this nature would directly impact the residents of Boston and surrounding communities, the DEIS must include a full public disclosure of the TRA such that community members and the Massachusetts residents at large can make an informed decision. Furthermore, the BUMC DEIS needs to specifically address this issue in regards to attacks against the facility and attacks during agent transport, in order to complete a thorough worst-case release scenario risk assessment.

4. The information concerning the Safety Record of Biocontainment at BUMC and NIAID's intramural facilities in Appendix 4 of the DEIS is completely false. The most notable omissions concern the USAMRIID record of safety from 1972-2004 on page Appendix 4-11. The DEIS reports only two incidents at this facility, occurring in 1979 and 1982, both involving finger punctures with a virus containing object. The SDEIS reconciles the notable omission of a 3rd accident at this facility in 2004 involving Anthrax. This incident was an obvious omission from the original DEIS.

However, there are no other incidents reported in either the DEIS or SDEIS. The reality is that many additional documented accidents have occurred at this facility. BUMC must reconcile their omission of the following documented accidents at the USAMRIID and similar facilities to appropriately represent the environmental impact of this lab to the community:

89.2

89.3

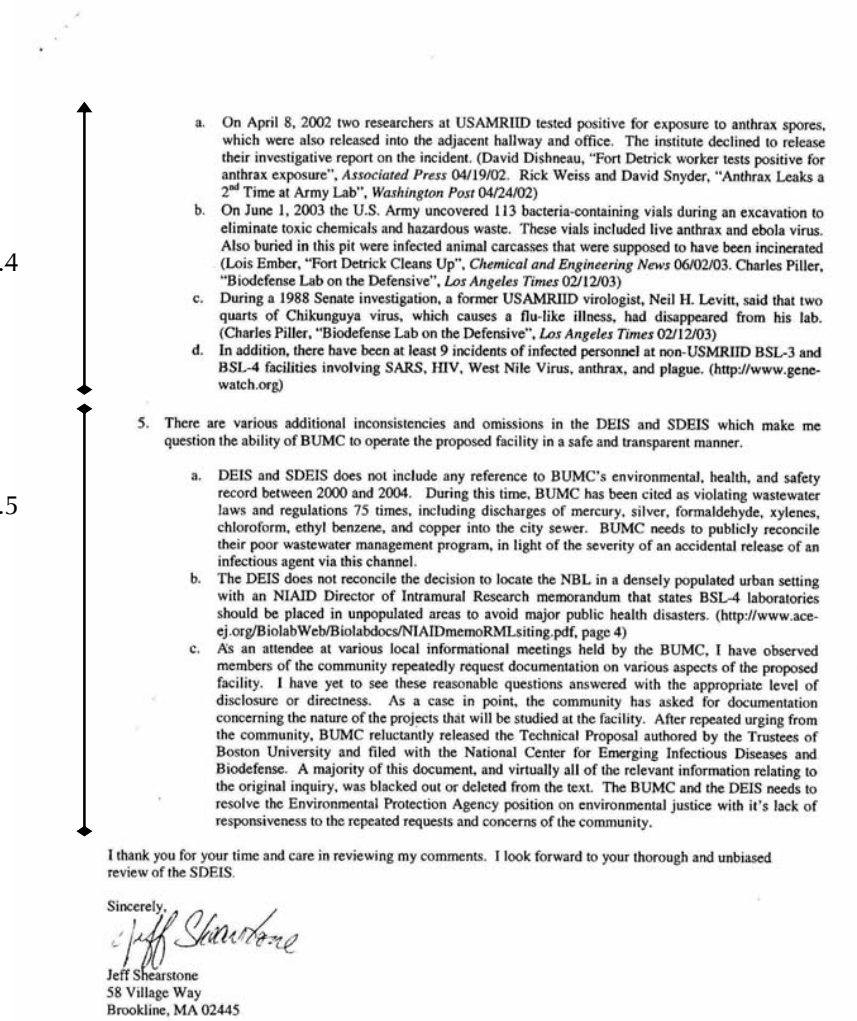
89.4

LETTER 89

Jeff Shearstone

89.3 See Response to Comment 4.8.

89.4 Dr. Johnson's report in Appendix 4 of the FEIS represents a factual study of the BSL-4 at USAMRIID among others. Nobody working in BSL-4 at USAMRIID suffered a clinical infection. The statement in Section 4.2.1.1 "Community Safety and Risk – Other Potential Risk Scenarios (a)" in the FEIS is correct with just one caveat. BSL-4 containment did not exist as such until 1984 when the first edition of Biosafety in Microbiological and Biomedical Laboratories came out. That's why Dr. Johnson covered a 20 year period through most of 2003. No clinical infections occurred in BSL-4 work at USAMRIID in that 20 year interval.



a. On April 8, 2002 two researchers at USAMRIID tested positive for exposure to anthrax spores, which were also released into the adjacent hallway and office. The institute declined to release their investigative report on the incident. (David Dishneau, "Fort Detrick worker tests positive for anthrax exposure", *Associated Press* 04/19/02. Rick Weiss and David Snyder, "Anthrax Leaks a 2nd Time at Army Lab", *Washington Post* 04/24/02)

b. On June 1, 2003 the U.S. Army uncovered 113 bacteria-containing vials during an excavation to eliminate toxic chemicals and hazardous waste. These vials included live anthrax and ebola virus. Also buried in this pit were infected animal carcasses that were supposed to have been incinerated (Lois Ember, "Fort Detrick Cleans Up", *Chemical and Engineering News* 06/02/03. Charles Piller, "Biodefense Lab on the Defensive", *Los Angeles Times* 02/12/03)

89.4

c. During a 1988 Senate investigation, a former USAMRIID virologist, Neil H. Levitt, said that two quarts of Chikunguya virus, which causes a flu-like illness, had disappeared from his lab. (Charles Piller, "Biodefense Lab on the Defensive", *Los Angeles Times* 02/12/03)

d. In addition, there have been at least 9 incidents of infected personnel at non-USMRIID BSL-3 and BSL-4 facilities involving SARS, HIV, West Nile Virus, anthrax, and plague. (http://www.gene-watch.org)

5. There are various additional inconsistencies and omissions in the DEIS and SDEIS which make me question the ability of BUMC to operate the proposed facility in a safe and transparent manner.

89.5

a. DEIS and SDEIS does not include any reference to BUMC's environmental, health, and safety record between 2000 and 2004. During this time, BUMC has been cited as violating wastewater laws and regulations 75 times, including discharges of mercury, silver, formaldehyde, xylenes, chloroform, ethyl benzene, and copper into the city sewer. BUMC needs to publicly reconcile their poor wastewater management program, in light of the severity of an accidental release of an infectious agent via this channel.

b. The DEIS does not reconcile the decision to locate the NBL in a densely populated urban setting with an NIAID Director of Intramural Research memorandum that states BSL-4 laboratories should be placed in unpopulated areas to avoid major public health disasters. (http://www.ace-ej.org/BiolabWeb/Biolabdocs/NIAIDmemoRMLsiting.pdf, page 4)

c. As an attendee at various local informational meetings held by the BUMC, I have observed members of the community repeatedly request documentation on various aspects of the proposed facility. I have yet to see these reasonable questions answered with the appropriate level of disclosure or directness. As a case in point, the community has asked for documentation concerning the nature of the projects that will be studied at the facility. After repeated urging from the community, BUMC reluctantly released the Technical Proposal authored by the Trustees of Boston University and filed with the National Center for Emerging Infectious Diseases and Biodefense. A majority of this document, and virtually all of the relevant information relating to the original inquiry, was blacked out or deleted from the text. The BUMC and the DEIS needs to resolve the Environmental Protection Agency position on environmental justice with it's lack of responsiveness to the repeated requests and concerns of the community.

I thank you for your time and care in reviewing my comments. I look forward to your thorough and unbiased review of the SDEIS.

Sincerely,

Jeff Shearstone

Jeff Shearstone
58 Village Way
Brookline, MA 02445

LETTER 89

Jeff Shearstone

89.5 BUMC operates in the service area of the Massachusetts Water Resources Authority (MWRA), owner of the treatment works handling the majority of the wastewater for Greater Boston area. MWRA has some of the strictest wastewater discharge limits in the country, especially regarding mercury discharges. Complying with MWRA discharge limits is a challenge faced by all institutions in the area, and BUMC's compliance history is comparable to every other institution of similar size under MWRA jurisdiction. Complicating matters is the fact that the Medical School was operating a medical waste incinerator during the period in question. Even using the best available control technology, incinerator wastewater discharges proved impossible to consistently keep below MWRA's mercury limit. The vast majority of wastewater discharge violations since 2000 are mercury violations. BUMC has worked hard to eliminate mercury and other wastewater discharge violations, and the compliance record reflects this. The ubiquitous nature of mercury and the strict MWRA limits make this task difficult. However, in 2004 BUMC violated MWRA discharge limits only 5 times (3 BUMC, 2 BMC). So far in 2005, there has not been a single wastewater violation. BUMC disputes the notion that its wastewater management program is poor. The history of violations is reflective of a strict and changing regulatory presence, and is shared by other institutions in the Boston area.

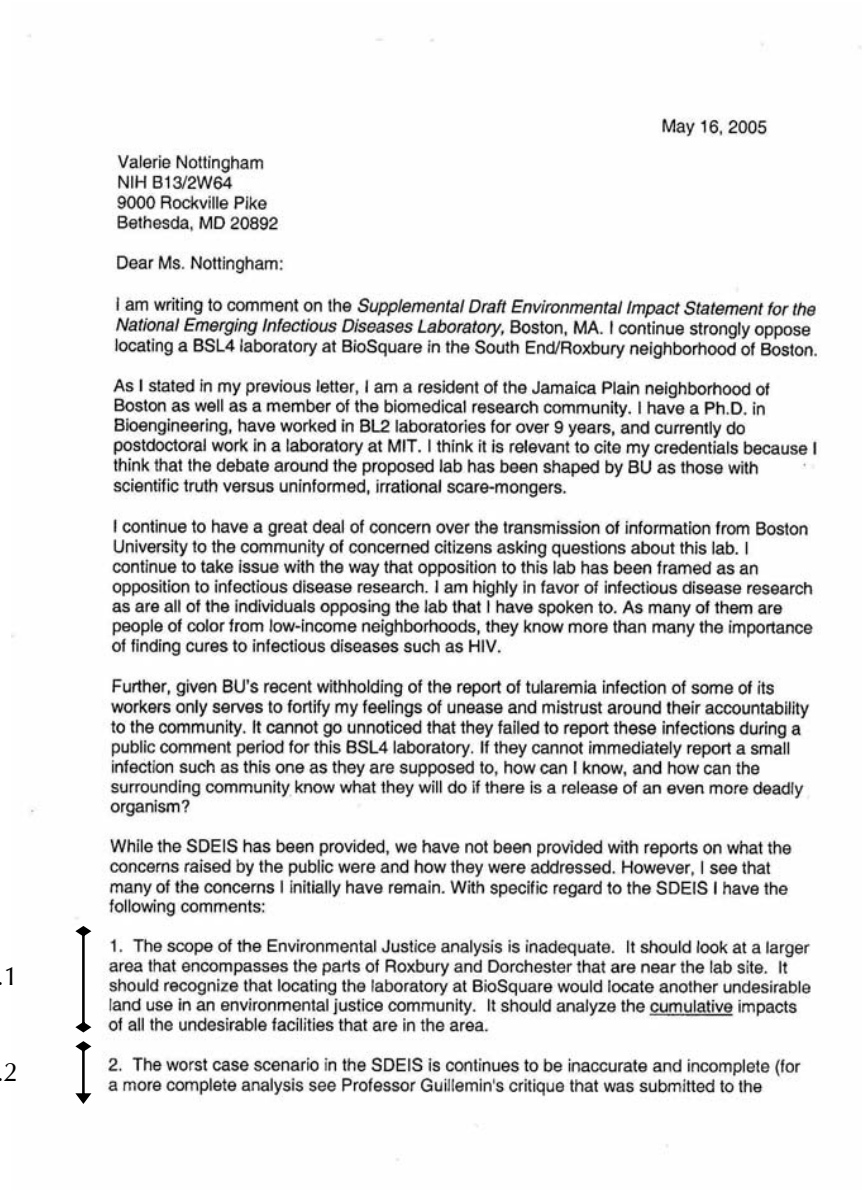
The Rocky Mountain Laboratory memo referred to in the comment was never officially signed or sent, and its author is unknown. NIH does not support the content of the memo as rationale for the location of any laboratory. NIH would have to believe that the proposed facility was unsafe, which it does not. Where the staff lives is not as important as where they work to facilitate collaboration. All the facilities listed are within a close distance, and not far removed from the city.

LETTER 89

Jeff Shearstone

BUMC implemented several strategies, outside the NEPA process, to respond to community requests for information on the Boston-NBL. Weekly Breakfast Briefings, supplemented by office hours in various neighborhood locations and attendance at community meetings, provided access and opportunity to receive project information and updates directly from members of the BUMC research and safety and security teams. Information repositories were created at four branches of the Boston Public Library for ease of access to project information; some of these materials were translated into Spanish. The technical proposal for the Boston-NBL, redacted to secure proprietary information, was placed at each of the information repositories. Finally, the website for the Boston-NBL was revised with the goal of responding to community concerns by increasing access to information and providing updates on the project on a more timely basis.

Section 1.76, Section 3.4, and Section 4.11.4 address the Environmental Justice issues raised by the Environmental Protection Agency.



May 16, 2005

Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham:

I am writing to comment on the *Supplemental Draft Environmental Impact Statement for the National Emerging Infectious Diseases Laboratory*, Boston, MA. I continue strongly oppose locating a BSL4 laboratory at BioSquare in the South End/Roxbury neighborhood of Boston.

As I stated in my previous letter, I am a resident of the Jamaica Plain neighborhood of Boston as well as a member of the biomedical research community. I have a Ph.D. in Bioengineering, have worked in BL2 laboratories for over 9 years, and currently do postdoctoral work in a laboratory at MIT. I think it is relevant to cite my credentials because I think that the debate around the proposed lab has been shaped by BU as those with scientific truth versus uninformed, irrational scare-mongers.

I continue to have a great deal of concern over the transmission of information from Boston University to the community of concerned citizens asking questions about this lab. I continue to take issue with the way that opposition to this lab has been framed as an opposition to infectious disease research. I am highly in favor of infectious disease research as are all of the individuals opposing the lab that I have spoken to. As many of them are people of color from low-income neighborhoods, they know more than many the importance of finding cures to infectious diseases such as HIV.

Further, given BU's recent withholding of the report of tularemia infection of some of its workers only serves to fortify my feelings of unease and mistrust around their accountability to the community. It cannot go unnoticed that they failed to report these infections during a public comment period for this BSL4 laboratory. If they cannot immediately report a small infection such as this one as they are supposed to, how can I know, and how can the surrounding community know what they will do if there is a release of an even more deadly organism?

While the SDEIS has been provided, we have not been provided with reports on what the concerns raised by the public were and how they were addressed. However, I see that many of the concerns I initially have remain. With specific regard to the SDEIS I have the following comments:

90.1 1. The scope of the Environmental Justice analysis is inadequate. It should look at a larger area that encompasses the parts of Roxbury and Dorchester that are near the lab site. It should recognize that locating the laboratory at BioSquare would locate another undesirable land use in an environmental justice community. It should analyze the cumulative impacts of all the undesirable facilities that are in the area.

90.2 2. The worst case scenario in the SDEIS is continues to be inaccurate and incomplete (for a more complete analysis see Professor Guillemin's critique that was submitted to the

LETTER 90

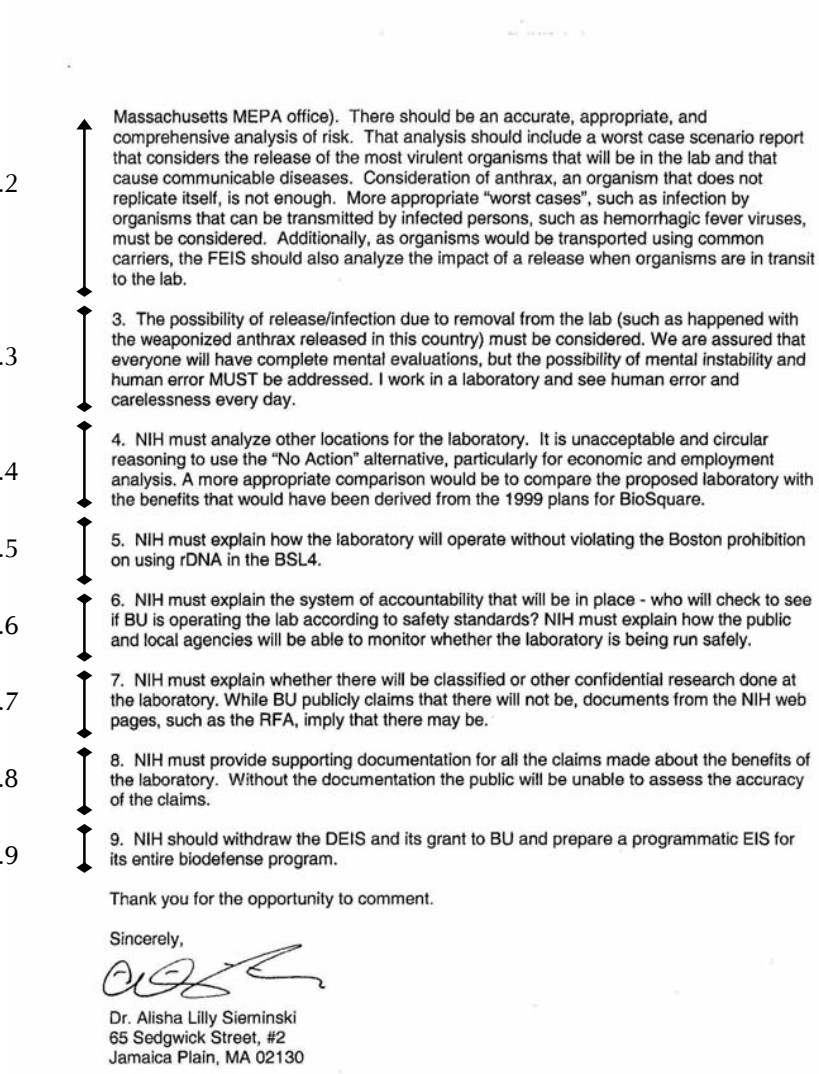
Dr. Alisha Lilly Sieminski

90.1 The analysis area for the project is determined by where effects are likely to occur. Increasing the size of an analysis area dilutes the effects. "Undesirable land use" is a subjective interpretation as is "undesirable facilities" making this request impossible to fulfill.

90.2 *Bacillus anthracis* is fully capable of replicating itself. Anthrax was chosen as the worst case release simply because, in a dried spore form, it is readily dispersed into the air. In the worst case scenario, a vial containing spores is dropped at the time of a simultaneous failure of the redundant HEPA exhaust filters. The spores are then exhausted into the external environment and dispersed by the prevailing wind.

In practice, anthrax spore preparations that would be used in the Boston-NBL would never be in a dried, milled, and coated (*i.e.*, weaponized) form that is readily aerosolized. Rather, anthrax spores that would be used for challenge experiments would always be in liquid suspension, and therefore the projected numbers of spores that would become aerosolized following a spill is overestimated by at least 3 orders of magnitude. This overestimation gives at least a 1,000-fold margin of safety to the projected numbers of spores that would be released into the environment in the worst case scenario. Furthermore, in contrast to any of the hemorrhagic fever viruses, anthrax spores are resistant to environmental inactivation by sun light and/or dehydration; therefore magnifying the environmental impact of a release as is appropriate for such an analysis.

In order to be transmitted from person to person, one must be directly exposed to infected bodily fluids from patients with end stage disease. There is little scientific evidence to support the contention that infection by this group of viruses occurs by the aerosol route. This lack of evidence supports the argument that an accidental spill of any hemorrhagic fever virus in the Boston-NBL would be completely contained within the facility even with a concomitant failure of the redundant HEPA exhaust filter system.



Massachusetts MEPA office). There should be an accurate, appropriate, and comprehensive analysis of risk. That analysis should include a worst case scenario report that considers the release of the most virulent organisms that will be in the lab and that cause communicable diseases. Consideration of anthrax, an organism that does not replicate itself, is not enough. More appropriate "worst cases", such as infection by organisms that can be transmitted by infected persons, such as hemorrhagic fever viruses, must be considered. Additionally, as organisms would be transported using common carriers, the FEIS should also analyze the impact of a release when organisms are in transit to the lab.

90.2

3. The possibility of release/infection due to removal from the lab (such as happened with the weaponized anthrax released in this country) must be considered. We are assured that everyone will have complete mental evaluations, but the possibility of mental instability and human error MUST be addressed. I work in a laboratory and see human error and carelessness every day.

90.3

4. NIH must analyze other locations for the laboratory. It is unacceptable and circular reasoning to use the "No Action" alternative, particularly for economic and employment analysis. A more appropriate comparison would be to compare the proposed laboratory with the benefits that would have been derived from the 1999 plans for BioSquare.

90.4

5. NIH must explain how the laboratory will operate without violating the Boston prohibition on using rDNA in the BSL4.

90.5

6. NIH must explain the system of accountability that will be in place - who will check to see if BU is operating the lab according to safety standards? NIH must explain how the public and local agencies will be able to monitor whether the laboratory is being run safely.

90.6

7. NIH must explain whether there will be classified or other confidential research done at the laboratory. While BU publicly claims that there will not be, documents from the NIH web pages, such as the RFA, imply that there may be.

90.7

8. NIH must provide supporting documentation for all the claims made about the benefits of the laboratory. Without the documentation the public will be unable to assess the accuracy of the claims.

90.8

9. NIH should withdraw the DEIS and its grant to BU and prepare a programmatic EIS for its entire biodefense program.

90.9

Thank you for the opportunity to comment.

Sincerely,

Dr. Alisha Lilly Sieminski
65 Sedgwick Street, #2
Jamaica Plain, MA 02130

LETTER 90

Dr. Alisha Lilly Sieminski

Further, accidental laboratory acquired infection by any of the hemorrhagic fever viruses in the BSL-4 laboratory is extremely unlikely. There is no documented case of a laboratory acquired infection in North America after decades of work with these agents under BSL-4 containment. Were a laboratory worker to be potentially infected by an accidental needle stick, that worker would be identified during the decontamination shower as having a puncture in their BSL-4 suit / gloves by their "buddy" (under the two person rule), and would be placed under mandatory clinical observation under infectious disease isolation in the hospital. In the event this individual presented with clinical hemorrhagic fever virus disease, he/she would be under containment and would be treated by medical staff trained to work under containment. Using such procedures, the secondary spread of hemorrhagic fever virus infection, even under primitive field hospital conditions in developing countries is extremely rare. In those instances where there has been documented hospital acquired infection, epidemic community outbreak of disease has not been reported. See Section 4.2.1.1 "Community Safety and Risk – Other Potential Risk Scenarios" in the FEIS.

90.3 See Response to Comment 26.9.

90.4 The NIH had nothing to do with the 1999 plans for BioSquare. The Council of Environmental Quality, in its direction on implementing NEPA, provides the discretion of determining the No Action Alternative in the hands of the federal agency making the proposal. In this instance, the NIH chose to define no action as not building the Boston-NBL so as to provide a benchmark, enabling decision makers to compare the magnitude of environmental effects of the action alternative. See Response to Comment 4.22.

90.5 See Response to Comment 4.15.

90.6 Compliance with the many environmental health and safety regulations and internal policies and procedures is a shared

LETTER 90

Dr. Alisha Lilly Sieminski

responsibility. The Principal Investigators, researchers, lab workers, OEHS staff, radiation protection staff and occupational medicine staff are all involved in monitoring compliance. A variety of approaches are taken to monitor compliance. For example, regular lab inspections are conducted by professional safety experts from the Office of Environmental Health and Safety and the Radiation Protection Office. The Lab Safety Committee, Institutional Biosafety Committee and Radiation Safety Committee monitor compliance, review inspection results and address any issues identified. External government agencies provide additional monitoring of compliance. These local, state and federal agencies monitor compliance by conducting inspections, issuing permits, licenses and approvals and if necessary, issuing penalties or even closing down unsafe lab operations. See Table 1-4 for a listing of the relevant regulatory authorities.

90.7 The facility is required to provide support for NIAID-funded research for the period of twenty years. The National Institute of Allergy and Infectious Diseases does not perform classified research and the proposed facility would not perform classified research.

90.8 The Boston-NBL would bring with it direct and indirect economic benefits to both residents and the local economy. First, the project is expected to create 1,300 construction jobs and 660 permanent jobs at all levels. These job estimates are based on BU's past experience as the largest developer of research buildings in the City of Boston, as well as on the specific program and design of the proposed building. During construction, BUMC is committed to working with City agencies to ensure that Boston residents have the opportunity to benefit from the new employment opportunities. Post-construction, it is expected that 37% of the permanent positions created would be held by City of Boston residents.

LETTER 90

Dr. Alisha Lilly Sieminski

90.9 A Programmatic Environmental Impact Statement is not necessary to assess the potential environmental impacts of the various biocontainment facilities proposed to be either constructed by the NIH itself or partly funded by the NIH. The various proposed biocontainment facility projects are not located in the same geographic region, and the proposed projects' potential impacts are neither synergistic nor cumulative. The various projects are not so interrelated or connected that their possible environmental impacts cannot be considered independently. Moreover, the NIH's approval of one project does not commit the agency to approve the other projects. As required by NEPA, the NIH is conducting an environmental review for the various biocontainment facilities.

Bayha, Ryan (NIH/OD/ORS)

From: Nottingham, Valerie (NIH/OD/ORF)
Sent: Tuesday, May 24, 2005 10:58 AM
To: Bayha, Ryan (NIH/OD/ORS)
Subject: FW: BUMC BioContainment Level 4 Lab - Boston, Massachusetts

From: Hsimmonds@aol.com [mailto:Hsimmonds@aol.com]
Sent: Tuesday, May 17, 2005 7:11 PM
To: NIH NEPA Comments
Subject: BUMC BioContainment Level 4 Lab - Boston, Massachusetts

Dear Ms. Nottingham May 17, 2005

To begin with, we incorporate our remarks sent in earlier on the Draft Environmental Impact Statement.

We remain opposed to the siting of the BUMC Bio Containment Level 4 Lab at the Albany Street site and are disillusioned by the process. We feel that our time has been wasted and that there was no true intent to listen to the community. This was confirmed when someone who works for Mayor Menino stated that once the train left the station there was no stopping it. We were further chagrined that Mayor Menino and Governor Romney and most of the other public officials, who supported the project, failed to show up at the public forums to defend their position. And yet the city councilors met privately with the developers in apparent violation of the open meeting laws.

91.1 Why should we bother to continue to plead our case when the decision was already made before the votes were even taken? The results were clearly in, regardless of what the community input was to be. The process was used to camouflage the decision that had already been made. Why waste our time? We should have realized that this "done deal" had occurred when for the first time since the ongoing development for the Bio Square Parcel a proposal was not first presented to the Project Advisory Committee and the abutting neighborhood.

91.2 After reviewing the SDEIS, we were chagrined to see that there were very few changes of substance and that, as the Conservation Law Foundation states, the SDEIS fails to justify why the location near BUMC is better than the alternatives, except to basically say that the scientists want to work near each other and NIH wanted the Level 4 Lab to be near other Level 2 and 3 labs. As the Foundation stated, convenience should not trump analysis.

91.3 Even though BUMC violated the law by not immediately reporting the tularemia exposures, the powers that be continue to place their trust in an untrustworthy institution. This was further demonstrated at the BRA hearing when BU officials continued to emphasize the exemplary safety record of BUMC, even though they knew the tularemia exposures had occurred. They knew that the public did not know

5/24/2005

LETTER 91

Helaine Simmonds, Cinda Stoner

91.1 The National Institutes of Health has not yet made its decision regarding the proposed action. The final decision would be issued in a Record of Decision after the publication of the Final Environmental Impact Statement and all consideration would be given to public comments before a decision is made by the NIH.

91.2 Justification of the decision would be made in the Record of Decision, not the EIS. NEPA does not require the NIH to select a particular alternative. NEPA requires the NIH to consider the reasonable alternatives to a proposed action, to disclose and analyze the potential environmental effects of the alternatives, to consider fully public comments on the action and its impacts, and to make an informed decision on whether to proceed with a proposed action or an alternative to the proposed action.

91.3 See Response to Comment 19.5.

91.3 and deliberately chose to conceal it from the public in order not to delay or sidetrack the necessary approvals for this lab.

91.4 Further evidence of their deception is the fact that at the Faneuil Hall hearing, Dr. Klempner misled the public by focusing on the West Nile Virus, which does not even need a Level 4 lab to be researched. It is difficult under these circumstances to trust the "collective wisdom", as he put it, of the people desiring to place the lab at this location.

91.5 Additional evidence of their untrustworthiness is their continuing statement in the DEIS that the "no alternative scenario" would mean that the parcel would remain a parking lot even though for years they had told the PAC and the neighborhood association that they would build a hotel, a garage, and additional Level 2 and 3 labs there. Also, the untrustworthiness of the developers is further demonstrated by their selecting for the BioLab Advisory Group, the so-called community oversight group, numerous individuals who are beholden to the city for development contracts and funding and who have never shown up at any of the meetings that have been held.

91.6 With regard to the SDEIS, the worst case scenario analysis should have dealt with other pathogens besides anthrax, should have dealt with the risk of transporting the material, should have dealt with presentation of an evacuation plan for the community in case of an accident, and should have dealt with the threat of a terrorist attack. How do you expect us to place trust in a plan or individuals who submit such a plan with such glaring omissions. What they did not deal with causes as great a concern, if not greater, as what they chose to present. Their silence will not protect us.

Finally, the Cooperation Agreement with the neighborhood for this parcel should be referenced in the Construction Management Plan Section of the SDEIS.

Thank you,

Helaine Simmonds,
49 East Springfield St. (one block up and three blocks over from the site)
Boston, MA 02118

Cinda Stoner
107 East Brookline St. (directly across the street from the site)
Boston, MA 02118

5/24/2005

LETTER 91

Helaine Simmonds, Cinda Stoner

91.4 West Nile Virus is contained on the CDC category A, B, C priority pathogens list which includes those infectious agents which are currently of highest priority for study at the Boston-NBL.

91.5 See Response to Comment 4.22.

91.6 Anthrax was chosen for use in the worst case scenario evaluations because the Centers for Disease Control and Prevention determined that second to smallpox (possession is restricted under international agreement), anthrax has the greatest potential for causing public health harm. The 2002 report, *Public Health Assessment of Potential Biological Terrorism Agents* (Rotz, et al. 2002) outlines the overall selection and prioritization process used to determine the biological agents for public health preparedness activities. This report was used as a basis for using anthrax in worst case modeling.

Biological Material Shipment and Transport. The packaging, labeling, and transport of etiologic agents are regulated by 42 CFR 72 (Interstate Shipment of Etiologic Agents); 49 CFR 172 and 173 (U.S. Dept. of Transportation regulations concerning shipment of hazardous materials); 9 CFR 122 (U.S. Dept. of Agriculture [USDA]-Restricted Animal Pathogens), and International Air Transport Association (IATA) rules. In addition, special rules apply for the transport of materials regulated by the U.S. Food and Drug Administration (21 CFR 312.120, Drugs for Investigational Use in Laboratory Research Animals or in Vitro Tests). Recent legislation – the USA PATRIOT Act, and the Public Health Preparedness and Bioterrorism Response Act of 2001 – have further strengthened the regulations controlling transport of certain etiologic agents, referred to as Select Agents, to include controls over possession and use. Boston-NBL will be registered with the Centers for Disease Control and Prevention and the USDA for possession, use, and transport of these agents. A Responsible Official will be designated at Boston-NBL and approved by the regulating agencies to oversee the

LETTER 91

Helaine Simmonds, Cinda Stoner

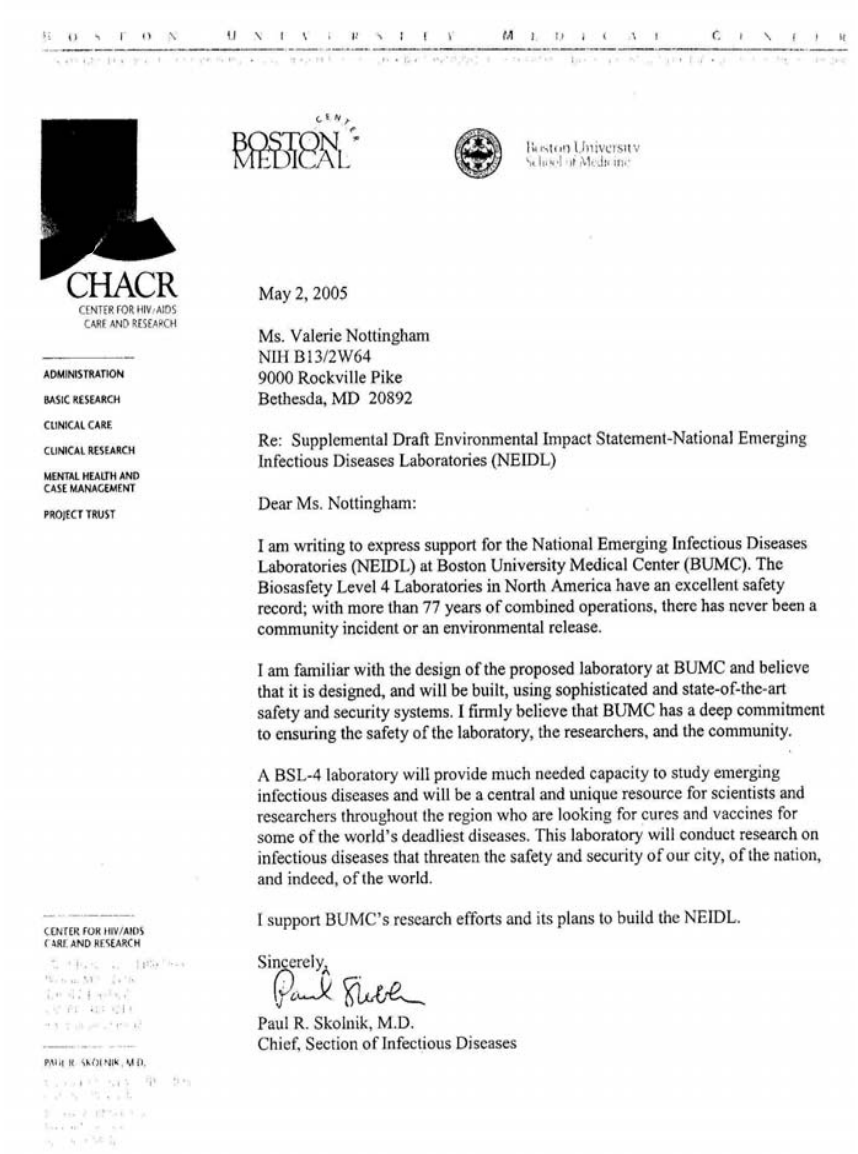
shipping, receipt, and usage. These individuals are subject to security risk assessments performed by the Federal Bureau of Investigation. Packaging requirements are strictly implemented in accordance with IATA regulations.

There have been no cases of illness attributable to the release of infectious materials during transport, worldwide, although incidents of damage to outer packaging of properly packaged materials have been reported (World Health Organization 2002; U.S. DOT 2001).

The risk to the community surrounding the Boston University and specifically the Boston-NBL from transport of infectious agents or other biologically-derived material is negligible.

Risk of a Terrorist Attack. A scenario evaluating the impact on the community as result of a deliberate release incident was included in the Maximum Possible Risk modeling. See Appendix 12.

Community Evacuation. Local, State and Federal authorities have developed disaster response plans that would be implemented if the Department of Public Health felt the need to declare such an emergency.



BOSTON UNIVERSITY MEDICAL CENTER

BOSTON MEDICAL CENTER

Boston University School of Medicine

CHACR
CENTER FOR HIV/AIDS CARE AND RESEARCH

ADMINISTRATION
BASIC RESEARCH
CLINICAL CARE
CLINICAL RESEARCH
MENTAL HEALTH AND CASE MANAGEMENT
PROJECT TRUST

May 2, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I am writing to express support for the National Emerging Infectious Diseases Laboratories (NEIDL) at Boston University Medical Center (BUMC). The Biosasfety Level 4 Laboratories in North America have an excellent safety record; with more than 77 years of combined operations, there has never been a community incident or an environmental release.

I am familiar with the design of the proposed laboratory at BUMC and believe that it is designed, and will be built, using sophisticated and state-of-the-art safety and security systems. I firmly believe that BUMC has a deep commitment to ensuring the safety of the laboratory, the researchers, and the community.

A BSL-4 laboratory will provide much needed capacity to study emerging infectious diseases and will be a central and unique resource for scientists and researchers throughout the region who are looking for cures and vaccines for some of the world's deadliest diseases. This laboratory will conduct research on infectious diseases that threaten the safety and security of our city, of the nation, and indeed, of the world.

I support BUMC's research efforts and its plans to build the NEIDL.

Sincerely,

Paul R. Skolnik, M.D.
Chief, Section of Infectious Diseases

CENTER FOR HIV/AIDS CARE AND RESEARCH

PAUL R. SKOLNIK, M.D.

LETTER 92

Paul R. Skolnik, M.D.

Bayha, Ryan (NIH/OD/ORS)

From: Nottingham, Valerie (NIH/OD/ORF)
Sent: Tuesday, May 24, 2005 11:01 AM
To: Bayha, Ryan (NIH/OD/ORS)
Subject: FW: Boston University SDEIS for proposed biosafety level-4 laboratory

From: Bill Sloan [mailto:bill.sloan@comcast.net]
Sent: Wednesday, May 18, 2005 4:48 PM
To: NIH NEPA Comments
Subject: Boston University SDEIS for proposed biosafety level-4 laboratory

Comment to *Supplemental Draft Environmental Impact Statement*
National Emerging Infectious Diseases Laboratories

Dear Director:

While the Supplemental Draft Environmental Impact Statement (SDEIS), like the original Final Project Impact Report/Final Environmental Impact Report (FPIR/FEIR), is flawed on many counts, I prefer to focus here on just one issue. The SDEIS relies on superficial speculation and spurious logic to rule out alternative locations for the proposed biosafety level-4 laboratory.

It is disingenuous to define close physical proximity to Harvard's planned Regional Center of Excellence as an absolute requirement for the proposed BU biosafety level-4 laboratory. This reduces the SDEIS conclusion that no more distant site is feasible to mere tautology. In reality, no evidence is presented to bolster the supplemental statement's implication that competent research scientists would be unwilling or incapable of commuting to one of the more rural locations named in this document. The Massachusetts Institute of Technology's Lincoln Laboratory, to name one example, has operated successfully for 54 years near Boston University's proposed alternative site at Tyngsborough.

93.1

Compared with Lincoln Laboratory, BU's proposed biosafety level-4 laboratory is even more suitable for a commuting workforce. The FPIR/FEIR explicitly states that continuous time spent in such a biosafety level-4 laboratory is limited by containment requirements to "under four hours a day" (section 5.2, p. 5-4). Furthermore, the workforce needs of the laboratory are not large. While the FPIR/FEIR claims this project will create 1,400 new jobs in Boston (sec. 2.6, p. 2-28), that number is reduced to 660 new jobs, based on an estimate of 3 employees per 1,000 sq. ft., in Appendix 1-30, section 15.7. This ratio in turn is explicitly characterized as not accurate due to containment requirements, which would reduce the actual workforce to a peak density of one employee per 1,000 sq. ft. (sec. 4.1.2, p. 4-2).

93.2

By the FPIR/FEIR's own calculations, therefore, no more than 220 employees are anticipated ever to be working at the proposed biosafety level-4 laboratory at any one time. The argument that close physical proximity to a trained workforce prohibits alternative locations is clearly

5/24/2005

LETTER 93

William N. Sloan

93.1 As described in Chapter 2, the distance of the Tyngsborough and Peterborough sites from the City of Boston was not the only determining factor in their removal from the universe of sites for location of the facility. Other factors include lack of appropriate zoning; lack of infrastructure and medical trauma facilities; increased costs and lack of efficiencies gained by ability to use existing BSL-2 and BSL-3 laboratories at the BioSquare Research Park; and inefficiencies in personnel costs. MIT's Lincoln Laboratories are not in a remote location, but are located in Lexington, MA, a close-in suburb of Boston.

93.2 This comment references data taken from the FPIR/FEIR, which is a document not affiliated with the NIH. The comment is outside the scope of the EIS.

spurious. A commuting workforce of this size could easily be accommodated at a location such as Tyngsborough, located as it is near the intersections of two major national highways.

The FPIR/FEIR states in several sections that a more rural location would fail to take advantage of "shared intellectual and capital resources" within the City of Boston (e.g., see Appendix 1-32, sec.18.2 and Appendix 1-38, sec 19.1). The notion that Boston's intellectual capital cannot be exploited successfully at a laboratory located thirty miles away is patently without merit in an age of global outsourcing. Good science today requires frequent cooperation among many researchers located in different nations on several continents. Adequate communication between Boston and a location such as Tyngsborough would constitute neither a technical challenge nor a significant cost impediment.

93.3 The SDEIS argument that the proposed biosafety level-4 laboratory must physically share Boston University's existing capital resources is not only invalid, it is irresponsible. This financial argument would imply that the University is pursing additional cost savings at the expense of concerns for public safety. All other existing biosafety level-4 laboratories are located outside of densely populated urban cores, including both the CDC facility in suburban Atlanta and the Southwest Foundation for Biomedical Research facility on the periphery of San Antonio. This clearly refutes Boston University's claim that the goals of the NEIDL project, as opposed to those of property developers for example, cannot be met at a location other than downtown Boston. To argue otherwise would be to state that maximizing public safety is not one of the goals of the project.

Public safety is a resource highly valued by the residents of the City of Boston. Public officials would forget at their peril that adequate expenditures are required to maintain that safety. Even the Department of Homeland Security has invested considerable sums in augmenting the safety of Boston's residents. For Boston University to build and operate its proposed biosafety level-4 laboratory in the city core, rather than pay the cost of locating that facility at a more remote and safer site, is like a corporation undertaking to build and operate an industrial plant while accepting no responsibility for mitigating the risks to the local environment. Eventually such costs must be paid, if not by the institution responsible then by the public purse and the public's lives.

93.4 Because the SDEIS has not given serious, thoughtful, and responsible consideration to the alternative locations it proposes, this draft is unacceptable as written. It satisfies neither the goals of the environmental impact review process, nor the requirements of the NEIDL as an agency of the United Stated Government to pursue the public interest. In lieu of tautological argument, contradictory speculation, and socially irresponsible cost/benefit analysis, the SDEIS requires a scientific demonstration that the NEIDL project goals could not be satisfied at an alternative location such as Tyngsborough. If no such demonstration is forthcoming, both precedent and a reasonable concern for public safety demand that the proposed biosafety level-4 laboratory be relocated outside of the Boston city core.

Thank you for your attention to this matter.

Sincerely,

5/24/2005

LETTER 93

William N. Sloan

93.3 Other BSL-4 laboratories, including the Southwest Foundation for Biomedical Research in San Antonio, Texas and the CDC are in heavily populated areas. The demonstrated safety record of BSL-4 laboratories and the worst case scenario presented in Section 4.2.1.1 show that the risk of these facilities is negligible regardless of their locations, urban or rural.

93.4 See Response to Comment 4.10.

William N. Sloan
33 Pond Circle
Boston, MA 02130

5/24/2005

LETTER 93

William N. Sloan

LETTER 94

Lawrence R. Smith

Lawrence R. Smith
4 Copley Place, Suite 120
Boston, MA 02116

May 13, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

I am writing to register my support for the Biosafety Lab at Boston University Medical Center (BUMC) in Boston, Massachusetts. I have attended most all of the public meetings and have listened carefully to the presentations from community residents, elected officials, city and state governmental officials and others both for and against this important project. After listening to the various presentations I have concluded that the project should move forward. I base this conclusion on the following points:

1. I feel that this lab is important to continue to advance research that aims to find cures for infectious diseases as they present themselves and in order to provide the best possible means for treatment on an ongoing basis. I have been the beneficiary of the outstanding research that developed medicines that were administered to me when I was under treatment in the not too distant past. In fact my life was saved because of past research efforts in this important area.

2. Boston is one of the leading areas for advance research and development in the biomedical area with many outstanding institutions performing cutting edge research. As such we have a large qualified talent base to staff future work in this important area. What we need are advanced facilities designed to provide a safe laboratory environment with redundant systems and security plans that will ensure the safety of staff and community residents in the adjacent neighborhood areas. It appears that BUMC has designed programs to ensure the latter.

3. The construction of the proposed bio-safety laboratory will have a positive economic impact in the Greater Boston area. 1,300 construction jobs and 660 permanent jobs will be created as the result of this project. BUMC has committed $1 million to training Boston residents to be lab technicians. The training will be part of the City Lab program. After nine months, the graduates will be able to find meaningful jobs in a laboratory at the medical center or in similar laboratories located

BioLab Support Letter - page two

part of the City Lab program. After nine months, the graduates will be able to find meaningful jobs in a laboratory at the medical center or in similar laboratories located in the Boston area for which there is a great demand. The multiplier effect of the economic benefits provided through local employment opportunities will generate dollars that can be recycled in our local communities.

I therefore urge that construction on this important project begin forthwith.

Very Truly Yours,

Lawrence. R. Smith

Rcvd 5/16/05 mlec

LETTER 94

Lawrence R. Smith

Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

It is now time to Just Say No.

Sincerely,

Pauline Solomon
104 Oldham Rd.
W. Newton, MA 02465

95.1
95.2
95.3
95.4

LETTER 95

Pauline Solomon

95.1 See Response to Comment 1.1.

95.2 See Response to Comment 1.2.

95.3 See Response to Comment 1.3.

95.4 See Response to Comment 1.4.

LETTER 96

Thomas J. Sommer

MassMEDIC
Massachusetts Medical Device Industry Council

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

As representatives of the Massachusetts medical device industry (MassMEDIC), I write in support of the Biosafety Lab also known as the National Emerging Infectious Diseases Laboratory (NEIDL) proposed at Boston University Medical Center (BUMC).

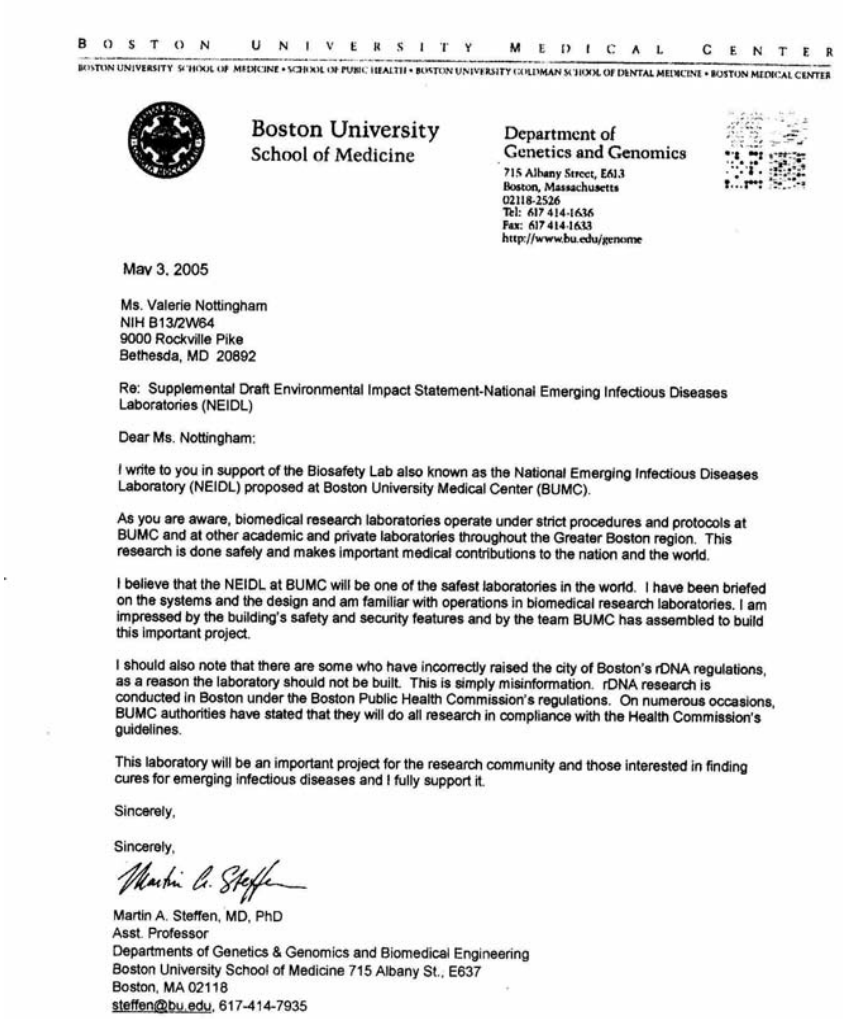
As you are probably aware, biomedical laboratories operate under strict procedures and protocols at BUMC and at many academic and private laboratories throughout the Greater Boston region. This research is done safely and makes important medical contributions to the nation and the world.

MassMEDIC believes that the NEIDL at BUMC will be one of the safest laboratories in the world. I have been briefed on the systems and the design and am familiar with operations in biomedical research laboratories. I am impressed by the building's safety and security features and by the team BUMC has assembled to build this important project.

look forward to partnering with the NEIDL in any way possible and believe that this laboratory will be an important project for the research community and those interested in finding cures for emerging infectious diseases. We fully support the development of the NEIDL.

Sincerely,

Thomas J. Sommer
President
MassMEDIC
715 Albany Street, TW1
Boston, MA 02118



BOSTON UNIVERSITY MEDICAL CENTER

BOSTON UNIVERSITY SCHOOL OF MEDICINE • SCHOOL OF PUBLIC HEALTH • BOSTON UNIVERSITY GOLDMAN SCHOOL OF DENTAL MEDICINE • BOSTON MEDICAL CENTER

Boston University
School of Medicine

Department of
Genetics and Genomics
715 Albany Street, E613
Boston, Massachusetts
02118-2526
Tel: 617 414-1636
Fax: 617 414-1633
http://www.bu.edu/genome

May 3, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab also known as the National Emerging Infectious Diseases Laboratory (NEIDL) proposed at Boston University Medical Center (BUMC).

As you are aware, biomedical research laboratories operate under strict procedures and protocols at BUMC and at other academic and private laboratories throughout the Greater Boston region. This research is done safely and makes important medical contributions to the nation and the world.

I believe that the NEIDL at BUMC will be one of the safest laboratories in the world. I have been briefed on the systems and the design and am familiar with operations in biomedical research laboratories. I am impressed by the building's safety and security features and by the team BUMC has assembled to build this important project.

I should also note that there are some who have incorrectly raised the city of Boston's rDNA regulations, as a reason the laboratory should not be built. This is simply misinformation. rDNA research is conducted in Boston under the Boston Public Health Commission's regulations. On numerous occasions, BUMC authorities have stated that they will do all research in compliance with the Health Commission's guidelines.

This laboratory will be an important project for the research community and those interested in finding cures for emerging infectious diseases and I fully support it.

Sincerely,

Sincerely,

Martin A. Steffen, MD, PhD
Asst. Professor
Departments of Genetics & Genomics and Biomedical Engineering
Boston University School of Medicine 715 Albany St., E637
Boston, MA 02118
steffen@bu.edu, 617-414-7935

LETTER 97

Martin A. Steffen, MD, PhD

LETTER 98

Elizabeth Bell Stengel

COBTH
CONFERENCE OF BOSTON TEACHING HOSPITALS

c/o Boston University Medical Center
715 Albany Street
Boston, MA 02118-2531
phone: 617/414-1888
fax: 617/414-1887
e-mail: estengel@bu.edu

Elizabeth Bell Stengel
Executive Director

May 10, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

On behalf of the Conference of Boston Teaching Hospitals (COBTH), I am writing to support the proposed National Emerging Infectious Disease Laboratory at Boston University Medical Center.

Our member hospitals include a broad spectrum of different institutions, but they come together around a mutual commitment to the unique missions of teaching hospitals: quality patient care, biomedical research, teaching, and community service. The Boston-area Teaching Hospitals are particularly proud of our long-standing in the development of therapies and diagnostic tools in virtually every area of medicine and public health. Research at our institutions has resulted in landmark advances, and these vital discoveries continue every day in laboratories throughout our city.

The proposed laboratory at Boston University Medical Center will be an important element in the continuation of our region's cutting edge research programs. The facility will be part of a national network and will serve as a resource for researchers throughout the country seeking how best to combat emerging and re-emerging infectious diseases. In addition, the location of the proposed laboratory here in Boston will allow collaborations among investigators from many prominent research entities in our region.

We recognize concern among some parties about construction and operation of this Level 4 laboratory in Boston. However, the overall safety record of biomedical and microbiological laboratories is very strong and the record of Level 4 laboratories in North America shows that laboratories of this kind are, in fact, safe. Moreover, the region is lacking a Level 4 Laboratory facility that is essential to conducting research on infectious diseases with the appropriate guidelines and protections in place.

The Conference of Boston Teaching Hospitals supports the National Emerging Infectious Diseases Laboratories and its mission.

Sincerely,

Elizabeth Bell Stengel
Executive Director
Conference of Boston Teaching Hospitals

Beth Israel Deaconess Medical Center • Boston Medical Center • Brigham and Women's Hospital • Cambridge Health Alliance
Caritas Carney Hospital • Caritas St. Elizabeth's Medical Center • Children's Hospital Boston • Dana-Farber Cancer Institute
Faulkner Hospital • Lahey Clinic • Massachusetts Eye and Ear Infirmary • Massachusetts General Hospital
Tufts-New England Medical Center / Floating Hospital for Children • VA Boston Healthcare System

LETTER 99

John L. Sullivan, MD

University of Massachusetts
UMASS Medical School

Office of Research
University of Massachusetts Medical School
55 Lake Avenue North
Worcester, MA 01655-0002
508.856.1572 (office) 508.856.5004 (fax)
john.sullivan@umassmed.edu (e-mail)

John L. Sullivan, M.D.
Professor of Pediatrics
Director, Office of Research

May 3, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

The University of Massachusetts Medical School is writing to express support for the National Emerging Infectious Diseases Laboratories at Boston University Medical Center (BUMC). There is an urgent need in this country to create facilities to conduct research aimed at finding causes, diagnoses and therapeutics for the alarming number of recently emerging and re-emerging infectious diseases.

Our organization would like to comment on two very important issues raised in the document - the appropriateness of the proposed location of the facility and the safety of the proposed Biosafety Level 4 laboratory.

As discussed in the document, prior to making a determination to site the proposed NEIDL facility at the BioSquare Research Park, Boston University undertook an alternatives siting analysis that evaluated existing sites under its control to determine the best location for the facility. The study concluded, and our organization agrees, that the best location for this facility is exactly where it is proposed in the BioSquare Research Park in the City of Boston, MA. BioSquare Research Park is a state of the art medical research park which contains medical research facilities including Biosafety Level 1, 2 and 3 laboratories that the proposed facility will be able to take advantage of. BioSquare Research Park is also located directly across the street from the Boston University Medical Center campus which also houses hospital and medical research facilities and is the largest Level 1 Trauma Center in New England.

We understand that some community members feel that such a facility should be located in a more rural location. We feel strongly that the facility should be located in an urban area which functions as a hub for medical research activities and which has a significant base of resident medical research scientists. Siting the facility in this manner assures that efficiencies are reached in terms in the ability to share research facilities and knowledge through direct collaboration among the various institutions located in the greater Boston area.

In regards to concerns regarding the safety of the proposed facility and in particular, the Biosafety Level 4 laboratory, our organization has no question that the facility will be safe. There are several federal and state programs which require the facility to be constructed and operated at extremely high safety standards. Similar laboratories throughout the United States have operated safely for decades.

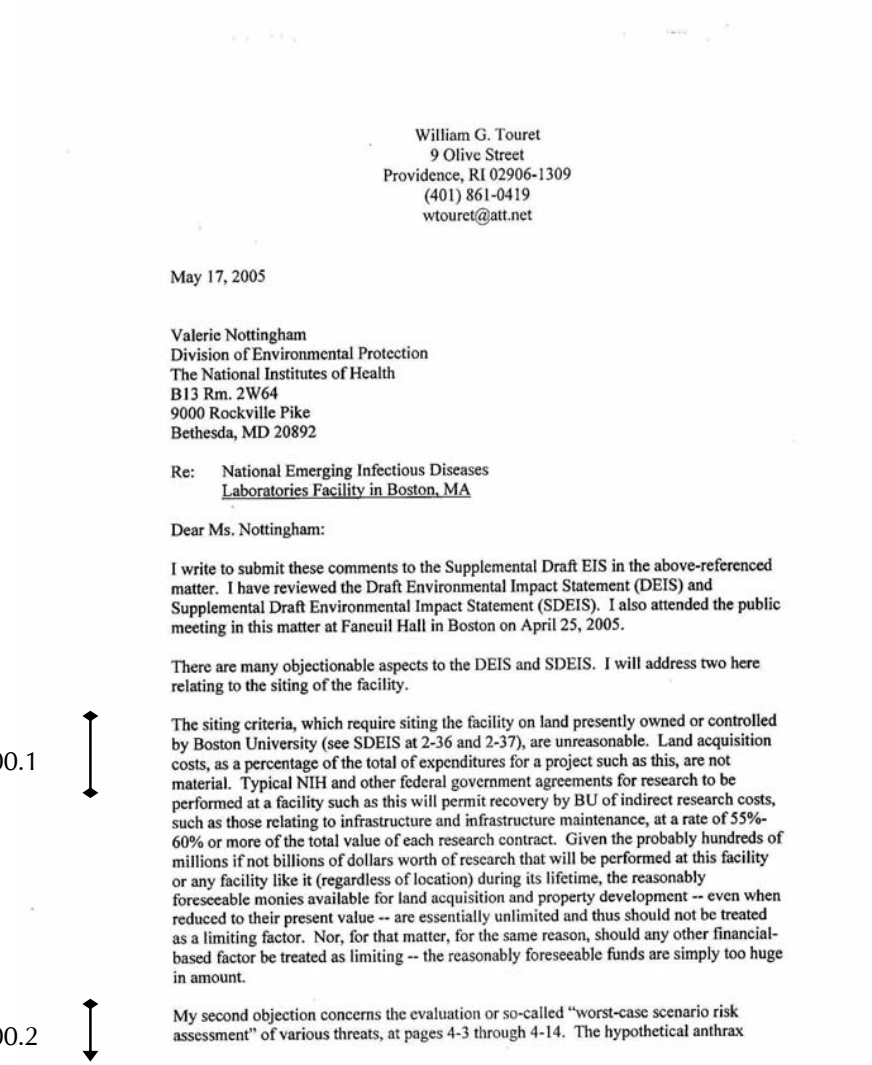
In closing, we urge you to proceed with the funding to construct this much needed national resource at the BioSquare Research Park in Boston.

Sincerely,

John L. Sullivan, MD
Professor of Pediatrics and Molecular Medicine
Director, Office of Research
University of Massachusetts Medical School

LETTER 99

John L. Sullivan, MD



William G. Touret
9 Olive Street
Providence, RI 02906-1309
(401) 861-0419
wtouret@att.net

May 17, 2005

Valerie Nottingham
Division of Environmental Protection
The National Institutes of Health
B13 Rm. 2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: National Emerging Infectious Diseases
Laboratories Facility in Boston, MA

Dear Ms. Nottingham:

I write to submit these comments to the Supplemental Draft EIS in the above-referenced matter. I have reviewed the Draft Environmental Impact Statement (DEIS) and Supplemental Draft Environmental Impact Statement (SDEIS). I also attended the public meeting in this matter at Faneuil Hall in Boston on April 25, 2005.

There are many objectionable aspects to the DEIS and SDEIS. I will address two here relating to the siting of the facility.

100.1

The siting criteria, which require siting the facility on land presently owned or controlled by Boston University (see SDEIS at 2-36 and 2-37), are unreasonable. Land acquisition costs, as a percentage of the total of expenditures for a project such as this, are not material. Typical NIH and other federal government agreements for research to be performed at a facility such as this will permit recovery by BU of indirect research costs, such as those relating to infrastructure and infrastructure maintenance, at a rate of 55%-60% or more of the total value of each research contract. Given the probably hundreds of millions if not billions of dollars worth of research that will be performed at this facility or any facility like it (regardless of location) during its lifetime, the reasonably foreseeable monies available for land acquisition and property development -- even when reduced to their present value -- are essentially unlimited and thus should not be treated as a limiting factor. Nor, for that matter, for the same reason, should any other financial-based factor be treated as limiting -- the reasonably foreseeable funds are simply too huge in amount.

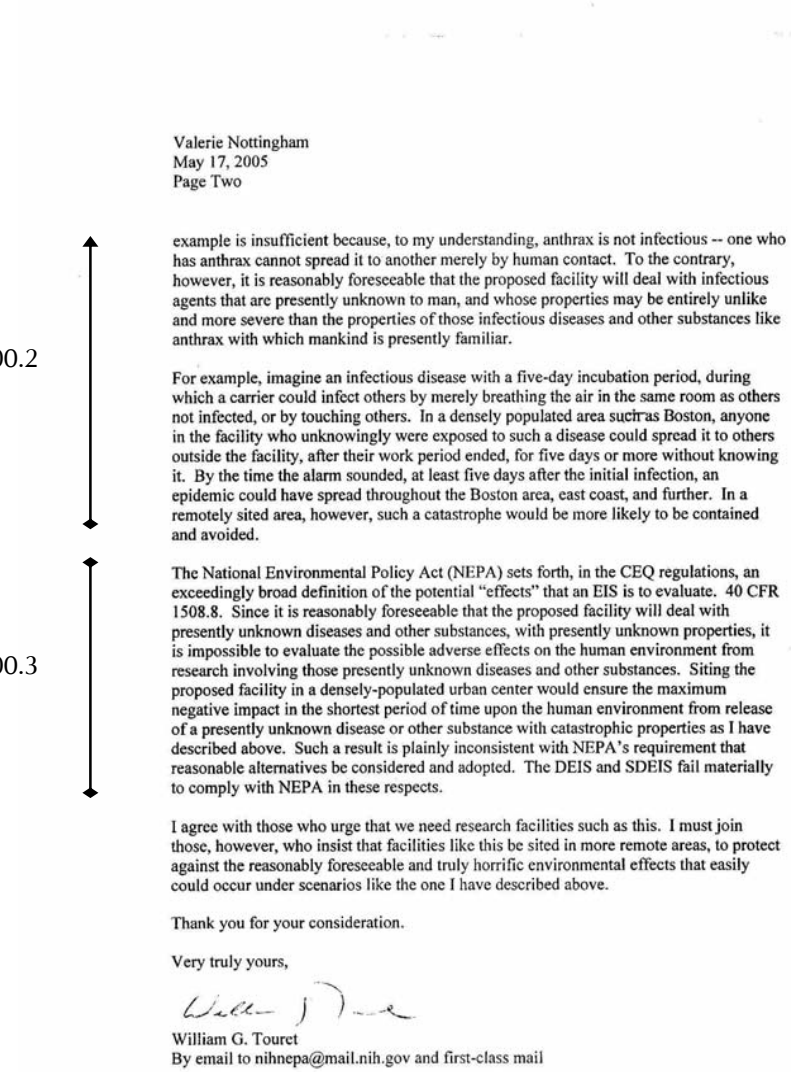
100.2

My second objection concerns the evaluation or so-called "worst-case scenario risk assessment" of various threats, at pages 4-3 through 4-14. The hypothetical anthrax

LETTER 100

William G. Touret

100.1 This is not a research grant, it is construction grant. The 55% or 60% stated in comment for research grant does not pay for the construction of a facility but for the operation support as it relates to the specific research grant.



Valerie Nottingham
May 17, 2005
Page Two

example is insufficient because, to my understanding, anthrax is not infectious -- one who has anthrax cannot spread it to another merely by human contact. To the contrary, however, it is reasonably foreseeable that the proposed facility will deal with infectious agents that are presently unknown to man, and whose properties may be entirely unlike and more severe than the properties of those infectious diseases and other substances like anthrax with which mankind is presently familiar.

100.2

For example, imagine an infectious disease with a five-day incubation period, during which a carrier could infect others by merely breathing the air in the same room as others not infected, or by touching others. In a densely populated area such as Boston, anyone in the facility who unknowingly were exposed to such a disease could spread it to others outside the facility, after their work period ended, for five days or more without knowing it. By the time the alarm sounded, at least five days after the initial infection, an epidemic could have spread throughout the Boston area, east coast, and further. In a remotely sited area, however, such a catastrophe would be more likely to be contained and avoided.

100.3

The National Environmental Policy Act (NEPA) sets forth, in the CEQ regulations, an exceedingly broad definition of the potential "effects" that an EIS is to evaluate. 40 CFR 1508.8. Since it is reasonably foreseeable that the proposed facility will deal with presently unknown diseases and other substances, with presently unknown properties, it is impossible to evaluate the possible adverse effects on the human environment from research involving those presently unknown diseases and other substances. Siting the proposed facility in a densely-populated urban center would ensure the maximum negative impact in the shortest period of time upon the human environment from release of a presently unknown disease or other substance with catastrophic properties as I have described above. Such a result is plainly inconsistent with NEPA's requirement that reasonable alternatives be considered and adopted. The DEIS and SDEIS fail materially to comply with NEPA in these respects.

I agree with those who urge that we need research facilities such as this. I must join those, however, who insist that facilities like this be sited in more remote areas, to protect against the reasonably foreseeable and truly horrific environmental effects that easily could occur under scenarios like the one I have described above.

Thank you for your consideration.

Very truly yours,

William G. Touret
By email to nihnepa@mail.nih.gov and first-class mail

LETTER 100

William G. Touret

100.2 See Response to Comment 78.2.

100.3 The EIS addresses fully all the reasonably foreseeable environmental effects of the proposed action, including the possible impacts of highly dangerous and infectious agents in an urban residential area. See Chapter 4 of the FEIS.

LETTER 101

Philip C. Trackman, Ph.D.

BOSTON UNIVERSITY MEDICAL CENTER

Boston University
Goldman School of
Dental Medicine

Department of
Periodontology
and Oral Biology
[illegible]

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

May 3, 2005

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I am writing to express support for the National Emerging Infectious Diseases Laboratories at Boston University Medical Center (BUMC).

The Biosafety Level 4 Laboratories in North America have a very good safety record. With more than 77 years of combined operations, there has never been a community incident or an environmental release.

I am familiar with the design of the proposed laboratory at BUMC and believe that it is being designed and built using some of the most sophisticated and state-of-the-art safety and security systems. I firmly believe that BUMC has a deep commitment to ensuring the safety of the laboratory, the researchers and the community.

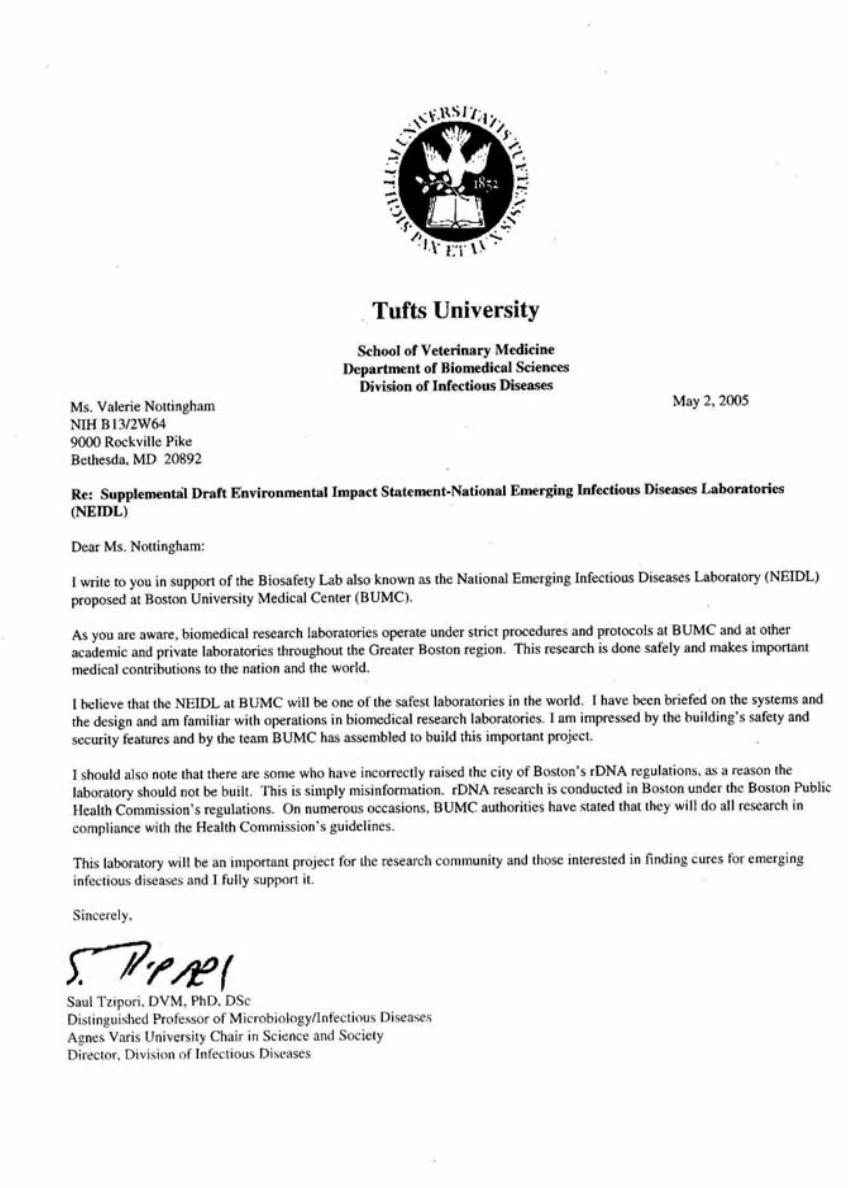
A BSL-4 laboratory will provide much needed capacity to study emerging infectious diseases and will be very beneficial for scientists and researchers throughout the region who are looking for cures and vaccines for some of the world's deadliest diseases. This laboratory will safely conduct research on infectious diseases that threaten the safety and security of our city, of the nation and indeed, of the world.

I support BUMC's research efforts and its plans to build the NEIDL.

Sincerely,

Philip C. Trackman

Philip C. Trackman, Ph.D.
Professor



Tufts University

School of Veterinary Medicine
Department of Biomedical Sciences
Division of Infectious Diseases

May 2, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

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I should also note that there are some who have incorrectly raised the city of Boston's rDNA regulations, as a reason the laboratory should not be built. This is simply misinformation. rDNA research is conducted in Boston under the Boston Public Health Commission's regulations. On numerous occasions, BUMC authorities have stated that they will do all research in compliance with the Health Commission's guidelines.

This laboratory will be an important project for the research community and those interested in finding cures for emerging infectious diseases and I fully support it.

Sincerely,

Saul Tzipori, DVM, PhD, DSc
Distinguished Professor of Microbiology/Infectious Diseases
Agnes Varis University Chair in Science and Society
Director, Division of Infectious Diseases

LETTER 102

Saul Tzipori, DVM, PhD, DSc

BOSTON UNIVERSITY MEDICAL CENTER

Boston University
Goldman School of
Dental Medicine

Department of
Periodontology
and Oral Biology

100 East Newton Street, Suite 107
Boston, Massachusetts 02118-2545
617.638-4571 tel
617.638-4799 fax

May 2, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

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I support BUMC's research efforts and its plans to build the NEIDL.

Sincerely,

Thomas E. Van Dyke, DDS, PhD
Professor

LETTER 103

Thomas E. Van Dyke, DDS, PhD

Nottingham, Valerie (NIH/OD/ORF)

From: Gregory Viglianti [gviglian@bu.edu]
Sent: Monday, May 02, 2005 4:21 PM
To: NIH NEPA Comments
Subject: BSL4 lab

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I am writing to express support for the National Emerging Infectious Diseases Laboratories at Boston University Medical Center (BUMC).

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I fully support BUMC's research efforts and its plans to build the NEIDL.

Sincerely,

Gregory Viglianti, PhD
Associate Professor of Microbiology

LETTER 104

Gregory Viglianti, PhD

Bayha, Ryan (NIH/OD/ORS)

From: Nottingham, Valerie (NIH/OD/ORF)
Sent: Tuesday, May 24, 2005 11:01 AM
To: Bayha, Ryan (NIH/OD/ORS)
Subject: FW: Comment on SDEIS of Boston Univesrity Lab

From: Michael Bishop [mailto:mxbishop@mindspring.com]
Sent: Wednesday, May 18, 2005 6:42 PM
To: NIH NEPA Comments
Subject: Comment on SDEIS of Boston Univesrity Lab

Watertown Citizens for Environmental Safety
Post Office Box 1194
Watertown, MA 02471-1194

May 17, 2005

NIH
9000 Rockville Pike
Bethesda, MD 20892
nihnepa@mail.nih.gov

To Whom It May Concern:

As residents of Watertown, Massachusetts, a community which lies adjacent to Boston, we have grave concerns about Boston University's proposed facility discussed in this report. In the event of an accident, the impacts upon the entire metropolitan area could be devastating. For this reason, and the points that follow, Watertown Citizens for Environmental Safety opposes locating the lab in the South End/Roxbury.

The SDEIS that has been submitted – like the DEIS before it – is in our view inadequate in that it does not cover the real and serious possibility of such accidents, as well as other required analyses. The supplemental DEIS also fails to account for the following points:

105.1 1) The "worst case scenario" fails to account for the potentially disastrous impacts on the surrounding community of a release of deadly and incurable viruses and toxins from the proposed laboratory besides anthrax.

105.2 2) The Threat and Vulnerability Analysis of the laboratory must be made available to the public. It is unacceptable for NIH to perform the analysis and then refuse to release it to those who will be impacted by a release into the community. We have a right to know about the potential threats to the laboratory, their potential impact, and how BU intends to mitigate them.

5/24/2005

LETTER 105

Watertown Citizens for Environmental Safety

105.1 See Response to Comment 78.2.

105.2 See Appendix 11, Executive Summary Threat and Vulnerability Analysis.

105.3 3) There should be an analysis of alternative locations for the laboratory. On what basis was the decision made to use the current location? BU has yet to provide a satisfactory answer to this most pressing question.

105.4 4) How will the laboratory comply with the city of Boston's ban on rDNA research in a BSL4 lab? Is it the position of the NIH that the type of research to be undertaken in the proposed lab supplants local legislation?

105.5 5) To date, there has been no analysis of a release of an agent within Boston during transport to the lab. Even the current premier labs such as Fort Detrick have had lapses in safety procedures, and there are documented cases of vehicular accidents involving commercial companies transporting these dangerous biological agents.

We were encouraged in early February when the NIH elected to release an SDEIS. At the same time, we are extremely disappointed that the SDEIS fails to account for some of the same pressing issues as the DEIS. In brief, the potential dangers from the bioterrorism lead us

105.6 to believe that NIH should withdraw the NIH grant to BU, and prepare a programmatic EIS for its entire biodefense program.

Thank you very much for the opportunity to comment.

Sincerely,
Michael Bishop
WCES Planning Committee Member

LETTER 105

Watertown Citizens for Environmental Safety

105.3 See Response to Comment 19.2.

105.4 As stated in Section 2.2.5.1 of the FEIS, any research that may be conducted in the proposed Boston-NBL would comply with all applicable Federal, state and local laws, including laws governing the use of recombinant DNA. It is not NIH's position that research that may be performed in the proposed Boston-NBL is exempt from municipal legislation.

105.5 See Response to Comment 4.7.

105.6 A Programmatic Environmental Impact Statement is not necessary to assess the potential environmental impacts of the various biocontainment facilities proposed to be either constructed by the NIH itself or partly funded by the NIH. The various proposed biocontainment facility projects are not located in the same geographic region, and the proposed projects' potential impacts are neither synergistic nor cumulative. The various projects are not so interrelated or connected that their possible environmental impacts cannot be considered independently. Moreover, the NIH's approval of one project does not commit the agency to approve the other projects. As required by NEPA, the NIH is conducting an environmental review for the various biocontainment facilities.

LETTER 106

Gary W. Walker

Local 103
OF GREATER
BOSTON

International Brotherhood of Electrical Workers
256 FREEPORT STREET • DORCHESTER, MASSACHUSETTS 0212
TELEPHONE: (617) 436-3710 FAX: (617) 436-3299
TOLL FREE: (800) 218-0075
WEBSITE: www.ibew103.com

May 12, 2005

Ms. Valerie Nottingham
NIH B13 / 2W64
9000 Rockville Pike
Bethesda, MD 20892

RE: Supplemental Draft Environmental Impact
Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

I write to you in support of the Bio-Safety Lab at Boston University Medical Center.

It is after attending countless neighborhood / citywide meetings that I come to my conclusion that this project is beneficial not only to the city of Boston, but to the state of Massachusetts and the nation as a whole.

It is a scary reality that we now need such facilities, but a reality all the same. The thought of an outbreak without a cure far outweighs any threat of accidental release and Boston University has proven to me, that this facility will be built and run safely with redundant systems and security procedures designed to keep us all safe.

This project will also create 1,300 construction jobs as well as 660 permanent jobs at a variety of skill levels. This will not only benefit our local economy short term, but long term as well by creating a new industry for generations to come.

Sincerely,

Gary W. Walker
Business Agent
Local 103, I.B.E.W.
Bio Lab Advisory Group

GWW/af

Recvd 5/16/05 - mac

LETTER 107

Beth Walsh

Nottingham, Valerie (NIH/OD/ORF)

From: Beth Walsh [beth_walsh@yahoo.com]
Sent: Wednesday, May 11, 2005 11:33 AM
To: NIH NEPA Comments
Subject: BUMC

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

Our community needs projects like the proposed biosafety laboratory. I have worked for many months in favor of this project.

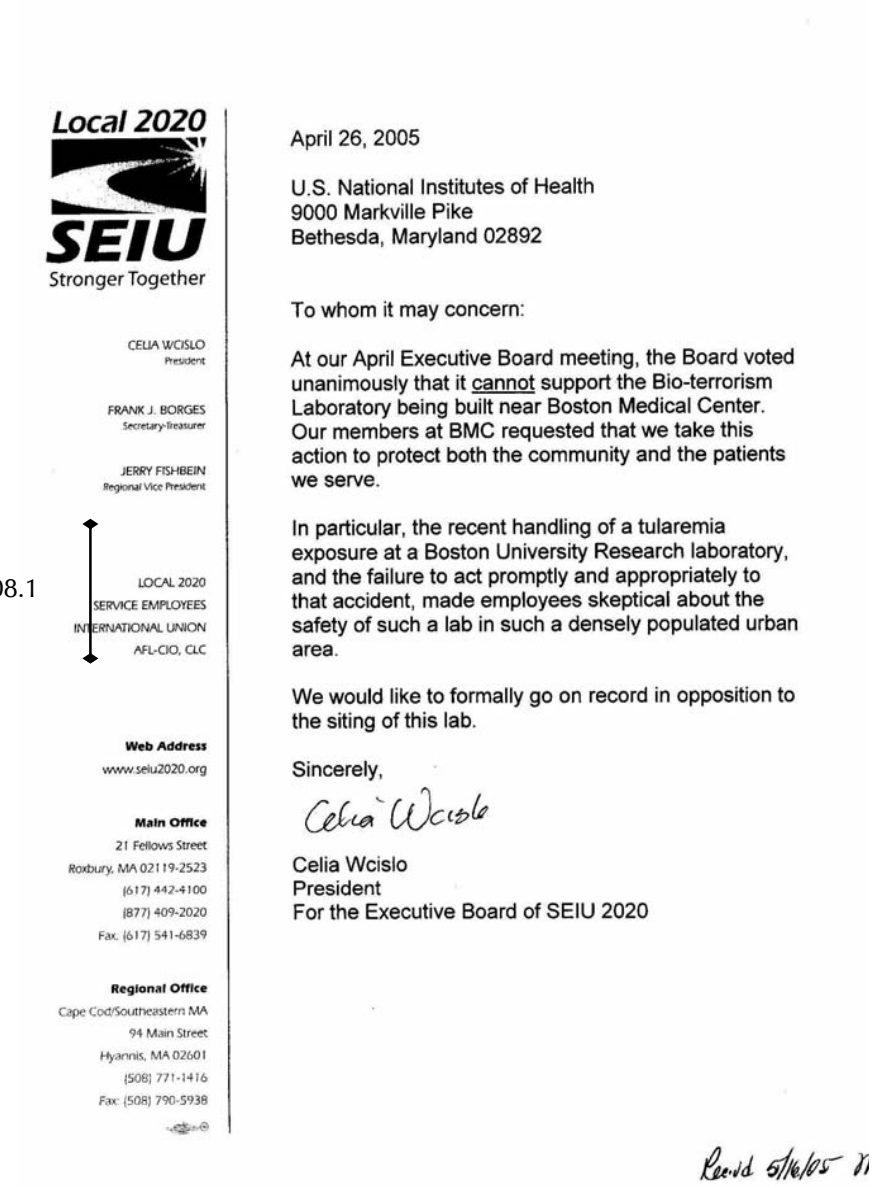
The biosafety lab will create jobs. Boston University Medical Center (BUMC) has said that 1300 construction jobs and 660 permanent jobs will be created. Our community needs these jobs.

In addition, BUMC has committed $1 million to training Boston residents to be lab technicians. The training will be part of the City Lab program. After nine months, the graduates are able to find meaningful jobs at a laboratory at the medical center or in a similar laboratory in the City. This will be a great partnership and illustrates BUMC's strong commitment to our community.

I support the Biosafety Lab.

Beth Walsh
Kenmore Community and Economic Development Corp.

5/11/2005



Local 2020
SEIU
Stronger Together

CELIA WCISLO
President

FRANK J. BORGES
Secretary-Treasurer

JERRY FISHBEIN
Regional Vice President

LOCAL 2020
SERVICE EMPLOYEES
INTERNATIONAL UNION
AFL-CIO, CLC

Web Address
www.seiu2020.org

Main Office
21 Fellows Street
Roxbury, MA 02119-2523
(617) 442-4100
(877) 409-2020
Fax: (617) 541-6839

Regional Office
Cape Cod/Southeastern MA
94 Main Street
Hyannis, MA 02601
(508) 771-1416
Fax: (508) 790-5938

April 26, 2005

U.S. National Institutes of Health
9000 Markville Pike
Bethesda, Maryland 02892

To whom it may concern:

At our April Executive Board meeting, the Board voted unanimously that it cannot support the Bio-terrorism Laboratory being built near Boston Medical Center. Our members at BMC requested that we take this action to protect both the community and the patients we serve.

In particular, the recent handling of a tularemia exposure at a Boston University Research laboratory, and the failure to act promptly and appropriately to that accident, made employees skeptical about the safety of such a lab in such a densely populated urban area.

We would like to formally go on record in opposition to the siting of this lab.

Sincerely,

Celia Wcislo

Celia Wcislo
President
For the Executive Board of SEIU 2020

Rec'd 5/16/05 JI

108.1

LETTER 108
Celia Wcislo

108.1 See Response to Comment 19.5.

LETTER 109

Donald A. Weiner, M.D.

May 6, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

RE: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab also known as the National Emerging Infectious Diseases Laboratory (NEIDL) proposed at Boston University Medical Center (BUMC).

As you are aware, biomedical research laboratories operate under strict procedures and protocols at BUMC and at other academic and private laboratories throughout the Greater Boston region. This research is done safely and makes important medical contributions to the nation and the world.

I am familiar with the design of the proposed laboratory at BUMC and believe that it is being designed and built using some of the most sophisticated and state-of-the-art safety and security systems. I firmly believe that BUMC has a deep commitment to ensuring the safety of the laboratory, the researchers and the community.

A BSL-4 laboratory will provide much needed capacity to study emerging infectious diseases and will be very beneficial for scientists and researchers throughout the region who are looking for cures and vaccines for some of the world's deadliest diseases. This laboratory will safely conduct research on infectious diseases that threaten the safety and security of our city, of the nation and indeed, of the world.

This laboratory will be an important project for the research community and those interested in finding cures for emerging infectious diseases and I fully support it.

Sincerely,

Donald A. Weiner, M.D.
Professor of Medicine
Boston University School of Medicine

DAW/jf
cc: file

Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

It is now time to Just Say No.

Sincerely,

PAUL WIERS
10 CLAFLIN RD.
BROOKLINE, MA.
02445

110.1
110.2
110.3
110.4

LETTER 110

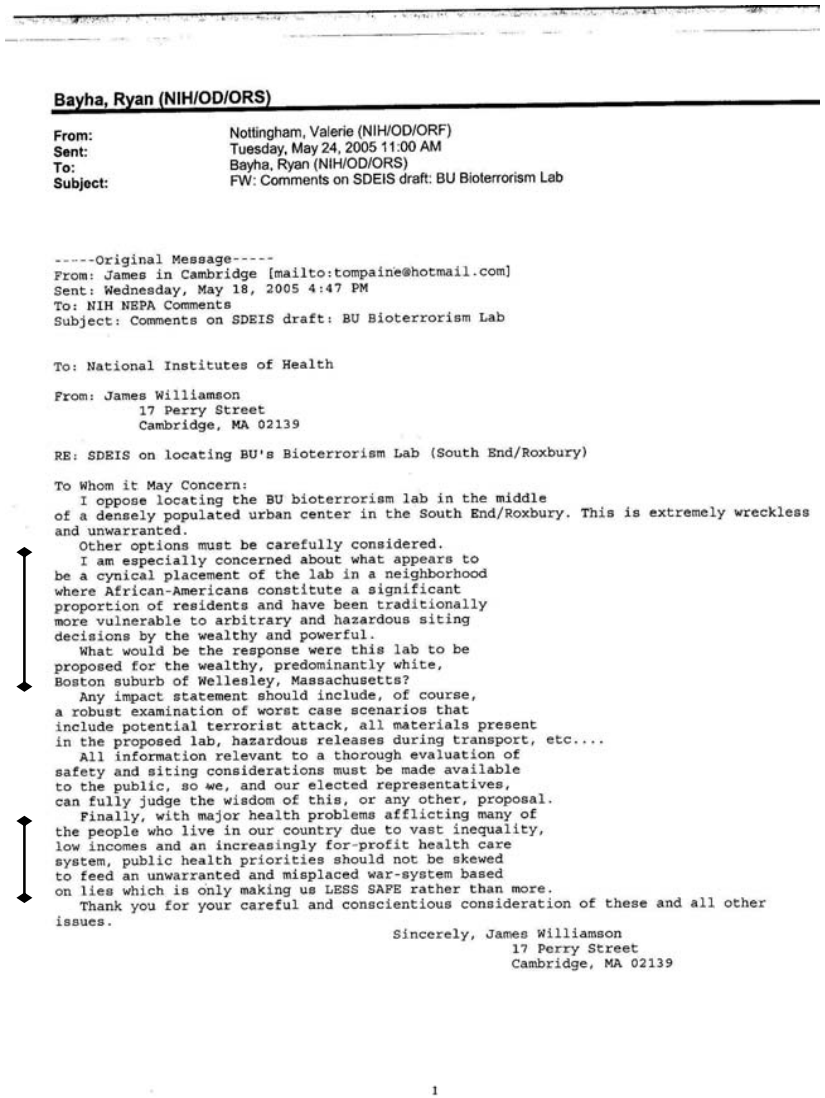
Paul Wiers

110.1 See Response to Comment 1.1.

110.2 See Response to Comment 1.2.

110.3 See Response to Comment 1.3.

110.4 See Response to Comment 1.4.



Bayha, Ryan (NIH/OD/ORS)

From: Nottingham, Valerie (NIH/OD/ORF)
Sent: Tuesday, May 24, 2005 11:00 AM
To: Bayha, Ryan (NIH/OD/ORS)
Subject: FW: Comments on SDEIS draft: BU Bioterrorism Lab

-----Original Message-----
From: James in Cambridge [mailto:tompaine@hotmail.com]
Sent: Wednesday, May 18, 2005 4:47 PM
To: NIH NEPA Comments
Subject: Comments on SDEIS draft: BU Bioterrorism Lab

To: National Institutes of Health

From: James Williamson
17 Perry Street
Cambridge, MA 02139

RE: SDEIS on locating BU's Bioterrorism Lab (South End/Roxbury)

To Whom it May Concern:
I oppose locating the BU bioterrorism lab in the middle of a densely populated urban center in the South End/Roxbury. This is extremely wreckless and unwarranted.
Other options must be carefully considered.
I am especially concerned about what appears to be a cynical placement of the lab in a neighborhood where African-Americans constitute a significant proportion of residents and have been traditionally more vulnerable to arbitrary and hazardous siting decisions by the wealthy and powerful.
What would be the response were this lab to be proposed for the wealthy, predominantly white, Boston suburb of Wellesley, Massachusetts?
Any impact statement should include, of course, a robust examination of worst case scenarios that include potential terrorist attack, all materials present in the proposed lab, hazardous releases during transport, etc....
All information relevant to a thorough evaluation of safety and siting considerations must be made available to the public, so we, and our elected representatives, can fully judge the wisdom of this, or any other, proposal.
Finally, with major health problems afflicting many of the people who live in our country due to vast inequality, low incomes and an increasingly for-profit health care system, public health priorities should not be skewed to feed an unwarranted and misplaced war-system based on lies which is only making us LESS SAFE rather than more.
Thank you for your careful and conscientious consideration of these and all other issues.

Sincerely, James Williamson
17 Perry Street
Cambridge, MA 02139

1

111.1

111.2

LETTER 111

James Williamson

111.1 See Responses to Comments 4.5 and 19.2.

111.2 The federal funding that would be used for the proposed facility is earmarked for biotechnology research not direct public health care.

April 25, 2005

Valerie Nottingham
NIHB13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Dear Ms. Nottingham,

As a resident of the Greater Boston community, I do not believe that the supplemental environmental impact statement (SDEIS) concerning Boston University's proposed biolab seriously addresses my concerns. It was not prepared by an organization independent of Boston University, which renders it irretrievably flawed. It correctly states that the area surrounding this lab faces a "growing challenge of housing affordability," but nowhere does it give a hint as to how such a lab would do other than exacerbate this problem by taking up valuable space. In addition, it gives precious little reassurance to those who DO live in the area that a realistic worst case scenario has been imagined or dealt with in any serious fashion.

112.1

112.2

112.3

It would, of course, be impossible to guarantee immunity to human error in such a project. Human error is inevitable (check out the news on the Big Dig), but when the consequences include possible exposure to deadly, incurable pathogens (e.g., Ebola. anthrax, hemorrhagic fever, plague) any risk is unacceptable.

112.4

It is now time to Just Say No.

Sincerely,

Dr. Nancy Lee Wood
74 Purchase Street
Taunton, MA 02780

LETTER 112

Dr. Nancy Lee Wood

112.1 See Response to Comment 1.1.

112.2 See Response to Comment 1.2.

112.3 See Response to Comment 1.3.

112.4 See Response to Comment 1.4.

LETTER 113

Linda Woodbury

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab at BUMC.

When I first heard about the laboratory, I must admit I was a bit apprehensive. However, the staff at Boston University Medical Center took the time to address my concerns and answer all my questions about the project.

I feel that this lab is important to find cures for infectious diseases. We need to have the appropriate facilities to do this important research. I believe that this lab will be built safely and that the redundant systems and the security plans will ensure that we are all safe.

Also, the development of this laboratory will create 1,300 construction jobs and 660 permanent jobs—jobs at all levels. This lab will have a positive economic impact at all levels in our community.

Sincerely,

Linda Woodbury

LETTER 114

Vassilis I. Zannis

Nottingham, Valerie (NIH/OD/ORF)

From: Vassilis I. Zannis [vzannis@bu.edu]
Sent: Tuesday, May 03, 2005 3:56 PM
To: NIH NEPA Comments
Cc: klempner@bu.edu
Subject: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I write to you in support of the Biosafety Lab also known as the National Emerging Infectious Diseases Laboratory (NEIDL) proposed at Boston University Medical Center (BUMC).

As you are aware, biomedical research laboratories operate under strict procedures and protocols at BUMC and at other academic and private laboratories throughout the Greater Boston region. This research is done safely and makes important medical contributions to the nation and the world.

I believe that the NEIDL at BUMC will be one of the safest laboratories in the world. I have been briefed on the systems and the design and am familiar with operations in biomedical research laboratories. I am impressed by the building's safety and security features and by the team BUMC has assembled to build this important project.

I should also note that there are some who have incorrectly raised the city of Boston's rDNA regulations, as a reason the laboratory should not be built. This is simply misinformation. rDNA research is conducted in Boston under the Boston Public Health Commission's regulations. On numerous occasions, BUMC authorities have stated that they will do all research in compliance with the Health Commission's guidelines.

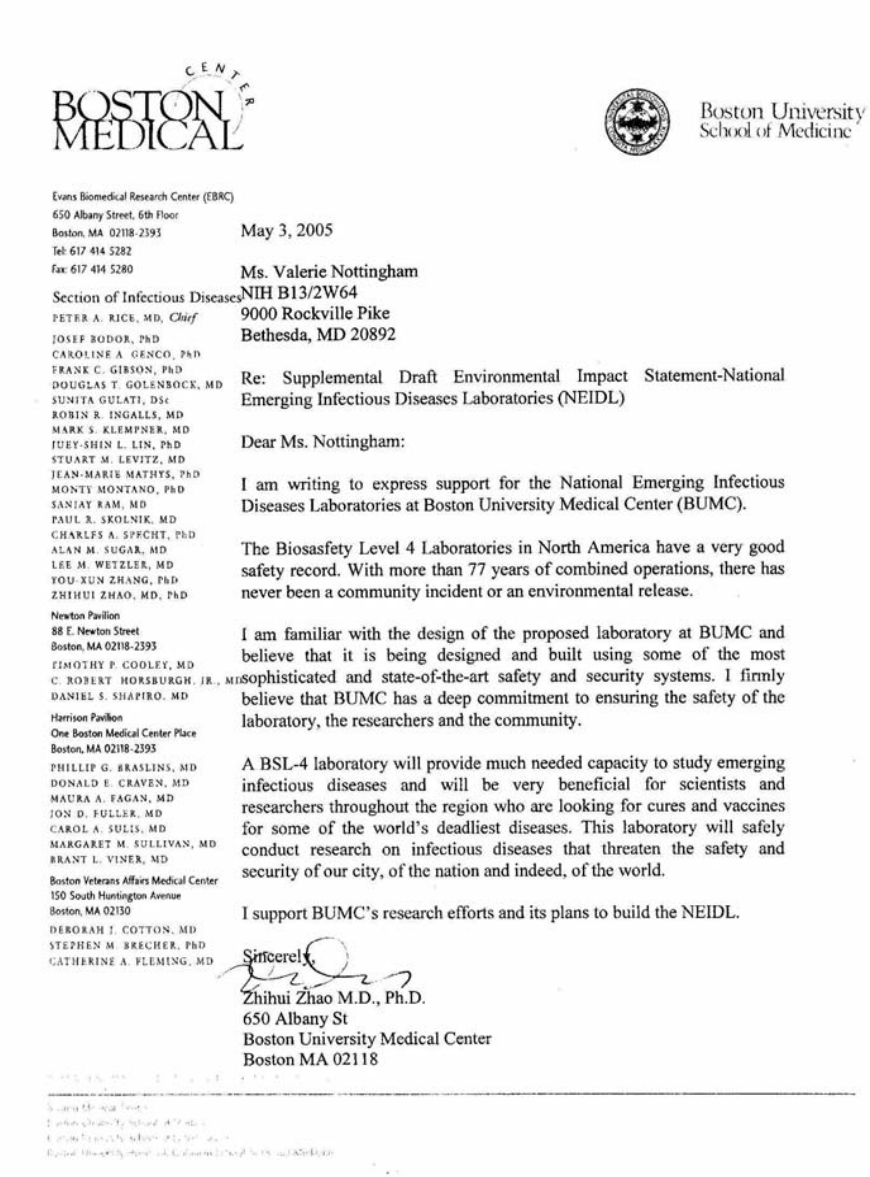
This laboratory will be an important project for the research community and those interested in finding cures for emerging infectious diseases and I fully support it.

Sincerely,

Vassilis I. Zannis
Professor, Medicine/Biochemistry
Director, Molecular Genetics

Section of Molecular Genetics
Boston University School of Medicine
715 Albany Street, W-509
Boston, MA 02118-2394
T: 617/638-5085
F: 617/638-5141

5/4/2005



BOSTON MEDICAL CENTER

Boston University School of Medicine

Evans Biomedical Research Center (EBRC)
650 Albany Street, 6th Floor
Boston, MA 02118-2393
Tel: 617 414 5282
Fax: 617 414 5280

Section of Infectious Diseases
PETER A. RICE, MD, *Chief*
JOSEF BODOR, PhD
CAROLINE A. GENCO, PhD
FRANK C. GIBSON, PhD
DOUGLAS T. GOLENBOCK, MD
SUNITA GULATI, DSc
ROBIN R. INGALLS, MD
MARK S. KLEMPNER, MD
JUEY-SHIN L. LIN, PhD
STUART M. LEVITZ, MD
JEAN-MARIE MATHYS, PhD
MONTY MONTANO, PhD
SANJAY RAM, MD
PAUL R. SKOLNIK, MD
CHARLES A. SPECHT, PhD
ALAN M. SUGAR, MD
LEE M. WETZLER, MD
YOU-XUN ZHANG, PhD
ZHIHUI ZHAO, MD, PhD

Newton Pavilion
88 E. Newton Street
Boston, MA 02118-2393
TIMOTHY P. COOLEY, MD
C. ROBERT HORSBURGH, JR., MD
DANIEL S. SHAPIRO, MD

Harrison Pavilion
One Boston Medical Center Place
Boston, MA 02118-2393
PHILLIP G. BRASLINS, MD
DONALD E. CRAVEN, MD
MAURA A. FAGAN, MD
JON D. FULLER, MD
CAROL A. SULIS, MD
MARGARET M. SULLIVAN, MD
BRANT L. VINER, MD

Boston Veterans Affairs Medical Center
150 South Huntington Avenue
Boston, MA 02130
DEBORAH J. COTTON, MD
STEPHEN M. BRECHER, PhD
CATHERINE A. FLEMING, MD

May 3, 2005

Ms. Valerie Nottingham
NIH B13/2W64
9000 Rockville Pike
Bethesda, MD 20892

Re: Supplemental Draft Environmental Impact Statement-National Emerging Infectious Diseases Laboratories (NEIDL)

Dear Ms. Nottingham:

I am writing to express support for the National Emerging Infectious Diseases Laboratories at Boston University Medical Center (BUMC).

The Biosasfety Level 4 Laboratories in North America have a very good safety record. With more than 77 years of combined operations, there has never been a community incident or an environmental release.

I am familiar with the design of the proposed laboratory at BUMC and believe that it is being designed and built using some of the most sophisticated and state-of-the-art safety and security systems. I firmly believe that BUMC has a deep commitment to ensuring the safety of the laboratory, the researchers and the community.

A BSL-4 laboratory will provide much needed capacity to study emerging infectious diseases and will be very beneficial for scientists and researchers throughout the region who are looking for cures and vaccines for some of the world's deadliest diseases. This laboratory will safely conduct research on infectious diseases that threaten the safety and security of our city, of the nation and indeed, of the world.

I support BUMC's research efforts and its plans to build the NEIDL.

Sincerely,

Zhihui Zhao M.D., Ph.D.
650 Albany St
Boston University Medical Center
Boston MA 02118

LETTER 115

Zhihui Zhao M.D., Ph.D.

PUBLIC MEETING

National Institutes of Health Public Comment Meeting on the Supplemental Draft EIS for the National Emerging Infectious Diseases Laboratory Meeting

Jamie Fay: Good evening, and welcome to historic Faneuil Hall. My name is Jamie Fay, and I'm president of Fort Point Associates, an environmental consulting and urban planning firm located here in Boston. Tonight we're here to give you a brief overview of the proposed National Emerging and Infectious Diseases Laboratory, and to listen to your thoughts and concerns regarding the Supplemental Draft Environmental Impact Statement filed for the project under the National Environmental Policy Act Review Process, also known as NEPA. I would also like to remind everyone that a Spanish translation service is available, and headphones may be obtained in the rear of the room.

With me here tonight are Dr. Mark Klempner, Associate Provost for Research, who will discuss the purpose and need for the facility, and Kevin Touhey, Executive Director of Operations and Public Safety, who will discuss the safety and security features of the building. Together, we will provide you with a brief summary of the NEPA process, an overview of the project, and then provide an extensive opportunity for comment.

I would like to remind everyone that this forum is not a debate or panel discussion. The purpose of the meeting is to simply hear comments on the supplemental draft EIS from the public, and we ask for your cooperation in providing everyone the opportunity to speak and be heard. The meeting is being transcribed, so please be sure to state your name and address clearly for the record. We will ask you to be as concise as you can be, so that everyone can have an opportunity to participate.

The building does close at 9:00 p.m., and to meet this deadline we'll have whoever is in line to speak at 8:45, will be allowed to speak, but that will be the end.

Let me begin by giving you a summary of the NEPA review process, an explanation of where we are, and a description of the next steps in this process.

The National Institutes of Health, which is part of the Department of Health and Human Services, has funded the proposed project. The National Environmental Policy Act requires that all major federal actions with potential for significantly effecting the human environment, be reviewed and evaluated prior to final action by the federal government. In the case of this project, the funding provided by the National Institutes of Health, or NIH, is considered to be a major federal action. Valerie Nottingham, Chief of the Environmental Quality branch of the NIH, is here with us tonight to hear your comments.

The goals of NEPA are to provide full disclosure of any environmental impacts; to consider reasonable alternatives that would avoid and minimize impacts, and to encourage public participation.

Last January, the NEPA process commenced with the publication of a Notice of

Intent to prepare an Environmental Impact Statement. Public hearing on the scope of the EIS was held on February 17 of 2004. Based on the oral and written comments received during the scoping process, a draft Environmental Impact Statement was prepared. This document was filed with the EPA and noticed in the Federal Register last October. The public hearing that many of you came to, was held on the draft EIS in November of 2004. Based on the comments received during the comment period, NIH decided to prepare a Supplemental Environmental Impact Statement. The availability of the supplemental draft EIS was noticed in the Federal Register on April 1st of 2005, and tonight we're holding a public meeting to solicit oral comments on the document.

The NEPA process allows for consideration of a broad range of social, economic and environmental concerns to be evaluated. The Supplemental Draft EIS addresses these concerns in detail. Tonight, we would like to hear your thoughts and comments about the document. Written comments may also be sent to Valerie Nottingham by mail or e-mail at the address listed in the handout. I hope all of you have had a chance to pick up a handout, if not, there should be more at the back with the address to send comments to Valerie Nottingham through the end of May 18, 2005.

Following the close of comments on the supplemental draft EIS, a final EIS will be prepared. All comments on the supplemental will be included in the final EIS when it's published this summer. Following the review of the final EIS, a Record of Decision will be issued by NIH on the proposed project.

The Supplemental DIS provides greater detail on a number of issues in response to comments filed on the draft EIS. In particular, the document provides a discussion of alternative sites for the facility, expands the area evaluated for environmental justice issues, and provides more detail on the cumulative effects of this project in concert with other planned development projects.

With that brief overview of the NEPA process, we'd like to provide you with a description of the project.

For those who may not be familiar with the project, the proposed building is located on Albany Street in Boston's South End. The building is cited on the Boston University medical campus near the Southeast Expressway.

The proposed building is shown on this site plan as Building F, and is to be constructed within the Phase II expansion area of the Biosquare Research Park. The Biosquare Research Park is the City of Boston's only research park dedicated to the biological sciences. The park has five buildings completed or under construction, with an additional parking garage to be commenced shortly.

The [Needle] Project is being developed to provide a state of the art facility for medical research on drugs, vaccines and diagnostics for infectious diseases. The facility will

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be owned, operated and managed by the Boston University Medical Center. This slide depicts the current design for the building, which reflects the cutting-edge research going on inside the building, while maintaining the rigorous structural building systems and security measures required for its operation. The building will be seven stories high, plus a penthouse. The building will be set back 150 feet off Albany Street to provide for a secure perimeter. The building will house 195,000 square feet of research space, administrative space, and support space. The total cost of the project is projected to be $178 million dollars. The NIH has awarded a grant of $128 million for this facility, and Boston University and Boston Medical Center will each provide an additional $25 million in funding.

With that brief overview, I'd like to turn it over to Dr. Mark Klempner to describe the important research goals for this endeavor.

Mark Klempner: Thanks Jamie, and thank you all for coming. One of the most dynamic areas in medicine are infectious diseases. And the reason that this area is so dynamic is that it involves the interaction of two entities: human beings and infectious agents, and these are constantly evolving, and as a result of that, we come and encounter infectious agents to which we've never seen, or we have no immunity against, and it is these infectious agents which cause more suffering and more deaths across the world than any other type of medical conditions that we're aware of.

Shown on this slide are three types of infectious diseases, three general categories of infectious diseases, to which this research institute will be dedicated. They include some newly emerging infectious diseases. Shown here in a slide that was put together by the Director of the National Institute of Allergy and Infectious Disease, Dr. Anthony Fauci, and in these dots over here, we see some newly emerging infectious diseases. And you can't pick up the newspaper without recognizing some of these, such as SARS, and West Nile Virus, and many other newly emerging infectious diseases.

In addition to these, there are some reemerging infectious diseases like influenza. We see new strains of influenza, new ability of influenza to cross species barriers, and we are greatly vulnerable. And the WHO has recently listed Avian Influenza as one of the greatest risks for a huge pandemic of disease around the world.

We also are aware, through events that happened in October and November of 2001, that there are infectious agents that can be used as agent of terror, and all three of those type of infectious diseases are the goals to create mitigating factors, vaccines, treatments, and understand these diseases so that we can protect the American public, and translate that research for protections to people all over the world.

I'd like to just share with you one example, and some consequences of that example. West Nile Virus is a virus that is present in Africa, was not present in the United States until the first bird was noticed to die in 1999. In a matter of four short years, that one bird that was originally found in Long Island, that virus spread all across America, and all of these now are,

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there are no blue and red states here, they were all blue states, because they all became infected and we see West Nile Virus throughout the United States now. And in that four year period, there were about 20,000 cases of West Nile Virus, there were about 600 deaths, and economically, the toll has been enormous.

We are now needing to test every single unit of blood that you donate to be transfused in the United States for West Nile Virus, because it's one of the viruses that can be transmitted and can be lethal, especially to people who are immuno-compromised, like transplant recipients. So there is a huge human cost, a huge animal cost, and there is a huge economic cost when a new emerging infectious disease does not have a good diagnostic, a good vaccine, or a good treatment.

We know the path to follow in order to address these kinds of newly emerging and reemerging infectious diseases, and it is to combine the brain power of a city like Boston, and the other many academic institutions with which we'll work, with that of industry up here, in order to come out at the end of this pipeline with new vaccines, new therapies, and new diagnostics. You all are the beneficiaries of this kind of research, largely funded by the National Institutes of Health, to do this academic part of the work, and then to partner with industry in order to reach the successful goals.

In order to make a more coordinated national effort to combat these newly emerging infectious diseases and reemerging infectious diseases, a network has been set up under the auspices of the National Institutes of Health, and the National Institute of Allergy and Infectious Diseases, and this network has several components. It has one component called Regional Centers of Excellence, one of them located in each of the public health service regions of the United States, and the one that is in Region I, which is what public health service region we're in, is led by Harvard University, of which all of the other universities in the area participate.

There are similar regional centers for excellence located at all of these green dots around the country, and there are support labs to make the work of these regional centers of excellence able to be done safely, and they include some regional bio-containment labs which will have biosafety Level II and Level III labs in them, and in addition, two national bio-containment labs were awarded out of this program, one in Galviston Texas at the University of Texas Medical branch, and the other one at Boston University. And this is the network that has been put together under the auspices of the National Institute of Allergy and Infectious Diseases to combat these emerging and newly emerging infectious diseases.

One of the reasons that we're here, is because Boston was the proud recipient of this laboratory, and questions, I think, that were asked of us during the application process included why should this be put in Boston? I think it's worth remembering that Boston is really a biomedical research hub. We have four medical schools here, we have some of the best hospitals in the world, we are the lucky participants in that. One of the major parts of our economy is biomedical research, as well as the educational institutions that underpin them, and it is, I believe, a major reason why Boston was chosen for this, and why Boston University was

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chosen as well.

Boston University also has a long and proud tradition of infectious diseases research. It was one of the first places to study and treat patients with tuberculosis and sexually transmitted diseases. It right now has the largest care group for patients with HIV in the city, and it continues to have a long tradition of biomedical research in infectious diseases.

Finally, I'll just end this part by saying that there has been a detailed analysis of many sites that were available to locate this laboratory, and I think the collective wisdom was that this was the premiere location to do this kind of research to benefit the nation's and the public's health. Thank you very much.

I'm going to turn this over now to Kevin Touhey, who is going to review some of the safety and security with relationship to the National Biocontainment Lab.

Kevin Touhey: Thank you. What you see in front of you is a slide that depicts the different labs that are out there in North America, their years of experience working with BL IV labs, and the bottom line comes down to a 77 year history with no negative impacts on the community, no environmental releases.

I want to tell you a little bit about the construction of this lab, but I also want to point out that one of the reasons that this lab works well at Boston University is because we have the infrastructure at this site. We have utility infrastructure, we have manpower, we pride ourselves on being prepared for anything that could occur within the city. Boston University Medical Center is the largest trauma center in New England, and so it's consistent with what we do to treat all sorts of things, and to respond to all sorts of things.

This particular project involves architectural, involves construction design engineering folks that have experience working on BL IV labs. They're working under guidelines that are new, and that are stricter than any other labs that [have] built under.

The construction of the project includes systems like hepifilters, it includes decontamination systems, and what it really results in is everything leaving the building leaves cleaner than when it came in. The building is designed to use negative air, and so as you move throughout different areas within labs, air is pulled away from the routine areas, into the most dangerous areas, into the hot labs, and then is hepifiltered out through redundant systems. We have set up utility delivery systems that are N plus One, and allow us to have redundancies upon our redundancies. This is essentially a submarine within a vault; it's all air tight.

This is a site plan, and what you see in the blue dots around the outside is the 150 foot setback. We've created a secure perimeter. It's in accordance with federal guidelines. It will allow us to make sure that we don't have any threats or risks coming near the building, and we'll reinforce that with the types of devices you see around the sides, including [bollards] and CCTV security officers, and iris scans. So our card access and our iris scan systems will insure only the appropriate people are in the building.

The risk assessment, the worst case scenario that we did, involved a release of anthrax

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from the building. It was a release that included a complete failure of mechanical systems. We used three different methodologies to test this, and under all three of the methodologies, we ended up with a result that was less than one spore being released at the worst possible area.

To cap off what I'm talking about, our plans at the medical center include very active and ongoing emergency response and planning situations. We work with BFD, with BPD, with BIMA. We test our response plans all the time. We have a brand new million dollar command and control center. We have 130 people that routinely address these types of safety and security concerns. Thank you.

Jamie Fay: Thank you Kevin, and thank you Dr. Klempner. We would now like to begin the public comment portion of this meeting. As noted, we are here to listen to your comments on the supplemental draft EIS. This is not a question and answer session. In order to provide everyone who wishes the opportunity to speak, we are limiting comments to three minutes or less. There is a timer here up front which will give you a green light for two and a half minutes, then a yellow light for 30 seconds, and we ask you to please conclude your comments when the yellow light comes on.

Comments of any length may be submitted in writing or by e-mail to Valerie Nottingham at the address on the hand-out. This meeting is being transcribed and recorded, so we ask each speaker to clearly state your name and address for the record before speaking. And with that, we'll begin. There is a microphone in the aisle, and those who wish to speak may line up and speak in turn.

Elaine Simmons: My name is Elaine Simmons, and I live at 49 East Springfield Street in the South End of Boston, approximately five or six blocks from where this facility is proposed to be built, and I'm still opposed to the facility being built there. I don't need to hear about the spread of the West Nile Virus, because I think most people agree that a facility of this type needs to be built, not just in that location.

C.1 The first question I have is why did Harvard Medical School vote not to have this facility, not to bid on this facility? I think because they recognize it shouldn't be in the City of Boston.

The next thing I have to say that this facility has been, the process has been one of deceit and intimidation. For instance, I don't know why we need ten or twelve cops outside of Faneuil Hall. I've lived in Boston all my life, and the only time I've ever seen this is when this particular facility is being discussed. [Applause] If it's not BU, it's the city and they are disrespecting us. I have never broken a law in my life, and I certainly wouldn't over this particular facility.

Another instance of the campaign of intimidation, is when they had a meeting at BU that I went to with their own employees and some of the public, and they had a security guard

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C.1 Harvard Medical School is the site of the New England Regional Center of Excellence. NIH cannot answer why Harvard did not apply; only Harvard Medical School would be able to respond to this comment.

with a gun outside of the meeting, and then they had some security thugs inside of the meeting. I don't know why. I don't know who they think we are. Apparently, they don't trust the validity of their own position, that they have to try to force people by intimidation. The campaign of deceit comes in where, for instance, they started their first public meeting in January of 2003 according to this document, yet they didn't meet with the abutting neighborhood association until January of 2004, and that's when we first found out about it.

Also, in addition, for the BRA, they submitted signatures of I don't know how many people. They weren't even honest with that. What they did basically, one of the trustees or prior trustees of BU submitted a letter in support, and didn't even identify himself as such. These people don't trust themselves.

In addition, they have this community process of the BLAG, or the Biolab Advisory Group. I would say a third to half of the people have never shown up, and these are people who are just looking for something from the city for their development projects. So when you talk about a community process, it's been a sham.

In addition, when you talk about other alternatives, and other alternatives wouldn't result in an efficiency of capital expenditures and labor, all I can say is they should tell those evildoers in Washington that if they didn't give tax breaks to their wealthy friends, they would have money for projects like this.

Jamie Fay: Thank you very much. Next speaker, please?

Carrie Shneider: Good evening. I'm Carrie Shneider. I'm an attorney from the Conservation Law Foundation. NIPA requires analysis of feasible alternatives. There are feasible alternative locations for this lab. In violation of NIPA, the SDEIS fails to analyze these alternatives. The SDEIS attempts to justify this failure, due to the conclusion the proposed location is preferred. That determination should be made after, not before, analysis of alternatives.

C.2

Given what the SDEIS calls "negligible risks of very great harm" the value of the convenience of proximity to BU and Harvard, and other such benefits of the proposed location, should not trump analysis. Convenience should be given some weight, but only due weight. We can't weigh alternatives if they are not analyzed.

C.3

Tularemia incidents were kept quiet, and now the SDEIS maintains BU's refusal to even evaluate alternative locations. Comply with NIPA. Provide the analysis of alternative locations needed to evaluate the appropriate citing of the lab. Thank you.

C.4

Jamie Fay: Thank you. Next?

Bruce Bickerstaff: Yes. My name is Bruce Bickerstaff. I live at 11 Carlisle Street in the community of Roxbury, and I'd like to make a general statement that relates to this project.

It was stated earlier by Kevin Touhey that this is a state of the art project, and the

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C.2 See Response to Comment 4.10.

C.3 See Response to Comment 19.2.

C.4 See Response to Comment 19.5 regarding the tularemia incident. An alternative siting analysis is provided in Section 2.3.2.

As discussed in Section 2.3.2, BUMC evaluated alternative locations to site the laboratory as part of its decision-making process to proceed with submitting a response to the Department of Health and Human Services Broad Agency Announcement issued on October 15, 2002.

young lady who just preceded me, some of her complaints, I believe, can be addressed in our ongoing development of oversight, security, and established protocols.

One of the things I believe that this project will allow us to do is us, being the community of Boston and the region in which we sit, is to put all of our energies together to maintain, to develop and maintain strong oversight, and as well protocols, to help prevent the issues that were just spoken to. And I'd like to say for the record, I personally am in favor of the project. Thank you.

Jamie Fay: Next, go ahead.

Peter Merkel: Good evening. My name is Dr. Peter Merkel. I live at 36 [Helen] Road in Newton, Massachusetts. I am a clinician and clinical researcher here in Boston at Boston University. I am here to support this project for the many, I think exciting and important scientific advances it is likely to provide. I am familiar with the plan, both scientifically and logistically, and I think it is a sound and really an exciting one.

There is a need for this level of Biosafety Laboratory nationally, and there is a need for the many other aspects of infectious disease research that will be done in this laboratory. I think it's important for people to recognize this is a multi-functional laboratory that will do a lot of different exciting emerging infectious disease work. I am not in infectious diseases, but I deal with complex autoimmune diseases, and I can tell you that the kind of collateral benefit you get from this kind of scientific inquiry is often enormous. And it is only through the kind of concentrated and concerted large projects, combining the resources of BU, and Harvard, and Tufts investigators, all of whom will certainly be part of the scientific community in this laboratory, that the United States tends to make huge advances in biomedical research. I think that the resources available here will be exciting to the entire biomedical community in Boston, but really also help the whole community and the nation, as we answer some very serious problems.

It's not just West Nile or HIV, but it's the next virus, and it's even more common ones like influenza, and all of the viruses that we don't yet know what causes these different diseases and I think we'll learn, certainly in my field, we will. I know the people who have been involved in putting this together, and I think they're a responsible and respected group of people. So I strongly support this as a clinician, and as a member of the research, and also just someone living in Boston. Thank you.

Jamie Fay: Thank you. Next speaker, please.

Howie Rutman: Yes, I'm Howie Rutman. I live at 30 [Vanwinkle] Street in Dorchester, Massachusetts. I've been at the Boston Medical Center as an employee there for 33, almost 34 years now. I am currently an employee at the Boston Medical Center.

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I'm a member of the Service Employees International Union. I'm on the Executive Board of the statewide union, also the chapter chair of the East Newton Pavilion at Boston Medical Center. So I represent people at Boston Medical Center as a chapter leader, and also state-wide for SEIU, and I'm speaking for that union recently took a stand against the Level IV Biocontainment Lab this Wednesday, April 20. Officially, we are taking a stand in opposition to it.

So SEIU Local 2020 is also working with ASCME Local [149] which has taken a stand, which is also the union at Boston Medical Center representing employees there, in addition to the Massachusetts Nurse's Association. So you can say that the majority of people in organized labor that work for Boston Medical Center are opposed to the Level IV lab for many reasons which we've talked about before in other forums, largely health and safety issues.

You know, as union people we're very concerned about the health and safety issues concerning employees, and also people that live in the community, the same community that I live in, Dorchester, the South End, Roxbury, and the Boston area. The people that work at Boston Medical Center live in those communities. They are mostly from those communities, and those are the communities that we serve.

C.5

We're concerned about Dr. Klempner's statement that the reason for the lab is because of what happened in 2001, and for the same reasons, it does pose a health and safety problem. Because it was within the Biodefense Program itself that the weaponized anthrax was released. So we have a lab that basically could do the same, it's a Trojan Horse that could do the same thing that happened in 2001, September 18th, 2001, or almost the same time as the attack on the Twin Towers.

The people that did it, that distributed the weaponized anthrax haven't been caught, they could even be hired at the laboratory due to the type of programs that they're involved in, similar to what was going on before [inaudible] that led to the weaponized anthrax attacks on the American public, the postal system; anthrax sent out in diplomatic pouches overseas, yet the perpetrator was never caught.

So the worst case scenario that's talked about talks about an unintentional release of anthrax, but it doesn't speak to what happened in September of 2001, the fact that the perpetrator was never caught.

Jamie Fay: Thank you very much.

Howie Rutman: Thank you.

Andrea Rabara: [Speaks Spanish].

Translator: My name is Andrea Rabara. My address is 103 Alexandra Street, Dorchester. I support the project. Thank you.

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C.5 The need for the laboratory is detailed in the NIAID strategic plan for biocontainment and emerging infectious diseases research.

Maria Bossa: My name is Maria Bossa, 8 [Norman] Street, Dorchester. I approve your program. [Speaks Spanish]

Translator: I support the program, and I congratulate the physicians who are doing all this work for us, the people who are ill. Thank you.

C.6

Elizabeth Leonard: My name is Elizabeth Leonard. I live at 5 [Wilbur] Court in East Boston, Massachusetts. And I think the thing that concerns me most is that this Bio IV lab is going to be placed in the most densely populated part of Boston. And not only that, it is one of the poorest communities. And these people are terribly over-stressed already. I think the whole psychological thing of yet another thing that they have to worry about. They've just found out that a lot of their children are experiencing some reverberations from lead poisoning. This is something that doesn't happen very often in a middle class or upper middle class community. They have nine garbage dumps within the area of their living situations, to say nothing of cement factories, and that kind of thing.

The pollution is already bad, and for most of these people, to have yet one more stressor, they have poor schools, they have-- I live in a poor community myself, and I know the garbage pick-up is much less than it was when I was living in Beacon Hill. On Beacon Hill we got garbage pick-ups three times a week. We're very lucky to get it once a week in East Boston and in other parts that are equally as poor.

And I think, for instance, during the snowstorm, it was three weeks before we had garbage pick-up, and the whole place was one big mass of illnesses waiting to happen.

I am very concerned, because a lot of these people do not have health insurance, and they have to go to public clinics. And if you've ever sat for a whole day in a public clinic waiting to be heard, and then sent some other place because they can't take care of you, or you don't have the right credentials, or especially because you don't have health insurance, it just makes for an environment that is really hard on people. And I think that the idea of putting it there, even though BU probably has what they think is state of the art resources, they need to think again.

That's what worries me, is that people are worried more about the reputation of our scientific community, than they are about the people living there. Thank you.

Chris Brayton: Good evening. I'm Chris Brayton, 3 Haven Street, South End. I live a good five minute walk from the site of the Level IV lab. I am in favor of it. I have listened in all of the meetings; I have been to almost all of them. I believe that they are setting their sights and plans to do the very best job possible. I believe that it is something that is needed; that we have got to have a way of fighting the emerging and reemerging diseases.

I do not believe that it will adversely affect that area of the South End. That is already

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C.6 The Boston-NBL is sited adjacent to the economically diverse South End neighborhood, has a higher per capita income than most parts of the City of Boston and is close to the state average. BUMC has been active in improving the quality of life and quality of health care throughout the City of Boston.

a fairly wealthy area in lieu of what was just said, [with] the houses selling for an awful lot per square foot, $600 plus dollars per square foot. And that's it. I'm in favor.

Jamie Fay: Next please.

Aordneia Lopez: [Speaks Spanish]

Translator: My name is Aordneia Lopez. I live at 418 Columbia Road, and I'm here to support this project.

Jamie Fay: Next speaker, please?

David Mundel: My name is David Mundel. I live in Boston's South End. This evening I want to address my comments to basically two questions. First, does the Supplemental Draft Impact Statement address the issues raised during the public comments, and second, does the Supplemental Draft Impact Statement demonstrate, as it states repeatedly, that quote "the risk of public harm is so minute, it can be considered or described as zero."

The brief answer to both these questions is, regrettably, no. First, with respect to addressing the public comments. The cover letter to the Impact Statement states that the SDEIS addresses concerns identified by the NIH, the proponent, issues raised during the public scoping, and documents received during the comment period. But, the comments are not included, so how can one address whether or not the comments are addressed?

C.7

I have written to both NIH and BU asking for copies of these comments, and to date, have received no response, and none of the comments. In December, I received an e-mail from a senior BU representative who spoke this evening, stating that quote "We will continue to share information and analysis." But to date, none of the information or analysis has been shared.

In January, I received a letter from BU which states, quote "Interestingly enough, one issue is that your information requests are extremely insightful" that's s-i-g-h-t, "and responses to them and the information needed to answer them are really of benefit to a much broader audience, so this is why they should be addressed later." They were not addressed in the draft impact statement, and they were not addressed in the Supplemental Impact Statement.

Turning to the question of whether the Supplemental Statement provides convincing evidence that, as it is stated repeatedly, the risk to public harm is so minute, it could be described as zero.

First, many of the so-called findings reported in the worst case assessment, are based on simulation models that are described as demonstrated predicted maximum exposure to any member of the community. These models do not predict maximum exposure, they predict, as the author and the creator of the models say "average levels, and the real levels will vary across

C.8

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C.7 Comments received on the DEIS were used as scoping comments for the SDEIS. All comments received on the SDEIS appear in Chapter 5.0 of the FEIS.

C.8 See Responses to Comments 1.3 and 4.6.

C.8 the average."

C.9 In addition, the Supplemental Statement of Minimal Impact appears to directly contradict NIH statements. In December 2000, the Director of [Intramural] Research--

Jamie Fay: David, would you try to wrap it up please? Thank you.

C.9 David Mundel: I will. I'm just quoting the NIH, okay? The Director of Intramural Research of the NIH National Institute of Allergy and Infectious Diseases, the sponsor of the proposed laboratory wrote in describing the advantages of a proposed Level IV laboratory in rural western Montana. Quote "The rural site is well removed from major population centers, and this location of the laboratory reduces the possibility that an accidental release of a biosafety Level IV organism would lead to a major public health disaster" close quote.

Jamie Fay: We're going to have to ask you to wrap it up. We have more speakers in line. Thank you.

Sue Gracey: I'm Sue Gracey, from Brookline. And before I start, I would like to note that it was the collective, I believe judgement was the phrase of both the University of California, and the citizens of Davis, California, that such a lab was not necessary or desirable to their community.

C.10 But as to this report, and the issue in general, I have only one real observation, and that is that proponents simply never address the questions of human error, negligence, greed, or mental instability. Yet one or more of these aspects of human behavior is often present when unforeseen tragedy occurs, and even the language used to sell this project, reflects the denial inherent in pursuing such a course.

From the get go, we've been told that quote "the best and brightest will be in charge here." That phrase became popular at the time of Vietnam, and it is not reassuring to those who can't forget that time. The lab has been frequently described as a quote "Submarine within a vault." This poorly chosen image brings to mind the agonizing death watch for the crew of the sunken [Thresher]. And hearing that only the best and most reliable of contractors will be involved in this construction, doesn't really cut it with residents of a city who daily read about the "don't blame me" fights going on around the Big Dig fiasco.

C.11 So in addition to presenting us with a still woefully understated worst case scenario, this latest effort on the part of the university to assure us that mere mortals can run a potentially catastrophic facility, in a fail-safe mode, in the middle of a city, fails completely.

Peter, Paul and Mary I think sing it the best, "When will we ever learn?"

Maja Weisl: My name is Maja Weisl. I live in Roxbury on the edge of Jamaica Plain, that is the back of Mission Hill, one block above the Hennigan School, one block from the corner of a

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C.9 The Rocky Mountain Laboratory memo referred to in the comment was never officially signed or sent, and its author is unknown. NIH does not support the content of the memo as rationale for the location of any laboratory. NIH would have to believe that the proposed facility was unsafe, which it does not. Where the staff lives is not as important as where they work to facilitate collaboration. All the facilities listed are within a close distance, and not far removed from the city.

C.10 The Boston-NBL would be designed and operated with safety systems and controls to preclude accidental releases due to human error. Each safety system has redundant back ups, laboratory operations would follow the "two person" rule, where no one is allowed in without a co-worker, background checks would be obtained on all building employees and activities would be monitored by the BUMC security staff. Even the "worst case" scenario indicates a negligible risk to the public. See Section 4.2.1.1 "Community Safety and Risk – Other Potential Risk Scenarios" in the FEIS.

C.11 See Responses to Comments 1.3 and 4.6.

very large housing project, Bromley Heath. We have, I'm a founding member of a community development corporation which has built 400 units of hopefully affordable housing, some of which will go to market.

When we bought it, we did not think we would have to warn people, or people would have to warn themselves, that they were coming into a potentially unsafe area. We're not that far from Albany Street.

I am also a retired worker and shop officer from Cole Hearsey, which is located on Dorchester Avenue and Old Colony Street. Of the 300 workers, about 200 are women, and at any one time there are a number of pregnant women in the shop. And I have had occasion to take one woman home in a hurricane, send another one to the ladies room at the opposite end of the shop when there was a leak in a chemical washer that was under repair. We've always had, we've had a number of things like that. And I know, I don't care how cautious you are, I don't care how careful you are, nothing is 100% safe. And the question is there is a good reason, I mean, it creates its problems, but there is a reason why medical schools and their teaching hospitals tend to be located in or near low income areas. They get practice patients and guinea pigs for new medications, but we get some medical care out of it. There is a trade off, although there are problems with it.

C.12

That does not apply to a research lab. There is absolutely no reason on earth why a lab dealing with dangerous germs and chemicals and so on, should be located in a densely populated area; in a densely populated area with not only mostly low income, although the South End yuppies ought to watch out, their property values will go to hell to, but at least they can get out.

However, the fact that there is just absolutely no reason. And in this particular case, it's an area that's right at sea level. Some of it's [inaudible] [upland]. I think that makes it more dangerous in a situation. Supposing we get a tsunami, or even just a really bad hurricane? We don't know how these, you know, it just increases the danger to the people. You cannot, in this particular area, there is no way of avoiding the rats that infest anyplace near a harbor--

Jamie Fay: Thank you very much, ma'am.

Sue Gracey: Okay.

[End of Tape #1, Side A]
[Beginning of Tape #1, Side B]

Janis Whelan: I am Janis Whelan. I own a building at 164 E Street in South Boston. I support this project for two reasons. At the age of seven I watched my father go through tuberculosis, and my own son, at the age of seven, had a general infection from tuberculosis, so we really need these type of projects.

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C.12 See Response to Comment 19.2.

And for the second reason, I'm a blue collar worker here, and this is going to create a lot of work for me and people in the union trades just like the one I'm in, and for our kids who are going to be able to work in these buildings when they're complete. Thank you.

Jamie Fay: Next speaker, please.

Erin French: Hi, good evening. My name is Erin French. I'm a neighbor of the BU Medical facility. Myself and many of our neighbors are very much for this facility going in. This is certainly a public health issue. I'm glad to hear that many of the comments have gone away from all this bioterror, and back to infectious diseases, which really do a number on us and our families.

After doing some research myself, I am in the scientific field, in educating myself, I have, really felt even more in support of this. And after speaking with people involved in this project, only 13% of this facility will be deemed for Biolevel IV. We already have the Level III. In fact, I wish that 13% would go up a little bit higher for the education and development of combating these infectious diseases. Thank you.

Jamie Fay: Next speaker, please.

Kay Carr: My name is Kay Carr. I live at 84 Bloomfield Street in Dorchester. I am for this project, and the reason for it is because I moved from the Midwest here, and my doctor that referred me here said that the best care was in Boston. So by them building this lab, I think that the young people here in Boston, and us that are still working now, will benefit from this project. It's not so much as about what may happen, but what they're doing so that it won't happen. Thank you.

Mary Corcoran: My name is Mary Corcoran. I live at 65 Martha Road in Boston. That's near North Station. I must say that I find the fact that there are a great many uniformed policemen standing outside right now, really informs what kind of hearing this is, and how few people are here. The notice was very [scanty]. In fact, I received no notice, and I usually receive notice of this kind of meeting. If I hadn't seen it in the newspaper, I wouldn't even have known to come.

C.13 I think this is a very dangerous kind of facility to have in a residential area, and I think it is outrageous that you have simply rolled on, despite all of the comments of people who are afraid to have this in their neighborhood. You have simply rolled on and rolled over them and gone ahead with it, and I object very strenuously, and I will continue to do so.

C.14 Virginia Pratt: I'm Virginia Pratt. I live in Jamaica Plain. I also use a fitness facility very near the Boston Medical Center on at least a weekly basis. I am here to oppose the Level IV lab; the Level IV lab that would operate in a shroud of secrecy; the Level IV lab that would operate

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C.13 See Response to Comment 19.2.

C.14 See Response to Comment 4.17.

with the most dangerous pathogens and viruses, the Level IV lab that would be operated through funds that come through the federal government, be it either through the Institutes of Health, or Defense, and having read numerous articles about an astronomical increase in bioterror funding with the Bush administration.

C.15 And knowing that right now one of the things that we're being told is that this has become very critical in the last few years. At one point there was a reference to 9/11. I'm glad that there was somebody here from Boston Medical Center's medical workers to confirm and remind us that were there any type of outbreak, this city does not have sufficient facilities for medical care right now.

But I'm really, what I most believe is that what is happening right now is happening, in large part, as an aftermath to 9/11. And I'm wondering what it would have been like during the time of World War II after Pearl Harbor when things changed, and there was a lab that was built in New Mexico to manufacture what later was called the atomic bomb or the H Bomb which was used in Japan. For this Level IV lab that would operate in a shroud of secrecy, the highest level lab is the one that I'm talking about, the Level IV lab. I cannot help but not think that some horrible thing would be brewed up there and unleashed. Thank you.

Jamie Fay: Next speaker, please?

Michael Cohen: Yes, I'm going to follow-up. My name is Michael Cohen. I live at Sterns

C.16 Road in Brookline. I'm going to follow-up a little bit on the last speaker. First of all, there is an amazingly good site, given everything that's been said, for a large BSL IV facility. A better site would be at the NIH in Bethesda. And in fact, there is such a facility, but they can't operate, to my understanding, due to opposition of the local population. That might tell us something here in Boston.

C.17 Second of all, people have forgotten, really, that while nuclear weapons can devastate, so can bacterial and emerging diseases, in a major way. Forty percent or so of the population was wiped out of Europe for the Black Plague, and millions of people here died of influenza.

So why do we need to put this in Boston? Well, we need to put it in Boston because the best minds in the sciences surround here. But as the speaker said before, the best minds in scientists went to Los Alamos to develop nuclear weapons. They didn't demand to have a testing zone in the middle of Boston. That's that.

C.18 The report mentions a lot about human diseases, it doesn't mention that this is a BLS IV animal facility, and there are going to be ticks bred, and the ticks can, in unfavorable circumstances, be picked up by birds, and the birds can fly and transmit the diseases elsewhere.

C.19 Long Island was an interesting case involving West Nile. Interestingly enough, Lyme Disease started 30 miles off of Long Island in Lyme Connecticut. Now, why is that interesting? There is an old biodefense lab, namely Plum Island, which basically has had known security lapses for years, and these are the places where these emerging diseases may

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C.15 See Response to Comment 29.2.

C.16 The National Institutes of Health has maintained a Biological Safety Level 4 laboratory on the Bethesda campus for over 20 years. Building 41A, the Maximum Containment Laboratory (MCL), a Biosafety Level 4 Facility was renovated and opened for work in November 1998. The facility now houses a state of the art, Biosafety Level 4 laboratory suite. Two of the three laboratory modules can accommodate animal research. At this time, due to scientific research needs, the facility is being operated at an enhanced Biosafety Level 3. Because of its relatively small size, Building 41A could not be used to satisfy the purpose and need of the Proposed Action.

C.17 The fact that plague and influenza have killed millions of people makes it is necessary to operate a laboratory that performs research on these agents to develop therapeutics, diagnostics and vaccines to ameliorate their harmful effects.

C.18 The insectary is a sealed room. The design of the insectary includes multiple barriers between the insect holding room and the exterior of the building. See Section 4.2.1.1 "Community Safety and Risk – Other Potential Risk Scenarios (c)" in the FEIS.

C.19 There is no credible evidence that Lyme disease had its origin from the Plum Island facility.

C.19 have started. Now, there is no proof that this happened, Plum Island has shredded their records, so we won't ever know whether this is the source of the vectorization of disease in this country. I have no doubt that the air locks and the sewerage treatment, etc., are being designed with maximal scrutiny, but I do have doubt what's going to happen 15 and 20 years down the pike when this is run by a university, not the military, and essentially people try to cut corners.

Most of the emerging infectious diseases, including AIDS, Lyme Disease, SARS, has been released from a lab, may or may not have found their origin through-- AIDS too by the way-- there is an argument that unbeknownst to the researchers, AIDS was produced via vaccination trials in Africa.

Jamie Fay: Sir, we're going to have to ask you to wrap it up, please.

C.20 Michael Cohen: So my summary is putting this in a city in a low income area where nothing is given to low income individuals, so there is no environmental justice, and subjecting us all to risk, is a disaster.

Jamie Fay: I'd like to just remind everybody, we do have quite a few speakers here, so if you could keep your comments to three minutes, it would be appreciated.

Clarence Cooper: Good evening. My name is Clarence Cooper. I am a resident of the City of Boston for the last 38 years, and I have had the privilege of being in attendance of seven of these public meetings. I have also represented a considerable members of my community, some who are here with me this evening, some who are unable to be here, who have asked me to kindly say that they do support the BU lab.

BU's management has displayed honesty, integrity, and a distinct ability in management to be given the opportunity to run this lab. I do have six children, two of them who live within a quarter of a mile of the proposed facilities, and I don't hear my children saying that I am concerned about what's going to go on at that center that will impact us negatively. What I do hear from my children is that is this lab going to provide us with the kind of jobs that were provided to you, so that we can take care of our children as you did, neither seeking assistance from any government entity, albeit city, state, or federal government.

This evening, I also represent a considerable amount of members from the carpenters and other unions, many of them today who are sitting on the brink of losing their homes because there are so few construction jobs here within Boston. And I say to you, that by providing them with the facility at BU to be built, instead of our brothers and sisters being allowed to say "We are going to lose our homes" they would be able to say to the bank owners "Here is your mortgage." Please continue to provide us with homes [sic] so that we can have a home for our children, and our family members.

I leave this evening, again, asking you to please consider, with the authority vested in

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C.20 See Response to Comment 19.2.

you by virtue of the position you hold, let the management people at BU you have displayed all the management skill, please build this facility. Thank you. [Applause]

Pamela Beal: Good evening. My name is Pam Beal, and I am a resident of the Back Bay, and I have a business in Kenmore Square. I, too, have attended, I think all of these meetings. I've spoken at many of them. I've read all of the literature that's been provided, I've received all of the reports, and I am in favor of this, I have always been in favor of it, and I greatly feel that Boston University will do a wonderful job, and I have all the confidence that they will build this as well as it can be built and run it as to the highest standard possible. So again, my support. Thank you.

Cinda Stoner: My name is Cinda Stoner. I live at 107 East Brookline Street, and I am against this facility being built in this area. I am not against this type of facility, but it does not belong in this area.

One of the things that was listed in the booklet was community concerns, and one of the concerns that I think should have been listed, is that there are many, many people who are against this facility being placed on Albany Street.

C.21 As well, they talked about a construction management plan, and there was no acknowledgement of what is called the Cooperation Agreement in the construction on that site. And I think [Dick Toll] is very familiar with that.

C.22 Also, it was clear to me when I read the part that said what were the other sites looked at, this is really very self-serving for the scientists. And I can remember, as though he were to say just a few minutes ago when Dr. Klempner stated that the reason the siting was so important here is because scientists like to work in urban areas. And I really do believe that is exactly what this is about, and has very little regard for the community.

C.23 Another thing that was stated is that if nothing, if this were not going to be developed, the area would remain on grade parking lot. That is not true. That area is being developed, and there would be some kind of research lab, I am sure, that would be placed on that development.

C.24 Another thing is that was stated about the Ebola Virus incident that happened at Fort Dedrick in Maryland, and did not acknowledge the fact that that researcher did go home, and then reported it the next day, that she thought she had stuck herself with a needle.

C.25 Another thing, the last thing I want to talk about, I don't know about people coming up here and saying how honestly that BU has presented themselves throughout the course of all of this, through this process. I can remember that December meeting very clearly at the BRA, in which a representative got up there and touted the safety record of BU. And at that time, there is not a doubt in my mind he must have known about the Tularemia problem over there at that Lab III.

At the same time, the other reps were sitting in that room, and they never got up and stated anything other than to talk about-- They didn't get up and correct that record that stated

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C.21 The Project is required to prepare a Construction Management Plan which must be approved by the Boston Transportation Department. A binding Cooperation Agreement between the BRA and University Associates Limited Partnership has been executed for the Project. This agreement has provided the framework for the community review of the BioSquare Phase II project which includes the proposed NBL facility.

C.22 The alternative siting analysis and the criteria used to consider alternative sites can be found in Section 2.3.

C.23 The No Action alternative states that the Boston-NBL would not be built, and remain an at-grade parking lot. This is true within the scope of the NIH decision to be made. If NIH decides not to undertake the proposed action, the lab will not be built at the BioSquare Research Park. Any other future uses would be outside the scope of this EIS.

C.24 The incident described at Fort Detrick posed no threat to the public. The researcher in this incident did not become infected with the virus and all appropriate local government agencies were contacted. At no time was public health threatened by this incident.

C.25 See Response to Comment 29.9.

how great BU had been around their handling of any kind of material over there.

C.26 Another thing is that they still do not know how that Tularemia was tainted. And so I've talked about the fact that they've been dishonest in the past, and this is just another incident where I just don't think-- I don't see how you can trust them. If they covered it up in the past, they're going to cover up anything else that is for their convenience, if it serves their purposes.

Jamie Fay: Next speaker, please.

Adrienne Benton: Good evening. My name is Adrienne Benton. I'm a Roxbury resident, and I'm pleased to state my support for the Biosafety Lab.

As a former health care management professional, I'm very familiar with the protocols related to laboratory operations, and I am confident that because BU MC will own, operate, and manage the Biosafety laboratory, and will conduct research in the lab under the administrative authority of BU's Research Oversight System, that all of the appropriate safeguards will be put into place, and are already inherent as a part of the Level IV designation. Thank you.

Mary Crotty: Hello. My name is Mary Crotty. I'm a registered nurse and attorney with the Massachusetts Nurse's Association, which is located in Canton, Massachusetts. I am here tonight on behalf of the Mass Nurse's Association, which our 24,000 nurses across the state have adopted a statement in opposition to the BU Level IV lab for a number of reasons, which I'll go through quickly.

We have four primary concerns. The first is safety. Massachusetts was recently ranked as one of the states least prepared to respond to a disaster in the entire country. While plans may be underway to improve national preparedness, this dangerous lab should not be

C.27 located in a state which is ill-prepared to prevent human error, or another 9/11 type terrorist event.

Related to that, Boston University has demonstrated its failure to prevent a biological

C.28 incident, the Tularemia cases, at a much less dangerous Level II facility. Also related to safety, Massachusetts has no regulatory program or standards for BSL IV labs in effect. Standards do exist, in contrast, for the siting of other inherently dangerous facilities, such as landfills, power plants, but there is absolutely nothing in place to guide regulation of this type of laboratory.

Our second concern is that Boston hospitals have no ability to respond if there is an

C.29 incident. There is absolutely no surge capacity. Hospital emergency departments are maxed out. They have no extra capacity to handle an average day's visit. Diversion statistics, which site the number of hours that emergency department is closed, were up by 40% in just the past month of March.

There are no surge plans for handling a disaster in existence, and there is no diversion planning by the state underway.

Our third issue speaks to equity issues, disparate treatment of racial and ethnic

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C.26 The federal Centers for Disease Control and Prevention is currently making efforts to determine the sources of the contaminated culture.

C.27 BUMC is prepared to respond to any and all city, state or national emergency situations and provide assistance as a Level 1 trauma center and as an academic medical center with multiple areas of clinical expertise. The City of Boston and the Commonwealth of Massachusetts have hospital surge plans, evacuation plans and disaster plans. These plans are tested regularly.

C.28 See Table 1-4 and Response to Comment 19.5.

C.29 Boston hospitals have a surge plan developed by the Public Health Commission, The Conference of Boston Teaching Hospitals, Boston Emergency Medical Services and the Boston Emergency Management Agency. This surge plan has been tested, works and resulted in the freeing up of 1,000 hospital beds in Boston on September 11, 2001.

minorities. BU, as noted, is siting this laboratory in a very dangerous way, next to Boston Medical Center, which primarily serves an undeserved community in Roxbury. The opinions of this community have really been mocked.

I was at a Boston City Council meeting a few weeks ago chaired by President James Kelly, and Boston University Public Relations people likened Tularemia to having the flu. They kept mentioning the flu-like symptoms. Tularemia is actually one of the most frequently researched biological weapons. They got President Kelly, of the Boston City Council, to respond that having the flu wasn't all that bad. Research dollars are pouring into BU with absolutely nothing left for the community. C.30

And finally, Department of Homeland Security regulations may prevent BU from giving notice to the community of a disaster, should it occur. [Applause] C.31

Jamie Fay: Next speaker, please.

Dan Kontoff: Hello, first of all, may I ask two people [inaudible] what are you names?

Jamie Fay: Could you give your name and address--

Dan Kontoff: My name is Dan Kontoff, and who am I speaking to, who am I addressing?

Jamie Fay: My name is Jamie Fay.

Dan Kontoff: And are you, you guys work for the government, right, I understand?

Jamie Fay: This is not a question and answer session, as I explained to everybody.

Dan Kontoff: Okay, all right.

Jamie Fay: If you have a statement, please make it.

Dan Kontoff: No problem. I'm here. I have money in my hand. The money in my hand, the reason I have this, is because I noticed there are a lot of people here who are getting paid to be here. They're doing it for money, and that's the problem. When people do things for money, they sometimes lose sight and judgement, as we look at the Big Dig, with all kinds of problems now. Bechtel built that with other companies, all kinds of leaking problems, all kinds of other problems built for money. And that's one of the major problems everybody talked about today, greed.

I could probably give anybody here money, and they could walk away and they'll do what I ask them to do for money. Will there be moral judgement to wake up the next day and

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C.30 See Response to Comment 19.5.

C.31 The comment does not provide a citation to any Department of Homeland Security regulation that would prohibit either NIH or BUMC from notifying the public of a release of infectious agents from the proposed NBL or other accident. Nothing in the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 ("Bioterrorism Act") prohibits a facility from voluntarily releasing information to the public about any accident, release, theft, or infection involving select agents. Further, the Bioterrorism Act requires that a facility that handles select agents must notify the Secretary of the Department of Health and Human Services about any release so that the Centers for Disease Control and Prevention (CDC), acting on the Secretary's behalf, can take appropriate action to notify the public and local authorities. CDC's notification is in addition to any actions the facility may take. The facility is not prevented from directly notifying the public about any accident, release, theft, or infection.

say they did something wrong? I hope so. But a lot of people turn their backs when it comes to money.

We look at our country's history and what we're doing in Iraq, El Salvador, Somalia, we did it for money, for greed. And today, a lot of people here are speaking for their wallet, not for reality, and that's the sad part.

I talked to a couple of security guards who work at Boston Medical. I offered them a couple million dollars to turn their back if we built this; would they turn their back and let a terrorist in? They said "No problem. For two or three million, my family could move to another part of the world and we'd be comfortable. That's the least we'd do." That's how safe it is; the security guards are willing to leave and let some terrorists in because they'll take the money and run.

And I don't say they're bad people for doing that. When you've got poverty around the world and in this country too, and you haven't had a rich life, you see everybody else around you with all of this money, security guards don't get paid that much. So I respect them for that, I see where they're coming from.

I think there are a lot of things we're not talking about today, and the problems we have to look at is why are people here? We know it's in the middle of the city, and one of the poorest areas of the city, surrounded by how many of thousands of people live. We know the track record of bio-weapon labs all over the country in germ warfare research have had all kinds of accidents. Those are facts. Why are we building it? Have we really discussed that, why we need to build it? This is year 2005. We've got seven million homeless, and we're building weapons of mass destruction like there is no tomorrow.

C.32

This is not a Level III lab, Anthrax, this is Level IV, things that have never been invented yet. So why are we building weapons of mass destruction towards the future? Shouldn't we be working with the world for peace, not for weapons, not for war? Half the people in here you know are here to make money, construction workers, they're paid to be here, corporations, it's all about profit. I'm not here, I'm not getting paid. Me and my friends are here, we're here from the heart because we believe in what we're doing. We care about building a better city of Boston, not destroying it for the greed of the capitalists. No. You can't look at life that way. It's time to end that. Let's look towards the future. Let's not have people out here for the money, let's get people who care about the city of Boston.

C.33

Jamie Fay: Thank you. Next speaker, please?

Laura Maslow-Armand: Hello. My name is Laura Maslow-Armand. I'm here as a Civil Rights Attorney from the Lawyer's Committee for Civil Rights. I have just a few questions, because so much has already been said. Why is this laboratory being built in Roxbury and the South End? Those are heavily burdened communities, which already have poor health. The highest rate of hospitalization for children under five with asthma is in Roxbury. Why are we

C.34

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C.32 Page ES-2 of the Executive Summary clearly describes the purpose and need of the facility.

C.33 The purpose of the laboratory is to develop diagnostics, therapeutics, and vaccines for emerging and re-emerging infectious diseases, and agents that could possibly be used for bioterrorism. The laboratory would not develop offensive or defensive biological weapons, as this is forbidden by a national security directive and international law.

C.34 See Response to Comment 19.2. The assumption about the rationale for the location is incorrect.

C.34 putting this community at risk? It's because other communities around Boston would have mobilized and prevented this laboratory from being built.

There is only the convenience of those working at Boston Medical Center to justify the siting of the lab in an area already burdened by environmental problems, and poor health.

Second question. What will this give to that area? Will it give jobs? No. Will it give public health benefits? No. The theme that has been echoed all through the subway, all through the newspaper announcements, finding cures, saving lives. What cures are going to be C.35 found for the illnesses that afflict the population of Roxbury and the South End? There is not one malady in this room that's going to be cured by a bio-safety Level IV laboratory working with Ebola Virus. There isn't Ebola Virus already in Roxbury and the South End, but there are serious medical problems that need to be addressed.

Finally, through the work of the community group [ACE], through Safety Net, through research of various scientists, we have identified over 30 accidents that have taken C.36 place in bio-safety labs, Level III, Level IV, serious accidents. Fingers being pricked with Ebola Virus, explosion of West Nile Virus in packages, Fed Ex trucks carrying Anthrax that have accidents. We are lulling ourselves into a false sense of security, accidents will happen. What is the plan for evacuation for that community? Thank you. [Applause]

[Julius Corley]: Good evening. My name is [Julius Corley]. I live in Cambridge off of Memorial Drive. I attend the BU School of Medicine. I'm a Ph.D. student in Molecular Medicine. I strongly support the building of the National Biosafety Lab here in Boston. In my eyes, as well as the eyes of many others, this project represents opportunity. Boston has over 30 colleges and universities in the area. It's a hub for technology. The National Biosafety Lab being here, represents the opportunity for the brightest scientists to work together to solve some of science's most complexing problems.

This also represents an opportunity for many people that have never had the opportunity to do science, to get involved. For so long, minorities have been under-represented in the sciences. This is an opportunity to change that. The building offers the opportunity for everyone to participate in some meaningful way, to help themselves and to help others. Those who are not qualified have the opportunity to be trained. They have an opportunity to contribute to their communities, and help themselves as well as others.

Lastly, I worship in this community. When I'm teaching Sunday School, it never fails that someone asks me what do I do? Where do I work? They are amazed when I tell them that I'm working on my Ph.D. at BU School of Medicine, and that I hope to be a part of the National Biosafety Lab that will do many great things to protect our people from emerging and reemerging disease. Their faces light up and they are encouraged. They feel that they have the opportunity to help themselves, to help their people, to help their country that we call the United States of America. Thank you. [Applause]

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C.35 The project would bring economic benefits to the City as described in Response to Comment 90.8. As noted in Section 3.2.5, Boston Medical Center emphasizes community-based care its mission is to provide consistently accessible health services to all regardless of their ability to pay, and is the largest free care provider in New England. BMC provides a full spectrum of pediatric and adult care services, from primary to family medicine advanced specialty care. Seventy percent of BMC's patients are minorities and nearly 50% speak English as a second language. BMC also responds to the unique needs of children who are the most vulnerable among underserved minorities. In 2004 BMC provided $350 million in free care. Of 853,050 prescriptions filled last year by BMC's outpatient pharmacy, which is the busiest single-site pharmacy in the United States, 75% were free care.

C.36 See Response to Comment C.27.

Glen Berkowitz: My name is Glen Berkowitz. I encourage you to approve construction of this important strategic and economic project. I live only three blocks from the Biolab site, and like many of my neighbors, have attended over a dozen meetings and discussions on this project in the past 18 months. I've tried hard to pay close attention to both the benefits and risks associated with this project. Over time, it became clear that the benefits, both to our national security and to our local economy are so great, that this project, notwithstanding its controversy, deserves to go ahead.

This is not Boston's first controversial project. Much of what makes Boston so special today results from projects whose construction engendered much controversy in their day. From the filling in of the Charles River to create the Back Bay that began in 1857, to the multi-billion dollar clean-up of Boston Harbor started in the 1980's, our region has developed into this wonderful place to live and work because of tough decisions made in the past by government officials and others.

Bioterrorism is likely not to be a question of if, but unfortunately, more a question of where and when. As I understand it, investigators working in the biolab will spend much of their time investigating inoculations to prevent disease and treatments, and as important, these treatments and vaccines may develop, could help respond to any bioterror attack.

If and when such a bioterror attack happens, I would prefer that Boston have supported and play a role in any public health response. Yes, the biolab will be in my backyard, but until someone can guarantee me that a zero percent chance of bioterror exists, the Biolab will be an abutter I will be proud to have in my neighborhood.

Jamie Fay: Next speaker, please.

Mark Trachtenberg: Good evening. My name is Mark David Trachtenberg. I live at 30 Kinross Road, Apartment number 4 in Brighton near Cleveland Circle, and I'm here to speak against the proposed Level IV Bioterror Lab, and I expect I can finish up in a good deal less than three minutes.

C.37

The state of quality control in the field is very troubling, as we've seen with several recent incidents, whether it's the Tularemia outbreak, or the accidental sending of the very dangerous flu virus from 1957 through the mail. If an infectious disease organism escaped from the Level IV lab, it would be in Government Center in five minutes, it would be at my home in ten minutes, maybe 15 minutes at the most. We wouldn't even have time to sing "Nearer My God to Thee". Please, don't make anybody sing "Nearer My God to Me".

As a loyal alumnus of the Boston University's School of Management, I respectfully ask Boston University and the National Institutes of Health to find another medical use for the site. Thanks. [Applause]

Hayden Frederick-Clarke: Good evening. My name is Hayden Frederick-Clarke, resident 21

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C.37 Maximum Possible Risk modeling investigated the potential risks across the urban environment surrounding the proposed site for the Boston-NBL including E. Brookline at Albany Street, E. Canton at Albany Street, the pedestrian walkway, the Flower Exchange Building, and the Guard House. See Appendix 12.

Linwood Street in Roxbury, Massachusetts, Chernobyl revisited, and I was induced to come here by a representative from BU. I was told that this would be a question and answer session which it's not, but I'll ask my questions rhetorically.

C.38 The question that the community, and I use that phrase loosely continues to ask that BU refuses to answer, is why should we trust BU, given its poor safety record at the BU Medical Center that exists presently? Eighty-one violations of MWRA regulation. They've only been fined $23,000. Excess formaldehyde waste, excess silver waste, improper signage, no access to safety manuals for employees and so on. If they can't get such a small task right, why should we trust them with the most viral, most deadly pathogens known to man? We haven't gotten an answer yet, and I don't think we will get an answer.

C.39 Secondly, everyone continues to ask as a recurrent theme, I've seen it in this line also, is why take such an extraordinary risk in a place where 50,000 people live within one mile of this facility that contains these pathogens? What possible benefit could offset that? If something should happen, human error is inevitable. What is the recourse, or what is the next step after such an outbreak, if you want to call it that? There is no cure for SARS, there is no cure for Ebola, so on and so forth. One shot, and that's it.

And I'd like to close by saying in my mind, the erection of this prospective lab is a massive failure of democracy, given most of the people that live within the area of the lab, or proposed lab, do not want this there. If we took a hand by hand or person by person poll, it would be voted down. But somehow, our elected officials are gleeful about having this erected in a place where their constituents don't want it. [Applause]

John Harris: My name is John Harris, and I live at 41 Osborn Road in Brookline. I do want to say that I strongly favor the construction of such a lab. It is essential that research be done on biological hazards, but I strongly oppose this particular location. Such a lab should be built in an unpopulated area, with wide buffer zones and multiple layers of security.

C.40 If it is built in a major urban area, like downtown Boston, like this plan, it is a disaster waiting to happen. First of all with simple accidents, with things going wrong, as happen inevitably in life, that could have possible catastrophic consequences.

C.41 Secondly, and very importantly, this is an invitation to terrorist attacks in downtown Boston. [Applause] As to assurances that the project would be failsafe, I would remind everyone that The World Trade Center in New York City was certified to be safe when it was constructed, against impacts by airliners.

C.42 In addition, if the lab is constructed in the city, the dangerous materials that will be researched will be transported to it and from it through the city on city streets, with increased vulnerability the entire way. That means that these very dangerous pathogens will be traveling close to the home or the office of probably everyone in this room, and certainly millions of other people. And because the facility is being constructed or will be operated under federal Home Security regulations, if problems arise, local officials, the mayor, the governor, etc., or

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C.38 BUMC has responded to the four-year listing of every wastewater exceedance and violation on several occasions. The Massachusetts Water Resource Authority (MWRA) in public testimony has stated that given the size and complexity of the BUMC operation, these exceedances and violations are typical.

C.39 See Responses to Comments 19.2 and 29.2.

C.40 See Responses to Comments 19.2 and 29.2.

C.41 See Response to Comment 75.7.

C.42 See Response to Comment 4.7. The facility would not be run under the Homeland Security Department. The facility would be partially funded by the NIH and owned and operated by Boston University.

C.42 the public, will not necessarily be informed. Again, while I strongly favor the construction of such a facility in a sparsely settled location, I strongly oppose the construction of this potentially very dangerous facility in Boston. Thank you. [Applause]

Christina [Tillman]: Hi. My name is Christina [Tillman]. I'm a youth resident of Dorchester, and a lot of people have been talking about the benefits of this project, but yet for some reason as a youth, I don't really see any. It's not like they're solving the poor education we have here. They're not going to address the youth violence that's happening here. It's not going to address the lack of youth opportunities in jobs. It's not going to help unemployment. You guys say it will, but I'm sure you're going to need at least a Bachelor's to even be a janitor in this research lab.

C.43 So my question is who's benefiting, because I definitely don't see it being me. [Applause]

Michael Higgins: Michael Higgins, 27 Sidney Street, Dorchester, Mass. I'm here to voice my support for the project, due to the volume of jobs it creates for the Boston residents. Also, as a resident of Dorchester, I feel all safety precautions have been met, and I feel comfortable with the project. Thank you.

Eddie Tuffo: My name is Eddie Tuffo, 79 Saxton Street, Dorchester, Savin Hill section of Dorchester. I'm here as the representative of Local 2168 Floor Coverers. I support the project. It will create many jobs, union jobs for Boston residents. So I do support the project. Thank you.

Juan Sanchez: My name is Juan Sanchez, 86 [inaudible] Street, Dorchester, Mass. I'm also with Local 2168. I'm also in favor of this project going up, due to the increase of work for Boston residents, and I strongly support this building being constructed. Thank you.

Reggie Bradley: Hi. My name is Reggie Bradley. I support the program. I'm with Local 2168 also. Thank you.

Ramone Fontes: Ramone Fontes out of Dorchester, and I support the project. I'm out of Local 2168 Floorlayer's Union.

Alexander Vazques: My name is Alexander Vazques. I live at 19 Nightingale Street. I came here to support the project. Thank you.

Mynor Perez: My name is Mynor Perez. I'm from 57 Savin Hill Avenue. I think all safety precautions have been taken with this project, and I feel very comfortable. I live in the city with

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C.43 See Response to Comment 90.8.

my family, and I'm comfortable this is going to be good for the city. Thank you.

John Stitzer: My name is John Stitzer. I live at 236 Commercial Street. I believe we have an extremely important need for facilities that are capable of researching all these deadly infectious diseases, and locating a facility of this importance in a rural area may compromise the quality of professional experience. Boston is already confirmed as a source of the best and brightest.

Most are familiar with Boston University as a good neighbor for our communities, and encourage their continuing participation benefiting each of the communities that BU resides in.

I also have confidence that BU will use its best discretion, before bringing in any agents into the facility, so that known characteristics may be identified before any possible compromises of mechanical purifying equipment. I am also pleased to know that if Boston happens to be the first point of impact of an infectious disease, having the benefit of locating a facility of this nature in the city, provides us with the best possibility of the fastest response possible in the nation. Thank you.

James Coyle: Good evening. My name is James Coyle. I live in Quincy. I am here tonight representing over 30,000 building trades, men and women, that live in the Boston area. Many of them live in the immediate neighborhood of this project. We are here tonight in support of this project. Many of those members have spoken at all of the other meetings in favor. I am here tonight to reaffirm their commitment. No one, none of them, have ever questioned BU, or questioned the National Institute of Health in their oversight of this project.

You know, it's ironic that I've sat through this meeting tonight and I've heard a lot of information, I've heard a lot of comments, a lot of negative comments about the project, and I heard those same comments well over 30 years ago. The Seabrook Power Station, the [inaudible] Nuclear Powerhouse and Yankee Rowe. All three of those nuclear powerhouses were built in the New England area, in areas where they weren't wanted. They weren't in urban areas, they were in the woods, in the sticks, on the beach, but those projects were all built, and they were operated for a period of over 30 years, which is their approximate lifespan, and now they're being decommissioned without any problems, without any accidents, without any deaths, and a lot of this was due to government oversight, rules and regulations. Contrary to your current president, George Bush's campaign mantra of less government, he wants to get government out of your life, this is a perfect example of where government worked, and it helped to protect the neighborhoods, our children, our life.

And we believe, the Boston Building trades, that the same thing is true of the BU project. We support it, and we believe that the National Institute of Health will oversee this project, and it will be a safe project. Thank you. [Applause]

Alyssa Arzola: Hi. My name is Alyssa Arzola, and I am a lifelong resident of the South End. I

hear a lot of people coming up here this evening and talking about the benefits that the youth will get due to this lab. But I work at a youth organization working with 20 some odd youth around the City of Boston, and none of us really have wonderful ideas, or do we feel as though this bioterror lab in any way, shape, or form will be benefiting us. I feel as though that the concerns that we have today are adequate education and graduating from high school to be able to have jobs like this, and right now Boston education is not up to that status. So as far as I'm concerned, I am not for the building of this lab in my community. [Applause]

Tom Ferrante: Hi, my name is Tom Ferrante. I'm a Boston resident, and I work in one of the labs down at the Boston University School of Medicine. I support the building of the lab because they are trying to find cures for diseases, and they're also trying to train the people of Boston to work in the labs. But there are people who oppose the lab, and their opposition should definitely be dealt with, and Boston University should try to speak with them and hear them out, and hear what they have to say, and try to get back to them with answers. If they don't have answers to their questions, then they'll definitely not support the lab. But overall, I am in support of the lab, and hopefully they will be too, if there is more interaction between them and the people of Boston University.

C.44

Jim Schneider: Thank you. I'm Jim Schneider. I live in the Lechmere section of Cambridge. I sell newspapers for The Globe and The Herald on the Gillmore Bridge, and I'm in opposition to the lab, and continuing with the prior gentleman's remarks, specifically that I think the optimum way for a terrorist group to exploit the opportunities presented by this lab is to release agents in various parts of the city, and let the people in this nice, safe lab watch the various hot spots where the people basically die. And to that end, I respectfully suggest that they name, that BU name this lab the Thanks for Making it Too Easy, Yours Truly Bin Laden Lab. Thank you.

Jhett: Hi. My name is Jhett. I'm a resident of Hyde Park, however, I frequent the area of the proposed lab. I also have family who live there, and I'm in direct support of the lab being built because of its medical benefits, and all of the research that's going to be done there. I think it's a really good thing. I think it's a good opportunity for people in general, people in the world, just to have some kind of help for the diseases that are plaguing us.

I'm just in support of it, and I just hope it goes forward. Thank you.

C.45

Dwaina Howson: Good evening. My name is Dwaina Howson, and I am a Legislative Aid with the office of Representative Marie St. Fleu. And I would just like to convey on behalf of the representative her concerns regarding the public safety issues of placing the lab in this particular neighborhood, but also, her hope that Boston University Medical Center and the National Institutes of Health will continue to foster an open relationship with the community and the legislators so that people can be involved and informed, and can make educated

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C.44 Research in this facility is designed to enhance our ability to respond with vaccines and treatments for potential biological agents.

C.45 BUMC has utilized several mechanisms, outside the NEPA process, to respond to requests for information and address community concerns. In addition to attendance and participation at more than 150 community meetings to provide an overview of the project, address specific issues and answer questions on the Boston-NBL, BUMC has set up information repositories that include key documents and materials at four local public libraries in neighborhoods near the project; some documents have been translated into Spanish to facilitate access for non-English and bilingual speakers. In addition, members of BUMC's Biosafety Laboratory Advisory Group comprised of community members from various Boston neighborhoods serve as focal points for community information exchange on the Boston-NBL.

C.45 decisions regarding this lab.

Jamie Fay: Okay. Seeing no one else waiting for the microphone, we'll declare the meeting closed. Thank you all for your-- I'm sorry, we have one more.

Maura Hennigan: Good evening. What good timing. For the record, my name is City Councilor Maura Hennigan. I'm an at-large City Councilor, and I represent the entire city. I just wanted to take the opportunity this evening to express my strong opposition to the location of a Level IV Biolab in the City of Boston. I do this with a great deal of input from constituents, not only in the abutting areas of the South End and Roxbury, but from people who are across the city who understand the very serious ramifications that will occur should a Bio IV level lab have an accident, and therefore impact not only those immediate areas, but the entire city of Boston and beyond.

I think what has been most disturbing to me during the number of hearings that I have attended, and receiving input from Boston University, is it is very clear to me that they do not have a well thought out plan to deal with what if the unthinkable occurs.

As you may be well aware, there was a Level II lab--

[End of Tape #1, Side B]
[Beginning of Tape #2, Side A]

C.46 Maura Hennigan: --of Tularemia was actually being worked on, and as a result, a number of laboratory workers became exposed and infected. In addition to that, in an unrelated case, we recently had a fire in the South End Boston Medical Center area, and unfortunately, because our firefighters were unaware of radioactivity that was contained in that particular lab, there was contamination of firefighters that actually went so far into Boston Medical Center.

I think it further points out just the fact of how unprepared we as a city are to deal with possible exposures of some of the most serious viruses and organisms known and unknown to man. I hope the National Institute of Health will consider this very, very seriously during its deliberations. We are not against research, we think it is very, very important that we

C.47 be able to discover antidotes and cures to many, many diseases and organisms. However, to do it in a highly populated area in the City of Boston, particularly in neighborhoods that historically have not had strong voting participation, we are very, very concerned that they have singled out neighborhoods that really have been disenfranchised over a number of years, and are not able, in many instances, to fight back as maybe neighborhoods that are much more organized to be able to fight back what would be a very, very serious threat to those communities.

So I ask you to take this into consideration. I once again appreciate the opportunity to testify, and glad I got here before you closed the hearing. Thank you very much. [Applause]

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C.46 See Response to Comment 19.5.

C.47 See Response to Comment 19.2.

Sharon Levine: My name is Sharon Levine. I'm a geriatrician and a physician at Boston Medical Center and Boston University School of Medicine. I make house calls to frail, homebound elderly from the ethnically and richly diverse community in Roxbury, Dorchester, Mattapan, and have done so for the last 16 years. Many of my patients come from countries in the world where people die in the tens of thousands every year from infectious diseases. We may think we live in a very, very small world. We may think we live in a one mile radius, but these are diseases, SARS, West Nile Virus, HIV, that are no longer restricted to far away places. They can be right here, and these are very important public health decisions that we're making here.

I strongly support the Biocontainment Lab, because I feel that the risks for what we can do for good in the world, that the benefits far outweigh any risks to the worldwide community. Thank you. [Applause]

Jim Thatcher: Hi. Jim Thatcher. I live over in the West End, Beacon Hill neighborhood, and I am very much in favor of this, so long as it's done right. I think some of the things that would happen, if they were, wouldn't be local. It would spread everywhere, no matter where this lab was. So it really doesn't matter where it is, and here we have a chance to come up and solve some of these problems by having this lab. Thank you.

[Donna Gittens]: Hello. My name is [Donna Gittens] and I live in Dorchester, and I'm here tonight. I've heard a lot about the lab, and I think it's important and necessary to not only have the lab here, but to also continue to have this industry in this region of the country. It is critical and central to have the research, the benefit of the jobs, and to learn about what those viruses are. Massachusetts, and Boston in particular, is the center of a lot of knowledge, and I think it's important that we get at the forefront of this, and I think the lab is a critical part for this region to move forward, and I support it.

Ed Crotty: Hi. My name is Ed Crotty. I live in Jamaica Plain. When I started my so-called career I was doing human services work in the South End in the area, including the area where this proposal is going to, seems to be wired to take place.

In 1969 the Urban Renewal Plan there was still very new, and there was hope that it was really going to be generating a lot of development that would have kind of [knock on] or [repercussive] effects. This looks to me like a classic dead-end development thing. The set-back, the area that's being set off would be essentially, like other hazardous or high security facilities, would be no go areas, probably for the rest of my lifetime, and maybe for the rest of the lifetime even for the youth in this room.

C.48 Again, I'm not the kind of, a Ludite that says "Don't do the research." By all means, do the research. But good lord, I mean, within a kilometer of the most expensive public works

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C.48 The project site has been zoned for medical research uses for many years and was designated by the City of Boston for biotechnology. The project would bring economic benefits to the City as described in Response to Comment 90.8.

C.48 project in the history of this country, is there not a higher, better use of that parcel? I've experienced a doubling of my real estate taxes in the last year. This would go off the real estate tax rolls. This would generate a few jobs for some highly trained researchers, but not for the general rank and file population of the city.

I don't know if these are considerations that have gone into the Environmental Impact Statement. It seems that they ought to, but I don't know if they have. Often, it's useful to narrow the scope of these things. But it is just inconceivable to me. I mean, it seems like money is driving this right from the very top. Obviously in this country right now, as we've discovered with the whole selling of the Pentagon phenomenon over my lifetime, if you fund it, they will build. There is money dangling out there, and there is a lot, you know, from City Hall, to the BRA, to developers that are close to the mayor and make contributions, there is a lot of money that's driving this. I would say to the people in the construction worker's unions, with whom I have an enormous sense of solidarity having variously belonged to unions over the years, there are other, better things to be done with this that will actually generate more jobs. It is not a no-build zone, but in the future, it will become a no-build zone, this kind of facility.

This belongs in a less densely populated area. What could be more obvious? It is a stunning lack of leadership. One person called this a lack of democracy. It is a stunning lack of public leadership at this point, that from the federal, through the state, and on down to the municipal level, that people can't figure out a better way to meet a need, and also to treat that extremely valuable urban site for better purposes.

C.49 I guess finally, there seems to be kind of a kangaroo court nature to this thing. The folks who want to fund this and want to build this are also the folks who are going to be making the decision. So at least not to feel too foolish in walking away, I want to acknowledge that I feel like I'm sort of preaching to the judge, jury and executioner on this, but that's the strange world we live in. Thank you. [Applause]

Jamie Fay: Okay. Seeing no more speakers, we're going to close the hearing. Thank you all for coming tonight.

PUBLIC MEETING

C.49 The Boston-NBL is being proposed by BUMC. The decision to fund the construction of this facility would be made by the NIH, not by BUMC. No decision to fund the building has been made.

RESPONSE TO COMMENTS ACRONYMS

AAL	Allowable Ambient Limits
B-LAG	Biosafety Laboratory Advisory Group
BMBL	Biosafety in Microbiological and Biomedical Laboratories
BMC	Boston Medical Center
Boston-NBL	National Emerging Infectious Diseases Laboratory (Proposed Action)
BPHC	Boston Public Health Commission
BRA	Boston Redevelopment Authority
BSC	Biological Safety Cabinet
BPHC	Boston Public Health Commission
BSL	Biological Safety Level
BTD	Boston Transportation Department
BU	Boston University
BUMC	Boston University Medical Center
BWSC	Boston Water and Sewer Commission
CDC	Centers for Disease Control and Prevention
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CLC	Community Liaison Committee
CMR	Code of Massachusetts Regulations
CMP	Construction Management Plan
DEP	Department of Environmental Protection (MA)
DHHS	Department of Health and Human Services (U.S.)
DNA	Deoxyribonucleic acid
DPH	Department of Public Health (MA)
DOT	Department of Transportation (U.S.)
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EJ	Environmental Justice
EMS	Emergency Medical Services
EPA	Environmental Protection Agency (U.S.)
F	Fahrenheit
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
GPS	Global Positioning System
HEPA	High Efficiency Particulate Air
HHMM	High Hazard Material Management
HVAC	Heating Ventilating and Air Conditioning
IATA	International Air Transport Association
IBC	Institutional Biosafety Committee

MEPA	Massachusetts Environmental Policy Act
MPR	Maximum Possible Risk
MWRA	Massachusetts Water Resource Authority
NAAQS	National Ambient Air Quality Standards
NBL	National Biocontainment Laboratory
NEPA	National Environmental Policy Act
NIAID	National Institute of Allergy and Infectious Diseases
NIH	National Institutes of Health
NSF	National Science Foundation
NSF	National Sanitation Foundation
OEHS	Office of Environmental Health and Safety
OSHA	Occupational Safety and Health Administration
RAM	Release Abatement Measure
rDNA	recombinant DNA
ROD	Record of Decision
sf	square feet
SDEIS	Supplemental Draft Environmental Impact Statement
TEL	Threshold Exposure Limits
USAMRIID	United States Army Medical Research Institute for Infectious Diseases
USDA	United States Department of Agriculture
VOC	Volatile Organic Compound
WOE	Weight of Evidence

Literature Cited
List of Preparers
Acronyms and Glossary
distribution list

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LIST OF PREPARERS

The following personnel provided technical assistance to NIH in the preparation and review of this EIS. None of these persons have a financial or other interest in the outcome of the project.

Name	Organization
Sarah Arulanandam Senior Technical Coordinator M.A. Sc.	RWDI Guelph, Ontario
Paul Avery, P.E. President, Civil Engineer M.S., Civil Engineering	Oak Engineers Newburyport, MA
Ryan Bayha Environmental Protection Specialist B.S., Environmental Science	National Institutes of Health Bethesda, MD
Ellen Berlin Director, Corporate Communications M.P.A.	Boston University Medical Center Boston, MA
Scott Butler, P.E. Architect, Project Director M.S. Civil Engineering	CUH2A Princeton, NJ
Jamie M. Fay, A.I.C.P. President B.A., Planning	Fort Point Associates, Inc. Boston, MA
Cameo Flood NEPA specialist BS/Forest Resource Management	Maxim Technologies Missoula, Montana

Name	Organization
Charles Hayter, RLA Senior Associate, Landscape Architect LEED™ 2.0 Accredited Professional	Stubbins Associates Boston, MA
Jane Howard Principal, Transportation Engineer/Planner M.A., Community Planning	Howard Stein Hudson Boston, MA
Karen Lyncoln Sr. Socioeconomic/ Environmental Justice Specialist BA/Urban Affairs	Maxim Technologies Helena, Montana
Valerie Nottingham Chief, Environmental Quality Branch M.S., Chemistry	National Institutes of Health Bethesda, MD
Jack Murphy, PhD Professor of Medicine and Microbiology Chief, Section of Molecular Medicine Associate Director, Graduate Program in Molecular Medicine	Boston University Medical Center Boston, MA
Stephen Ransom, P.E., L.S.P. President, Environmental Engineer B.S., Forest Engineering, M.S., Civil Environmental Engineering	Ransom Environmental Newburyport, MA
Carla Richards Director, Community Relations M.A., Public Policy	Boston University Medical Center Boston, MA
Robert Rossi, C.C.M Senior Atmospheric Scientist Ph.D., Atmospheric Science	Tech Environmental Inc. Waltham, MA

Name	Organization
Rebecca Ryan Biosafety Officer M.P.H. Enivornmental Health, B.S. Biology	Boston University Medical Center Boston, MA
Peter Schneider Director, Environmental Health and Safety B.S. Political Science, M.A., Urban Affairs	Boston University Medical Center Boston, MA
Felipe Schwarz Planner B.A., Architectural Studies, M.A., City and Regional Planning	Fort Point Associates, Inc. Boston, MA
Susan St. Pierre, A.I.C.P. Senior Associate B.S., Geography, M.A., Geography	Fort Point Associates, Inc. Boston, MA
Kevin Tuohey, C.H.P.A. Executive Director, Operations and Public Safety B.A., Criminal Justice, B.A., Political Science	Boston University Medical Center Boston, MA
Kara Wilbur Planner B.A., Environmental Studies	Fort Point Associates, Inc. Boston, MA

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ACRONYMS AND GLOSSARY

Acronyms

AHU	Air Handling Unit
AIDS	Acquired Immune Deficiency Syndrome
BAA	Broad Agency Announcement
BAS	Building Automation System
B-LAG	Biosafety Laboratory Advisory Group
BMBL	Biosafety in Microbiological and Biomedical Laboratories
BMC	Boston Medical Center
Boston-NBL	National Emerging Infectious Diseases Laboratory (Proposed Action)
BPHC	Boston Public Health Commission
BRA	Boston Redevelopment Authority
BSC	Biological Safety Cabinet
BPHC	Boston Public Health Commission
BSL	Biological Safety Level
BTD	Boston Transportation Department
BUMC	Boston University Medical Center
BWSC	Boston Water and Sewer Commission
CA/T	Central Artery/Tunnel
CDC	Centers for Disease Control and Prevention
CEQ	Council on Environmental Quality
cfh	cubic feet per hour
CFR	Code of Federal Regulations
CLC	Community Liaison Committee
CMP	Construction Management Plan
CMR	Code of Massachusetts Regulations
dBA	decibels
DEP	Department of Environmental Protection (MA)
DHHS	Department of Health and Human Services (U.S.)
DIR	Division of Intramural Research (NIAID)
DOT	Department of Transportation (U.S.)
DPH	Department of Public Health (MA)
ED	Emergency Department
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EJ	Environmental Justice
EMS	Emergency Medical Services
EOEA	Executive Office of Environmental Affairs
EPA	Environmental Protection Agency (U.S.)
F	Fahrenheit

FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
gpd	gallons per day
HEPA	High Efficiency Particulate Air
HHMM	High Hazard Material Management
HIV	Human Immunodeficiency Virus
HVAC	Heating Ventilating and Air Conditioning
IATA	International Air Transport Association
IBC	Institutional Biosafety Committee
ICAO	International Civil Aviation Organization
ICP	Integrated Contingency Plan
ICS	Incident Command System
KV	Kilovolt
KW	Kilowatt
LEPC	Local Emergency Planning Committee
LOS	Level of Service
MAC	Massachusetts Avenue Connector
MBTA	Massachusetts Bay Transportation Authority
MEPA	Massachusetts Environmental Policy Act
MHD	Massachusetts Highway Department
mgd	million gallons per day
MMRS	Metropolitan Medical Response System
MPR	Maximum Possible Risk
MRI	Magnetic Resonance Imaging
MWRA	Massachusetts Water Resource Authority
NAAQS	National Ambient Air Quality Standards
NBL	National Biocontainment Laboratory
NEPA	National Environmental Policy Act
NIAID	National Institute of Allergy and Infectious Diseases
NIH	National Institutes of Health
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NSF	National Sanitation Foundation
NSF	National Science Foundation
OEHS	Office of Environmental Health and Safety
OGS	Office of General Services
OSHA	Occupational Safety and Health Administration
PAC	Project Advisory Committee
PARP	Power Air Purifying Respirators
PI	Principal Investigator
PILOT	Payment In Lieu of Taxes
PIR	Project Impact Report
RCE	Regional Center of Excellence

rDNA	recombinant DNA
RAM	Release Abatement Measure
RBL	Regional Biocontainment Laboratories
RPO	Radiation Protection Office
sf	square feet
SPCC	Spill Prevention Controls and Countermeasures
TDM	Transportation Demand Management
TMA	Transportation Management Association
TranSComm	Transportation Solutions for Commuters
TSS	Total Suspended Solids
USAMRIID	United States Army Medical Research Institute for Infectious Diseases
USDA	United States Department of Agriculture
USPS	United States Postal Service
VOC	Volatile Organic Compound
WOE	Weight of Evidence

Glossary

Aerosol – a suspension of fine solid or liquid particles in gas (smoke, fog, and mist).

Affected Environment – the conditions of the area to be affected or created by the alternatives under consideration.

Alkaline Hydrolysis Process Tissue Digester - a process where strong chemical solutions and high temperatures are used to dissolve and sterilize animal tissue.

Antigenic – ability to be recognized by antibodies.

Autoclave - an apparatus using superheated steam under high pressure for sterilization.

Bacteriology – the study of bacteria.

Biodefense – measures taken or planned to provide safety and security against biohazards.

Biohazard – containing material that may cause illness or disease.

Biological Safety Cabinet (Class II, type A or type B) – Equipment designed as a primary means of containment developed to provide personnel, product and environmental protection while working with infectious microorganisms.

Biological weapon – any material that can be deliberately distributed to cause illness or death by disease.

Bioterrorism – the use of microorganisms that cause human disease, or of toxins derived from them, to harm people or to elicit widespread fear or intimidation of society for political or ideological goals.

Chemical Shower – a sealed shower stall in which biological decontamination of a positive pressure personnel suit is performed, using a chemical decontaminant.
Communicable Period – The time during which and infections agent may be transferred directly from an infected person to another uninfected person.

Community Stakeholders – people in the community who are able to influence public opinion or who may be impacted by the proposed activities.

Connected Actions - are closely related and 1) automatically trigger other actions, 2) could not or would not proceed unless other actions are taken previously or simultaneously, and 3) are interdependent parts of a larger action and depend on the larger action for their justification.

Containment - describing safe methods for handling, managing, and maintaining infectious materials in the laboratory environment. The purpose of containment is to reduce or eliminate exposure of laboratory workers, other persons, and the outside environment to potentially hazardous agents.

Council on Environmental Quality – Established by Congress under the Executive Office of the President to oversee the National Environmental Policy Act (NEPA) to ensure that federal agencies meet their obligations under NEPA.

Cumulative Effects – impacts which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Decontamination – the process of removing harmful substances (biological, chemical or nuclear).

Direct Effect – effects which are caused by the action and occur at the same time and place.

Drug-Resistant – microbes that are able to survive medication normally used to fight them.

Emerging infectious disease –A previously unknown infectious disease, or an infectious disease new to a particular location.

Endemic – A disease that occurs continuously in a particular population.

Environmental Justice - Avoiding disproportionately high and adverse human health or environmental impacts on minority and low-income populations.

Epidemiology - branch of medical science that deals with the incidence, distribution, and control of disease in a population.

Etiologic Agent – the cause or origin of an infectious disease.

Exotic agent – Pathogens or microbes not naturally occurring in a given location.

Host - a living insect, animal or plant providing subsistence to a parasite.

Immune Response – a natural response within the human body that occurs when a foreign molecule is detected and rendered harmless.

Immunization – a process by which medical therapy creates natural resistance within the human body.

Immunologic – pertaining to the immune system.

Immunology – study of the immune system and its responses to foreign molecules.

Incubation Period – The time interval between infection and the appearance of the first sign or symptom of the disease.

Indigenous Agent – naturally occurring in a given location.

Indirect Effects –impacts caused by an action that are not directly attributable, but instead, evolve over time.

Infectious – A microbe or pathogen able to cause disease.

Infectious Agent – Pathogens or microbes able to cause disease.

Infectious Disease – and illness caused by microorganisms that can be spread from one person to another.

Ingestion –entry into body through swallowing.

Irreversible Commitment of Resources – those that cannot be reversed, except perhaps in the extreme long term. Examples included species extinction, permanent removal of minerals.

Irretrievable Commitment of Resources – those that are lost for a period.

Labor income - income from work or earnings.

Life-Threatening Disease – illness that may cause one to die.

Low-income population - refers to a community in which 25% or more of the population is characterized as living in poverty, as determined by statistical poverty thresholds used by the U.S.

Microbe – microorganism.

Microorganism – a microscopic organism. Those of medical concern and interest include bacteria, viruses, fungi, and protozoa.

Minority Population - refers to an area where minority individuals comprise 25% or more of the population.

Minorities are people who classified themselves as African Americans, Asian or Pacific Islanders, American Indians, Hispanics of any race or origin, or other non-White races.

Mitigation – measures taken or planned to reduce or avoid impacts.

Monitoring – repeated measurement taken to ascertain effects, document compliance or effectiveness of protection measures.

Negative Pressure – a term used when describing controlled, interior air flow that identifies a space that has lower air pressure from adjacent spaces.

Nucleic Acids - any of various acids (as DNA or RNA) that are composed of nucleotide chains.

Pathogen – a microscopic organism that causes infection and/or disease.

Pathogenesis – the mechanism by which an infectious agent leads to disease or clinical illness.

Per Capita Income - all personal income divided by total population.

Percutaneous Injury – cut or puncture of the skin.

Personal Income - all income received by individuals from all sources.

Positive Pressure –a term used when describing controlled, interior air flow from a higher air pressure space to an adjacent lower air pressure space.

Positive Pressure Personnel Suit – A containment suit worn for protection in a Biological Safety Level 4 environment that maintains positive pressure throughout air line supplied breathing air.

Poverty - having an income below what is necessary for basic necessities – adequate housing, food, transportation, energy, health care, etc.

Preferred Alternative – the alternative that the agency is currently considering selecting.
Primary Containment -protection measures from exposure to infectious agents for personnel within the immediate laboratory environment.

Prions - a protein particle that lacks nucleic acid and is believed to be the cause of various infectious diseases of the nervous system (as bovine spongiform encephalopathy and Creutzfeldt-Jakob disease).

Proposed Action – the activities initially described to meet the purpose and need.

Proximity Reader System – a security device that reads a card held near it to verify is access is authorized.

Reasonably Foreseeable Action – activities that are planned, which will occur in the near future, yet are not part of the Proposed Action.

Reemerging Infectious Diseases – illnesses that have been previously identified and largely controlled that have recently become more active in the human population.

Salmonid – from the family Salmonidae (such as salmon and trout).

Sanitary Sewer – system to remove and convey waste and wastewater to a treatment facility.

Scope – the range of topics considered within the environmental impact statement.

Secondary Barriers - separation between primary containment areas and non-containment areas within a laboratory facility.

Secondary Containment - provides protection of the environment external to the laboratory from exposure to infectious materials, and is provided by a combination of facility design and operational practices.

Sharps – objects capable of causing punctures or cuts, which may be contaminated.

Tissue Culture – the process of growing live cells outside the body for study purposes.

Transmission – mechanism by which an infectious agent is spread from source a person.

Unavoidable Adverse Effects – adverse effect that can not be avoided if the proposed action is implemented.

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DISTRIBUTION LIST

Libraries

Grove Hall Branch Library
Joanne Goodman, Head Librarian
5 Crawford Street
Dorchester MA 02121

Dudley Branch Library
Carin O'Connor
65 Warren Street
Roxbury MA 02119

South End Branch Library
Ann Smart, Archives
685 Tremont Street
Boston MA 02118

Boston Public Library
Government Documents Section
700 Boylston Street
Boston MA 02116

Public Agencies

Diane Lazinsky
Andrew Raddant
U.S. Department of Interior
408 Atlantic Avenue, Room 142
Boston MA 02210

Robert Varney, Regional Administrator
U.S. EPA, Region 1
One Congress Street, Suite 1100
Boston MA 02114

Valerie Nottingham
Division of Environmental Protection
The National Institutes of Health
B13 Rm. 2W64, 9000 Rockville Pike
Bethesda, MD 20892

Kenneth Havran
Department of Interior
Office of Environmental Policy & Compliance
1849 C NW MS 2342
Washington DC 20240

General Public

Christopher Brayton
3 Haven Street
Boston MA 02118

Jeff Shearstone
58 Village Way
Brookline MA 02445

Blackstone/Franklin Square Neighborhood Association
C/o 1 Saint George Street, #3C
attn: Sherwood Hughes
Boston MA 02118

Sherwood Hughes
1 Saint George Street, #3C
Boston MA 02118

Christos Hamawi
690 Massachusetts Avenue, Unit 2
Boston MA 02118

Howard Rotman, Chapter Chair
E. Newton Pavilion, SEIU Local 2020
Boston Medical Center
30 Van Winkle Street
Dorchester MA 02124

David Mundel
36 Gray Street
Boston MA 02116

Luis Prado
8 Park Lane
Boston MA 02130

Susan Gracey
18 Monmouth Court
Brookline MA 02446

Sharon Berke
8 Glade Avenue #2
Jamaica Plain MA 02130

Ernesta Kraczkiewicz)
Watertown Citizens for
Environmental Safety
P.O. Box 1194
Watertown MA 02471

Phoebe Knopf
20 Charlesgate W.
Boston MA 02115

John Allocca
14 Mayhew Street
Dorchester MA 02125

Helaine Simmonds
49 East Springfield Street
Boston MA 02118

Cinda Stoner
107 East Brookline Street
Boston MA 02118

Carrie Schneider, Esq., Staff Attorney
Conservation Law Foundation
62 Summer Street
Boston MA 02110

Peter Shelley, Esq., Vice President
Conservation Law Foundation
62 Summer Street
Boston MA 02110

Carolyn Poinelli
36 Prince Street #12
Boston MA 02113

Shirley Kressel
27 Hereford Street
Boston MA 02115

Mary Ann Nelson, Chair
Sierra Club, Massachusetts
Chapter
100 Boylston Street
Boston MA 02116

Carol Marusi Draper
66 Westminster Court
Roxbury MA 02119

Virginia Pratt
7 Segel Street
Jamaica Plain MA 02130

Douglas Hart
250 Standish Street
Duxbury MA 02331

Alicia Siminski
65 Sedgewick Street
Jamaica Plain MA 02130

Mark Pelletier
8 Glade Avenue
Jamaica Plain MA 02130

Colin Riley
85 Hamilton Street
Dorchester MA 02121

David Ludlow
69 Robeson St,
Jamaica Plain MA 02130

Arthur Zeanabus
14 Duck Road
Reading MA 01867

Thomas Eliot
17 Parish Path
Marshfield MA 02059

Clarence Cooper
12 Rugby Road
Mattapan, MA 02126

Maryanne Nelson
10 Gore Street
Boston, MA 02128

Daryl DeLucca
522 Park Drive
Boston, MA 02215

Alex Allen
10 Saint John Street
Boston MA 02130

Julius Corley
362 Memorial Drive.
Cambridge MA 02139

Pam Beale
462 Beacon Street
Boston MA 02115

Dr. Gerald Beltz
4 Eustis Street
Lexington. MA.02421

Randolph E. Green
8 Woodbine Street #2
Roxbury MA 02119

Barton Reppert
433 Westside Drive #204
Gaithersburg MD 20878

Janice Whalen
164 E Street
South Boston MA 02127

Gary Walker
18 Brenton
Dorchester MA.02121

Claire Allen
Safety Net and ACE
Alternatives for Community
& Environment, Suite 301
2181 Washington Street
Roxbury MA 02119

John Duffy
11 Captains Hill Road
Duxbury MA 02332

Dan McLaughlin
38 Roslin Street
Dorchester MA 02124

Julian Maynard
59 Elm Street
Cambridge MA 02139

Mary Regan
37 Mt. Ida Road.
Dorchester MA 02125

Marie Louise Jackson Miller
10 Elm Street
Quincy MA 02169

Peter Sanborn
59 East Springfield Street
Boston MA 02118

Fay Sliger
ACE
28 Clearway Street
Boston MA 02115

Laura Armond-Maslow
58 Grozier Road
Cambridge MA 02138

Isabel A. Leonard
Medical & Technical Translations
5 Hearn Street
Watertown MA 02472

Ann Langone
14 Mayhew Street
Dorchester MA 02125

Deidre Doran
90 Rossmore Road
Jamaica Plain MA 02130

Kyle Loring
ACE Legal Fellow
2343 Washington Street, 2nd Floor
Roxbury MA 02119

Louise Baxter
290 Athens Street
South Boston MA 02127

James Ratcliffe
16 Wellington Street #3
Boston MA 02118

Eve Lyman
Boston Mobilization
971 Commonwealth Avenue
Suite 20
Boston MA 02215

Anne Alison Barnet
49 East Springfiled Street
Boston MA 02118

Jonathan Tucker
1191 Boylston Street #41
Boston MA 02215

Sharon Hueul
461 Commonwealth Avenue #2
Boston MA 02215

Carrie L. Nelson
1569 Beacon Street #12
Brookline MA 02446

Elizabeth Mac Neil
23 Baystate Street
Dorchester MA 02125

Sheila Cheimets
540 Massachusetts Avenue
Boston MA 02118

Michael W. Parker
197 8th Street #515
Charlestown MA 02129

Scarlett Bartlett
222 Chestnut Street
Cambridge MA 02139

Karen Johnson
31A Alveston Street
Jamaica Plain MA 02130

Sheryl Brown-Shimer
President , BFSNA
P.O. Box 180940
Boston MA 02118

Patricia Glynn
6 Fort Avenue Terrace
Roxbury MA 02119

Donovan Walker
5 Burton Avenue #2
Roxbury MA 02119

Alexandra Gorman
Women's Voices of the Earth
114 W. Pine Street
Missoula MT 59802

Maura Jacobs
700 Commonwealth Avenue
Boston MA 02115

Dr. Margaret S. Race
SETI Institute
1709 Greenhills Court
Lafayette CA 94549

.

Appendix 1

NIAID Publication "The Need for Biosafety laboratory facilities" February 2004

Research On
National Institute of Allergy and Infectious Diseases
National Institutes of Health
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

February 2004

The Need for Biosafety Laboratory Facilities

Introduction

In the past century, medical research has led to improved health and increased life expectancy largely because of success in preventing and treating infectious diseases. This success has come about through the use of antibiotics and vaccines, improved hygiene, and increased public awareness. New threats to health continually emerge naturally, however, as bacteria and viruses evolve, are transported to new environments, or develop resistance to drugs and vaccines. Some familiar examples of these so-called emerging or re-emerging infections include HIV/AIDS, West Nile virus, severe acute respiratory syndrome (SARS), monkeypox, and annual outbreaks of influenza.

To control epidemics and protect the public health, medical researchers must quickly identify naturally occurring microbes and then develop diagnostic tests, treatments, and vaccines for them. Preparing for bioterrorism - the deliberate release of a microbe into a community in which it is not a current health concern - calls for the identical scientific skills and strategies.

For more than 50 years, the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health (NIH), has led the nation's medical research effort to understand, treat, and prevent the myriad infectious diseases that threaten hundreds of millions of people worldwide. NIAID's portion of the NIH budget-received each year from Congress-not only supports medical research conducted on the NIH campus in Maryland but also at universities and research centers primarily nationwide but also overseas. The benefits of this research reach people of all ages worldwide.

Because NIAID has broad experience, expertise, and success in developing medical tools to fight infectious diseases, it now also plays a leading role in the nation's fight against bioterrorism. The Institute is expanding its research programs to accelerate the development of new and improved diagnostics, treatments, and vaccines to protect civilians from deadly infectious diseases, whether they emerge naturally or are deliberately released in a bioterrorist attack.

NIAID'S BIODEFENSE RESEARCH PLAN

Through a process of extensive expert consultation, NIAID has developed a strategic plan for biodefense and emerging infectious diseases research. Key elements of the plan include the following:

- Support medical research on microbes and the human immune response to them
- Apply such research to the discovery and development of vaccines, drugs, and diagnostic tests designed to protect the general population
- Ensure that the United States has enough research facilities to carry out these activities

NIAID's strategic plan for biodefense, detailed research agendas, and a progress report can be found at http://biodefense.niaid.nih.gov.

ENSURING SUFFICIENT RESEARCH FACILITIES

NIAID's ultimate goal is to develop new and improved diagnostics, vaccines, and treatments for diseases caused by infectious agents. Medical tools such as these can only be developed, however, with a solid understanding of the biology of the disease-causing agents, whether they occur naturally or are deliberately released by terrorists. Such research sometimes requires working with the actual microbes or their toxins. This research must be conducted in special biosafety laboratories and in accord with the many laws, regulations, policies, and well-established guidelines that govern research on these microbes and the design, management, and operation of these laboratories. All these provisions aim to protect not only the lab workers but also the surrounding community from accidental exposure to infectious agents.

Certain guidelines (*Biosafety in Microbiological and Biomedical Laboratories*, http://bmbl.od.nih.gov/index.htm) specify four levels of safety and security required for laboratory facilities in which such research will take place. The general characteristics of the biosafety levels (often referred to as BSL-2 to BSL-4) are summarized in Table 1.

Many U.S. institutions and companies with infectious disease research programs have BSL-3 laboratory suites required to perform their research. Most such laboratories, however, are small, dedicated to particular uses, or in need of modernization. In addition, some hospitals have small laboratory or clinical areas that can operate at this level, including space for isolating patients suspected or known to have certain highly contagious diseases.

BSL-4 labs have the most stringent safety and security requirements. There are currently only four operational BSL-4 laboratory suites in the United States: at the Centers for Disease Control and Prevention in Atlanta; at the United States Army

Medical Research Institute for Infectious Diseases at Fort Detrick in Frederick, MD; at the Southwest Foundation for Biomedical Research in San Antonio; and at the University of Texas at Galveston. A small BSL-4 facility exists on the NIH campus in Bethesda, MD, but it is currently being operated only at a BSL-3 level for research on important emerging infectious diseases.

The recent bioterrorist events made it very clear that from a strategic national perspective, a serious shortage of BSL-3 and BSL-4 laboratory space exists. This problem has been well documented by the Institute of Medicine, and it has repeatedly been identified in NIAID's strategic planning process. Thus, NIAID's research agenda for biodefense and emerging infectious diseases includes plans to construct and renovate BSL-3 and BSL-4 laboratories around the country. To be most effective, these laboratories must be located where established teams of researchers already work side-by-side on related scientific problems.

PROPOSED BIOSAFETY LAB FACILITIES

1. **NIAID has received funding to construct four new national facilities, all of which will include BSL-4 and BSL-3 laboratory suites as well as BSL-2 space**
    - A new NIAID facility at Fort Detrick, a U.S. Army installation located in Frederick, MD
    - A new facility at NIAID's Rocky Mountain Laboratories, located in Hamilton, MT
    - Two National Biocontainment Laboratories, located at Boston University and at the University of Texas Medical Branch at Galveston. The sites for these were chosen in a competitive process known as peer review from among applications received from researchers nationwide

    Additional individual information on all these projects can be found at these links
    http://www.niaid.nih.gov/biodefense/public/detrick_rocky_qa.htm
    http://www.niaid.nih.gov/newsroom/releases/nblscorrect21.htm

2. **NIAID also is funding construction or renovation of facilities that include BSL-3 and BSL-2 laboratory suites**
    - Building 33, a new integrated research facility, on the NIH campus in Bethesda, MD
    - Nine Regional Biocontainment Laboratories, selected in a competitive, peer-review process from applications received from researchers nationwide

    Additional individual information on all these projects can be found at

these links
http://www.niaid.nih.gov/factsheets/qanda.htm
http://www.nih.gov/news/NIH-Record/10_14_2003/story01.htm
http://www.niaid.nih.gov/newsroom/releases/nblscorrect21.htm

FEATURES OF RESEARCH PLANNED FOR THESE FACILITIES

NIAID-Funded Research Will Include

- Laboratory research on the biology of the disease-causing agents
- Laboratory and animal model studies testing the usefulness of new drugs, vaccines, and diagnostic tests to detect, treat, and prevent illness among civilians
- Adherence to all relevant security and safety standards required by law

NIAID-Funded Research Will NOT Include

- Research on bioweapons (which is not even permissible under international law)

NIAID Policies Regarding Security, Publication, and Secrecy

- The extent to which publications or access to data from biodefense research should be limited is being widely debated. NIAID supports a policy encouraging publication and dissemination of research findings through proper scientific channels in the belief that this policy will provide many more opportunities for good than for harm. More people will know more about microbes and toxins and be able to use that information for beneficial purposes. The fact that the information is widely available in the scientific community makes it less attractive to use with malicious intent.
- NIAID is not supporting any secret (so-called "classified") research. Furthermore, NIAID has no plans to do so. This matter is also being widely debated among scientists and policy makers, and it is possible that in the future, the criteria for what should and should not be classified might change. Nonetheless, NIAID supports a policy of openness. The justification for classifying certain projects would require a clear case that the potential for harm from misuse of specific information by individuals with nefarious intents significantly exceeds the potential for good. Whether it is classified or not, however, it is important to emphasize that NIAID-funded research will not include research on bioweapons.

Table 1: Biosafety Levels

Biosafety Level	Agents	Practices	Safety Equipment	Facilities
BSL-1	These agents are not generally associated with disease in healthy people	• Good microbiological practice • Hand washing • No eating, drinking or gum chewing in the laboratory	• Pipeting devices- mouth pipeting is prohibited	
BSL-2	These agents are associated with human disease	• Limited lab access • Most work may be performed on a bench top • Biohazard warning signs • "Sharps" precautions • Biosafety manual defining any needed waste decontamination or medical surveillance policies	• Class I or II Biological Safety Cabinets (BSCs) or other physical containment devices • Lab coats, gloves, face protection, as needed	• Open bench-top • sink for hand washing is required • Autoclave available
BSL-3	These agents: • Are associated with human disease and cause illness by spreading through the air (aerosol) • Cause diseases that may have serious or lethal consequenc es	BSL-2 practice plus • Controlled access • Decontaminati on of all waste • Decontaminati on of lab clothing before laundering	• Class I or II Biological Safety Cabinets (BSCs) or other physical containment devices • Protective lab clothing, gloves, respiratory protection as needed	BSL-2 plus • Physical separation from access corridors • Self-closing, double-door access • Exhaust air is not recirculated • Negative airflow into laboratory • Design includes back-up/redundant systems
BSL-4	These agents:	BSL-3 practices plus	• All procedures	BSL-3 plus

	• Are associated with human disease and cause illness by spreading through the air (aerosol) or have an unknown cause of transmission ; • Cause diseases that are usually life-threatening;	• Clothing change before entering • Shower on exit • All material decontaminated on exit from facility	conducted in Class III BSCs or Class I or II BSCs in combination with full-body, air-supplied, positive-pressure personnel suit	• Separate building or isolated zone • Dedicated supply and exhaust, vacuum, and decontamination systems • Design includes back-up/redundant systems • Other requirements outlined in NIH/CDC publication "Biosafety in Microbiological and Biomedical Laboratories"*

NIAID is a component of the National Institutes of Health (NIH), which is an agency of the Department of Health and Human Services. NIAID supports basic and applied research to prevent, diagnose, and treat infectious and immune-mediated illnesses, including HIV/AIDS and other sexually transmitted diseases, illness from potential agents of bioterrorism, tuberculosis, malaria, autoimmune disorders, asthma and allergies.

News releases, fact sheets and other NIAID-related materials are available on the NIAID Web site at http://www.niaid.nih.gov.

Prepared by:
Office of Communications and Public Liaison
National Institute of Allergy and Infectious Diseases
National Institutes of Health
Bethesda, MD 20892

U.S. Department of Health and Human Services

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Appendix 2

Characteristics of Diseases Studied at BUMC and which may be Studied at BUMC and the Boston-NBL

Appendix 2: Characteristics of Diseases Studied at BUMC and which may be Studied at BUMC and the Boston-NBL

TABLE 1

Characteristics of Primary Diseases That Are Being or Have Previously Been Studied at BUMC, at BSL-2 and BSL-3

Disease	Infectious Agent	Occurrence	Reservoir[2]	Transmission[3]	Incubation Period[4]	Communicable Period[5]
Bacterial Diseases						
Lyme Disease	*Borrelia burgdorferi*	Along the Atlantic coast, concentrated between Massachusetts and Maryland; upper Midwest; and local areas of California and Oregon. Cases reported from 47 states, Canada. Also occurs in Europe and Asia.	Primarily wild rodents.	Primarily ticks of the genus Ixodes.	3-32 days, mean of 7-10 days.	No evidence of person-to-person transmission.
Plague	Yersinia pestis, Yersinia enterocolitica	Wild rodent plague occurs in the western U.S.; large areas of South America; north central, eastern, and southern Africa; central and southeast Asia, and south-eastern Europe near the Caspian Sea; and localized areas in the Russian Federation and Kazakhstan. Recent outbreaks of have occurred in Africa and Asia, and local outbreaks South America.	Wild rodents, rabbits and hares, wild carnivores and domestic cats.	People generally become infected by being bitten by an infected rodent flea or handling an infected animal; rarely by airborne droplets from human patients or household cats with plague pharyngitis or pneumonia.	1-7 days.	Fleas may remain infective for months. Pneumonic plague may be highly communicable under some conditions. Bubonic (swollen lymph nodes) form is rarely transmitted directly.

Appendix 2: Characteristics of Diseases Studied at BUMC and which may be Studied at BUMC and the Boston-NBL

TABLE 1

Characteristics of Primary Diseases That Are Being or Have Previously Been Studied at BUMC, at BSL-2 and BSL-3

Disease	Infectious Agent	Occurrence	Reservoir[2]	Transmission[3]	Incubation Period[4]	Communicable Period[5]
Tuberculosis (TB)	Mycobacterium tuberculosis complex. Includes M. tuberculosis and M. africanum from humans, M. bovis from cattle	Worldwide.	Humans, rarely primates. Possibly diseased cattle, swine, badgers, and other mammals	Coughing or sneezing by people with tuberculosis of the lungs or throat. Rarely transmitted through direct contact with broken skin or mucous membrane. Bovine tuberculosis may be acquired from tuberculosis cattle or unpasturized milk products.	2-10 weeks. Latent (inactive, asymptomatic) infection may persist for a lifetime.	As long as viable tubercle bacilli are being discharged while coughing.
Brucellosis	Brucella melitensis,	Worldwide- high risks are the Mediterranean Basin (Portugal, Spain, Southern France, Italy, Greece, Turkey, North Africa), South and Central America, Eastern Europe, Asia, Africa, the Caribbean, and the Middle East.	Sheep, goats, cows, or camels	The most common way to be infected is by eating or drinking contaminated milk products. Direct person to person rare	8 weeks to 1 year	Unclear
Antibiotic- resistant Staphylococcus infection	Staphylococcus Aureus, Staphylococcal enterotoxin	Worldwide	Humans, rarely animals	Person-to-person	Variable and indefinite. Often 4-10 days.	Variable: as long as purulent lesions continue to drain or the carrier state persists.
Conjunctivitis ("pinkeye")	Chlamydia trachomatis	Worldwide	Humans	Direct contact with infectious eye or nasal discharges, or contact with contaminated towels or clothing.	5-12 days	As long as active lesions are present.

Appendix 2: Characteristics of Diseases Studied at BUMC and which may be Studied at BUMC and the Boston-NBL

TABLE 1

Characteristics of Primary Diseases That Are Being or Have Previously Been Studied at BUMC, at BSL-2 and BSL-3

Disease	Infectious Agent	Occurrence	Reservoir[2]	Transmission[3]	Incubation Period[4]	Communicable Period[5]
Sexually transmitted Chlamydia	*Chlamydia trachomatis*	Worldwide	Humans	Person-to-person transmission through sexual intercourse.	7-14 days.	Unknown
Tularemia	*Francisella tularensis*	Worldwide	Primarily rabbits, and rodents,	Primarily through exposure of aerosols or droplets from rabbits or rodent.	3-14 days	Can remain active in natural moist conditions in the environment for several weeks. No evidence of person-to - person transmission
Cholera	*Vibrio cholerae*	Cholera spread from India in 19th century, currently some outbreaks in Japan and South Pacific; few sporadic cases in North America; recent outbreak in South America	Humans and environmental reservoirs – such as water,	Primarily through ingestion of water contaminated with feces or vomitus of patients; ingestion of food which had been contaminated by dirty water, feces, soiled hands or flies	From a few hours to 5 days; usually 2-3 days	Communicable for the duration of time it is found in stool, usually only a few days after recovery
Salmonellosis	*Salmonella urbana, Salmonella typhimurium*	Worldwide	Wide range of domestic and wild animals, including poultry, swine, cattle, rodents, and pets; also infected humans.	Eating contaminated food (raw or undercooked). Fecal-oral transmission from person to person.	6-72 hours	Extremely variable, throughout the course of infection; usually several days to weeks.
Friedlander's pneumonia	*K .pneumoniae*, K, spp.	Worldwide	Humans, animals	Transmitted through contact with contaminated feces	Not clearly defined	Not directly transmitted
Family Enterobacteriaceae	Enterobacter aerogenes	Worldwide	Soil, water, sewage, intestinal tract of humans and animals, dairy products	Contact of mucous membranes, fecal-oral transmission	Not clearly defined	As long as viable organisms are shed

Appendix 2: Characteristics of Diseases Studied at BUMC and which may be Studied at BUMC and the Boston-NBL

TABLE I

Characteristics of Primary Diseases That Are Being or Have Previously Been Studied at BUMC, at BSL-2 and BSL-3

Disease	Infectious Agent	Occurrence	Reservoir[2]	Transmission[3]	Incubation Period[4]	Communicable Period[5]
Chronic urinary tract infections, bacteremia, pneumonia	*Proteus mirabilis*	Worldwide	Soil, water, sewage and part of normal flora of intestinal tract	Produces infections after leaving normal habitat in intestinal tract	Not clearly defined	Not transmitted person to person
Family Pseudomonadaceae	*Pseudomonas aeruginosa*	Worldwide	Humans, animals, plants	Direct contact with contaminated water	depending on infection; eye infection - 24 to 72 hours	Can be transmitted during course of active infection
Gonorrhea	Neisseria gonorrhoeae	Worldwide	Humans	Mucuous membrane contact	2-7 days	may extend for months if untreated, effective therapy usually ends communicability within hours
Meningococcal meningitis, Meningococcal infection, cerebrospinal fever, meningococcemia	Neisseria meningitidis	Worldwide	Humans	Direct contact, usually droplets	2-10 days, usually 3-4 days	Communicable until meningococci are no longer present in discharges;
Anthrax	Bacillus anthracis	Worldwide	Cattle, sheep, goats, camel, antelopes, and other herbivores	Cutaneous, gastroentestinal, and inhalation exposures. Anthrax is not contagious and can not be transmitted person-to person contact	Symptoms occur within 7 days.	Can live naturally in the soil for many years.

Appendix 2: Characteristics of Diseases Studied at BUMC and which may be Studied at BUMC and the Boston-NBL

TABLE 1

Characteristics of Primary Diseases That Are Being or Have Previously Been Studied at BUMC, at BSL-2 and BSL-3

Disease	Infectious Agent	Occurrence	Reservoir[2]	Transmission[3]	Incubation Period[4]	Communicable Period[5]
Viral Diseases						
Acquired Immuno-deficiency Syndrome (AIDS)	Human immunodeficiency virus (HIV), a retrovirus. Two seroligc types: HIV-1 and HIV-2	Worldwide	Humans	Person-to-person transmission through sexual contact, sharing HIV contaminated needles and syringes, transfusion of infected blood or its components, transplant of infected tissues or organs. Transmission through bodily secretions not yet been reported.	Generally 1-3 months. Time from infection to diagnosis can be < 1 year to 15 years or more.	Unknown, presumed to be throughout life.
Non-HIV retroviral infections e.g., (Adult T-cell leukemia, T-cell lymphosarcoma)	Retroviruses; e.g human T-cell lymphotrophic virus (HTLV-I, HTLV-II)	Japan, Caribbean, Pacific coast of South America, equatorial Africa, southern USA.	Humans	Infection early in life primarily through breast milk. Also through transfer of blood or blood products, IV drug use, or sexual activity.	Exposure through breast milk leads to tumor development in the adult with a peak at age 50.	Throughout infection.
Flu; orthomyxovirus; influenza virus types A, B, and C	Haemophilus influenza	Worldwide	Influenza A virus - humans; swine, horses; domestic and wild avian species, influenza B virus - humans only	By direct contact through droplet infection	Usually 1-4 days	Highly communicable; probably limited to 3-5 days from clinical onset, up to 7 days in young children
Toxins						
Botulism	Botulinum neurotoxin producing species of Clostridium, Clostridium perfringens epsilon	US and worldwide	Bacterial toxin that is produced from contaminated food, canning processes	Not spread person to person, Foodborne, wound, or infant botulinum	6 hrs- 10 days	None

Appendix 2: Characteristics of Diseases Studied at BUMC and which may be Studied at BUMC and the Boston-NBL

TABLE 1

Characteristics of Primary Diseases That Are Being or Have Previously Been Studied at BUMC, at BSL-2 and BSL-3

Disease	Infectious Agent	Occurrence	Reservoir[2]	Transmission[3]	Incubation Period[4]	Communicable Period[5]
	toxin,					
Naturally-found toxin	Conotoxin	Found Worldwide	Cone snail	Not spread person to person, No antidote	Less than 6 hrs- 3-5 days	None
Naturally-found toxin	Ricin	Found Worldwide	Castor bean plant	Not spread person to person, No antidote	Less than 6 hrs- 3-5 days	None
Naturally-found toxin	Tetrodotoxin (T-2 toxin)	Found Worldwide	Found in puffer fish	Not spread person to person, No antidote	15 minutes-24hours	None
Fungal Diseases						
Cryptococcosis, Torulosis, European blastomycosis	Cryptococcus neoformans	Worldwide	Humans; cats, dogs, horses, cows, monkeys and other animals	Inhalation route	Unknown	Not Directly Transmitted person to person
Aspergillus fumigatus, *A. niger*, *A. flavus*, Aspergillosis, Farmer's lung	Aspergillus fumigatus	Worldwide	Nature, soil, hay, food grans	Inhalation of airborne conidia	Variable, few days to weeks	Not Directly Transmitted person to person

1 Reservoir of infection – Any animal, plant, plant, soil, or substance (or combination) in which the infectious agent normally lives and multiplies; and serves as a source of infection
2 Transmission – Mechanism by which an infectious agent is spread from source or reservoir to another person.
3 Incubation period – The time interval between infection and the appearance of the first sign or symptom of the disease.
4 Communicable Period – The time during which and infections agent may be transferred directly from an infected person to another uninfected person.
Source: APHA. 2000. The control of communicable diseases manual (17th edition), J. Chin, editor. American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710

TABLE 2

Characteristics of Primary Diseases which may be Studied at BUMC and NBL BSL-2 and BSL-3 laboratories in addition to those listed in Table 1

Disease	Infectious Agent	Occurrence	Reservoir[2]	Transmission[3]	Incubation Period[4]	Communicable Period[5]
Bacterial Diseases						
Chlamydial Pneumonia	Chlamyid pneumoniae, strain TWAR	Worldwide	Humans; no avian associations, not dogs or cats.	Unknown, possibly direct contact with secretions, spread via particles to which bacteria adhere, and airborne spread.	Unknown, possibly at least 20 days	Unknown but believed to be 8 months or more.
Salmonellosis	Salmonella entericaserovar	Worldwide	Wide range of domestic and wild animals, including poultry, swine, cattle, rodents, and pets; also infected humans.	Eating contaminated food (raw or undercooked). Fecal-oral transmission from person to person.	6-72 hours	Extremely variable, throughout the course of infection; usually several days to weeks.
Streptococcal epidemics and vaccine development	Streptococcus pyogenes	Worldwide	Humans	Person-to-person, often through exposure to large respiratory droplets from an infected patient or carrier, or direct contact.	Short; usually 1-3 days.	10-21 days in untreated and uncomplicated cases. Weeks to months in untreated conditions with purulent discharges.
Psittacosis (Parrot fever)	Chlamydia psittaci	Worldwide	Primarily parakeets, parrots and lovebirds; less often in poultry, pigeons, canaries and sea birds.	Inhaling the agent from desiccated droppings, secretions, and dust from feathers of infected birds.	1-4 weeks.	No person-to-person transmission. Infected birds may shed the agent intermittently, and sometimes continuously for weeks to months.
Endemic Relapsing Fever	Borrelia hermsii	Endemic in the United States	Rodents and soft- bodied ticks	Ticks Onitodoros hermsii	5-15 days.	No person-to-person transmission
Glanders, Malleomyces mallei, Farcy, Malleus; formerly classified with Pseudomonas	Burkholderia mallei (formerly Pseudomonas mallei)	Has disappeared from most regions of the world, particularly Asia and Mediterranean areas	Environmental organism found in soil and water; horses, mules, donkeys	Direct contact with nasal secretions of horses, aerosols of horses	1-14 days	Survives outside host up to 30 days

TABLE 2

Characteristics of Primary Diseases which may be Studied at BUMC and NBL BSL-2 and BSL-3 laboratories in addition to those listed in Table 1

Disease	Infectious Agent	Occurrence	Reservoir[2]	Transmission[3]	Incubation Period[4]	Communicable Period[5]
Melioidosis, Whitmore disease; (formerly Pseudomonas)	Burkholderia pseudomallei	Worldwide distribution, however, found primarily in tropical or subtropical regions, especially in Southeast Asia and northern Australia	Environmental organism found in certain waters and soils; animals include sheep, goats, horses, swine, monkey and rodents	Contact with soil and water from endemic areas	2 days	Person to Person extremely rare
Mycoplasma spp.	Mycoplasma capricolumni M.F38/M. mycoides capri	Worldwide	In nature - soil, water, milk, dust, tissues of domestic animals	Skin or mucous membrane contact with droplets of contaminated animals, soil.	Long incubation period-up to 10 yrs	No evidence of person-to-person transmission
Fungal Diseases						
Coccidioidomycosis, Valley Fever, Desert fever	Coccocidiodesimmitis, C. posadasii	Worldwide	Found naturally in soil	Inhalation of infected soil	1-4 weeks	None, no person-to-person transmission
Viral diseases						
Severe acute respiratory syndrome	SARS-associated coronavirus (SARS-CoV)	Worldwide, concentrated outbreaks in Asia in 2002-2003	Human to human	Close person-to-person contact through respiratory droplets	2-14 days	Patients most contagious in 2nd week, possible up to 10 days after fever disappears

TABLE 2

Characteristics of Primary Diseases which may be Studied at BUMC and NBL BSL-2 and BSL-3 laboratories in addition to those listed in Table 1

Disease	Infectious Agent	Occurrence	Reservoir[2]	Transmission[3]	Incubation Period[4]	Communicable Period[5]
Monkeypox Virus, Smallpox, Alastrim	Variola major, Variola minor	Worldwide Pox Viruses	Non-human primates, humans	Generally, direct and fairly prolonged face-to-face contact is required to spread smallpox from one person to another. Smallpox also can be spread through direct contact with infected bodily fluids or contaminated objects such as bedding or clothing	12-14 days	0-4 days
Hendra Virus	Paramyxoviridae	Australia, Malaysia, Singapore,	Flying foxes (bats of the genus Pteropus)	Exposure to body fluids and excretions of horses infected with Hendra virus	3-14 days	None
Rift Valley Fever Virus	Genus Phlebovirus in the family Bunyaviridae	Regions of eastern and southern Africa where sheep and cattle are raised, but the virus also exists in most countries of sub-Saharan Africa and in Madagascar	Cattle, sheep	Humans can get RVF as a result of bites from mosquitoes and possibly other bloodsucking insects that serve as vectors. Humans can also get the disease if they are exposed to either the blood or other body fluids of infected animals.	0-2 weeks	None

TABLE 2

Characteristics of Primary Diseases which may be Studied at BUMC and NBL BSL-2 and BSL-3 laboratories in addition to those listed in Table 1

Disease	Infectious Agent	Occurrence	Reservoir[2]	Transmission[3]	Incubation Period[4]	Communicable Period[5]
Peripheral T-cell lymphoma) Aleutian mink disease parvovirus	Parvoviruses	Worldwide	Wild and domestic mink and mustelids	Contact with infected animals through biting, urine and respiratory secretions.	Variable; 20-90 days.	Throughout infection
Rabies	Rabies virus; a rhabdovirus of the genus Lyssavirus	Worldwide	Wild and domestic canids, skunks, raccoons, mongooses, and certain bats are primary reservoirs.	Saliva of rabid animal is introduced by a bite or scratch, rarely through a break in the skin or intact mucous membrane.		While theoretically possible, person-to-person transmission has never been documented.
Toxins						
Naturally-found toxin-dinoflagellates, which include Alexandrium tamarense, Gymnodinium catenatum, and Pyrodinium bahamense		Found Worldwide, particularly in North America	Naturally occurring toxin in algae-found in algal blooms	Not spread person to person	Immediate-2 days	None
Natural Poison	Abrin	Found worldwide	Seeds of a plant called the rosary pea or jequirity pea	Not spread person to person, Inhalation, Absorption, and ingestion 3 routes of accidental exposure in environment	Less than 6 hrs- 3 days	None

TABLE 2

Characteristics of Primary Diseases which may be Studied at BUMC and NBL BSL-2 and BSL-3 laboratories in addition to those listed in Table 1

Disease	Infectious Agent	Occurrence	Reservoir[2]	Transmission[3]	Incubation Period[4]	Communicable Period[5]
Rickettsial Diseases						
Q Fever	Coxiella burnetii	Reported from all continents. Endemic in areas where reservoir animals are present. Veterinarians, ranchers, farmers, meatpackers, lab workers are at high risk.	Sheep, cattle, goats, cats, dogs, some wild mammals, birds, ticks are natural reservoirs	Commonly transmitted by airborne coxiellae in dust particles contaminated with birth fluids or excreta from infected animals.	Usually 2-3 weeks.	Direct person-to- person transmission is unlikely. Possibly through contaminated clothing.
Rocky Mountain Spotted Fever	Rickettsia rickettsii	Throughout the U.S, and in Canada, Central and South America.	Ticks, small and medium-sized mammals.	Ticks	3-14 days	No person-to-person transmission.

1 Reservoir of infection – Any animal, plant, plant, soil, or substance (or combination) in which the infectious agent normally lives and multiplies; and serves as a source of infection

2 Transmission – Mechanism by which an infectious agent is spread from source or reservoir to another person.

3 Incubation period – The time interval between infection and the appearance of the first sign or symptom of the disease.

4 Communicable Period – The time during which and infections agent may be transferred directly from an infected person to another uninfected person.

Source: APHA. 2000. The control of communicable diseases manual (17th edition), J. Chin, editor. American Public Health Association, 800 I Street, NW, Washington, DC

TABLE 3

Characteristics of Viral and Bacterial Diseases which may be Studied at NBL, BSL-4 Laboratories

Disease	Infectious Agent	Occurrence	Reservoir[2]	Transmission[3]	Incubation Period[4]	Communicable Period[5]
Tick-borne encephalitdes a. Central European tick-borne encephalitis (CEE Subtype) b. Russian Spring-summer Encephalitis (FE Subtype)	A complex within the flaviviruses; minor antigenic differences exist. Viruses causing these diseases are closely related.	CEE Subtype Predominates in Europe, while FE Subtype has been found predominantly in the far eastern region of the former Soviet Union.	Ticks or ticks and mammals in combination. Rodents and other small mammals and birds serve as sources of tick infections with CEE and FEE Subtypes.	Bite of an infected tick or by consumption of milk from certain infected animals.	7-14 days.	No direct person-to-person transmission.
Congo-Crimean hemorrhagic fever	Congo-Crimean hemmorhagic fever virus (Bunyaviridae, Nairovirus)	Observed in the steppe regions of western Crimea, Kersch Peninsula, Kazakhstan, Uzbekistan, Rostov and Astrakhan regions of Russia, Albania and Bosnia-Herzogovina, Bulgaria, Iraq, Arabian Peninsula, Pakistan, western China, tropical Africa and South Africa.	Hares, birds and Hyalomma ticks. Domestic animals may serve as hosts. Hosts are unkown in tropical Africa.	Bite of an infected adult tick. Direct person-to-person transmission through contact with blood and secretions from infected patients. Infection also associated with butchering infected animals.	1-12 days, usually 1-3 days.	During period of infection. Highly infectious in hospital setting; infections are common following exposure to blood and secretions.

TABLE 3

Characteristics of Viral and Bacterial Diseases which may be Studied at NBL, BSL-4 Laboratories

Disease	Infectious Agent	Occurrence	Reservoir[2]	Transmission[3]	Incubation Period[4]	Communicable Period[5]
Ebola hemorrhagic fever	Ebola virus; a filovirus, related to but antigenically distinct from Marburg virus.	Confirmed cases reported from Africa in the Democratic Republic of the Congo, Republic of the Congo, Gabon, Sudan, Ivory Coast, and Uganda.	Unknown despite extensive studies. Believed to be animal-borne	Person-to-person transmission through direct contact with infected blood secretions, organs or semen. Risk is highest during late stages of illness. Under natural conditions, airborne transmission among humans has not been documented.	2-21 days	As long as blood and secretions contain virus.
Nipah virus encephalitis.	Nipah virus; a paramyxovirus	Malaysia	Maybe fruit bats. Infected pigs may serve as a source of human exposure.	Believed to be by transmitted via aerosols, but transmission efficiency from pigs to humans is low. No documented person-to-person transmission.	Unknown	Unknown

TABLE 3

Characteristics of Viral and Bacterial Diseases which may be Studied at NBL, BSL-4 Laboratories

Disease	Infectious Agent	Occurrence	Reservoir[2]	Transmission[3]	Incubation Period[4]	Communicable Period[5]
Kyasanur Forest disease	Flavivirus belonging to the tickborne encephalitis-louping Ill complex.	Kyasanur Forest of the Shimonga and Kanara districts of Karnataka, India.	Probably rodents, shrews, monkeys, and ticks.	By bite of infective (especially nymphal) ticks; most likely Haemaphysalis spinigera.	3-8 days.	Not directly transmitted from person to person. Infected ticks remains so for life.
South American arenaviral hemorrhagic fevers: a. Argentinian b. Bolivian c. Venezuelan d. Brazilian	Tacaribe complex of arenavirus a. Junín virus. b. Machup virus c. Guanarito virus d. Sabiá virus	a. Argentinian pampas b. Rural northeastern Bolivian c. Venezuelan d. Brazilian	Wild rodents; but unknown for Sabiá virus.	Transmission to humans occurs primarily by inhalation of small particle aerosols derived directly from rodent excreta containing virus, saliva, to body fluids. Virus deposited in the environment may also be infective when ingested or by contact with cuts or abrasions. While uncommon, person-to-person transmission of Machupo virus has been documented in health care and family settings.		

TABLE 3

Characteristics of Viral and Bacterial Diseases which may be Studied at NBL, BSL-4 Laboratories

Disease	Infectious Agent	Occurrence	Reservoir[2]	Transmission[3]	Incubation Period[4]	Communicable Period[5]
Omsk hemorrhagic fever	Flavivirus belonging to the tickborne encephalitis-louping Ill complex.	Forest steppe regions of western Siberia; within the Omsk, Novosibirsk, Kurgan and Tjumen regions.	Rodents, including muskrat, and ticks.	By bite of infective (especially nymphal) ticks; most likely Dermacentor reticulates and D. marginatus. Direct transmission from muskrat to human occurs, with disease in families of muskrat trappers.	3-8 days.	Not directly transmitted from person to person. Infected ticks remains so for life.
Lassa fever	Lassa virus; an arenavirus, serologically related to lymphotocytic choriomeningitis, Machupo, Junín, Guanarito and Sabiá viruses.	Sierra Leone, Liberia, Guinea and regions of Nigeria.	Wild rodents; in west Africa, the Mastomys species complex.	Primarily through aerosol or direct contact with excreta of infected rodents deposited on surfaces such as floors and beds or in food and water. Direct contact with blood through inoculation with contaminated needles and pharyngeal secretions or urine of infected patient. Infections can also spread by sexual contact.	6-21 days.	During acute febrile phase when virus is present in the throat. Virus may be excreted in urine of patients for 3-9 weeks from onset of illness.

TABLE 3

Characteristics of Viral and Bacterial Diseases which may be Studied at NBL, BSL-4 Laboratories

Disease	Infectious Agent	Occurrence	Reservoir[2]	Transmission[3]	Incubation Period[4]	Communicable Period[5]
Marburg fever	Marburg virus; a filovirus, related to but antigenically distinct from Ebola virus.	Zimbabwe, Kenya, Democratic Republic of the Congo. Six cases in Germany and Yugoslavia in 1967 followed exposure to African green monkeys from Uganda.	Unknown despite extensive studies. Believed to be animal-borne	Person-to-person transmission through direct contact with infected blood, secretions, organs or semen. Risk is highest during late stages of illness. Under natural conditions, airborne transmission among humans has not been documented	3-9 days	As long as blood and secretions contain virus
Herpes B Virus	Cercopithecine herpesvirus	Worldwide	Macaque non-human primates	Primate to Human transmission normally through animal bite or contact with body fluids into mucous membranes or open wound	1-4 weeks	Macques need to be treated with Universal precautions, as many contain the virus but do not show symptoms. Once primate is B Virus +, will be for life, all blood and secretions must be treated as if containing virus.

Appendix 3

List of Community Meetings

List of Community Meetings

Date	Meeting
9/30/2005	Allegheny Conference of CEOs
9/29/2005	Presentation - Historical Problems in Modern Medicine - Harvard University
9/27/2005	Community Meeting - Worcester Square Area Neighborhood Association
9/21/2005	Community Meeting - Old Dover Neighborhood Association
9/19/2005	Community Meeting - Roxbury Strategic Master Plan Oversight Committee
9/18/2005	Community Event - South End Open Studios
9/14/2005	Community Event - Washington Gateway Main Street
9/13/2005	Community Meeting - Blackstone/Franklin Sq. Neighborhood Association
9/8/2005	Public Meeting - State Board of Buildings Regulations & Standards-PT I
9/1/2005	Community Event - Violence Free Zone Initiative
8/27/2005	Community Event-Caribbean Carnival of Boston
8/17/2005	Annual Meeting - New Market Business Assoc
8/8/2005	Follow-up Mtg re: Collaboration with RCC
8/5/2005	Site Visit - SummerLab Program, BUMC
8/3/2005	Site Visit - SummerLab Program, BUMC
7/28/2005	Planning Meeting - CityLab Ademy Recruitment
7/27/2005	Community Meeting - Biosafety Laboratory Advisory Group
7/26/2005	Community Meeting Worcester Sq. NA
7/25/2005	Executive Committee Meeting - NEIDL Institute
7/12/2005	Community Meeting - Blackstone/Franklin Sq Neighborhood Association
6/29/2005	Follow-up Mtg re: Collaboration with RCC
6/28/2005	Community Meeting- Worcester Sq. NA
6/14/2005	Community Meeting - Blackstone/Franklin Square NA
6/13/2005	Mtg re: Collaboration with RCC
6/9/2005	State Hearing - Biosafety Labs
6/8/2005	Community Meeting - New Market Business Association
6/7/2005	Presentation - Dorchester House Multi Service Center
6/2/2005	Meeting with community resident B. Bickerstaff
5/31/2005	Community Meeting, Executive Board, Blackstone/Franklin
5/24/2005	Community Meeting - Worcester Sq Area Neighborhood Association
5/12/2005	Community Meeting, Bradord Street Neighborhood Association
5/10/2005	Community Event Mtg - National Black College Alliance
5/2/2005	Presentation - Odyssey High School
4/28/2005	Community Event Mtg - National Black College Alliance
4/26/2005	Monthly Meeting - Biosafety Laboratory Advisory Group
4/25/2005	NEPA Public Hearing
4/20/2005	Community Event - Umiversity of Massachusetts - Boston

4/15/2005	Presentation - South Boston Harbor Point School
4/13/2005	Community Meeting - New Market Business Associaton
4/12/2005	Community Event - Washington Gateway Main Street
4/12/2005	Presentation - Timilty Middle School
4/9/2005	Community Event - Urban League Awards
4/7/2005	Community Meeting - Inquilinos Boricua en Accion
3/30/2005	Community Event - New Market Business Association
3/28/2005	Public Hearing - Boston City Council
3/24/2005	Caribbean Amer Carnival Assoc Corporate Breakfast
3/8/2005	Community Meeting - Blackstone Franklin Sq NA
3/8/2005	Community Meeting - Black Ministerial Alliance
3/2/2005	Presentation - British Innovations in Biosecurity Meeting
3/1/2005	Presentation - BU Faculty Council Meeting
2/23/2005	Monthly Meeting - Biosafety Laboratory Advisory Group
2/22/2005	Community Meeting - Worcester Square Area Neighborhood Association
2/17/2005	Meeting with community resident M. Perry
2/16/2005	Community Meeting w/ members of the Black Ministerial Alliance
2/15/2005	Community Meeting, Members, Ellis Street Neighborhood Association
2/9/2005	Community Meeting - New Market Business Associaton
2/7/2005	Community Event - Job Fair Grand Prize Winners
1/20/2005	Community Event - 1st Annual BU/BMC/BUMC Job Fair
1/12/2005	Zoning Commission Hearing
1/11/2005	Weekly Breakfast Briefing - Madison Park Voc Tech HS
12/26/2004	Community Event - Health Matters Radio Show - WILD Radio
12/19/2004	Community Event - Health Matters Radio Show - WILD Radio
12/15/2004	Meeting with Massachusets Nurses Assoctiation
12/14/2004	Weekly Breakfast Briefing
12/14/2004	Boston Redevelopment Authority Board Hearing
12/12/2004	Community Event - Health Matters Radio Show - WILD Radio
12/9/2004	Office Hours - South End
12/8/2004	Community Meeting - New Market Business Associaton
12/8/2004	Monthly Meeting - Biosafety Laboratory Advisory Group Meeting
12/7/2004	Community Event - Site Visit - George State University, CDC
12/7/2004	Weekly Breakfast Briefing
12/5/2004	Community Event - Health Matters Radio Show - WILD Radio
12/3/2004	Meeting with ED., Inquilinos Boricua En Accion
11/30/2004	Weekly Breakfast Briefing
11/29/2004	Office Hours - Roxbury
11/28/2004	Community Event - Health Matters Radio Show - WILD Radio
11/23/2004	Weekly Breakfast Briefing
11/21/2004	Community Event - Health Matters Radio Show - WILD Radio

1/18/2004	Community Meeting - Bradford Street Neighborhood Association
11/16/2004	Weekly Breakfast Briefing
11/14/2004	Community Event - Health Matters Radio Show - WILD Radio
11/10/2004	NEPA Public Hearing
11/10/2004	Community Meeting - Mujeres Unidas
11/9/2004	Weekly Breakfast Briefing
11/7/2004	Community Event - Health Matters Radio Show - WILD Radio
11/3/2004	Community Meeting - Mujeres Unidas
11/2/2004	Weekly Breakfast Briefing
11/1/2004	Meeting with members of The Burroughs Group
10/29/2004	Community Event - Community Gems
10/26/2004	Weekly Breakfast Briefing
10/25/2004	Office Hours - South End
10/24/2004	Community Event - Health Matters Radio Show - WILD Radio
10/20/2004	Community Meeting - Groom/Humphrey Neighborhood Association
10/19/2004	Weekly Breakfast Briefing
10/17/2004	Community Event - Health Matters Radio Show - WILD Radio
10/13/2004	Monthly Meeting - Biosafety Laboratory Advisory Group
10/13/2004	Life Sciences Forum - Greater Boston Chamber of commerce
10/12/2004	Weekly Breakfast Briefing
10/10/2004	Community Event - Health Matters Radio Show - WILD Radio
10/5/2004	Weekly Breakfast Briefing
10/4/2004	Public hearing - Boston Redevelopment Authority
10/3/2004	Community Event - Health Matters Radio Show - WILD Radio
9/28/2004	Weekly Breakfast Briefing
9/26/2004	Community Event - Health Matters Radio Show - WILD Radio
9/23/2004	BU Student Forum
9/23/2004	Office Hours - Roxbury
9/22/2004	Community Meeting - Old Dover Neighborhood Association
9/21/2004	Weekly Breakfast Briefing
9/19/2004	Community Event - Health Matters Radio Show - WILD Radio
9/19/2004	Community Event - South End Baseball
9/15/2004	Community Meeting - Claremont Street Neighborhood Association
9/14/2004	Community Meeting - Washington Gateway Main Streets
9/14/2004	Community Meeting - Blackstone Franklin Square Neighborhood Association
9/14/2004	Weekly Breakfast Briefing
9/12/2004	Community Event - Health Matters Radio Show - WILD Radio
9/8/2004	Community Meeting - New Market Business Associaton
9/8/2004	Office Hours - Dorchester
9/8/2004	Monthly Meeting - Biosafety Laboratory Advisory Group Meeting
9/7/2004	Weekly Breakfast Briefing

9/5/2004	Community Event - Health Matters Radio Show - WILD Radio
8/22/2004	Community Event - WRBB Radio - Northeastern University
8/17/2004	Press Conference - Education & Training Community Benefits
8/11/2004	Monthly Meeting - Biosafety Laboratory Advisory Group Meeting
8/7/2004	Office Hours - Roxbury
8/6/2004	Community Meeting - President, Member, Worcester Sq. Area Neigh Assoc
8/3/2004	Office Hours - South End
7/28/2004	Open Forum - Rally for 'Stop the Bioweapons Campaign'
7/27/2004	Weekly Breakfast Briefing
7/22/2004	Meeting with WSANA representatives
7/20/2004	Weekly Breakfast Briefing
7/14/2004	Monthly Meeting - Biosafety Laboratory Advisory Group
7/13/2004	Community Meeting - Blackstone Franklin Neighborhood Association
7/13/2004	Weekly Breakfast Briefing
6/17/2004	Open Forum - BU School of Public Health
6/16/2004	Community Meeting - Old Dover Neighborhood Association
6/10/2004	Community Event - 35th Anniversary South End Community Health Center
6/9/2004	Annual Meeting - Massachusetts Infectious Diseases Society
6/8/2004	Open Forum - IDEAS-Boston
6/8/2004	Open Forum - BMC Board of Trustees Public Meeting
6/3/2004	Meeting with representatives - Eastern Maine Medical Center
6/2/2004	Meeting with ED., South End Baseball, Inc.
5/26/2004	Public Involvement Plan Meeting
5/19/2004	Meeting with ED., South End Community Health Center
5/19/2004	Community Meeting - Old Dover Neighborhood Association
5/19/2004	Meeting with ED., Mattapan Community Health Center
5/18/2004	Community Meeting - McCormack Civic Association
5/17/2004	Meeting with representative from Morgan Memorial Goodwill Industries
5/17/2004	Meeting with ED., Madison Park CDC
5/12/2004	Community Meeting - BRA Neighborhood Night-Roxbury
5/5/2004	Community Meeting - Project Area Committee BioSquare
5/4/2004	Community Meeting - Washington Gateway Main Streets
4/27/2004	Community Meeting - Worcester Square Area Neighborhood Association
4/20/2004	Public Hearing - Boston City Council
4/20/2004	Meeting with representatives from MassPep
4/14/2004	Meeting with CARG/Multicultural AIDS Coalition
4/13/2004	Open Forum - District 6 Organizing Meeting
3/25/2004	Meeting with police and private security
3/24/2004	Meeting with representatives at Executive Office of Public Safety
3/24/2004	Community Meeting - Inquilinos Boricua en Accion

3/11/2004	Community - Bradford Street Neighborhood Association
3/9/2004	Community Meeting -CARG - Black HIV/AIDS Coal.
3/2/2004	Community Meeting - Executive Board, McCormack Civic Association
2/27/2004	Meeting with Dorchester Resident S. Shaw
2/26/2004	Meeting with 'Minorities in Biotech'
2/26/2004	Open Forum w/ David Ozonoff (BU), ACE, Johnathan King (MIT), Rotman
2/25/2004	Meeting with Faith-Based Leaders
2/24/2004	Meeting with Tuesday Evening Club
2/24/2004	Community Meeting - Worcester Sq. Area Neighorhood Association
2/18/2004	Meeting with ED., Codman Square Health Ctr
2/17/2004	Open Forum - NEPA Scoping Session
2/12/2004	Planning Meeting - BU Student Forum
2/11/2004	Community Meeting - ED., CDCs of Boston
2/5/2004	Meeting with Friends of Blackstone Franklin Sq
2/1/2004	Open Forum - "Stop the BU Bioweapons Lab" , Brookliine PeaceWorks, ACE, Boston Mobilization, Women's International League for Peace and Freedom
1/28/2004	Community Meeting wMulticultural AIDS Coalition
1/26/2004	Monthly Meeting-Worcester Sq. Area Neigh Assoc
1/26/2004	Meeting with Conservation Law Foundation
1/23/2004	Meeting with Roxbury Resident M. Perry
1/22/2004	Meeting with Roxbury Resident B. Bickerstaff
1/21/2004	Presentation - Faculty - School of Medicine, Boston University
1/21/2004	Faculty Forum - School of Public Health, Boston University
1/20/2004	Meeting with BU Student Groups and Dean of Students
1/13/2004	Community Meeting - Blackstone Franklin Neighborhood Association
1/8/2004	Meeting with Boston Health Net Directors
1/6/2004	Meeting with Boston Economic Development Breakfast Group
12/21/2003	Community Meeting - "Boston's Unwanted Christmas Present"
12/16/2003	Community Meeting - Ellis St. Neigbhorhood Assoc. Mtg
12/10/2003	Open Forum Boston Forum on Life Sciences and Biotech, BRA, City of Boston
12/10/2003	Presentation - New Market Sq. Bus. Association
11/25/2003	Open Forum - All Staff Informational Meeting
7/8/2003	Community Meeting - P.A.C., South End, Lower Roxbury, Cathedral Tenants Association, neighborhood and civic groups
5/12/2003	Community Meeting - South End, Lower Roxbury, Dorchester Neighborhood Associations and Civic Groups
2/5/2003	Meeting with Newmarket Business Association
2/4/2003	Community Meeting - Madison Park Development
2/4/2003	Community Meeting - McCormack Civic Association Board Meeting
2/3/2003	Community Meeting - Washington Gateway Main Streets, Andrew Square Neighborhood Association

1/29/2003	Community Meeting - Project Area Committee BioSquare
1/22/2003	Community Meeting -McCormack Civic Association
1/21/2003	Community Meeting - South End, Lower Roxbury, Dorchester Neighborhood Associations and Civic Groups
1/16/2003	Community Meeting - Lower Roxbury Residents
1/15/2003	Community Meeting - Blackstone/Franklin Squares. Neighborhood Assoc., Washington Gateway Main Streets; McCormack Civic Association; Andrew Square Neighborhood Association, Chester Square Neighborhood Association

Appendix 4

Safety Record of Biocontainment Laboratories at BUMC and at NIAID's Intramural Facilities

The following Appendix consists of four parts.

Part 1 is entitled "Review of Laboratory Safety Record at Boston University Medical Center" and was prepared by BUMC staff.
Part 2, entitled "Biosafety at National Institute of Allergy and Infectious Diseases" was prepared by Karl M. Johnson, M.D. in October of 2003.
Part 3, entitled "Biosafety at BSL-4, More than 20 Years Experience at Three Major Facilities" was prepared by Karl M. Johnson, M.D. in October of 2003
Part 4, entitled "Biosafety Update:Short Review of BSL-3 and BSL-4 Viral Agent Laboratory Incidents Worldwide" was prepared by Karl M. Johnson, M.D. in August of 2004

Review of Laboratory Safety Record at Boston University Medical Center

The Boston University Medical Center (BUMC) is a combination of two large medical research organizations consisting of the Boston University's Medical Campus and the Boston Medical Center Corporation. BUMC comprises nearly 4 million square feet in 40 buildings and with more than over 8,000 employees. There are approximately 268 laboratories operating under dozens of Environmental Health and Safety (EHS) permits and licenses from federal, state, regional and local agencies.

As one of the nation's premier research institutions, safety is a top priority for the campus. The Office of Environmental Health and Safety's (OEHS) mission is to provide a safe and healthy work environment for all faculty, staff, and students, including complying with all local, state, and federal regulations.

The Medical Campus contains approximately 263 BSL-2 laboratories, and five BSL-3 laboratories that participate in various fields of research.

As part of the requirements to ensure worker safety, OEHS requires initial orientation, annual laboratory safety training for all research staff. This training includes the following topics: biosafety, chemical safety, regulatory requirements, spill response, waste, fire safety, disaster training, blood borne pathogen training, and security. Other training includes, but is not limited to, required annual BSL-3 laboratory training for staff working in these labs, shipping training, safety and infection control training. In 2003 and 2004 over 2,500 lab workers attended training.

All training also includes instructions on how to seek medical treatment if there is an employee injury, including who to notify and how to report an injury.

OEHS also conducts inspections of all labs to ensure compliance with all local, state, and federal regulations. In collaboration with Office of Facilities Management, OEHS works to conduct building repairs and maintenance, to ensure all building operations are functioning appropriately. In 2003 and 2004, over 280 lab inspections were conducted.

Researchers at BUMC work with a variety of BSL-2 agents, including bacteria, viruses, and toxins. The primary toxins that are studied at BUMC include Botulinum neurotoxin, Ricin, Tetrodotoxin, and Conotoxin. Bacterial agents include: *Chlamydia trachomatis*, *Borrelia burgdorferi, Brucella melitensis, Staphylococcal aureous,, Bacillus anthracis, Francisella tularensis,* and *Mycobacterium tuberculosis*. The main virus work at BUMC is on retroviruses, which include lentiviruses, and adenoviruses.

Previous and current BSL-3 research agents include the lentiretrovirus, HIV, along with the bacteria: *Brucella melitensis, Francisella tularensis,* and *M. tuberculosis*.

In 2004, three research laboratory workers at Boston University Medical Center (BUMC) were accidentally infected with tularemia bacteria in their BSL-2 lab. This incident is still under investigation by BUMC, city, state, and federal public health agencies. Corrective actions already identified and implemented include:

- Increased safety training and procedures for lab workers;
- Strengthened laboratory safety procedures;
- Unannounced safety inspections of BUMC laboratories;
- Applying additional tests and safeguards to infectious material sent to BUMC for research purposes;
- Outside, expert review of BUMC research controls and procedures; and,
- Working with the Boston Public Health Commission to improve the notification process.

Records of all reported laboratory accidents were reviewed from the past ten years, and it has been confirmed by the Occupational and Environmental Medicine Department that BUMC did not have any laboratory-acquired infections from research work at BSL-2 and BSL-3 facilities, with the exception of the incident described above. Further, there has not been any reported biosafety exposure in a BSL-3 laboratory. With approximately 14 million hours of operating time in the laboratories during this period, the following biosafety exposures, with no illness or evidence of serological exposure, were reported.

Exposure within BSL-2 Laboratories	Number of incidents
Animal (including bites)	9
Percutaneous (skin penetration/needle stick)	16
Eye splash	2
Total	27

BUMC has a database of all employee accidents and potential injuries including an OSHA 300 log of all OSHA-reportable employee injuries, as required by the Occupational Safety and Health Administration. Accidents and injuries are also reported to the Office of Occupational and Environmental Medicine, an accident/exposure reporting form is completed, and the information is forwarded to the Office of Environmental Health and Safety (OEHS). OEHS compiles this information into a database and follows up with individual exposures as appropriate with safety training and education to prevent reoccurrences.

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Biosafety at National Institute of Allergy and Infectious Diseases:

1982-2003

Karl M. Johnson, M.D.
October 15, 2003

Biosafety at National Institute of Allergy and Infectious Diseases

1982-2003

The National Institutes of Health and the Centers for Disease Control (NIH/CDC) first promulgated National Guidelines for safe work with a broad range of infectious organisms in 1980. Four levels of physical containment and work practices were designated for agents with different virulence for humans and relative risk of infection from aerosols induced by laboratory manipulation. Biosafety Level 3 (BSL-3) is reserved for organisms that cause serious disease and which are known to be infectious via the respiratory route. Examples include Mycobacterium tuberculosis and West Nile virus. For such agents all procedures must be carried out in biosafety cabinets (BSC) fitted with high efficiency filters (HEPA). Centrifuges require sealed rotors so that aerosols that ensue if a tube breaks during spinning runs will be contained until the rotor is opened under the BSC. Air in such laboratories is maintained at negative pressure relative to hallways and cannot be blended with air to other laboratories and offices in order to prevent potential infection to others in the building. More and more such laboratories also have HEPA filters on laboratory room exhaust.

In addition to agents known to be aerosol transmitted, microbiological science continues to confront newly discovered viruses and bacteria for which aerosol infectiousness is uncertain. The NIAID has adopted a policy for such organisms that stipulates BSL-3 equipment and practices in BSL-2 laboratories with negative pressure. Work with the Human Immunodeficiency Virus (HIV) in the early 1980s led to adoption of that strategy for HIV and its close animal virus relatives, a policy that continues. Similar standards were initiated for work with hepatitis viruses at request of senior investigators, largely because new agents that cause hepatitis continue to emerge and little is known in early years regarding their infectiousness as aerosols.

This review is limited to work done during the past two decades by scientists at intramural laboratories of NIAID located on the Bethesda campus, at a neighboring facility in Rockville, MD, and at the institute's Rocky Mountain Laboratories in Hamilton, Montana.

Senior scientists were interviewed to ascertain agents studied, the variety of research programs that evolved over two decades, animals employed, if any, laboratory space, daily number of workers in the laboratories, and specific histories of laboratory accidents and consequences. Problems with function of facilities also were solicited and recorded.

Independent records of reported laboratory accidents that might expose workers to infection were reviewed. During the past 21 years all such accidents were to be reported quickly to the NIH Occupational Medical Service (OMS) for epidemiologic and medical evaluation as

well as immediate prophylactic treatment if indicated. Invasive wounds in course of laboratory work and clinical care of persons with chronic HIV infection are of continuing concern. The OMS is now able to provide antiviral therapy within two hours of an accident on a 7day/24 hour basis when circumstances indicate the need for therapy.

Intake records of all accidents on the NIH campus were initially paper documents. Copies were forwarded to the Occupational Safety and Health Branch (OSHB) in the Director's office for to follow up circumstances of an accident and for remedial action when indicated. In addition to such immediate reaction to accidents and facility emergencies, the OSHB has developed standardized protocols for periodic review of all laboratories for compliance with NIH safety practices. Laboratories at BSL-3 level are reviewed at six month intervals; all others annually. For the past decade, all records are computerized and electronic copies go from OMS to OSHB instantly. Records for this 21-year interval were cross-checked for details by staff of both Offices, together with specific scientist memory, in constructing the biosafety record for NIAID since 1982. Records for the Rocky Mountain Laboratories were reviewed with biosafety and scientific staff at that facility.

The detailed report is organized by Laboratory within the NIAID Division of Intramural Research. Agents, research agendas, containment levels, animal use, location and space for laboratories are presented in tabular form, together with histories of laboratory accidents and of facility problems that have affected work in those laboratories.

By any measure, the safety record at intramural NIAID laboratories, where work is done with the Institute's most pathogenic agents, is outstanding. No agent has escaped from any laboratory to cause infection in adjacent civilian communities. Indeed, this record stretches to almost 70 years at RML where several agents now on the national "Select List" have been studied for decades.

If one takes the number of 8-hour person days estimated by senior research staff during direct conversations and translates these into 2000 person hours per year in exposure to microbial organisms, impressive numbers emerge as shown in the following Table.

PERSONNEL HOURS WORKED AND OUTCOMES OF ACCIDENTAL EXPOSURES TO INFECTIOUS AGENTS: INTRAMURAL NIAID 1982-2003

HOURS AT RISK			
	BENCH	Animal	Total
BSL-3	553,000	81,500	634,500
BSL-2/3 P	2,235,500	360,200	2,555,200
Total	2,788,500	441,700	3,189,700

OUTCOMES OF ACCIDENTAL EXPOSURES			
	Clinical Infections	Silent Infections	Other Exposures, No infections
BSL-3	1	2	9*
BSL-2/3 P	0	2	15
Total	1	4	24

* One HIV invasive accident treated with anti-retroviral drugs. No infection ensued.

One clinical infection without sequelae and four silent infections in more than three million hours of exposure is a remarkable record, especially when continuous exposure of personnel to fluids containing HIV virus over many years is a significant part of that record. Indeed, only a single instance was considered worthy of immediate prophylaxis for that agent and no infection occurred.

Biosafety in NIAID laboratories demands, and receives, constant vigilance. I recommend, however, better documentation of communication between the OSHB and NIH Division of Engineering Services. I was unable to find very many records of specific facility problems and their outcomes. It might be well to have a brief computerized form for registry of each event that requires action, together with follow-up reports that find their way to OSHB.

Another concern is design and function of air handling systems for BSL-3 laboratories. In both Building 10 and the new Building 50, BSC IIB cabinets directly ventilated externally are an essential part of the overall exhaust system that always must be greater than the input air. If room negative pressure diminishes, the BSCs also shut down, a poor condition if aerosols are being generated in course of the work. Much better would be to have IIA BSCs as workstations. These would continue to capture aerosols regardless of overall room negativity. Hoods would not have to run continuously and room failure would not also release aerosols into the laboratory. The Uninterrupted Power Supply installed in Building 50 was a prudent decision. I hope that these questions will be/have been considered in the current renovation of Twinbrook III as BSL-3 laboratory. Finally, it was a pleasure to receive frank, careful responses from all the scientists I approached. They willingly turned from their particular microbial environments to candidly discuss the history of their work from a safety perspective.

This report is included in the Final Environmental Impact Statement of the Integrated Research Facility.

Biosafety at BSL-4
More than 20 Years Experience at Three Major Facilities

Karl M. Johnson, M.D.

October 15, 2003

Biosafety at BSL-4:
More than 20 Years Experience at Three Major Facilities

WHAT IS BSL-4, AND HOW DID WE GET THERE?

Special containment for work with infectious microbes in the United States originated during World War II in response to intelligence that the German army had a program for development of biological, in additional to chemical weapons that had been used during the first World conflict. Temporary facilities were established in a suburb of Frederick, Maryland, later to become the permanent Fort Detrick. During the 1950s and 1960s several agents, most notably the bacteria that cause plague and anthrax and the rickettsial organism that causes so-called Q fever, were produced in large quantities and in forms with properties that make highly infectious tiny particles in the air. The term used was, and is, 'weaponized.'

Infections among those working with these and other microbes were a recurrent problem. Under the inspired leadership of the late Dr. Arnold G. Wedum, recognized today throughout the world as the "Father of Biosafety," Fort Detrick borrowed technology from the nuclear industry to prevent such infections, especially those induced by small aerosols that arose during the course of routine laboratory manipulations. Stainless steel cabinets (termed Class III) were constructed and assembled in continuous airtight lines. Each had at least one pair of sealed glove ports to allow manipulation of hazardous materials in a sealed-off environment. Incubators, microscopes, and doors leading directly to autoclaves and to animal cabinets were integral to the cabinet line. The cabinets had a constant supply of filtered air and filtered exhaust fans to remove any particles generated during the work sessions. Air pressure in cabinet lines was negative to the laboratory room and the exhaust was filtered. The room itself also was negative to the rest of the building, and exhaust air was filtered before release to the environment. Thus workers, others in the building, and the outside community, were all protected against aerosol infection from agents otherwise intended for battle.

During these same two decades, new organisms with serious human pathogenicity were discovered in nature on several continents. Most of these, all of which were viruses, caused a syndrome (with variations) known as acute viral hemorrhagic fever (VHF). There was no specific treatment or vaccine available for any of them, except for the classical virus that causes yellow fever. That disease is now recognized as the prototype of VHF. Even more disturbing was the fact that aerosols were infectious for laboratory staff for most of these agents. Virology at Fort Detrick quickly entered the Class III cabinet habitat.

The recognition of Marburg virus in 1967 propelled the Centers for Disease Control (CDC) into this arena. That agency was asked to help with field studies designed to uncover the African reservoir for the virus, and it was decided that diagnostic reagents were needed.

Visions of travelers returning from parts of the globe endemic for HF agents became a chronic concern. A small Class III cabinet laboratory was established in 1970 at the CDC. It had about 70 linear feet of cabinet line and a staff of two persons who tested samples from wild animals for infection and made diagnostic reagents for Marburg and other viruses of concern.

One year previously (1969), President Richard Nixon unilaterally terminated the national program of offensive biowarfare at Fort Detrick. Most of the buildings were given over to the National Cancer Institute. But the Army now expanded its defensive program. A new facility was constructed that became the principal laboratory of the U. S. Army Medical Research Institute for Infectious Diseases (USAMRIID). It opened in early 1971 with a mission to develop technology for detection and identification of potential biowarfare agents, to understand pathogenesis of the new VHF agents, to search for specific antiviral therapies, and to develop vaccines.

Another VHF agent, Lassa virus, appeared in Nigeria in 1969. When Marburg virus attacked two young Australians traveling in southern Africa in 1975, CDC Director David Sencer decided that it was time to reinforce the nascent Special Pathogens Branch. A surplus large trailer was obtained from NIH and outfitted as a new laboratory for work with VHF agents. It had a Class III cabinet line. Space previously used as offices was redesigned as the first completely suited laboratory and animal room. Workers wore special positive pressured suits that could be hooked up to hoses from the ceiling that provided clean breathing air. Suits came in several sizes and each worker was now able to have gloves that truly fit their hands. All work was to be done in movable Class II laminar flow biosafety cabinets (BSC) that pulled air across the work surface then filtered it, with about half recirculated in the box and the rest released into the laboratory. Similar filtered enclosures were employed to house infected animals. Laboratory exhaust air was twice filtered before release to the environment, all solid wastes were autoclaved in double-door machines installed through a laboratory wall, and all liquid wastes were pressure cooked at high temperature before cool down and released to sanitary sewers. Workers leaving the laboratory stood in a chemical shower to decontaminate the "space" suits before doffing scrub suits and showering before leaving the facility. Various alarms and redundant systems were installed to ensure that power, continuous negative pressure, and breathing air were always available in emergency. Needles and scalpels were used as infrequently as possible and plastic ware replaced glass for almost all procedures.

The new CDC laboratory was opened at the end of 1978. Laboratories utilizing positive pressure suits also were ready at USAMRIID within months. These configurations allowed convenient installation and maintenance of new instruments and other equipment that was being developed for molecular work on viruses. The principles of biocontainment were: (1) capture each small particulate aerosol immediately where it is generated, (2) ensure that workers have functional hands, life support, minimum exposure to invasive accidents, and ready access to the tools required for research, and (3) make sure that systems for

prevention of escape of aerosolized viruses to the environment are redundant. The BSC cabinets were the primary containment, the exhaust-filtered laboratories were the secondary, and even these were redundant.

By 1976, some leading molecular microbiologists became worried that new technology could potentially create novel organisms that might conceivably become Andromeda strains. The Director of the National Institutes of Health (NIH) ordered new guidelines for standards of microbiological safety for diverse agents with known properties of human pathogenicity and modes of transmission, as well as for newly discovered agents. The first edition of the NIH/CDC guidelines was published in 1980. Most work could be done in ordinary laboratories at BioSafety Level 2 (BSL-2). Others that cause more serious illness in humans, and/or for which no treatment is available, were assigned to BSL-3. All work was to be done in Class II biosafety cabinets. Room air was to be under negative pressure relative to hallways with no recirculation to other space in the building.

BSL-4 was reserved for VHF agents, certain tick-borne encephalitis viruses, and a simian herpesvirus for which human infection is almost universally fatal. At the time, this meant USAMRIID and CDC Special Pathogens, but authorities in South Africa were progressively concerned about VHF on their continent. Ebola virus, an even more virulent relative of Marburg, had been discovered in 1976. Rift Valley fever virus had caused its first-ever epidemic that included hemorrhagic fever. Crimean-Congo virus was a new concern. To meet these challenges, a BSL-4 laboratory, modeled on the Detrick and Atlanta prototypes, was constructed outside Johannesburg and commissioned in 1980. It had both suit and cabinet-line laboratories.

These three laboratories were virtually the sites of BSL-4 viral work during the past 22-30 years. With experience over time, most investigators chose to work primarily in the positive-pressure suit environment. Indeed, at the end of the1980s, CDC moved into new large laboratories that were almost devoid of Class III cabinet lines. Moreover, the Johannesburg laboratory, now part of the National Institute for Communicable Diseases (NICD), recently removed its Class III cabinets in order to expand positive-pressure suit space. Only the British BSL-4 laboratories continue to depend on Class III cabinet line configurations. All recently constructed Level 4 facilities in other countries, as well as those proposed for ours, are positive-pressure suit labs. Accordingly, this review will not include biosafety at the Porton Down facility. We are concerned principally with the track record of, and a risk analysis for, BSL-4 positive-pressure suit laboratories.

That record is exemplary. Most individuals who begin work in BSL-4 suites are already experienced microbiologists. Specific training for use of the positive-pressure suits and for safe execution of all procedures is standard practice at all of the laboratories. In context of current international concern regarding potential use of some of these viruses as weapons of terror, access to the facilities and to individual laboratories is carefully controlled. At two of the facilities in the United States individual security clearance is required to qualify for work

at the BSL-4 level. The viruses under study do not escape, neither by accident nor by covert design. Reviews of individual facilities are summarized below.

USAMRIID — 1972-2003

Persons Interviewed:

Drs. Peter Jahrling, Chief Civilian Scientist; Gerald Eddy, retired Chief, Virology Division.

Research Program:

Pathogenesis of viral infections in animal models, including clinical and anatomical pathology. Quantitative susceptibility of animals to aerosol infection by VHF pathogens. Development of diagnostic assays and air sampling detectors. Molecular anatomy and genetics of agents. Drug screening program in search of antiviral compounds. Development of live attenuated, inactivated, and recombinant vaccines.

Agents Studied:

Machupo, Junin, Guanarito, Sabia, and Lassa arenaviruses; Marburg and Ebola; Rift Valley fever and Crimean-Congo hemorrhagic fever viruses; Tick-Borne encephalitis virus. Yersinia pestisand Bacillus anthracis.

Animals Used:

Mice, hamsters, guinea pigs, non-human primates, wild rodents, lambs,

Site:

Two buildings, Fort Detrick, Maryland. Total BSL-4 space: about 6500 sf. One third is animal space and suit/cabinet ratio of lab space is about 2:1.

Time Devoted in BSL-4 Space:

Approximately 343,980 hours. (6.5 persons/8 hour day x 1680 hours/year x 31.5 years).

Laboratory Accidents and Outcomes:

During early years when work was completely in cabinets, invasive accidents resulted in treatment with human plasma containing specific antibodies to virus in question, as well as confinement in an isolation suite in one building that was also set up as an intensive care facility in event that a worker became ill after accidental exposure to an agent. Two invasive accidents were of most concern:

November 1979. Accidental finger puncture with needle on a syringe loaded with Lassa

virus. Ribavirin and immune plasma were given. (This was an experimental therapy for monkeys under development at the Institute.) No illness or serological evidence for infection occurred.

December 1982. During autopsy, a bone fragment of a monkey infected with Junin virus punctured a finger. Immune plasma was used and no clinical or subclinical infection ensued.

CDC SPECIAL PATHOGENS

Persons Interviewed: Senior Scientists and Author Research Program:

Development of diagnostic methods and reagents for diagnosis of all BSL-4 agents. Pathogenesis of viral infections in animal models, including natural wild reservoirs. Molecular anatomy and genetics of VHF agents. Limited vaccine development work. Response to VHF epidemics in natural settings. Diagnosis, clinical pathology and virology, discovery of new agents.

Agents Studied:

Five arenaviruses, Marburg, Ebola, Crimean-Congo HF virus, Rift Valley fever virus, Nipah and Hendra viruses, Russian spring summer encephalitis and Tick-Borne encephalitis viruses, Omsk and Kyasanur Forest disease viruses, Hantavirus (animal work only).

Animals Employed:

Mice, hamsters, guinea pigs, non-human primates, rats, five wild rodent species for rodent-borne agents.

Sites:

Building A: 1970-78. About 70 linear feet of Cabinet line.

Building B: 1979-1989. About 900 sf with 30 ft cabinet line, 300 sf positive-pressure suit lab and 200 sf of positive-pressure suit animal space.

Building C: 1990-2003. About 5000 sf of which approximately 30% is animal space. Laboratory is entirely positive-pressure suit operated.

Time Devoted in BSL-4 Space:

120,560 hours.

Laboratory Accidents and Outcomes:
Animal bite; Hantavirus infected rodent, no infection.

Animal bite; animals being inoculated with Hantavirus. Pre-inoculation bite from rat.
Needle stick to worker prior to setting up an inoculum with mouse-adapted Ebola virus. No infection.
Autoclave door interlock failed and a load not autoclaved was opened, but not handled. No infections resulted.
Multiple events over the years of outer gloves or suits developing tears or holes detected during work. Such incidents are evaluated and followed up. No treatments were ever used and no infections resulted.

Facility/System Failures: None of note that caused interruption of work.

National Institute for Communicable Diseases

Johannesburg, South Africa, 1980-2003

Person Interviewed:

Dr. Robert Swanepoel, BSL-4 Laboratory Director

Research Program:

Diagnostic reagents and support for all HF outbreaks in Africa and neighboring regions when requested,; pathogenesis of infections in animals, especially candidate wild reservoir species; clinical virology; molecular biology of selected hemorrhagic fever viruses; field investigations of natural history of disease outbreaks; and seroepidemiology of infections in humans and animals.

Agents Studied:

Marburg and Ebola viruses, Rift Valley fever virus, Crimean-Congo HF virus, ten hantaviruses.

Animals Employed:

Mice, guinea pigs, rabbits, bats, tortoises, pigeons, snakes, roaches, spiders, frogs, millipedes, snails, 20 species of wild rodents, hares, hedgehogs, guinea fowl, chickens, etc. Much animal work was devoted to a search for wild reservoirs of Marburg and Ebola viruses.

Site:

Rietfontein, 4500 sf. Space divided into 721 sf positive-pressure suit lab and 222 sf similar animal holding room, plus cabinet lab of 999 sf (now defunct). Remaining 1443 sf devoted to change rooms, showers, and service corridors.

Time Devoted in BSL-4 Space:

Approximately 40,000 hours in nearly 23 years.

Laboratory Accidents and Outcomes:

Bat bite through double gloves. No infection.

Multiple other accidents. Those exposed are monitored closely for 21 days, during which time they are not permitted to leave town—as are all employees after their last day of work inside BSL-4 space. No infections recorded.

Facility/System Failures:

Only one that caused shutdown of operations. About 5 liters of highly concentrated Marburg virus was suddenly aerosolized when worker opened chamber to add a bit more fluid without closing the nitrogen pressure tank and bleeding off pressure. Laboratory was mopped for several hours with glutaraldehyde, and finally decontaminated with formaldehyde gas. No infection occurred in two "exposed" workers. There was no breach in BSL-4 containment, and no infections occurred in neighboring open-air monkey colonies on the campus. This was a maximum challenge to BSL-4 containment, and I am aware of no other event remotely comparable in terms of concentration and volume of a highly lethal virus.

Summary

No clinical infections occurred at three institutions during work with BSL-4 agents, mostly hemorrhagic fever viruses during the past 31 years. Almost half a million hours of laboratory (and field) exposure have been recorded, the majority of which was time spent in positive pressure suits. Nor have there been major defects or incidents in operation of the physical facilities. No escape of any agent with clinical consequences for neighboring communities occurred.

Invasive injuries were infrequent, eloquent testimony to the awareness of the dangers and the daily care observed by workers who volunteer for such duty. One laboratory inadvertently carried out a maximum aerosol challenge to BSL-4 containment with a highly pathogenic hemorrhagic fever virus. Virus did not escape the laboratory, nor was a worker infected.

The zero numerator of infections in these three laboratories and the huge denominator of exposure hours make it impossible to provide a number for 'risk of infection' to either laboratory workers or outside communities. Nevertheless, that number must be small. When the value of diagnosis, treatment, and control of deadly outbreaks of hemorrhagic fever over the past three decades is added to this equation, risk/benefit clearly comes out in favor of continued operation of BSL-4 laboratories.

Indeed, considering new challenges posed to the world community by these agents, it is fair to conclude that more such facilities are needed. Better therapeutic agents are desperately needed. High priority also must go to the development of vaccines that can protect laboratory and hospital personnel in countries where natural epidemics occur, as well as first responders to intentional aerosol attack on any community.

This report is included in the Final Environmental Impact Statement of the Integrated Research Facility

Biosafety Update:
Short Review of BSL-3 and BSL-4 Viral Agent Laboratory Incidents Worldwide

Karl M. Johnson, M.D.
August 28, 2004

In March of 2003, the global health community was alerted to a new respiratory infection that is deadly and readily transmissible. The disease became known as severe acute respiratory syndrome (SARS), and now is believed to have originated in China in the fall of 2002. Cases quickly were reported from Vietnam, China, Hong Kong, Singapore, and Canada. On July 5 2003, the World Health Organization announced that the disease had been contained, and although only four months had passed since the first report, more than 7,000 cases were confirmed and 774 attributable deaths were recorded. Intensive study revealed that the infection is caused by a corona virus, now known as SARS corona virus (SARS-CoV). .

BSL-3 Laboratory Infections
SARS

Since the primary epidemic of severe acute respiratory syndrome (SARS) in Asia and Canada was terminated in early summer of 2003, there have been three instances of laboratory clinical SARS infections.

- Singapore: August 26, 2003.
  A university graduate student worked on attenuated strains of West Nile virus and obtained a virulent recent New York strain of the virus. To work on the virus, he was sent to an Institute in Singapore that had BSL-3 laboratories. After minimal training, and with help of an Institute technician, several passages of the new virus were made in Vero E6 cells. This line also was used by the Institute to grow the SARS coronavirus. The student sickened with fever and myalgia on August 26. On September 3, he was admitted to hospital with a dry cough and signs of pulmonary inflammation. He was transferred to an isolation hospital, and had a moderately severe evolution of the disease. Supplemental oxygen was not required. Surveillance, even quarantine, was maintained on several dozen contacts, but no secondary infections occurred.

  It was discovered that supernatant fluids of the virulent West Nile virus that was to become stock for further experiments was significantly contaminated with the SARS strain of corona virus under investigation in the Institute laboratory. The student and the technician prepared storage vials of the West Nile harvest on August 26 and this work is thought to have been point of exposure, albeit the technician did not become infected with the corona virus, and had no antibodies to signify past infection.

- Taipei, Taiwan: December 10, 2003
  A senior research scientist at the National Defense University worked with the SARS virus to screen compounds for antiviral activity in a Class III cabinet (BSL-4). On December 6, he noticed that waste fluid placed in a tightly docked transfer chamber had leaked onto the floor of that attached unit. From inside the main cabinet he sprayed alcohol into the chamber, waited 10 minutes, then undocked the chamber, opened and sprayed more alcohol into it, then physically cleaned up the spill. Next day he went to Singapore to a SARS meeting. The evening of return on December 10 he noted fever and fatigue. These symptoms progressed to include dry cough and severe myalgia. He was finally hospitalized on December 16 and experienced only moderately severe clinical illness. Contacts, especially a number of passengers on the plane with him from Singapore on December 10 were monitored or quarantined. No secondary infections occurred.

  Environmental samples obtained from his laboratory on December 18 revealed SARS corona virus nucleic on the handle of an alcohol bottle kept on top of the transfer chamber and on the light switch of the Class II cabinet. It is postulated that the scientist grossly contaminated his hands during the waste mopping of the transfer chamber after an incomplete inactivation step using alcohol spray.

- Beijing, China: February and April 2004
  Two SARS workers at the National Institute of Virology sickened and were diagnosed with that disease two weeks apart in April. The identity of these infections was not recognized until the mother of one of the workers also sickened. She died. Six other persons in contact with these two individuals also acquired the disease. During the course of intense investigation at the laboratory, two other workers were discovered to have experienced SARS-compatible illness in February 2004. These individuals had antibodies to the etiologic coronavirus. Details regarding likely sources of these laboratory infections have not been published to date.

Subsequent to the October 15, 2003 report, "Biosafety at BSL-4: More than 20 Years Experience at Three Major Facilities," there have been three reported laboratory-acquired infections with BSL-4 viruses, one fatal ebola lab infection in 2004 and two Marburg infections, 1988 and 1990, as reported by ProMed-mail and detailed below. ProMed is the Program for Monitoring Emerging Infectious Diseases, a public service internet-based reporting system dedicated to rapid global dissemination of information on outbreaks of infectious diseases and acute exposures to toxins that affect human health.

BSL-4 Laboratory Infections

- Fatal Ebola Lab Infection: May 19, 2004:
  On May 5, 2004, a 46-year-old female employee at Vektor, the leading BSL-4 laboratory complex in Novosibirsk, Russia, was admitted to hospital with fever and severe myalgia. Several days previously she had accidentally stuck a finger with a needle during experiments with guinea pigs infected with the Zaire strain (most virulent) of Ebola virus. Despite all measures she died on May 19.

  Informal verbal information from a colleague who works on viral hemorrhagic fevers is that the Institute did not have any proper needle disposal boxes at the time of the accident. Workers had apparently been instructed to replace the plastic sheaths on needles after use. This was purportedly the maneuver that resulted in her injury, although such detail is omitted in the Special Committee report of the Russian Federation Ministry of Health.

- Two Infections (with One Fatality) of Marburg Virus: 1988
  In the same ProMed report concerning the fatal Ebola case, it is mentioned without further detail that two Marburg virus clinical laboratory infections occurred in the past at the same laboratory, Vektor in Novosibirsk, Russia. One of these was fatal. A second worker survived Marburg disease.

These experiences demonstrate that working with certain viruses carries significant risk to workers, and further indicates that facility, equipment, and adherence to sound protocols for worker safety are all important in minimizing infections. The secondary SARS infections in China, moreover, raise the question of whether those working with that corona virus should also wear respirators. Respirator use for this virus is justifiable as the virus is transmissible from person to person and secondary infections in the general population have already proven to be international emergencies.

Data Sources

SARS

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Appendix 5

Boston-NBL Security Program and Emergency Response

Boston-NBL Security Program and Emergency Response

Security Program

Boston University Medical Center (BUMC) incorporates a wide range of public safety, facilities, design, and construction and information technology expertise into its security programs. These programs include a blend of staffing and security systems that are reviewed annually. The senior managers responsible for these programs are active in a number of professional organizations and attend at least two professional development seminars a year to ensure that staff training and system support is current with, or exceeds, industry standards.

The Executive Director of Operations and Public Safety manages the process of defining programmatic needs and is supported by a Public Safety Department made up a Director, an investigations group, a systems group and an operations group that includes eighty-six officers. This department of 100 includes forty sworn police officers and attends more than fifty mandatory hours of training each year. The BUMC Public Safety staff is supported by the Boston University Police Department's fifty-five sworn police officers. Within these two operations there is ongoing coordination related to technology by systems experts, investigations by trained and experienced investigators and joint coordination with local, state and federal law enforcement agencies.

Security plans are tailored to programs and/or facilities and are addressed in the design of new facilities or through risk assessments in existing facilities and programs. BUMC utilizes two separate and distinct card access and alarm systems that are produced by General Electric and Tyco. These systems are capable of providing card access, panic alarms and door alarms for areas of the campus. Both systems are capable of integrating with biometric devices and closed circuit television as well as with fire alarm systems and building automation systems. The inclusion of facilities, design and construction and information technology staff in security system design and implementation provides a high degree of reliability once a project is complete or protocols are revised.

The convergence of staffing and systems takes place in the 24 hour a day, 7 day a week Command and Control Center where public safety and facilities staff manage information delivered over alarm, card access, closed circuit television, communication and panic alarm systems. The staffs that manage this information and initiate response are selected based on their success in security or facilities roles, their ability to think critically, their ability to work with technology and their knowledge of the campus.

The description of the public safety program above is the basis for planning and designing a program related to the National Emerging Infectious Diseases Laboratories (NEIDL). BUMC has designed the project with an addition of twenty-five to thirty new public safety officers, five to ten new Command and Control Center staff and three to five new management staff.

These staff may either be hired from external sources if background, training and education are appropriate or may be selected from experienced existing staff. In either case, these staff will undergo training done in coordination with the National Institutes of Health Security and Emergency Response personnel, will undergo police academy training, including firearms training and will undergo significant BUMC biosafety training.

Public Safety staff will be assigned to the following locations:

1. Perimeter pedestrian entry/exit point where staff will only admit authorized personnel and where personnel and belongings will be checked. This post will be staffed 24 hours a day by at least one public safety officer and will have monitors to view the perimeter of the site.
2. Main entrance where staff will manage the entrance/exit of authorized personnel that have been checked in through the perimeter pedestrian entrance. This post will be staffed 24 hours a day and will have monitors to view closed circuit television, access, and audit and alarm activity within the building.
3. Perimeter Vehicular entry/exit point where limited access will be granted to select vehicles providing specialized deliveries or services. This post will be staffed at least 12 hours a day during the business week and will have monitors to view the perimeter of the site. This post will include vehicle control devices that allow public safety staff to secure a vehicle when checking it and to then direct the vehicle to enter the site, exit the site, or to secure the vehicle for entering or exiting if necessary.
4. Loading Dock will be staffed at least 12 hours a day during the business week, will have monitors to view the perimeter of the site as well as the main entrance and will manage the entrance/exit of personnel that have been checked in through the perimeter vehicle entry/exit.
5. Control Center will be staffed 24 hours a day to provide additional support and response to requests for assistance or emergency situations.
6. Patrol officers will be in the building 24 hours a day monitoring the environment and ensuring that all security protocols are in place.

The design of the NEIDL includes the installation of one of the two primary card access systems acting as the primary system that will integrate card access with biometric iris scan readers, closed circuit television cameras and applications of those systems to ensure absolute identity, audit and conformance with a two-person rule. These systems, like all mechanical, electrical and plumbing systems are designed with system and operational redundancies to ensure that the systems have no down time.

The security system will enforce levels of access that individuals will be granted based upon their responsibilities in the building. Employees will pass through security layers that will require identification by a public safety officer, use of card access, use of biometric iris readers, access with another authorized employee or any combination of those approaches. Activity will be monitored by close circuit television. Entry, egress and activity will be

monitored for compliance both electronically and by public safety staff. Variances to authorized entry, egress or activity will result in electronic notification of public safety staff within the building and at the Control Center and will initiate response to that variance.

The combination of staff and systems related to the NEIDL will take place at two locations. The building will contain its own command center and will be staffed with employees capable of managing events within the structure. The systems will also report to the existing Command and Control Center where critical thinkers can support the NEIDL operations, coordinate response, notify both external and internal responders and activate campus wide plans if necessary.

Emergency Response

Boston University Medical Center (BUMC) prepares for a variety of emergency, contingency and disaster scenarios that include events that occur within the medical center, external to the medical center and/or from natural events. Planning is done on the institution level and with the City of Boston. Response plans are documented, tested with full response or as a table-top exercise and are reviewed annually. Internal plans include fire, chemical, biological or radiation spill/release, evacuation, criminal incident (bomb threat, infant abduction, etc), or loss of utility (heat, electrical power, water, etc). External plans include incidents in which a large influx of patients are expected or an incident occurs that may become an internal incident such as a large scale utility issue. Natural disaster plans include severe weather conditions or situations that may impact the structural integrity of medical center facilities.

BUMC constructs and manages its facilities in accordance with all applicable design, construction and regulatory standards and prepares for scenarios during the design phase of a project. Building automation systems are incorporated into all design plans to maximize control over building systems including those related to fire and evacuation. Security features are designed into buildings considering the use of the facility. Structural plans are incorporated recognizing potential for manmade and natural occurring events such as earthquakes. Plans include compliant means of egress and areas of refuge for both lateral and vertical evacuations, depending on the building occupancy.

The Office of Environmental Health and Safety (OEHS) manages the development of plans, develops test (drill) scenarios, critiques events that take place following drills and represents BUMC with regulatory and emergency/disaster response agencies. These efforts include significant involvement of BUMC Administration, the Office of Occupational and Environmental Medicine,,, the Office of Public Safety and the Medical Center Disaster Coordinator. Plans are reviewed by the Boston Fire Department and/or the Boston Emergency Management Agency, when applicable. Tours of laboratory space are provided to City of Boston emergency responders as necessary. Compliance and hazard surveillance tours, including documentation audits are conducted on a regular basis to ensure continued compliance.

The OEHS includes thirty employees representing expertise in fire and life safety, environmental compliance, radiation safety, industrial hygiene, construction safety, hazardous materials, environmental management and biological and laboratory safety.. The specialized managers and staff responsible for these programs are active in a number of professional organizations and attend at least one professional seminar a year to ensure that staff training and knowledge of regulatory standards are current with, or exceed industry standards. In addition, all OEHS staff are trained annually in HAZWOPER, OSHA's emergency responder standard, in order to manage on-site chemical incidents.

The activation of any BUMC emergency, contingency or disaster plan involves activation of the Command Center to manage the incident independently or with the assistance or under the direction of the City of Boston depending on the type of situation. The public safety and facilities located in the Control Center collect and disseminate information while the emergency response team implements actions.

The description of the existing emergency response planning process described above will be used as the foundation for planning and designing a program for the National Emerging Infectious Diseases Laboratories (NEIDL). BUMC has designed the NEIDL like similar research buildings on the campus but has added significantly to the design of the BSL-4 space and to the building security. This area has been designed to manage incidents from within the space utilizing lateral evacuation plans within defined compartments, redundant systems for controlling the environment, and will be managed with an additional two to four Environmental Health and Safety / Emergency Response personnel. These staff will undergo training in coordination with the National Institutes of Health Security and Emergency Response personnel, including coordinating all plans with the City of Boston and undergoing significant BUMC biosafety training in an on-site BSL-4 training laboratory.

In the event of an emergency situation that may impact the community BUMC will immediately contact all appropriate responding agencies including the Boston Public Health Commission, the Boston Fire Department and the Boston Police Department who will activate city plans to command and coordinate all appropriate agencies and response plans.

It is important to note that in almost eighty years of operation the five existing BSL-4 Labs have had not incidents that impacted the communities surrounding them.

Environmental Health and Safety (EHS) and Emergency Response personnel assigned to the NEIDL will include the following personnel;

1. Biosafety Officer will be responsible for ongoing monitoring of laboratory protocols for performance improvement and compliance with internal and regulatory standards.
2. Laboratory Safety Technician will be responsible for inspections and audits related to all laboratory space.
3. Emergency Response Manager will be responsible for all emergency response plans and the coordination of those plans with local, state and federal authorities.
4. Other EHS professional staff will be identified for other safety and industrial hygiene related activities.

BUMC continues to work with the City of Boston's Public Health Commission, Fire Department, Police Department and Emergency Management Agency regarding preparedness for incidents that occur at BUMC and how they could impact the community. This type of planning and preparedness includes facility evacuation plans, the identification

of areas of refuge, communication to external response agencies, and their communication to the surrounding community. BUMC will be the primary non-governmental responder given the knowledge of the facility, expertise in disaster response, and its capabilities in trauma services. The planning will include the roles and responsibilities of external response agencies including but not limited to how determinations are made regarding evacuation of non-BUMC properties and areas. BUMC will communicate immediately to the City of Boston should it be aware of an emergency situation and to provide services as necessary in response to that situation.

The response to an incident in the BSL-4 area of the building will include protocols that define the isolation and containment of the area for emergency responders as well as the protocols for those who work in the area. This space is designed to allow for those inside to move from one compartment into another allowing for a safe re-location within containment. All compartments have access to decontamination showers or, in the event of an immediate evacuation, fumigation chambers to ensure those in containment can exit the facility without the risk of contamination to the building exterior. The operations of the area require conformance with a two-person rule that addresses issues associated with an individual becoming disabled, becoming exposed or panicking as a result of those types of situations. Application of the two-person rule includes training on how individuals should respond to situations within containment to ensure all risk is isolated and contained.

The convergence of emergency response staff and plans related to the NEIDL will take place at two locations. The building will contain its own command center and will be staffed with employees capable of managing events within the structure. The systems will also report to the existing Command and Control Center where critical thinkers can support the NEIDL operations, coordinate response, notify both internal and external responders and activate campus wide plans as necessary.

Appendix 6

BUMC Standard Operating Procedures

The following standard operating procedure is an example of the level of detail that will be required for every SOP for the proposed Boston NBL facility. This example is for a U.S. Centers for Disease Control Prevention (CDC)/U.S. Department of Agriculture Select Agent and Biosafety Level 3 agent currently being used at Boston University Medical Center (BUMC). For the purposes of this example, the name has been removed for security reasons, and will only be designated as "X bacteria." All Select Agent work will be approved by the BUMC Institutional Biosafety Committee, including the NBL Select Agent work.

Standard Operating Procedures For Experiments with Select Agent X

I. Project Description

The major objectives of this research will be to: (1) to develop a vaccine candidate to protect against inhalation of X (caused by X bacteria). (2) to develop a polyclonal antibody library to be used for passive immunization to ameliorate or prevent acute illness from X bacteria acquired by the inhalation route and (3) to develop diagnostic systems to detect X bacteria in clinical specimens and in the environment using immunochemical and/or gene amplification methods.

Project 1:

The overall research program is made-up of three sub-projects and two cores. In project 1 we will prepare and use as vaccine candidates in experimental systems, X bacteria lipopolysaccharide derived O-polysaccharide and capsular polysaccharides. We will use conjugates and clinically relevant adjuvant and delivery systems to recruit T cell help to enhance immune responses. We will also create peptide surrogates (called mimics) of the two saccharide prototypes and use these for immunization. Mice will be immunized to assess vaccine efficacy against aerosol challenge with X bacteria.

Project 2:

In project 2, we will design polyclonal antibody expression libraries (PCALs) against X bacteria and examine the efficacy of passive administration in preventing and treating experimentally induced inhalation tularemia. We will use widely directed polyclonal antibodies to determine overall efficacy, use libraries depleted of putative subversive (blocking) antibodies and generate monospecific polyclonals directed against O-polysaccharides and capsular epitopes to passively immunize mice and assess protection from aerosol challenge with X bacteria.

Project 3:

In project 3, we will develop three diagnostic systems, using gene amplification and immunochemical detection, to detect X bacteria in clinical and environmental specimens. A transcription mediated amplification (TMA) assay will be developed to detect X bacteria in respiratory secretions and an immunochemical test to detect X bacteria antigens in respiratory secretions and urine and for monitoring environmental air samples.

Core A:
The Core A (Animal Core) will support research on X bacteria in mice to develop a vaccine candidates (developed in Project 1). Vaccine candidates that yield a high immune response will be used to vaccinate mice prior to aerosol challenge with living organisms. Vaccine efficacy against aerosol challenge will be assessed on the basis of survival and quantitative organ cultures. In addition, Prophylaxis and therapeutic efficacy of the PCALs (developed in Project 2) to aerosol challenge with live organisms will be performed on mice. Urine and respiratory secretions from infected mice will be used to optimize the development of diagnostic assays (Project 3)

Core B:
The Core B (Bacteriology/Immunology) will provide the centralized bacteriology support needed for each of the projects and Core A.

II. LABORATORY FACILITY

A. Biocontainment Suite

The Biocontainment Suite is a BSL-3 lab facility, consisting of 6 lab rooms, shared by one common hallway, a main room containing storage space, common sink and double-door autoclave, airlock, and common locker change room. This Suite is located on the xth floor of the XYZ building which requires card access from the 1st floor level elevator as well as the elevator foyer on the xth floor.

The Suite will be separated from areas that are open to unrestricted traffic flow within the XYZ building. Entry will be restricted by card key access or biometric scanner. The Suite will operate under negative-pressure at all times (see emergency response plans for failure or loss of power).

Due to the isolated nature of this 6- lab multi-room space, OEHS recommends that researchers do not work alone in the space for any aerosol challenge work or large manipulations of Tularemia culture. Should a researcher need to work alone, OEHS will require that personnel notify a person when they enter and exit the space. That person they are notifying must be on-campus during the time that the work is being completed. Should a worker have a medical injury or fail to report back, the colleague should immediately contact the Control Center (4-6666).

B. Work Space for X bacteria Experiments

Work space will consist of 3 rooms (A, B, & C) within the biocontainment suite (A-bacteriology laboratory, B- procedure room, and C-Animal housing).

1. Common Space

There is a common hallway leading to these three labs. There is a shared autoclave in the common entry/supply room.

2. Safety Equipment

There is a safety shower, newly placed in the common hallway that shares all 6 labs. There is an emergency phone and flip chart located in the hallway. There is an eyewash, hands free sink, and telephone in each individual lab room.

III. ROLES AND RESPONSIBILITIES

A. Program Director-

The Program Director will be responsible for the following.

- Identify a Laboratory Director to provide supervision
- Assign a Laboratory Supervisor(s) to oversee daily operation of the laboratory
- Maintaining communication with LASC, OEHS, Facilities Management, IACUC & IBC committees.
- Communicating with LASC as necessary to review issues of animal welfare, operations, and compliance.
- Ongoing communication with other PIs to ensure that all users of the BSL-3 suite are familiar with the SOP, training, and other requirements of the laboratory.

B. Supervisor

The Laboratory Supervisor, (for Core A) will be responsible for:

- operating the animal housing room and the procedure room.
- He will ensure that all animals housed in the laboratory are properly cared for according to the standards of the Laboratory Animal Science Center (LASC).
- He will perform or train staff thoroughly on all aerosol infection studies, all tissue harvesting procedures, and all daily animal care.
- He will be responsible for tracking all animals used by the laboratory, for decontamination of all waste generated by the laboratory.
- He is also responsible for maintaining all select agent inventory records, and notifying the RO of any discrepancies.
- The Laboratory Supervisor (for Core B) will be responsible for operating the bacteriology laboratory. He will supervise the personnel working in the laboratory to maintain the lab according to the standard operating procedures. He will be responsible for keeping the lab according to the standard operating procedures and for keeping the laboratory supplied.

C. LASC Veterinary Manager

Provide oversight to all aspects of animal health and welfare and review and approve SOPs in accordance with the IBC and IACUC committees.

D. Security

The security department will be responsible for completing a risk assessment of the space, prior to the laboratory opening, and as needed. Security will also be responsible for monitoring the activity of the exterior locations of the storage space and lab, granting card access authorized by OEHS, and issuing color coded Select Agent ID cards to the users. Security will contain the

outside of the laboratory in the event of an emergency, and will investigate any loss of select agent material in collaboration with OEHS, LASC, the Lab Director, and other parties as needed.

E. Office of Environmental Health and Safety

OEHS is responsible for the training of all staff on lab safety training, BSL-3 & select agent training. OEHS is also responsible for monitoring the Select Agent Program.

F. Responsible Facility Official (RO)

Director of OEHS, is the RO for BUMC. He is responsible for:
Inspecting all select agent records, and auditing these records at least twice per year.
He is also responsible for notifying the CDC of any changes to the X bacteria project.

G. Approved Personnel

Personnel will need to be approved by filling out an FD-961 form for FBI background clearance checks.

IV. Access to BSL3 Suite

Prior to gaining access, all personnel entering suite must receive required safety training for BSL3 hazards, fit testing for N95 or EHS approved respiratory protection, and all trainings listed in Section VI B. Access to rooms will be further restricted to the following persons in Sections A through E:

A. Members

Members of the lab who have received safety training specifically for the laboratory under the Laboratory Director's supervision.

B. Visitors

Visitors (facilities maintenance workers, inspectors) must be trained, fit tested, and then accompanied by an approved Select Agent lab member, only after approval of the Safety Office and Laboratory Director. Visitors must meet BUMC Security Clearance requirements (see attached Appendix A) and must be escorted at all times.

C. LASC Personnel

LASC personnel who have received safety training specifically for the tularemia project under the Laboratory Director's supervision will enter to monitor the condition of mice.

D. Maintenance personnel

Maintenance personnel will enter the laboratory only after communicating with the Laboratory Director or the Laboratory Supervisor. Prior to entry by maintenance personnel, the Laboratory Supervisor will ensure that all staff have been properly fit tested and trained, infectious materials are safely stored, (i.e. no work is out in the Biosafety Cabinet, all animals are in appropriate cages), no experimental procedures are in progress, and that all work surfaces are

sanitized. Maintenance workers must be escorted by an approved staff members at all times and will have the appropriate PPE on approved by OEHS at all times.

E. Other

No persons under age 18 are permitted in the laboratory.

V. Violations

Violations of safety and security rules will be reported to the Research Laboratory Director, LASC Veterinary Manager, and to the Office of Environmental Health and Safety (OEHS) Biosafety Officer and Responsible Facility Official, and Security. Serious repeated infractions will be grounds for denying further access to the laboratory. The Select Agent Response Policy SP-XXX will be used by BUMC Security in the event of a security violation.

VI. Personnel training

A. Administration Responsibilities

The Laboratory Director is responsible for ensuring that all personnel working in the laboratory receive specific training in safe procedures for experimentation with X bacteria in the BSL-3 laboratory. The Laboratory Director will maintain a record of training session attendees. The Laboratory Director is also responsible for ensuring that all personnel have received whatever additional training may be mandated by OEHS, LASC, OEM, or IBC.

B. Training/ Other Requirements

- Lab Safety Training
- LASC Animal Training
- BSL-3 training- (Lecture and hands-on walkthrough)
- Select Agent Training
- OSHA Medical Clearance for Respirator Use by OEM
- Fit Testing through OEHS
- Occupational and Environmental Medicine- (medical evaluation & additional requirements)
- Biologicals Shipping Training (specifically required for all personnel that are responsible for shipping infectious materials in this lab.)
- Basic First Aid/ CPR Training

VII. Lab Operating Procedures

A. Entry Procedures

1. **Prior to entering:** workers must be sure the HVAC alarm is not sounding indicating exhaust failure.

2. Entrance: Rooms will be entered via the front corridor with card key access and/or biometric iris scanner.

3. Logbook: Personnel must indicate Name, Date, Time of entry, and the Work Room destination, and purpose of work.

4. PPE: All researchers will wear the following personal protective equipment:

- disposable Tyvec gowns
- double gloves
- shoe covers
- eye protection
- respiratory protection (For all entry and all work to the BSL-3 suite an N-95 or NIOSH approved respirator will be required).

5. Checks: Upon entering the Biocontainment Suite, the following items should be checked:

- Magnehelic gauges
- Telephone.
- Door Sweeps
- Supplies and reagents are available, open, and ready for use.
- Aerosol Challenge Sign-Must be posted on Door to Lab B prior to challenge.

6. Before beginning any work: Surface disinfect work areas with 70% Ethanol. Do not assume that any surface is clean. If any problem is noted, contact the previous person that has signed into the suite for assistance and notify the Laboratory Supervisor.

B. Exit Procedures

1. **Wipe down:** the work area with 70% ethanol.

2. **Collect:** biohazard waste bags for disposal. Bags are then sprayed down on the outside with 70% ethanol or 70% isopropanol disinfectant.

3. **Discard:** outer gloves in the biowaste bag, close the bag in laboratory room (A, B or C). Carry biohazard waste bags to the autoclave.

4. **Trash:** bags in autoclave in secondary containment, start cycle, then proceed to locker room exit door.

5. **Removal:** If any trays or materials need to be removed**,** they must be surface decontaminated by soaking with 70% ethanol, and placing in the airlock for pick up on the other side.

6**. Exit**: You must swipe your authorized BUMC ID upon exiting BSL lab hallway to activate motion sensors per security protocol. Exit through the ante room/ Locker room. Discard Personal Protective equipment in the following order: Tyvec and head cover. Next the respirator should be removed and discarded. Next, the employee should step over the floor area indicating going from "dirty" to "clean" area of the locker room, while one shoe cover

should be removed at a time upon stepping over the line on the floor. Lastly, the inner glove should be discarded after all other PPE is removed.

7**. Hygiene:** Employees must wash hands upon every exit, then sign out of logbook indicating departure.

8. **Airlock**: Materials can now be safely retrieved out of autoclave on clean side, and the airlock on the clean side of the lab.

9. **Autoclaved waste**: bags are placed in Biohazard cardboard boxes in the waste storage room on the Xth floor. These boxes are then picked up by Stericycle for transport to an off-site incinerator.

C. General BSL-3 Microbiological Practices

1. **Handwashing**: Hand washing is required after handling infectious materials and before leaving the suite.

2. **Double Gloves**: Use of double gloves is required. The outer gloves should always be changed immediately after handing potentially infectious materials and after any spill or accident.

3. **Restrictions**: Eating, drinking, applying cosmetics, inserting contact lenses, storing food, shorts and perforated shoes or cloth sneakers are prohibited in the lab.

4. **Decontamination Practices**: Work surfaces must be decontaminated after every use, and immediately after any spill of infectious material. Disinfectant solutions are kept in every work area. Bleach solutions should always be dated.

5. **BSC Use**: All procedures with infectious materials are performed in a biosafety cabinet or other physical containment device to minimize exposure to aerosols.

6. **Waste**: All infectious waste must be autoclaved before removal from the BSL-3 lab.

7. **Autoclave Validation**: Laboratory personnel will check autoclave performance monthly with a biological indicator. Biological indicators consist of ampoules containing heat resistant spores (*Bacillus stearothermophilus*). All usage of the autoclave needs to be recorded in a dedicated autoclave notebook located next to the BSL3 autoclave. The Ampoules of *B. Stearothermophilus* need to be placed inside the autoclave bag, once per month. Upon completion of cycle, vial is removed and placed in a 50°C incubator for 48 hours to verify there is no growth of organism. This validates the autoclave is sterilizing the waste appropriately.

8. **Contaminated equipment:** Equipment must be surface decontaminated by soaking with 70% ethanol in the airlock. On the occasional occurrence of trays or other equipment that needs to leave the BSL3 lab, the material must be brought to the air-lock, thoroughly drench-sprayed down with 70% ethanol spray, and surface wiped down. Upon exiting the facility, personnel may retrieve the item from the air-lock on the outer-containment door.

D. Aerosol Infection Experiments

1. **Intox**: The In-Tox Nose-Only Inhalation Exposure System will be used for inhalation exposure of mice to X bacteria. Only the Laboratory Supervisor, or persons trained and approved by the Laboratory Supervisor and the Laboratory Director, may operate the unit.

2. **Operating Manual**: A copy of the operating manual will be kept in the BSL-3 laboratory at all times.

3. **Signage**: A warning sign stating "Caution- Aerosol Challenge in Progress- X bacteria present" should be placed on the door of the lab when a challenge with the InTox system is taking place. This will prevent other persons from inadvertently entering the lab, and all lab staff and animal care personnel must be trained to recognize this sign. Note: it is important that lab staff are wearing the approved N95 respirator before entering the lab to complete the aerosol experiment.

There will be an additional sign placed on the locker room door and the airlock to indicate the PPE required to enter the space, even if emergency responder.

4. **Rodent Control**: Each mouse is put into an individual exposure chamber, face first, exposing the nose of the mouse out of the opening.

5. **Mice Removal**: Upon completion of the aerosol exposure to the mice, mice should be removed and placed back into cages.

6. **Disinfection of Chamber**: The interior of the chamber should now be cleaned with 70% ethanol solution.

7. **Disinfection of Surfaces**: Next all surfaces, floors, and countertops should be wiped down with 70% ethanol.

8. **Exiting**: Before leaving the laboratory, remove the above "Aerosol Exposure…" sign on the outer door to indicate experiment is complete.

E. Handling Infected Mice.

1. **BSC**: All work with infected mice will be conducted in the Class II, AII or Class II BII biological safety cabinet that is hard-ducted and HEPA filtered to the HVAC system.

2. **Necropsy**: Necropsy procedures will be conducted with a minimal use of sharps. Scissors will be used in place of scalpels wherever possible. Blunt dissection will be performed in place of cutting wherever possible. Use of needles will be minimized, and needles will be never re-capped. An approved sharps disposal container will be present in the work area.

3. **Tissue Homogenization**: Homogenization of tissues will be conducted only in the class II biological safety cabinet.

4. **Tissue Safety**: After tissue grinding operations, wait 10 minutes before removing homogenate samples from the safety cabinet. Tubes should be covered and decontaminated on their exterior surface by spraying with 70% ethanol.

5. **BSC Decontamination**: After completing work in the safety cabinet, decontaminate the inside and outside of the BSC and chair with 70% ethanol.

F. Animal Care

1. **Laboratory Supervisor**: Supervisor, along with other designated and trained members of the laboratory works in collaboration with LASC personnel to ensure proper animal care. All routine animal care will be conducted with ABSL-3 practices.

2. **Rodent care**: Mice will be housed in micro-isolator cages, a ventilated HEPA filtered cage rack system purchased from Biozone, will hold 81 cages. There will be no more than 4 animals per cage. All mice will be visually inspected once daily for general appearance and for consumption of food and water. LASC personnel will conduct routine daily checks according to their requirements for general healthy condition of the mice along with room temperature and humidity checks. Any problems with the animals will be reported to the Laboratory Supervisor.

3. **Special requirements**: Room will be decontaminated and open for LASC inspection when necessary, in collaboration with researchers.

4. **Loose Rodents**: Any mouse found on the floor of the laboratory will be euthanized.

5. **Animal Care**: Lab personnel will change cages once every two weeks or as needed. Used cages, along with their bedding and water emptied water bottles, (while working inside a BSC) cages will be placed directly in biohazard bags for autoclaving. These bagged cages will be removed from the lab, then the outside of the bag is sprayed with 70% ethanol, and transferred to the autoclave for sterilization. Ultra high temperature cages and bottles will be used.

6. **LASC personnel**: LASC will retrieve autoclaved cages from the outer autoclave door outside containment. Bedding will be discarded and cages will be placed in the cage washer for future use. LASC personnel will supply fresh cages, bottles, and food to the Air Lock on a cart. The material will be left in the airlock, carts will be sprayed down with Quatricide disinfectant prior

to removal from the airlock by LASC personnel. An easily decontaminated plastic or stainless steel table may be dedicated to the airlock, and left in the airlock only to assist LASC personnel in providing clean animal cages and supplies for the lab staff.

7. **Lab Personnel**: lab will have dedicated stainless steel carts for the Suite that will never leave the suite. These carts can be surface decontaminated by soaking thoroughly all 4 sides with 70% ethanol, and also soaking the wheels. After surface decontamination is complete, sterilized carts can be wheeled into the airlock, in order to safely pick up clean cages and animal supplies left by LASC personnel.

G. Waste disposal

1. **Liquid waste:** Waste will be collected into tall plastic bins with lids, these bins will contain concentrated bleach solution to a final concentration of 10%. This decontaminated liquid waste bleach solution should be autoclaved prior to sink disposal with plenty of running water.

2. **Solid waste**: Waste will be collected in double biohazard bags and autoclaved. Autoclave standard cycle is 250°F (121°C) 15psi, for 30 minute cycle.

3. **Autoclave Validation**: Laboratory personnel will check autoclave performance monthly with a biological indicator. Biological indicators consist of ampoules containing heat resistant spores (*Bacillus stearothermophilus*).

4. **Autoclave Logbook**: Every use of the autoclave by Biocontainment Suite laboratory personnel must be recorded in a logbook, indicating the date, type of waste, operator, and result of biological indicator test, if used. Monthly biological indicator tests must also be recorded in the log. OEHS will train staff on proper autoclave use, including logbook entry and validation procedures. OEHS will monitor the autoclave validation throughout the year. After autoclaving sharps boxes, they are placed in the medical waste room on the Xth floor for BUMC Facilities pickup.

5. **Animal Carcasses and Sharps**: Carcasses will be placed in double biohazard bags and autoclaved. Sharps will be collected in an approved Sharps waste container which is puncture-resistant, and the container is autoclaved. All waste is placed in the medical waste room on the Xth floor for incineration pickup by BUMC facilities.

H. Removal of materials from the facility

1. **Research materials**: Research material removed from the facility must be decontaminated by autoclaving or by chemical disinfection. Autoclaving is the preferred mode and should be used for all refuse and labware. Items that cannot be autoclaved must be decontaminated by spraying the surfaces thoroughly with 70% ethanol or 10% bleach.

2. **Secondary containment**: Any samples transported into the lab will be transported only in sealed plastic containers, placed in a durable leak-proof container with a lid and may require a security officer validate the transporter as wearing an authorized select agent color coded ID and may require an escort to a different location if leaving the storage containment area to another building location.

3. **Container Removal**: Any removal of containers from the BSL-3 lab must be surface decontaminated. No live samples may leave the BSL-3 laboratory without prior authorization from OEHS. This includes samples that are transported from the basement storage area to XXX room. Any samples transported from XXX must have two approved personnel completing the transfer, and logbook must indicate this as required. The exterior of the primary containers (tubes) will be sprayed down with 70% ethanol or an OEHS-approved disinfectant prior to removal from the biosafety cabinet. These samples are placed in the secondary container. The container is brought to the airlock where the entire outside and inside is sprayed down with 70% ethanol before removal from the facility.

4. **Equipment Decontamination**: Lab Equipment will be decontaminated by autoclave or surface decontamination before removal from the facility for repair, maintenance, or packaging for transport.

VIII. Emergency Procedures

A. Loose Animal Procedure

In the event that an animal escapes from a micro-isolator cage, the animal will be trapped in the room by the door sweeps and will be caught and euthanized by the Lab personnel. Should the lab personnel need assistance, they should contact LASC for a veterinary manager and notify the Control Center so security can contain the area to prevent further injury. There will be detailed trainings as to how this functions with Security, Control, and the researchers involved.

B. HVAC Failure

In the event of a failure of the HVAC system, the HVAC system will sound an audible alarm indicating failure. Lab personnel are asked to immediately cease all lab work, secure any animals or select agents, and proceed calmly to the locker room, following normal exit procedures. Upon exiting personnel should call the Control Center (4-6666) to report the HVAC failure. There will be detailed trainings as to how this alarm functions with Security, Control, and the researchers involved.

C. Biosafety Cabinet Failure (BSC)

In the event of a failure of the BSC, the BSC alarm will sound an audible alarm.
Lab personnel are instructed to immediately cease all lab work in the Biosafety cabinet, and secure any animals or select agents. There will be detailed trainings as to how this alarm functions with Security, Control, and the researchers involved.

Also, lab personnel may note that when the BSC alarm begins, air will be flowing towards them when sitting in front of the cabinet. This is an excellent physical indicator of an alarm failure. After securing materials, personnel should proceed calmly to the common autoclave room, call the Control Center (4-6666) to alert them of the BSC failure, then proceed to the locker room, following normal exit procedures. There will be detailed trainings as to how this alarm functions with Security, Control, and the researchers involved.

D. Aerosol Chamber Failure

In the event of a failure of the Aerosol Chamber, Lab personnel are asked to immediately cease all lab work. Personnel should secure any animals or select agents, and step into the common corridor. Personnel will be asked to push the yellow "Emergency Exhaust" button next to the emergency exit. This button will activate the exhaust fan to increase their flow rate from 60% to 80% from the lab. Personnel should pick up the emergency phone in the hallway, and call the Control center at (4-6666) to notify them of this failure. Then, if personnel are contaminated, they should identify to Control they need an emergency responder.
The Control Center technician will alert Security staff that an SA incident has occurred, and security staff will follow Select Agent Response Plan as trained and will contact EMS and BFD to assist.

Lab personnel should drop all contaminated PPE (Tyvec suit and outer gloves) in the common hallway next to Lab B door. Personnel should proceed to autoclave room 935, pull decon shower from wall, and with hose in sink, proceed to soak themselves with water and soap provided. Upon completion of this, personnel should step into airlock where emergency responders will be waiting. Emergency responders will assess the situation, and if the person is contaminated, they will be suited in clean Tyvec and brought over to the Menino pavilion for medical treatment. There will be detailed trainings as to how this alarm functions with Security, Control, and the researchers involved.

E. Facility/ Building Failure

For any building related failure, including outside fire alarms, lighting, elevators, and similar, Personnel should call the Control (4-6666) to be alerted to the specifics to determine if they affect the BSL-3 space prior to entering/exiting. If personnel are already in the space and note a building problem, they should call the Control (4-6666) to determine if the problem will or could affect the space. In the case of a fire alarm outside the lab, personnel should follow normal exit procedures and immediately exit the lab and take the nearest stairwell exit.

F. Security Breach

If lab personnel note any discrepancy in the logbook or select agent storage area, they should immediately contact Security at 4-4444. Security will follow the Select Agent Response Plan, and notifying their supervisor immediately. A Security supervisor will be required to contact the OEHS approved staff to report the potential breach. Also if there is an intruder into the space, lab personnel are advised to stay in their laboratory and call Security immediately at 4-4444. There will be detailed trainings as to how this functions with Security, Control, and the

researchers involved. Security monitors will receive a motion detection alarm which will alert security to CCTV monitors and review last card or iris scanner used.

G. Fire in the Suite

An audible alarm will sound in the common hallway and strobe lights will initiate in each individual lab to indicate fire alarm. Lab personnel are asked to immediately cease all lab work and proceed calmly to the locker room. Personnel can then quickly remove all PPE in the airlock and exit the laboratory. In the event that exit way is blocked or the fire danger is great, personnel should exit the nearest exit, through the airlock or the emergency exit. However, personnel should drop all PPE at the exit door or inside the airlock. Upon exiting personnel should proceed down nearest exit stairwell and exit the building. There will be detailed trainings as to how this alarm functions with Security, Control, and the researchers involved.

H. Spills and Accidents

There will be detailed trainings and mock scenarios as to how this functions with Security, Control, and the researchers involved.

1. Disinfectants:

Before beginning work, check to see that a disinfectant solution is on hand and that it has not expired. If there is insufficient quantity then prepare 70% ethanol (preferred) or a 1:10 dilution of bleach containing 5.25% sodium hypochlorite.

2. Spills inside a biological safety cabinet:

a. Step out of lab, Put on a clean protective gown (if necessary) and clean outer gloves.

b. Spray or wipe walls, work surfaces, and equipment with a disinfectant solution.

c. Flood the top work surface tray and the drain pans and catch basins below the work surface with a disinfectant solution and let it stand for 20 minutes.

d. Remove excess disinfectant from the tray by wiping with a sponge or cloth soaked in disinfectant. Drain the tray and wipe the top and underside surfaces with a sponge or cloth soaked in disinfectant. Drain disinfectant from the cabinet base into a leak-proof container and let it stand for an additional 20 minutes before discarding in the sink.

3. Spills outside a biological safety cabinet:

a. Step out of lab room, covering spill with paper towels if able to upon exit.
b. Warn all others present in the BSL-3 not to enter the contaminated area by posting a sign on the lab door.

c. Wait 30 minutes to allow dissipation of aerosols created by the spill. While waiting, call the Lab Director and the OEHS. Retrieve the spill kit and other spill clean-up materials from the common autoclave room.

d. Put on a clean protective gown and double gloves before re-entering lab.
Place Paper towels over spill, and soak with disinfectant. To minimize aerosol formation, avoid pouring disinfectant directly on the spill.
Let stand 20 minutes to allow adequate contact time.

e. Using an autoclave-resistant dust pan and squeegee transfer all contaminated material, including the dust pan and squeegee into a deep autoclave pan and autoclave promptly according to the standard directions.

f. Spray down floor again with disinfectant, and wipe down all surfaces and equipment with disinfectant.

4. Large Spill Response:

a. Step out of lab, immediately press "Emergency Exhaust" button located next to Emergency Exit Door. Drop all contaminated Tyvec and other PPE in hallway outside lab door.

b. Pick up emergency phone call Control (4-6666) to report large spill. Control will follow Security Plan for Select Agents, and will immediately contact the OEHS- approved Safety personnel listed on-call for this area, to respond to the spill clean-up.

c. If personally contaminated, personnel should alert Control during the phone call, they will alert emergency responders to the area as part of the response to the spill. Proceed with Decon procedures as described in Section D-Aerosol Chamber Failure.

d. Exit lab according to same procedures in Section D-Aerosol Chamber Failure.

5. Medical Emergency:

If a worker becomes unconscious in a laboratory, a co-worker must call Control (4-6666) to alert them medical attention is needed. Personnel are asked to drag worker to airlock, or in the case of greater difficulty, drag to the emergency exit door, and cut with scissors the Tyvec gown from the worker in the common hallway. Emergency responders can meet the personnel in the airlock or at the emergency exit doorway to seek medical treatment. The common hallway floors and walls can be decontaminated as necessary after the incident.

*If an unconscious worker will be too difficult for the person to move, Personnel should call Control (4-6666), and wait with the downed worker. Trained emergency responders will be escorted by Security to the lab entrance, and will be able to enter the space with appropriate PPE to remove the unconscious worker. In this case, the space will be decontaminated as necessary after the incident.

6. SOP Manual and Emergency Instructions

A copy of the SOP manual will be kept in the BSL-3 laboratory at all times.
Instructions for responding to spills and emergencies will be posted in the BSL-3 laboratory.
Emergency telephone numbers will be posted in the laboratory and in the common hallway next to the emergency phone.

IX. Maintenance, Cleaning, and Inspection

A. Maintenance

1. **Laboratory Director**: Responsible for ensuring that the class II BII Biosafety cabinets are certified on a yearly basis.

2. **Facilities Management:** Responsible for inspection and maintenance of the ventilation system, including monitoring the condition of HEPA filters on the roof of the building, and checking the eyewash, safety shower, and fire extinguisher annually which are all outside the containment area in 990 hallway. If access to area is required, it will only be with prior approval by OEHS and escorted by OEHS or their designee.

3. **LASC:** Assist laboratory personnel in maintaining rodent health.

4. **OEHS:** Responsible for safety of BSL-3 and training all staff. Safety will require that the Suite be decontaminated on an annual basis for general maintenance. This will include: Certification of the BSCs, Aerosol Chamber, Autoclave, Fire alarm, HVAC alarm, ventilated cage rack system, visual and mechanical checks of the plumbing, walls, and ceilings in the suite.

B. Cleaning/ Disinfection

1. **Laboratory personnel:** Responsible for daily housekeeping activities, including trash removal in rooms. LASC staff will not enter these areas for routine cleaning.

2. **Decontamination**: Work surfaces are decontaminated when work is finished, at the end of every workday, and immediately after any spill of infectious material. Large equipment will have inner and outer surfaces wiped with disinfectant weekly.

3. **Work surfaces:** The biosafety cabinet, glovebox, and aerosol chamber are decontaminated when work with infectious materials is finished.

4. **Sinks**: Sinks are scrubbed down weekly with a disinfectant and then flushed.

5. **Floors**: The floors are wiped down with 10% Bleach solution once each month, and immediately following any aerosol infection experiment. Wet mopping is the only approved method; dry mopping and sweeping are prohibited.

C. Inspections

The Laboratory Supervisor will conduct a daily inspection for general cleanliness, (See attached checklist) and to confirm that all interlocking doors close properly, that all airflow indicators are in the desired range, that the class II biological safety cabinets are operational, and that all mice are contained within their cages.

Any minor deficiencies will be corrected and any major deficiencies will be reported to the Laboratory Director, LASC, OEHS, and/or Facilities Management if needed. The Laboratory Director will conduct a monthly inspection with the Laboratory Supervisor and review the SOP. The Biocontainment Suite laboratories will be decontaminated and opened for inspection by personnel from LASC, OEHS, Facilities Management, IACUC, or the IBC at any time this is requested, within a reasonable amount of time for all parties involved.

List of Appendices (Not included in this document)

Appendix A: Security Plan for Select Agents
Appendix B: Biosafety Plan for Select Agents
Appendix C: Emergency Response Plan for Select Agents
Appendix D: Floor Plan XXX
Appendix E: Medical Surveillance

Note: Appendices A-C are required for the Select Agent Program, and are kept secured in the Office of Environmental Health and Safety due to Security concerns. Appendix E is a Medical Surveillance protocol developed by Occupational and Environmental Medicine for responding to researcher exposure to X bacteria. The security plan should remain with the OEHS manual as it is secure information regarding security for the space.

Appendix 7

High Hazard Material Management (HHMM) Policy

High Hazard Material Management Policy

1.0 Purpose and Applicability

1.1 The purpose of this policy is to define the procedures used to manage the shipping, receiving, and transportation of items determined to be high risk by the Office of Environmental Health and Safety in accordance with Boston University Medical Center (BUMC) policies and procedures and all applicable laws and regulations.

1.2 This policy applies to all items determined to be high risk and to all employees and staff, including those who are visiting users of BUMC facilities and those who are contracted services involved in the shipping, receiving, handling or other use of high hazard materials as described below.

1.3 This policy defines the protocols for the selection of contracted services to be used in the shipping, receiving and transport of high risk materials. It also includes standards for packaging, transporting, delivery routes and the quality controls to be utilized to ensure that these standards are adhered to by all those involved in the management of high hazard materials transport.

2.0 Definitions

2.1 "**High Hazard Materials**" - are a substance or material in a quantity and form that may pose a high level of risk to health, safety or property when received, transported and/or stored. These materials include, but are not limited to, Toxic/Infectious substances (including select agents), radioactive materials, chemicals, compressed gases, and any other materials that BUMC OEHS deems a material that should be managed throughout its transport.

2.2 **"Select Agents"** – Biological agents and toxins that have the potential to pose a threat to public health and safety if used for bioterrorism purposes. The list includes over 70 bacteria, viruses, toxins, rickettsia, and fungi and the program is regulated by the Department of Health and Human Services (DHHS) and Department of Agriculture (USDA) under the Federal Regulation for Select Agents [42 CFR 73.0; 7 CFR 331; 9 CFR 121].

2.3 "**Shipper" –** The shipper is the person who packages the high hazard material and signs the shipper's declaration form. This person is responsible for the material to be classified, identified, packaged, marked and labeled, with all appropriate documentation included with the package.

2.4 "**Transporter**" – The transporter is the individual, operator or contracted service who obtains the package from the shipper, verifies it has been packaged correctly, and carries the package to the receiver

2.5 "**Receiver**" – The receiver, for the purposes of this policy, is the individual who receives the package. This individual is required to have shipping training, and notify the shipper upon receipt of the planned delivery of high hazard material.

2.6 "**Shippers Declaration Form**"- the documentation that a high hazard material will be shipped. These documents will be maintained in accordance with all laws, regulations and BUMC policies including standards for the maintenance of original forms to be maintained by the shipper, the transporter and the receiver.

3.0 Roles and Responsibilities

3.1 **The Office of Environmental Health and Safety (OEHS)** is responsible for the management and oversight of the High Hazard Materials Management program and for ensuring compliance with the procedures outlined within this policy by all employees and staff, visiting users of BUMC facilities and contracted services including associated transporters.

3.2 **The Office of General Services (OGS)**, through its Security Investigations Unit, will initiate, conduct and/or participate in audits and conduct investigations as necessary. OGS, through its Systems and Operations Units, will be responsible for maintaining the security of locations determined to be appropriate for the receiving, shipping and storage of designated materials as well as the screening and examination of vehicles, packages and personnel.

3.3 **The Office of Mail Services** will provide support to OEHS and OGS with the screening/examination of delivered packages, with the staffing of designated locations, and with the management of contracted services.

3.4 **The Office of Purchasing Services** will be responsible for facilitating the selection of contracted service providers who are capable of providing services in accordance with this policy and in compliance with all applicable laws and regulations. The Office of Purchasing Services will select, monitor, manage and discharge all contracted services who are involved in the management and transport of materials determined to be high risk.

3.5 **The Shipper** will be responsible for ensuring that the material being shipped is appropriately packaged including classifying, identifying, marking, labeling and providing appropriate

documentation with the package. The shipper must be trained in accordance with all applicable laws, regulations and BUMC policies including that addresses the type and frequency of training and necessity of additional training should laws, regulations or BUMC policies change at any time.

3.6 **The Transporter** will be required to do the following: to accept, store, load, inspect and deliver packages to an approved location using approved access routes; to report any and all violations of law, regulation or policy; to retain all records; and to have proper shipping training. The inspection of packages includes requirements involving damage to packages, reporting guidelines and immediate communication to the shipper and receiver, public health and regulatory authorities. In addition to these requirements, transport companies may have their own specific safety requirements for high hazard material transport.

4.0 Procedures

4.1 **OEHS and OGS** will determine the best location for the receipt, control, audit, transport, and shipping of all items under this policy. Such location(s) will be operated or provided with oversight by representatives of OEHS and other related user departments. These areas will be routinely audited. Transport to and from this location will be by major routes of travel that immediately border BUMC and are limited to Albany Street, Massachusetts Avenue and the highway/connector system in the rear of BioSquare. (see attached map).

4.2 **OEHS** will train all users of the laws, regulations, polices and requirements involved in the shipping and receiving of materials determined to be high risk and will manage the tightly controlled, pre-approved, scheduling of shipment and delivery times. OEHS will train all users in the approved procedures for the packaging of materials, the approved contracted services to be used in the transport of such materials and the penalties of failing to follow all aspects of this policy.

4.3 **OEHS and OGS** will ensure that all staff involved in the high risk materials shipping / receiving areas will undergo a background clearance check, as appropriate, consistent with the Select Agent law requirements prior to being approved to work in these locations.

4.4 **Packaging standards** will be determined by the appropriate regulatory authorities with all specified package integrity testing complete. These mandated packaging requirements will only be altered in the event that BUMC determines a need to exceed the standard and will only be altered with the approval of all relevant regulatory authorities.

4.5 **Transport of Select Agents** will be done in accordance with all laws and regulations including the immediate notification of the U.S. Department of Health and Human Services, Center for Disease Control and Prevention, prior to being sent, and within 24 hours of receipt. The transport will also include the utilization of appropriate forms and the reporting of registration numbers of all parties involved in shipping, transporting and receiving packages.

4.6 **OEHS, OGS and the Office of Purchasing** will select contractors for the transportation of high risk materials based on criteria including, but not limited to, the following:

4.6.1 Past performance on similar contracts.
4.6.2 Ability to provide services as a single source provider for transport of all materials determined to be high risk.
4.6.3 Ability to provide transport services in accordance with all regulatory standards.
4.6.4 Ability to provide transport services in accordance with all BUMC standards.
4.6.5 Ability to provide staffing that has undergone, and continues to undergo on an annual basis, appropriate background checks.
4.6.6 Ability to provide courier services that may require that a single individual pick up and deliver packages.
4.6.7 Ability to provide GPS tracking of packages or vehicles as determined appropriate.
4.6.8 Ability to provide customized services that require adherence to BUMC determined routes of travel, audit procedures and strictly defined schedules for both pick-ups and deliveries.
4.6.9 Ability to provide an all-inclusive chain of custody document upon delivery of each package.
4.6.10 Ability to provide resources to participate in BUMC audits of services.

4.7 **OEHS** will schedule all deliveries and will track the delivery with the contracted service performing the transportation by means of contractor-provided tracking methods. BUMC will initiate its own tracking methods at its discretion and will determine the type of packaging that the shipper, receiver and transportation company uses, and that it is in compliance with all laws and regulations.

4.8 **Failure to receive** package within the specified time range of delivery will result in an immediate investigation involving the transport contractor, the shipper, BUMC and all applicable regulatory personnel.

4.9 Packages delivered to BUMC will be inspected, verified, documented and transported to the appropriate location within BUMC by OEHS.

5.0 Key References and Resources

U.S. Department of Transportation, 49 CFR Part 171 final rule, 09/14/02
International Air Transport Authority 2004, 45th edition Dangerous Goods Regulations
U.S. Public Health Service (HHS)/ CDC 42 CFR Part 73.0, "Possession, Use & Transfer of Select Agents and Toxins," 12/13/02
Morbidity and Mortality Weekly Report Vol. 1 No. RR-19, "Laboratory Security and Emergency Response Guidance for Laboratories Working with Select Agents 12/06/02

Websites

BUMC, Office of Environmental Health and Safety (OEHS) www.bumc.bu.edu/ehs
BUMC, Office of General Services www.bumc.bu.edu/gs
BUMC, Mail Services www.bu.edu
BUMC, Purchasing www.bumc.bu.edu
U.S. Department of Transportation www.dot.gov
MA Department of Public Health-State Lab Institute www.state.ma.us/dph/sli/htm
International Air Transport Authority www.iata.org
United Parcel Service, Hazardous Materials Support Center www.ups.com
The Centers for Disease Control and Prevention www.cdc.gov
CDC Select Agent Program, Laboratory Registration www.cdc.gov/od/sap
United States Postal Service www.usps.gov
Federal Express, Dangerous Goods Program www.fedex.com
United States Public Health Service www.usphs.gov
USDA Select Agent Program http://www.aphis.usda.gov/vs/ncie/bta.html

Appendix 8

BUMC ICP Table of Contents

INTEGRATED CONTINGENCY PLAN

PREPARED FOR:

BOSTON UNIVERSITY MEDICAL CAMPUS

BOSTON, MASSACHUSETTS

PREPARED BY:

GZA GEOENVIRONMENTAL, INC.

NORWOOD, MASSACHUSETTS

REVISION: APRIL 2003

Section 3.0 – Fire, Explosion, and Spill/Release Prevention

TABLES

FIGURES

Detailed Site Diagrams

APPENDICES

Appendix A EPA's Oil Pollution Prevention Regulations (40 CFR 112)
Appendix B Certification of Substantial Harm Determination Form
Appendix C Spill Incident Report Form
Appendix D Inspection Forms
Appendix E Notice to Fuel Delivery Vendors
Appendix F Hospital Wide Fire Plan
Appendix G Regulatory Cross Reference

Appendix 9

Risk Assessment Reports
September 1, 2004 and
March 23, 2005

The following Appendix consists of 2 parts.

Part 1 is entitled “Summary Report Hazard and Risk Assessment National Emerging Infectious Diseases Laboratories (NEIDL)” and was prepared by RWDI West Inc., September 1, 2004.
Part 2 is entitled “Summary Report Hazard and Risk Assessment National Emerging Infectious Diseases Laboratories (NEIDL)” and was prepared by RWDI West Inc., March 23, 2005.

SUMMARY REPORT
HAZARD AND RISK ASSESSMENT
NATIONAL EMERGING INFECTIOUS DISEASES LABORATORIES (NEIDL)
BOSTON UNIVERSITY MEDICAL CAMPUS
BOSTON, MASSACHUSETTS

Project Number: W04-263

Date: September 1, 2004

Submitted By: RWDI West Inc.

Senior Technical Coordinator - Sarah Arulanandam, M.A.Sc.

Senior Hazard & Risk Specialist - Arthur Springer, M.Sc., P.Eng.

Senior Project Manager - John Alberico, M.Sc.

Project Director - Ian Dowsett, R.E.T.

Submitted to: Boston University Medical School

RWDI West Inc.
Consulting Engineers

CALGARY:
#1800, 840-7th Avenue S.W.
Calgary, Alberta
Canada T2P 3G2
Tel: (403) 232-6771
Fax: (403) 232-6762

VANCOUVER:
222-1628 West First Avenue
Vancouver, B.C.
Canada V6J 1G1
Tel: (604) 730-5688
Fax: (604) 730-2915

Email: info@rwdiwest.com
Website: http://www.rwdiwest.com

Other Locations of RWDI Group Inc.:

- Guelph (519) 823-1311
- Sudbury (705) 523-4535
- Montreal (450) 776-6877
- Windsor (519) 728-2702
- Ottawa (613) 225-5648

U.S. Contacts:

RWDI LLC

- California (909) 793-7080

1. INTRODUCTION

Boston University Medical Campus (BUMC) retained RWDI West Inc. to conduct a risk assessment for the proposed BSL-4 facility at the new National Emerging Infectious Diseases Laboratories (NEIDL) at the BUMC campus.

This report summarizes the results for a screening-level assessment conducted to provide anthrax spore concentration isopleths under a variety of release conditions. Maximum downwind ground-level anthrax spores concentrations were predicted using dispersion modeling techniques following an accidental laboratory release for three conceivable release scenarios to provide an estimate of the maximum possible risk of exposure to these spore concentrations along the path of the dispersing plume.

The following analysis was prepared to support a BUMC review of the public health risk of a "worst-case scenario" at a proposed BSL-4 laboratory. The worst case scenario was defined to include:

- Complete loss of containment systems in the BSL-4 laboratory despite preventative maintenance, testing and HEPA certification programs.

- Impacts to individuals not associated with the Boston-NBL, including nearby residents, workers, inmates, patients and pedestrians. Worker exposure is not part of the public health risk assessment.

- The maximum exposure potential is through the release of aerosolized anthrax spores.

- The entire release from the facility can be assumed to have elapsed over approximately 30 minutes.

Anthrax was selected because of its resistance to environmental factors such as sunlight and lack of humidity, and ease of airborne dissemination.

The primary risk associated with the inhalation exposure to anthrax spores by humans are initial symptoms resembling a common cold (e.g., sore throat, mild fever, muscle aches and malaise), and if untreated progressing to severe breathing problems, shock and death.

The literature regarding exposure levels reference a range of exposure criteria, including:

- US Defense Department estimate of LD_{50} for humans - between 8,000 and 10,000 spores (Reference 2).

- Meselson et. al. reference from a forensic study of the release at Svardlosk – "the dose causing 2% fatalities ... is nine spores" (Reference 2).

The references used in this assessment, including the one noted above, are listed in Section 6 of this report.

2. ASSUMPTIONS

The following assumptions were used in determining the dispersion modeling results for the Maximum Possible Risk (MPR) scenarios.

Source Characterization Assumptions

- Each 15 cc (cubic centimeter) container of purified anthrax (anthrax vial) contains 10 billion spores of which approximately 400,000 respirable particles are available to become and remain airborne.

- This quantity has been selected to coincide with a range finding study previously conducted within the NIH. The study reviewed a laboratory release of anthrax to determine the number of reparable particles generated that became airborne following a laboratory accident involving 1 gram of dry purified anthrax. Under the worst-case scenario, the full 10 billion spores, approximately 1 gram of dry purified anthrax, was presumed to be manipulated in the laboratory and dropped to the floor prior to tightening the cap, allowing the entire contents of the vial to be released to the environment. Based on the simulations by the NIH, it was determined that of 10 Billion anthrax spores only 400,000 spores would become airborne and respirable.

- The breathing rate corresponds to the rate of inhalation for an active person, 30 liters per minute to provide a conservative upper bound on the potential number of inhaled spores (Reference 2, Reference 7).

- Ventilation flow rates from the exhaust stacks were assumed to correspond with 12 air changes per hour (corresponding to an exhaust flow rate of 14,000 cubic feet per minute) for the building BSL-4 Laboratory Space.

Dispersion Modeling Assumptions

- Dispersion modeling was conducted from the top of the building exhaust stack.

- Dispersion modeling of the spores was performed using SLAB, a U.S. EPA-approved dispersion model developed at Lawrence Livermore Laboratories to determine the hazard associated with different release scenarios. The SLAB model is a general purpose dispersion model with additional algorithms capable of handling the dispersion of a dense vapor cloud. Buoyant and neutrally buoyant releases are handled in a manner similar to other Gaussian dispersion models.

- The SLAB model provides concentration versus time information for short duration releases (less than 1 hour). Many other dispersion models regularly used for air quality impact studies operate on a 1 hour time frame; as a result, the information required to estimate the impacts of a short duration transient release are not as readily available. The SLAB model results are used to obtain concentration information for transient releases that does not require modifications to the model itself, since it involves post-processing of the results once the model is run.

- Dispersion modeling was conducted using a range of weather conditions that may be encountered, from sunny, summer windy conditions to calm clear, winter nights (Table 1 summarizes the different weather conditions used in the analyses).

- Dispersion modeling assumed that the spores did not contribute to the plume buoyancy.

- The plume was modeled as room temperature air with trace amounts of contaminant.

- In each release scenario, under the specific meteorological conditions modeled, all of the spores are assumed to travel downwind in the same direction to provide an upper bound or maximum value for the estimated ground level concentration.

Table 1: Description of The Meteorological Conditions Used in Modeling Release Scenarios

Stability Class	Wind Speed		Description
	(m/s)	(km/hr)	
B	2	7.2	Bright sunny afternoons in late spring, summer and early fall. Skies are clear or almost clear and winds are light. Temperatures range from warm to hot.
D	2	7.2	Sunny days in early spring and late fall. Overcast days and evenings with light winds at any time of the year. Hours with rain or snow falling.
D	5	18.0	Partly cloudy to overcast days and nights (anytime of year) with moderate winds. Periods with weak sunshine in early spring and late fall.
D	10	36.0	Strong winds at any time of the day or night, regardless of temperature or cloud cover.
E	3	10.8	Nights with some cloud at any time of the year. Daytime conditions on the coldest days in winter.
F	2	7.2	Cold clear nights in winter or cool clear nights in the rest of the year.

3. RELEASE SCENARIOS

In the release events modeled, the number of spores released is expected to vary over time, decaying exponentially (see Figure 3.1), and extending the time of the release event. In these scenarios, the spore cloud mixes with the surrounding air as the fresh air is brought into laboratory space.

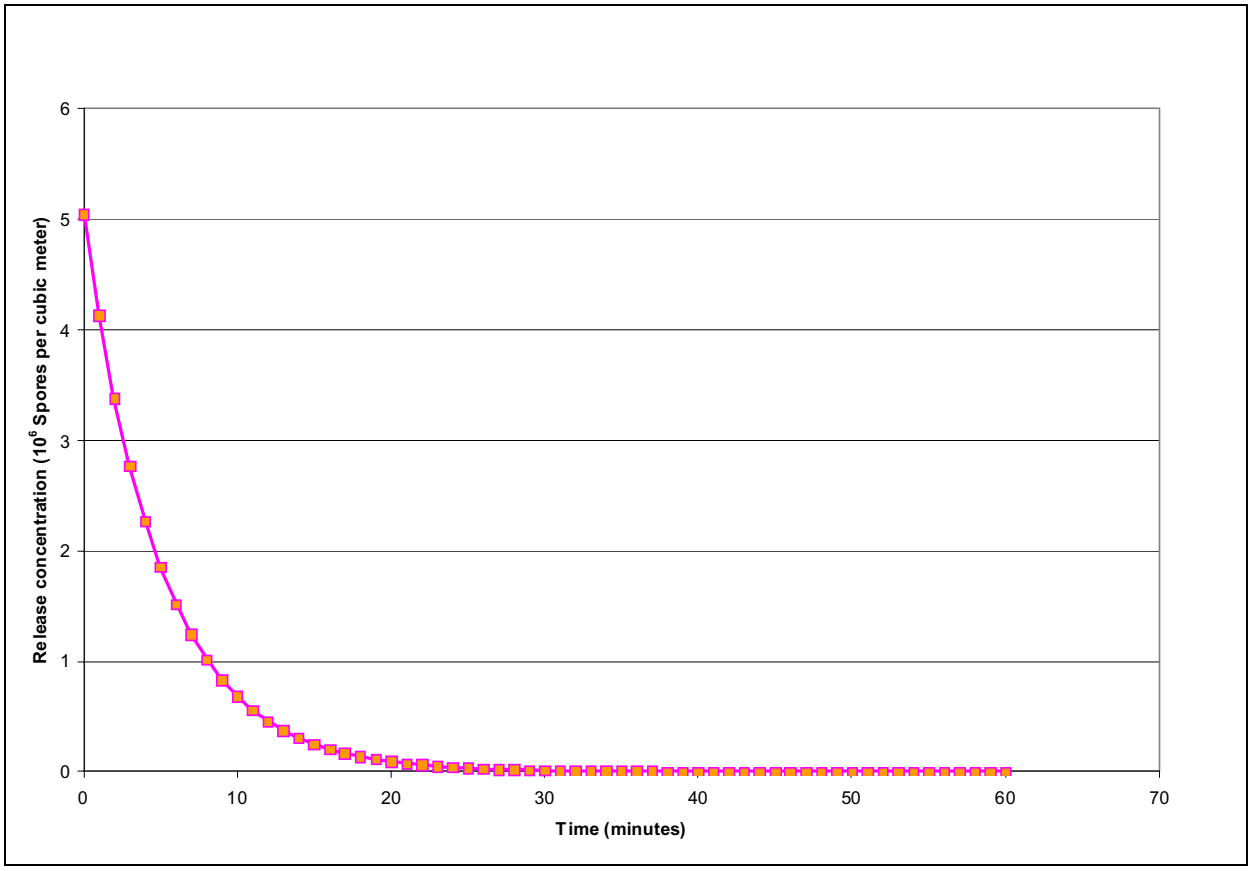

Figure 3.1: The concentration of spores released, varying with time, for a ventilation rate of 12 air changes per hour (corresponding to a ventilation rate of 14,000 cubic feet per minute for the BSL-4 laboratory space).

3.1 Accidental Laboratory Release Scenario - Two HEPA Filters

This scenario simulates an accidental laboratory release where the entire contents of an anthrax vial are released within the BSL-4 Laboratory space in a cloud of spores. Figure 3.2 shows the spore concentration varying with time at a distance downwind of the release where the maximum ground level concentration occurs. The results are considered over the range of weather conditions noted in Table 1.

The calculated maximum number of spores that may be inhaled by an individual standing on the plume centerline at a given downwind distance from the release in this scenario occurs under B stability (wind speed of 2 m/s). For an individual breathing at a rate of 30 litres per minute (the

breathing rate of an active person) for the duration of the release event, the calculated maximum number of spores that may be inhaled is 0.00000000021 spores. Since the release and inhalation of a partial spore is not feasible, this number may be practically considered as zero.

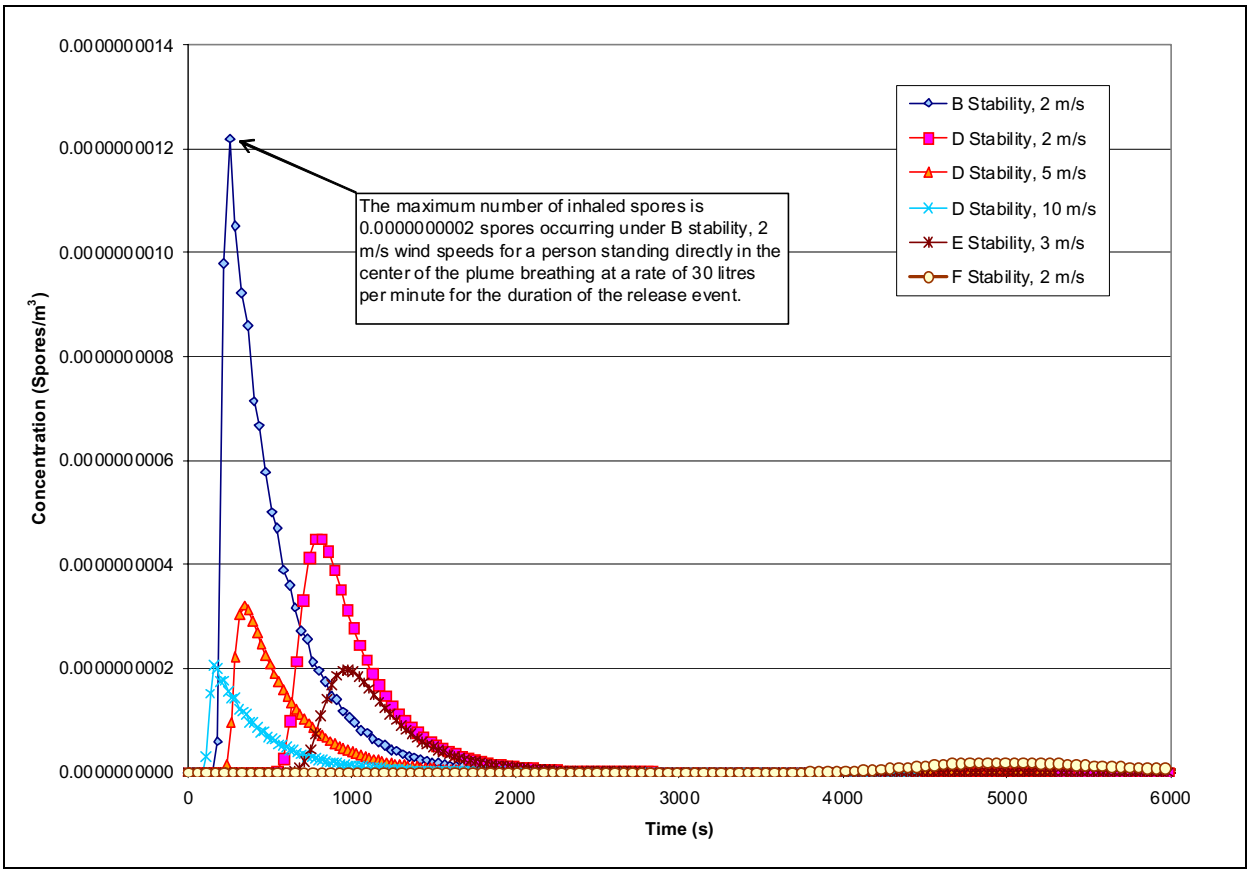

Figure 3.2: Accidental Laboratory Release Scenario: *Maximum* predicted ground-level concentration of spores occurring downwind of a release (with two HEPA Filters in place) shown at the maximum point of impingement for the range of meteorological conditions considered.

3.2 Accidental Laboratory Release Scenario – Single HEPA Filter Malfunction

This scenario simulates an accidental laboratory release where the entire contents of an anthrax vial are released within the BSL-4 Laboratory space in a cloud of spores when only one of the HEPA filters is not functioning. Figure 3.3 shows the spore concentration varying with time at

a distance downwind of the release where the maximum ground level concentration occurs. The results are considered over the range of weather conditions as noted in Table 1.

The calculated maximum number of spores that may be inhaled by an individual standing on the plume centerline at a given downwind distance from the release in this scenario occurs under B stability (wind speed of 2 m/s). For an individual breathing at a rate of 30 litres per minute (the breathing rate of an active person) for the duration of the release event, the calculated maximum number of spores that may be inhaled is 0.0000007 spores. Since the release and inhalation of a partial spore is not feasible, this number may be practically considered as zero.

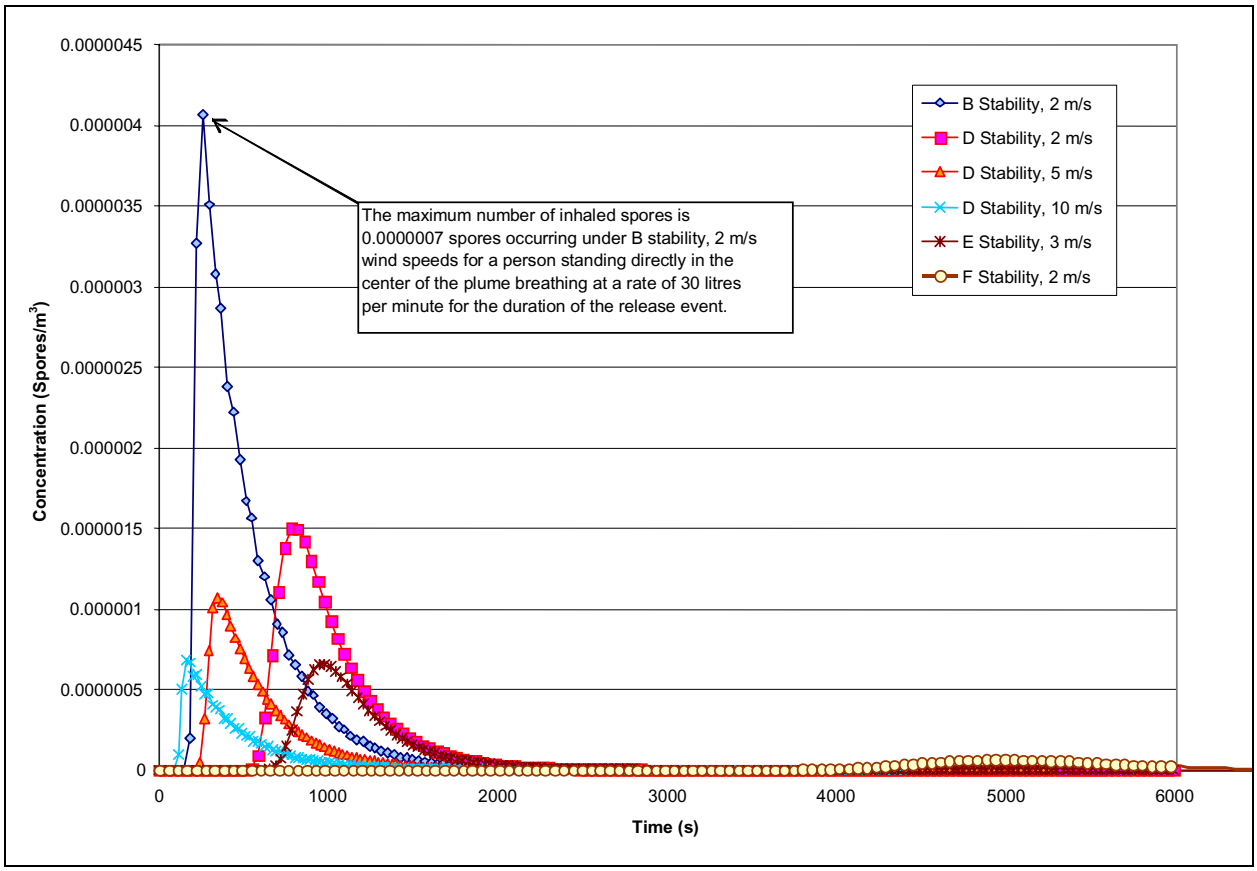

Figure 3.3: Accidental Laboratory Release Scenario – Single HEPA Filter Malfunction: *Maximum* predicted ground-level concentration of spores occurring downwind of a release shown at the maximum point of impingement for the range of meteorological conditions considered.

3.3 Accidental Laboratory Release Scenario – No HEPA Filters

This scenario simulates an accidental laboratory release where the entire contents of an anthrax vial are released within the BSL-4 Laboratory Space in a cloud of spores with neither of the HEPA filters in operation. Figure 3.4 shows the spore concentration varying with time at a distance downwind of the release where the maximum ground level concentration occurs. The results are considered over the range of weather conditions noted in Table 1.

The calculated maximum number of spores that may be inhaled by an individual standing on the plume centerline at a given downwind distance from the release in this scenario occurs under B stability (wind speed of 2 m/s). For an individual breathing at a rate of 30 litres per minute (the breathing rate of an active person) for the duration of the release event, the calculated maximum number of spores that may be inhaled is 0.0024 spores. Since the release and inhalation of a partial spore is not feasible, this number may be practically considered as zero.

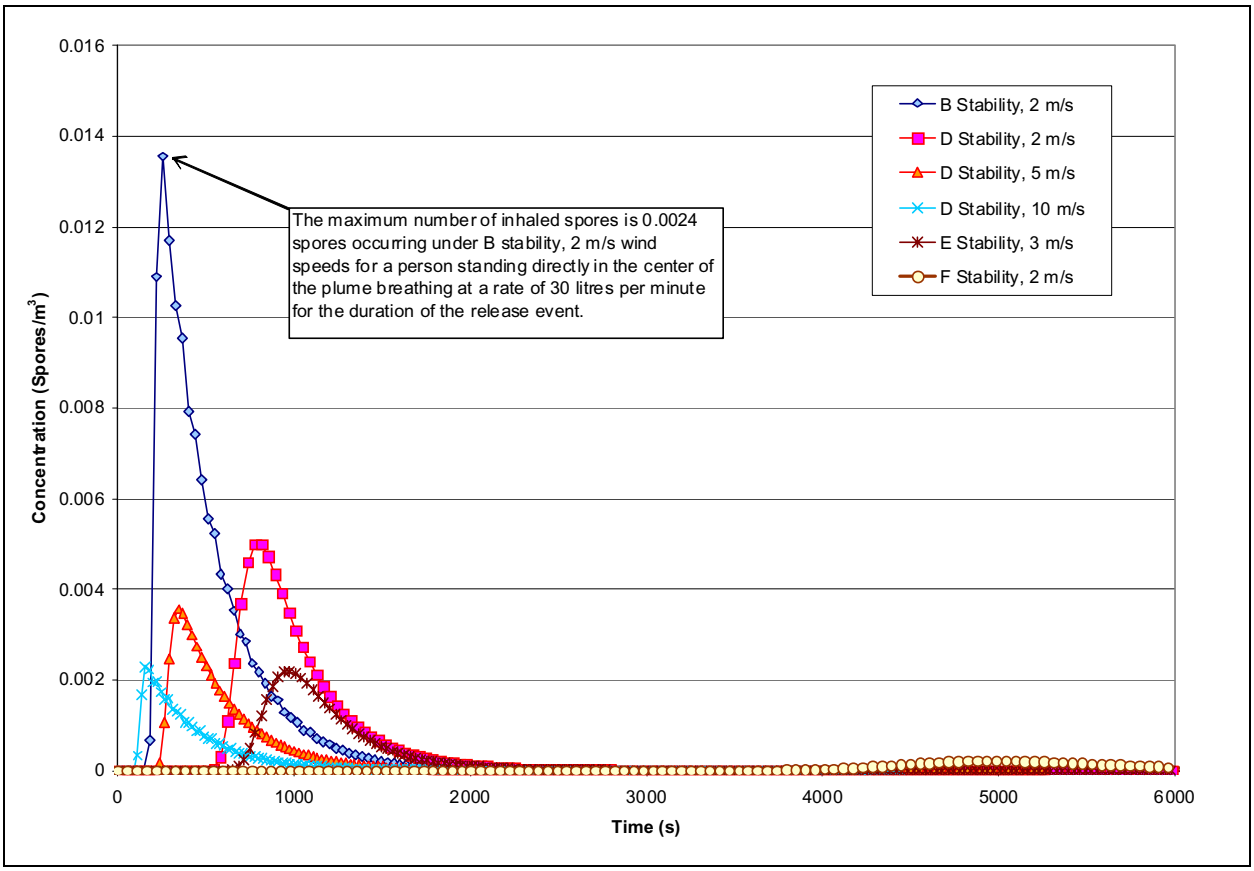

Figure 3.4: Accidental Laboratory Release Scenario – No HEPA Filters: *Maximum* predicted ground-level concentration of spores occurring downwind of a release shown at the maximum point of impingement for the range of meteorological conditions considered.

4. SUMMARY

The results presented in this report summarize preliminary dispersion modeling results describing the maximum downwind ground-level anthrax spore concentrations predicted for three release scenarios. In each case, the calculated maximum number of spores that may be inhaled by an individual standing on the plume centerline downwind from the release is less than a single spore. Since the release and inhalation of a partial spore is not feasible, this number may be practically considered as zero.

5. REFERENCES

1. Emergency response to Anthrax Attack (Lawrence M. Wein, David L. Craft, and Edward H. Kaplan), PNAS, Vol.100, No.7.

2. The Sverdlovsk Anthrax Outbreak of 1979 (M. Meselson et al.), Science, 1994, Vol. 266.

3. Simulation Modeling of Anthrax Spore Dispersion in a Bioterrorism Incident (V. Reshetin and J. Regens), Risk Analysis, Vol. 23, No. 6.

4. Airborne dispersion modeling for outbreak detection (W.Hogan), RODS Conference Presentation.

5. NIH Building 33 Risk Assessment – Executive Summary (NIH Community Liaison Council, November 20, 2003).

6. "User's Manual for SLAB: An Atmospheric Dispersion Model for Denser-Than-Air Releases" (Donald L. Ermak) available through the National Technical Information Services (NTIS).

7. Handbook of Respiration. (D.S. Ditmer and R.M. Grebe, Eds.), Saunders: Philadelphia, 1958. As cited in M. Meselson et.al., Science, 1994, Vol. 266.

SUMMARY REPORT
HAZARD AND RISK ASSESSMENT
NATIONAL EMERGING INFECTIOUS DISEASES LABORATORIES (NEIDL)
BOSTON UNIVERSITY MEDICAL CAMPUS
BOSTON, MASSACHUSETTS

Project Number: W04-263

Date: March 23, 2005

Submitted By: RWDI West Inc.

Senior Technical Coordinator - Sarah Arulanandam, M.A.Sc.

Senior Hazard & Risk Specialist - Arthur Springer, M.Sc., P.Eng.

Senior Project Manager - John Alberico, M.Sc.

Project Director - Ian Dowsett, R.E.T.

Submitted to: Boston University Medical School

RWDI West Inc.
Consulting Engineers
CALGARY:
#1800, 840-7th Avenue S.W.
Calgary, Alberta
Canada T2P 3G2
Tel: (403) 232-6771
Fax: (403) 232-6762
VANCOUVER:
222-1628 West First Avenue
Vancouver, B.C.
Canada V6J 1G1
Tel: (604) 730-5688
Fax: (604) 730-2915
Email: info@rwdiwest.com
Website: http://www.rwdiwest.com

Other Locations of RWDI Group Inc.:
- Guelph (519) 823-1311
- Sudbury (705) 523-4535
- Montreal (450) 776-6877
- Windsor (519) 728-2702
- Ottawa (613) 225-5648

U.S. Contacts:
RWDI LLC
- California (909) 793-7080

TABLE OF CONTENTS

Page No.

1. INTRODUCTION

Boston University Medical Campus (BUMC) retained RWDI AIR Inc. to conduct a risk assessment for the proposed high-containment laboratory facilities at the new National Emerging Infectious Diseases Laboratories (NEIDL) at the BUMC campus.

This report summarizes the results for a second screening-level assessment conducted to provide estimates of the potential maximum number of inhaled anthrax spores under a variety of release conditions. The second screening-level assessment involved the use of more inclusive dispersion modeling techniques that accounted for building downwash. Maximum downwind anthrax spores concentrations were predicted in order to estimate the maximum possible risk of exposure following an accidental laboratory release to these spore concentrations along the path of the dispersing plume from one of the high-containment laboratory exhausts (BSL-3 and BSL-4). The concentrations were predicted using two different dispersion modeling techniques: numerical dispersion modeling using the U.S. EPA ISC-Prime model; and wind tunnel tests on a scale model of the NEIDL and its surroundings.

The following analysis was prepared to support a BUMC review of the public health risk of a "worst-case scenario" at one of the proposed high-containment laboratories within the NEIDL. The worst case scenario was defined to include:

- complete loss of containment systems in one of the high-containment laboratories despite preventative maintenance, testing and HEPA certification programs;

- impacts to individuals not associated with the Boston-NBL, including nearby residents, workers, inmates, patients and pedestrians; worker exposure is not part of the public health risk assessment;

- the maximum exposure potential is through the release of aerosolized anthrax spores;

- the entire release from the facility can be assumed to have elapsed over approximately 30 minutes; and

- the individuals in the path of the plume (the receptors) were assumed to remain in their locations for the duration of the release; no benefit from shelter-in-place or evacuation was included in the analysis.

Anthrax was selected because of its resistance to environmental factors such as sunlight and lack of humidity and ease of airborne dissemination.

The primary risk associated with the inhalation exposure to anthrax spores by humans are initial symptoms resembling a common cold (e.g., sore throat, mild fever, muscle aches and malaise), and if untreated progressing to severe breathing problems, shock and death.

The literature regarding exposure levels reference a range of exposure criteria, including:

- US Defense Department estimate of LD_{50} for humans - between 8,000 and 10,000 spores (Reference 2).

- Meselson et. al. reference from a forensic study of the release at Svardlosk – "the dose causing 2% fatalities ... is nine spores" (Reference 2).

The references used in this assessment, including the one noted above, are listed in Section 5 of this report.

2. ASSUMPTIONS

The following assumptions were used in determining the dispersion modeling results for the Maximum Possible Risk (MPR) scenarios.

Source Characterization Assumptions

- Approximately 400,000 respirable particles are available to be released from the exhaust stack and become airborne.

- The breathing rate corresponds to the rate of inhalation for an active person, 30 liters per minute to provide a conservative upper bound on the potential number of inhaled spores (Reference 2).

- The possible release of anthrax could occur from one of the high-containment laboratories. The wind tunnel tests showed that the highest anthrax concentration would occur for the high-containment laboratory exhaust with the lowest ventilation rate (6,900 cubic feet per minute). This was attributed to the lower exhaust momentum and higher anthrax concentration in the exhaust.

Numerical Dispersion Modeling Assumptions

- Dispersion modeling was conducted from the top of the building exhaust stack.

- Dispersion modeling of the spores was performed using ISC-PRIME, a U.S. EPA recommended dispersion model to determine the downwind concentration (dilution). The use of this model was recommended by the U.S. EPA based on their review of the Draft Environmental Impact Statement for this project in order to account for building downwash.

- Dispersion modeling was conducted using a range of weather conditions that may be encountered, based on historical meteorological data for the Boston area.

- In each release scenario, under the specific meteorological conditions modeled, all of the spores are assumed to travel downwind in the same direction to provide an upper bound or maximum value for the estimated ground level concentration.

Wind Tunnel Modeling Assumptions

- Details regarding wind tunnel modeling approach are provided in Appendix A

Receptors

- Receptor locations were chosen based both on RWDI's experience with exhaust dispersion, and input from BUMC and the building designers for the NEIDL.

- The receptor locations evaluated for this risk assessment included those beyond the NEIDL, specifically air intakes on the existing and future planned BUMC buildings surrounding the NEIDL, and off-site (non-BUMC buildings) such as commercial buildings and residential areas.

- Receptor heights varied from ground-level to rooftop heights for both on-site and off-site locations**.** One receptor was located on a possible rooftop air intake on a future proposed BUMC building to the east of the NEIDL. This rooftop receptor location on a future proposed building was chosen because of its proximity (both vertical distance and horizontal distance) to the potential NEIDL release point and is expected to result in high anthrax concentrations.

- The highest anthrax concentrations due to emissions from the high-containment laboratory exhaust were predicted to occur at a possible rooftop air intake on a future proposed BUMC laboratory building to the east of the NEIDL. The results presented below present the predicted anthrax spore concentration at this receptor only. Anthrax concentrations at all other receptor locations beyond the NEIDL would be less than those reported herein.

3. RELEASE SCENARIOS

In the release events modeled, the number of spores released is expected to vary over time, decaying exponentially, and extending the time of the release event. In these scenarios, the spore cloud mixes with the surrounding air as the fresh air is brought into laboratory space. To provide a conservative upper bound for the analysis, the individual receptors are assumed to remain in place for the duration of the release.

3.1 Accidental Laboratory Release Scenario - Two HEPA Filters

This scenario simulates an accidental laboratory release where the entire contents of an anthrax vial are released within the high-containment laboratory space (with the lowest ventilation rate) in a cloud of spores.

Using the dispersion model ISC-PRIME, for an individual breathing at a rate of 30 litres per minute (the breathing rate of an active person) for the duration of the release event, the calculated maximum number of spores that may be inhaled is 0.0000000361 spores. Since the release and inhalation of a partial spore is not feasible, this number may be practically considered as zero.

Using the wind tunnel, for an individual breathing at a rate of 30 litres per minute (the breathing rate of an active person) for the duration of the release event, the calculated maximum number of spores that may be inhaled is 0.0000000263 spores. Since the release and inhalation of a partial spore is not feasible, this number may be practically considered as zero.

3.2 Accidental Laboratory Release Scenario – Single HEPA Filter Malfunction

This scenario simulates an accidental laboratory release where the entire contents of an anthrax vial are released within the high-containment laboratory space (with the lowest ventilation rate) in a cloud of spores when one of the two HEPA filters is not functioning.

Using the dispersion model ISC-PRIME, for an individual breathing at a rate of 30 litres per minute (the breathing rate of an active person) for the duration of the release event, the calculated maximum number of spores that may be inhaled is 0.0000526 spores. Since the release and inhalation of a partial spore is not feasible, this number may be practically considered as zero.

Using the wind tunnel, for an individual breathing at a rate of 30 litres per minute (the breathing rate of an active person) for the duration of the release event, the calculated maximum number of spores that may be inhaled is 0.0000877383 spores. Since the release and inhalation of a partial spore is not feasible, this number may be practically considered as zero.

3.3 Accidental Laboratory Release Scenario – No HEPA Filters

This scenario simulates an accidental laboratory release where the entire contents of an anthrax vial are released within the high-containment laboratory space (with the lowest ventilation rate) in a cloud of spores with neither of the HEPA filters in operation.

Using the dispersion model ISC-PRIME, for an individual breathing at a rate of 30 litres per minute (the breathing rate of an active person) for the duration of the release event, the calculated maximum number of spores that may be inhaled is 0.1755 spores. Since the release and inhalation of a partial spore is not feasible, this number may be practically considered as zero.

Using the wind tunnel, for an individual breathing at a rate of 30 litres per minute (the breathing rate of an active person) for the duration of the release event, the calculated maximum number of spores that may be inhaled is 0.2925 spores. Since the release and inhalation of a partial spore is not feasible, this number may be practically considered as zero.

4. SUMMARY

The results presented in this report summarize dispersion modeling and wind tunnel modeling results describing the potential maximum downwind ground-level anthrax spore inhalation predicted for three release scenarios. In each case, the calculated maximum number of spores that may be inhaled by an individual standing on the plume centerline downwind from the release is less than a single spore. Since the release and inhalation of a partial spore is not feasible, this number may be practically considered as zero.

5. REFERENCES

1. Emergency response to Anthrax Attack (Lawrence M. Wein, David L. Craft, and Edward H. Kaplan), PNAS, Vol.100, No.7.

2. The Sverdlovsk Anthrax Outbreak of 1979 (M. Meselson et al.), Science, 1994, Vol. 266.

3. Simulation Modeling of Anthrax Spore Dispersion in a Bioterrorism Incident (V. Reshetin and J. Regens), Risk Analysis, Vol. 23, No. 6.

4. Airborne dispersion modeling for outbreak detection (W.Hogan), RODS Conference Presentation.

5. NIH Building 33 Risk Assessment – Executive Summary (NIH Community Liaison Council, November 20, 2003).

6. "User's Manual for SLAB: An Atmospheric Dispersion Model for Denser-Than-Air Releases" (Donald L. Ermak) available through the National Technical Information Services (NTIS).

APPENDIX A

APPENDIX A: Wind Tunnel Model

The larger of RWDI's two wind tunnels was used to measure the impact of emissions from two of the high-containment laboratory exhausts (BSL-3 and BSL-4) on the NEIDL. This tunnel has a cross-section of 16 feet across and 8 feet tall. The wind tunnel was developed to simulate a boundary layer under neutral atmospheric stability. The elements on the floor of the wind tunnel simulate a ground roughness that is designed to represent the buildings and obstructions upwind of the NEIDL. This roughness creates a velocity profile in which the mean wind speeds increase with height until the top of the boundary layer is reached, after which the surface roughness does not play a role. Physical modeling takes into account the effect of building downwash, the complicated building structures, and the layout of the surrounding, and produces what are considered to be the most accurate modeling results available.

A scale model of the proposed NEIDL and surroundings within 800 ft was constructed at a scale of 1:200. This included many Boston University Medical Campus buildings (currently standing and future), and commercial and residential areas. Due to the height of the penitentiary south of the NEIDL, an extension was also added to include this in the model.

The wind tunnel tests were conducted by emitting a tracer gas at a known concentration from a BSL-3 and a BSL-4 exhaust. Each source was tested independently so that the impacts from the different sources could be distinguished. Mean concentrations of tracer gas were measured at receptor locations by drawing samples through flush-mounted tubes leading to a bank of infrared analysers stationed outside the tunnel. Wind tunnel tests were performed over a broad range of wind directions and wind speeds (i.e., up to 24 wind directions in 15° increments and five wind speeds) to ensure that the worst-case (highest) concentrations were captured at the tested receptors. The wind tunnel tests showed that the highest concentrations would occur for the high-containment laboratory exhaust with the lower ventilation rate (6,900 cfm) because of the lower exhaust momentum and higher source concentration of anthrax.

Receptors were installed on the model to represent the NEIDL air intakes, surrounding BUMC building air intakes and pedestrian locations, and off-site locations such as commercial buildings and residential areas. The receptors were chosen based on RWDI's experience with exhaust dispersion, and input from BUMC, and the NEIDL building designers. For the purpose of the risk assessment, only receptors beyond the NEIDL were considered. It was determined that the highest exhaust impacts would occur at a possible rooftop air intake on a future BUMC laboratory building to the east of the NEIDL.

Appendix 10

Supplemental Air Quality Analysis

SUPPLEMENTAL AIR QUALITY ANALYSIS

Prepared for:

Fort Point Associates, Inc.
286 Congress Street, 6th Floor
Boston, MA 02210

Prepared by:

Tech Environmental, Inc.
1601 Trapelo Road
Waltham, Massachusetts 02451

(781) 890-2220

February 16, 2005

EXECUTIVE SUMMARY

Air Quality – General

Air pollutant emissions were calculated for the proposed emergency generators and boilers at the NEIDL. The generator emissions were based on operating two units the maximum allowed 300 hours per year, and the boiler emissions were based on the equipment being required to meet the building's heating and hot water load. The project proponent plans to utilize the Trigen steam plant on Kneeland Street to provide steam to heat the building and provide hot water, with the proposed on-site boilers as backup units.

A range of emissions that the Trigen plant may generate to provide energy to the NEIDL were estimated, with the lowest emission rates assuming natural gas is used by Trigen to generate the steam and the highest emission rates assuming oil as the fuel. The use of Trigen to provide heat and hot water for the NEIDL will likely result in higher emissions than if the project's boilers were used. The additional air pollution emissions that Trigen would generate to provide heat and hot water to the NEIDL building will not result in adverse air quality effects, and these emissions are already accounted for in Trigen's Massachusetts DEP air quality permit.

Air Quality – Building Design

NEIDL will be designed with a redundant mechanical ventilation and HEPA filtration system for treating air prior to its release outside of the laboratory. HEPA filters used at NEIDL will be decontaminated in place following a strict decontamination protocol. The decontamination process will not have any adverse effects on air quality.

During the design process for NEIDL, all possible failure modes of mechanical systems and design components for the building were identified in a procedure similar to a fault-tree analysis. The health and safety protection elements of the laboratory design have built-in redundancies to ensure essentially zero risk of failure for NEIDL safety features.

Other Issues -Cumulative Air Quality Impacts

An air quality dispersion modeling analysis was performed for the proposed generators, boilers, and laboratory vents at the NEIDL in accordance with the U.S. EPA and Massachusetts Department of Environmental Protection (DEP) modeling guidelines. The EPA ISC-PRIME model was used for the analysis with downwash parameters calculated with BPIP-PRM. Modeling of criteria air pollutants from the NEIDL sources, and other interacting sources identified by the Massachusetts DEP, were modeled for locations within one mile of the project. The maximum cumulative air quality effects were added to background concentrations and the total concentrations were compared to the Massachusetts and National Ambient Air Quality Standards (NAAQS). Maximum cumulative 24-hour and annual VOC concentrations were compared to Massachusetts TELs and AALs for existing and proposed sources immediately surrounding the project.

The dispersion modeling results demonstrate that the maximum cumulative concentrations of criteria air pollutants from the proposed boilers and generators, modeled with the existing interactive sources, and with background air pollutant concentrations added, will be safely in compliance with the NAAQS for all of the criteria air pollutants analyzed: nitrogen dioxide (NO_2), sulfur dioxide (SO_2), coarse particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and carbon monoxide (CO). The NAAQS were established to protect public health and welfare, with a margin for safety.

The dispersion modeling results demonstrate that the maximum cumulative concentrations of VOC from the laboratory exhaust stacks, modeled with the existing and proposed laboratories in the BioSquare Research Park, will be safely in compliance with the Massachusetts DEP 24-hour average Threshold Exposure Limits (TELs) and annual average Allowable Ambient Limits (AALs) . The TELs and AALs were established by the Massachusetts DEP as concentrations that an individual source of air pollution should not exceed to protect public health, with a margin for safety.

Other Issues - Environmental Justice

At the suggestion of EPA, a cumulative impact analysis was performed for all DEP-registered sources within one mile of the proposed site, using an EPA refined dispersion model to predict air concentrations for both criteria and non-criteria pollutants at receptors covering the area circumscribed by a 1-mile radius from the site. The large receptor network used for the dispersion modeling covers not only the South End, a portion of which was identified as an environmental justice (EJ) area in the DEIS, but also some of the Roxbury and North Dorchester sections of Boston that are classified by MA DEP as EJ areas.

The results of the dispersion modeling demonstrate that air concentrations from NEIDL operations and construction will be insignificant for all pollutants in the EJ areas of Roxbury and North Dorchester and are also far below the maximum levels that would occur on the site property line. And, even those maximum property line levels are safely in compliance with the NAAQS, TEL, and AAL health criteria. Operation of the NEIDL will not result in adverse human health effects or negative environmental consequences in any of the EJ areas near the proposed NEIDL site. None of the extremely low air concentrations of particulate matter or VOC compounds predicted in the analysis of NEIDL operations and construction would aggravate asthma in persons living near the site. The NEIDL will comply with EPA's policy regarding environmental justice.

AIR QUALITY - GENERAL

The air pollutant emissions associated with the operation of the NEIDL were calculated. The expected design is for the building to obtain energy for heating and hot water from the Trigen (Boston Energy Corporation) Steam Plan located at 165 Kneeland Street, approximately 2 km northeast of the project site. The annual heat and hot water energy load for the building was estimated by Hemisphere Engineering to be approximately 4.89×10^{10} Btu. The annual emissions associated with satisfying the heating and hot water load for the building are shown in Table 1.

Trigen Generated Emissions

The annual energy necessary for Trigen to provide steam to the facility was estimated to be 9.78×10^{10} Btu, twice the building's heating and hot water load value, assuming a 50% net efficiency for creating the steam and transporting the steam to the project.

The Trigen Kneeland Street air quality operating permit was reviewed to determine the allowable emission rates for various air pollutants at the steam plant. Trigen creates steam with four different boilers and may use natural gas or oil to operate the various boilers. The emission rate for Trigen will depend on which boiler and what fuel are used to create the steam. Annual air pollutant emission rates for Trigen are presented in Table 1 as a range, with the lowest emissions associated with the firing of natural gas and the highest emissions associated with oil-firing to create the steam.

On-Site Generated Emissions

The NEIDL is being designed to have 900 Hp and 500 Hp backup gas-fired boilers and three 1,750 kW diesel-fired emergency generators (only two would operate at any given time, with the third as a backup unit). The potential emissions from this on-site equipment were calculated. The boiler emissions for all pollutants were calculated using AP-42 emission factors for gas-firing (Section 1.4) and the emissions from the generators were based on AP-42 Section 3.4 (for SO_2) and vendor

emissions data (for the other criteria air pollutants). The generator and boiler emissions shown in Table 1 are maximum annual amounts that assume the two emergency generators operate the maximum allowable 300 hours per year and that the boilers are required to provide the entire annual building heating and hot water load due to the non-availability of Trigen. Actual annual emissions from the on-site equipment are expected to be much less than what is shown in Table1.

The emissions information in Table 1 show that the use of Trigen for the heating and hot water requirements for the building will result in higher air pollution emissions than if the on-site boilers were used. The primary reasons for this are the net loss of energy that occurs from transporting the steam from the Trigen steam plant to the laboratory and the higher emission rates for the Trigen equipment. The increased air pollutant emissions from Trigen that would result from it supplying the project with steam would not have an adverse air quality impact on any location. The permitting process for a large fuel combustion facility such as Trigen includes detailed air pollution modeling to demonstrate that the facility operating at its maximum potential load will not result in any exceedances of Massachusetts and National Ambient Air Quality Standards (NAAQS) at any location. Cumulative air quality dispersion modeling performed for the NEIDL and interacting sources (including Trigen), described later in this document, confirms that the maximum cumulative air quality effects, from the NEIDL and sources within one mile of the NEIDL, will comply with the NAAQS at all locations near the project.

AIR QUALITY - BUILDING DESIGN

Air Filtration

NEIDL will be designed with a redundant mechanical ventilation and HEPA filtration system for treating air prior to its release outside of the laboratory. NIH design guidelines require that HEPA filters be configured in the ventilation system so that they can be isolated for individual unit testing or decontamination.[1] When one filter is being tested or decontaminated, a second HEPA filter will always be in service to ensure that exhaust air is treated to meet NIH BSL-4 requirements. The ventilation design for the facility includes fail-safe controls so that no contaminated air can bypass both HEPA filters.

The HEPA filters are designed to be resistant to moisture and the low level of solvents present in laboratory exhaust. In compliance with CDC requirements and National Science Foundation (NSF) Standard 49 procedures, all HEPA filters would be tested and certified at least once per year,[2] and if any degradation of the filter is found it will be replaced. CDC requires that the HEPA filter design allow for *in situ* decontamination of the filter prior to removal and/or removal in a sealed container for transport and disposal off-site. HEPA filters used at NEIDL will be decontaminated in place following a strict decontamination protocol. Depending on the exposure history of the unit, decontamination will utilize either hydrogen peroxide gas or formaldehyde gas. The decontamination process is carried out in a sealed room, maintained under negative pressure so that the sterilizing gas does not escape to the environment before it is neutralized. Hydrogen peroxide vapor decontamination of HEPA filters is a relatively quick technique that can be used for BSL-4 laboratory filters. It decomposes to oxygen and water vapor and leaves no residues in the filter. The other decontamination method utilizes formaldehyde gas to sterilize the filter element, followed by neutralization with ammonia vapors. The neutralization process leaves a harmless solid residue of hexamine on the filter, and purging of the decontamination space after neutralization may release small amounts of hexamine into the air. Hexamine is used as an antiseptic and antibacterial agent

[1] National Institute of Health, Office of Research Facilities, "Design Policy and Guidelines, Biomedical Research Laboratories," 2003, page D.22.
[2] Centers for Disease Control, Office of Health and Safety, "Laboratory Biosafety Level Criteria," for a Biosafety Level-4 Laboratory Facility, Requirement 15, November 2000.

and is harmless at the low concentrations that might occur in ventilation air for a short period of time. The selection of the decontamination approach would depend on the microbiological agents that were filtered out by the HEPA filter. No toxic releases will be made to the outside environment from the decontamination room. Following decontamination, the HEPA filter would be sealed in an air-tight container for shipment and disposal off-site.

During the design process for NEIDL, all possible failure modes of mechanical systems and design components for the building were identified in a procedure similar to a fault-tree analysis. The health and safety protection elements of the laboratory design have built-in redundancies to ensure essentially zero risk of failure for NEIDL safety features.

OTHER ISSUES – CUMULATIVE IMPACT

A refined air quality impact analysis was performed to determine the worst-case air quality effects from the proposed National Emerging Infectious Disease Laboratory (NEIDL) at the Boston University Medical Center Campus in Boston. This analysis determined the maximum air concentrations from NEIDL operations alone and the cumulative effects from the NEIDL and other significant sources of air pollution within one mile of the NEIDL (interacting sources were identified by the Massachusetts DEP). The EPA ISC-PRIME model (version 04269) was used for the cumulative air quality impact analysis.

Refined dispersion modeling was performed to predict air concentrations for the criteria air pollutants emitted by the project's emergency generators and backup boilers: nitrogen dioxide (NO_2), sulfur dioxide (SO_2), coarse particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and carbon monoxide (CO). In addition, an air quality impact analysis was performed for volatile organic compounds (VOC) that may be emitted from the NEIDL laboratory exhaust vents. The dispersion modeling followed EPA and Massachusetts Department of Environmental Protection's (DEP) established dispersion modeling analysis procedures.

The air quality impact analysis for the proposed combustion sources at the NEIDL and the interacting sources demonstrates that the air quality effects from the facility will be very small, and the cumulative effects from the facility and the existing interactive sources will be safely in compliance with the Massachusetts and National Ambient Air Quality Standards (NAAQS). The NAAQS were established to protect public health and welfare with an adequate margin for safety. Similarly, the air quality effects of the facility's laboratory stacks will be very small, and the cumulative effects from the facility and other existing and planned laboratories in its immediate vicinity (within the BioSquare Research Park) will be in compliance with the Massachusetts DEP 24-hour average Threshold Exposure Limits (TELs) and annual average Allowable Ambient Limits (AALs) for Ambient Air. The TELs and AALs have been designed by the Massachusetts DEP as concentrations that an individual source of air pollution should not exceed to protect public health with a margin for safety. There are no federal ambient air quality standards for VOC (noncriteria) air pollutants.

Good Engineering Practice (GEP) Stack Height Analysis

The NEIDL generators, boilers and laboratory stacks were conservatively modeled with the minimum design height of ten feet above the main building roof top. Each of these stacks will be subject to aerodynamic building downwash from the NEIDL building and surrounding buildings.

The EPA Building Profile Input Program for ISC-PRIME (BPIP-PRM) (version 04274) was used to calculate the GEP stack height for each of the NEIDL stacks and to calculate the direction-dependent building downwash parameters for these stacks for the ISC-PRIME model. Building downwash was modeled for all of the NEIDL sources. The BPIPPRM analysis included the NEIDL building (including the higher tier on the southwest side of the building roof and the penthouse on the northwest side of the building roof), the existing Evans Research Building, and the proposed BioSquare Research Park Buildings E and G. Other buildings were determined to be too far from the NEIDL and/or too short to influence the NEIDL stacks with downwash. The BPIPPRM summary output files in the Air Quality Appendix show the downwash parameters calculated with BPIPPRM that are required by the ISC-PRIME model to model building downwash effects.

The GEP stack height for each stack was calculated based on the layout of the nearby existing and proposed buildings. The GEP stack height is equal to the height of the controlling structure plus 1.5 times the lesser of the structure's height or projected width.[3] The controlling building for determining the GEP stack height for the NEIDL stacks is the proposed 150-foot tall BioSquare Research Park Building E. The stacks on the NEIDL would have to be built to a height of 375 feet (2.5 x 150-feet) above ground level to be GEP stacks and be unaffected by building downwash.

Following Massachusetts DEP policy, the interacting sources modeled for the cumulative impact analysis for the criteria air pollutants do not include downwash affects. However, downwash was modeled for the interacting VOC sources located in the BioSquare Research Park (Evans Research Building, Building E, and Building G), in the cumulative VOC impact analysis.

[3] U.S. EPA, Guideline for Determination of Good Engineering Practice Stack Height (Revised), EPA-450/4-80-023R, Office of Air Quality Planning and Standards, June 1985, Section 1.1.

Stack Exhaust Parameters and Emission Rates

NEIDL

The exhaust from the two generators was conservatively modeled as coming from one stack. The two boilers were also conservatively modeled as one source. All VOC emissions from the NEIDL were conservatively considered to be emitted from one stack (the radioisotope exhaust). Table 2 shows the stack exhaust parameters for each of the modeled NEIDL stacks.

Criteria Air Pollutant Emissions – The NEIDL proposes to contract with the Trigen steam plant on Kneeland Street to provide steam for heating and hot water. The plans for the NEIDL include two 1,750 kW diesel-fired emergency generators (three units with one dedicated as a standby unit) and two boilers for heating to serve a backup units in the event of a loss of the connection to the Trigen steam plant. Therefore, under normal operations the project's generators and boilers will only be operated a minimal amount for testing purposes. The maximum emission rates for the generators and boilers were used for the modeling of short-term periods (24-hour averages or less). For modeling of annual averages, the modeled criteria air pollutant emission rates were based on the maximum annual usage of 300 hours for each generator and the usage necessary to satisfy the annual building heating and hot water load for the boilers.

Criteria air pollutant emission rates for the two generators, for all criteria air pollutants except SO_2, were based on vendor data for a Caterpillar Model DM4685, 1,750 kW generator. The SO_2 emissions for the generator were based on Table 3.4-1 in AP-42 assuming 0.05% sulfur diesel fuel. Criteria air pollutant emissions for the NEIDL gas-fired boilers were based on Section 1.4 of AP-42. Table 3 shows the short-term and annual emission rates for the NEIDL generators and boilers.

VOC Emissions - The laboratory emissions of VOC from NEIDL will be less than 2,000 pounds per year. To be conservative, the emissions for the laboratory VOC were assumed to be 2,000 pounds divided over a year (0.029 grams/second). This emission rate was applied to both the 24-hour and annual average modeling of VOC. Waste disposal records for existing facilities in the Biosquare Research Park indicates that VOC to be used at the NEIDL will primarily consist of acetone, ethanol

(alcohol), and toluene. To be conservative, the VOC dispersion modeling analysis was performed for each of these VOC, assuming the entire annual emissions were each of the three VOC species (i.e. each of the three VOC were assumed to be emitted at the rate of 0.029 gram/second).

Interacting Sources

Criteria Air Pollutant Emissions - The interacting sources of NO_x, SO_2, PM_{10}, PM_{10}, and CO were modeled with the NEIDL sources to predict cumulative air quality effects. Stack parameters and potential emissions rates for these interacting sources were provided by the Massachusetts DEP.[4] The Massachusetts DEP provided modeling data for all sources (eleven sources) of the modeled air pollutants within one mile of the NEIDL. The potential emission rates modeled represent the maximum allowable emission rates for each source. Table 3 includes a listing of the modeled emission rate for each interacting source. Figure 1 identifies the locations of each of the eleven interacting sources.

VOC Emissions - The surrounding buildings in the BioSquare Research Park, including the existing Evans Research Building and the proposed BioSquare Research Park Buildings E and G were also assumed to have annual laboratory VOC emissions limited to 2,000 pounds per year (0.029 grams/second). This is a conservative approach in that the Massachusetts TELs and AALs, that the VOC modeling results are compared to, are meant to be applied to individual sources and not cumulatively.

Background Air Quality

Existing background concentrations of criteria air pollutants at the NEIDL site were estimated using Massachusetts DEP air monitoring data obtained from the U.S. EPA Air Quality System (AQS) for the most recent, complete three-year period (2001 – 2003).[5] All of the monitoring data, except PM_{10}, are from air monitors located on Harrison Avenue at Dudley Square, approximately one-half

[4] Massachusetts DEP, E-mail correspondence from Boisselle, Robert (DEP) [Robert.Boisselle@state.ma.us], RE: Request for Radius report for Dispersion Modeling, February 4 and 7, 2005.
[5] U.S. EPA, AirData Monitor Values, Internet address: www.epa.gov/air/data.

mile southwest of the site. The PM_{10} background were obtained from a monitor located on Southampton Street, less than one-half mile east of the site. Table 4 summarizes the background air pollutant concentrations determined from the Massachusetts DEP monitoring data. The background concentrations represent the existing impacts from the diverse air pollution sources in the Boston area, including the interacting source that are included in the modeling analysis.

Dispersion Modeling Results

Dispersion Model and Meteorological Data

Refined dispersion modeling was performed with the EPA ISC-PRIME model (version 04269). Five years (1995-1999) of hourly meteorological data were used for the analysis. The hourly meteorological data were processed with the PCRAMMET program, utilizing hourly surface meteorological data from Logan Airport and twice-daily mixing height data from Chatham, Massachusetts. Summary output files from the ISC-PRIME model are included in the Air Quality Appendix. The urban land use option was selected in the ISC-PRIME model.

The ISC-PRIME model was chosen to perform the refined modeling because the PRIME downwash computer code that is incorporated in ISC-PRIME is considered to be a significant improvement to the downwash algorithms that are in the ISCST3 model. Another advantage of the ISC-PRIME model is that it allows predictions of pollutant concentrations within the downwash cavities of structures that may affect the stack. The refined dispersion modeling included the direction-dependent structure dimensions for downwash modeling of the NEIDL sources, calculated with the BPIPPRM.

Model Receptor Network

A receptor grid containing 601 receptors was used for the dispersion modeling analysis. This grid only included locations available to the general public, i.e., locations outside the secure perimeter surrounding the NEIDL, made up of the following:

- A polar receptor grid of 576 receptors, at ten degree intervals, with 100 meter spacing at distances between 100 and 1,600 meters from the center of the NEIDL. These receptors are shown in Figure 1. Flagpole heights were set equal to zero (ground level) for these receptors.

- Ten of the receptors included in RWDI's wind tunnel analysis of the NEIDL. These are the ten receptors that are located outside the secure perimeter. These receptor are shown but not identified in Figure 2. These receptors used flagpole heights provided by RWDI.

- Fifteen receptors at 50 meter spacing along the secure perimeter surrounding the project. These receptor are shown but not identified in Figure 2. Flagpole heights were set equal to zero (ground level) for these receptors.

All receptor elevations were conservatively determined from digital US Geological Survey (USGS) maps (30-meter DEM files) by taking the highest elevation within a rectangle around each receptor whose sides equal the receptor spacing.

Modeling Results

The dispersion modeling of criteria and VOC air pollutants demonstrates that the NEIDL will not have an adverse effect on air quality.

Criteria Air Pollutants - The maximum cumulative concentrations of criteria air pollutants are shown in Table 5. The maximum cumulative concentrations, including background levels for all pollutants and averaging periods, are predicted to be safely in compliance with the NAAQS. For CO, the maximum air quality effects are a result of the NEIDL. Table 6 shows the maximum predicted air quality effects from the NEIDL alone. These air concentrations are much lower than the cumulative values and show that the NEIDL will have a very small effect on air quality. Generally, the maximum predicted air concentrations for the criteria air pollutants occurred 500

meters and farther from the NEIDL; while the maximum predicted NEIDL effects occurred within 100 meters of the facility (see Figures 3 and 4).

VOC - The maximum cumulative VOC concentrations are shown in Table 7. In a conservative approach, the entire VOC emissions for the NEIDL were modeled as acetone, ethanol, and toluene. Interacting sources include the existing Evans Research Center and the proposed BioSquare Research Park Laboratory Buildings E and G in the immediate vicinity of the NEIDL. Table 7 shows that the maximum cumulative concentrations for these pollutants are safely in compliance with the Massachusetts TELs (24-hour averages) and AALs (annual averages). Table 8 shows the maximum predicted VOC levels for the NEIDL alone. These values are lower than the cumulative effects and are safely in compliance with the TELs and AALs for the modeled VOC. The maximum cumulative and NEIDL VOC concentrations occurred within 100 meters of the NEIDL (see Figures 3 and 4).

OTHER ISSUES – ENVIRONMENTAL JUSTICE

According to U.S. EPA regulations[6], environmental justice (EJ) means:

- The fair treatment of people of all races, cultures and incomes with respect to the development, implementation and enforcement of environmental laws, regulations, programs and policies;
- That no racial, ethnic or socioeconomic group should bear a disproportionate share of the ***negative environmental consequences*** [emphasis added] resulting from the operation of industrial, municipal and commercial enterprises and from the execution of federal, state and local programs and policies; and
- That communities, private industries, local governments, states, tribes, federal government, grass roots organizations and individuals act responsibly and ensure environmental protection to all communities.

U.S. EPA has two goals[7] in regards to environmental justice:

1. EPA's first goal is to ensure that no segment of the population, regardless of race, color, national origin, or income, suffers disproportionately from ***adverse human health or environmental effects*** [emphasis added] as a result of EPA's policies, programs and activities.
2. EPA's second goal is to ensure that those who must live with environmental decision must have every opportunity for public participation in the making of those decisions.

Ensuring that a new facility complies with EPA's policy regarding environmental justice begins with identifying what, if any, "adverse human health effects" or "negative environmental consequences" the proposed project may have on the surrounding community. At the suggestion of EPA, a cumulative impact analysis was performed for all DEP-registered sources within one mile of the proposed site, using an EPA refined dispersion model to predict air concentrations for both criteria and non-criteria pollutants at receptors covering the area circumscribed by a 1-mile radius from the site. Details of the cumulative impact modeling are given in the previous section. The large receptor network covers not only the South End, a portion of which was identified as an EJ area in the DEIS, but also some of the Roxbury and North Dorchester sections of Boston that are classified by Massachusetts DEP as EJ areas.

[6] 58 Federal Register 63955, December 3, 1993.
[7] U.S. EPA, Draft Environmental Justice Strategy for Executive Order 12898, January 1995.

Maximum air concentrations for NEIDL operations occur at locations on or immediately adjacent to the NEIDL property line (see Figure 2). None of these highest concentrations occur in any EJ residential area. These maximum concentrations are presented in Tables 9 and 10 alongside the highest predicted levels from NEIDL in the EJ areas of Roxbury and North Dorchester. EPA thresholds for insignificant effects are also presented for comparison.[8]

The results in Tables 9 and 10 demonstrate that air concentrations from NEIDL operations are insignificant for all pollutants in the EJ areas of Roxbury and North Dorchester and are also far below the maximum levels that would occur on the site property line. And, even those maximum property line levels are safely in compliance with the NAAQS, TEL and AAL health criteria, as documented in Tables 5 through 8. EPA established the NAAQS to protect public health and welfare against all know adverse effects (including aggravation of asthma) with a margin of safety. Similarly, the Massachusetts DEP set the TEL and AAL guidelines to ensure insignificant health risk for all known effects with a margin of safety for non-criteria pollutants. Thus, there are no adverse human health effects or negative environmental consequences in any of the EJ areas near the proposed NEIDL site. In addition, Figures 3 and 4 show that the highest air pollution effects of NEIDL operations occur in institutional and commercial areas of the South End, and there is no disproportionate share of either the singular effects from the NEIDL project or the cumulative effects from all sources on EJ residential areas within one mile of the site.

A separate air quality modeling analysis was performed for site construction. During construction, temporary emissions will occur from construction vehicles on the site and earth-moving activities. The peak for these emissions will be in the excavation phase when four heavy-duty vehicles will be working on the site. In accordance with Massachusetts regulations, construction operations will be conducted in a manner not to cause a condition of air pollution, and mitigation measures will be implemented to control fugitive dust, including wet suppression of exposed areas, periodic street cleaning near the site entrances, secure covers on all dump trucks, and fencing around the site. Using the EPA MOBILE and SCREEN3 models, total particulate matter (PM_{10}) concentrations from

[8] For the three VOC compounds, the significance threshold is assumed to be 1/100 of the Massachusetts DEP TEL or AAL health criteria. Since those DEP criteria themselves represent insignificant health risk, the significance threshold used in this EJ analysis is very conservative.

diesel exhaust and earth-moving operations were predicted for receptors on the site and in the nearest residential area to the north (East Canton Street), which is part of the South End EJ area.

Maximum predicted 24-hour PM_{10} levels from construction activity are 19 $\mu g/m^3$ at the site property line and 12 $\mu g/m^3$ at the nearest residence in the nearest EJ area. Adding in a conservative PM_{10} background level of 43 $\mu g/m^3$ (see Table 3), the total concentrations of 62 and 55 $\mu g/m^3$ at the two receptors are safely in compliance with the NAAQS for PM_{10}. If the same emissions are conservatively assumed to be $PM_{2.5}$, the modeling results plus a conservative $PM_{2.5}$ background level of 33 $\mu g/m^3$ (see Table 3) yields total $PM_{2.5}$ concentrations of 52 and 45 $\mu g/m^3$ at the two receptors, and those results are safely in compliance with the NAAQS for $PM_{2.5}$. Results from a refined modeling analysis would be still lower. Since construction emissions are released near ground level, air quality effects occur very close to the site and there would be insignificant effects in other EJ areas (Roxbury and North Dorchester) that are about a mile away. Since EPA established the Particulate Matter NAAQS to protect public health and welfare against all know adverse effects with a margin of safety, including "increased respiratory symptoms for persons with asthma,"[9] there are no adverse human health effects (including aggravation of asthma) or negative environmental consequences in EJ areas near the proposed NEIDL site from project construction. To further ensure protection of public health, the proponent will investigate the feasibility of implementing the Massachusetts Diesel Retrofit Program in the bidding specifications for the construction of the project.

Asthma is a chronic respiratory disease with no known cure. While the cause is unknown in most cases, a past family history of asthma increases the chances of an individual having the disease.[10] Viral infections are the leading cause of acute asthma attacks, followed by exposure to indoor allergens and irritants.[11] Exposure to high levels of industrial chemicals, perfume or gasoline fumes can also trigger an asthma attack, i.e. aggravate asthma. None of the extremely low air concentrations of particulate matter or VOC compounds predicted in the analysis of NEIDL operations and construction would aggravate asthma in persons living near the site. As shown

[9] EPA, "National Ambient Air Quality Standards for Particulate Matter," 61 Federal Register 65638, December 13, 1996.
[10] Centers for Disease Control, National Center for Environmental Health, "Basic Facts About Asthma," October 2003.
[11] EPA, "Asthma Frequent Questions," http://env1.kangwon.ac.kr/project/sdwr2004/litsurv/intwebsites/epa-ost/www.epa.gov/asthma/introduction.html

above, all project effects are insignificant and/or are safely in compliance with EPA and DEP air quality standards and guidelines established to protect public health, including persons with asthma, with a margin of safety.

TABLE 1

SUMMARY OF AIR POLLUTANT EMISSIONS RELATED TO ENERGY USE AT THE PROPOSED NEIDL (TONS/YEAR)

Air Pollutant	Trigen Steam Plant Heating Emissions	On-Site Boiler Heating Emissions	On-Site Emergency Generator Emissions
NO_x	9.8 to 13.7	0.8	15.6
CO	7.3 to 7.8	2.1	0.3
SO_2	0.3 to 58.7	< 0.1	0.3
PM_{10}	0.5 to 5.9	0.2	0.1
$PM_{2.5}$	0.5 to 5.7	0.2	0.1
VOC	0.3	0.1	0.5

Trigen (Kneeland Street) emissions are presented as a range; with the lower emission values associated with gas-firing and the higher emission values associated with oil-firing. Trigen emissions are based on the NEIDL's expected annual building heating and hot water load with a 50% efficiency factor.

On-site boiler emissions are calculated based on the assumption that they satisfy the same annual heat and hot water load as the Trigen Steam Plant.

On-site generator emissions are calculated based on two 1,750 kilowatt units, each operating for 300 hours per year, assuming diesel fuel with 0.05% sulfur.

TABLE 2

MODELED STACK PARAMETERS FOR NEIDL SOURCES

Stack Parameter	Generators	Boilers	Laboratory
Stack Height Above Ground Level	121 feet (36.9 m)	121 feet (36.9m)	121 feet (36.9m)
Stack Exit Diameter	17 inches (0.43 m)	28 inches (0.71 m)	7.5 inches (0.19 m)
Stack Velocity	145.7 ft/s (44.4 m/s)	49.2 ft/s (15 m/s)	65.2 ft/s (19.9 m/s)
Stack Temperature	800 ^{o}F (700 ^{o}K)	170 ^{o}F (350 ^{o}K)	77 ^{o}F (298.2 ^{o}K)

The emissions from the two generators were conservatively modeled as being emitted from one stack.

The emissions from the two boilers were conservatively modeled as being emitted from one stack.

All of the VOC emissions from laboratory operations were conservatively assumed to be emitted from the radioisotope area exhaust stack.

All stack heights are conservatively modeled at the minimum design height of 10 feet above the main roof height.

TABLE 3

EMISSION RATES FOR THE AIR QUALITY DISPERSION MODELING OF CRITERIA AIR POLLUTANTS (GRAMS/SECOND)

Source	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
NEIDL GENERATORS	0.25/NA	NA/0.45	0.26/0.009	0.11/0.004	0.09/0.003
NEIDL BOILERS	0.67/NA	NA/0.023	0.005/0.0004	0.06/0.005	0.06/0.005
NEW ENGLAND MEDICAL CENTER HOSPITAL	4.23	6.31	1.27	1.35	1.35
FIRST CHURCH OF CHRIST SCIENTIST	1.70	5.99	0.60	0.49	0.49
BOSTON UNIVERSITY MEDICAL CAMPUS	0.35	0.83	0.03	0.03	0.03
BOSTON MEDICAL CENTRE	0.35	1.58	0.29	0.12	0.12
BHA LENOX STREET	0.12	0.46	1.73	0.12	0.12
BHA CAMDEN STREET	0.20	0.26	0.00	0.00	0.00
BOSTON WATER AND SEWER COMMISSION	0.09	13.82	0.17	0.17	0.17
MORGAN SERVICES INC	0.17	0.29	0.00	0.03	0.03
MBTA ALBANY STREET BUS GARAGE	0.26	1.07	0.63	0.09	0.09
PERKIN ELMER LIFE SCIENCES INC	Zero	1.15	0.03	0.00	0.00
TRIGEN STEAM PLANT	59.28	93.23	138.75	27.21	27.21

NA = Not Applicable

Emission rates shown for the NEIDL boilers and generators are for short-term (24-hour average or shorter) and annual air quality impact modeling. The short-term emission rates, shown first, are the expected emission rate for the equipment operating at 100% load; while the annual emission rates are the expected annual emissions divided over the year. The annual emissions for the generators are based on the 300 hours annual limit for these units; while the annual emissions for the boilers were based on meeting the expected annual heating and hot water load for the building. The emissions rates for the other (interactive) sources are potential emission rates provided by the Massachusetts DEP and were assumed to be representative of short-term and annual periods.

The PM_{10} emission rates for the interactive sources were conservatively assumed to equal the PM_{10} emission rates provided by the DEP

TABLE 4

MONITORED BACKGROUND CRITERIA AIR POLLUTANT VALUES USED FOR THE AIR QUALITY IMPACT ANALYSIS ($\mu g/m^3$)

Pollutant, Averaging Period	DEP Monitor Location	Background Value ($\mu g/m^3$)
CO, 1-hour	Harrison Avenue, Boston	5,635
CO, 8-hour	Harrison Avenue, Boston	3,220
NO_2, Annual	Harrison Avenue, Boston	47
PM_{10}, 24-hour	115 Southampton St., Boston	43
PM_{10}, Annual	115 Southampton St., Boston	23
$PM_{2.5}$, 24-hour	Harrison Avenue, Boston	33
$PM_{2.5}$, Annual	Harrison Avenue, Boston	12.5
SO_2, 3-hour	Harrison Avenue, Boston	107.4
SO_2, 24-hour	Harrison Avenue, Boston	62.9
SO_2, Annual	Harrison Avenue, Boston	18.3

Source: EPA, http://www.epa.gov/air/data.

Annual averages are highest measured during the most recent three-year period for which data are available (2001 - 2003). Values for periods of 24-hours or less are highest, second-highest over the three-year period unless otherwise noted.

The 24-hour PM_{10} background value is the 3-year average of the 99th percentile values, the 24-hour $PM_{2.5}$ background value is the 3-year average of the 98th percentile values, the annual $PM_{2.5}$ background value is the 3-year averages of the annual values – these are the values used to determine compliance with the NAAQS for these air pollutants.

TABLE 5

SUMMARY OF MAXIMUM ISC-PRIME PREDICTED CRITERIA AIR POLLUTANT CONCENTRATIONS

CUMULATIVE EFFECTS – ALL SOURCES

Pollutant	Averaging Period	Maximum Cumulative Effect ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Cumulative Effect ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2	Annual	47.6	47.0	94.6	100
SO_2	3-Hour	178.4	107.4	285.8	1,300
	24-Hour	95.3	62.9	158.2	365
	Annual	11.2	18.3	29.5	80
PM_{10}	24-Hour	21.9	43.0	64.9	150
	Annual	2.2	23.0	25.2	50
$PM_{2.5}$	24-Hour	21.9	33.0	54.9	65
	Annual	2.2	12.5	14.7	15
CO	1-Hour	175.0	5,635	5,810.0	40,000
	8-Hour	88.1	3,220	3,308.1	10,000

Maximum predicted 3-hour and 24-hour average SO_2 concentrations, and 1-hour and 8-hour average CO concentrations are the highest, second-highest concentrations predicted from the five-year period (1995 – 1999). Maximum predicted 24-hour average PM_{10} and $PM_{2.5}$ concentrations are conservatively chosen as the highest concentrations from the five-year period. Maximum predicted annual concentrations of NO_2, SO_2, PM_{10}, and $PM_{2.5}$ are the highest annual average concentrations from the five-year period. ISC-PRIME model output summaries are included in the Air Quality Appendix.

The maximum predicted cumulative criteria air pollutant effects were predicted to occur more than 500 meters from the NEIDL, except for CO whose maximum predicted impact occurred on the secure perimeter line (see Figure 3).

The total impact for NO_2 includes a NO_x to NO_2 conversion factor of 0.75 (75%).

Background concentrations are summarized in Table 4.

TABLE 6

SUMMARY OF MAXIMUM ISC-PRIME PREDICTED CRITERIA AIR POLLUTANT CONCENTRATIONS

NEIDL EFFECTS

Pollutant	Averaging Period	Maximum NEIDL Effect ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total NEIDL Effect ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2	Annual	2.5	47.0	49.5	100
SO_2	3-Hour	15.1	107.4	122.5	1,300
	24-Hour	10.2	62.9	73.1	365
	Annual	0.1	18.3	18.4	80
PM_{10}	24-Hour	7.5	43.0	50.5	150
	Annual	0.1	23.0	23.1	50
$PM_{2.5}$	24-Hour	6.7	33.0	39.7	65
	Annual	0.1	12.5	12.6	15
CO	1-Hour	175.0	5,635	5,810.0	40,000
	8-Hour	88.1	3,220	3,308.1	10,000

Maximum predicted 3-hour and 24-hour average SO_2 concentrations, and 1-hour and 8-hour average CO concentrations are the highest, second-highest concentrations predicted from the five-year period (1995 – 1999). Maximum predicted 24-hour average PM_{10} and $PM_{2.5}$ concentrations are conservatively chosen as the highest concentrations from the five-year period. Maximum predicted annual concentrations of NO_2, SO_2, PM_{10}, and $PM_{2.5}$ are the highest annual average concentrations from the five-year period. ISC-PRIME model output summaries are included in the Air Quality Appendix.

The maximum predicted NEIDL criteria air pollutant effects were predicted to occur either on the secured perimeter line or the 100-meter polar receptor ring (see Figure 4).

The total impact for NO_2 includes a NO_x to NO_2 conversion factor of 0.75 (75%).

Background concentrations are summarized in Table 4.

TABLE 7

SUMMARY OF MAXIMUM ISC-PRIME PREDICTED VOC CONCENTRATIONS

CUMULATIVE EFFECTS – ALL SOURCES

VOC	Maximum 24-Hour Cumulative Effect ($\mu g/m^3$)	Massachusetts 24-Hour TEL ($\mu g/m^3$)	Maximum Annual Cumulative Effect ($\mu g/m^3$)	Massachusetts Annual AAL ($\mu g/m^3$)
Acetone	10.5	160.5	2.4	160.5
Ethanol	10.5	51.2	2.4	51.2
Toluene	10.5	80	2.4	20

Modeling conservatively assumes that the NEIDL will emit 2,000 pounds of VOC per year and that all of it is either acetone, ethanol, or toluene.

Cumulative effects include effects from the existing Evans Research Building and the proposed Buildings E and G, at BioSquare Research Park, each emitting 2,000 pounds of VOC as acetone, ethanol, or toluene in a year.

The maximum predicted cumulative VOC concentrations are predicted to occur on the security perimeter line or the 100-meter polar receptor ring (see Figure 3).

TABLE 8

SUMMARY OF MAXIMUM ISC-PRIME PREDICTED VOC CONCENTRATIONS

NEIDL EFFECTS

VOC	Maximum 24-Hour NEIDL Effect ($\mu g/m^3$)	Massachusetts 24-Hour TEL ($\mu g/m^3$)	Maximum Annual NEIDL Effect ($\mu g/m^3$)	Massachusetts Annual AAL ($\mu g/m^3$)
Acetone	4.4	160.5	0.8	160.5
Ethanol	4.4	51.2	0.8	51.2
Toluene	4.4	80	0.8	20

Modeling conservatively assumes that the NEIDL will emit 2,000 pounds of VOC per year and that all of it is either acetone, ethanol, or toluene.

The maximum predicted VOC concentrations for the NEIDL alone are predicted to occur on the security perimeter line (see Figure 4).

TABLE 9

COMPARISON OF MAXIMUM ISC-PRIME PREDICTED NEIDL AIR CONCENTRATIONS FOR CRITERIA POLLUTANTS IN EJ AREAS TO MAXIMUM LEVELS ALONG SITE PROPERTY LINE

Pollutant	Averaging Period	In the Roxbury EJ Area ($\mu g/m^3$)	In the North Dorchester EJ Area ($\mu g/m^3$)	In the South End – Site Property Line ($\mu g/m^3$)	Insignificant Threshold ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2	Annual	0.2	0.2	2.5	1.0	100
SO_2	3-Hour 24-Hour Annual	1.3 0.2 0.0005	0.7 0.2 0.0004	15.1 10.2 0.1	25 5 1	1,300 365 80
PM_{10}	24-Hour Annual	0.3 0.0004	0.1 0.0004	7.5 0.1	5 1	150 50
$PM_{2.5}$	24-Hour Annual	0.2 0.0004	0.1 0.0004	6.7 0.1	5 1	65 15
CO	1-Hour 8-Hour	9 2	5 1	175 88	2,000 500	40,000 10,000

TABLE 10

COMPARISON OF MAXIMUM ISC-PRIME PREDICTED NEIDL AIR CONCENTRATIONS FOR VOC COMPOUNDS IN EJ AREAS TO MAXIMUM LEVELS ALONG SITE PROPERTY LINE

Pollutant	Averaging Period	In the Roxbury EJ Area ($\mu g/m^3$)	In the North Dorchester EJ Area ($\mu g/m^3$)	In the South End – Site Property Line ($\mu g/m^3$)	Insignificant Threshold ($\mu g/m^3$)	TEL or AAL ($\mu g/m^3$)
Acetone	24-Hour Annual	0.03 0.001	0.02 0.0007	4.4 0.8	1.6 1.6	160.5 160.5
Ethanol	24-Hour Annual	0.03 0.001	0.02 0.0007	4.4 0.8	0.5 0.5	51.2 51.2
Toluene	24-Hour Annual	0.03 0.001	0.02 0.007	4.4 0.8	0.8 0.2	80 20

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Modeled Interacting Sources:

1 = New England Med. Ctr. Hosp.	2 = First Church of Christ Scientist	3 = Boston Univ. Medical Campus
4 = Boston Medical Centre	5 = BHA Lenox Street	6 = BHA Camden Street
7 = Boston Water & Sewer Comm.	8 = Morgan Services	9 = MBTA Albany St. Bus Garage
10 = Perkin-Elmer Life Sciences	11 = Trigen Steam Plant (Kneeland St.)	

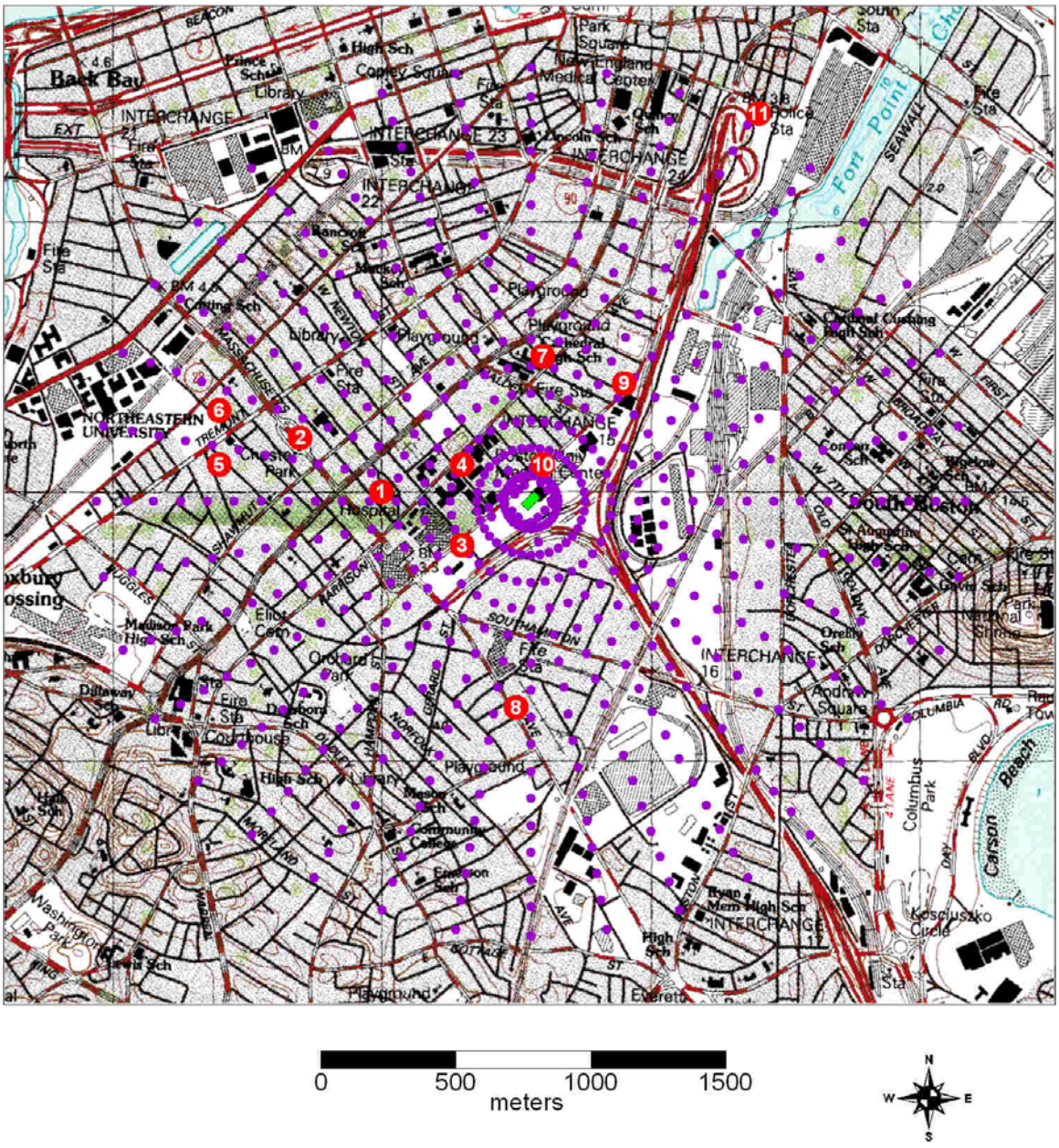

Figure 1. Location of the Proposed NEIDL, Interactive Sources, and the Receptor Grid

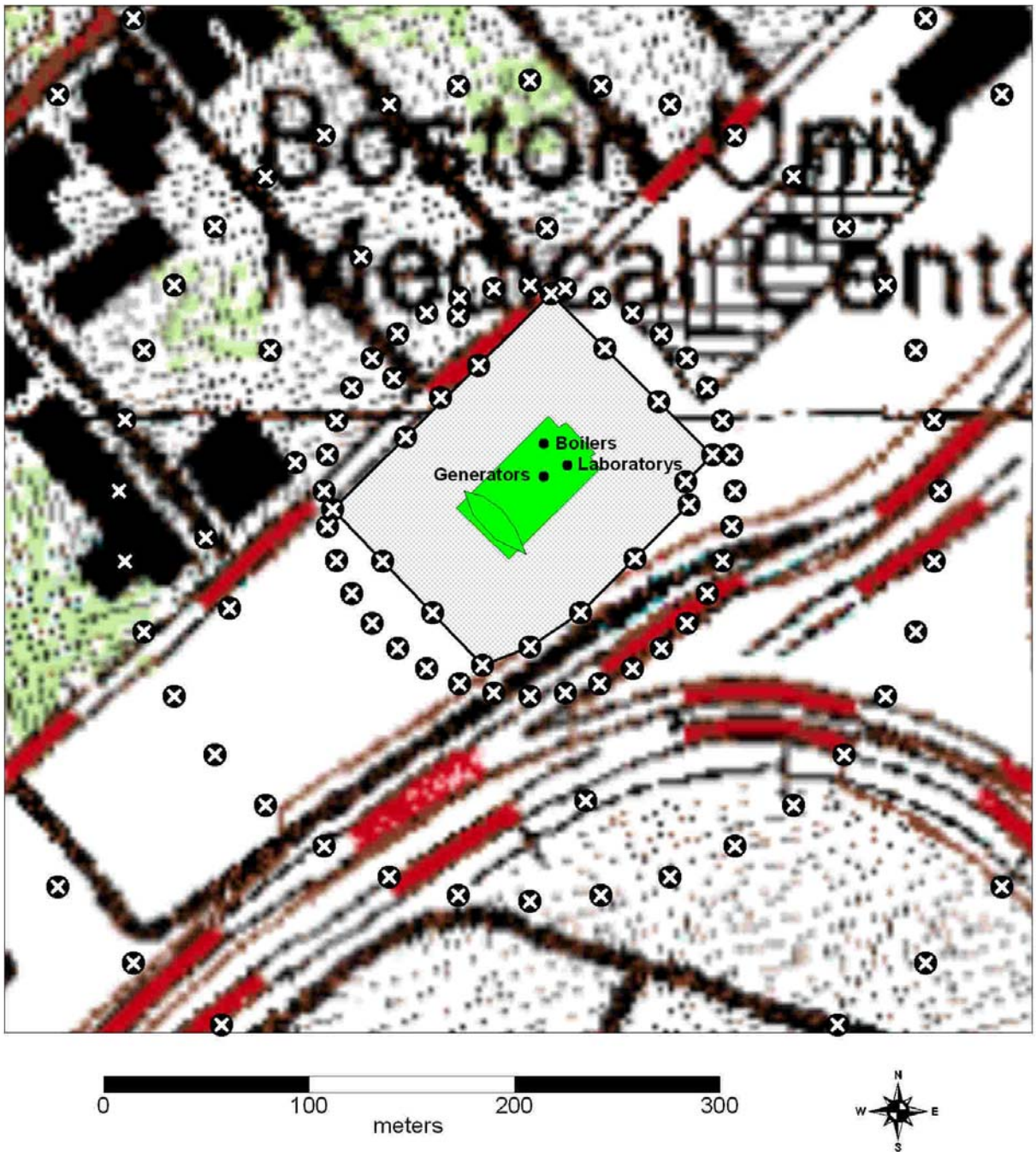

Figure 2. Location of Modeled Generator, Boiler, and Laboratory Stacks and Close-In Receptors

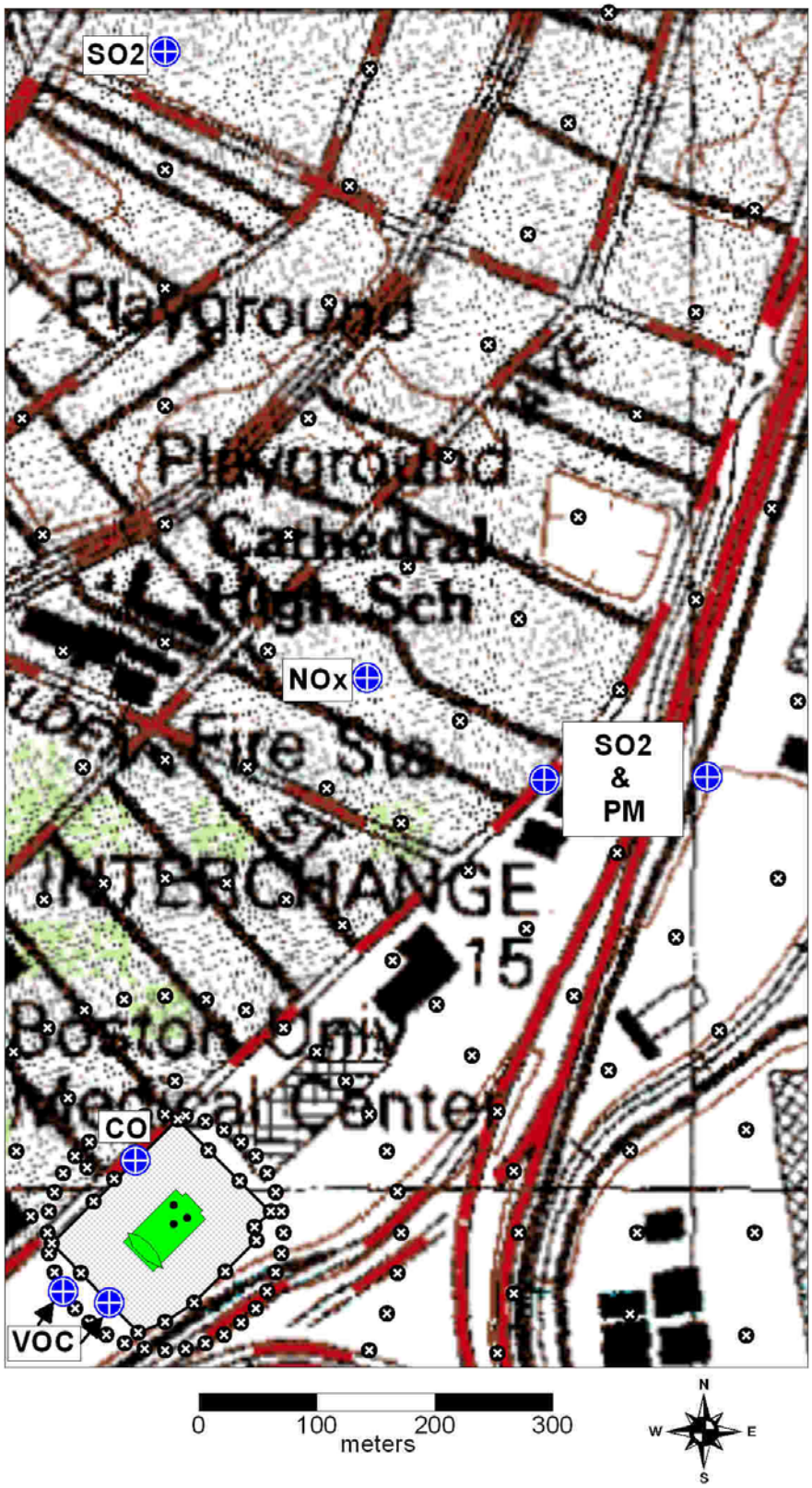

Figure 3. Location of the Receptors where the Maximum Predicted Cumulative Air Quality Impacts were Predicted to Occur.

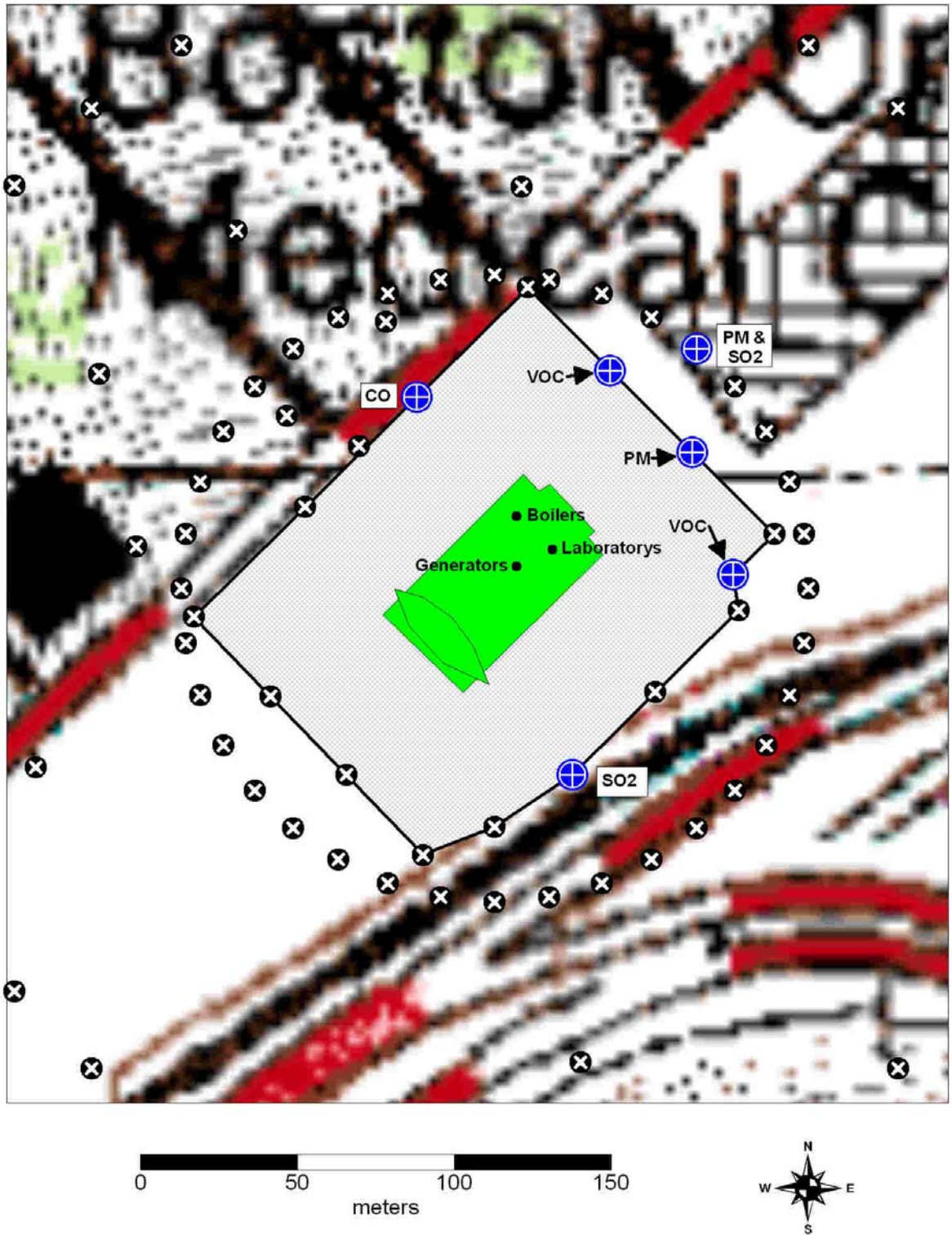

Figure 4. Location of the Receptors where the Maximum Predicted NEIDL Air Quality Impacts were Predicted to Occur.

Supplemental Air Quality Analysis
Attachment A

Notes: Full ISC-PRIME Model Output files and other supporting files are available upon request.

In the attached output files the results identified as 'All" represent the cumulative impacts from all modeled sources; while the results labeled as "NEIDL" represent only the NEIDL sources.

	SO BUILDHGT GENS	44.81	44.81	44.81	44.81	44.81	44.81
SO	BUILDHGT GENS	44.81	44.81	44.81	42.37	42.37	40.84
SO	BUILDHGT GENS	39.32	37.49	40.84	42.37	42.37	44.81
SO	BUILDHGT GENS	44.81	44.81	44.81	44.81	44.81	44.81
SO	BUILDHGT GENS	44.81	44.81	44.81	42.37	42.37	40.84
SO	BUILDHGT GENS	39.32	37.49	40.84	42.37	42.37	44.81
SO	BUILDWID GENS	44.81	44.81	44.73	43.05	43.69	45.36
SO	BUILDWID GENS	44.81	44.81	42.10	89.03	91.33	45.28
SO	BUILDWID GENS	39.64	68.90	38.31	89.61	87.74	41.60
SO	BUILDWID GENS	44.81	44.81	44.73	43.05	43.69	45.36
SO	BUILDWID GENS	44.81	44.81	42.10	89.03	91.33	45.28
SO	BUILDWID GENS	39.64	68.90	38.31	89.61	87.74	41.60
SO	BUILDLEN GENS	64.41	65.16	27.56	20.81	20.68	27.33
SO	BUILDLEN GENS	64.38	63.76	41.60	76.14	66.76	44.73
SO	BUILDLEN GENS	56.34	41.13	50.68	68.25	77.60	42.10
SO	BUILDLEN GENS	64.41	65.16	27.56	20.81	20.68	27.33
SO	BUILDLEN GENS	64.38	63.76	41.60	76.14	66.76	44.73
SO	BUILDLEN GENS	56.34	41.13	50.68	68.25	77.60	42.10
SO	XBADJ GENS	-102.58	-110.54	35.09	37.81	35.67	28.72
SO	XBADJ GENS	-110.61	-102.82	3.60	-78.19	-62.11	-22.48
SO	XBADJ GENS	-43.44	-21.34	-46.65	-6.82	0.04	-63.10
SO	XBADJ GENS	38.17	45.38	-62.65	-58.62	-56.35	-56.04
SO	XBADJ GENS	46.22	39.05	-45.20	2.06	-4.65	-22.24
SO	XBADJ GENS	-12.90	-19.79	-4.03	-61.42	-77.64	21.00
SO	YBADJ GENS	49.80	36.79	0.12	8.63	16.21	23.97
SO	YBADJ GENS	-36.03	-49.08	42.05	-58.06	-64.88	40.01
SO	YBADJ GENS	39.48	-7.89	36.89	-65.80	-58.95	24.40
SO	YBADJ GENS	-49.80	-36.79	-0.12	-8.63	-16.21	-23.97
SO	YBADJ GENS	36.03	49.08	-42.05	58.06	64.88	-40.01
SO	YBADJ GENS	-39.48	7.89	-36.89	65.80	58.95	-24.40
SO	BUILDHGT BOILERS	45.72	45.72	44.81	44.81	44.81	44.81
SO	BUILDHGT BOILERS	44.81	44.81	44.81	44.81	40.84	40.84
SO	BUILDHGT BOILERS	40.84	40.84	40.84	40.84	42.37	44.81
SO	BUILDHGT BOILERS	45.72	45.72	44.81	44.81	44.81	44.81
SO	BUILDHGT BOILERS	44.81	44.81	44.81	44.81	40.84	40.84
SO	BUILDHGT BOILERS	40.84	40.84	40.84	40.84	42.37	44.81
SO	BUILDWID BOILERS	56.78	50.63	44.73	43.05	43.69	45.36
SO	BUILDWID BOILERS	45.65	44.55	42.10	38.37	50.21	45.28
SO	BUILDWID BOILERS	38.97	35.91	38.31	39.54	87.74	41.60
SO	BUILDWID BOILERS	56.78	50.63	44.73	43.05	43.69	45.36
SO	BUILDWID BOILERS	45.65	44.55	42.10	38.37	50.21	45.28
SO	BUILDWID BOILERS	38.97	35.91	38.31	39.54	87.74	41.60
SO	BUILDLEN BOILERS	64.41	65.16	27.56	20.81	20.68	27.33
SO	BUILDLEN BOILERS	33.14	37.95	41.60	43.99	45.04	44.73
SO	BUILDLEN BOILERS	43.05	45.91	50.68	53.91	77.60	42.10
SO	BUILDLEN BOILERS	64.41	65.16	27.56	20.81	20.68	27.33
SO	BUILDLEN BOILERS	33.14	37.95	41.60	43.99	45.04	44.73
SO	BUILDLEN BOILERS	43.05	45.91	50.68	53.91	77.60	42.10
SO	XBADJ BOILERS	-118.33	-125.57	21.23	25.56	25.38	20.72
SO	XBADJ BOILERS	15.42	9.66	3.60	-2.57	-8.66	-14.48
SO	XBADJ BOILERS	-19.87	-25.80	-32.79	-38.79	15.80	-47.10
SO	XBADJ BOILERS	53.93	60.41	-48.79	-46.37	-46.07	-48.04
SO	XBADJ BOILERS	-48.56	-47.60	-45.20	-41.42	-36.39	-30.24
SO	XBADJ BOILERS	-23.18	-20.11	-17.89	-15.12	-93.40	5.00
SO	YBADJ BOILERS	47.02	31.32	-7.88	-1.66	3.95	10.11
SO	YBADJ BOILERS	15.96	21.33	26.05	29.98	24.63	26.15
SO	YBADJ BOILERS	26.88	28.11	28.89	28.79	-61.73	24.40
SO	YBADJ BOILERS	-47.02	-31.32	7.88	1.66	-3.95	-10.11
SO	YBADJ BOILERS	-15.96	-21.33	-26.05	-29.98	-24.63	-26.15
SO	YBADJ BOILERS	-26.88	-28.11	-28.89	-28.79	61.73	-24.40

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SO BUILDHGT NEIDLLAB    44.81    44.81    44.81    44.81    44.81    44.81
SO BUILDHGT NEIDLLAB    44.81    44.81    44.81    42.37    40.84    40.84
SO BUILDHGT NEIDLLAB    40.84    40.84    40.84    40.84    44.81    44.81
SO BUILDHGT NEIDLLAB    44.81    44.81    44.81    44.81    44.81    44.81
SO BUILDHGT NEIDLLAB    44.81    44.81    44.81    42.37    40.84    40.84
SO BUILDHGT NEIDLLAB    40.84    40.84    40.84    40.84    44.81    44.81
SO BUILDWID NEIDLLAB    43.99    44.81    44.73    43.05    43.69    45.36
SO BUILDWID NEIDLLAB    44.81    44.55    42.10    89.03    50.21    45.28
SO BUILDWID NEIDLLAB    38.97    35.91    38.31    39.54    37.95    41.60
SO BUILDWID NEIDLLAB    43.99    44.81    44.73    43.05    43.69    45.36
SO BUILDWID NEIDLLAB    44.81    44.55    42.10    89.03    50.21    45.28
SO BUILDWID NEIDLLAB    38.97    35.91    38.31    39.54    37.95    41.60
SO BUILDLEN NEIDLLAB    38.37    65.16    27.56    20.81    20.68    27.33
SO BUILDLEN NEIDLLAB    64.38    37.95    41.60    76.14    45.04    44.73
SO BUILDLEN NEIDLLAB    43.05    45.91    50.68    53.91    44.55    42.10
SO BUILDLEN NEIDLLAB    38.37    65.16    27.56    20.81    20.68    27.33
SO BUILDLEN NEIDLLAB    64.38    37.95    41.60    76.14    45.04    44.73
SO BUILDLEN NEIDLLAB    43.05    45.91    50.68    53.91    44.55    42.10
SO XBADJ    NEIDLLAB    18.96  -119.79    24.45    26.12    23.27    15.99
SO XBADJ    NEIDLLAB  -123.27     0.22    -7.80   -88.43   -22.89   -29.51
SO XBADJ    NEIDLLAB   -35.22   -41.01   -47.41   -52.37   -55.73   -57.40
SO XBADJ    NEIDLLAB   -57.33    54.63   -52.01   -46.93   -43.95   -43.32
SO XBADJ    NEIDLLAB    58.89   -38.17   -33.80    12.29   -22.15   -15.22
SO XBADJ    NEIDLLAB    -7.83    -4.90    -3.27    -1.54    11.18    15.30
SO YBADJ    NEIDLLAB    -6.41    45.55     7.14    13.70    19.17    24.73
SO YBADJ    NEIDLLAB   -37.48    33.45    36.35   -65.66    30.41    29.37
SO YBADJ    NEIDLLAB    27.44    26.00    24.17    21.60    19.19    13.00
SO YBADJ    NEIDLLAB     6.41   -45.55    -7.14   -13.70   -19.17   -24.73
SO YBADJ    NEIDLLAB    37.48   -33.45   -36.35    65.66   -30.41   -29.37
SO YBADJ    NEIDLLAB   -27.44   -26.00   -24.17   -21.60   -19.19   -13.00
SO BUILDHGT EVANLAB     45.72    45.72    36.58    37.49    42.37    42.37
SO BUILDHGT EVANLAB     45.72    45.72    45.72    45.72    45.72    45.72
SO BUILDHGT EVANLAB     45.72    45.72    45.72    45.72    45.72    45.72
SO BUILDHGT EVANLAB     45.72    45.72    36.58    39.32    44.81    44.81
SO BUILDHGT EVANLAB     45.72    45.72    45.72    45.72    45.72    45.72
SO BUILDHGT EVANLAB     45.72    45.72    45.72    45.72    45.72    45.72
SO BUILDWID EVANLAB     56.78    50.63    43.80    61.95    42.85    56.82
SO BUILDWID EVANLAB     50.80    57.12    61.70    64.41    65.16    63.93
SO BUILDWID EVANLAB     60.76    59.80    63.05    64.38    63.76    61.20
SO BUILDWID EVANLAB     56.78    50.63    43.80    56.34    43.69    45.36
SO BUILDWID EVANLAB     50.80    57.12    61.70    64.41    65.16    63.93
SO BUILDWID EVANLAB     60.76    59.80    63.05    64.38    63.76    61.20
SO BUILDLEN EVANLAB     64.41    65.16    63.50   175.54    12.29    90.49
SO BUILDLEN EVANLAB     64.38    63.76    61.20    56.78    50.63    42.95
SO BUILDLEN EVANLAB     33.96    33.77    42.93    50.80    57.12    61.70
SO BUILDLEN EVANLAB     64.41    65.16    63.50    28.75    20.68    27.33
SO BUILDLEN EVANLAB     64.38    63.76    61.20    56.78    50.63    42.95
SO BUILDLEN EVANLAB     33.96    33.77    42.93    50.80    57.12    61.70
SO XBADJ    EVANLAB    -58.81   -52.24   -32.63   -34.58    51.43   -19.85
SO XBADJ    EVANLAB    -12.92    -5.60     1.90     9.34    16.49    23.15
SO XBADJ    EVANLAB     29.10    29.10    23.15    16.49     9.34     1.90
SO XBADJ    EVANLAB     -5.60   -12.92   -30.87  -140.96  -146.14  -151.23
SO XBADJ    EVANLAB    -51.46   -58.16   -63.10   -66.12   -67.13   -66.10
SO XBADJ    EVANLAB    -63.06   -62.86   -66.08   -67.29   -66.45   -63.60
SO YBADJ    EVANLAB    -37.73   -41.81     0.56   -41.46   -40.63   -37.67
SO YBADJ    EVANLAB    -41.89   -37.90   -32.75   -26.61   -19.66   -12.11
SO YBADJ    EVANLAB     -4.20     3.72    11.67    19.27    26.28    32.50
SO YBADJ    EVANLAB     37.73    41.81    -0.56    38.65    22.71    -1.23
SO YBADJ    EVANLAB     41.89    37.90    32.75    26.61    19.66    12.11
SO YBADJ    EVANLAB      4.20    -3.72   -11.67   -19.27   -26.28   -32.50
SO BUILDHGT ELAB        45.72    45.72    45.72    42.37    42.37    45.72
SO BUILDHGT ELAB        45.72    45.72    45.72    45.72    45.72    45.72
SO BUILDHGT ELAB        45.72    45.72    45.72    45.72    45.72    45.72
SO BUILDHGT ELAB        45.72    45.72    44.81    44.81    44.81    45.72
SO BUILDHGT ELAB        45.72    45.72    45.72    45.72    45.72    45.72
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SO BUILDHGT ELAB        45.72    45.72    45.72    45.72    45.72    45.72
SO BUILDWID ELAB        56.78    50.63    42.95    42.80    42.85    42.93
SO BUILDWID ELAB        50.80    57.12    61.70    64.41    65.16    63.93
SO BUILDWID ELAB        60.76    59.80    63.05    64.38    63.76    61.20
SO BUILDWID ELAB        56.78    50.63    44.73    43.05    43.69    42.93
SO BUILDWID ELAB        50.80    57.12    61.70    64.41    65.16    63.93
SO BUILDWID ELAB        60.76    59.80    63.05    64.38    63.76    61.20
SO BUILDLEN ELAB        64.41    65.16    63.93    13.06    12.29    63.05
SO BUILDLEN ELAB        64.38    63.76    61.20    56.78    50.63    42.95
SO BUILDLEN ELAB        33.96    33.77    42.93    50.80    57.12    61.70
SO BUILDLEN ELAB        64.41    65.16    27.56    20.81    20.68    63.05
SO BUILDLEN ELAB        64.38    63.76    61.20    56.78    50.63    42.95
SO BUILDLEN ELAB        33.96    33.77    42.93    50.80    57.12    61.70
SO XBADJ    ELAB       -30.99   -31.33   -30.72    48.51    48.71   -30.62
SO XBADJ    ELAB       -31.40   -31.22   -30.10   -28.06   -25.17   -21.52
SO XBADJ    ELAB       -17.21   -17.44   -22.21   -26.31   -29.60   -32.00
SO XBADJ    ELAB       -33.42   -33.83  -147.07  -145.69  -143.42   -32.43
SO XBADJ    ELAB       -32.99   -32.54   -31.10   -28.72   -25.46   -21.43
SO XBADJ    ELAB       -16.75   -16.32   -20.72   -24.49   -27.51   -29.70
SO YBADJ    ELAB        -0.33    -0.14     0.04    -3.66     5.91     0.75
SO YBADJ    ELAB         0.91     1.05     1.15     1.22     1.25     1.25
SO YBADJ    ELAB         1.20     0.99     0.91     0.79     0.66     0.50
SO YBADJ    ELAB         0.33     0.14    22.50    -1.01   -23.82    -0.75
SO YBADJ    ELAB        -0.91    -1.05    -1.15    -1.22    -1.25    -1.25
SO YBADJ    ELAB        -1.20    -0.99    -0.91    -0.79    -0.66    -0.50
SO BUILDHGT GLAB        44.81    44.81    44.81    44.81    44.81    44.81
SO BUILDHGT GLAB        44.81    44.81    44.81    44.81    40.84    40.84
SO BUILDHGT GLAB        40.84    40.84    40.84    40.84    44.81    44.81
SO BUILDHGT GLAB        44.81    44.81    44.81    44.81    44.81    44.81
SO BUILDHGT GLAB        44.81    44.81    44.81    44.81    40.84    40.84
SO BUILDHGT GLAB        40.84    40.84    40.84    40.84    44.81    44.81
SO BUILDWID GLAB        43.99    44.81    44.73    43.05    43.69    45.36
SO BUILDWID GLAB        45.65    44.55    42.10    38.37    50.21    45.28
SO BUILDWID GLAB        38.97    35.91    38.31    39.54    37.95    41.60
SO BUILDWID GLAB        43.99    45.04    44.73    43.05    43.69    45.36
SO BUILDWID GLAB        45.65    44.55    42.10    38.37    50.21    45.28
SO BUILDWID GLAB        38.97    35.91    38.31    39.54    37.95    41.60
SO BUILDLEN GLAB        38.37    65.16    27.56    20.81    20.68    27.33
SO BUILDLEN GLAB        33.14    37.95    41.60    43.99    45.04    44.73
SO BUILDLEN GLAB        43.05    45.91    50.68    53.91    44.55    42.10
SO BUILDLEN GLAB        38.37    33.47    27.56    20.81    20.68    27.33
SO BUILDLEN GLAB        33.14    37.95    41.60    43.99    45.04    44.73
SO BUILDLEN GLAB        43.05    45.91    50.68    53.91    44.55    42.10
SO XBADJ    GLAB       -20.47  -159.36   -14.05   -10.14    -9.65   -12.58
SO XBADJ    GLAB       -15.14   -17.23   -18.80   -19.80   -20.20   -19.98
SO XBADJ    GLAB       -19.16   -18.90   -19.91   -20.32   -20.12   -19.30
SO XBADJ    GLAB       -17.90   -15.95   -13.51   -10.67   -11.04   -14.75
SO XBADJ    GLAB       -18.00   -20.72   -22.80   -24.19   -24.85   -24.75
SO XBADJ    GLAB       -23.89   -27.01   -30.76   -33.58   -24.43   -22.80
SO YBADJ    GLAB        -2.20    42.86    -2.38    -2.37    -2.95    -2.77
SO YBADJ    GLAB        -2.50    -2.16    -1.75    -1.29    -9.16    -9.12
SO YBADJ    GLAB        -8.81    -6.92    -4.41    -1.76     1.74     2.00
SO YBADJ    GLAB         2.20     2.32     2.38     2.37     2.95     2.77
SO YBADJ    GLAB         2.50     2.16     1.75     1.29     9.16     9.12
SO YBADJ    GLAB         8.81     6.92     4.41     1.76    -1.74    -2.00
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*** ISC3P - VERSION 04269 ***
*** NOx Modeling NEIDL Annual 1995                                    ***
*** Model Executed on 02/14/05 at 08:06:56 ***
 Input File - W:\Apps\ISCPRIME\1886\NOx\LT95_95_NO2.DTA
Output File - W:\Apps\ISCPRIME\1886\NOx\LT95_95_NO2.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos95.ASC

      Number of sources -         13
Number of source groups -          2
    Number of receptors -        601
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*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.44800E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.23000E-01	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.63100E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.59900E+01	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.83000E+00	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.15800E+01	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.46000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BHACAM	0	0.26000E+00	328400.0	4689300.0	4.0	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.13820E+02	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.29000E+00	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.10700E+01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
PERKIN	0	0.11500E+01	329600.0	4689100.0	3.1	18.29	344.26	43.12	0.09	NO	
TRIGEN	0	0.93230E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BHACAM , BWSC , MORGAN , MBTA , PERKIN , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	54.39981 AT	(329726.50,	4689434.00,	3.40,	0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	43.56631 AT	(329805.50,	4689397.00,	3.70,	0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	41.93577 AT	(329692.31,	4689340.00,	3.40,	0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	36.20424 AT	(329624.97,	4689358.00,	3.70,	0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	35.58701 AT	(329755.50,	4689310.50,	3.40,	0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	33.69247 AT	(329760.72,	4689528.00,	3.70,	0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	2.78103 AT	(329592.19,	4689033.50,	3.00,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.70470 AT	(329619.78,	4689040.50,	3.00,	0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	2.18023 AT	(329580.19,	4688904.50,	3.00,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.09879 AT	(329606.69,	4688931.00,	3.00,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.07406 AT	(329605.50,	4689050.50,	3.00,	0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	1.89882 AT	(329632.09,	4689028.50,	3.40,	0.00)	GP	POLAR

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*** ISC3P - VERSION 04269 ***
*** NOx Modeling NEIDL Annual 1996                                    ***
*** Model Executed on 02/14/05 at 08:22:24 ***
 Input File - W:\Apps\ISCPRIME\1886\NOx\LT96_96_NO2.DTA
. Output File - W:\Apps\ISCPRIME\1886\NOx\LT96_96_NO2.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos96.ASC

      Number of sources -         13
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.44800E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.23000E-01	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.63100E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.59900E+01	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.83000E+00	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.15800E+01	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.46000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BHACAM	0	0.26000E+00	328400.0	4689300.0	4.0	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.13820E+02	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.29000E+00	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.10700E+01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
PERKIN	0	0.11500E+01	329600.0	4689100.0	3.1	18.29	344.26	43.12	0.09	NO	
TRIGEN	0	0.93230E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BHACAM , BWSC , MORGAN , MBTA , PERKIN , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8784 HRS) RESULTS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	53.59523	AT (329726.50,	4689434.00,	3.40,	0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	45.92954	AT (329805.50,	4689397.00,	3.70,	0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	38.77794	AT (329677.06,	4689653.50,	3.40,	0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	37.97326	AT (329760.72,	4689528.00,	3.70,	0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	37.30137	AT (329692.31,	4689340.00,	3.40,	0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	34.62343	AT (329855.50,	4689483.50,	3.70,	0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	2.97581	AT (329592.19,	4689033.50,	3.00,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.74635	AT (329619.78,	4689040.50,	3.00,	0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	2.33471	AT (329580.19,	4688904.50,	3.00,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.28976	AT (329605.50,	4689050.50,	3.00,	0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	2.10179	AT (329606.69,	4688931.00,	3.00,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.07432	AT (329619.78,	4688887.50,	3.00,	0.00)	GP	POLAR

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   *** ISC3P - VERSION 04269 ***
*** NOx Modeling NEIDL Annual 1997                                    ***
*** Model Executed on 02/14/05 at 08:09:14 ***
 Input File - W:\Apps\ISCPRIME\1886\NOx\LT97_97_NO2.DTA
Output File - W:\Apps\ISCPRIME\1886\NOx\LT97_97_NO2.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos97.ASC

      Number of sources -         13
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.44800E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.23000E-01	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.63100E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.59900E+01	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.83000E+00	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.15800E+01	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.46000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BHACAM	0	0.26000E+00	328400.0	4689300.0	4.0	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.13820E+02	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.29000E+00	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.10700E+01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
PERKIN	0	0.11500E+01	329600.0	4689100.0	3.1	18.29	344.26	43.12	0.09	NO	
TRIGEN	0	0.93230E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BHACAM , BWSC , MORGAN , MBTA , PERKIN , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	63.48902 AT	(329726.50,	4689434.00,	3.40,	0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	53.75286 AT	(329805.50,	4689397.00,	3.70,	0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	45.88927 AT	(329760.72,	4689528.00,	3.70,	0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	43.91681 AT	(329855.50,	4689483.50,	3.70,	0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	39.90331 AT	(329692.31,	4689340.00,	3.40,	0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	39.88035 AT	(329941.19,	4689423.50,	5.50,	0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	2.95710 AT	(329580.19,	4688904.50,	3.00,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.95372 AT	(329592.19,	4689033.50,	3.00,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.83193 AT	(329619.78,	4689040.50,	3.00,	0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	2.67583 AT	(329619.78,	4688887.50,	3.00,	0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	2.58541 AT	(329606.69,	4688931.00,	3.00,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.49855 AT	(329605.50,	4688877.50,	3.00,	0.00)	GP	POLAR

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*** ISC3P - VERSION 04269 ***
*** NOx Modeling NEIDL Annual 1998                                    ***
*** Model Executed on 02/14/05 at 08:10:24 ***
 Input File - W:\Apps\ISCPRIME\1886\NOx\LT98_98_NO2.DTA
Output File - W:\Apps\ISCPRIME\1886\NOx\LT98_98_NO2.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos98.ASC

      Number of sources -         13
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.44800E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.23000E-01	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.63100E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.59900E+01	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.83000E+00	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.15800E+01	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.46000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BHACAM	0	0.26000E+00	328400.0	4689300.0	4.0	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.13820E+02	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.29000E+00	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.10700E+01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
PERKIN	0	0.11500E+01	329600.0	4689100.0	3.1	18.29	344.26	43.12	0.09	NO	
TRIGEN	0	0.93230E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BHACAM , BWSC , MORGAN , MBTA , PERKIN , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	53.44598 AT	(329726.50,	4689434.00,	3.40,	0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	46.72054 AT	(329805.50,	4689397.00,	3.70,	0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	41.87490 AT	(329692.31,	4689340.00,	3.40,	0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	40.86523 AT	(329794.91,	4689622.00,	3.00,	0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	39.92365 AT	(329755.50,	4689310.50,	3.40,	0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	38.82208 AT	(329677.06,	4689653.50,	3.40,	0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	3.32699 AT	(329619.78,	4689040.50,	3.00,	0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	3.32370 AT	(329592.19,	4689033.50,	3.00,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.59985 AT	(329605.50,	4689050.50,	3.00,	0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	2.49899 AT	(329580.19,	4688904.50,	3.00,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.32242 AT	(329606.69,	4688931.00,	3.00,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	2.23034 AT	(329619.78,	4688887.50,	3.00,	0.00)	GP	POLAR

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*** ISC3P - VERSION 04269 ***
*** NOx Modeling NEIDL Annual 1999                                    ***
*** Model Executed on 02/14/05 at 08:11:38 ***
 Input File - W:\Apps\ISCPRIME\1886\NOx\LT99_99_NO2.DTA
Output File - W:\Apps\ISCPRIME\1886\NOx\LT99_99_NO2.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos99.ASC

      Number of sources -         13
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.44800E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.23000E-01	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.63100E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.59900E+01	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.83000E+00	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.15800E+01	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.46000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BHACAM	0	0.26000E+00	328400.0	4689300.0	4.0	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.13820E+02	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.29000E+00	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.10700E+01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
PERKIN	0	0.11500E+01	329600.0	4689100.0	3.1	18.29	344.26	43.12	0.09	NO	
TRIGEN	0	0.93230E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BHACAM , BWSC , MORGAN , MBTA , PERKIN , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	57.58815 AT	(329726.50,	4689434.00,	3.40,	0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	49.42626 AT	(329805.50,	4689397.00,	3.70,	0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	40.03016 AT	(329692.31,	4689340.00,	3.40,	0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	38.65792 AT	(329760.72,	4689528.00,	3.70,	0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	38.07271 AT	(329755.50,	4689310.50,	3.40,	0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	37.95757 AT	(329677.06,	4689653.50,	3.40,	0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	3.00616 AT	(329592.19,	4689033.50,	3.00,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.84343 AT	(329619.78,	4689040.50,	3.00,	0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	2.59308 AT	(329580.19,	4688904.50,	3.00,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	2.35259 AT	(329606.69,	4688931.00,	3.00,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	2.34206 AT	(329619.78,	4688887.50,	3.00,	0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	2.32746 AT	(329605.50,	4689050.50,	3.00,	0.00)	GP	POLAR

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*** ISC3P - VERSION 04269 ***
*** SO2 Modeling NEIDL Short-Term 1995                                  ***
*** Model Executed on 02/12/05 at 13:42:43 ***
 Input File - W:\Apps\ISCPRIME\1886\SO2\ST95_95_SO.DTA
Output File - W:\Apps\ISCPRIME\1886\SO2\ST95_95_SO.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos95.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.26000E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.47700E-02	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.12700E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.60000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.29000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.17300E+01	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MBTA	0	0.63000E+00	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
PERKIN	0	0.30000E-01	329600.0	4689100.0	3.1	18.29	344.26	43.12	0.09	NO	
TRIGEN	0	0.13875E+03	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MBTA , PERKIN , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 3-HR RESULTS ***

** CONC OF SO IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS 177.53601	ON 95011906:	AT (330508.12, 4689514.00, 5.80, 0.00)	GP	POLAR
NEIDL	HIGH 2ND HIGH VALUE IS 13.22874	ON 95011903:	AT (329606.69, 4688931.00, 3.00, 0.00)	DC	NA

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF SO IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS 70.04241	ON 95041424:	AT (330949.81, 4689769.00, 3.00, 0.00)	GP	POLAR
NEIDL	HIGH 2ND HIGH VALUE IS 8.78506	ON 95091324:	AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR

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*** ISC3P - VERSION 04269 ***
*** SO2 Modeling NEIDL Short-Term 1996                                  ***
*** Model Executed on 02/12/05 at 13:43:48 ***
 Input File - W:\Apps\ISCPRIME\1886\SO2\ST96_96_SO.DTA
Output File - W:\Apps\ISCPRIME\1886\SO2\ST96_96_SO.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos96.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.26000E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.47700E-02	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.12700E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.60000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.29000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.17300E+01	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MBTA	0	0.63000E+00	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
PERKIN	0	0.30000E-01	329600.0	4689100.0	3.1	18.29	344.26	43.12	0.09	NO	
TRIGEN	0	0.13875E+03	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MBTA , PERKIN , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 3-HR RESULTS ***

** CONC OF SO IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS	156.10524	ON 96091312:	AT (329829.12, 4689716.00, 4.00, 0.00)	GP	POLAR
NEIDL	HIGH 2ND HIGH VALUE IS	13.56412	ON 96090512:	AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF SO IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS	75.94979	ON 96022624:	AT (330949.81, 4689769.00, 3.00, 0.00)	GP	POLAR
NEIDL	HIGH 2ND HIGH VALUE IS	9.39720	ON 96082324:	AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR

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*** ISC3P - VERSION 04269 ***
*** SO2 Modeling NEIDL Short-Term 1997                                  ***
*** Model Executed on 02/12/05 at 13:44:50 ***
 Input File - W:\Apps\ISCPRIME\1886\SO2\ST97_97_SO.DTA
Output File - W:\Apps\ISCPRIME\1886\SO2\ST97_97_SO.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos97.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.26000E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.47700E-02	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.12700E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.60000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.29000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.17300E+01	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MBTA	0	0.63000E+00	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
PERKIN	0	0.30000E-01	329600.0	4689100.0	3.1	18.29	344.26	43.12	0.09	NO	
TRIGEN	0	0.13875E+03	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MBTA , PERKIN , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 3-HR RESULTS ***

** CONC OF SO IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)			OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS	154.72679	ON 97060409: AT (	329876.91,	4689347.00,	4.60, 0.00)	GP	POLAR
NEIDL	HIGH 2ND HIGH VALUE IS	15.10740	ON 97112003: AT (	329580.19,	4688904.50,	3.00, 0.00)	DC	NA

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF SO IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)			OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS	72.22667	ON 97072924: AT (	330854.53,	4689714.00,	4.30, 0.00)	GP	POLAR
NEIDL	HIGH 2ND HIGH VALUE IS	8.72552	ON 97021824: AT (	329619.78,	4689040.50,	3.00, 0.00)	GP	POLAR

```
*** ISC3P - VERSION 04269 ***
*** SO2 Modeling NEIDL Short-Term 1998                                  ***
*** Model Executed on 02/12/05 at 13:45:53 ***
 Input File - W:\Apps\ISCPRIME\1886\SO2\ST98_98_SO.DTA
Output File - W:\Apps\ISCPRIME\1886\SO2\ST98_98_SO.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos98.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.26000E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.47700E-02	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.12700E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.60000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.29000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.17300E+01	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MBTA	0	0.63000E+00	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
PERKIN	0	0.30000E-01	329600.0	4689100.0	3.1	18.29	344.26	43.12	0.09	NO	
TRIGEN	0	0.13875E+03	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MBTA , PERKIN , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 3-HR RESULTS ***

** CONC OF SO IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS 171.61986	ON 98051112:	AT (329876.91, 4689347.00, 4.60, 0.00)	GP	POLAR
NEIDL	HIGH 2ND HIGH VALUE IS 14.69022	ON 98073009:	AT (329580.19, 4688904.50, 3.00, 0.00)	DC	NA

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF SO IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS 92.90733	ON 98050924:	AT (329794.91, 4689622.00, 3.00, 0.00)	GP	POLAR
NEIDL	HIGH 2ND HIGH VALUE IS 10.24367	ON 98071424:	AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR

```
*** ISC3P - VERSION 04269 ***
*** SO2 Modeling NEIDL Short-Term 1999                                  ***
*** Model Executed on 02/12/05 at 13:46:55 ***
 Input File - W:\Apps\ISCPRIME\1886\SO2\ST99_99_SO.DTA
Output File - W:\Apps\ISCPRIME\1886\SO2\ST99_99_SO.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos99.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.26000E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.47700E-02	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.12700E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.60000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.29000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.17300E+01	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MBTA	0	0.63000E+00	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
PERKIN	0	0.30000E-01	329600.0	4689100.0	3.1	18.29	344.26	43.12	0.09	NO	
TRIGEN	0	0.13875E+03	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MBTA , PERKIN , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 3-HR RESULTS ***

** CONC OF SO IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS 178.42151	ON 99060918:	AT (329555.50, 4689964.00, 3.40, 0.00)	GP	POLAR
NEIDL	HIGH 2ND HIGH VALUE IS 15.13875	ON 99092921:	AT (329495.00, 4688990.00, 3.00, 0.00)	DC	NA

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF SO IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS 95.25536	ON 99032824:	AT (329876.91, 4689347.00, 4.60, 0.00)	GP	POLAR
NEIDL	HIGH 2ND HIGH VALUE IS 8.79612	ON 99081724:	AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR

```
*** ISC3P - VERSION 04269 ***
*** SO2 Modeling NEIDL Annual 1995                                    ***
*** Model Executed on 02/14/05 at 08:23:14 ***
 Input File - W:\Apps\ISCPRIME\1886\SO2\LT95_95_SO.DTA
Output File - W:\Apps\ISCPRIME\1886\SO2\LT95_95_SO.LST
  Met File - W:\Apps\ISCPRIME\1886\metdata\Bos95.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.89000E-02	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.42000E-03	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.12700E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.60000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.29000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.17300E+01	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MBTA	0	0.63000E+00	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
PERKIN	0	0.30000E-01	329600.0	4689100.0	3.1	18.29	344.26	43.12	0.09	NO	
TRIGEN	0	0.13875E+03	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MBTA , PERKIN , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF SO IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	9.41661	AT (330949.81,	4689769.00,	3.00,	0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	9.05656	AT (330854.53,	4689714.00,	4.30,	0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	8.69382	AT (330015.12,	4689349.50,	5.20,	0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	8.61711	AT (330767.94,	4689664.00,	6.10,	0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	8.40633	AT (330788.84,	4689999.00,	3.40,	0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	7.99454	AT (330681.34,	4689614.00,	6.40,	0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	0.05463	AT (329592.19,	4689033.50,	3.00,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.05333	AT (329619.78,	4689040.50,	3.00,	0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	0.04326	AT (329580.19,	4688904.50,	3.00,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.04149	AT (329606.69,	4688931.00,	3.00,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	0.04093	AT (329605.50,	4689050.50,	3.00,	0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	0.03760	AT (329619.78,	4688887.50,	3.00,	0.00)	GP	POLAR

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*** ISC3P - VERSION 04269 ***
*** SO2 Modeling NEIDL Annual 1996                                    ***
*** Model Executed on 02/14/05 at 08:24:18 ***
 Input File - W:\Apps\ISCPRIME\1886\SO2\LT96_96_SO.DTA
Output File - W:\Apps\ISCPRIME\1886\SO2\LT96_96_SO.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos96.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.89000E-02	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.42000E-03	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.12700E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.60000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.29000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.17300E+01	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MBTA	0	0.63000E+00	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
PERKIN	0	0.30000E-01	329600.0	4689100.0	3.1	18.29	344.26	43.12	0.09	NO	
TRIGEN	0	0.13875E+03	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MBTA , PERKIN , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8784 HRS) RESULTS ***

** CONC OF SO IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	9.35320 AT (330015.12, 4689349.50, 5.20, 0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	7.80441 AT (330949.81, 4689769.00, 3.00, 0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	7.32101 AT (330005.44, 4689500.00, 4.00, 0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	7.26582 AT (330854.53, 4689714.00, 4.30, 0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	6.82072 AT (330788.84, 4689999.00, 3.40, 0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	6.75668 AT (329938.53, 4689285.50, 4.30, 0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	0.05843 AT (329592.19, 4689033.50, 3.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.05411 AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	0.04633 AT (329580.19, 4688904.50, 3.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.04517 AT (329605.50, 4689050.50, 3.00, 0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	0.04158 AT (329606.69, 4688931.00, 3.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	0.04113 AT (329619.78, 4688887.50, 3.00, 0.00)	GP	POLAR

```
*** ISC3P - VERSION 04269 ***
*** SO2 Modeling NEIDL Annual 1997                                    ***
*** Model Executed on 02/14/05 at 08:25:20 ***
 Input File - W:\Apps\ISCPRIME\1886\SO2\LT97_97_SO.DTA
Output File - W:\Apps\ISCPRIME\1886\SO2\LT97_97_SO.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos97.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.89000E-02	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.42000E-03	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.12700E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.60000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.29000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.17300E+01	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MBTA	0	0.63000E+00	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
PERKIN	0	0.30000E-01	329600.0	4689100.0	3.1	18.29	344.26	43.12	0.09	NO	
TRIGEN	0	0.13875E+03	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MBTA , PERKIN , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF SO IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	11.22850	AT (330015.12,	4689349.50,	5.20,	0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	9.63681	AT (330949.81,	4689769.00,	3.00,	0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	8.80277	AT (330854.53,	4689714.00,	4.30,	0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	8.36283	AT (331068.41,	4689514.50,	5.50,	0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	8.01797	AT (330788.84,	4689999.00,	3.40,	0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	7.76115	AT (330965.03,	4689477.00,	6.70,	0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	0.05870	AT (329580.19,	4688904.50,	3.00,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.05798	AT (329592.19,	4689033.50,	3.00,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.05579	AT (329619.78,	4689040.50,	3.00,	0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	0.05307	AT (329619.78,	4688887.50,	3.00,	0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	0.05117	AT (329606.69,	4688931.00,	3.00,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	0.04956	AT (329605.50,	4688877.50,	3.00,	0.00)	GP	POLAR

```
*** ISC3P - VERSION 04269 ***
*** SO2 Modeling NEIDL Annual 1998                                    ***
*** Model Executed on 02/14/05 at 08:26:22 ***
 Input File - W:\Apps\ISCPRIME\1886\SO2\LT98_98_SO.DTA
Output File - W:\Apps\ISCPRIME\1886\SO2\LT98_98_SO.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos98.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.89000E-02	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.42000E-03	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.12700E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.60000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.29000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.17300E+01	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MBTA	0	0.63000E+00	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
PERKIN	0	0.30000E-01	329600.0	4689100.0	3.1	18.29	344.26	43.12	0.09	NO	
TRIGEN	0	0.13875E+03	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MBTA , PERKIN , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF SO IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	10.07175	AT (330015.12,	4689349.50,	5.20,	0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	9.56325	AT (330949.81,	4689769.00,	3.00,	0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	9.48990	AT (330005.44,	4689500.00,	4.00,	0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	8.88332	AT (330854.53,	4689714.00,	4.30,	0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	8.56992	AT (331068.41,	4689514.50,	5.50,	0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	8.15136	AT (329941.19,	4689423.50,	5.50,	0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	0.06560	AT (329619.78,	4689040.50,	3.00,	0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	0.06531	AT (329592.19,	4689033.50,	3.00,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.05130	AT (329605.50,	4689050.50,	3.00,	0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	0.04960	AT (329580.19,	4688904.50,	3.00,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	0.04593	AT (329606.69,	4688931.00,	3.00,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	0.04421	AT (329619.78,	4688887.50,	3.00,	0.00)	GP	POLAR

```
*** ISC3P - VERSION 04269 ***
*** SO2 Modeling NEIDL Annual 1999                                    ***
*** Model Executed on 02/14/05 at 08:27:26 ***
 Input File - W:\Apps\ISCPRIME\1886\SO2\LT99_99_SO.DTA
Output File - W:\Apps\ISCPRIME\1886\SO2\LT99_99_SO.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos99.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.89000E-02	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.42000E-03	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.12700E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.60000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.29000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.17300E+01	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MBTA	0	0.63000E+00	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
PERKIN	0	0.30000E-01	329600.0	4689100.0	3.1	18.29	344.26	43.12	0.09	NO	
TRIGEN	0	0.13875E+03	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MBTA , PERKIN , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF SO IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	10.30711 AT (330015.12, 4689349.50, 5.20, 0.00)	GP	POLAR	
	2ND HIGHEST VALUE IS	9.67657 AT (330949.81, 4689769.00, 3.00, 0.00)	GP	POLAR	
	3RD HIGHEST VALUE IS	8.64771 AT (330854.53, 4689714.00, 4.30, 0.00)	GP	POLAR	
	4TH HIGHEST VALUE IS	8.29388 AT (331068.41, 4689514.50, 5.50, 0.00)	GP	POLAR	
	5TH HIGHEST VALUE IS	7.96787 AT (330788.84, 4689999.00, 3.40, 0.00)	GP	POLAR	
	6TH HIGHEST VALUE IS	7.71029 AT (330005.44, 4689500.00, 4.00, 0.00)	GP	POLAR	
NEIDL	1ST HIGHEST VALUE IS	0.05903 AT (329592.19, 4689033.50, 3.00, 0.00)	DC	NA	
	2ND HIGHEST VALUE IS	0.05605 AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR	
	3RD HIGHEST VALUE IS	0.05147 AT (329580.19, 4688904.50, 3.00, 0.00)	DC	NA	
	4TH HIGHEST VALUE IS	0.04655 AT (329606.69, 4688931.00, 3.00, 0.00)	DC	NA	
	5TH HIGHEST VALUE IS	0.04644 AT (329619.78, 4688887.50, 3.00, 0.00)	GP	POLAR	
	6TH HIGHEST VALUE IS	0.04592 AT (329605.50, 4689050.50, 3.00, 0.00)	GP	POLAR	

```
*** ISC3P - VERSION 04269 ***
*** PM10 Modeling NEIDL Short-Term 1995                              ***
*** Model Executed on 02/12/05 at 13:25:52 ***
 Input File - W:\Apps\ISCPRIME\1886\PM10\ST95_95_PM1.DTA
Output File - W:\Apps\ISCPRIME\1886\PM10\ST95_95_PM1.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos95.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.11000E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.60400E-01	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM1 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	18.30123	ON 95011924:	AT (330508.12, 4689514.00, 5.80, 0.00)	GP	POLAR
NEIDL	HIGH 1ST HIGH VALUE IS	6.86277	ON 95011324:	AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR

```
*** ISC3P - VERSION 04269 ***
*** PM10 Modeling NEIDL Short-Term 1996                              ***
*** Model Executed on 02/12/05 at 13:26:56 ***
 Input File - W:\Apps\ISCPRIME\1886\PM10\ST96_96_PM1.DTA

Output File - W:\Apps\ISCPRIME\1886\PM10\ST96_96_PM1.LST

   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos96.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.11000E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.60400E-01	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM1 IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	17.35663c	ON 96082824: AT (329812.62, 4689270.50, 3.40, 0.00)	GP	POLAR
NEIDL	HIGH 1ST HIGH VALUE IS	7.42924	ON 96082324: AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR

```
*** ISC3P - VERSION 04269 ***
*** PM10 Modeling NEIDL Short-Term 1997                                  ***
*** Model Executed on 02/12/05 at 13:27:57 ***
 Input File - W:\Apps\ISCPRIME\1886\PM10\ST97_97_PM1.DTA

Output File - W:\Apps\ISCPRIME\1886\PM10\ST97_97_PM1.LST

   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos97.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.11000E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.60400E-01	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM1 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	15.73466	ON 97072924:	AT (330949.81, 4689769.00, 3.00, 0.00)	GP	POLAR
NEIDL	HIGH 1ST HIGH VALUE IS	6.40872	ON 97022624:	AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR

```
*** ISC3P - VERSION 04269 ***
*** PM10 Modeling NEIDL Short-Term 1998                                  ***
*** Model Executed on 02/12/05 at 13:28:59 ***
 Input File - W:\Apps\ISCPRIME\1886\PM10\ST98_98_PM1.DTA

Output File - W:\Apps\ISCPRIME\1886\PM10\ST98_98_PM1.LST

   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos98.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.11000E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.60400E-01	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM1 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	20.00248	ON 98051024:	AT (329829.12, 4689716.00, 4.00, 0.00)	GP	POLAR
NEIDL	HIGH 1ST HIGH VALUE IS	7.49411	ON 98071424:	AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR

```
*** ISC3P - VERSION 04269 ***
*** PM10 Modeling NEIDL Short-Term 1999                              ***
*** Model Executed on 02/12/05 at 13:30:03 ***
 Input File - W:\Apps\ISCPRIME\1886\PM10\ST99_99_PM1.DTA

Output File - W:\Apps\ISCPRIME\1886\PM10\ST99_99_PM1.LST

   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos99.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.11000E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.60400E-01	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM1 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	21.91377	ON 99050424:	AT (329876.91, 4689347.00, 4.60, 0.00)	GP	POLAR
NEIDL	HIGH 1ST HIGH VALUE IS	6.84930	ON 99062524:	AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR

```
*** ISC3P - VERSION 04269 ***
*** PM10 Modeling NEIDL Annual 1995                                    ***
*** Model Executed on 02/14/05 at 08:15:15 ***
 Input File - W:\Apps\ISCPRIME\1886\PM10\LT95_95_PM1.DTA
Output File - W:\Apps\ISCPRIME\1886\PM10\LT95_95_PM1.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos95.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.36600E-02	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.54000E-02	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF PM1 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	1.91484	AT (330949.81,	4689769.00,	3.00,	0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	1.84902	AT (330854.53,	4689714.00,	4.30,	0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	1.76815	AT (330767.94,	4689664.00,	6.10,	0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	1.73698	AT (330788.84,	4689999.00,	3.40,	0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	1.67917	AT (330015.12,	4689349.50,	5.20,	0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	1.67537	AT (329726.50,	4689434.00,	3.40,	0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	0.10971	AT (329592.19,	4689033.50,	3.00,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.10831	AT (329618.50,	4689007.50,	3.40,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.07929	AT (329619.78,	4689040.50,	3.00,	0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	0.07698	AT (329631.41,	4688968.50,	3.40,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	0.07406	AT (329632.09,	4689028.50,	3.40,	0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	0.07246	AT (329530.50,	4689025.00,	3.00,	0.00)	DC	NA

```
*** ISC3P - VERSION 04269 ***
*** PM10 Modeling NEIDL Annual 1996                                    ***
*** Model Executed on 02/14/05 at 08:16:19 ***
 Input File - W:\Apps\ISCPRIME\1886\PM10\LT96_96_PM1.DTA
Output File - W:\Apps\ISCPRIME\1886\PM10\LT96_96_PM1.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos96.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.36600E-02	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.54000E-02	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8784 HRS) RESULTS ***

** CONC OF PM1 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	1.81888	AT (	330015.12,	4689349.50,	5.20,	0.00)	GP POLAR
	2ND HIGHEST VALUE IS	1.72989	AT (	329260.06,	4688912.00,	4.00,	0.00)	GP POLAR
	3RD HIGHEST VALUE IS	1.70321	AT (	329805.50,	4689397.00,	3.70,	0.00)	GP POLAR
	4TH HIGHEST VALUE IS	1.65828	AT (	329409.19,	4688907.00,	3.00,	44.20)	DC NA
	5TH HIGHEST VALUE IS	1.65168	AT (	329255.50,	4688964.00,	3.70,	0.00)	GP POLAR
	6TH HIGHEST VALUE IS	1.64550	AT (	329726.50,	4689434.00,	3.40,	0.00)	GP POLAR
NEIDL	1ST HIGHEST VALUE IS	0.12153	AT (	329592.19,	4689033.50,	3.00,	0.00)	DC NA
	2ND HIGHEST VALUE IS	0.11889	AT (	329618.50,	4689007.50,	3.40,	0.00)	DC NA
	3RD HIGHEST VALUE IS	0.08518	AT (	329619.78,	4689040.50,	3.00,	0.00)	GP POLAR
	4TH HIGHEST VALUE IS	0.07911	AT (	329632.09,	4689028.50,	3.40,	0.00)	GP POLAR
	5TH HIGHEST VALUE IS	0.07486	AT (	329631.41,	4688968.50,	3.40,	0.00)	DC NA
	6TH HIGHEST VALUE IS	0.06875	AT (	329530.50,	4689025.00,	3.00,	0.00)	DC NA

```
*** ISC3P - VERSION 04269 ***
*** PM10 Modeling NEIDL Annual 1997                                    ***
*** Model Executed on 02/14/05 at 08:17:20 ***
 Input File - W:\Apps\ISCPRIME\1886\PM10\LT97_97_PM1.DTA
Output File - W:\Apps\ISCPRIME\1886\PM10\LT97_97_PM1.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos97.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.36600E-02	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.54000E-02	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF PM1 IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	2.15731 AT (330015.12, 4689349.50, 5.20, 0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	2.10492 AT (329260.06, 4688912.00, 4.00, 0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	2.02621 AT (329255.50, 4688964.00, 3.70, 0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	1.98093 AT (329409.19, 4688907.00, 3.00, 44.20)	DC	NA
	5TH HIGHEST VALUE IS	1.96767 AT (330949.81, 4689769.00, 3.00, 0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	1.91385 AT (329273.59, 4688861.50, 3.70, 0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	0.14343 AT (329618.50, 4689007.50, 3.40, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.12274 AT (329592.19, 4689033.50, 3.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.09075 AT (329632.09, 4689028.50, 3.40, 0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	0.09026 AT (329631.41, 4688968.50, 3.40, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	0.09007 AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	0.08192 AT (329642.09, 4689014.00, 3.40, 0.00)	GP	POLAR

```
*** ISC3P - VERSION 04269 ***
*** PM10 Modeling NEIDL Annual 1998                                    ***
*** Model Executed on 02/14/05 at 08:18:23 ***
 Input File - W:\Apps\ISCPRIME\1886\PM10\LT98_98_PM1.DTA
Output File - W:\Apps\ISCPRIME\1886\PM10\LT98_98_PM1.LST
 Met File - W:\Apps\ISCPRIME\1886\metdata\Bos98.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.36600E-02	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.54000E-02	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF PM1 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	2.00419	AT (	329209.09,	4689164.00,	3.70,	0.00)	GP POLAR
	2ND HIGHEST VALUE IS	1.94481	AT (	330015.12,	4689349.50,	5.20,	0.00)	GP POLAR
	3RD HIGHEST VALUE IS	1.93796	AT (	330949.81,	4689769.00,	3.00,	0.00)	GP POLAR
	4TH HIGHEST VALUE IS	1.90018	AT (	329249.09,	4689221.00,	3.40,	0.00)	GP POLAR
	5TH HIGHEST VALUE IS	1.89615	AT (	329726.50,	4689434.00,	3.40,	0.00)	GP POLAR
	6TH HIGHEST VALUE IS	1.88341	AT (	329805.50,	4689397.00,	3.70,	0.00)	GP POLAR
NEIDL	1ST HIGHEST VALUE IS	0.12866	AT (	329592.19,	4689033.50,	3.00,	0.00)	DC NA
	2ND HIGHEST VALUE IS	0.12319	AT (	329618.50,	4689007.50,	3.40,	0.00)	DC NA
	3RD HIGHEST VALUE IS	0.09691	AT (	329619.78,	4689040.50,	3.00,	0.00)	GP POLAR
	4TH HIGHEST VALUE IS	0.08560	AT (	329632.09,	4689028.50,	3.40,	0.00)	GP POLAR
	5TH HIGHEST VALUE IS	0.08049	AT (	329631.41,	4688968.50,	3.40,	0.00)	DC NA
	6TH HIGHEST VALUE IS	0.07360	AT (	329530.50,	4689025.00,	3.00,	0.00)	DC NA

```
*** ISC3P - VERSION 04269 ***
*** PM10 Modeling NEIDL Annual 1999                                    ***
*** Model Executed on 02/14/05 at 08:19:25 ***
 Input File - W:\Apps\ISCPRIME\1886\PM10\LT99_99_PM1.DTA
Output File - W:\Apps\ISCPRIME\1886\PM10\LT99_99_PM1.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos99.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.36600E-02	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.54000E-02	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF PM1 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	1.97261	AT (	330015.12,	4689349.50,	5.20,	0.00)	GP POLAR
	2ND HIGHEST VALUE IS	1.96197	AT (	330949.81,	4689769.00,	3.00,	0.00)	GP POLAR
	3RD HIGHEST VALUE IS	1.87901	AT (	329260.06,	4688912.00,	4.00,	0.00)	GP POLAR
	4TH HIGHEST VALUE IS	1.77810	AT (	329409.19,	4688907.00,	3.00,	44.20)	DC NA
	5TH HIGHEST VALUE IS	1.76570	AT (	330854.53,	4689714.00,	4.30,	0.00)	GP POLAR
	6TH HIGHEST VALUE IS	1.76505	AT (	329273.59,	4688861.50,	3.70,	0.00)	GP POLAR
NEIDL	1ST HIGHEST VALUE IS	0.12399	AT (	329618.50,	4689007.50,	3.40,	0.00)	DC NA
	2ND HIGHEST VALUE IS	0.12260	AT (	329592.19,	4689033.50,	3.00,	0.00)	DC NA
	3RD HIGHEST VALUE IS	0.08572	AT (	329619.78,	4689040.50,	3.00,	0.00)	GP POLAR
	4TH HIGHEST VALUE IS	0.08330	AT (	329631.41,	4688968.50,	3.40,	0.00)	DC NA
	5TH HIGHEST VALUE IS	0.07949	AT (	329632.09,	4689028.50,	3.40,	0.00)	GP POLAR
	6TH HIGHEST VALUE IS	0.07379	AT (	329530.50,	4689025.00,	3.00,	0.00)	DC NA

```
*** ISC3P - VERSION 04269 ***
*** PM2.5 Modeling NEIDL Short-Term 1995                              ***
*** Model Executed on 02/12/05 at 13:08:53 ***
 Input File - W:\Apps\ISCPRIME\1886\PM2.5\ST95_95_PM2.DTA
Output File - W:\Apps\ISCPRIME\1886\PM2.5\ST95_95_PM2.LST

   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos95.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.90000E-01	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.60400E-01	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM2 IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS 18.30123	ON 95011924:	AT (330508.12, 4689514.00, 5.80, 0.00)	GP	POLAR
NEIDL	HIGH 1ST HIGH VALUE IS 6.19045	ON 95011324:	AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR

```
*** ISC3P - VERSION 04269 ***
*** PM2.5 Modeling NEIDL Short-Term 1996                                  ***
*** Model Executed on 02/12/05 at 13:09:59 ***
 Input File - W:\Apps\ISCPRIME\1886\PM2.5\ST96_96_PM2.DTA

Output File - W:\Apps\ISCPRIME\1886\PM2.5\ST96_96_PM2.LST

   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos96.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.90000E-01	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.60400E-01	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	17.35663c	ON 96082824:	AT (329812.62, 4689270.50, 3.40, 0.00)	GP	POLAR
NEIDL	HIGH 1ST HIGH VALUE IS	6.72808	ON 96082324:	AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR

```
*** ISC3P - VERSION 04269 ***
*** PM2.5 Modeling NEIDL Short-Term 1997                              ***
*** Model Executed on 02/12/05 at 13:11:00 ***
 Input File - W:\Apps\ISCPRIME\1886\PM2.5\ST97_97_PM2.DTA

Output File - W:\Apps\ISCPRIME\1886\PM2.5\ST97_97_PM2.LST

   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos97.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.90000E-01	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.60400E-01	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	15.73466	ON 97072924:	AT (330949.81, 4689769.00, 3.00, 0.00)	GP	POLAR
NEIDL	HIGH 1ST HIGH VALUE IS	5.77385	ON 97062124:	AT (329592.19, 4689033.50, 3.00, 0.00)	DC	NA

```
*** ISC3P - VERSION 04269 ***
*** PM2.5 Modeling NEIDL Short-Term 1998                              ***
*** Model Executed on 02/12/05 at 13:12:03 ***
 Input File - W:\Apps\ISCPRIME\1886\PM2.5\ST98_98_PM2.DTA

Output File - W:\Apps\ISCPRIME\1886\PM2.5\ST98_98_PM2.LST

   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos98.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.90000E-01	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.60400E-01	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	20.00248	ON 98051024:	AT (329829.12,	4689716.00,	4.00,	0.00)	GP	POLAR
NEIDL	HIGH 1ST HIGH VALUE IS	6.72599	ON 98071424:	AT (329619.78,	4689040.50,	3.00,	0.00)	GP	POLAR

```
*** ISC3P - VERSION 04269 ***
*** PM2.5 Modeling NEIDL Short-Term 1999                                  ***
*** Model Executed on 02/12/05 at 13:13:05 ***
 Input File - W:\Apps\ISCPRIME\1886\PM2.5\ST99_99_PM2.DTA

Output File - W:\Apps\ISCPRIME\1886\PM2.5\ST99_99_PM2.LST

   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos99.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.90000E-01	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.60400E-01	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM2 IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS 21.91377	ON 99050424:	AT (329876.91, 4689347.00, 4.60, 0.00)	GP	POLAR
NEIDL	HIGH 1ST HIGH VALUE IS 6.13934	ON 99062524:	AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR

```
*** ISC3P - VERSION 04269 ***
*** PM2.5 Modeling NEIDL Annual 1995                                    ***
*** Model Executed on 02/14/05 at 08:18:42 ***
 Input File - W:\Apps\ISCPRIME\1886\PM2.5\LT95_95_PM2.DTA
Output File - W:\Apps\ISCPRIME\1886\PM2.5\LT95_95_PM2.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos95.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.30700E-02	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.54000E-02	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF PM2 IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	1.91479 AT (330949.81, 4689769.00, 3.00, 0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	1.84897 AT (330854.53, 4689714.00, 4.30, 0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	1.76809 AT (330767.94, 4689664.00, 6.10, 0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	1.73692 AT (330788.84, 4689999.00, 3.40, 0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	1.67890 AT (330015.12, 4689349.50, 5.20, 0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	1.67516 AT (329726.50, 4689434.00, 3.40, 0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	0.10666 AT (329618.50, 4689007.50, 3.40, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.10655 AT (329592.19, 4689033.50, 3.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.07673 AT (329631.41, 4688968.50, 3.40, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.07606 AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	0.07190 AT (329632.09, 4689028.50, 3.40, 0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	0.07170 AT (329530.50, 4689025.00, 3.00, 0.00)	DC	NA

```
*** ISC3P - VERSION 04269 ***
*** PM2.5 Modeling NEIDL Annual 1996                                    ***
*** Model Executed on 02/14/05 at 08:19:30 ***
 Input File - W:\Apps\ISCPRIME\1886\PM2.5\LT96_96_PM2.DTA
Output File - W:\Apps\ISCPRIME\1886\PM2.5\LT96_96_PM2.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos96.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.30700E-02	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.54000E-02	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8784 HRS) RESULTS ***

** CONC OF PM2   IN MICROGRAMS/M**3   **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	1.81858 AT (330015.12, 4689349.50, 5.20, 0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	1.72958 AT (329260.06, 4688912.00, 4.00, 0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	1.70286 AT (329805.50, 4689397.00, 3.70, 0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	1.65737 AT (329409.19, 4688907.00, 3.00, 44.20)	DC	NA
	5TH HIGHEST VALUE IS	1.65134 AT (329255.50, 4688964.00, 3.70, 0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	1.64520 AT (329726.50, 4689434.00, 3.40, 0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	0.11818 AT (329592.19, 4689033.50, 3.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.11734 AT (329618.50, 4689007.50, 3.40, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.08193 AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	0.07710 AT (329632.09, 4689028.50, 3.40, 0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	0.07458 AT (329631.41, 4688968.50, 3.40, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	0.06806 AT (329530.50, 4689025.00, 3.00, 0.00)	DC	NA

```
*** ISC3P - VERSION 04269 ***
*** PM2.5 Modeling NEIDL Annual 1997                                    ***
*** Model Executed on 02/14/05 at 08:20:16 ***
 Input File - W:\Apps\ISCPRIME\1886\PM2.5\LT97_97_PM2.DTA
Output File - W:\Apps\ISCPRIME\1886\PM2.5\LT97_97_PM2.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos97.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.30700E-02	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.54000E-02	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF PM2 IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	2.15702 AT (330015.12, 4689349.50, 5.20, 0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	2.10469 AT (329260.06, 4688912.00, 4.00, 0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	2.02595 AT (329255.50, 4688964.00, 3.70, 0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	1.98020 AT (329409.19, 4688907.00, 3.00, 44.20)	DC	NA
	5TH HIGHEST VALUE IS	1.96762 AT (330949.81, 4689769.00, 3.00, 0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	1.91361 AT (329273.59, 4688861.50, 3.70, 0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	0.14183 AT (329618.50, 4689007.50, 3.40, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.11943 AT (329592.19, 4689033.50, 3.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.08988 AT (329631.41, 4688968.50, 3.40, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.08864 AT (329632.09, 4689028.50, 3.40, 0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	0.08673 AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	0.08134 AT (329642.09, 4689014.00, 3.40, 0.00)	GP	POLAR

```
*** ISC3P - VERSION 04269 ***
*** PM2.5 Modeling NEIDL Annual 1998                                    ***
*** Model Executed on 02/14/05 at 08:21:02 ***
 Input File - W:\Apps\ISCPRIME\1886\PM2.5\LT98_98_PM2.DTA
Output File - W:\Apps\ISCPRIME\1886\PM2.5\LT98_98_PM2.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos98.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.30700E-02	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.54000E-02	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF PM2   IN MICROGRAMS/M**3   **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	2.00394 AT (329209.09, 4689164.00, 3.70, 0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	1.94446 AT (330015.12, 4689349.50, 5.20, 0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	1.93791 AT (330949.81, 4689769.00, 3.00, 0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	1.89994 AT (329249.09, 4689221.00, 3.40, 0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	1.89589 AT (329726.50, 4689434.00, 3.40, 0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	1.88306 AT (329805.50, 4689397.00, 3.70, 0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	0.12487 AT (329592.19, 4689033.50, 3.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.12132 AT (329618.50, 4689007.50, 3.40, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.09294 AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	0.08306 AT (329632.09, 4689028.50, 3.40, 0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	0.08022 AT (329631.41, 4688968.50, 3.40, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	0.07289 AT (329530.50, 4689025.00, 3.00, 0.00)	DC	NA

```
*** ISC3P - VERSION 04269 ***
*** PM2.5 Modeling NEIDL Annual 1999                                    ***
*** Model Executed on 02/14/05 at 08:21:49 ***
 Input File - W:\Apps\ISCPRIME\1886\PM2.5\LT99_99_PM2.DTA
Output File - W:\Apps\ISCPRIME\1886\PM2.5\LT99_99_PM2.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos99.ASC

      Number of sources -         11
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.30700E-02	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.54000E-02	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.13500E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.49000E+00	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.30000E-01	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.12000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.17000E+00	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.30000E-01	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.90000E-01	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.27210E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF PM2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	1.97231	AT (330015.12,	4689349.50,	5.20,	0.00)	GP	POLAR
	2ND HIGHEST VALUE IS	1.96192	AT (330949.81,	4689769.00,	3.00,	0.00)	GP	POLAR
	3RD HIGHEST VALUE IS	1.87870	AT (329260.06,	4688912.00,	4.00,	0.00)	GP	POLAR
	4TH HIGHEST VALUE IS	1.77723	AT (329409.19,	4688907.00,	3.00,	44.20)	DC	NA
	5TH HIGHEST VALUE IS	1.76565	AT (330854.53,	4689714.00,	4.30,	0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	1.76476	AT (329273.59,	4688861.50,	3.70,	0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	0.12239	AT (329618.50,	4689007.50,	3.40,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.11921	AT (329592.19,	4689033.50,	3.00,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.08300	AT (329631.41,	4688968.50,	3.40,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.08234	AT (329619.78,	4689040.50,	3.00,	0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	0.07739	AT (329632.09,	4689028.50,	3.40,	0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	0.07306	AT (329633.19,	4688957.00,	3.40,	0.00)	DC	NA

```
*** ISC3P - VERSION 04269 ***
*** CO Modeling NEIDL Short-Term 1995                                  ***
*** Model Executed on 02/12/05 at 12:42:19 ***
 Input File - W:\Apps\ISCPRIME\1886\CO\ST95_95_CO.DTA
Output File - W:\Apps\ISCPRIME\1886\CO\ST95_95_CO.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos95.ASC

      Number of sources -         12
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.25000E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.67000E+00	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.42300E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.17000E+01	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.35000E+00	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.35000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BHACAM	0	0.20000E+00	328400.0	4689300.0	4.0	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.90000E-01	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.17000E+00	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.26000E+00	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.59280E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BHACAM , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS 172.00298	ON 95092119:	AT (329530.50, 4689025.00, 3.00, 0.00)	DC	NA
NEIDL	HIGH 2ND HIGH VALUE IS 172.00298	ON 95092119:	AT (329530.50, 4689025.00, 3.00, 0.00)	DC	NA

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS 82.84682	ON 95092616:	AT (329530.50, 4689025.00, 3.00, 0.00)	DC	NA
NEIDL	HIGH 2ND HIGH VALUE IS 82.84682	ON 95092616:	AT (329530.50, 4689025.00, 3.00, 0.00)	DC	NA

```
*** ISC3P - VERSION 04269 ***
*** CO Modeling NEIDL Short-Term 1996                                  ***
*** Model Executed on 02/12/05 at 12:43:30 ***
 Input File - W:\Apps\ISCPRIME\1886\CO\ST96_96_CO.DTA
Output File - W:\Apps\ISCPRIME\1886\CO\ST96_96_CO.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos96.ASC

      Number of sources -         12
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.25000E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.67000E+00	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.42300E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.17000E+01	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.35000E+00	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.35000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BHACAM	0	0.20000E+00	328400.0	4689300.0	4.0	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.90000E-01	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.17000E+00	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.26000E+00	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.59280E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BHACAM , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS 175.01637	ON 96072424:	AT (329530.50, 4689025.00, 3.00, 0.00)	DC	NA
NEIDL	HIGH 2ND HIGH VALUE IS 175.01637	ON 96072424:	AT (329530.50, 4689025.00, 3.00, 0.00)	DC	NA

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS 79.72579	ON 96101816:	AT (329512.09, 4689009.50, 3.40, 0.00)	DC	NA
NEIDL	HIGH 2ND HIGH VALUE IS 79.72577	ON 96101816:	AT (329512.09, 4689009.50, 3.40, 0.00)	DC	NA

```
*** ISC3P - VERSION 04269 ***
*** CO Modeling NEIDL Short-Term 1997                                  ***
*** Model Executed on 02/12/05 at 12:44:38 ***
 Input File - W:\Apps\ISCPRIME\1886\CO\ST97_97_CO.DTA
Output File - W:\Apps\ISCPRIME\1886\CO\ST97_97_CO.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos97.ASC

      Number of sources -         12
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.25000E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.67000E+00	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.42300E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.17000E+01	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.35000E+00	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.35000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BHACAM	0	0.20000E+00	328400.0	4689300.0	4.0	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.90000E-01	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.17000E+00	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.26000E+00	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.59280E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BHACAM , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS	170.20432	ON 97050823:	AT (329530.50,	4689025.00,	3.00,	0.00)	DC	NA
NEIDL	HIGH 2ND HIGH VALUE IS	170.20432	ON 97050823:	AT (329530.50,	4689025.00,	3.00,	0.00)	DC	NA

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS	76.61451	ON 97022824:	AT (329530.50,	4689025.00,	3.00,	0.00)	DC	NA
NEIDL	HIGH 2ND HIGH VALUE IS	76.61407	ON 97022824:	AT (329530.50,	4689025.00,	3.00,	0.00)	DC	NA

```
*** ISC3P - VERSION 04269 ***
*** CO Modeling NEIDL Short-Term 1998                                  ***
*** Model Executed on 02/12/05 at 12:45:47 ***
 Input File - W:\Apps\ISCPRIME\1886\CO\ST98_98_CO.DTA
Output File - W:\Apps\ISCPRIME\1886\CO\ST98_98_CO.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos98.ASC

      Number of sources -         12
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.25000E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.67000E+00	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.42300E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.17000E+01	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.35000E+00	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.35000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BHACAM	0	0.20000E+00	328400.0	4689300.0	4.0	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.90000E-01	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.17000E+00	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.26000E+00	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.59280E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BHACAM , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS 174.79674	ON 98082119:	AT (329530.50, 4689025.00, 3.00, 0.00)	DC	NA
NEIDL	HIGH 2ND HIGH VALUE IS 174.79674	ON 98082119:	AT (329530.50, 4689025.00, 3.00, 0.00)	DC	NA

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS 88.10035	ON 98102624:	AT (329530.50, 4689025.00, 3.00, 0.00)	DC	NA
NEIDL	HIGH 2ND HIGH VALUE IS 88.10035	ON 98102624:	AT (329530.50, 4689025.00, 3.00, 0.00)	DC	NA

```
*** ISC3P - VERSION 04269 ***
*** CO Modeling NEIDL Short-Term 1999                                  ***
*** Model Executed on 02/12/05 at 12:47:02 ***
 Input File - W:\Apps\ISCPRIME\1886\CO\ST99_99_CO.DTA

Output File - W:\Apps\ISCPRIME\1886\CO\ST99_99_CO.LST

   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos99.ASC

      Number of sources -         12
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
GENS	0	0.25000E+00	329562.4	4688971.0	3.0	36.88	700.00	44.41	0.43	YES	
BOILERS	0	0.67000E+00	329562.4	4688987.0	3.0	36.88	350.00	15.00	0.70	YES	
NEMC	0	0.42300E+01	329000.0	4689000.0	4.3	51.21	394.26	15.00	0.31	NO	
FCCS	0	0.17000E+01	328700.0	4689200.0	4.1	36.58	416.48	15.00	0.76	NO	
BUMC	0	0.35000E+00	329300.0	4688800.0	3.5	56.08	699.82	15.00	0.31	NO	
BMC	0	0.35000E+00	329300.0	4689100.0	3.0	56.08	333.15	15.00	0.52	NO	
BHALEN	0	0.12000E+00	328400.0	4689100.0	4.5	30.48	522.04	15.00	1.52	NO	
BHACAM	0	0.20000E+00	328400.0	4689300.0	4.0	30.48	522.04	15.00	1.52	NO	
BWSC	0	0.90000E-01	329600.0	4689500.0	3.5	15.24	644.26	15.00	0.61	NO	
MORGAN	0	0.17000E+00	329500.0	4688200.0	4.6	18.29	477.59	15.00	0.61	NO	
MBTA	0	0.26000E+00	329900.0	4689400.0	5.2	7.32	477.59	15.00	0.46	NO	
TRIGEN	0	0.59280E+02	330400.0	4690400.0	3.7	80.77	405.37	15.00	3.51	NO	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	GENS , BOILERS , NEMC , FCCS , BUMC , BMC , BHALEN , BHACAM , BWSC , MORGAN , MBTA , TRIGEN ,
NEIDL	GENS , BOILERS ,

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS 174.38589	ON 99050208:	AT (329530.50, 4689025.00, 3.00, 0.00)	DC	NA
NEIDL	HIGH 2ND HIGH VALUE IS 174.38589	ON 99050208:	AT (329530.50, 4689025.00, 3.00, 0.00)	DC	NA

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 2ND HIGH VALUE IS 79.16931c	ON 99090608:	AT (329512.09, 4689009.50, 3.40, 0.00)	DC	NA
NEIDL	HIGH 2ND HIGH VALUE IS 79.16930c	ON 99090608:	AT (329512.09, 4689009.50, 3.40, 0.00)	DC	NA

```
*** ISC3P - VERSION 04269 ***
*** VOC Modeling NEIDL  1995                                          ***
*** Model Executed on 02/14/05 at 08:59:35 ***
 Input File - W:\Apps\ISCPRIME\1886\VOC\ALL95.DTA
Output File - W:\Apps\ISCPRIME\1886\VOC\ALL95.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos95.ASC

      Number of sources -          4
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
NEIDLLAB	0	0.29000E-01	329573.8	4688976.5	3.0	36.88	298.15	19.87	0.19	YES	
EVANLAB	0	0.29000E-01	329468.6	4688943.0	3.0	36.88	298.15	19.87	0.19	YES	
ELAB	0	0.29000E-01	329500.6	4688909.0	3.0	36.88	298.15	19.87	0.19	YES	
GLAB	0	0.29000E-01	329584.8	4689014.5	3.0	36.88	298.15	19.87	0.19	YES	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	NEIDLLAB, EVANLAB , ELAB , GLAB ,
NEIDL	NEIDLLAB,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF VOC IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)			OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	2.06694	AT (329508.19,	4688904.50,	3.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	1.77305	AT (329592.19,	4689033.50,	3.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	1.61141	AT (329618.50,	4689007.50,	3.40, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	1.53122	AT (329491.22,	4688887.50,	3.00, 0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	1.52767	AT (329478.91,	4688899.50,	3.00, 0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	1.52751	AT (329483.91,	4688929.50,	3.00, 0.00)	DC	NA
NEIDL	1ST HIGHEST VALUE IS	0.61650	AT (329592.19,	4689033.50,	3.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.58788	AT (329631.41,	4688968.50,	3.40, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.54686	AT (329633.19,	4688957.00,	3.40, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.52786	AT (329618.50,	4689007.50,	3.40, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	0.36752	AT (329606.69,	4688931.00,	3.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	0.34084	AT (329619.78,	4689040.50,	3.00, 0.00)	GP	POLAR

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF VOC IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)		OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	6.49122	ON 95021924:	AT (329592.19,	4689033.50, 3.00, 0.00)	DC	NA

```
NEIDL    HIGH  1ST HIGH VALUE IS      2.82199  ON 95122324: AT (  329631.41,  4688968.50,     3.40,     0.00)  DC     NA
```

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*** ISC3P - VERSION 04269 ***
*** VOC Modeling NEIDL  1996                                          ***
*** Model Executed on 02/14/05 at 09:01:47 ***
 Input File - W:\Apps\ISCPRIME\1886\VOC\ALL96.DTA
Output File - W:\Apps\ISCPRIME\1886\VOC\ALL96.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos96.ASC

      Number of sources -          4
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
NEIDLLAB	0	0.29000E-01	329573.8	4688976.5	3.0	36.88	298.15	19.87	0.19	YES	
EVANLAB	0	0.29000E-01	329468.6	4688943.0	3.0	36.88	298.15	19.87	0.19	YES	
ELAB	0	0.29000E-01	329500.6	4688909.0	3.0	36.88	298.15	19.87	0.19	YES	
GLAB	0	0.29000E-01	329584.8	4689014.5	3.0	36.88	298.15	19.87	0.19	YES	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	NEIDLLAB, EVANLAB , ELAB , GLAB ,
NEIDL	NEIDLLAB,

*** THE SUMMARY OF MAXIMUM ANNUAL (8784 HRS) RESULTS ***

** CONC OF VOC IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)			OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	2.39331 AT	329508.19,	4688904.50,	3.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.22388 AT	329592.19,	4689033.50,	3.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	1.92166 AT	329618.50,	4689007.50,	3.40, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	1.83759 AT	329483.91,	4688929.50,	3.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	1.76905 AT	329478.91,	4688899.50,	3.00, 0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	1.70776 AT	329491.22,	4688887.50,	3.00, 0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	0.76172 AT	329592.19,	4689033.50,	3.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.61164 AT	329618.50,	4689007.50,	3.40, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.59797 AT	329631.41,	4688968.50,	3.40, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.53859 AT	329633.19,	4688957.00,	3.40, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	0.43429 AT	329619.78,	4689040.50,	3.00, 0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	0.42505 AT	329605.50,	4689050.50,	3.00, 0.00)	GP	POLAR

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF VOC IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)			OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	8.74727c ON	96111724: AT (	329631.41,	4688968.50,	3.40, 0.00)	DC	NA
NEIDL	HIGH 1ST HIGH VALUE IS	4.44488c ON	96111724: AT (	329631.41,	4688968.50,	3.40, 0.00)	DC	NA

```
*** ISC3P - VERSION 04269 ***
*** VOC Modeling NEIDL  1997                                          ***
*** Model Executed on 02/14/05 at 09:03:52 ***
 Input File - W:\Apps\ISCPRIME\1886\VOC\ALL97.DTA
Output File - W:\Apps\ISCPRIME\1886\VOC\ALL97.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos97.ASC

      Number of sources -          4
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
NEIDLLAB	0	0.29000E-01	329573.8	4688976.5	3.0	36.88	298.15	19.87	0.19	YES	
EVANLAB	0	0.29000E-01	329468.6	4688943.0	3.0	36.88	298.15	19.87	0.19	YES	
ELAB	0	0.29000E-01	329500.6	4688909.0	3.0	36.88	298.15	19.87	0.19	YES	
GLAB	0	0.29000E-01	329584.8	4689014.5	3.0	36.88	298.15	19.87	0.19	YES	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	NEIDLLAB, EVANLAB , ELAB , GLAB ,
NEIDL	NEIDLLAB,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF VOC IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	2.43499 AT (329508.19, 4688904.50, 3.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.24094 AT (329618.50, 4689007.50, 3.40, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.11704 AT (329592.19, 4689033.50, 3.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	1.65973 AT (329491.22, 4688887.50, 3.00, 0.00)	GP	POLAR
	5TH HIGHEST VALUE IS	1.64341 AT (329631.41, 4688968.50, 3.40, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	1.60750 AT (329483.91, 4688929.50, 3.00, 0.00)	DC	NA
NEIDL	1ST HIGHEST VALUE IS	0.71794 AT (329631.41, 4688968.50, 3.40, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.71369 AT (329592.19, 4689033.50, 3.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.69461 AT (329618.50, 4689007.50, 3.40, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.64527 AT (329633.19, 4688957.00, 3.40, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	0.47075 AT (329644.69, 4688981.50, 3.40, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	0.42182 AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF VOC IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	8.22874c ON 97090124:	AT (329592.19, 4689033.50, 3.00, 0.00)	DC	NA
NEIDL	HIGH 1ST HIGH VALUE IS	2.94147 ON 97041124:	AT (329631.41, 4688968.50, 3.40, 0.00)	DC	NA

```
*** ISC3P - VERSION 04269 ***
*** VOC Modeling NEIDL  1998                                          ***
*** Model Executed on 02/14/05 at 09:05:01 ***
 Input File - W:\Apps\ISCPRIME\1886\VOC\ALL98.DTA
Output File - W:\Apps\ISCPRIME\1886\VOC\ALL98.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos98.ASC

      Number of sources -          4
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
NEIDLLAB	0	0.29000E-01	329573.8	4688976.5	3.0	36.88	298.15	19.87	0.19	YES	
EVANLAB	0	0.29000E-01	329468.6	4688943.0	3.0	36.88	298.15	19.87	0.19	YES	
ELAB	0	0.29000E-01	329500.6	4688909.0	3.0	36.88	298.15	19.87	0.19	YES	
GLAB	0	0.29000E-01	329584.8	4689014.5	3.0	36.88	298.15	19.87	0.19	YES	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	NEIDLLAB, EVANLAB , ELAB , GLAB ,
NEIDL	NEIDLLAB,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF VOC IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	2.41858 AT (329508.19, 4688904.50, 3.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.23650 AT (329592.19, 4689033.50, 3.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	1.99990 AT (329618.50, 4689007.50, 3.40, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	1.81876 AT (329483.91, 4688929.50, 3.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	1.80062 AT (329478.91, 4688899.50, 3.00, 0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	1.76402 AT (329491.22, 4688887.50, 3.00, 0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	0.76263 AT (329592.19, 4689033.50, 3.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.66384 AT (329631.41, 4688968.50, 3.40, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.63458 AT (329618.50, 4689007.50, 3.40, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.62207 AT (329633.19, 4688957.00, 3.40, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	0.47914 AT (329619.78, 4689040.50, 3.00, 0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	0.43144 AT (329605.50, 4689050.50, 3.00, 0.00)	GP	POLAR

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF VOC IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	8.86656c ON 98062024:	AT (329468.91, 4688914.00, 3.00, 0.00)	GP	POLAR
NEIDL	HIGH 1ST HIGH VALUE IS	2.99548c ON 98062024:	AT (329512.09, 4689009.50, 3.40, 0.00)	DC	NA

```
*** ISC3P - VERSION 04269 ***
*** VOC Modeling NEIDL  1999                                          ***
*** Model Executed on 02/14/05 at 09:06:13 ***
 Input File - W:\Apps\ISCPRIME\1886\VOC\ALL99.DTA
Output File - W:\Apps\ISCPRIME\1886\VOC\ALL99.LST
   Met File - W:\Apps\ISCPRIME\1886\metdata\Bos99.ASC

      Number of sources -          4
Number of source groups -          2
    Number of receptors -        601
```

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
NEIDLLAB	0	0.29000E-01	329573.8	4688976.5	3.0	36.88	298.15	19.87	0.19	YES	
EVANLAB	0	0.29000E-01	329468.6	4688943.0	3.0	36.88	298.15	19.87	0.19	YES	
ELAB	0	0.29000E-01	329500.6	4688909.0	3.0	36.88	298.15	19.87	0.19	YES	
GLAB	0	0.29000E-01	329584.8	4689014.5	3.0	36.88	298.15	19.87	0.19	YES	

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
ALL	NEIDLLAB, EVANLAB , ELAB , GLAB ,
NEIDL	NEIDLLAB,

*** THE SUMMARY OF MAXIMUM ANNUAL (8760 HRS) RESULTS ***

** CONC OF VOC IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)			OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	2.42465 AT	329508.19,	4688904.50,	3.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.23945 AT	329592.19,	4689033.50,	3.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	1.97412 AT	329618.50,	4689007.50,	3.40, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	1.86151 AT	329483.91,	4688929.50,	3.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	1.75983 AT	329478.91,	4688899.50,	3.00, 0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	1.70475 AT	329491.22,	4688887.50,	3.00, 0.00)	GP	POLAR
NEIDL	1ST HIGHEST VALUE IS	0.77154 AT	329592.19,	4689033.50,	3.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.67077 AT	329631.41,	4688968.50,	3.40, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.63074 AT	329618.50,	4689007.50,	3.40, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.60878 AT	329633.19,	4688957.00,	3.40, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	0.42741 AT	329619.78,	4689040.50,	3.00, 0.00)	GP	POLAR
	6TH HIGHEST VALUE IS	0.42350 AT	329605.50,	4689050.50,	3.00, 0.00)	GP	POLAR

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF VOC IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)			OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	10.52398c	ON 99091524: AT (	329468.91,	4688914.00,	3.00, 0.00)	GP	POLAR
NEIDL	HIGH 1ST HIGH VALUE IS	3.42636	ON 99031024: AT (	329631.41,	4688968.50,	3.40, 0.00)	DC	NA

Appendix 11

Executive Summary
Threat and Risk Assessment

EXECUTIVE SUMMARY

Applied Risk Management (ARM) used a four-step vulnerability assessment methodology as a framework for developing the Threat and Risk Assessment. The steps are as follows:

Step One:	Operational Analysis
Step Two:	Identify Critical Assets
Step Three:	Determine Threats, Countermeasures and Vulnerabilities
Step Four:	Assign an ARM Score and Plot the Scores

Below is a brief description of each step used and the key findings from each step.

Step One – Operational Analysis

Process: This process includes analyzing the facility and developing a detailed understanding of its mission, goals and objectives. In this step, an understanding of the organization's culture is developed, thus allowing the team to balance risk reduction, convenience, financial budgets and customer service.

Step Two – Identify Critical Assets

Process: This step includes a detailed analysis of the critical assets of the organization including people, property, information and credibility. ARM identifies the assets that are most critical to accomplishing the mission of the organization and evaluates the impact that would be created if the assets were damaged or destroyed.

Step Three: Determine Threats, Countermeasures And Vulnerabilities

Process: Step Three is broken down into two parts: determining threats and determining the effectiveness of existing countermeasures.

The team conducts a practical analysis of the threats against the organization based on qualitative, open source data obtained during the survey process and from industry specific analysis. All threats to the system are identified along with the likelihood of a threat occurrence. Threats are defined as acts that may result in undesired consequences and could include intentional acts such as an internal attack by a disgruntled employee, terrorist attack, damage caused by domestic or international organized groups, or vandalism.

Once all threats are identified, existing countermeasures are proposed that mitigate existing vulnerabilities. A review of existing policies, procedures, training and equipment helped to identify countermeasures that are currently providing system security throughout the BUMC Campus.

Step Four: Assign a Vulnerability Assessment Score

Process: Based on data from the initial three steps, the team categorizes the criticality and vulnerability of each asset.

The first step in this process consists of determining a Vulnerability Assessment score (VA) for each asset. The vulnerability score evaluates each asset taking into account many factors, such as how visible or recognizable an asset is as a target, historical threats, disgruntled employee issues, policies and procedures, existing technology used at the facility and other factors.

To determine the vulnerability score, a Threat Assessment score (TA score) and a Countermeasure/Recoverability Assessment (C/RA) score are calculated. The TA score takes into account local threats, outside business and internal threats, asset recognition and historical security issues. The C/RA score takes into account the existence of written policies and procedures, physical barriers that deter, delay and prevent security related incidents, human elements such as trained employees that prevent and respond to security related incidents, technological devices such as access control and intrusion alarm systems, and system redundancy.

The VA score is calculated as the difference between the TA score and C/RA score, which reflects the balance of threats against an asset as compared to the amount of countermeasures available to protect the asset. If the amount of countermeasures exceeds the amount of potential threats, the VA score will be low. Conversely, if there are few countermeasures in place and the threat potential is high, the VA score will be high.

The VA score is given as a grade designation from "A" through "D" where an "A" is given as a minimal vulnerability rating and a "D" is given as a highly vulnerable

Conclusion

The assessment team has conducted a thorough analysis of the risk and vulnerability of the planned BUMC National Biocontainment Laboratory. Throughout the process many factors, issues, and solutions have been introduced by the ARM team, BUMC team and others working on the project in an effort to create the most secure facility possible.

Based on the conclusions, the following synopsis has been developed:

- **Structures**: Structures have a minimal vulnerability score due to the extensive countermeasures planned. The various technologies used to protect the structures takes into consideration a multitude of threats.
- **BSL-4 Space**: BSL-4 space have a minimal vulnerability rating, and select agents have a low vulnerability category due to the potential associated with human interaction. The countermeasures planned for authorized access into

the laboratory is comprehensive and uses state –of- the- art technology to protect the extremely vital assets.

- **BSL-3 Space**: Similar to BSL-4 assets, the select agents are in the low vulnerability rating, while BSL-3 space has a minimal vulnerability. The countermeasures planned are similar in nature to the above grouping, and are well planned and designed.
- **Supporting Infrastructure:** All the assets in this group have been rated in the minimal vulnerability category. BUMC has developed excellent redundancy in its major systems; the planned coordination with city utilities and services will assure the most negligible of impacts during an emergency; the removal of waste, water and bio-hazardous materials is well thought out; the building automation system is designed to protect those inside in a well maintained environment; and exhaust systems and air handlers will protect those outside the facility through well designed engineering and technology.
- **Intangible Assets:** All intangible assets, including reputation, cost of lost research time and the like rated highly critical to the mission of the project or BUMC, and have a minimal vulnerability. These resources, although impossible to physically touch, have perhaps the most far-reaching impact on the future and success of the organization. With all of the planned countermeasures in place as defined in the body of this report, this group of assets will remain secure.

In the post-9/11 world, security and safety have new meanings. New threats emerge and new dangers frequently present themselves. As such, up-to-the-minute countermeasures, innovative ways of thinking and "outside the box" solutions must be created to combat these threats.

In ARM's assessment of the facility, it was found that because of its mission, there are potentially dangerous external threats. However, the project has been designed and planned to incorporate strong countermeasures to mitigate these threats. The Public Safety Department of BUMC, because of its existing mandate to react to city-wide emergencies, has many security procedures, contingency plans and extensive knowledge already at hand. They have identified many external and internal risks and are actively taking steps to diminish them.

In the assessment process a multitude of concerns were raised from the community related to the construction and operation of this facility, both due to the potential for release of a biological agent and the potential for attack by external forces. It is encouraging to observe local community involvement in a project that could have far reaching implications. At the same time, one of the beneficiaries of the existing and planned defenses mentioned above is the surrounding community. BUMC management is keenly aware of the impact that the project engenders, and throughout this assessment, BUMC has kept the wellbeing of the community at the forefront of the process. BUMC has been active in community meetings and local

discussions about the project, and will continue to promote an open dialog with those impacted by this project.

Although BUMC is moving appropriately in the design and fulfillment of the NBL mission, it is necessary to see the planned countermeasures to fruition to reap the benefits of the desired results. Additionally, regular assessments such as this one, both planned and surreptitious, should be the conducted regularly to keep those involved thinking and acting “out of the box” and mindful toward the future.

Appendix 12

BUMC/NEIDL RISK ASSESSMENT
SEPTEMBER, 2005

BUMC/NEIDL
Risk Assessment

For the

National Institutes of Health
Division of Occupational Health and Safety
Bethesda, Maryland

Prepared by **CDIC, Inc.**

Consultants in Disease and Injury Control
Atlanta, Georgia USA

September 2005

Table of Contents

Tables and Figures

Section

1 Executive Summary

The "maximum possible risk" (MPR) model is used to assess risk of release of pathogens from the proposed biosafety level 4 (BSL-4) bio-containment laboratory at Boston University Medical Center, National Emerging Infectious Diseases Laboratory (BUMC/NEIDL). The MPR model considers reasonably foreseeable errors of behavior, including human performance and mechanical system failure. At each possible risk-defining point through a release event, the worst-case possibility is used for the analysis. The intent is an over-statement of risks, to assure a safety-margin in precautions and strategies for risk control.

Prior work at the National Institutes of Health (NIH) for similar BSL-4 facilities established that the worst-case event within the scope of human error and mechanical failure is the release of anthrax spores to the environment, because unlike most viruses and bacteria, these spores can withstand the conditions of release and survive for long periods outside a laboratory or animal host. Also, these spores are considered the highest classification of bio-terrorism agent (Category A Select Agent) in the U.S. The Centers for Disease Control and Prevention (CDC) has determined that, second to smallpox (which is restricted in its possession and use by international agreements), anthrax poses the greatest real and perceived public health risk if used as a weapon, or through accidental release.

Accordingly, the maximum possible risk model used to evaluate the BUMC/NEIDL is consideration of an aerosol release of anthrax spores in the respirable particle size range.

The risk assessment model ensures a comprehensive analysis while taking into account unique factors of this particular laboratory, including its urban location. Various scenarios illustrating filtration failure, human error, breaches of security, and ambient wind speed and direction are evaluated.

A quantitative dispersion model is applied, which captures the likelihood of human exposure to a potentially pathogenic dose of *Bacillus anthracis* spores at various neighborhood points near the laboratory. Tabular and schematic results of this quantitative analysis are reported herein.

The risk assessment demonstrates that the BUMC/NEIDL design and operations plan will be sufficient to prevent harm to the public from release of infectious agents from the facility under conditions described in the scenarios presented. Anthrax spores were used as the worst-case modeling agent. By extension, since other agents represent lower risk of a biological release/hazardous exposure, building and operating the BSL-4 facility will not cause an appreciable addition of risk of harm to the public health.

Section

2 Introduction

2.1 Scope

A commonly used risk assessment model developed by the U.S. Military is based on a concept of "maximum credible event" or MCE (DOD, 1993). For the BUMC/NEIDL Risk Assessment, a more cautious approach of "maximum possible risk" (MPR) is used. This approach bypasses the issue of what is credible and what is not. The more extreme scenarios modeled here are *not* credible; they are barely conceivable, but "barely conceivable" is consistent with the environment of risk assessment since the attack of 9/11/01 in the U.S.

According to the classical definition of risk, the risk of a potentially harmful event incorporates the probability of the event and how great the impact (loss or cost) of that event would be if it does occur. Mathematically, the risk of a potentially harmful event is the product of probability and impact:

Risk (public health harm) = Probability (harmful spore release) * Impact

The total risk of an action (or inaction) is the sum of the risk of the different potentially harmful events that might follow the action.

For example, not carrying an umbrella on a day with ten percent chance of rain is not considered unreasonably risky because the impact of getting wet is not too severe. Conversely, the general lack of protection against meteorites is justified because the probability of being hit by a meteorite is quite low, even though the impact might be quite severe. For the rain example, the risk is low because he impact is low; for the meteorite, the risk is low because the probability is low.

If one or more potentially-harmful events have probability and impact that are both nonzero, the action is a risky one and it becomes necessary to weigh the level of risk against the benefits expected and the risks and benefits of alternative actions. In choosing between two actions, we must also include the product of the benefits of possible beneficial outcomes times the probability of those beneficial outcomes in the sum, along with the certain financial and other costs of the actions (including risk countermeasures). This presents an additional complication of measuring benefits, financial costs, and possible harm all on a common scale, which makes risk-benefit analysis far more complex than simple risk analysis.

On the other hand, if the action (in this case, building and operating the BUMC/NEIDL) includes sufficient countermeasures to reduce the probability and/or the impact of each potentially harmful event to zero, there is no need to attempt the extremely questionable exercise of

establishing an "acceptable" level of risk -- in effect, the acceptable level can be considered to be zero.

Given the normal operating procedures of the lab, a worst-possible release event for quantitative risk assessment is an aerosol release of biological material through the stack due to a mishap in the laboratory.

The only harmful impact considered in this report is for a pathogenic concentration of anthrax spores reaching the surrounding community. In the absence of such a harmful spore release, there is no public health impact (loss or cost). For the purposes of this report we are relying on the most cautious published evidence, which suggests that the pathogenic level is greater than 500 spores breathed over an 8-hour period (Brachman PS, 1966).

The minimum human infectious dose of anthrax spores is not known, though sources cite between 8,000 to50,000 spores (Albrink 1959, Brachman 1980). Another source suggests that the pathogenic level is achieved from respiration of greater than 500 spores (Brachman 1966). In addition, the identity of the bacterium strain and the influence of host factors on this infectious dose are not completely understood. An MPR approach suggests use of 500 spores as a potentially dangerous level, but clearly this could include a safety margin of as much as two orders of magnitude.

An at-rest respiration rate is about 12 liters/minute for a healthy adult. To put this in perspective, a concentration of 1 spore per liter, breathed for about 40 minutes, would accumulate to 500 spores. The settling time for spores is considerably less than 40 minutes, while additional dispersion would be occurring all the time.

The concentrations presented in the MPR model assume instant saturation to various target points. In reality, there would be further dispersion, and thus further reduction of concentration.

2.2 Anthrax

Bacillus anthracis (anthrax) is a gram-positive, spore-forming bacillus that can cause acute infections in both animals and humans. It is primarily a disease of herbivores, which acquire infection after coming in contact with soil-borne spores. In spore form, the organism can persist in the environment for years; the distribution of anthrax is worldwide.

With regard to laboratory safety, there are four forms of anthrax, each entailing its own level of risk to the laboratory worker and the environment. The four forms are vegetative bacteria, naturally-occurring spores, technical powder (which is simply concentrated natural spores), and enhanced spores which constitute the bio-weapon.

Anthrax bacteria exist primarily as vegetative bacteria, living either within a host or in culture in a laboratory. Cultures are generally either liquid medium in a flask, or agar plates with bacterial colonies. In vegetative form, anthrax bacteria are typically not resistant to standard decontamination methods. The bacteria can easily be killed using chemical disinfectants (bleach, iodine, etc.) or by autoclaving. Since anthrax bacterial cultures are not prone to aerosolization,

the primary safety concerns are spills that create low-level transient aerosols or infectious droplets, or accidental self-inoculation. Liquid droplets from splashes generally do not travel far and, as stated above, can be easily decontaminated.

Under certain conditions, anthrax bacteria form spores. These spores are resistant to desiccation and chemical/heat decontamination. If released, these spores can remain airborne for some time, creating a risk of aerosol exposure. Therefore, anthrax spores are considered to be a much higher safety risk for laboratory workers than vegetative bacterial cultures of the same organism.

Anthrax spores can be "enhanced" for the purposes of biological warfare or terrorism. These spores are also called "weaponized" or "energetic." This process involves taking anthrax spores and treating them with chemical additives. These additives can reduce the effect of static charges on the spores, making them resistant to sticking or clumping. This allows the spores to remain airborne for much longer periods of time. Additives can also reduce the spore's susceptibility to UV light and disinfection. Enhanced spores represent the highest level of laboratory hazard, and the greatest potential for public health risk if released from the laboratory.

However, the BUMC/NEIDL will be doing NO bioweapons research. Accordingly, the spores considered for analysis of public health impacts are the natural spores, or technical powder. Furthermore, the highest concentration of a technical powder of surrogate anthrax spores (*B.subtilis*) that could be achieved by the NIH was 7×10^{11} per gram; thus this is used as a "worst possible case" concentration of anthrax spores for purposes of this risk assessment.

Section 3 Methods, Assumptions, Analytical Framework

3.1 Materials Reviewed

NIH provided the following materials to be reviewed:

- Civil, Landscape, Architectural, and Mechanical drawings for the BUMC/NEIDL, 70% construction documents submittal
- Supplemental Draft Environmental Impact Statement, March 2005
- CDC Emerging Infectious Diseases List
- Report Summary "Public Health Assessment of Biological Terrorism Agents"
- NIAID Bio-defense Research Agenda for CDC Category A Agents
- NIAID Bio-defense Research Agenda for CDC Category B and C Agents

Additional reference materials are listed in the Bibliography.

3.2 Dispersion of Spores

In order to better understand spore dispersion that could occur as a result of a laboratory accident or mechanical failure, NIH conducted a series of experiments designed to determine dispersion potential of *B. subtilis* spores as a surrogate for anthrax spores.

3.2.1. Static Aerosol Chamber:

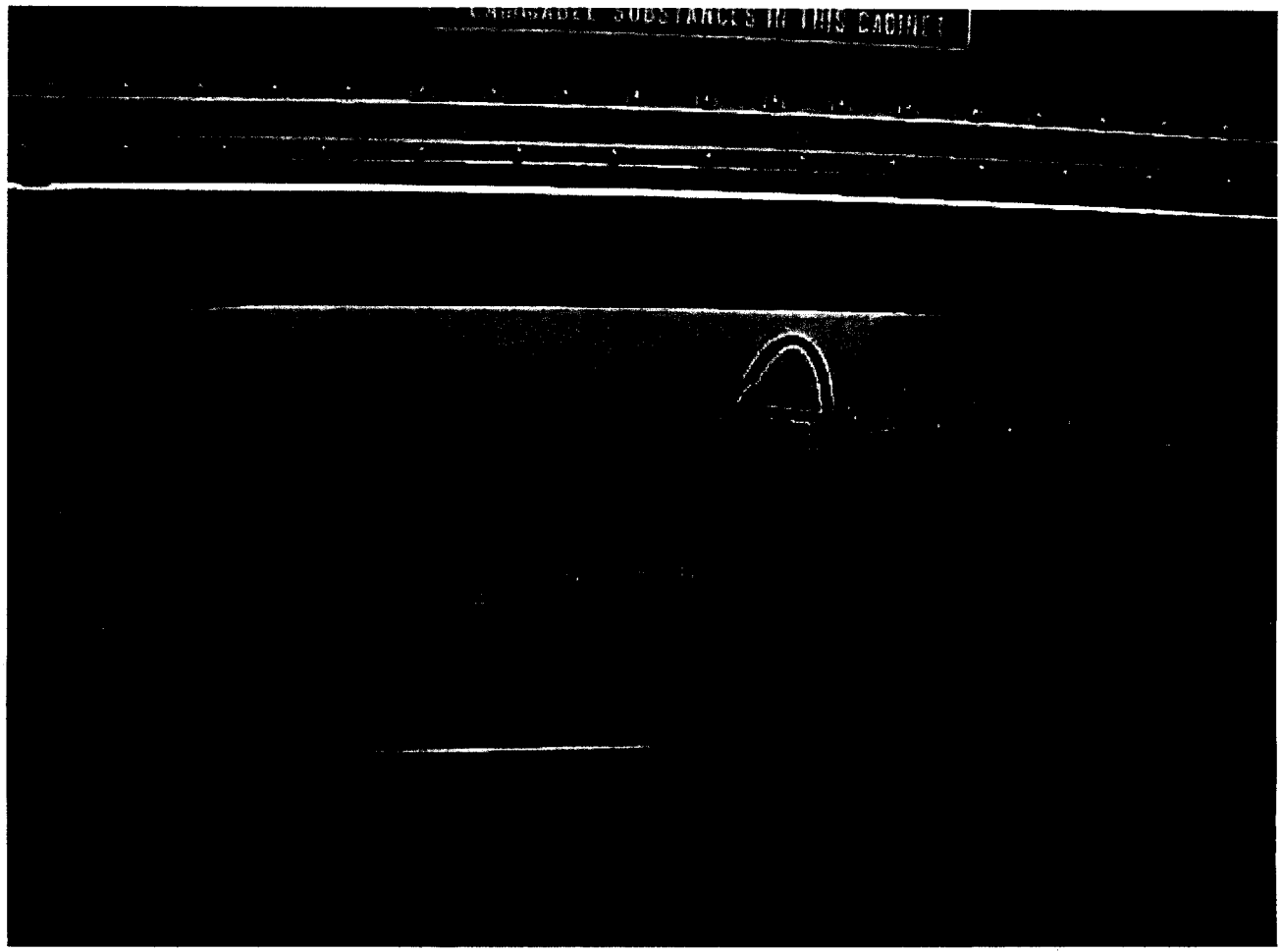
A modified Henderson apparatus (11" x 11.2" x 18") was used to model an accidental laboratory release. The chamber was oriented so that sampling ports and main hatch entry on the surface were parallel to the laboratory bench, the chamber exhaust was attached to house vacuum protected by a HEPA filter. The aerosol generator port and annular ring were sealed and not used in this set of experiments. The pressure relief port on the apparatus was also protected by a HEPA filter, to provide make up air when the chamber was placed under vacuum to clear aerosols from the chamber in between experimental runs and between releases of spore preparations. In between each accidental aerosol release experiment, the chamber was washed, decontaminated with bleach solution, and dried with an alcohol wash. The experiment was repeated 19 times.

3.2.2. Procedure for Release of Aerosols within the Chamber:

Sampling ports on either side of the main chamber hatch were used to insert the sampling probes from 2 particle counters. One counter was calibrated to count and determine the total number of

particles within the respirable range of man (0.3 – 10.0 microns). The other port was fitted with a probe sampling total particles generated. Background measurements were obtained prior to "accidental" release of the spores. A spore preparation contained in a 15 cc conical bottom Falcon tube with the cap loosened and simply sitting on the tube was held parallel to the bench and dropped into the chamber from a height of 15 inches, just at the height of the open hatch. The gasketed hatch was fitted into place as soon as the drop was accomplished. Particle counting was begun prior to the "drop" to establish background, and continued for as long as it took to stabilize at, or close to, zero particle counts after the "drop". The chamber was held static during background and test sampling. A photograph of the laboratory apparatus and set-up is depicted in Figure 1.

Figure 1. Laboratory Apparatus in the Biological Safety Cabinet.



3.2.3. Results:

The lab-based "drop studies" were used to generate data for the fraction of respirable spores which are released when a known quantity of technical powder is spilled. For a fixed-quantity

release of material, a number of trials were made, resulting in different measurements of the respirable spore count from the fixed number of total spores. That is, there was either inherent variance in the fraction of respirable spores present in a given number of total (all size) spores, or there was variance in the measurement technique. Either way, enough trials were made to establish a mean and standard deviation of the observed number of respirable spores.

Nineteen replications of the drop study were performed using technical powder in a 1.2-cubic foot space. For each replication, an upper bound for the total number of respirable spores was calculated as (respirable particles < 0.3 microns minus >10 microns). Since the size of the test chamber was 1.28 cubic feet, the total number of respirable spores was 1.28 x concentration of spores per cubic foot.

The mean upper bound based on 19 replications was 319,703 particles, with standard deviation 155,950 particles. In order to ensure a totally reliable upper bound for the number of respirable particles, six times the standard deviation ("six sigma") was added to the mean, leading to a worst-case release of 1,255,396 of respirable particles from one gram of technical powder.

Applying the MPR modeling strategy to the respirable spore issue suggests application of the quality-based "six-sigma" approach. Six-sigma corresponds to a value which is six standard deviations above the mean value. This means that the actual number of respirable spores will be less than 1,255,396 of the 700 billion total spores, 99.9999999 % of the time. In other words, there is one chance in a billion of getting this many *respirable* spores dispersed from a release of the total number of 700 billion spores; or the probability that 1.255 million respirable spores (or more) would be released is <0.000000001.

Additionally, in these experiments, 90% of respirable spores settled out of the air in the test chamber in 1 minute, and 99% in 2 minutes.

3.3 Weight of Evidence (WoE)

Measurement of probabilities is not realistic for many of the scenarios developed. While it might be possible to use historical lab-safety data to compute the probability of a spill, it is quite impossible to compute the probability of any type of deliberate attack or sabotage. Accordingly, classical loss-function modeling is not applicable.

An integrated Weight-of-Evidence (WoE) approach is used instead, which allows application of data (where these data exist), scientific literature, pathogenesis information, infective dose, and transmissibility, as well as less tangible risk information such as heightened general public awareness and concern. These factors are presented in Table 1.

TABLE 1: COMPARATIVE HAZARD RANKINGS OF *B. anthracis* PREPARATIONS

RANK CRITERIA	*ENHANCED*	*TECHNICAL POWDER*	LIQUID SPORE SUSPENSION	VEGETATIVE BACTERIA
Public Health Hazard				
Disease Morbidity				
Cutaneous	High	Moderate	Low	Low
Respiratory	High	Moderate	Low	Negligible or None
Disease Mortality				
Cutaneous	Low	Low	Low	Negligible or none
Respiratory	Moderate	Low	Low	Negligible or none
		Environmental Hazard		
Dissemination	None*	Moderate	Low	None
Transmissibility	None	None	None	None
		Other Considerations		
Potential for Large Scale Dissemination from Building	None*	None	None	None
Heightened General Public Awareness	High	High	High	Moderate

* Based on the fact that work with "enhanced anthrax spores," a bioweapon, will never be conducted at BUMC/NEIDL.

WoE methodology is a semi-quantitative method. Evidentiary data is collected from both scientific and non-scientific sources such as (a) experimental data, (b) number of experts having a particular view, (c) number of hits on a particular Internet search, (d) number of lines or minutes of news coverage, etc. These inputs are categorized and grouped in a comparable way to produce a Weight-of-Evidence scale, with values such as "++++" for extreme or much, and "++" for moderate or fair. The defining element is that some not-very-precise quantitative observation (evidence) is translated into English-language descriptions of risk which can be ranked. It does *not* mean that four pluses is twice as risky as two pluses, or that "extremely" is twice as risky as "moderately."

Considering the magnitude of aerolized particle concentrations elucidated in this series of experiments, and the time required for "settling" of the particles in the experimental chamber,

qualitative measures of relative hazard potential were assigned to each spore or bacterial preparation. These qualitative values are presented in Table 2.

Table 2. Relative Hazard Potential Determined in Laboratory Tests for Various *B. subtilis* (anthrax surrogate) Preparations

ANTHRAX (SURROGATE) PREPARATION	HAZARD POTENTIAL
Concentrated, enhanced spores	++++
Technical powder	++
Technical powder in suspension	+
Vegetative bacteria on sheep blood agar	+/-

3.4 Assumptions in Building the Risk Assessment Model

In keeping with the concept of "maximum possible risk," simplifying assumptions are made which are more unfavorable than analogous "credible" assumptions. This approach makes calculations in the model easier to understand by eliminating complex turbulence/dispersion estimations or assumptions. The purpose of the model is not accuracy; still less is it to give an "unbiased estimate" because it is virtually impossible to accurately calculate fluid dynamics outside of precisely engineered environments such as airplane wings, internal combustion engines, and oil pipelines. Instead, dispersion patterns are assumed that are certain to deliver more pathogens to a given location than any dispersion pattern that could happen in the real world. This gives extra confidence that the actual risks are less than the risks that are calculated and presented in the risk analysis.

3.4.1 Assumption that Respirable Spores do not Clump or Settle to the Ground.

Reality: NIH simulated laboratory accident release studies in still air indicated that 90% of released spores had settled in 1 minute, and 99% in 2 minutes. Outside the laboratory, wind might re-entrain spores, but grass, foliage, and other surface features would counter this by entrapping spores more efficiently than a smooth surface. Impaction and spore retention in duct work and on building surfaces also reduce the number of respirable spores released from the lab in any scenario.

Net Effect: This assumption will cause the model to overstate the hazard.

3.4.2. Assumption that Particles are Uniformly Distributed Throughout the Dispersion Pattern.

Reality: Particles may be systematically concentrated nearer the release point, leading to lower transient peak concentrations away from the stack. Turbulent eddies will produce small parcels of concentration higher or lower than the model.

When the leading edge of the plume reaches a specified distance from the release point, the concentration of particles is below what it would be under a uniform distribution. Closer to the center of the plume, the concentration reaches a maximum that is higher than what it would be under a uniform distribution.

If the wind speed is low, the region of high concentration will have dispersed to a lower concentration by the time it reaches the specified distance. If the wind speed is high, each breath taken by an exposed person will contain air from various portions of the moving plume so the effective exposure is no more than that implied by a uniform distribution.

Net Effect: This assumption may cause the model to overstate the hazard but will certainty not cause the model to understate the hazard.

3.4.3. Assumption of Cone Dispersion Geometry.

The cone dispersion pattern is a simple model of the dispersion of pathogens into the surrounding environment following a laboratory release. The MPR risk assessment model is based on a series of geometric assumptions. The basic principle is that released spores disperse uniformly inside the specified shape for the given scenario. All shapes assume that spores travel from the dispersion point on, in, or near the building directly toward the perimeter of the campus, spreading into a cone, half-cone, or sphere, before falling to the ground.

In the cone model, there is a wind that confines the pathogens to the "forward" direction. If the release point is high above the ground and there is no turbulence, the pathogens disperse in a conical pattern. At a distance from the release point depending on its height and the cone's opened angle, the pathogens encounter the ground. In a real incident, many of them would remain on the ground and pose no further inhalation threat; however, to be sure of overstating risk, we assume all pathogens are "reflected" from the ground back into the cone, leading to a concentration of pathogens twice that of the simple cone.

In the cone model, the release point is treated as if it were at ground level, the worst possible height given the assumption that no pathogens remain on the ground.

In a very light wind, pathogens would disperse broadly before they were carried far from the release point, leading to a wide opening angle and thus a low concentration of pathogens per cubic meter at a given downwind location. The pathogens would be well confined to this wide cone due to low turbulence.

In a stronger wind, the basic cone would open at a narrower angle. In the absence of turbulence, this would lead to a higher concentration of pathogens at a given downwind location. However, higher wind speed produces greater turbulence, which would blow pathogens outside the basic cone, leading to a wider equivalent opening angle and lower concentrations.

Net Effect: This assumption will cause the model to overstate the hazard.

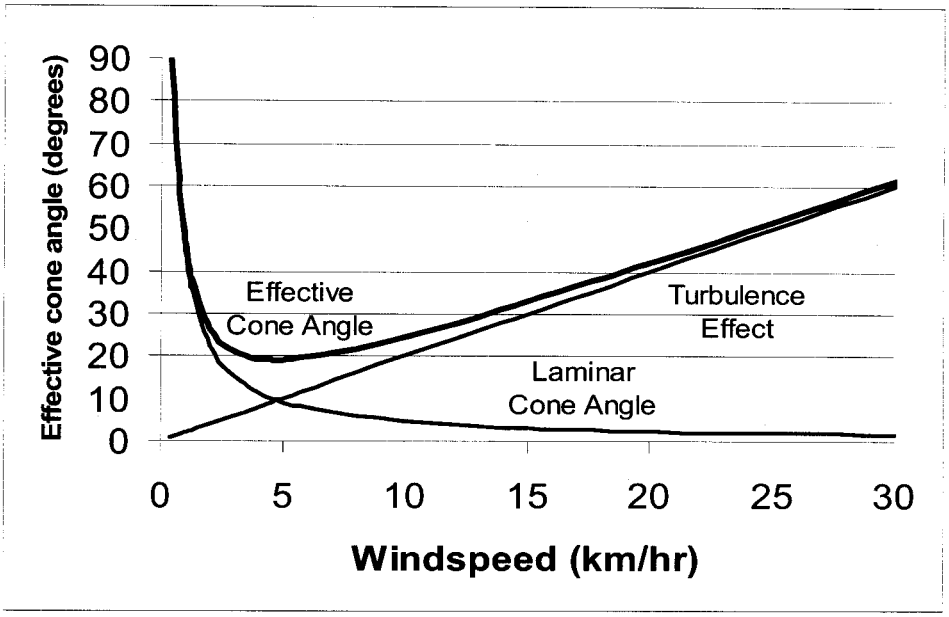
3.4.4. Assumptions of Wind Speed and Direction.

The theoretical worst-case scenario is release of spores to the environment via the normal exhaust stack. There is a matrix of possible outcomes associated with wind speeds and directions. The plume would move in accordance with the prevailing wind and gradually spread; in the absence of turbulence, the spread would be narrower in a strong wind and wider in a light wind.

A full 360-degree range of potential directions was evaluated; the worst-case dispersion spread determined by the wind speed was calculated to be 19 degrees. The worst-case direction would be toward the closest potentially-populated areas such as the parking garage, or less-proximate but more-populated areas such as buildings across Albany Street. Figure 2 shows cone opening angle as a function of wind speed. The lower curve is the turbulence-free cone angle. The effect of turbulence is conservatively estimated as a linear increase in cone angle of three degrees per kilometer per hour. Note that the actual effect of turbulence is strongly nonlinear, the rate increases as wind speed increases. The "extra" degrees of cone angle are shown by the straight line, and the upper curve is the effective cone opening angle as a function of wind speed taking turbulence into account.

A gradual expansion of the spore plume is the net effect of (a) the laminar flow in the direction of the wind and (b) turbulence which would naturally occur around the edges of the dispersion. The tradeoff between straight-line dispersion and spreading-out dispersion creates a mathematical minimum (represented by the low point in the net-effect curve on the plot) at a cone-angle of 19 degrees, which therefore represents the worst-case cone angle in terms of spore concentration in the environment.

Figure 2. Windspeed and Cone Angle



3.5. The Quantitative Risk Assessment Model

3.5.1. MPR Model Calculations

Quantitive inputs to the MPR model include the total number of spores released; number of spores in the respirable fraction (0.3 to 10 microns); the high efficiency particulate air (HEPA) filtration efficiency of 99.97% of the aerosolized particles; angle of cone, and distance to a target exposure point.

For all scenarios, the total spores per vial is 700 billion (7×10^{11}); the number of vials involved in the incident is one; the respirable fraction of spores is 1.255 million of the 700 billion total spores; the exposure "target" is taken from the architectural drawings of the site plan.

3.5.2. The Basic Risk Model for Each Theoretical Scenario:

a. A release point is assumed - For the spills, it is the top of the building exhaust stack. For the criminal releases, it is the drop point, such as the vials thrown off the roof (open already), or the vials dropped and breaking on the sidewalk. For the explosions, it is the center of the lab.

b. A dispersion pattern is chosen that is both simpler and more restrictive than credible, actual dispersion patterns. For all but the explosions it is a cone or half-cone emanating from the release point, as if the worst possible wind pattern is at play. For the high releases, e.g., an exhaust stack, it is a full cone; for the low ones, such as breakage on the sidewalk, it is a half cone. For the explosions, it is a sphere - dispersion in all directions (including downward into the ground).

c. Upper bounds for the total number of spores per vial and the total number of vials involved in the simulated incident are determined and input to the model.

d. The number of filtrations the "cloud" of released spores would undergo in the presented scenario is input into the model.

e. An analysis of the scenarios as they would occur in a BSL-3 laboratory is included to provide reference for the countermeasures (filtrations) employed. The main difference between the BSL-3 and BSL-4 analyses is that there is an additional HEPA filter in BSL-4 building exhaust systems.

3.6 Scenarios

SCENARIOS DEPICTING SPILLS AND WORK DISRUPTION

1. Spill in BSC. A researcher is working within a Class 2 Biological Safety Cabinet (BSC) that is ducted and located within a Biosafety Level 4 (BSL-4) laboratory. He is handling a 15 cc conical tube containing a powder-like preparation of purified anthrax containing 7×10^{11} spores. The cap fits loosely. *The researcher accidentally drops the tube on the bare, stainless steel surface of the properly operating BSC.* The cap comes off of the tube upon impact and a visible "cloud" of spores is released within the cabinet.

The cabinet is exhausted through a dedicated HVAC system for the BSL-4 laboratory that contains a properly seated and gasketed high efficiency particulate air (HEPA) filter. The BSC is ducted through a manifold with the other BSCs in the BSL-4 laboratories located in the laboratory building.

What is the potential for release of anthrax spores to the outdoor environment?
What is the probability of public health harm.

2. No Filter in HVAC. A researcher is working within a Class 2 Biological Safety Cabinet (BSC) that is ducted and located within a Biosafety Level 4 (BSL-4) laboratory. He is handling a 15 cc conical tube containing a powder-like preparation of purified anthrax containing 7×10^{11} spores. The cap fits loosely. *The researcher accidentally drops the tube on the bare, stainless steel surface of the properly operating BSC.* The cap comes off of the tube upon impact and a visible "cloud" of spores is released within the cabinet.

The cabinet is exhausted through a dedicated HVAC system for the BSL-4 laboratory. However, *the HEPA filter was accidentally left out of the filter housing in the building HVAC system.* The BSC is ducted through a manifold with the other BSCs in the BSL-4 laboratories located in the laboratory building.

What is the potential for release of anthrax spores to the outdoor environment?
What is the probability of public health harm?

3. **Spill on Floor; No HVAC Filter.** A researcher is working within a Class 2 Biological Safety Cabinet (BSC) that is ducted and located within a Biosafety Level 4 (BSL-4) laboratory. He is handling a 15 cc conical tube containing a powder-like preparation of purified anthrax containing 7 x 10^{11} spores. The cap fits loosely. *The researcher accidentally drops the tube on the floor of the BSL-4 laboratory.* The cap comes off of the tube upon impact and a visible "cloud" of spores is released within the laboratory room.

The cabinet is exhausted through a dedicated HVAC system for the BSL-4 laboratory. However, *the HEPA filter was accidentally left out of the filter housing.* The BSC is ducted through a manifold with the other BSCs in the BSL-4 laboratories located in the laboratory building.

What is the potential for release of anthrax spores to the outdoor environment?
What is the probability of public health harm?

SCENARIO DEPICTING SAFETY SYSTEM FAILURE

4. Spill on Floor; Power Outage. A researcher is working within a Class 2 Biological Safety Cabinet (BSC) that is ducted and located within a Biosafety Level 4 (BSL-4) laboratory. He is handling a 15 cc conical tube containing a powder-like preparation of purified anthrax containing 7 x 10^{11} spores. The cap fits loosely. *The researcher accidentally drops the tube on the floor of the BSL-4 laboratory.* The cap comes off of the tube upon impact and a visible "cloud" of spores is released within the laboratory room. *At this exact moment, the building is struck by a major electrical outage and the HVAC system fails.*

What is the potential for release of anthrax spores to the outdoor environment?
What is the probability of public health harm.

SCENARIOS DEPICTING PHYSICAL REMOVAL OF BIOLOGICAL MATERIAL

5. Accidental; Spill Outside on Sidewalk. *An employee removes a* 15 cc plastic conical *tube of dry anthrax spores* (clean, washed, spores dried and in powder form) from the laboratory in his pants pocket. He leaves the building through the main entrance. When he reaches the outdoors, he removes the tube from his pocket *and accidentally drops it on the sidewalk.* The cap flies off the tube and a plume of spores is released into the air.

What is the probability of public health harm?

6. Criminal Trespass and Occupation of Building. Six radical activists dressed in dark clothing and carrying weapons enter the BUMC Campus late one night by climbing over the perimeter fence. They had read information on a web site that led them to believe that a large amount of anthrax was produced and stored in BUMC/NEIDL. Their plan was to gain control of the anthrax and take hostages until the University agreed to release all the nonhuman primates

housed in its laboratories. If the University did not agree to their demands, they intended to infect the hostages with anthrax and release significant amounts to the environment.

What is the probability that the activists will be successful in entering the building and gaining control of a sufficient amount of anthrax to do harm?

SCENARIOS DEPICTING FIRE

7. Accidental; Fire in Lab. A researcher handling anthrax cultures is hurrying to finish work on a Friday afternoon. Freshly inoculated *B. anthracis* cultures on 5% sheep blood agar plates are placed in the incubator. She places a stock of anthrax spores (7×10^{11} spores in 10 mL of phosphate buffered solution in a 50 cc polypropylene tube) in the secure laboratory refrigerator. In her haste, she does not notice that a heated water bath has been left on and has no water left in it. Sometime late Saturday evening, the water bath overheats and a small fire ignites. Some small cardboard boxes are stored on a shelf above the water bath.

What is the potential for release of anthrax spores to the outdoor environment?
What is the probability of public health harm?

8. Deliberate; Arson in Building. A new employee enters BUMC/NEIDL on a weekend. Unknown to the BUMC, this employee has a psychopathy presenting in remorseless destruction of life and property through fire setting. The arsonist sets a fire in a paper recycling container using a flammable laboratory chemical as a primer. The paper recycling bin is located in an alcove in the main administrative area on the first floor.

What is the potential for release of anthrax spores to the outdoor environment?
What is the probability of public health harm?

SCENARIOS DEPICTING EXPLOSIONS

9. Bomb at Out Wall; Spill on Floor. An employee enters the BUMC/NEIDL carrying a backpack. *The backpack contains explosives* equivalent to DoD applicable explosive wt. II (55 pounds TNT). As he approaches BUMC/NEIDL, he places the backpack *in a trash container against the east wall of the building at the foundation. The backpack explodes.* At the time of the explosion, a technician is handling a tube containing one gram of anthrax spores (7×10^{11} spores) in the BSL-4 laboratory.

What is the effect of the explosion on the BSL-4 lab?
What is the potential for release of anthrax spores to the outdoor environment?
What is the probability of public health harm?

10. Bomb Breaches Lab Wall. An employee enters BUMC/NEIDL carrying a backpack. *The backpack contains explosives* equivalent to DoD applicable explosive wt. II (55 pounds TNT). He *enters the anthrax BSL-4 laboratory through the airlock and places the backpack against the*

wall. The backpack explodes. At the time of the explosion, a technician is handling a tube containing anthrax spores (7×10^{11} spores) in the BSL-4 laboratory.

What is the effect of the explosion on the BSL-4 lab?
What is the potential for release of anthrax spores to the outdoor environment?
What is the probability of public health harm?

11. Bomb on Roof; Spill on Floor. A helicopter drops a *backpack containing explosives* equivalent to DoD applicable explosive wt. II (55 pounds TNT) on the roof of BUMC/NEIDL. *The backpack is remotely detonated and explodes ten minutes later.* At the time of the explosion, a technician is handling a tube containing anthrax spores (7×10^{11} spores) in the BSL-4 laboratory. The technician drops the tube on the floor and a "cloud" of anthrax spores is released into the laboratory.

What is the effect of the explosion on the BSL-4 lab?
What is the potential for release of anthrax spores to the outdoor environment?
What is the probability of public health harm?

12. TOW Missile. A large bed pickup truck with a tarpaulin-covered object is traveling west on Albany Street at 11:00 p.m. As the vehicle approaches the intersection of Brookline Street, men in the back of the truck quickly remove the "tarp" and aim an M-220 tube-launched, optically tracked, wire-guided (TOW) missile launcher at the northeast corner of BUMC/NEIDL. The missile travels at 290 mps and carries 5.4 lbs of explosive filler. The armor penetration of this missile is 700-800 mm. *No one is working in the BSL-4 laboratories at this time of night. Anthrax spores (7×10^{11} spores) in a 15 cc conical plastic tube with the cap tightly in place are stored in a locked cabinet.*

What is the effect of the explosion on the BSL-4 lab?
What is the potential for release of anthrax spores to the outdoor environment?
What is the probability of public health harm?

13. TOW Missile; Spill on Floor. A large bed pickup truck with a tarpaulin-covered object is traveling west on Albany Street at 11:00 p.m. As the vehicle approaches the intersection of Brookline Street, men in the back of the truck quickly remove the "tarp" and aim an M-220 tube-launched, optically tracked, wire-guided (TOW) missile launcher at the northeast corner of BUMC/NEIDL. The missile travels at 290 mps and carries 5.4 lbs of explosive filler. The armor penetration of this missile is 700-800 mm. *A lab technician has just finished harvesting anthrax spores and preparing them in powdered form. The spores are in a 15 cc conical plastic tube. At the sound of the explosion, the technician drops the tube on the floor.*

What is the effect of the explosion on the BSL-4 lab?
What is the potential for release of anthrax spores to the outdoor environment?
What is the probability of public health harm?

14. Arson; Major Fire in Lab. A visiting scientist from a country known to harbor terrorists has been working in the BSL-4 anthrax laboratory for one year. Late one evening, he enters the

mechanical space and disables the air handling units and exhaust fans serving the BSL-4 laboratory. He returns to the lab and lights a Bunsen burner; he then turns on a gas tank secured to the bench in the room. With the intent of disseminating anthrax through the explosion, he leaves and closes the door. Anthrax spores (7×10^{11} spores) are left in a tube on the counter near the Bunsen burner. Over time, the natural gas concentration in the laboratory reaches the lower explosive limit and is ignited by the natural gas flame. The sprinkler system in this zone is inoperable. The resultant fire reaches temperatures of 1300-2000 F.

What is the potential for release of anthrax spores to the outdoor environment?
What is the probability of public health harm?

15. Big Bomb on Roof. A helicopter drops a *backpack containing explosives* equivalent to 300 pounds TNT on the roof of BUMC/NEIDL. *The backpack is remotely detonated and explodes ten minutes later.* At the time of the explosion, a technician is handling a tube containing anthrax spores (7×10^{11} spores) in the BSL-4 laboratory. The technician drops the tube on the floor and a "cloud" of anthrax spores is released into the laboratory.

What is the effect of the explosion on the BSL-4 lab?
What is the potential for release of anthrax spores to the outdoor environment?
What is the probability of public health harm?

Section

4 Qualitative Risk Assessment

4.1 Overview

Unlike the quantitative analysis, there is no "model" for the qualitative analysis. Situation discussed in this section include those for which computations are so wrought with imprecision as to be meaningless. Some of the cases seem plausible at first, but turn out to be beyond even MPR principles due to various circumstances described in the respective situation. Therefore a qualitative approach is used herein to address these situations.

4.2 Escape of an Infected Animal

The likelihood of escape of an infected animal from a containment animal facility is extremely remote. Due to the specialized design and construction of BSL-3 and BSL-4 laboratories, modes of escape are reduced to the maximum extent. Containment husbandry practices further reduce the already miniscule risk. Simultaneous breakdown of multiple levels of physical and procedural countermeasures would need to occur for a live animal to escape from the containment laboratories.

A BSL-4 animal room is an airtight room with positive pressure doors providing an absolute seal when the doors are closed. Access to these areas is through airlocks with interlocking positive pressure doors and a chemical shower, thus adding even more physical barriers. In the event that a small animal escapes from a cage or is dropped during a manipulation, there is no avenue of escape available from the room. In these rodent rooms, baited "live traps" are used as standard practice as an extra precaution so that in the event an animal escapes into the room, the valuable research animal can be recovered alive. All cages and bedding are decontaminated in an autoclave prior to removal from the containment facility. Therefore, should an animal burrow in bedding and not be transferred to a fresh cage prior to removal from the animal room, it would not survive the decontamination process.

The BSL-3 animal rooms are also accessed via air lock through interlocking doors. These doors are fitted with "sweeps" and open inward to preclude animal escapes. Small rodents housed in BSL-3 animal rooms are maintained in micro-isolator cages in ventilated cage racks that serve as a primary barrier preventing escape of the animal. As in the BSL-4 animal room, baited live traps are employed as a secondary measure to prevent escapes and preserve valuable laboratory animals. Daily animal observation is a matter of good husbandry practice and required for accreditation of the BUMC/NEIDL animal care and use program. BSL-3 laboratories are, by design, removed from general access corridors, thus even further reducing the likelihood of an animal reaching an exterior door. As in the BSL-4 case, all cages and bedding are decontaminated in an autoclave prior to removal from the containment facility. Therefore, should an animal burrow in bedding and not be transferred to a fresh cage prior to removal from the animal room, it would not survive the decontamination process.

The probability of any animal escape is so low to defy calculation. The additional conditions that (a) an animal infected with anthrax or other select agent escapes, and (b) it spreads the infection to a human before succumbing to the disease reduce the probabilities to such low levels that the risk to the public from an infected animal is virtually non-existent.

4.3 Release of Biological Material During Shipment

The packaging, labeling, and transport of etiologic agents are regulated 42 CFR 72(Interstate Shipment of Etiologic Agents); 49(CFR 172 and 173 U.S. Dept. of Transportation regulations concerning shipment of hazardous materials); 9 CFR 122 (U.S. Dept. of Agriculture [USDA]-Restricted Animal Pathogens, and International Air Transport Association (IATA) rules. In addition, special rules apply for the transport of materials regulated by the U.S. Food and Drug Administration (21 CFR 312.120, Drugs for Investigational Use in Laboratory Research Animals or in Vitro Tests). Recent legislation-the USA PATRIOT Act, and the Public Health Preparedness and Bioterrorism Response Act of 2001- have further strengthened the regulations controlling transport of certain etiologic agents, referred to as Select Agents, to include controls over possession and use. The BUMC/NEIDL is registered with the Centers for Disease Control and Prevention and the U.S. Dept. of Agriculture for possession, use, and transport of these agents. A Responsible Official is designated at BUMC/NEIDL and approved by the regulating agencies to oversee the shipping, receipt, and usage. Packaging requirements are strictly implemented in accordance with IATA regulations.

There have been no cases of illness attributable to the release of infectious materials during transport, worldwide, although incidents of damage to outer packaging of properly packaged materials have been reported (World Health Organization, 2002; U.S. Department of Transportation, 2001).

The risk to the community surrounding the BUMC/NEIDL from transport of infectious agents or other biologically-derived material is negligible.

"Unforeseen" Emergencies

Only since 9/11/01 has the idea of a truly unforeseen emergency entered the risk arena. Toward that end, the risk of all other hazards and threats, including hurricanes, which are actually foreseeable, must be considered. Still, enumerating inconceivable events and assigning probabilities and specific countermeasures is a fruitless approach. Instead, a general set of procedures, collectively known as an *Emergency Response Plan* is an appropriate and realistic countermeasure. The quality of that plan is paramount.

As a minimum, the Plan should cite the importance of the HEPA filters and the fail-safe systems. It is a training matter that even in an emergency, these systems should not be bypassed or over-ridden.

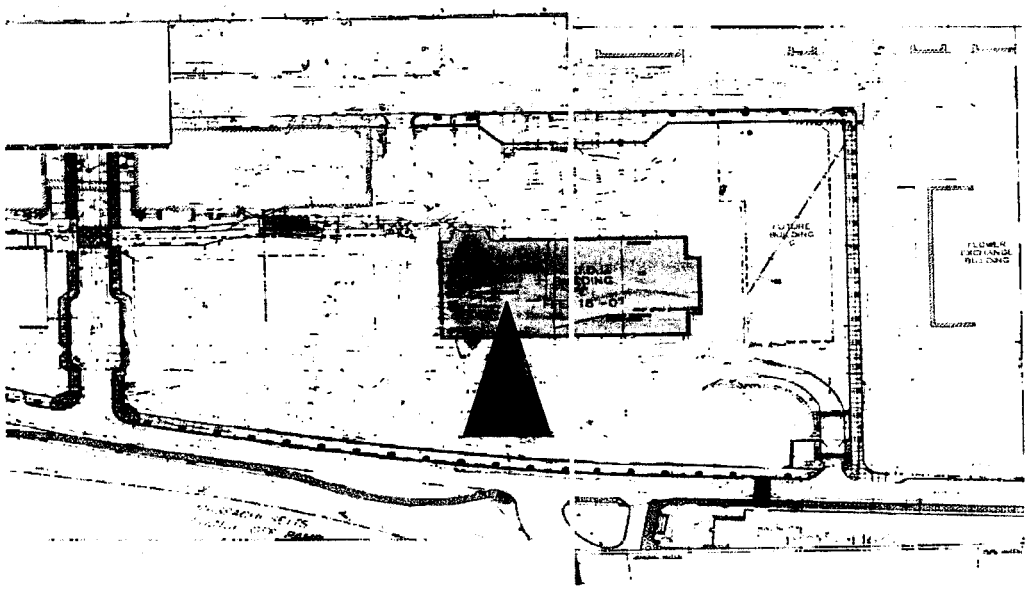
Section

5 Results

Quantitative results are presented for the specified dispersion angle (19°), and for several exposure "targets" away from the lab.

Figure 3 exhibits the campus with overhead view of half-cone plume generated by release of material in a very light wind, which results in a 19-degree spread considering the offsetting effects of laminar flow and turbulence. The length of the half-cone depicted in Figure 3 is 165 feet, because at a breathing rate of 12 lpm, a person at the outer edge of the plume could inhale a potentially pathogenic dose of spores in one hour if the spores persisted without further dispersion.

Fig. 3 Dispersion of Spores If Released in a Lab Spill (Worst-Case, Maximum Possible Risk)



The cone represents the reach of the maximum transient peak concentration of 500 respirable spore/m^3. The "Maximum Possible Risk release" conditions are 700 billion spores that all go up and out the stack with NO filtration, at 19-degree angle half-cone dispersion geometry, in a light uni-directional wind. In order to suffer an exposure of 500 spores, a person would have to breath for 1 hour inside this "dilution/dispersion/settling," which would have to sit static with no dispersion/dilution of spores for the entire 1-hour period.

This report is being done for NIH and BU and is project related; the use of the drawing C1.3 as a reference in the report is acceptable and approved.

Table 3 focuses on five specific "targets" considered in the risk assessment: (1) the pedestrian walkway to the parking garage, (2) E. Brookline Street Building, (3) Guardhouse, (4) Flower Exchange Building, and (5) E. Canton Street Building.

Table 3. Target Exposure Points

	Distance from nearest lab point
Pedestrian Walkway	300 feet
E. Brookline Street Bldg.	290 feet
Guardhouse	300 feet
Flower Exchange Bldg.	360 feet
E. Canton Street Bldg.	400 feet

Table 4. MPR Model Calculations – Number of spores in a release plume at the closest PEDESTRIAN WALKWAY, 300 FEET from Release Point, 19° Cone Dispersal Angle; and the time required to achieve an Exposure of 500 spores breathing at that point

Type of Scenario	Respirable Spores (0.3-10 micron) from Technical Powder Released at Accident or Incident Site	Number of Filtrations (99.97% HEPA Filtration Efficiency) and Total Respirable Spores Potentially Released into the Environment		Hours needed to breathe 500 Spores	
		Filtration	Spores Released		
Light, uni-directional wind, release approximately at ground level (half-cone only)	1,255,396	3	Less than 1		*
	1,255,396	2	Less than 1		*
	1,255,396	1	377		*
	1,255,396	0	1,255,396		6.2

* Since less than 500 total respirable spores are released, it is not possible to breathe the MPR possible pathogenic dose.

Table 5. MPR Model Calculations – Number of spores in a release plume at the closest BUILDING ON E. BROOKLINE STREET, 290 FEET from Release Point, 19° Cone Dispersal Angle; and the time required to achieve an Exposure of 500 spores breathing at that point

Type of Scenario	Respirable Spores (0.3-10 micron) from Technical Powder Released at Accident or Incident Site	Number of Filtrations (99.97% HEPA Filtration Efficiency) and Total Respirable Spores Potentially Released into the Environment		Hours needed to breathe 500 Spores	
		Filtration	Spores Released		
Light, uni-directional wind, release approximately at ground level (half-cone only)	1,255,396	3	Less than 1		*
	1,255,396	2	Less than 1		*
	1,255,396	1	377		*
	1,255,396	0	1,255,396		5.6

* Since less than 500 total respirable spores are released, it is not possible to breathe the MPR possible pathogenic dose.

Table 6. MPR Model Calculations – Number of spores in a release plume at the GUARDHOUSE, 300 FEET from Release Point, 19° Cone Dispersal Angle; and the time required to achieve an Exposure of 500 spores breathing at that point

Type of Scenario	Respirable Spores (0.3-10 micron) from Technical Powder Released at Accident or Incident Site	Number of Filtrations (99.97% HEPA Filtration Efficiency) and Total Respirable Spores Potentially Released into the Environment		Hours needed to breathe 500 Spores	
		Filtration	Spores Released		
Light, uni-directional wind, release approximately at ground level (half-cone only)	1,255,396	3	Less than 1		*
	1,255,396	2	Less than 1		*
	1,255,396	1	377		*
	1,255,396	0	1,255,396		6.2

* Since less than 500 total respirable spores are released, it is not possible to breathe the MPR possible pathogenic dose.

Table 7. MPR Model Calculations – Number of spores in a release plume at the FLOWER EXCHANGE BUILDING, 360 FEET from Release Point, 19° Cone Dispersal Angle; and the time required to achieve an Exposure of 500 spores breathing at that point

Type of Scenario	Respirable Spores (0.3-10 micron) from Technical Powder Released at Accident or Incident Site	Number of Filtrations (99.97% HEPA Filtration Efficiency) and Total Respirable Spores Potentially Released into the Environment		Hours needed to breathe 500 Spores	
		Filtration	Spores Released		
Light, uni-directional wind, release approximately at ground level (half-cone only)	1,255,396	3	Less than 1		*
	1,255,396	2	Less than 1		*
	1,255,396	1	377		*
	1,255,396	0	1,255,396		10.7

* Since less than 500 total respirable spores are released, it is not possible to breathe the MPR possible pathogenic dose.

Table 8. MPR Model Calculations – Number of spores in a release plume at the closest BUILDING ON E. CANTON STREET, 400 FEET from Release Point, 19° Cone Dispersal Angle; and the time required to achieve an Exposure of 500 spores breathing at that point

Type of Scenario	Respirable Spores (0.3-10 micron) from Technical Powder Released at Accident or Incident Site	Number of Filtrations (99.97% HEPA Filtration Efficiency) and Total Respirable Spores Potentially Released into the Environment		Hours needed to breathe 500 Spores	
		Filtration	Spores Released		
Light, uni-directional wind, release approximately at ground level (half-cone only)	1,255,396	3	Less than 1		*
	1,255,396	2	Less than 1		*
	1,255,396	1	377		*
	1,255,396	0	1,255,396		14.7

* Since less than 500 total respirable spores are released, it is not possible to breathe the MPR possible pathogenic dose.

Table 9. Scenarios Spreadsheet (at closest target - 290 feet)

Scenario	Respirable Spores Released	Dispersion Pattern and	BSL-3 Number of Filtrations, and Total Respirable Spores Released		Hours needed to breathe 500 spores	BSL-4 Number of Filtrations, and Total Respirable Spores Released		Hours needed to breathe 500 spores
1 Spill in BSC	1,255,396	cone	2	0	<500 spores*	3	0	<500 spores*
2 No filter in HVAC	1,255,396	cone	1	377	<500 spores*	1	377	<500 spores*
3 Spill on floor, no HVAC filter	1,255,396	cone	0	1,255,396	11.2	0	1,255,396	11.2
4 Spill on floor; power outage	-	shutdown	-	-	<500 spores*	-	-	<500 spores*
5 Spill outside on sidewalk	1,255,396	half-cone	0	1,255,396	5.6	0	1,255,396	5.6
6 Takeover of bldg.	1,255,396	cone	0	1,255,396	11.2	0	1,255,396	11.2
7 Fire in a lab	-	none	-	-	<500 spores*	-	-	<500 spores*
8 Arson in the bldg	-	none	-	-	<500 spores*	-	-	<500 spores*
9 Bomb at outer wall, spill on floor	1,255,396	cone	1	377	<500 spores*	2	0	<500 spores*
10 Bomb breaches lab wall	-	shutdown	-	-	<500 spores*	-	-	<500 spores*
11 Bomb on roof; spill on floor	1,255,396	cone	0	1,255,396	11.2	1	377	<500 spores*
12 TOW missile	-	no breach	-	-	<500 spores*	-	-	<500 spores*
13 TOW missile, spill on floor	1,255,396	cone	0	1,255,396	11.2	1	377	<500 spores*
14 Arson major fire in lab	-	none	-	-	<500 spores*	-	-	<500 spores*
15 Big bomb on roof	-	no breach	-	-	<500 spores*	-	-	<500 spores*

*Since less than 500 total respirable spores are released, it is not possible to breathe the MPR possible pathogenic dose.

Section

6 Discussion and Conclusions

6.1 Quantitative Outcomes of Risk Scenarios

SCENARIOS DEPICTING SPILLS AND WORK DISRUPTION

1. Spill in BSC

Outcome: *All* of the spores in the tube are assumed to be released and the aerosolized spores are filtered through the BSC HEPA filter and through the building HVAC HEPA filter. The filtered air, which then contains no spores, is released to the environment via the building's normal exhaust stack.

Q.: What is the potential for release of anthrax spores to the outdoor environment?
A.: There is no potential for release of anthrax spores to the external environment.

Q.: What is the probability of public health harm?
A.: None.

Discussion: This scenario is the most likely to occur and the least likely to cause public harm. BSL-4 countermeasures (HEPA filtrations) are designed for and are effective in containing this potential release.

2. No Filter in HVAC.

Outcome: *All* of the spores in the tube are assumed to be released and the aerosolized spores are filtered through the BSC HEPA filter, but bypass further filtration since the HVAC HEPA filter is assumed to be missing. The once-filtered air is released to the environment via the building's normal exhaust stack.

Q: What is the potential for release of anthrax spores to the outdoor environment?
A: A total of approximately 377 respirable spores would be released from the building exhaust stack.

Q: What is the probability of public health harm?
A: None

Discussion: This scenario is contrived to yield some escape of spores from the building since various engineering and procedural controls such as pressure differential monitors and alarms as well as routine testing and certification of all HEPA filter installations by the BUMC/NEIDL

would prevent the scenario from occurring. Even so, it could not be shown that a potentially pathogenic dose could be released from the laboratory facility.

3. Spill on Floor; No HVAC Filter.

Outcome: *All* of the spores in the tube are assumed to be released and the fraction of the spores which are aerosolized are not filtered at all since the spill is outside the BSC and since the HVAC filter is assumed to be missing. The un-filtered air, which then contains approximately 1.79×10^6 respirable spores, is released to the environment via the building's exhaust stack. The plume disperses in a 19 degree cone-shaped pattern emanating from the top of the exhaust stack.

Q: What is the potential for release of anthrax spores to the outdoor environment?
A: Assuming no interference caused by static charges or settling in turns of exhaust duct, 1,255,396 spores in the respirable size range would be released.

Q: What is the probability of public health harm?
A: None. A harmful exposure in this scenario could only be achieved by breathing the contaminated air for 11.2 hours under the worst case assumption described at 3.4.4.

Discussion: The engineering controls designed into BUMC/NEIDL would cause a shutdown of laboratory exhaust in the event of the pressure change caused by a HEPA filter not properly operating in the housing. This scenario is contrived to yield some escape of spores from the building since various engineering and procedural controls such as pressure differential monitors and alarms as well as routine testing and certification of all HEPA filters would prevent the scenario from occurring.

SCENARIO DEPICTING SAFETY SYSTEM FAILURE

4. Spill on Floor; Power Outage.

Outcome: The typical BSL-4 HVAC system is designed with safety controls in place. In the event that either the exhaust or supply "shut down," electronic interlocks assure that the laboratory is not pressurized. In the event of a total electrical outage, the laboratory pressure differential drops to "zero" and the room becomes static with regard to airflow. Additionally, positive pressure bubble dampers, installed for decontamination purposes, close and isolate the air in the laboratory.

Q: What is the potential for release of anthrax spores to the outdoor environment?
A: None

Q: What is the probability of public health harm?
A: None

SCENARIOS DEPICTING PHYSICAL REMOVAL OF BIOLOGICAL MATERIAL

5. Single Vial Release Just Outside Building; Spill Outside on Sidewalk.

Q: What is the probability of public health harm?
A: None.

Discussion: As a first line of defense, the security precautions including background investigations, FBI clearance and fingerprinting will limit the chances that a compromised employee will have access. The access to Select Agent laboratories is strictly limited.

Nevertheless, this scenario was created to test the theoretical removal of the biological material, and release outside the building. As shown in Table 9, the expected dispersion of the spores would require 5.6 hours of breathing the air at the transient peak concentration. The model overstates (perhaps substantially) the true concentration that would remain after a duration of hours, because the model computes the potential exposure as if, among other unrealistic assumptions, there were no passage of time for settling to occur.

6. Criminal Trespass and Occupation of Building.

Q: What is the probability that the activists will be successful in entering the building and gaining control of a sufficient amount of anthrax to do harm?
A: None

Discussion:
Security design features planned for BUMC/NEIDL include surveillance cameras, building security guards, physical and electronic barriers to unauthorized entrance. Even so, should criminals steal the biological material and disperse it outside the building, the maximum quantities of Select Agents in any labs will not be sufficient to render public health harm.

SCENARIOS DEPICTING FIRE

7. Accidental; Fire in Lab.

Outcome: The spores are secured in a locked refrigerator. All personnel are pre-screened in compliance with the USA Patriot Act. The laboratory mist suppression system will discharge as soon as the cardboard combustibles begin to burn, dousing the fire. In the event that the mist system fails to completely douse the fire, the Fire Department will respond and perform manual discharge of the secondary suppression system. Additionally, the re-enforced walls prevent expansion of the fire beyond this laboratory module.

Q: What is the potential for release of anthrax spores to the outdoor environment?
A: None.
Q: What is the probability of public health harm?
A: None.

8. Arson in the Building.

Outcome: The building sprinkler system will discharge as soon as the cardboard and paper combustibles begin to burn, dousing the fire. In the event that the sprinkler fails to completely douse the fire, the Fire Department responds within minutes. Additionally, fire rated walls in all laboratories will prevent the fire from impacting laboratory operations.
Employee screening, background checks, fingerprinting and other personnel-reliability programs used for workers in the BUMC/NEIDL further reduce the probability of this occurrence.

Q: What is the potential for release of anthrax spores to the outdoor environment?
A. None.

Q: What is the probability of public health harm?
A: None.

SCENARIOS DEPICTING EXPLOSIONS

9. Bomb at Outer Wall; Spill on Floor.

Q: What is the effect of the explosion on the BSL-4 lab?
A: The explosion at the outer wall of the building has no appreciable structural effect on the BSL-4 lab. The building is being designed for blast resistance and the interior BSL-4 core walls are hardened. As a result of the surprise of noise and possible minor vibration from the explosion, the technician drops the vial on the floor. *All* of the spores in the vial are assumed to be released and the aerosolized spores filtered through the BSL-4 exhaust HEPA filters. The twice-filtered air released to the environment via the building's normal exhaust stack does not contain any respirable spores.

Q: What is the potential for release of anthrax spores to the outdoor environment?
A: None

Q: What is the probability of public health harm?
A: None

10. Bomb Breaches Lab Wall.

Q: What is the effect of the explosion on the BSL-4 lab? What is the potential for release of anthrax spores to the outdoor environment? What is the probability of public health harm?

A: The bomb is assumed to breach the wall; the wall is compromised, and all the spores are released. However, the building HVAC goes into fail-safe mode, i.e. shuts down, and no spores are released to the environment. There is no public health harm outside the building.

11. Bomb on Roof; Spill on Floor.

Q: What is the effect of the explosion on the BSL-4 lab? What is the potential for release of anthrax spores to the outdoor environment?

A: The explosion on the roof of the building has no appreciable structural effect on the BSL-4 lab due to the hardening of the building which simply forces the blast wave up and away from the labs. As a result of the surprise of noise and possible minor vibration from the explosion, the technician drops the vial on the floor. *All* of the spores in the vial are assumed to be released and the aerosolized spores are filtered through the BSL-4 laboratory exhaust HEPA filter. The worst-case scenario is that 377 spores could be released to the environment, which does not constitute a potentially hazardous exposure.

Q: What is the probability of public health harm beyond the perimeter fence?
A: None.

12. TOW Missile.

Outcome: The missile may or may not penetrate the outside wall of the building, as the missile is designed to penetrate 700-800 mm and then discharge a small explosive. The BUMC/NEIDL exterior will be blast hardened. The BSL-4 laboratories are planned to occupy the center of the building. No container of anthrax is damaged.

Q: What is the effect of the explosion on the BSL-4 lab?
A: Disruption of subsequent work.

Q: What is the potential for release of anthrax spores to the outdoor environment?
A: None

Q: What is the probability of public health harm within a one mile radius of the building?
A: None.

13. TOW Missile; Spill on Floor.

Q: What is the effect of the explosion on the BSL-4 lab?
A: As above, the missile may penetrate the outside wall of the building *but does not* penetrate the lab. The technician drops the vial at the sound of the explosion, and *all* spores from the vial are released inside the lab but not inside a BSC.

Q: What is the potential for release of anthrax spores to the outdoor environment?
A: Approximately 377 spores may be released to the environment.

Q: What is the probability of public health harm?
A: None

14. Arson; Major Fire In Lab.

Outcome: All spores in the lab are destroyed by the fire; the HVAC is shutdown and all vents are closed as per scenario 4.

Q: What is the potential for release of anthrax spores to the outdoor environment?
A: None.

Q: What is the probability of public health harm?
A: None.

15. Big Bomb on Roof.

Q: What is the effect of the explosion on the BSL-4 lab?
A: The explosion on the roof of the building may damage the roof, but explodes outward and upward because there is no shape charge (ASCE, 2001). Additionally, the roof will have a concrete deck which will further protect the mechanical space below. As a result of the surprise of noise and possible vibration from the explosion, the technician drops the vial on the floor. *All* of the spores in the vial are assumed to be released. Either (1) the HVAC goes into fail-safe, shut-down mode due to mechanical room damage or a direct hit, and no spores are released; OR (2) all the spores are filtered through the BSL-4 exhaust HEPA filter which is located in the interstitial space between floors, remote from the roof.

Q: What is the potential for release of anthrax spores to the outdoor environment?
A: None

Q: What is the probability of public health harm?
A: None.

6.2 Lessons from the Maximum Possible Risk (MPR) Model

Given the environmental viability of spores, the worldwide experience in BSL-4 risk assessment, and the potential virulence of aerosolized anthrax, a maximum possible risk (MPR) model for the safety at BUMC/NEIDL is to consider environmental release of anthrax spores. To create measurable scenarios in the geographic area around the lab, even harsher assumptions of lack of filtration and a massive number of spores in one release have been made. Using all of these MPR assumptions and unrealistic possibilities, it is possible to compute a transient spore concentration in the air outside the lab under certain conditions.

In conjunction with a spore concentration in the air, a conservative level of estimated pathogenic dose of spores was applied to compute exposure times of risk to the public under the release-event conditions. For all of the potential release events and ambient winds, and for all locations off-site, the duration of exposure would need to be hours or more. Even if such conditions and durations could exist, the lab would realize an event had occurred and take remedial action (stop further release), the spores would actually further dissipate in the environment, and/or affected individuals would evacuate the area.

The conclusion from this data is that the general public is not at risk for environmental exposure of pathogens from the construction or operation of the BSL-4 laboratory at BUMC.

The propriety of the MPR model, for this application, lies in the combined effect of three realities. First, the total volume of potentially-released material is several orders of magnitude lower than what it would take to form a plume that would be simultaneously concentrated enough to pose a risk to human health, and sustained, without dissipation, over a long enough time to negate avoidance behavior. If these factors were simultaneously present, for example, if the giant plume of dust associated with the collapse of the Trade Center had been anthrax spores, then a so-called "urban fluid mechanics" model might be a desirable, though unattainable, methodology.

The second reason the MPR model is appropriate is that a physics-based fluid mechanics model is virtually impossible to apply beyond small, tightly-controlled, simulated physical environments, e.g. inside jet engines, high-performance exhaust systems, or over portions of wing surfaces. Even for the latter, such models are not considered reliable and are supplemented by wind-tunnel testing and test-pilot bravado.

Finally, the MPR is appropriate because, at every step of calculations, assumptions have been applied which are unrealistically negative:

(a) that an entire vial of spores would all get released, when in fact, many spores would likely remain in the vial, in the lab, or in the building;

(b) the dispersion to the community would be relatively uni-directional toward the points of interest when, in fact, the much more likely scenario is that spores would be blown this way and that;

(c) that at the extreme reaches of the dispersion patterns and at the same point in time, the spores would be as concentrated as at the points closer to the release, when, in fact, by the time the concentrations reached the reported levels, some of the spores would be past that point and therefore the total possible exposure would be lower, and;

(d) that everything would happen instantly, without time for evacuation or closing off relevant areas near the lab.

It is, of course, impossible to account precisely for all these factors. This is precisely why the MPR approach was employed. It should be clear that the MPR approach is over-stating risks, perhaps by orders of magnitude. Even so, the analysis demonstrates that building and operating the BSL-4 facility at the BUMC will not cause an appreciable addition of risk of harm to the public health.

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