DRAFT FINAL

ENVIRONMENTAL ASSESSMENT (EA)

for the

DESIGN AND CONSTRUCTION OF A USDA AGRICULTURAL RESEARCH SERVICE (ARS) ANIMAL HEALTH RESEARCH CENTER (AHRC)

at the

UNIVERSITY OF CONNECTICUT
STORRS, CONNECTICUT

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<td>Ag</td>
<td>Agriculture</td>
</tr>
<tr>
<td>amsl</td>
<td>Above Mean Sea Level</td>
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<td>AHRC</td>
<td>Animal Health Research Center</td>
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<td>AQCR</td>
<td>Air Quality Control Regions</td>
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<td>Best Management Practices</td>
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<td>Bio-safety Level</td>
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<td>Conditionally Exempt Small Quantity Generator</td>
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<td>Code of Federal Regulations</td>
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<td>CO</td>
<td>Carbon Monoxide</td>
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<td>gpd</td>
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<td>General Permit to Limit the Potential to Emit</td>
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<td>Institutional Animal Care &amp; Use Committee</td>
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<td>ID</td>
<td>Identification</td>
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<td>Illuminating Engineering Society of North America</td>
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<tr>
<td>lbs</td>
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<td>LEED</td>
<td>Leadership in Energy and Environmental Design</td>
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<td>LID</td>
<td>Low Impact Development</td>
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<td>LQG</td>
<td>Large Quantity Generator</td>
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<tr>
<td>m</td>
<td>Meters</td>
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<tr>
<td>Mgpd</td>
<td>Million Gallons per Day</td>
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<tr>
<td>MISC</td>
<td>Miscellaneous Discharges of Sewer Compatible Wastewater Permit</td>
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<td>NDDB</td>
<td>Natural Diversity Data Base</td>
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<tr>
<td>Acronym</td>
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<td>NEPA</td>
<td>National Environmental Policy Act</td>
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<tr>
<td>NO₂</td>
<td>Nitrogen Dioxide</td>
</tr>
<tr>
<td>NOI</td>
<td>Notice of Intent</td>
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<td>NOₓ</td>
<td>Nitrogen Oxide</td>
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<td>NPDES</td>
<td>National Pollutant Discharge Elimination System</td>
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<td>Ozone</td>
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<td>pB</td>
<td>Lead</td>
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<td>PFO</td>
<td>Palustrine Forested Wetland</td>
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<td>pH</td>
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<td>PH₁₀</td>
<td>Nominal 10 Micrometers</td>
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<tr>
<td>POTW</td>
<td>Publicly Owned Treatment Works</td>
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<tr>
<td>ppm</td>
<td>Parts per Million</td>
</tr>
<tr>
<td>psig</td>
<td>Pound force per square inch gauge</td>
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<tr>
<td>PSS</td>
<td>Palustrine Scrub Shrub</td>
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<td>Resource Conservation and Recovery Act</td>
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<td>SAA</td>
<td>Satellite Accumulation Area</td>
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<td>SO₂</td>
<td>Sulfur Dioxide</td>
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<td>State Pollutant Discharge Elimination System</td>
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<td>Small Quantity Generator</td>
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<td>STV Incorporated</td>
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<td>T&amp;E</td>
<td>Threatened and Endangered Species</td>
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<td>UConn</td>
<td>University of Connecticut</td>
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<td>United States Army Corps of Engineers</td>
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<td>United Stated Department of Agriculture</td>
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<td>U.S. Environmental Protection Agency</td>
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<td>United States Geologic Service</td>
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<tr>
<td>VOC</td>
<td>Volatile Organic Compounds</td>
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Abstract:

The United States Department of Agriculture (USDA) is proposing to design and construct a new Agricultural Research Service (ARS) Animal Health Research Center (AHRC) at the University of Connecticut (UConn) Depot Campus (ARS-AHRC: Preferred Alternative). The land would be leased by the USDA from UConn. The primary objectives of the proposed facility would be to study host-pathogen interactions of endemic diseases affecting livestock in the United States and to discover highly effective vaccines to control and eliminate these diseases. The proposed facility would provide the ability to work with pathogens and vaccines at bio-safety level 2 (BSL-2). Since the proposed function will focus on vaccines, the animal component is critical to the overall mission. Research of animal vaccines will be the core competency; e.g. immune responses, determinants of disease susceptibility, animal challenges, parameters to measure if an animal is protected, and the testing of vaccines that can enhance the immune response. Locating the new research facility at UConn would provide the following benefits:

- There is a history of USDA’s ARS performing collaborative research at UConn.
- Additional collaborative scientific research between UConn and ARS would provide critical mass to speed the development of urgently needed vaccines.
- There is also a distinct advantage given UConn’s proximity to other USDA research facilities within the Northeast U.S.
- The proposed project would increase the number of undergraduates, graduate students and postdoctoral trainees working on projects related to animal health.
- The proposed project would build upon pre-existing ARS-UConn collaborative activities.

The mission of the ARS-AHRC at UConn would be to deliver scientific information that would advance the discovery of highly effective vaccines and other countermeasures specifically designed for the control and eradication of infectious diseases that threaten animal agriculture and public health. Some of the tangible goals of locating and maintaining the proposed facility on the Depot Campus of UConn include:

- Reducing costs of animal studies that do not require high containment facilities;
- Increasing the number of scientists working in animal health research;
- Implementing vaccine discovery programs that would support animal health studies in other centers;
- Conducting bio-therapeutic studies;
- Conducting internationally recognized research;
- Discovering vaccines of national priority;
• Providing direct access between personnel at other USDA research facilities and UConn academic and research departments, including Pathobiology and Veterinary Science, Animal Science, Molecular and Cell Biology, and the School of Pharmacy, and
• Providing access to the Department of Immunology, the Department of Genetics and Developmental Medicine, and the Department of Molecular, Microbial and Structural Biology at UConn’s Health Center in Farmington, CT.

The proposed scientific program to be employed at the new facility would include the following:

• Immunology (mechanisms of immune evasion & protective immunity);
• Host functional genomics;
• Animal model development (pathogenesis and challenge models);
• Biological discovery support function;
• Diagnostic discovery (to differentiate infected from vaccinated animals); and
• Clinical research.

Implementation of the Preferred Alternative and other project alternatives would result in impacts to soils, topography, geology, woodlands, and terrestrial wildlife. All of these impacts are anticipated to be minor. It does not appear that there would be direct impacts to jurisdictional wetlands and/or associated waterways within the Preferred Alternative location, which, if noted, would require mitigation. None of the aforementioned impacts are characterized as significant.

The USDA is proposing to build this project entirely within the confines of UConn’s Depot Campus. This EA evaluates potential environmental impacts associated with the No Action Alternative (Alternative 1), the Preferred Alternative, and two additional Alternative Sites.
SECTION 1
PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

The U.S. Department of Agriculture (USDA) Agricultural Research Service (ARS) proposes to construct a Bio-Safety Level-2 (BSL) Animal Health Research Center (AHRC, together ARS-AHRC) facility on lands currently owned by the University of Connecticut (UConn). This environmental assessment (EA) analyzes the potential impacts associated with the construction and operation of the ARS-AHRC.

The purpose of this EA is to identify and evaluate the environmental aspects of implementing the proposed project in accordance with the National Environmental Policy Act (NEPA) of 1969. NEPA requires that federal agencies consider environmental consequences in their decision-making process. The President’s Council on Environmental Quality (CEQ) issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental analysis. These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation that is designed to ensure deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action.

This EA has been prepared in accordance with NEPA, Section 102(2)(C) and the CEQ Regulations for Implementing the Procedural Provisions of NEPA; 40 Code of Federal Regulation (CFR), Parts 1500 through 1508. The objective of this EA is to determine and report the magnitude of the environmental impacts of the Proposed Action. If no potentially significant impacts are identified from the Proposed Action, a Finding of No Significant Impact (FONSI) can be issued and the Proposed Action may proceed. If significant impacts are deemed probable (in accordance with Council on Environmental Quality criteria (40 CFR 1508.27)), even after mitigation measures or specific conditions are incorporated into the design, a Notice of Intent (NOI) to prepare a NEPA Environmental Impact Statement (EIS) is required, followed by the completion of the EIS itself.

**Biosafety Levels**

*The Centers for Disease Control (CDC)*
*Biosafety in Microbiological and Biomedical Laboratories (BMBL) 5th Edition* identifies four biosafety levels that are used to define the types of facilities, protective equipment, and administrative controls needed to conduct research on pathogens. The levels are designated in ascending order, by degree of protection provided to personnel, the environment, and the community:

- **BSL-1:** Facilities suitable for work involving well-characterized agents that present minimal potential hazard to laboratory personnel and the environment.
- **BSL-2:** Facilities suitable for work involving agents that pose moderate hazards to personnel and the environment.
- **BSL-3:** Facilities where work is performed with indigenous or exotic agents that may cause serious or potentially lethal disease through inhalation route exposure.
- **BSL-4:** Facilities required for work with dangerous and exotic agents that pose a high individual risk of life-threatening disease, aerosol transmission, or related agent with unknown risk of transmission.
1.2 PURPOSE OF AND NEED FOR ACTION

The USDA proposes to design, construct, and operate an Animal Health Research Center (AHRC) at UConn’s Depot Campus (see Figure 1-1: Project Location Map). Construction and operation of the AHRC (i.e., Proposed Action) would be intended to deliver scientific information that would advance the discovery of highly efficacious vaccines and other countermeasures specifically designed for the control and eradication of infectious diseases that threaten animal agriculture and public health.

The objective of this EA is to ensure consideration of the environmental aspects of the proposed actions in the Federal decision-making processes; determine whether or not the proposed actions have the potential for creating significant impacts on the human and/or natural environment; and to make environmental information available to the public before decisions are made and actions taken.

1.3 THE DECISION

The decision to be made is whether to implement the Proposed Action (Preferred), modify the Proposed Action, or select from other Alternative Actions, within which the No Action Alternative is included.

1.4 SCOPING AND POTENTIALLY SIGNIFICANT ISSUES

Scoping covers the range and detail of issues covered in this EA document. Agency scoping was conducted as part of the original NEPA process to ensure that identification of issues of concern (i.e., potentially significant impacts) occurred as early in the assessment process as possible. Further, scoping enabled the project objectives to concentrate on "real problems," rather than spend time and effort on addressing and studying issues that are of little or no concern. The following activities were conducted to define and refine the scope of this EA:

- Evaluated existing/current site conditions and natural resources and the human environment within and adjacent to the proposed project area and alternative sites.

- Arranged and conducted a Public Information Session during which members of the general public were briefed on the proposed project and then given the opportunity to ask questions about any aspect of the project.

- Coordinated with UConn personnel knowledgeable of site conditions, existing planning documents (e.g. available master plans), University codes and standards, etc.

- Corresponded with local, state, and federal regulatory agencies (ongoing) to obtain information pertaining to critical resources (e.g., threatened and endangered species) and environmental permits and approvals required for land development activities within the proposed project area.
FIGURE 1-1
PROJECT LOCATION MAP - PREFERRED ALTERNATIVE
USDA-APHIS ARS ANIMAL HEALTH RESEARCH CENTER
UNIVERSITY OF CONNECTICUT

REFERENCE: United States Department of Interior Geological Survey
Coventry, Conn (1983)
In accordance with CEQ regulations (specifically sections 1500.4 and 1501.7), this EA includes detailed discussions of only those issues deemed to be potentially significant. Issues pertinent to this EA are summarized and incorporated by reference. Project scoping resulted in the identification of the following potentially critical issues, each of which is addressed in greater detail within the body of this document.

**Construction Impacts**

Impacts that result from construction of the new facilities would be similar to those from any small to medium-sized construction project. Construction would produce temporary local increases in noise and dust levels. Gaseous emissions from construction equipment would be similar to those of routine construction jobs. Construction activities would use standard earthmoving machinery and carpentry, mechanical, and electrical equipment. There would be no unusual worker hazards associated with construction of the facilities associated with the AHRC. No threatened or endangered species would be affected, and no wetlands are located within the Proposed (Preferred) project area. The Proposed project area is not located within a floodplain; however, streams and potential wetlands are found within the two alternative site locations.

**Project Communications and Coordination**

The USDA proposes to construct and operate the AHRC within the Depot Campus of UConn. UConn maintains close ties and communications with the local community (e.g., residents, municipal officials, special interest groups, business people, etc.). Extensive coordination between USDA, UConn personnel, the local community, and future site contractors will be essential toward maintaining project continuity and avoiding conflicts with ongoing operations within the partially occupied Depot Campus, as well as other areas within the UConn campus (e.g., roads, parking areas, etc.). Frequent communications between affected parties will be conducted during the project planning activities and prior to and during construction activities to reduce the potential for disruption of off- and on-site vehicular circulation, mitigate noise impacts, reduce air emissions, and ensure adherence with site development and building permit and approval requirements.

**Natural Resources**

Natural features and resources across the proposed project area, adjacent areas, and alternative project areas include primary- and secondary-growth woodlands, open fields, steep slopes, overland drainage features, and indigenous wildlife. Reviews of secondary source information and site visits revealed that there are no threatened or endangered species, wetlands, or prime farmland soils within the Proposed project area. Reviews did, however, indicate the potential presence of threatened and endangered species with one of the alternative sites. Tree clearing from the Proposed location would not result in segmentation of woodlands, thereby maximizing the amount of remaining contiguous woodlands habitat and reducing adverse impacts to wildlife that may utilize it as a wildlife corridor. Direct and indirect impacts associated with construction activities and facility operations within the Proposed project area as well as the alternative sites will likely affect some of these resources.

**Water Demand**

Any new facilities built within the North, East and Depot Campuses will be held to a high standard of water conservation through the use of high-efficiency fixtures and other features consistent with UConn’s 2004 Sustainable Design Guidelines and 2007 Sustainable Design & Construction Policy.
The Willimantic River Wellfield in northwest Mansfield and the Fenton River Wellfield in northeast Mansfield represent the sources for a drinking water supply system that UConn maintains within the Storrs campus. Water from the Willimantic Wellfield supplies water to the Depot Campus and the Main Campus, while the Fenton River Wellfield supplies water to the Main Campus. The average daily demand on the water system for the two campuses is 1.36 million gallons per day (Mgpd) with a peak demand of 2.2 Mgpd. Current registered water diversions include 2.3077 Mgpd from the Willimantic River Wellfield and 0.844 Mgpd from the Fenton River Wellfield, for an aggregate of 3.1517 Mgpd. However, despite these registered diversions, the available supply from the Willimantic Wellfield is limited by the configuration of the well field – the production wells are in close proximity to each other which results in a cumulative drawdown that limits the amount of water that can be pumped. In addition, two of the wells have pump capacities that are less than their individual registered diversions. However, these pump limitations are advantageous, since running at these wells at their full diversion rate would exacerbate the drawdown and further limit the overall capacity of the well field. Consequently, the withdrawal rate is maximized at 1400 gpm (2.016 Mgpd), compared to the registered diversion of 2.3077 Mgpd, as was stated in the 2007 Water/Wastewater Master Plan (DRAFT Report of the Willimantic River Study, An Analysis of the Impact of the University of Connecticut Water Supply Wells on the Fisheries Habitat of the Willimantic River (not yet published)).

Water quality of the Willimantic and Fenton River Wellfields currently meets all state and federal standards for public drinking water supplies. The system has been operated since 2006 by New England Water Utility Services, Inc. (FEIS: North Hillside Road Extension; May 2009).

Peak daily demand for the new AHRC is anticipated to be less than 2,000 gpd, including domestic use, laboratory use and wastewater demand. This projected water demand/water usage for the new AHRC should not result in significant adverse impacts to the current hydrologic regime or aquatic habitat within the Willimantic River.

Site Lighting
The outdoor lighting system at the AHRC will consist of metal pole mounted, metal halide fixtures for the parking lot. Walkways around the AHRC will include a post-top style pedestrian light fixture with a partial cut-off shield that directs light downward to reduce nighttime light pollution. Pole height, light spacing, and lamp wattage will be determined, based upon the specific application, during design of the AHRC. Design criteria for exterior lighting will include minimizing unnecessary light spillage. The design goal will be to provide measures to mitigate impacts of lighting while still providing the level of lighting necessary for pedestrian and motor vehicle safety. The University’s Sustainable Design Guidelines articulate clear goals related to the environmental impact of exterior lighting. The guidelines state that projects should provide site lighting that is sensitive to light pollution of the night sky and minimize impacts on nocturnal environments. There are two strategies for achieving this goal:

- Designing exterior light fixtures with shielding to prevent light spillage to the night sky.
While vehicle light use will be required when traveling on Campus roads after dusk and before dawn, given the type of use for the AHRC, the majority of trips are anticipated to occur during daytime hours. Nighttime traffic will not provide a constant source of illumination and is anticipated to be a relatively minor light source compared to roadway lighting.

**Waste Management**

Some hazardous and non-hazardous materials will be used within the new facility (e.g., solvents, cleaning solutions, other chemicals, etc.). Solid and liquid hazardous and non-hazardous waste will be generated during daily activities within the proposed AHRC. The USDA will work closely with UConn to establish procedures for compliance with all applicable local, state, and federal laws and regulations for collecting, storing, processing (possible chemical pre-treatment) and disposing of solid and liquid wastes at the AHRC. It is understood that UConn’s EH&S will manage all wastes generated at the AHRC under a separate Research Service Agreement. The management and disposal of solid and liquid animal waste materials will require considerable planning and unique design considerations. Animal waste materials will be generated in the Ag Barn, animal holding areas, Necropsy, and laboratories inside the BSL-2. Additionally, animals that are humanely euthanized in the animal holding rooms will require special handling and disposal.

**Sustainable Initiatives**

The USDA would strive to adhere to UConn’s 2008 *Sustainable Office Guidelines*, which promote sustainable practices at work among staff and faculty throughout the University. Several University offices are currently participating in the program. The *UConn Sustainable Office Guidelines* are available on the University’s EcoHusky web page (www.ecohusky.uconn.edu/). The guidelines promote waste reduction, recycling and reuse opportunities; energy efficiency and energy reduction; paper and office supply purchasing opportunities; water conservation; and transportation initiatives (e.g. fuel-efficient vehicles, reduced travel, and alternative modes of transportation).

Daily and periodic janitorial cleaning is commonplace at every UConn campus due to the large mass of traffic from the University community. As a result, the University is a large consumer of cleaning products and purchases and uses only green cleaning products that have received the green seal of approval. Public Act No. 07-100 and Public Act No. 08-186 include the following language:

> Effective as of October 2007, persons shall use only certified Environmentally Preferable Products (EPP) cleaning products—“Green Seal Certified” or “EcoLogo”—inside state owned and leased facilities. EPP products for State Agency use are approved by the Connecticut Department of Administrative Services (DAS), in consultation with the DEP.

While the DAS currently has contracts with vendors to provide EPP Green Seal Certified or EcoLogo cleaning products as well as disinfectants, disinfecting cleaners, sanitizers, and antimicrobial products sanitizers, UConn instead utilizes its own purchasing department to purchase its cleaning products. To make these purchases, UConn is required to consult Green Seals Products’ Institutional and Industrial Cleaning list and EcoLogo’s Cleaning and Janitorial Products list.
Public Act 08-186 further requires that when procuring EPP cleaning products, disinfectants, disinfecting cleaners, sanitizers, and antimicrobial products sanitizers, a State agency must take the following steps:

- Items should be purchased for their intended use.
- Follow all manufacturers’ instructions when using these products.
- Consult the DAS contracted vendors of EPP cleaning products for information and training on the use of these products (training is highly recommended when using new EPP products).
- Although all products that are certified by Green Seal or EcoLogo have met Green Seal or EcoLogo’s environmental standards, not all products are necessarily safe to use in all office environments due to individual sensitivities. Careful review of product Material Safety Data Sheets, usage recommendations, and manufacturer’s usage instructions before purchase is always recommended.
- EPP products shall be ordered following standard purchasing procedure for items available on state contract.

The Green Cleaning laws are self-enforcing; the regulations do not require State agencies to officially report their purchases to the DAS or any other State agency. It is advisable, however, to maintain a list of purchases for reference purposes.

UConn will be responsible for cleaning and maintaining the AHRC buildings, either directly or through a third party contract. Therefore, the State’s requirements for the purchase and use of green cleaning products will be strictly enforced within the AHRC facility.

### 1.5 PERMIT AND APPROVAL REQUIREMENTS

One aspect of the development of this EA that helps focus the discussion of impacts and stimulates the involvement of regulatory agencies is the identification of potential environmental permits and approvals applicable to the Proposed Action. Four permitted activities are identified for this proposed project. They include:

- Wetland/Waterway Permits and Water Resource Activities
- Stormwater Management
- Water Discharges
- Air Quality

Each permit/approval is summarized in the following sections and the agency under which each authorization is obtained is identified. In addition, each of the following sections includes a compliance statement that ensures that the project will be constructed and operated in accordance with each of the identified permits and approvals.

#### 1.5.1 Wetland/Waterway Permits & Water Resource Activities

CT DEP’s Inland Water Resource Division (IWRD) administers the Inland Wetland and Watercourses program. State agency activities conducting regulated activities must obtain an Inland Wetlands and Watercourses program permit. State agencies obtain permits from IWRD
and not through the local municipality. Any wetlands that are adversely impacted by construction of project components must be restored or mitigated.

The proposed AHRC project (Preferred Alternative) would potentially involve the construction of new sanitary sewer lines through a wetland and stream corridor adjacent to the proposed site in order to tie in with existing sanitary lines. This activity would necessitate the procurement of a General Permit for Placement of Utilities and Drainage within Inland Wetlands and Stream Channel Encroachment Lines. This general permit authorizes: placement, repair, or replacement of cables, conduits and pipelines placement, repair, or replacement of a cable, conduit or pipeline that is located on a bridge or located underground provided: 1) the ground surface elevation and hydrology of any wetland, watercourse or floodplain altered or disturbed by such placement is restored to the elevation and condition that existed prior to such placement; 2) proper cover is provided for underground work; and 3) cables, conduits or pipelines are placed above the low chord of a bridge or are relocated to be above the low chord of a bridge. A request for authorization is required to be submitted and approved in writing by the Commissioner (as defined by Section 22.a-2(b) of the General Statutes) in order for an activity to be authorized by this general permit.

Additionally, it is anticipated that the proposed project would be required to submit for a Flood Management Certification through CT DEP’s Bureau of Water Protection and Land Reuse’s Inland Water Resources Division. This certification is required for any activity within or affecting a floodplain or that impacts natural or man-made storm drainage facilities. The construction of the new AHRC would add impervious surfaces to the Depot Campus site. The increased impervious surfaces have the potential to increase peak run-off rates. The design will include low-impact-design features such as pervious pavement and bio-infiltration which would mimic pre-existing natural conditions.

1.5.2 Stormwater Management

The 2004 Connecticut Stormwater Quality Manual provides guidance on the measures necessary to protect the waters of the State of Connecticut from the adverse impacts of post-construction stormwater runoff. This manual focuses on site planning, source control, and stormwater treatment practices and is intended for use as a planning tool and design guidance document by the regulated and regulatory communities involved in stormwater quality management. The proposed USDA project will be constructed and operated in full compliance with this manual.

In addition, in December 2007, Congress enacted the Energy Independence and Security Act (EISA) of 2007. Under Section 438 of the Act, federal agencies have new requirements to reduce stormwater runoff from federal development and redevelopment projects to protect water resources. Federal agencies can comply using a variety of stormwater management practices, including "green infrastructure" or "low impact development" practices (e.g., reducing impervious surfaces, using vegetative practices, porous pavements, cisterns and green roofs). The provision reads as follows:

“Storm water runoff requirements for federal development projects. The sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.”
While the planning, design, and construction of the stormwater runoff devices can vary for each State, the intent of Section 438 of the EISA 2007 remains consistent in that it requires federal agencies to develop and redevelop applicable facilities in a manner that maintains or restores stormwater runoff to the maximum extent technically feasible.

A CT DEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities general permit applies to all discharges of stormwater and dewatering wastewater from construction activities which result in the disturbance of one or more total acres of land area on a site regardless of project phasing. State projects must register and comply with Section 6 of this general permit. The proposed USDA project will be constructed and operated in full compliance with this general permit. For the proposed AHRC project, a General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities application with a soil erosion and sedimentation control plan (E&S Plan) would be submitted to CT DEP.

The 2002 Connecticut Guidelines for Soil Erosion and Sediment Control (CT DEP Bulletin 34) is intended to provide information to government agencies and the public on soil erosion and sediment control. These guidelines fulfill the requirements of Connecticut’s Soil Erosion and Sediment Control Act (§§ 22a-325 through 22a-329 of the Connecticut General Statutes). Additionally, as the technical standard, they are required to be complied with in many municipal planning and zoning regulations and in many permits issued by CT DEP associated with land development.

### 1.5.3 Wastewater Discharges

Any person or municipality that discharges water, substances, or materials into the waters of the state (including all surface and ground waters, and sanitary and storm sewers) is required to obtain a permit prior to commencing the discharge. Proposed sanitary sewer discharges from AHRC would first be reviewed by UConn’s Water and Wastewater Advisory Committee and, if approved, regulated directly by the University. Non-domestic wastewater, however, would be permitted and regulated by CT DEP either by General Permit or an individual State Pollutant Discharge Elimination System (SPDES) permit. Prior to the start of construction, final project design technical requirements for water and sewer connections would be reviewed and approved by UConn’s Director of Facilities Operations.

A Miscellaneous Discharges of Sewer Compatible (MISC) Wastewater general permit applies to wastewater resulting from any of the following processes or activities: air compressor condensate; air compressor blowdown; building maintenance wastewater; contact cooling and heating wastewater; cutting and grinding wastewater; fire sprinkler system test water; non-destruct testing rinse water; and undesignated MISC wastewater. The general permit authorizes discharges to a publicly owned treatment works (POTW) only, either directly via a sanitary sewer or to a holding tank that meets the requirements of the general permit. The water would then be transported from the holding tank to a POTW.

All commercial connections are subject to periodic evaluation of their waste streams for pH, temperature, BOD loadings, hazardous waste content and other criteria pursuant to the University’s CT DEP permit. Pretreatment of waste may be needed when the waste exceeds the University’s permitted acceptance criteria.
1.5.4 Air Quality

The CT DEP New Source Review permit program, administered by the Engineering and Enforcement Division of the Bureau of Air Management, regulates emissions released to the air from new and modified stationary sources. Examples of such sources include, but are not limited to: boilers; stationary internal combustion engines such as diesels and turbines; incinerators; rock crushing operations; chemical reactors and mixers; paint spray booths; metal degreasers; metal plating and surface treatment operations; printing operations; volatile liquid storage tanks; and many other manufacturing or processing operations.

Prior to beginning the actual construction of any stationary source or modification of any source (to which RCSA Section 22a-174-3a(a)(1) applies), the USDA would be required to:

- apply for and obtain an individual permit; or
- operate the source in accordance with the provisions of RCSA Section 22a-174-3b or 3c.

In making a decision to grant an air permit, CT DEP must determine, at a minimum, that: 1) the proposed activity will incorporate the appropriate control technology and/or operational limitations; 2) the emissions will be in compliance with the state's hazardous air pollutant regulations; and, 3) the proposed activity will not cause any significant deterioration in the air quality.
SECTION 2
DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES CONSIDERED

Section 2.1 describes the Proposed Action for the EA that would allow the USDA to meet its purpose and need for agency action. Two additional alternatives are presented in Section 2.2 and 2.3, respectively. The No Action Alternative is presented in Section 2.4 as a baseline for comparison with the consequences of implementing the Proposed Action. Alternatives that were considered in this EA but were not analyzed further are discussed in Section 2.5, and related actions are identified in Section 2.6.

2.1 DESCRIPTION OF PROPOSED ACTION – PREFERRED ALTERNATIVE

Preventing and controlling diseases that can be transmitted from animals to other animals, or humans (zoonotic diseases) at the source (i.e., animal reservoirs) is the most efficient and cost-effective means of protecting the general public. Successful completion of the research proposed at the new UConn facility will result in scientific information necessary to advance the discovery of vaccines to prevent, control, and eradicate animal and zoonotic diseases.

The USDA proposes to construct and operate a Bio-Safety Level 2 (BSL-2) Agricultural Research Service (ARS) Animal Health Research Center (AHRC) facility at UConn’s Depot Campus (see Figure 2-1; Preferred Alternative). This program fits within the ARS Animal Health National Program and in many ways compliments science and research programs currently underway at UConn. AHRC will implement research programs at UConn that support national priorities in vaccine discovery. Paramount for the success of this program will be to establish collaborative activities to support vaccine discovery programs at other ARS locations.

In 1993, UConn was conveyed the 300-acre Mansfield Training Center (former state hospital complex) property from the State of Connecticut. The site contains numerous buildings and natural features preserved as part of its original development. Natural features include forested lands, wetlands, streams, open space, and steep slopes. The property was renamed the Depot Campus. UConn’s Outlying Parcels Master Plan (JJR, June 2000) includes the following general details about the Depot Campus:

- Site location;
- Access with existing road configuration and conditions;
- Natural features, including topographic relief;
- Utilities; and
- Development opportunities/potential.

The following broad planning guidelines were established to facilitate a physical framework within which opportunities for future development within the Depot Campus could be identified:

- Develop a clear understanding of existing site features (natural and manmade).
- Identify existing facilities by type which are worthy of renovation.
- Establish a primary vehicular circulation system by improving on the existing roadway network.
● Locate primary and secondary access points.
● Identify parcels which are most suitable for development.
● Understand the significant features and opportunities within each development parcel
● Respect viewsheeds.
● Develop within all applicable state of Connecticut regulations.
● Best Management Practices should be followed to treat stormwater runoff.
● Care should be taken to minimize impervious surfaces.

Ideal land uses within the Campus include public and private ventures, business incubators, special academic, recreation, community outreach, and special short-term housing. The planning, design, construction and operation of the AHRC within the Depot Campus would fit within the private venture, special academic, and business incubator land use categories.

The University is currently analyzing the existing building and infrastructure of the Depot Campus as a prelude to updating the 2000 Outlying Parcels Master Plan.

ARS is proposing to construct a best in class center of excellence in immunology and vaccine discovery with working space for three scientists, six post-doctoral fellows, and three support staff. The proposed facility would be a new 35,875 gross square foot building located on approximately five acres of undeveloped land in the eastern quadrant of the Depot campus site adjacent to and east of Ahern Lane. Access to the new facility would be off of Route 44 to the north onto Weaver Road, then Walters Ave, and then into the site access driveway off Ahern Lane. Research at the new facility would investigate known agents only; that is, there would be no unknown agents researched at this BSL-2 facility. All of the animals that will be transported to the new facility will be healthy livestock. The only disease organisms that will be housed at the AHRC are commonly found in farm animals and are not dangerous to humans. Work on high-consequence livestock pathogens will not be carried out at this facility; it will be done at other USDA laboratories with higher containment levels.

The proposed facility would be programmed in accordance with ARS Facility Design Standards 242.1M-ARS of July 2002, the “Guide for the Care and Use of Laboratory Animals” (1996), with recommended individual spaces for farm animals (e.g., cattle, pigs, sheep and possibly goats). The construction would be permanent and meet applicable building and fire codes, and required structural, plumbing, and electrical standards. The facility would be fenced and would include the necessary alarm systems for maximum protection against unauthorized entry.

The current proposed program reflects the design of a facility containing three functional wings:

● A BSL-2 suite containing four two-pen rooms, two four-pen rooms and one eight-pen holding room, a Necropsy suite with a holding cooler and tissue collection area, solid waste staging area, feed and general storage areas, a centralized freezer room and an incoming animal triage area. To allow maximum flexibility in the animal population, the BSL-2 holding area of the facility is predicated upon three typical rooms, sized for 160 square foot holding pens using “commercially available” penning and gating systems:
  ● Type A with two pens for up to four, 500 kg animals (320 dedicated animal square feet)
- Type B with four pens for up to eight, 500kg animals (640 dedicated animal square feet)
- Type C with eight pens for up to 16, 500 kg animals (1,280 dedicated animal square feet);
  - A laboratory and administrative suite providing lab space for three scientists, six post-doctoral fellows, three support staff, a general flex lab, a conference room, visitor’s entry and staff locker rooms;
  - A holding barn (Ag Barn) divided into three 18-animal sub-sections designed to house animals ranging from 50kg to 500kg.

Animals located at the facility would be maintained within the Ag Barn and BSL-2 suite. No animals would be allowed to roam freely outside of these areas. The design would include a fence with gated entry around the entire facility; animals would not be able to escape from the facility.

2.2 ALTERNATIVE SITES CONSIDERED

At the outset, a total of four alternatives were considered for the Proposed Action - No Action Alternative, two Alternative Sites, and the Preferred Alternative.

2.2.1 Alternative 1 – No Action Alternative

Consideration of the No Action Alternative is required by NEPA regulations (Section 1502.14(d)). The No Action Alternative provides a description of what would occur if the Proposed Action were not implemented to compare with the potential effects of the Proposed Action. Under the No Action Alternative, USDA would not construct and operate a new BSL-2 facility. Under this scenario, USDA would continue to rely on meeting its BSL-2 laboratory obligations by exporting work and staff to its existing BSL-2 laboratories. Additionally, under the No Action Alternative, there would be no collaboration between USDA and UConn scientists under BSL-2 conditions for the research of highly efficacious animal vaccines, thereby hindering UConn’s research mission. The No Action Alternative would not meet USDA’s identified purpose and need for action at UConn. Finally, implementation of the No Action Alternative would result in the under-development of the Depot Campus; the campus would not be utilized to its fullest potential.

2.2.2 Alternative Sites

Two Alternative Sites were evaluated for this NEPA document. The first site was the North Hillside Road site, which is located within the University’s North Campus area. The North Campus is defined as the area of the Main Campus located north of North Eagleville Road. The second site was Horsebarn Hill, which is located within a section of campus known as the East Campus. Any design and construction activities within either of these two campuses would proceed following the University’s Sustainable Design Guidelines and Sustainable Design and Construction Policy, which have provisions requiring any new building construction or renovation project entering the pre-design planning phase to establish the Leadership in Energy & Environmental Design (LEED) Silver rating as a minimum performance requirement. Comprehensive approaches to energy efficiency in the design of the new AHRC would help to offset increased energy consumption and reduce potential increases in greenhouse gas (GHG) emissions. UConn, through its Environmental Policy Advisory Council (formerly the Climate Action Task Force), will continue to update and
implement the recommendations of its Climate Action Plan, which will also guide the design of facilities to be located at East and North Campuses.

Additionally, any new facilities built along North Hillside Road will be held to a high standard of water conservation through the use of high-efficiency fixtures and other features consistent with UConn’s Sustainable Design Guidelines and Sustainable Design and Construction Policy.

North Campus - North Hillside Road Site
This alternative would include the construction of a BSL-2 Laboratory with Ag Barn and parking facilities on lands located within UConn’s North Campus.

In May 2009, the Federal Highway Administration (FHWA), in cooperation with UConn and in accordance with the NEPA, completed a Draft Final Environmental Impact Statement (EIS) for the extension of North Hillside Road on the UConn Storrs Campus from its current terminus northward toward U.S. Route 44 in the Town of Mansfield, Connecticut. The proposal is for the construction of an approximate 3,400-foot, 2-lane, 32-foot wide road through a portion of land adjacent to the Storrs core academic campus within the North Campus. The project would provide an alternative entrance to the University, relieve traffic on surrounding roads, primarily Route 195, and facilitate the development of the North Campus.

While federal funding is now available for the construction of the North Hillside Road Extension, it may be some time before construction would begin on the approximate 3,400-foot extension. This alternative site location would be unavailable for an extended period of time because of the schedule requirements for the Environmental Impact Evaluation (EIE) Record of Decision (ROD), environmental permitting, land acquisition, and the construction schedule for the North Hillside Road extension, itself. No construction start date has been established for this project.

In June 2000, UConn released the Outlying Parcels Master Plan (JJR, 2000) that includes a master plan for the development of the North Campus, in which the North Hillside Road alternative site is located. This document was written with four very distinct planning goals in mind:

- Strengthen strategic campus relationships;
- Protect sensitive and regulated environmental resources;
- Respect important cultural features; and
- Promote sustainable design concepts.

The North Campus includes 333 acres of rolling forested land with several man-made and natural development constraints. The natural features included within the North campus include mature hardwood forest, rolling topography, stream corridors, wetlands, and prime farmland acreage. Preservation of wetlands and prime farmland (which constitutes approximately 50 percent of the North Campus), streams, woodlands, and steep slopes is an integral component of the planning initiatives and recommendations within the Outlying Parcels Master Plan for the North Campus.

East Campus - Horsebarn Hill Road
This alternative would include siting and constructing the BSL-2 Laboratory with Ag Barn and parking facilities at two sites located along UConn’s Horsebarn Hill Road, which is located east of Route 195 and north of UConn’s main Storrs Campus area (see Figures 2-2 and 2-3).
“Heart-Shaped” Field

Cattle Barn

Bio-Behavioral Complex

Wolf Den

Dairy Barn (aka Yellow Barn)

Legend

- Fenton Forest
- Special Forest
- Wetland Soil
- Fenton Wellfield
- Historic District (Natl. Registry)

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REFERENCE: University of Connecticut Siting Study (2008)

FIGURE 2-2

HORSEBARN HILL ROAD - SITE RESOURCES - ALTERNATIVE SITE
USDA-APHIS ARS ANIMAL HEALTH RESEARCH CENTER
UNIVERSITY OF CONNECTICUT
## Limits of New Construction

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**FIGURE 2-3**

HORSEBARN HILL ROAD - EXISTING LAND USE - ALTERNATIVE SITE
USDA-APHIS ARS ANIMAL HEALTH RESEARCH CENTER
UNIVERSITY OF CONNECTICUT

**REFERENCE:** University of Connecticut Siting Study (2008)
Horsebarn Hill Road originates and terminates on Route 195; it is a loop road approximately 1.3 miles in length. Several barns, including Horsebarn, Beef and Sheep Barn, Cattle Resource Unit (CRU), and the Kellogg Dairy Center (KDC) are located along this scenic road. These barns are open to the public on a daily basis. The facilities located along Horsebarn Hill Road represent traditional agriculture in the State of Connecticut. The BSL-2 Laboratory building was proposed to be constructed within the Biobehavioral Complex; the Ag Barn would be located at the Yellow Barn. The Yellow Barn is listed on the National Register of Historic Places (NRHP) as an historic building; UConn is obligated to maintain the barn in compliance with applicable regulations.

The Ag Barn would be constructed in the vicinity of the Dairy Barn (aka Yellow Barn), adjacent to Route 195, and the BSL-2 would be constructed within the Bio-Behavioral Complex, which is located at the easternmost end of the loop road. This separation of structures creates several difficulties with animal transport between the Ag Barn and the BSL-2, which must occur on a regular basis. Also, it is likely that buildings currently located within the Bio-behavioral Complex would have to be demolished to accommodate the BSL-2 laboratory building and parking spaces. It is expected that construction of the laboratory building and parking facilities would therefore encroach upon areas that are currently set aside for the conservation of wetlands.

The entire Agriculture Campus (including Horsebarn Hill) lies within the OPM classification of Conservation Areas. Conservation Areas are defined by OPM as a Priority 3 conservation area behind Existing Preserved Open Space (Priority 1), and Preservation Areas (Priority 2). OPM’s Conservation and Development Policies Plan for Connecticut states that this classification “does not necessarily mean halting all development in such areas, but it does involve careful attention to ensure that the resources of concern are not harmed.” It is the University’s intent to conform to the guidelines for development within Conservation Areas.

UConn’s 2004 East Campus Plan of Conservation and Development was reviewed for additional information pertaining to Horsebarn Hill. In addition, the University’s Outlying Parcels Master Plan was reviewed. This plan also includes valuable information pertaining to Agricultural Campus of UConn, which includes Horsebarn Hill. Of consideration is the University’s desire to maintain Horsebarn Hill area in the following manner:

- Preserve existing character of key natural features.
- Enhance image and identity along Route 195.
- Identify future infill opportunities.
- Create an appropriate gateway image to UConn.

### 2.3 COMPARISON OF ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

Table 2-1 provides a brief comparison of the environmental consequences (i.e., impacts) associated with the various alternatives.
### Table 2-1: Environmental Consequences of Alternatives

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>Physical Resources</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Geology, Topography, Soils)</td>
<td>No impacts to geology,</td>
<td>Disturbance of soils and topography during earthmoving activities.</td>
<td>Disturbance of soils and topography during earthmoving activities.</td>
<td>Disturbance of soils and topography during earthmoving activities.</td>
</tr>
<tr>
<td><strong>Water Resources</strong></td>
<td></td>
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</tr>
<tr>
<td>(Surface Water, Wetlands, Floodplains, Groundwater)</td>
<td>No impacts to water resources would occur.</td>
<td>Compliance with CT DEP sediment and erosion control measures during construction. Installation of sewer line is anticipated to be by directional bore beneath unnamed stream and wetland. Permitted activity. No impacts to area groundwater are expected.</td>
<td>Compliance with CT DEP sediment and erosion control measures during construction activities. Presence and locations of streams and wetlands for this alternative are unknown. Proper protection of water resources would be employed.</td>
<td>Compliance with CT DEP sediment and erosion control measures during construction activities. Presence and locations of streams and wetlands for this alternative are unknown. Proper protection of water resources would be employed.</td>
</tr>
<tr>
<td><strong>Biological Resources</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>(Vegetation, Wildlife/Aquatic Resource, T&amp;E Species)</td>
<td>No adverse biological impacts would occur.</td>
<td>This alternative would result in approximately 4 to 5 acres of mature tree stand removal. No significant impacts to wildlife (including threatened and endangered species) or aquatic resources are anticipated.</td>
<td>The Southern bog lemming and the Eastern hognose snake may be found within the North Hillside Road Alternative site. Coordination with CT DEP would be conducted prior to construction activities. Impacts to T&amp;E species are possible; however it is likely that any impacts would not be significant. No other significant impacts to wildlife or vegetation are expected at this location.</td>
<td>Historic records indicate the presence of the Eastern hog nose snake in the vicinity of Horsebarn Hill. Implementation of the project in this area may impact this species; however, no significant impacts to wildlife, vegetation or aquatic resources are expected.</td>
</tr>
<tr>
<td><strong>Cultural Resources</strong></td>
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<tr>
<td></td>
<td>No cultural resources</td>
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<tr>
<td>impacts would occur.</td>
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<tr>
<td><strong>Noise</strong></td>
<td>No noise impacts would</td>
<td>It is expected that temporary and minor noise impacts would occur from the use of heavy equipment during construction. No additional noise impacts would occur once the facility is completed.</td>
<td>It is expected that temporary and minor noise impacts would occur from the use of heavy equipment during construction. No additional noise impacts would occur once facility is completed.</td>
<td>It is expected that temporary and minor noise impacts would occur from the use of heavy equipment during construction. No additional noise impacts would occur once the facility is completed.</td>
</tr>
<tr>
<td><strong>Access/Traffic</strong></td>
<td>No impacts to vehicular</td>
<td>Would result in minor impacts to traffic on Route 44, Weaver Road, and Alter Lane during construction activities. Following construction, there would be only minor traffic impacts from additional staff accessing the site.</td>
<td>Traffic impacts to the University would be greater than those anticipated for the Preferred Alternative because the construction would occur off of a main campus road.</td>
<td>Traffic impacts to the University would be greater than those anticipated for the Preferred Alternative because the construction would occur off of a main campus road. Also, the BSL-2 and Ag Barn would be separated, resulting in additional traffic and fuel consumption with this alternative.</td>
</tr>
<tr>
<td></td>
<td>access or traffic would</td>
<td></td>
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<td></td>
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<tr>
<td>occur.</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Utilities</strong></td>
<td>No impacts to utilities</td>
<td>A review of adjacent utilities indicates there may be upgrades required for this alternative.</td>
<td>A review of onsite rights of way and existing secondary sources indicates that existing utilities are capable of expansion with very minor impacts. Some relocation of underground utilities would be necessary resulting in minor impacts.</td>
<td>A review of onsite rights of way and existing secondary sources indicates that existing utilities are capable of expansion with very minor impacts. Some relocation of underground utilities would be necessary resulting in minor impacts.</td>
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<tr>
<td></td>
<td>would occur.</td>
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<td></td>
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</tr>
<tr>
<td><strong>Socioeconomic Resources</strong></td>
<td>No impacts to socioecon</td>
<td>Based upon the small number of new employees to work in the new facility, no impacts, adverse or beneficial, are anticipated under this scenario.</td>
<td>Based upon the small number of new employees to work in the new facility, no adverse impacts are anticipated under this scenario. The services and supplies purchased by these employees under this scenario would produce an economic benefit to the surrounding community.</td>
<td>Based upon the small number of new employees to work in the new facility, no adverse impacts are anticipated under this scenario. The services and supplies purchased by these employees under this scenario would produce an economic benefit to the surrounding community.</td>
</tr>
<tr>
<td></td>
<td>omic resources would</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>occur.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Solid and Hazardous Materials/Waste</strong></td>
<td>No impacts</td>
<td>Operation of the AHRC would result in the generation of a variety of waste materials – animal waste, carcasses, human waste, hazardous waste. All waste materials would be managed and disposed in accordance with all appropriate and applicable local, state, and federal regulations. No significant impacts expected.</td>
<td>Operation of the AHRC would result in the generation of a variety of waste materials – animal waste, carcasses, human waste, hazardous waste. All waste materials would be managed and disposed in accordance with all appropriate and applicable local, state, and federal regulations. No significant impacts expected.</td>
<td>Operation of the AHRC would result in the generation of a variety of waste materials – animal waste, carcasses, human waste, hazardous waste. All waste materials would be managed and disposed in accordance with all appropriate and applicable local, state, and federal regulations. No significant impacts expected.</td>
</tr>
<tr>
<td><strong>Air Quality</strong></td>
<td>Air quality would not</td>
<td>Construction activities will result in very minor VOC and NOx emissions – below de minimis levels. Impacts to local air quality would be insignificant during facility operations.</td>
<td>Construction activities will result in very minor VOC and NOx emissions – below de minimis levels. Impacts to air quality would be insignificant.</td>
<td>Construction activities will result in very minor VOC and NOx emissions – below de minimis levels. Impacts to air quality would be insignificant.</td>
</tr>
</tbody>
</table>
SECTION 3
EXISTING ENVIRONMENTAL CONDITIONS & IMPACT ASSESSMENT

This section presents the baseline environmental conditions for the proposed project. Information in this chapter is derived from primary and secondary sources, as noted. Primary data sources included site reconnaissance to collect field data. Secondary data sources included resource mapping, reports, and internet data (i.e., reports) authored by reliable secondary sources. The various environmental resources affected by the proposed project are presented.

This section identifies and analyzes the probable effects on the natural and man-made environments anticipated if the preferred alternative (see Figure 3-1: Aerial Map), No Action Alternative or additional alternatives would be implemented. Where potential environmental impacts are identified, specific mitigation measures are described. The purpose of mitigation is to reduce the undesirable effects of an action on the environment. Five means of mitigation available for consideration are avoidance of the impact, limitation of the action, restoration of the environment, reduction over time by preservation/maintenance, and replacement of resources.

3.1 PHYSICAL RESOURCES

3.1.1 Topography, Geology and Soils

Topography (see Figure 3-2: Site Topography – Proposed Project Location), geology and soil conditions (see Figure 3-3 & Figure 3-4: Soils Map – Proposed Project Location and Alternative Sites, respectively) were evaluated in the proposed and alternative project areas to describe existing conditions and to facilitate a determination of suitable construction techniques during the proposed construction. Evaluations of soil and geologic conditions were based upon research of published literature on soils and geology of the area (U.S. Geological Survey (USGS) topographical maps and U.S. Department of Agriculture’s (USDA) Natural Resource Conservation Service (NRCS) Soil Surveys), and a review of the available subsurface information. Field reconnaissance was conducted to verify existing site conditions within the project area.

3.1.1.1 No Action Alternative

There would be no effects on site soils, geology or topography under this alternative as there would be no earthmoving activities. Implementation of the No Action Alternative would result in no changes to the sites being considered under the proposed action as there would be no demolition and construction.

3.1.1.2 Preferred Alternative

The preferred project area is sloped in two directions due to an existing ridge dividing the site. Grades vary between 5% and 10% slopes and elevations range between 496 feet to 514 feet above mean sea level (amsl). From the top of the ridge, the site slopes to the southwest toward Ahern Lane. The site drops along a severe embankment that parallels Ahern Lane.
FIGURE 3-1
AERIAL MAP - PREFERRED ALTERNATIVE
USDA-APHIS ARS ANIMAL HEALTH RESEARCH CENTER
UNIVERSITY OF CONNECTICUT

REFERENCE: ACME Mapping Online

PROPOSED PROJECT LOCATION
FIGURE 3-2
SITE TOPOGRAPHY - PREFERRED ALTERNATIVE
USDA-APHIS ARS ANIMAL HEALTH RESEARCH CENTER
UNIVERSITY OF CONNECTICUT

REFERENCE: United States Department of Interior Geological Survey
Coventry, Conn (1983)
Soil Map—State of Connecticut

Map Unit Legend

<table>
<thead>
<tr>
<th>Map Unit Symbol</th>
<th>Map Unit Name</th>
<th>Acres in AOI</th>
<th>Percent of AOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Ridgebury fine sandy loam</td>
<td>6.5</td>
<td>1.5%</td>
</tr>
<tr>
<td>3</td>
<td>Ridgebury, Leicester, and Whitman soils, extremely stony</td>
<td>34.1</td>
<td>7.9%</td>
</tr>
<tr>
<td>29A</td>
<td>Agawam fine sandy loam, 0 to 3 percent slopes</td>
<td>1.5</td>
<td>0.4%</td>
</tr>
<tr>
<td>4B</td>
<td>Woodbridge fine sandy loam, 0 to 6 percent slopes</td>
<td>12.7</td>
<td>2.9%</td>
</tr>
<tr>
<td>4B</td>
<td>Woodbridge fine sandy loam, 2 to 6 percent slopes, very stony</td>
<td>40.3</td>
<td>11.7%</td>
</tr>
<tr>
<td>32B</td>
<td>Bolton fine sandy loam, 3 to 6 percent slopes</td>
<td>2.2</td>
<td>0.6%</td>
</tr>
<tr>
<td>5B</td>
<td>Bolton fine sandy loam, 2 to 6 percent slopes, very stony</td>
<td>33.5</td>
<td>7.9%</td>
</tr>
<tr>
<td>3C</td>
<td>Glastonbury sandy loam, 6 to 15 percent slopes</td>
<td>5.1</td>
<td>0.7%</td>
</tr>
<tr>
<td>50B</td>
<td>Canton and Charlton soils, 3 to 8 percent slopes</td>
<td>1.9</td>
<td>0.4%</td>
</tr>
<tr>
<td>51B</td>
<td>Canton and Charlton soils, 2 to 8 percent slopes, very stony</td>
<td>33.0</td>
<td>7.6%</td>
</tr>
<tr>
<td>57C</td>
<td>Gloucester gravelly sandy loam, 8 to 15 percent slopes</td>
<td>3.0</td>
<td>0.7%</td>
</tr>
<tr>
<td>61B</td>
<td>Canton and Charlton soils, 3 to 8 percent slopes, very stony</td>
<td>20.3</td>
<td>4.7%</td>
</tr>
<tr>
<td>61C</td>
<td>Canton and Charlton soils, 8 to 15 percent slopes, very stony</td>
<td>6.3</td>
<td>1.4%</td>
</tr>
<tr>
<td>62D</td>
<td>Canton and Charlton soils, 15 to 35 percent slopes, extremely stony</td>
<td>30.7</td>
<td>7.1%</td>
</tr>
<tr>
<td>73C</td>
<td>Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky</td>
<td>3.0</td>
<td>0.7%</td>
</tr>
<tr>
<td>73E</td>
<td>Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky</td>
<td>9.3</td>
<td>2.1%</td>
</tr>
<tr>
<td>84B</td>
<td>Paxton and Montauk fine sandy loams, 3 to 8 percent slopes</td>
<td>45.4</td>
<td>10.5%</td>
</tr>
<tr>
<td>84C</td>
<td>Paxton and Montauk fine sandy loams, 8 to 15 percent slopes</td>
<td>20.8</td>
<td>4.8%</td>
</tr>
<tr>
<td>85B</td>
<td>Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony</td>
<td>19.8</td>
<td>4.6%</td>
</tr>
<tr>
<td>85C</td>
<td>Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony</td>
<td>12.2</td>
<td>2.8%</td>
</tr>
<tr>
<td>86D</td>
<td>Paxton and Montauk fine sandy loams, 15 to 35 percent slopes, extremely stony</td>
<td>15.3</td>
<td>3.6%</td>
</tr>
<tr>
<td>306</td>
<td>Udorthents-Urban land complex</td>
<td>11.9</td>
<td>11.9%</td>
</tr>
<tr>
<td>W</td>
<td>Water</td>
<td>11.9</td>
<td>11.9%</td>
</tr>
</tbody>
</table>

Totals for Area of Interest: 433.6 acres (100.0%)
Large boulders have been placed to create an overlook along a gently sloping bank in the central portion of the woodland area, southeast of the proposed new building location. This overlook, while elevated only a few feet off of the woodland floor, is approximately 40 feet wide. It appears that the boulders, both round and flat, have been pushed into position to create this horseshoe-shaped anomaly. The top of the overlook was flat and contained several small saplings and other undergrowth. In addition, fill areas may exist adjacent to this overlook. At the time of this writing, the extent of the fill area is unknown; further investigations may be necessary if the proposed project will encroach upon this area.

Numerous rock outcroppings and single boulders were noted throughout the site. Observable rock became more prevalent in the northern portion of the site than in the southern.

Preliminary findings indicate that the site is underlain with gneiss, a rock that will make the excavation of foundations and utility trenches more difficult. A geotechnical investigation conducted at the subject site in August 2009 has found till with boulders over rock. Most of the borings met refusal on what is expected to be boulders, with the exception of three borings. In some cases, a second hole was drilled close to a shallow refusal (about 5 feet). In some of these cases, the boring continued through soil beyond 5 feet, thereby confirming the initial refusal was a boulder. Water depth was measured at 10.1 ft in one of the borings.

Based upon the geotechnical information, the project design team will develop strategies (establishing the floor elevation of the building and adjusting the building location on the site) to balance the amount of rock excavation in the final design against the optimum site location.

For construction at this site, excavations would be in existing forest mat and glacial till deposits. Conventional heavy construction equipment would be suitable for excavation of overburden soils. Site planning would assume the generation of a quantity of boulders, which would likely require crushing prior to reuse as on-site fill. Bedrock excavation would be required in the laboratory/administration building if the foundations are to be below El. 510 (north side) and El. 503 (south side). It does not appear that bedrock excavation would be required within the barn area.

The geotechnical investigation found that the upper few feet may be rippable in most areas; however, blasting may be required to facilitate bedrock excavation of a significant volume. The geology of the material to be broken would be the most important factor in determining the overall blast design. Borehole diameter and hole spacing would change as varied conditions such as stratification or increased depth are encountered. While there is currently no schedule for blasting, it is anticipated that, should it be necessary, it would be conducted in accordance with a pre-determined schedule and permits received from the University’s Fire Chief. Drilling and blasting would be conducted during normal working hours. Local residents, college officials, and students would be notified well in advance of any blasting activities. Please note that blasting of bedrock does not appear to be necessary for this project. Proper security procedures would be enacted to ensure the safety of site personnel and local residents.

In a partnership led by the U.S. Department of Agriculture (USDA) - Natural Resources Conservation Service, the National Cooperative Soil Survey has developed a Web Soil Survey of the proposed project area. This survey contains data on soils and shallow subsurface conditions within and adjacent to the project area. This information is useful at the planning level to draw general conclusions about the suitability of a site for certain land uses. The soils underlying the
project area consist of Paxton sandy loam with a 3 to 8 percent slope. Paxton soils are made up of coarse-loamy lodgment till derived from granite and/or schist and/or gneiss, and are located on drumlins, hills and till plains. The surface area of Paxton soils are covered with cobbles, stones or boulders. Paxton soils are well drained, have a low available water capacity, and depth to water table is approximately 18 to 30 inches.

The eastern and southern portions of the site drain to Cedar Swamp Brook, which then flows into Eagleville Pond. A run of the river dam on the Willimantic River impounds Eagleville Pond. The western portion of the site also drains to an unnamed tributary of the Eagleville Pond. The site grading and drainage will need to be designed in a manner so that positive drainage away from the building and paved surfaces will be provided. All paved and non paved surfaces should be sloped to a minimum 2% slope. It should be noted that since the site is mildly sloped, cut and fill would be necessary. The designers goal should be to balance all cut and fill at the site while minimizing the overall area of disturbance. Implementation of this Alternative would have no long term or significant impacts on site soils, geology, or topography. Temporary disturbance of site soils would occur during construction activities. Proposed construction would not have any effects on soils beyond construction sites. Site soil will be regraded to accommodate the building design without the need to import soil.

Best Management Practices (BMPs) to control erosion and sedimentation, such as silt fences, would be used to ensure soils do not erode from the construction site to offsite locations. The following mitigation measures would likely be instituted, in combination, during the construction phase of the project:

- Protect existing vegetation and ground cover as much as possible;
- Application of soil erosion and sediment control measures; and
- Adherence to any required moratoriums for the protection of natural resources (if necessary).

Erosion and sediment control measures will follow Connecticut’s 2004 Guidelines for Soil Erosion and Sediment Control. Measures may include the following, separately or in combination:

- Silt fencing systems around all disturbed areas;
- Inlet protection on any storm drain inlets;
- Soil stabilization such as seeding, sodding and mulching shall be applied;
- No disturbed area shall remain denuded for an extended period;
- Temporary seeding shall be used when required; and
- The contractor shall obtain a General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (Stormwater Construction General Permit) for the discharges from construction activities.

3.1.1.3 Alternative Sites

Impacts to site topography and soils (see Figure 3-4: Alternative Site Soils Map) at each of the alternative locations would be similar to those described for the Preferred Alternative. East Campus areas, including Horsebarn Hill, exceed 15 percent grade and are considered steep slopes. According to the East Campus Plan of Conservation and Development (JJR; August 2004), it is best to allow these areas to remain in their current state as forested and agricultural land. The North Campus area (including the North Hillside Road alternative) ranges in
elevation from a high elevation of 739 feet amsl to a low elevation of 510 feet. Slopes range from 4% to 20%; slopes over 15% should be preserved in their current form.

### 3.1.2 Air Quality

Under the Clean Air Act and Amendments, the U.S. Environmental Protection Agency (USEPA) enacted the National Ambient Air Quality Standards (NAAQS) for the protection of the public health and welfare. Standards have been established for the following pollutants: carbon monoxide (CO), sulfur dioxide (SO₂), particulates with a diameter less than or equal to a nominal 10 micrometers (PM₁₀), ozone (O₃), nitrogen dioxide (NO₂), and lead (Pb). In accordance with the federal criteria, geographic areas that are in violation of the NAAQS as non-attainment areas can be designated as Air Quality Control Regions (AQCR). Based on the severity of the pollution problem, non-attainment areas can be categorized as marginal, moderate, serious, severe, or extreme.

Since the formation of CT DEP in 1971, Connecticut has had significant improvements in air quality. Connecticut now meets health related standards for most pollutants regulated under the federal Clean Air Act. However, levels of ground-level ozone and particles still remain to be a health and environmental concern.

On March 12, 2008, the USEPA promulgated a more stringent National Ambient Air Quality Standard (NAAQS) for ozone, lowering the 8-hour ozone NAAQS from 0.08 parts per million (ppm) to 0.075 ppm. Pursuant to Section 107(d) of the Clean Air Act, the CT DEP recommended that EPA designate the entire State of Connecticut as nonattainment for the 2008 8-hour ozone NAAQS.

Portions of the University operate under an existing Title V permit (permit number 098-0029-TV). Other portions of the University are regulated under a General Permit to Limit the Potential to Emit (GPLPE).

#### 3.1.2.1 No Action Alternative

There would be no effect on ambient air quality under this alternative as there would be no use of construction equipment. Additionally, no new laboratory facilities would be constructed which could potentially increase air emissions.

#### 3.1.2.2 Proposed Alternative (Preferred)

The operation of heavy equipment during construction of the Proposed Alternative would release an insignificant amount of carbon monoxide and other emissions into the air. Some fugitive particulate emissions would result from construction activities, such as site preparation activities, and/or delivery of new materials and equipment. Construction-related emissions would be short term and are not expected to be substantial enough to affect the attainment status of the six priority pollutants, including ozone. All construction activities would comply with local and regional air quality regulations. Use of street sweepers and/or water trucks with spray-bars and other engineering controls by the contractors to remove any soils or materials falling on paved surfaces would minimize fugitive dust emissions. Appropriate emission control devices on vehicles would minimize adverse effects to air quality during construction.
In accordance with CT DEP directives, reasonable precautions will be taken to prevent particulate matter, such as fugitive dust, from becoming airborne. No permit or approval is required for fugitive dust or emissions created during construction.

The CT DEP Department recommends contract specifications to reduce diesel exhaust emissions from on-road and construction vehicles and equipment for UConn projects. Such specifications can include either retrofit emission control devices or are equipped with original manufacturers' equipment that meets the most recent federal standards as well as use of ultralow sulfur diesel fuel. Retrofit devices such as diesel oxidation catalysts or diesel particulate filters are options for many vehicles and equipment typically used in construction projects. The on-road vehicles include dump trucks, fuel delivery trucks and other vehicles typically found at construction sites.

In addition, section 22a-174-18(b)(3)(C) of the Regulations of Connecticut State Agencies limits the idling of mobile sources to 3 minutes. This regulation includes on-road vehicles such as trucks and other diesel engine-powered vehicles commonly used on construction sites. Adhering to the regulation will reduce unnecessary idling at truck staging zones, delivery or truck dumping areas and further reduce construction equipment emissions. Use of posted signs indicating the three-minute idling limit is recommended. Therefore, CT DEP recommends that UConn includes language similar to the anti-idling regulations in the contract specifications.

The Depot Campus does not have a Title V permit; rather, it has a GPLPE. Any additional emission sources at the Depot Campus would require modification to the GPLPE.

In livestock housing and management, odor is a product of microbial degradation of organic matter. The major source of odor on livestock farms is manure. As biological activity occurs, gases are released. Compounds including hydrogen sulfide and ammonia have been identified which contribute to odor from livestock manure. To minimize odor impacts, the design of the AHRC will consider potential odor pollution impacts from solid waste and wastewater handling and disposal.

Solid waste and wastewater handling processes during animal housing will be designed and managed to minimize odor production. Management is the key to controlling odors. Odor-reducing management practices include site selection, building design, waste processing and disposal, and daily operation and maintenance. Goals of the AHRC are to ensure good solid waste and wastewater management and control of odors to facilitate a clean and efficient Ag Barn that produces fewer odors.

A management plan might consider not scraping and hauling manure on holidays or on the weekends. Also, the facility would consider not hauling when there are strong winds blowing off site. When hauling manure, the facility would clean up any spills on roadways and around the building immediately.

3.1.2.3 Alternative Sites

Impacts associated with the alternative locations would be similar to those described for the Preferred Alternative.

The Alternate Sites are considered to be part of the Storrs Campus. As such any additional emission sources would be subject to the existing Title V air permit emission standards.
3.1.3 Solid Waste and Hazardous Materials/Waste

Solid waste generated at the University main campus is collected by Willimantic Waste and transported to an approved off-site waste disposal facility. Willimantic Waste is currently the University’s primary recycling contractor. The University has been active in waste recycling since the early 1990s. Northeast Lamp currently recycles fluorescent light bulbs. Color coded recycling receptacles are located in and around campus buildings. Recyclable materials in these bins are collected by custodial staff and placed in dedicated dumpsters for final pickup and off-site recycling. Since 1991, the University has been successful in reducing the amount of solid waste generated from daily activities.

USEPA defines hazardous wastes as those declared waste materials having corrosive, reactive, ignitable, or toxic characteristics. Hazardous waste generation, management, and disposal are regulated by the EPA’s Resource Conservation and Recovery Act (RCRA).

The University currently holds a USEPA identification number and the main Storrs Campus is regulated as a large quantity generator (LQG) of hazardous waste. The University Environmental Health & Safety (EH&S) Department has primary responsibility for hazardous waste and material management on campus and compliance with state and federal hazardous waste regulations. Hazardous wastes generated at various locations across the campus are collected and temporarily stored at satellite locations. The University EH&S Department performs a weekly collection of waste from the satellite locations to be transported to a main accumulation area.

It is the intention of the USDA to acquire an EPA ID # for the management and disposal of its RCRA-designated hazardous waste at the new AHRC.

The University EH&S Department maintains a Hazard Communication Program in accordance with the Department of Labor, Occupational Safety and Health Administration’s Hazard Communication Standard (29 CFR 1910-1200). The program outlines protocols for labeling hazardous chemicals, Material Safety Data Sheets (MSDS), training, and contractor work.

The University EH&S Department reported that, to the best of their knowledge, there have been no reportable spills or releases of hazardous materials or waste in the immediate vicinity of the Depot Campus, and more specifically, the proposed project area along Ahern Lane.

**Liquid and Solid Waste Management**

Operation of the AHRC at the University would result in the generation of a variety of waste materials:

- Liquid and solid animal waste from the Ag Barn and from within the animal holding rooms in the new AHRC
- Laboratory waste
- Sanitary waste
- Animal Carcasses
Prior to commencement of any study at the facility, the handling of liquid and solid animal waste materials and carcasses would be governed by individual protocols that are established by the Institutional Biosafety Commission (IBC) and Institutional Animal Care and Use Committee (IACUC).

All animal waste from the new AHRC and the new Agricultural Barn would be collected and connected to the site sanitary sewer system. Separate piping systems, which would allow for maximum flexibility in the event that program needs change over time, would be used to convey waste from various use groups within the buildings. Separate building drains would be used to collect waste from animal rooms, anterooms (i.e., secure, pre-entry room to the animal room), and Necropsy. Waste from research labs and from toilet and shower rooms (sanitary waste) would also be collected using separate building drains. The proposed systems would effectively separate animal waste from human waste, and lab waste from sanitary waste. Lab waste and sanitary waste would discharge to a common sump ejector located outside the building. Animal waste and necropsy waste would be piped to a similar collection system located in a basement adjacent to the animal wing. All waste from this site would discharge to the sanitary system.

If chemical pretreatment of liquid waste and autoclaving of solids are required, the specific animal room would be setup for this use prior to housing the animal. To facilitate appropriate liquid waste handling, each animal room would have a dual liquid waste drainage system. The first system (color coded green), would go to a holding tank and then directly into the sanitary waste stream to the University’s Waste Water Treatment Plant. The second drainage system (color coded red), would be piped to a chemical pre-treatment holding tank. After pre-treatment (in accordance with the protocols established by the IBC and IACUC), the treated waste would be pumped to the sanitary sewer system and then to the University’s Waste Water Treatment Plant.

Solid animal waste (collected from animal holding rooms, ante rooms, and the Necropsy) requiring decontamination prior to disposal would be appropriately bagged and then autoclaved. To assure compliance with the established cleaning procedures, the room would be inspected by the Research Manager against a protocol checklist prior to use.

Within the AHRC area, non-contaminated solid waste would be scraped and bagged. The bags would be collected from each holding room and placed in a designated solid waste storage area. From this area the animal waste would be routinely collected by University staff for transport to a designated disposal facility. Liquid waste would be collected in trench drains in each animal room through the green drain. The drains would be piped to a liquid holding tank, from which the waste would be pumped to the University’s Waste Water Treatment Plant.

Liquid non-contaminated waste from Necropsy would also use the two-drain-pipe system to convey waste to the liquid holding tank; waste would be treated the same as the animal waste described above prior to pumping to the University’s Waste Water Treatment Plant.

Solid animal waste from the Ag Barn would be scraped daily, transported to a holding area and then transported to a designated offsite disposal facility.
Carcass Disposal

The facility would be designed to perform challenge studies, which would include endemic agents (low level). Some animals from these studies may have to be disposed as bio-medical waste or veterinary pathological waste. Carcass disposal would be in accordance with protocols established by the IBC and IACUC prior to the start of a study.

Animals that are humanely euthanized in an animal holding room would be lifted by a portable hoist attached to permanent lift points on the ceiling of each holding room. The carcass would be placed on a cart for transport to the Necropsy area for sectioning and study. If necessary, the carcass could be held in the incoming cooler prior to sectioning. After sectioning, the containers holding the sectioned carcass would be placed in the outgoing cooler and held for subsequent disposal by the contracted rendering firm.

Carcasses of animals sacrificed at the end of the study would be sectioned and held in containers in the outgoing cooler of Necropsy for disposal.

3.1.3.1 No Action Alternative

Under this Alternative, the proposed AHRC would not be constructed at the University. As such, there would be no additional solid or hazardous waste/materials generated from the use of the buildings or from construction activities. Consequently, the University’s Hazard Communications Program would not have to be augmented to address this additional waste material.

3.1.3.2 Proposed Alternative (Preferred)

The Depot Campus is currently regulated by the USEPA as a small quantity generator (SQG) of hazardous waste. CT DEP’s requirements for a SQG are more stringent than the EPA’s. CT DEP limits waste generation per month for a SQG at 2,200 lbs and storage at 2,200 lbs total storage (compared to the EPA’s monthly storage limit of 13,200 lbs for a SQG). Since April 2008, Depot Campus has been operating under the conditionally exempt small quantity generator (CESQG) threshold of 220 lbs per month of hazardous waste generation.

If the USDA were to operate under UConn’s USEPA ID #, it would have to do so as a satellite accumulation area (SAA); however, it is the intention of the USDA to acquire its own EPA ID # for the management and disposal of its RCRA-designated hazardous waste at the new AHRC; therefore construction and operation of the new AHRC would not contribute to the University’s hazardous waste quantities. All hazardous waste generated at the new facility would be managed and disposed in accordance with all appropriate and applicable federal regulations.

A site walk (conducted in February 2009) across the proposed project area resulted in the identification of miscellaneous trash throughout the site (plastic wrappers, paper, bottles, etc.). A single rusted trashcan and what appeared to be the top of a metal drum was located in the central portion of the site. Several small earthen mounds were scattered throughout the site. It was not clear as to the origin or contents of these mounds. They could be the long-term accumulation of leaf litter, twigs, and other forest debris as they were primarily located around small growths of saplings. A couple of dilapidated picnic tables were found in the northern and northwestern portion of the site.
Large boulders were used to create an overlook along a gently sloping bank within the central portion of the woodland area. This overlook, while only elevated by a few feet off of the woodland floor, was approximately 40 feet wide. It appears that the boulders, both round and flat, have been pushed into position to create this anomaly. The top of the overlook was flat and contained several small saplings and other undergrowth. Miscellaneous debris found at the base of the overlook (and scattered out to approximately 30 feet beyond the toe of slope) included:

- several metal trashcans (varying in size), most rusted and several crushed;
- rusted drums;
- rusted metal buckets;
- lead pipe;
- colored glass bottles, intact and broken;
- ash;
- terracotta pipe;
- numerous pieces of broken porcelain;
- pieces of wire mesh; and
- metal strapping.

Construction of the AHRC at the Depot Campus would generate solid waste (and possibly some hazardous waste) during the construction phase of the project. The waste generated during construction of the proposed buildings would be recycled by the contractor or hauled to an appropriate disposal facility. Managing construction debris through regulated disposal methods will reduce adverse impacts to the environment. Construction activities at the proposed site would result in the temporary storage of petroleum oils and lubricants (for construction machinery). The contractor would be required to store and dispose of these materials in accordance with appropriate regulations.

3.1.3.3 Alternative Sites

The Storrs Campus is currently regulated as a RCRA LQG. Hazardous waste quantities generated at a new AHRC located at either of the two alternative sites would not adversely impact the University’s generator status under USEPA requirements. All hazardous waste generated at the new facility would be managed and disposed in accordance with all appropriate and applicable federal regulations.

3.1.4 Noise

Section 22a-69 of the Connecticut General Statutes gives the Commissioner of Environmental Protection the authority to develop, adopt, maintain, and enforce a comprehensive statewide program of noise regulation. Noise regulations are implemented according to land use categories.

Class A Land Use Category – Class A land uses are generally residential areas where human beings sleep or areas where serenity and tranquility are essential to the intended use of the land. Class A land uses include, but are not be limited to, single and multiple family homes, hotels, prisons, hospitals, religious facilities, cultural activities, forest preserves, and land intended for residential or special uses requiring such protection.
Class B Land Use Category – Class B land uses are generally commercial in nature, and areas where human beings converse and such conversation is essential to the intended use of the land. Class B land uses include, but are not be limited to, retail trade, personal, business and legal services, educational institutions, and government services.

Class C Land Use Category – Class C land uses are generally industrial where protection against damage to hearing is essential, and the necessity for conversation is limited. Class C land uses include, but not be limited to, manufacturing activities, transportation facilities, warehousing, military bases, mining, and other lands intended for such uses.

UConn is categorized as a Class B Land Use. The regulations state that no person in a Class B noise zone shall emit noise to adjacent land uses in exceedance of the following: 62 dBA in Class C land uses, 55 dBA in Class B land uses, 55 dBA in Class A land uses during the day, and 45 dBA in Class A land uses at night. Exemptions to these levels are made for construction noise.

3.1.4.1 No Action Alternative

There would be no contribution to additional noise impacts under this alternative.

3.1.4.2 Proposed Alternative (Preferred)

While no site-specific noise monitoring data has been collected for the proposed project sites, site observations and existing land uses are coincident with noise levels well below regulatory levels.

The primary noise generators resulting from implementation of the Proposed Alternative would be construction activities, including blasting (if necessary), excavating, heavy materials handling equipment, and the rock crusher (if necessary). These impacts would be primarily limited to the hours between 7:00 am and 5:00 pm Mondays through Fridays. As stated previously, adjacent residents, college officials, and students would be notified well in advance of any blasting activities.

Site use activities are anticipated to generate minimal noise. Minor noise impacts would be associated with truck (occasional) and passenger car traffic, particularly during the morning and afternoon commuting hours. All research activities are to be conducted inside the confines of the BSL-2 laboratory building. Animals would be housed within the Ag Barn at all times; site use activities would not include animals ranging outside the confines of the barn (with the exception of walking the animal into the BSL-2 building).

3.1.4.3 Alternative Sites

While no site-specific noise monitoring data has been collected for the alternative project sites, site observations and existing land uses are coincident with noise levels well below regulatory levels. Noise generation at any alternative site would be similar to projected noise at the Preferred Alternative site.
3.2 WATER RESOURCES

3.2.1 Surface Waters, Floodplains, Wetlands

Due to its gently rolling topography and proximity to streams and other waterbodies, the proposed activities could potentially affect the water resources in the region. Water resources potentially impacted by the proposed project include surface water (i.e. watersheds), groundwater, streams, floodplains, and wetlands. Each of these features is discussed below.

3.2.1.1 No Action Alternative

Under the No Action Alternative, there would be no construction activities associated with the construction of the AHRC. Therefore, there would be no adverse impacts to surface waters, floodplains or wetlands.

3.2.1.2 Proposed Alternative (Preferred)

Based on a review of soil survey data (see Figure 3-3) and the National Wetland Inventory Map (NWI) (Figure 3-5: Wetland Map), no wetlands or perennial waterways were identified within the project area. Additionally, on-the-ground site surveys did not reveal the presence of wetlands or waterways. The Depot Campus is located within the Willimantic River Watershed (see Figure 3-6: Willimantic River & Watershed). A review of Federal Emergency Management Agency (FEMA) 100-year floodplain mapping did not reveal the presence of floodplains within the project area (Figure 3-7: FEMA Floodplain Map).

Although there are no wetlands, surface waters or floodplains within or immediately adjacent to the proposed project area, the proposed project would involve the crossing of an adjacent wetland and stream corridor for the construction of new sanitary sewer lines in order to tie in with existing sanitary lines, thereby necessitating a Utilities and Drainage general permit. Following installation of the sewer line, wetlands would be restored to pre-existing elevations, and re-vegetated with wetland plants. For the sanitary sewer lines, site design will consider the use of a directional boring technique to reduce impacts to the wetland and waterway. The design would include entry and exit bore pits outside of the wetland/waterway limits to further reduce impacts to sensitive natural resources. After installation of the sanitary line, both sites would be restored to pre-construction conditions.

The Depot Campus area ultimately drains to the Willimantic River. The Proposed Alternative project area is located within the Willimantic River Watershed (see Figure 3-6: Willimantic River & Watershed). The Willimantic River is located approximately 4,500 feet southwest of the proposed project site. For 25 miles in Northeast Connecticut, the Willimantic River provides a scenic conduit between diverse landscapes, including deep forests, farmlands and historic mill villages. The 25-mile corridor was designated as a Connecticut State greenway in 2003. Its recreational uses include hiking, fishing, canoeing/kayaking, and parklands. The health of the Willimantic River is directly linked to the land use in its entire watershed. Sound land use planning and protection of critical and natural areas have contributed to improving water quality within the river. The watershed encompasses 225 square miles of land in Massachusetts and Connecticut. Cedar Swamp Brook, which is located approximately 3,000 feet east and south of the project area, is the only major tributary that feeds the river in the vicinity of the proposed project area. The Willimantic River surface waters are classified as Class B. Designated uses of
FIGURE 3-6
WILLIMANTIC RIVER & WATERSHED MAP - PREFERRED ALTERNATIVE
USDA-APHIS ARS ANIMAL HEALTH RESEARCH CENTER
UNIVERSITY OF CONNECTICUT
FIGURE 3-7
FEMA FLOODPLAIN MAP - PREFERRED ALTERNATIVE
USDA-APHIS ARS ANIMAL HEALTH RESEARCH CENTER
UNIVERSITY OF CONNECTICUT

REFERENCES: FEMA Floodplain Mapping Online
Class B waters include recreation, fish and wildlife habitat, agricultural and industrial supply. Other legitimate uses include navigation.

Currently, under the CT DEP’s Aquifer Protection Area Program, the state has designated a number of Level A and Level B Aquifer Protection Areas within the Willimantic River Watershed. These areas contain high yielding public water supply wells in stratified drift areas, such as the University of Connecticut wells located in Mansfield. Land use regulations administered by the CT DEP were established to minimize the potential for contamination of well fields. The regulations restrict development of certain new land use activities that use, store, handle or dispose hazardous materials. Further, the regulations require existing regulated land uses to register and follow best management practices. Construction of the AHRC at the Depot Campus would be subject to applicable land use regulations as part of the DEP’s Aquifer Protection Area Program.

Future developments on or within the Depot Campus would employ water conservation measures consistent with the University’s targeted conservation initiatives that are described in the 2007 Water and Wastewater Master Plan and UConn’s Sustainable Design Guidelines and Green Building Policy. The new AHRC project would incorporate project design elements that limit or reduce potential aquatic impacts of stormwater runoff from impervious cover.

### 3.2.1.3 Alternative Sites

Based on a review of soil survey data (see Figure 3-4) and NWI mapping (see Figure 3-8: Alternative Sites National Wetland Inventory Map), there appear to be palustrine forested/scrub shrub (PFO/SS) and open water wetlands in close proximity to the North Hillside Road alternative. A review of resource mapping and the 2004 East Campus Plan of Conservation and Development revealed designated wet soils adjacent to the Dairy Barn complex. Additional wet soils are found along the northern end of the Horsebarn Hill loop road. Wet soils are supportive of jurisdictional wetlands. Development within these sensitive areas is not encouraged by the University.

A review of site topography revealed that both alternative sites are located within the Fenton River Greenway watershed. The main stem of the Fenton River is located approximately 2,000 feet to the east of the Horsebarn Hill alternative and approximately 4,000 feet east of the North Hillside Road alternative. In 2005, it was reported that UConn was allowed to draw approximately 844,300 gallons of water a day from its wellfields near the Fenton River and approximately 2.3 million gallons from the Willimantic River wellfields. On average, the University Water Supply System supplied 1.3 million gallons of water per day to UConn students, administration, faculty, staff, and community members. As a result of severe dry conditions on the river in 2005, the University has implemented several restorative and conservation measures to help preserve the quality of water and aquatic life within the Fenton River. These included fish re-stocking, promoting public awareness, studying the re-colonization of macroinvertebrates within the river, continuation of voluntary and mandatory conservation measures until seasonally normal stream flow was restored, hiring and utilizing an expert in water conservation techniques, and implementation of a variety of other water conservation awareness programs across the campus.

Design of the new AHRC at either of these locations has the potential to adversely impact wetlands and streams. Any impacts to streams or wetlands would be addressed through a permit.
FIGURE 3-8
NATIONAL WETLAND INVENTORY MAP - ALTERNATIVE SITES
USDA-APHIS ARS ANIMAL HEALTH RESEARCH CENTER
UNIVERSITY OF CONNECTICUT

REFERENCE: National Wetland Inventory Mapping Online - State of Connecticut
REFERENCE:
FEMA Floodplain Mapping Online

FIGURE 3-9
FEMA FLOODPLAIN MAP - ALTERNATIVE SITES
USDA-APHIS ARS ANIMAL HEALTH RESEARCH CENTER
UNIVERSITY OF CONNECTICUT
application process with the CT DEP Inland Water Resources Division (IWRD). IWRD permits activities on State-owned land.

Future developments on the North Campus would also employ water conservation measures consistent with the University’s targeted conservation initiatives that are described in the 2007 Water and Wastewater Master Plan and UConn’s Sustainable Design Guidelines and Green Building Policy. The new AHRC project would incorporate project design elements that limit or reduce potential aquatic impacts of stormwater runoff from impervious cover.

No floodplains are located within either alternate site location (see Figure 3-9: Alternative Sites FEMA Floodplain Map). Therefore, construction of the AHRC within either of these two sites would have no directly adverse impacts on floodplains.

3.2.2 Groundwater and Drinking Water Supplies

The quality of groundwater beneath a majority the Storrs Campus study areas is classified by the CT DEP as GAA/GA. The Depot Campus is located entirely within areas having a GAA/GA groundwater quality classification. Class GAA/GA groundwater is groundwater within the area of existing private water supply wells or an area with the potential to provide water to public or private water supply wells. Class GAA/GA groundwater is presumed suitable for drinking or other domestic uses without treatment (CT DEP, 1996).

The Willimantic River Wellfield in northwest Mansfield and the Fenton River Wellfield in northeast Mansfield represent the sources for a drinking water supply system that UConn maintains within the Storrs campus. Water from the Willimantic Wellfield supplies water to the Depot Campus and the Main Campus, while the Fenton River Wellfield supplies water to the Main Campus. The average daily demand on the water system for the two campuses is 1.36 Mgpd with a peak demand of 2.2 Mgpd. Current registered water diversions include 2.3077 Mgpd from the Willimantic River Wellfield and 0.844 Mgpd from the Fenton River Wellfield, for a total available supply of 3.1517 Mgpd. Water quality from the Willimantic and Fenton River Wellfields currently meets all state and federal standards for public drinking water supplies. The system has been operated since 2006 by New England Water Utility Services, Inc. (FEIS: North Hillside Road Extension; May 2009).

Portions of the East Campus (including the Horsebarn Hill site) are located within a public water supply watershed. The Windham Water Works draws surface water from the Willimantic Reservoir, which is part of a 164 square mile watershed. The Fenton, Mount Hope and Natchaug rivers are the largest rivers that contribute to the reservoir. The Windham Water Works treatment facility includes a pump house and a water treatment facility. The water treatment facility treats an average of 2.5 million gallons per day. A total of three storage tanks (one 4.5 million gallons and two 1.1 million gallons) supply treated water to the system.

In addition to stormwater management practices to reduce the effects of impervious cover at the site, construction-phase best management practices will also be implemented to reduce the potential for impacts to nearby public drinking water supply wells and surface water supplies.
3.2.2.1 No Action Alternative

The No Action Alternative would result in no significant impacts to area groundwater resources.

3.2.2.2 Proposed Alternative (Preferred)

Geotechnical investigations were conducted within the Preferred Alternative area between August 20 and 24, 2009. A USGS research station is located 180 feet north of the site. The USGS has installed three groundwater observation wells around the station, one of which lies within 100 feet of the Animal Health Research Center.

Groundwater was gauged in boring location B1-OW well at about 10.1 ft (Elevation 502.4) below ground surface (refer to Appendix B for boring locations). Groundwater was gauged at about 7.6 ft (Elevation 498.4) at boring location IT-1 after being allowed to stabilize for approximately 30 minutes after completion of drilling. The USGS well was gauged at about 15.85 ft (Elevation 498.2) below ground surface. Water levels are expected to be higher in the spring and during times of average or above normal precipitation, in the range of 5 to 10 ft below ground surface. Since the combined June and July (2009) rainfall total was the highest total of those two months on record, these groundwater levels are likely higher than usual.

Based on the borings and the observation well at B1-OW, high groundwater level is estimated to be at Elevation 500. Estimated permeability of the soil is 0.0001 cm/sec. based on the grain size distribution of the glacial till soils obtained from the laboratory analyses. The dense glacial till overburden has relatively low permeability and is not well suited to accommodating stormwater infiltration (Haley & Aldrich, 2009).

3.2.2.3 Alternative Sites

Groundwater quality at the North Hillside Road alternative site is classified by the CT DEP as GAA/GA. The Horsebarn Hill Road site is located within a public water supply watershed (Windham Waterworks, Willimantic Reservoir). It is not anticipated that construction of the AHRC at either of the two alternative sites would result in significant adverse impacts to groundwater quality.

3.2.3 Water Usage - Domestic and Wastewater

Daily consumption of water at the new AHRC will include water for animal room cleaning, animal watering (BSL-2 and Ag Barn), and in the laboratory and administrative areas. Also, waste water flow will originate from these same areas. The following table depicts proposed water usage at the new AHRC. Please note that the numbers of daily and annual gallons presented below are estimates only. They are based upon general assumptions of the ratio of the number of gallons of water into the facility versus the number of gallons of wastewater that will be available to leave the facility via the wastewater collection system. For example, the washdown and lab/admin water is expected to go down the drain gallon for gallon. A large percentage of the animal watering component is absorbed into the animal bedding as urine and fecal matter, which is removed in the scrape/bag/burn component. It is assumed that of the 175,000 gallons of water usage (Animal Watering), 30,000 gallons leaks out of the bedding and into the drains. The remaining 145,000 gallons goes with the bedding. An 80%/20% ratio of water in to water out was assumed in this scenario. It is also likely that water usage and
wastewater production will be more variable during weekends. Based upon these assumptions (and others), the daily total gallons do not calculate out to the annual total gallons of water divided by 365 days.

<table>
<thead>
<tr>
<th>Water Usage</th>
<th>Annual Cold Water – Gallons</th>
<th>Annual Hot Water- Gallons</th>
<th>Annual Total – Gallons</th>
<th>Daily Total- Gallons</th>
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</thead>
<tbody>
<tr>
<td>Animal Room Cleaning (4 Times Daily)</td>
<td>40,000</td>
<td>60,000</td>
<td>100,000</td>
<td>300</td>
</tr>
<tr>
<td>Animal Watering</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSL-2</td>
<td>65,000</td>
<td>65,000</td>
<td>110,000</td>
<td>200</td>
</tr>
<tr>
<td>Ag</td>
<td>110,000</td>
<td></td>
<td></td>
<td>370</td>
</tr>
<tr>
<td>Laboratory/Admin.</td>
<td>70,000</td>
<td>30,000</td>
<td>100,000</td>
<td>330</td>
</tr>
<tr>
<td>Totals</td>
<td><strong>285,000</strong></td>
<td><strong>90,000</strong></td>
<td><strong>375,000</strong></td>
<td><strong>1,200</strong></td>
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</table>

<table>
<thead>
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<th>Wastewater Flow</th>
<th>Annual – Gallons</th>
<th>Daily Total - Gallons</th>
</tr>
</thead>
<tbody>
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<td>Animal Room Cleaning</td>
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<td>30</td>
</tr>
<tr>
<td>Animal Watering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSL-2</td>
<td>20,000</td>
<td>60</td>
</tr>
<tr>
<td>Ag</td>
<td>10,000</td>
<td>30</td>
</tr>
<tr>
<td>Laboratory/Admin.</td>
<td>100,000</td>
<td>310</td>
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<tr>
<td>Totals</td>
<td><strong>230,000</strong></td>
<td><strong>700</strong></td>
</tr>
</tbody>
</table>

3.2.3.1 No Action Alternative

Under the No Action alternative, the AHRC would not be constructed at the Depot Campus of the University of Connecticut. Therefore, there would be no impact on water consumption from this facility.

3.2.3.2 Proposed Alternative (Preferred)

Under this alternative, all components of the AHRC would be constructed within the Depot Campus of the University of Connecticut. Water consumption at the AHRC would equate to approximately 1,200 gallons per day. In addition to supplying water to the Main Campus, water from the Willimantic Wellfield also supplies drinking water to the Depot Campus. The average daily demand on the water system for the two campuses is 1.36 Mgpd with a peak demand of 2.2 Mgpd. Current registered water diversions from the Willimantic and Fenton River Wellfields total 3.1517 Mgpd. Considering the peak demand of 2.2 Mgpd and a total daily water diversion of 3.1517 mg, the addition of approximately 1,200 gallons per day on the system will not result in a significant adverse impact on the daily water supply or consumption at the Depot Campus location.

3.2.3.3 Alternative Sites

Based upon the relatively low daily water usage at the new AHRC, no significant adverse impacts to daily water supply would be associated with the construction and operation of the AHRC at either the North Hillside Road or Horsebarn Hill alternative sites.
3.3 STORMWATER MANAGEMENT

3.3.1 Stormwater Runoff Management Requirements

Potential impacts from storm water runoff associated with the construction and operation of the AHRC were evaluated based upon review of site specific information obtained from site mapping, aerial photographs, the geotechnical report, current stormwater management design guidance, and site walks. Design guidance that reflects an integrated approach to stormwater quality and quantity management were reviewed. This section includes conceptual stormwater management for the new AHRC (including the BSL-2 and Ag Barn) during construction and at full-build out and an overall management strategy to satisfy stormwater quantity and quality objectives.

The University’s Sustainable Design Guidelines and Green Building Policy, which was adopted in 2007, requires new building construction or renovation projects entering the pre-design planning phase to meet the LEED Silver rating as a minimum performance standard. Key objectives of the Sustainable Design Guidelines and Green Building Policy are to reduce development stormwater runoff impacts on the quantity and quality of the area’s water resources, prevent any increase in the rate of stormwater flow leaving the site, and provide for infiltration of stormwater runoff on greenfield and previously disturbed sites by implementing the following strategies:

- Promoting permeable paving technologies in lieu of the conventional impervious surfaces for drives and parking lots. Perform a life-cycle cost analysis that recognizes the long-term maintenance costs with the resulting benefits when choosing the appropriate system.
- Collecting rainwater from project roofs, where feasible, and storing it for reuse or slow release.
- Implement landscaping that has a higher rate of absorption than conventional turf grass.
- Reduce the need for stormwater utilities and detention basins. Introduce stormwater bio-retention basins, swales, or rain gardens within the project site or within the adjacent campus or clusters of buildings.
  - Pervious pavement for parking areas, water quality swales, rain gardens/bio-retention, infiltration of roof runoff, stormwater ponds with sediment forebays, underground detention systems, swirl concentrator units, and level spreaders.
- Using a vegetated roof for flat or low sloping roofs.
- Incorporate on-site stormwater treatment and infiltration to meet the guidelines of the CT DEP’s Connecticut Stormwater Quality Manual (2004). Strategies for consideration, in order of preference, for implementing this goal include:
  - Incorporating bio-retention areas, rain gardens, vegetated basins, vegetated swales, constructed wetlands, etc. on site to treat stormwater.
  - Including on-site mechanical filtration systems to treat stormwater to meet the standards as defined in the manual.

In addition to stormwater management practices to reduce the effects of impervious cover, construction-phase best management practices will also be implemented to reduce the potential for impacts on public drinking water supply wells and surface water supplies.
3.3.1.1 No Action Alternative

Under this alternative, the AHRC would not be constructed within University grounds. Consequently, site drainage at the proposed location and at the Alternative Sites would remain as it is currently. There would be no impacts to stormwater management associated with this Alternative.

3.3.1.2 Proposed Alternative (Preferred)

CT DEP Flood Management Certification would be required because of the increase in impervious cover and the change in drainage. The certification application would be developed consistent with guidance provided in the Connecticut Stormwater Quality Manual (2004). Though the project will not seek formal US Green Building Council (USGBC) LEED certification, the site/civil design would incorporate sustainable design features into the design, with a goal of achieving sufficient points to achieve USGBC Silver status. Consequently, the overall limit of disturbance for construction would be minimized as much as possible.

The site grading and drainage would be designed for positive drainage away from the building and paved surfaces. All paved and non-paved surfaces would be sloped to a minimum 2% grade. Because the site is mildly sloped, cut and fill would be necessary. It is anticipated that the AHRC would be situated at the highest elevation within the proposed project area to minimize the limits of site grading and site clearing. The designers’ goal should be to balance the site’s cut/fill while minimizing the overall area of disturbance.

For stormwater management, subsurface detention/infiltration basins would be proposed beneath the porous pavement. Installation and effectiveness of this type of system would be dependent upon the actual depth to bedrock and ground water table, and site soil conditions (i.e., permeability), respectively. Preliminary geotechnical findings indicate relatively low permeability in site soils (0.0001 cm/sec.) According to the geotechnical report, dense glacial till overburden is likely a contributing factor toward the low permeability of site soils. It was stated that these soils may not be well suited to accommodate stormwater infiltration. It should be noted, however, that infiltration tests have not yet been completed at the site.

Additional stormwater management Best Management Practices (BMP) such as rain gardens/bio-retention facilities, and vegetated swales would also be incorporated in to the design (and in accordance with the CT DEP’s Connecticut Stormwater Quality Manual). BMP’s such as rain gardens and vegetated swales not only improve the water quality but also provide enhancement to the site and are fairly inexpensive for treatment of stormwater runoff. The ultimate goal of the stormwater management design would be to maintain the pre-development hydrology of the site by not exceeding the pre-development stormwater runoff peak discharge rates and volume (also required by Section 438 of the Energy Independence and Security Act (EISA 2007)).

The proposed stormwater management system for the Proposed Alternative development would maintain existing peak rates of runoff, as well as runoff volume and groundwater recharge through infiltration of roof runoff and other methods. Therefore, the potential impacts of new impervious cover on the AHRC would be effectively mitigated by implementing new stormwater management controls.
A proposed stormwater management system for the new AHRC at the Depot Campus would include a variety of stormwater management methods, including LID techniques, to achieve stormwater quantity and quality objectives consistent with the stormwater management standards and design guidelines in the CT DEP *Connecticut Stormwater Quality Manual* (2004), the *University’s Sustainable Design Guidelines and Green Building Policy*, and the U.S. Congress’ Section 438 of the EISA 2007. The project would not result in increases in peak runoff over existing conditions for storms up to and including the 100-year storm for the project’s sub-watershed. In addition, the proposed stormwater management system for the proposed project site would be designed to preserve the existing hydrologic conditions to the extent possible, including drainage patterns, runoff volume, temperature, groundwater recharge, and runoff quality.

During construction and operation of the facility, an operations and maintenance plan (O&M Plan) would be developed to include requirements for street sweeping and stormwater system inspections and maintenance. For a more detailed description of stormwater management during construction of the AHRC, please refer to subsection 3.1.1.2 Preferred Alternative (Section 3.1.1: Topography, Geology and Soils). O&M Plans will identify the parties responsible for inspecting and maintaining the stormwater controls. The nature of the specific developments (UConn-led development, private development, or developments involving public-private partnerships) will dictate post-construction operation and maintenance responsibilities.

### 3.3.1.3 Alternative Sites

Stormwater management within the North Hillside Road or Horsebarn Hill alternative sites would be addressed in very much the same manner as the Preferred Alternative. Management would be designed to avoid an increase in post-design runoff over pre-design conditions. Also, site design would address key objectives of the University’s Sustainable Design Guidelines to reduce development stormwater runoff impacts on the quantity and quality of the area’s water resources, prevent any increase in the rate of stormwater flow leaving the site, and provide for infiltration of stormwater runoff at each site.

The proposed stormwater management system for Alternative Site development would maintain existing peak rates of runoff, as well as runoff volume and groundwater recharge through infiltration of roof runoff and other methods. Therefore, the potential impacts of new impervious cover on the AHRC would be effectively mitigated by implementing new stormwater management controls.

Any proposed stormwater management system for the Alternative Sites development would include a variety of stormwater management methods, including LID techniques, to achieve stormwater quantity and quality objectives consistent with the stormwater management standards and design guidelines in the CT DEP 2004 *Connecticut Stormwater Quality Manual* and the University’s Sustainable Design Guidelines and Green Building Policy. Development of either site at the North Campus would not result in increases in peak runoff over existing conditions for storms up to and including the 100-year storm for any of the drainage areas analyzed within the project area. In addition, proposed stormwater management systems for the North Campus sites would be designed to preserve the existing hydrologic conditions to the extent possible, including drainage patterns, runoff volume, groundwater recharge, and runoff quality.
Similar to the Proposed Alternative, an O&M plan would be developed for the stormwater management system. The O&M Plan will include requirements for street sweeping and stormwater system inspections and maintenance. O&M Plans will identify the parties responsible for inspecting and maintaining the stormwater controls.

3.4 BIOLOGICAL RESOURCES

3.4.1 Vegetation & Wildlife

This section describes the regional and local biological resources of the areas in which the various alternatives are found. The assessment of the existing vegetation and wildlife at the alternative sites was based upon secondary data sources, including the Outlying Parcels Master Plan (JJR, 2000), aerial photographs, land use maps, and other previously prepared reports.

3.4.1.1 No Action Alternative

Implementation of this Alternative would not result in adverse impacts to vegetation or wildlife resources within UConn and lands adjacent to UConn.

3.4.1.2 Proposed Alternative (Preferred)

The proposed project area consists primarily of mixed deciduous and coniferous upland vegetation. Vegetation comprises mature woodland growth, including primary and secondary growth hardwoods. Overstory vegetation consists primarily of tulip poplar (*Liriodendron tulipifera*), red oak (*Quercus rubra*), white oak (*Quercus alba*), American beech (*Fagus grandifolia*), (pin oak (*Quercus palustris*), and red maple (*Acer rubrum*). Understory vegetation includes greenbrier (*Samilax roundifolia*), multiflora rose (*Rosa multiflora*), and holly (*Ilex opaca*). The proposed project area does not include open fields or grasslands, nor does it include agricultural lands, though an agricultural field is located approximately 200 feet to the north east of the Preferred Alternative project area.

Wildlife species expected to be present within the preferred project area include Eastern garter snake (*Thamnophis sirtalis*), Northern brown snake (*Storeria d. dekayi*), Eastern milk snake (*Lampropeltis t. triangulum*), Black rat snake (*Elaphe o. obsolete*), Eastern American toad (*Bufo a. americanus*), Northern Spring peeper (*Pseudacris c. crucifer*), Eastern box turtle (*Terrepene carolina carolina*), Northern Redback salamander (*Plethodon cinereus*), spotted salamander (*Ambystoma maculatum*), gray squirrel (*Sciurus carolinensis*), chipmunk (*Tamias striatus*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), white-footed mouse (*Peromyscus leucopus*), coyote (*Canis latrans*), New England cottontail (*Sylvilagus transitionalis*), Eastern cottontail (*Sylvilagus floridanus*), Virginia opossum (*Didelphis virginianus*), white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), and Eastern groundhog (*Marmota monax*), among others. Also, numerous species of woodland and woodland edge birds would be expected to be present across the site, including but not limited to: American robin (*Turdus migratorius*), Northern mockingbird (*Mimus polyglottos*), house finch (*Carpodacus mexicanus*), blue jay (*Cyanocitta cristata*), European starling (*Sturnus vulgaris*), and American crow (*Corvus brachyrhynchos*).
Construction of the BSL-2 laboratory would result in direct and indirect impacts, including the loss of approximately five (5) acres of woodland. Under the Proposed Alternative, stands of hardwood would be cleared and grubbed and the land would be graded. The project site is bordered on three sides by existing campus development, which maximizes the amount of remaining contiguous woodland habitat. Following construction, land surrounding the laboratory would consist of maintained grass and decorative landscaping. Wildlife in the immediate area would be displaced to other woodlands surrounding the project area during and after the construction period. It would be the intent of the USDA to minimize the amount of woodland clearing as much as possible.

3.4.1.3 Alternative Sites

The North Hillside Road site contains a mixture of farmland and woodlands. The 333-acre parcel includes mature hardwood woodlands, rolling topography, stream corridors, wetland areas, and prime farmland acreage. The University’s Outlying Parcels Master Plan identifies that planning recommendations for this acreage should include preserving as many of the woodland acres, wetlands, streams, steep slopes and prime farmlands as possible. Almost one-half of the North Campus (including the North Hillside Road site) acreage consists of wetland and prime farmland areas. Development opportunities have already been identified for the remaining acreage. Although there may be some tree clearing required for this alternative site, the acreage of woodland impacts would be less than the Preferred Alternative. Impacts on agricultural lands, including prime farmland soils, would be greater within the North Hillside Road site than the Preferred Alternative.

The Horsebarn Hill (Agriculture Campus) site consists of land that is developed with academic and agricultural facilities, pasture lands, and lands utilized for traditional agriculture purposes (Yellow Barn, Biobehavioral Complex). Also, approximately two-thirds of the approximate 886-acre parcel is woodlands with mixed hardwoods to stands of hemlock and pine. It is not anticipated that there would be significant woodland impacts with construction of the facilities; there would be greater impacts to farmlands and existing buildings than with the Preferred Alternative.

The entire Agriculture Campus, including the Biobehavioral Complex and Yellow Barn areas, lie within the OPM classification of Conservation Areas. These areas are defined by OPM as Priority 3 conservation areas. According to OPM, this classification should involve careful attention to ensure that the resources of concern are not harmed. For example, away from the buildable portions of the Campus, the remaining woodland includes the Fenton Tract of the University of Connecticut, which is utilized as a research lab for forest management by the College of Agriculture. This tract is important in research, protection of water quality in the area, important wildlife considerations, and preservation of topography, wetlands, soils, and viewsheds. The Outlying Parcels Master Plan states that this area should be preserved for land uses that include forest management and passive recreation.

As with the Preferred Alternative, wildlife located within the immediate vicinity of both alternative sites would most likely become temporarily displaced to other surrounding suitable lands during the construction period. After completion of the project, wildlife species are expected to return to the area.
3.4.2 Rare, Threatened, or Endangered Species

The Endangered Species Act (ESA) requires federal agencies to ensure that their actions and those of their contractors do not jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat.

State endangered and threatened species are protected by the Connecticut Endangered Species Act (Connecticut General Statutes Section 26-303 to Section 26-315). The most recent CT DEP Natural Diversity Data Base (NDDB) map of State and Federal Listed Species and Significant Natural Communities (June 2009) (see Figure 3-10: State & Federal Species Map) was reviewed in order to determine if any areas of listed species and natural communities exist within the preferred project area or either of the alternative project areas.

Locations of listed species and natural communities identified on Figure 3-10 are based on data collected by the CT DEP, private conservation groups and the scientific community and compiled by the Natural Diversity Data Base. The information is not necessarily the result of comprehensive or site-specific field investigations; in some cases locations have been derived from literature or museum searches or historic records. Exact locations have been buffered to produce generalized locations. The exact species or community location falls somewhere within the shaded area and not necessarily in the center. Species are listed according to their level of risk, and their status is reviewed every five years. The following definitions were derived from CT DEP’s Endangered, Threatened and Special Concern Species in Connecticut web page:

**Endangered Species** – Refers to any native species documented by biological research and inventory to be in danger of extirpation throughout all or a significant portion of its range within the state and to have no more than five occurrences in the state, and any species determined to be an "endangered species" pursuant to the federal Endangered Species Act.

**Threatened Species** – Refers to any native species documented by biological research and inventory to be likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range within the state and to have no more than nine occurrences in the state, and any species determined to be a "threatened species" pursuant to the federal Endangered Species Act, except for such species determined to be endangered by the Commissioner in accordance with section 4 of this act.

**Species of Special Concern** – Refers to any native plant species or any native nonharvested wildlife species documented by scientific research and inventory to have a naturally restricted range or habitat in the state, to be at a low population level, to be in such high demand by man that its unregulated taking would be detrimental to the conservation of its population or has been extirpated from the state.

3.4.2.1 No Action Alternative

Rare, threatened, or endangered species would be unaffected under the No Action Alternative.
3.4.2.2 Proposed Alternative (Preferred)

The June 2009 NDDB mapping indicates that the proposed project location is outside of any shaded areas on the map and therefore does not contain listed species and is not within a natural community. The proposed project (if located within the preferred project location) is therefore unlikely to have an impact on endangered and threatened species or significant natural communities.

3.4.2.3 Alternative Sites

According to the June 2009 NDDB mapping, the North Hillside Road and Horsebarn Hill alternative sites are located in areas designated as having records of listed species and natural communities. Therefore, construction and operation of the AHRC within either of these two alternative sites may adversely impact these resources.

3.5 SOCIOECONOMICS

3.5.1 Land Use and Zoning

The Conservation and Development Policies Plan for Connecticut (2005-2010) (C&D Plan) was reviewed for an understanding of the land use plans and policies at the local, regional, and state levels. This understanding is essential to any analysis of land use alterations that may affect the project area and adjacent land uses. The C&D Plan includes two components (plan text and Locational Guide Map; see Figure 3-11: Land Use Map). Each component includes policies that guide the planning and decision-making processes of state government relative to: (1) addressing human resource needs and development; (2) balancing economic growth with environmental protection and resource conservation concerns; and (3) coordinating the functional planning activities of state agencies to accomplish long-term effectiveness and economies in the expenditure of public funds. Specifically, the Locational Guide Map depicts the conservation and development plan land designations for the project area in Mansfield Township.

In addition, the Plan of Conservation and Development (April 2006) Planned Development Areas map for Mansfield, Connecticut was obtained and reviewed (see Figure 3-12: Planned Development Areas Map) to determine future land use plans for the three alternative locations.

3.5.1.1 No Action Alternative

Implementation of the No-Build Alternative would have no impact on land use or zoning.

3.5.1.2 Proposed Alternative (Preferred)

The Preferred Alternative falls completely within land designated as Neighborhood Conservation Area on the C&D Plan. Neighborhood Conservation Areas are typically characterized as lands that are significantly built up and well populated. These areas generally reflect stable, developed neighborhoods and communities. State policy seeks to support the maintenance of these basically stable neighborhoods and communities and also intensify development when it is supportive of community stability and consistent with the capacity of the existing urban services. The proposed project is believed to be consistent with the C&D Plan.
FIGURE 3-11
LAND USE MAP - PREFERRED AND ALTERNATIVE SITE LOCATIONS
USDA-APHIS ARS ANIMAL HEALTH RESEARCH CENTER
UNIVERSITY OF CONNECTICUT
Planned Development Areas

Legend
- Historic villages or hamlets
- Medium to High-Density Institutional/Mixed-Use
- Low Density Residential
- Medium to High Density Age Restricted Residential
- Planned Business/Mixed Use
- Planned Office/Mixed Use
- Agriculture/Medium to High Density Residential/Open Space
- Neighborhood Business/Mixed Use
- Flood Hazard Zone (Depicted for Reference Purposes)

Plan of Conservation and Development
April 2006

FIGURE 3-12
PLANNED DEVELOPMENT AREAS MAP - PREFERRED AND ALTERNATIVE SITE LOCATIONS
USDA-APHIS ARS ANIMAL HEALTH RESEARCH CENTER
UNIVERSITY OF CONNECTICUT
3.5.1.3 Alternative Sites

According to a review of the June 2005 OPM Locational Guide Map for Mansfield, a small portion of the Horsebarn Hill alternative site is located within a Preservation Area. According to the more recent CT DEP November 2009 Aquifer Protection Areas map for Mansfield, CT, the Horsebarn Hill area has been updated with a refined aquifer mapping analysis and the alternative site is not located within an aquifer protection areas. An even smaller portion is located within a Neighborhood Conservation Area. In addition, according to Figure 3-12, a majority of the Horsebarn Hill alternative site is located on lands designated for Low Density Residential development; a small portion of land (encompassing the Yellow Barn and Bio-behavioral Complex areas) is designated for Medium to High-Density Institutional/Mixed Use development. A majority of the North Hillside Road alternative site is located on land designated for Medium to High-Density Institutional/Mixed Use development, while a much small portion of this alternative site location includes land designated by the Town of Mansfield for Low Density Residential development.

Construction of the AHRC within either of the two alternative locations would not result in a significant adverse impact on land use or zoning.

3.5.2 Environmental Justice

Executive Order (EO) 12898 stipulates that federal actions must be accomplished in a way that does not subject disproportionately high or adverse effects on minority or low-income populations. According to the EO, a minority population exists where the percentage of minorities in an affected area either exceeds 50-percent or is meaningfully greater than the general population. Low income populations are identified using the U.S. Census Bureau’s statistical poverty threshold based on income and family size. The Census Bureau defines a “poverty area” as a census tract with 20-percent or more of its residents below the poverty threshold.

3.5.2.1 No Action Alternative

Implementation of the No-Build Alternative would have no impact on minority or low-income populations.

3.5.2.2 Proposed Alternative (Preferred)

The Proposed Alternative would have no impact on minority or low-income populations.

3.5.2.3 Alternative Sites

Alternative site locations would not be expected to have an effect on minority or low-income populations.

3.4.3 Population

According to the U.S. Census Bureau’s “Quick Facts for Tolland County”, Connecticut, Tolland County has an estimated 2008 population of 141,406. This is an estimated 8.8% increase since April 1, 2000. Additionally, enrollment at the University’s Storrs campus as of spring 2008 included 16,348 undergraduates and 6,425 graduates.
3.5.3.1 No Action Alternative

The No-Build Alternative would not result in an increase in the population of Tolland County.

3.5.3.2 Proposed Alternative (Preferred)

It is estimated that the new AHRC would employee a total of 22 persons. The facility would be a shared facility, used by both USDA and UConn personnel. It is anticipated that some of the UConn personnel to benefit from the use the facility would be graduate students from UConn. It is not expected that the use of the facility will impact the population of Tolland County.

3.5.3.3 Alternative Sites

Use of the facility by UConn and USDA personnel would not change regardless of where the AHRC would be constructed and operated on the UConn campus. It is still anticipated that approximately 22 employees would conduct research at the new facility. Therefore, construction and operation of the AHRC at North Hillside Road or Horsebarn Hill alternative sites should have no impact on the population of Tolland County or the Town of Mansfield.

3.6 UTILITIES

Domestic water, natural gas, sanitary and electric services are available within the vicinity of the preferred and alternative site project areas. The exact locations, depths and sizes of existing underground utilities are unknown at this time and should be further investigated during the design phase.

A utility corridor is proposed within the space between the BSL Lab and the Ag Animal Holding Barn to minimize site disturbances. Electric, fiber optic, natural gas and other utilities would be located in this corridor.

3.6.1 No Action Alternative

Under this Alternative, existing utilities would not be affected. Additionally, there would be no construction impacts associated with installation of new utility tie-ins.

3.6.2 Proposed Alternative (Preferred)

Domestic water, natural gas, sanitary and electric services are available within the vicinity of the Preferred project site. The Connecticut “Call Before You Dig” Utility Locator Service will need to be contacted prior to the start of any design work, to verify the locations of existing underground utilities. Note that all proposed utilities that would tie-in to any UConn-owned utilities would be designed and constructed in accordance with UConn standards.

A utility corridor routed around the BSL-2 Lab is proposed to minimize site disturbances. Electric, fiber optic, natural gas and other utilities will be located in this corridor.
Domestic Water
Domestic water service would be provided by extending the existing 8 inch main from the northwest corner of the project site near Ashford and Bolton Halls. UConn owns and maintains the water distribution system at the Depot Campus (see Section 3.2.3).

The 0.5 million gallon Bone Mill Water Storage Tank is located northwest of the Depot Campus, close to Bone Mill Road. From the tank, the campus is served by a 12 inch cast iron main with the 8 inch branch mentioned above to the cottages along Weaver Road. The main distribution extends behind and south of Thomson and Merritt buildings. The only concern is that this 8-inch service pipe to the other two groups of cottages has experienced leaks in the past.

A pipe of unknown size extends from the 10-inch main behind Thomson to a fire hydrant in the side of Ahern Lane directly across from the preferred project area. The integrity and capacity of the pipe and hydrant are not known. The static pressure in the area is approximately 40-50 psig.

There are no available fire flow data for the hydrants nearby the site. Fire flow data has been collected at the fire pumps located in the Surplus Building and Columbia cottage. The University would provide the design team this data prior to commencing final design of the new AHRC.

The following table represents an estimate of daily and annual water usage for the proposed AHRC. The Animal Room Cleaning washdown and Laboratory/Administration water is expected to go down the drain gallon for gallon. A large percentage of the animal watering component is absorbed into the animal bedding as urine and fecal matter, which is removed in the scrape/bag/burn component. It is assumed that of the 175,000 gallons of water usage (Animal Watering), 30,000 gallons leaks out of the bedding and into the drains. The remaining 145,000 gallons goes with the bedding. An 80%/20% ratio of water in to water out was assumed in this scenario. It is also likely that water usage and wastewater production will be more variable during weekends. Based upon these assumptions (and others), the daily total gallons do not calculate out to the annual total gallons of water divided by 365 days.

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Animal Room Cleaning</td>
<td>40,000</td>
<td>60,000</td>
<td>100,000</td>
<td>300</td>
</tr>
<tr>
<td>(4 Times Daily)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal Watering</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSL-2</td>
<td>65,000</td>
<td></td>
<td>65,000</td>
<td>200</td>
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<tr>
<td>Ag</td>
<td>110,000</td>
<td></td>
<td>110,000</td>
<td>370</td>
</tr>
<tr>
<td>Laboratory/Admin.</td>
<td>70,000</td>
<td>30,000</td>
<td>100,000</td>
<td>330</td>
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<tr>
<td>Totals</td>
<td>285,000</td>
<td>90,000</td>
<td>375,000</td>
<td>1,200</td>
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</tbody>
</table>

Natural Gas
Natural gas would be extended from the campus loop drive near Merritt Hall and would run within the proposed utility corridor, to the facility. The main is owned by Connecticut Natural Gas. Service within the Weaver Road area is by a 6 inch main and gas service within Ahern lane is provided by a 2 inch main. A 2 inch line is anticipated for serving the needs of the AHRC.

Sanitary Sewer
Sanitary sewage from Depot Campus is pumped to the waste water treatment plant at the main campus of the University. The University owns and operates the collection, conveyance, pumping and treatment systems for the University Depot Campus.
Sanitary sewage from the new AHRC facility would flow northeast and tie in to the existing system. Due to the depth of the sewer at the proposed building, an ejector pump would be required at the two lift stations serving the AHRC. These ejectors would connect to the high point gravity manhole at Weaver and Bone Mill Roads. There are no known sewer capacity issues with the high point gravity system, the second pump station, or the treatment plant.

The sewer force main behind Hebron cottage crosses a wetland and stream. The main line would be bored under the wetland to minimize disturbance to it. The University believes that the crossing would be permitted by the State if wetlands are present. Unavoidable impacts to wetlands and streams as a result of boring activities would be permitted through an application process through CT DEP and USACE.

The field north of the cottages and at the intersection of Weaver and Bone Mill Road is owned by the University and no easement would be required to cross the field. The estimated sewage flow for the site is approximately 700 gallons per day, a value that would be refined as the design process continues.

Prior to the start of any design work, Connecticut’s “Call Before You Dig” Utility Locator Service would be contacted to verify the locations of existing underground utilities. Proposed utilities that would extend from the new AHRC and tie in to UConn-owned utilities would be designed and constructed in accordance with UConn standards.

The following table represents an estimate of anticipated wastewater flow from the proposed AHRC. Again, please note that calculations are based upon a ratio of water into the buildings versus water that is available to leave the building as wastewater. As such, the daily total gallons do not calculate out to the annual total gallons of water divided by 365 days.

<table>
<thead>
<tr>
<th>Wastewater Flow</th>
<th>Annual – Gallons</th>
<th>Daily Total - Gallons</th>
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<tbody>
<tr>
<td>Animal Room Cleaning</td>
<td>100,000</td>
<td>30</td>
</tr>
<tr>
<td>Animal Watering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSL-2</td>
<td>20,000</td>
<td>60</td>
</tr>
<tr>
<td>Ag</td>
<td>10,000</td>
<td>30</td>
</tr>
<tr>
<td>Laboratory/Admin.</td>
<td>100,000</td>
<td>310</td>
</tr>
<tr>
<td>Totals</td>
<td>230,000</td>
<td>700</td>
</tr>
</tbody>
</table>

### 3.6.3 Alternative Sites

According to the UConn Outlying Parcels Master Plan, the Bio-behavioral Complex and the approximate 24-acre parcel that includes the Yellow Barn and other academic buildings (titled College of Agriculture and Natural Resources; East Campus Plan of Conservation and Development, August 2004), are fully serviced by major utilities. The design team, in coordination with UConn staff, would be responsible for evaluating the conditions and overall capacities of these utilities.
As stated previously, the BSL-2 laboratory and the Ag Barn would not be constructed adjacent to each other at the Horsebarn Hill site. The Ag Barn would be constructed within the College of Agriculture and Natural Resources, 24-acre parcel and the BSL-2 would be constructed within the Bio-behavioral Complex, thereby requiring utility tie-ins at two different locations. Also, the two facilities would be tied together via communication utilities (e.g. telephone, video). It is not anticipated that construction of the AHRC within the Horsebarn Hill Road alternative project area would result in significant adverse impacts to utility services within UConn’s East Campus area.

Several parcels within the North Hillside Road project area are also serviced by major utilities, the current conditions of which are unknown. Other parcels within the North Campus area are either heavily wooded or surrounded by hardwood stands and not currently serviced by major utilities. The university has plans to extend all utilities to Route 44 from its current terminus on North Hillside Road when they construct the road extension (possibly within 3-4 years). It is not anticipated that construction of the AHRC within the North Hillside Road alternative project area would result in significant adverse impacts to utility services within UConn’s North Campus area.

### 3.7 Vehicular Access, Circulation and Parking Analysis

The vast majority of USDA and UConn employees and students that would work in or maintain the AHRC would travel to the site via passenger vehicles and public transportation. Animals slated for use in research activities would be transported to the site via a variety of truck types; e.g. stakebody trucks, tractor trailers, pickup trucks with trailers, etc. Similarly, deliveries of materials (e.g. animal food, bedding, equipment, office materials, laboratory materials, etc.) and waste pickup would be accomplished with a variety of vehicles. Site ingress and egress and parking at the AHRC must therefore be designed to accommodate a variety of vehicles arriving and departing during normal business hours.

It has been estimated that a total of 22 permanent and 28 transient and part-time employees would be on site at the new AHRC. Therefore, using a 1 for 2 parking ratio to people, a total of 25 parking spaces would be proposed. Of these spaces, one space would be handicap accessible and two would be parking spaces for transient employees; the remaining 22 spaces would be provided on-site. In this way, the University would promote the wider use of ride sharing and public transportation to access the AHRC.

#### 3.7.1 No-Action Alternative

There would be no impacts to vehicle access, circulation, or parking. Implementation of this Alternative would result in no additional impacts on traffic or access within UConn.

#### 3.7.2 Proposed Alternative (Preferred)

Access to the site would be off of Route 44, to the north, onto Weaver Road. From Weaver Road, drivers would take a right onto Walters Ave, followed by a left onto Ahern Lane. An access driveway to the facility would be constructed off of Ahern Lane (see Figure 3-1, Aerial Map – Preferred Alternative). This driveway would be situated near the northeast corner of Merritt Hall. A straight-in driveway is proposed since the topography would allow an acceptable design slope. Heavy duty asphalt paving would be proposed for the access driveway, given the typical vehicle usage and frequency for an AHRC. Other driving and parking surfaces could be porous paving and gravel.
This project should not directly or indirectly impact Bone Mill Road, located to the east of the proposed project area.

In an effort to decrease the total footprint of the project, it would be proposed that in lieu of a separate parking area, parking would be provided along the access drive, on the southeast side of the Administration Building. Porous bituminous paving would be proposed for the employee/visitor parking area, which would reduce the overall disturbance for construction of stormwater management areas.

Access to the southeast side of the Ag Barn and the Triage and waste areas of the BSL lab would also be provided. Heavy duty paving would be proposed for the area between the BSL Lab and the Ag Barn; however, all other driveways would be proposed as gravel surface or grass paver blocks. Any proposed pavement surface area for access around the BSL Lab and Ag Animal Holding Barn would be minimized to accommodate turning movements of the vehicle types that would serve the facility.

Given the relatively low number of personnel that would be using the new AHRC on a daily basis, there should be no adverse traffic impacts on area roads and intersections surrounding the Depot Campus. There may be a slight increase in morning and afternoon traffic as employees arrive and depart the facility; however, this increase is not expected to be significant or adverse in nature. During construction, heavy trucks and passenger vehicles would enter and exit the site off Ahern Lane. This activity may temporarily disrupt traffic on Ahern Land, but impacts are expected to be minimal. Delivery trucks (e.g. materials, equipment, animals) would also enter and exit the site via Ahern Lane. Once again, temporary impacts to area traffic may occur; these are not expected to be significant or long in duration.

### 3.7.3 Alternative Sites

Design considerations would be similar for the Alternative Sites as those outlined for the Preferred Alternative. Personal vehicles, delivery trucks, and construction vehicles would enter and exit the Horsebarn Hill and North Hillside Road sites via Route 195. As with the Preferred Alternative, impacts to area roads and intersections are expected to be minimal and insignificant. The nearest major intersection is Route 44 and Route 195, to the north of the Alternative Site locations. Under the Alternative Site scenario and given the relatively low number of vehicles (personal, delivery, and construction), traffic impacts are not anticipated to be significant at this intersection.

It is important to note also that the layout of the Horsebarn Hill alternate site would necessitate the physical separation of the Ag Barn from the BSL-2 facility. The consequences of this separation would be operation of the facility on two separate parcels, thereby requiring additional travel (cars and trucks) between the two locations (i.e., additional fuel consumption).
SECTION 4
CUMULATIVE IMPACTS

40 CFR 1508.7 defines a cumulative impact as “the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future action regardless of what agency (federal or non-federal) or person undertakes such other actions.” Cumulative effects include the total effects (including direct and indirect) of the proposed action along with other measurable development actions on the resources within the project area and the human environment surrounding the project area. The purpose of reviewing cumulative effects is to address or evaluate the additive impacts of primary, secondary, and tertiary sources within the project area. Considering cumulative effects is also essential to developing appropriate mitigation measures and monitoring their effectiveness over a given period of time.

Cumulative impacts associated with implementation of the Proposed Action would include any impacts from other on-going actions that would be incremental to the impacts of constructing and operating the proposed facilities at UConn. Of course, any evaluation of cumulative impacts must also consider project schedules (i.e. timing) and proximity to the proposed action discussed herein.

For this evaluation of cumulative impacts, other ongoing and future construction activities, regardless of size, were considered. At any one time, operations within UConn may be affected by numerous construction projects (e.g., roofing projects, internal cosmetic projects, utility upgrades and refurbishments, new construction, road improvements, etc.). Construction of the Proposed Action, when assessed in consideration of other construction projects within UConn, would likely result in cumulative impacts associated with traffic, site access, noise, utilities, and air quality.

4.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no laboratory constructed and, therefore, no new impacts that could interact with impacts of other past, present, and reasonably foreseeable actions. Therefore, there would be no cumulative impacts associated with this alternative.

4.2 PROPOSED ALTERNATIVE (PREFERRED ALTERNATIVE)

Topography, Geology, and Soils
Impacts on geology, topography, and soils are typically site-specific. As such, they are not affected by cumulative development in the region. An exception to this would be projects involving earth disturbance that are located immediately adjacent to each other and that occur simultaneously. E&S and mitigation measures would be enacted to rehabilitate soils disturbed during construction of the proposed project. No significant impacts on topography, geology or soils are expected. As a result, the construction project proposed would not likely have any significant cumulative impacts on topography, geology, or soils within or immediately adjacent to the project area.
Water Resources
No water resources are being directly affected by the proposed project. It is noted, however, that construction activities that result in the removal of some vegetation and the creation of exposed soils may also create an increase potential for transport of surface pollutants to adjacent and downstream receptors. E&S control measures that would be implemented during construction would minimize runoff of sediment-laden waters into downstream surface waters.

With the implementation of an effective stormwater management program, the proposed project does not add a significant potential for increased cumulative effects when considered in concert with other ongoing or future development actions at UConn.

Air Quality
Air quality impacts from the proposed projects, even in combination with other UConn projects, would be minor and temporary. When considered in combination with other larger development projects within UConn lands, the proposed project discussed herein would not contribute to the degradation of air quality within the region. Additionally, the travel patterns of construction workers and equipment to and from the project sites would represent a negligible impact on regional air quality. The proposed project would have no impact on respective de minimis values of NOx, VOC, or PM10, thereby eliminating the need to conduct an additional general conformity determination within UConn.

Biological Resources
Development of the proposed project within UConn would have temporary and minimal impacts on the area’s remaining natural resources. The Preferred Alternative would be designed to avoid segmentation and loss of woodland to the greatest extent possible. As a result, the proposed project, when considered in combination with other development projects within UConn would not result in a significant adverse effect on area vegetation resources.

Impacts on wildlife resources would be avoided or minimized in compliance with existing federal statutes that apply to federal development. The USACE (under the Clean Water Act or CWA) and the USFWS (under the Endangered Species Act) have legislative mandates to reduce or avoid substantial adverse impacts on protected resources on an individual as well as cumulative project basis. There are no rare, threatened, or endangered species present within the proposed project area. As a result, the proposed project, when considered in combination with other existing or future projects, would not cause a significant adverse cumulative impact on biological resources within UConn.

Noise
During construction, noise levels would increase in the immediate vicinity of the construction. Minor impacts from this construction noise would extend beyond the immediate area; impacts are expected to be temporary and minor and are not expected to create significant cumulative impacts when evaluated in association with other UConn construction activities. The proximity of the proposed project to other development projects on UConn would not result in significant adverse cumulative noise impacts.
Traffic and Access
The proposed project would result in minor and temporary additions of vehicles to area roads. Construction crews are expected to be very small and heavy construction equipment would arrive on site only to remain on site for the duration of the project. The addition of construction vehicles (personal construction vehicles and heavy equipment) throughout UConn for construction of the Preferred Alternative, when combined with other larger development projects within UConn, would result in insignificant impacts on area traffic or site access. Due to the limited amount of additional employees being employed by this facility, the Proposed Alternative would have an insignificant cumulative impact on traffic and access.

Socioeconomic Resources
Construction of the Preferred Alternative would not contribute to the growth of available services within the region. Therefore the proposed project, when considered in conjunction with other development projects, is not expected to have a disproportionately high and adverse effect on minority or low-income segments of the local population.

4.3 ALTERNATIVE SITES

Topography, Geology, and Soils
Cumulative impacts on topography, geology, or soils from Alternative Sites would be similar as those for the Preferred Alternative.

Water Resources
Due to the present of wetlands within close proximity to the North Hillside Road site, cumulative impacts to wetlands would likely be greater from this alternative than the Preferred Alternative. Impacts to other water resources from the North Hillside Road site would be similar as those for the Preferred Alternative. Cumulative impacts to water resources from the Horsebarn Hill alternative would be similar as those for the Preferred Alternative.

Air Quality
Cumulative impacts on Air Quality from Alternative Sites would be similar as those for the Preferred Alternative.

Biological Resources
Based on the presence of listed species and natural communities within the North Hillside Road and Horsebarn Hill sites, cumulative impacts to biological resources would be greater from these alternatives than the Preferred Alternative.

Noise
Cumulative impacts on noise from Alternative Sites would be similar as those for the Preferred Alternative.

Traffic and Access
Cumulative impacts on traffic and access from Alternative Sites would be similar as those for the Preferred Alternative.

Socioeconomic Resources
Cumulative impacts on socioeconomic resources from Alternative Sites would be similar as those for the Preferred Alternative.
ATTACHMENT A
TECHNICAL REFERENCES


United State Department of Interior, 1983. US GS Topographic Quadrangle for Coventry, CT.


Design and Construction of a USDA Agricultural Research Service Animal Health Research Center at the University of Connecticut, Depot Campus, Mansfield, Connecticut


www.ct.gov/dep


www.fema.gov

www.fws.gov/wetlands/Data/GoogleEarth.html

www.quickfacts.census.gov/qfd/states/09/09013.html

www.willimanticriver.org
ATTACHMENT A
Technical References
ATTACHMENT A

TECHNICAL REFERENCES


United State Department of Interior, 1983. US GS Topographic Quadrangle for Coventry, CT.


www.ct.gov/dep


www.fema.gov

www.fws.gov/wetlands/Data/GoogleEarth.html

www.quickfacts.census.gov/qfd/states/09/09013.html
ATTACHMENT B
Geotechnical Report
PRELIMINARY GEOTECHNICAL ENGINEERING RECOMMENDATIONS
UCONN-USDA ANIMAL HEALTH RESEARCH CENTER
MANSFIELD, CONNECTICUT

by

Haley & Aldrich, Inc.
East Hartford, Connecticut

for

STV, Inc.
Douglassville, Pennsylvania

File No. 36034-000
22 September 2009
22 September 2009
File No. 36034-000

STV, Inc.
205 West Welsh Drive
Douglassville, PA 19518

Attention:    Steven M. Sottung

Subject:     Preliminary Geotechnical Engineering Recommendations
             UCONN-USDA Animal Health Research Center
             Mansfield, Connecticut

Ladies and Gentlemen:

This letter provides our preliminary geotechnical engineering evaluation for the proposed University of Connecticut (UCONN) and United States Department of Agriculture (USDA) Animal Health Research Center in Mansfield, Connecticut. Our recommendations are provided at this time to assist you with beginning design. Our evaluation is based on our recent subsurface investigation and the site plan you have provided.

PROPOSED CONSTRUCTION

Based on the Option E2 Site and Boring Location Plan, we understand a laboratory and administration building with a 5,575 square foot footprint area and a barn with a 1,500 square foot footprint area will be constructed at the site. The lowest floor grade is not known at this time, however we understand that basement space is not planned. Parking and landscaped areas will surround both buildings. We do not anticipate significant changes in grade at the site.

SITE CONDITIONS

The site is heavily wooded and undeveloped. Grade ranges from El 495 at the south to El 519 at the north, although the topography suggests the elevation change is gradual. Several rock outcrops are visible throughout the site, specifically within the northern half. Buildings associated with the UCONN Depot Campus and its activities lie to the north and west of the site.

A United States Geological Survey (USGS) research station is located 180 feet north of the site. USGS has installed three groundwater observation wells around the station, one of which lies within 100 feet of the Animal Health Research Center.
SUBSURFACE EXPLORATION

Between 20 and 24 August 2009, ten borings were drilled at the site by Seaboard Drilling, Inc. of Chicopee, Massachusetts. Five building borings were completed. Four borings (B1, B2, B4, and B5) were advanced to refusal on presumed bedrock between 6 to 13 ft below existing grade. At B1, a rock core was obtained after auger refusal at 8 ft to confirm the bedrock. At building boring B6, sampler refusal at 15 ft indicated probable bedrock. Three borings (IT-1 to IT-3) were advanced between 6 and 10 ft below existing grade within potential infiltration areas. Refusal was obtained at IT-1 at 8 ft and at IT-2 at 6 ft on probable bedrock. Two borings (CB-1 and CB-2) were advanced to 6 ft within proposed pavement areas.

The borings were drilled using a CME ATV or Marooka ATV drill rig. The borings were laid out by a private land surveying company prior to drilling. Ground surface elevations were estimated from the contours on Option E2 Boring Location Plan prepared by STV, Inc. The locations of the borings are shown on Figure 2.

The test borings were advanced by standard auger boring techniques with 4 1/4-inch I.D. hollow stem augers. Soil samples were typically recovered at 2-ft intervals through the forest mat thickness (up to 3 ft) and at 5 ft intervals thereafter by driving a standard split-spoon sampler (1-3/8-inch I.D., 2 inch O.D.) a distance of 24 inches under the impact of an automatic (CME) or safety (Marooka), 140-lb hammer free-falling 30 inches as specified in ASTM D1586. An NX-size core barrel was used to obtain a rock sample from B1-OW with an approximate diameter of 2 inches. A description of the rock core, including percent core recovery and Rock Quality Designation (RQD) is provided on the log in Appendix A. Each boring was backfilled with the auger cuttings upon completion. At B1, an observation well was installed at 13 ft below existing grade. The boring logs are provided in Appendix A.

SUBSURFACE CONDITIONS

Subsurface conditions consist of forest mat over glacial till over bedrock at about 5 to 15 ft below ground surface. The forest mat is up to 3.5 ft thick and contains roots and leaves. Glacial till is encountered immediately below the forest mat, consisting of medium to very dense silty SAND with gravel to medium to fine SAND with silt and gravel. Cobbles and boulders were noted during drilling within the glacial till.

Based on the rock core sample obtained from B1, the upper few feet of bedrock is highly weathered. Groundwater was gauged in the B1-OW well at about 10.1 ft (E1 508.2) below ground surface. At IT-1, groundwater was gauged at about 7.6 ft (E1 504.4) after being allowed to stabilize for approximately 30 minutes after drilling completion. The USGS well approximately 100 ft northwest of B1-OW was gauged at about 15.85 ft below ground surface. Water levels are expected to be higher in the spring and during times of average or above normal precipitation, in the range of 5 to 10 ft below ground surface. Current groundwater levels are likely higher than usual, considering that this June and July combined had the highest rainfall of those two months on record.
LABORATORY TESTING

Haley & Aldrich performed grain size analyses on soil samples in general conformance with ASTM D422 for 2 samples at infiltration area borings. The testing was performed to assist with visual classification of soils and help determine engineering properties. Grain size analysis results are provided in Appendix B.

PRELIMINARY GEOTECHNICAL ENGINEERING RECOMMENDATIONS

Foundation and Slab Design

- The building may be supported on spread footings bearing on naturally deposited glacial till, weathered or sound bedrock, or compacted granular fill placed over these materials.

- The forest mat is not suitable to support building foundations. During clearing and grubbing of the site prior to construction, these materials will generally be removed. However, some overexcavation of these unsuitable soils and replacement with compacted fill will be required if they are not removed during normal site clearing and rough grading.

- Where boulders project above the footing bearing level, they will need to be removed. The excavation should be backfilled with compacted granular fill. Larger boulders may require a hoe ram for removal.

- Footings may be designed to bear on the following materials using the indicated allowable bearing pressure:
  
  - Compacted Granular Fill, Glacial Till or Weathered Bedrock: 4 tsf
  
  - Design footings to bear a minimum of 3.5 ft below proposed exterior grade for frost protection.

- The soils will not undergo liquefaction during the design earthquake. In accordance with the Building Code, the seismic soil design criteria are as follows:

  \[
  S_p = 0.231 \text{ g} \\
  S_t = 0.062 \text{ g} \\
  \text{Site Class} = C
  \]

- The lowest slab may be designed as a soil-supported slab-on-grade.

- Foundation and underslab drainage should be assumed throughout the building if the floor slab is planned below El. 512.
Excavation and Backfilling

Proposed grades are not known. However, excavations will be in existing forest mat and glacial till deposits. Conventional heavy construction equipment will be suitable for excavation of overburden soils. A number of the borings met refusal on boulders in the glacial till, therefore planning should assume a quantity of boulders will be generated, which will require crushing prior to reuse as on-site fill.

Bedrock excavation will be required in the laboratory / administration building if the foundations will be below El. 510 on the north side and El. 503 on the south side. The upper few feet may berippable in most areas, however, blasting should be assumed to be required to facilitate bedrock excavation of a significant volume. It does not appear that bedrock excavation will be required within the barn area at this time.

Existing soils are not suitable for reuse as structural fill below footings. Glacial till may be suitable for structural fill below the slabs but only during favorable weather (warm and dry), and after separation of oversize material. Imported compacted granular fill will be required immediately below the slab. Existing soils will generally be suitable for reuse as common fill after removal of organic material, but will be difficult to compact when wet. If economical, the bedrock could be crushed and reused as granular structural fill. As noted above, boulders in the till will have to be crushed prior to reuse on site.

Pavement Design

A new driveway and parking areas are planned. Based on the laboratory analyses, we recommend a preliminary California Bearing Ratio (CBR) value equal to 30 be used for design of the pavement sections. A bulk sample (50 lb.) and laboratory analysis of the glacial till soils would be required to provide a final assessment of the appropriate CBR value.

Infiltration Areas

We understand an underground infiltration system is being considered for the site. We estimate the design high groundwater level at El. 510 based on the borings and the observation well at B1-OW. Estimated permeability of the soil is 0.0001 cm/sec. based on the grain size distribution of the glacial till soils obtained from the laboratory analyses. The dense glacial till overburden has relatively low permeability and is not well suited to accommodating stormwater infiltration.

Utilities

Underground utilities may be supported on the site soils with normal bedding materials, except that forest mat soils should be removed where encountered at subgrade level. Where crushed stone bedding is used below groundwater level, a geotextile filter is recommended between the crushed stone and natural sand.
SUMMARY OF POTENTIAL GEOTECHNICAL PREMIUM COST ITEMS

- Removal of trees and forest mat materials
- Bedrock excavation.
- Imported structural fill.
- Processing of excavated boulders.

FINAL DESIGN REQUIREMENTS

We will provide detailed geotechnical design studies and criteria specific to the proposed building during the design phase. Additional explorations are recommended to provide additional information for final design. For example, backhoe test pits would provide information on size and percentage of boulders in the till and supplement data on bedrock level.

Please let us know if you have any questions.

Sincerely yours,
Haley & Aldrich, Inc.

[Signature]

Jennifer N. Buchanon
Engineer

[Signature]

John P. Dugan, Jr., P.E.
Senior Vice Principal
**TABLE I**
**SUMMARY OF SUBSURFACE EXPLORATIONS**
**UCONN - USDA ANIMAL HEALTH RESEARCH CENTER**
**MANSFIELD, CONNECTICUT**

<table>
<thead>
<tr>
<th>BORING NO.</th>
<th>APPROXIMATE GROUND SURFACE ELEVATION</th>
<th>TOTAL DEPTH (FT)</th>
<th>THICKNESS OF STRATA (FT)</th>
<th>BEDROCK LEVEL (FT) DEPTH ELEVATION</th>
<th>WATER LEVEL (FT) DEPTH ELEVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1-OW</td>
<td>(C) 518.3</td>
<td>13.0</td>
<td>3.0 5.0</td>
<td>8.0 510.3</td>
<td>10.1 508.2</td>
</tr>
<tr>
<td>B2</td>
<td>(R) 514.0</td>
<td>10.0</td>
<td>3.5 6.5</td>
<td>10.0 504.0</td>
<td>--</td>
</tr>
<tr>
<td>B4</td>
<td>(R) 514.3</td>
<td>5.5</td>
<td>2.0 &gt;3.5</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>B4A</td>
<td>(R) 513.8</td>
<td>13.0</td>
<td>-- 11.0</td>
<td>13.0 500.8</td>
<td>--</td>
</tr>
<tr>
<td>B5</td>
<td>(R) 509.4</td>
<td>6.0</td>
<td>2.5 3.5</td>
<td>6.0 503.4</td>
<td>--</td>
</tr>
<tr>
<td>B5A</td>
<td>(R) 511.4</td>
<td>5.0</td>
<td>--</td>
<td>5.0 506.4</td>
<td>--</td>
</tr>
<tr>
<td>B6</td>
<td>513.8</td>
<td>15.3</td>
<td>3.0 12.3</td>
<td>15.3 498.5</td>
<td>--</td>
</tr>
<tr>
<td>CB-1</td>
<td>509.4</td>
<td>6.0</td>
<td>2.0 &gt;4.0</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>CB-2</td>
<td>515.5</td>
<td>6.0</td>
<td>3.0 &gt;3.0</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>IT-1</td>
<td>(R) 512</td>
<td>8.0</td>
<td>2.5 5.5</td>
<td>8.0 504</td>
<td>7.6 504.4</td>
</tr>
<tr>
<td>IT-2</td>
<td>(R) 512.2</td>
<td>10.0</td>
<td>2.0 8.0</td>
<td>9.4 502.8</td>
<td>--</td>
</tr>
<tr>
<td>IT-3</td>
<td>497.2</td>
<td>10.0</td>
<td>-- &gt;10.0</td>
<td>--</td>
<td>7.0 490.2</td>
</tr>
</tbody>
</table>

**NOTES:**
1. *"* indicates greater than
2. *"*- indicates less than
3. *"* indicates not encountered or not known
4. *(R)* indicates auger refusal
5. *(C)* indicates rock cored after auger refusal

2. Elevations are in feet.
3. Elevations of explorations were estimated from topographic contours shown on survey provided to us on 17 September 2009
4. Refer to test borings for detailed soil descriptions.
5. Boring IT-1 is beyond the survey limits and its elevation was estimated by extrapolating from the contour plan
APPENDIX A

Logs of Test Borings
## TEST BORING REPORT

### Project
UCONN-USDA Animal Health Research Center, Mansfield, Connecticut

### Client
STV, Inc.

### Contractor
Seaboard Drilling, Inc.

### Boring No.
B1-OW

### Drilling Equipment and Procedures
- Rig Make & Model: Marooka ATV
- Bit Type: Auger
- Drill Mud: None
- Casing: None
- Hoist/Hammer: Winch / Safety Hammer
- PID Make & Model: None

### Visual-Manual Identification and Description

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Sample No. &amp; Rec. (in.)</th>
<th>Sample Depth (in.)</th>
<th>Stratum Change Depth (in.)</th>
<th>USCS Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>S1</td>
<td>0.0</td>
<td></td>
<td>SP-SM</td>
<td>Loose orange brown silty fine SAND, some roots, some leaves, no odor, dry</td>
</tr>
<tr>
<td>1-2</td>
<td>1-2</td>
<td>2.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-9</td>
<td>S2</td>
<td>2.0</td>
<td>4.0</td>
<td>SP-SM</td>
<td>Medium dense brown silty medium to fine SAND, trace gravel, trace roots, no odor, moist</td>
</tr>
<tr>
<td>5-10</td>
<td>10</td>
<td>5.0</td>
<td>5.9</td>
<td>SP-SM</td>
<td>Dense orange brown silty medium to fine SAND, some gravel, some cobble fragments, no odor, dry</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>3.0</td>
<td></td>
<td></td>
<td>- FOREST MAT-</td>
</tr>
</tbody>
</table>

### SEE CORE BORING REPORT FOR ROCK DETAILS

### Water Level Data

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Depth (ft) to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/24/2009</td>
<td>1040h</td>
<td>10.1</td>
</tr>
</tbody>
</table>

### Summary
- Overburden (R): 8
- Rock Cored (R): 5
- Samples: 3S 1C

### Field Tests:
- Dilatancy: R - Rapid, S - Slow, N - None
- Plasticity: N - Nonplastic, L - Low, M - Medium, H - High
- Toughness: L - Low, M - Medium, H - High
- Dry Strength: N - None, L - Low, M - Medium, H - High, V - Very High

*Note: Maximum particle size is determined by direct observation within the limitations of sampler size.*

*Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.*
**Haley & Aldrich**

**CORE BORING REPORT**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Drilling Rate (min/ft)</th>
<th>Run No.</th>
<th>Run Depth (ft)</th>
<th>Recovery/RQD</th>
<th>Weathering</th>
<th>Well Diagram</th>
<th>Elev. Depth (ft)</th>
<th>Visual Description and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.0</td>
<td></td>
<td>CT</td>
<td>8.0</td>
<td>36</td>
<td>60</td>
<td>High</td>
<td>510.3</td>
<td>Medium hard, gray, highly weathered, fine grained GNEISS. Bedding is thin. Joints are low angle, rough, close to extremely close, rough, discolored, open. (HEBRON GNEISS)</td>
</tr>
<tr>
<td>13.0</td>
<td></td>
<td></td>
<td>13.0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>506.3</td>
<td>End of Boring: 13ft</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13.0</td>
<td>Note: Groundwater Observation well installed at completion.</td>
</tr>
</tbody>
</table>

SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
<table>
<thead>
<tr>
<th>Conditions</th>
<th>Depth (ft.)</th>
<th>Graphic</th>
<th>Well Details</th>
<th>Depth (ft.)</th>
<th>Elevation (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<td></td>
<td>518.3</td>
<td>0.0</td>
<td>518.3</td>
</tr>
<tr>
<td>-3</td>
<td>0.3</td>
<td></td>
<td>518.1</td>
<td>1.0</td>
<td>517.3</td>
</tr>
<tr>
<td>-5</td>
<td>3.0</td>
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<td>515.3</td>
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<td></td>
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<tr>
<td>8.0</td>
<td></td>
<td></td>
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<td>210</td>
<td></td>
<td></td>
<td></td>
<td>13.0</td>
<td>505.3</td>
</tr>
</tbody>
</table>

**WELL CONSTRUCTION DETAILS**

- **Type of protective cover**: Roadway Box
- **Height of PVC above ground surface**: 512.5 ft
- **Height of top of riser above ground surface**: 512.25 ft
- **Type of protective casing**: PVC
  - **Length**: 3.0 ft
  - **Inside diameter**: 2.0 in.
  - **Depth of bottom of PVC**: -509.5 ft
- **Type of riser pipe**: 
  - **Inside diameter of riser pipe**: 
  - **Depth of bottom of riser pipe**: 3.0 ft
- **Type of Seals**
  - Concrete: Top of Seal (ft): 512.5 ft, Thickness (ft): 0.3 ft
  - Bentonite: Top of Seal (ft): 512.3 ft, Thickness (ft): 0.8 ft
- **Diameter of borehole**: 4.25 in.
- **Type of screen**: Machine slotted Sch 40 PVC
  - Screen gauge or size of openings: 0.010 in.
  - Diameter of screen: 2.0 in.
  - Depth to top of well screen: 3.0 ft
  - Depth to bottom of well screen: 13.0 ft
  - Bottom of silt trap: 
  - Depth of bottom of borehole: 13.0 ft
### TEST BORING REPORT

**Project:** UCONN-USDA Animal Health Research Center Mansfield, Connecticut  
**Client:** STV, Inc.  
**Contractor:** Seaboard Drilling, Inc.

<table>
<thead>
<tr>
<th>Casing</th>
<th>Sampler</th>
<th>Barrel</th>
<th>Drilling Equipment and Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>S</td>
<td>-</td>
<td>Rig Make &amp; Model: CME ATV</td>
</tr>
<tr>
<td>NA</td>
<td>1 3/8</td>
<td>-</td>
<td>Bit Type: Auger</td>
</tr>
<tr>
<td>NA</td>
<td>140</td>
<td>-</td>
<td>Drill Mud: None</td>
</tr>
<tr>
<td>NA</td>
<td>30</td>
<td>-</td>
<td>Casing: None</td>
</tr>
</tbody>
</table>

**H&A Rep.:** J. Buchanon  
**Elevation:** 514.0  
**Datum:** NGVD  
**Location:** See Plan

**Depth (ft):**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Sample Box</th>
<th>Sample Rec. (in.)</th>
<th>Sample Depth (ft)</th>
<th>USGS Symbol</th>
<th>Visual- Manual Identification and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
<td>SP-SM</td>
<td>Loose brown silty fine SAND, some roots, some leaves, no odor, dry</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2.0</td>
<td>2.0</td>
<td>SP-SM</td>
<td>Similar to S1</td>
</tr>
<tr>
<td>13</td>
<td>5</td>
<td>5.0</td>
<td>5.0</td>
<td>SP</td>
<td>Similar to S2 (below 3.5ft), except with gray rock fragments</td>
</tr>
<tr>
<td>504.0</td>
<td>100</td>
<td>10.0</td>
<td>10.0</td>
<td>Auger Refusal at 10ft</td>
<td>END OF BORING: 10ft</td>
</tr>
</tbody>
</table>

**Water Level Data:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Elapsed Time (hr)</th>
<th>Depth (ft) to:</th>
<th>Sample ID</th>
<th>Well Diagram</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bottom of casing</td>
<td></td>
<td></td>
<td>Overburden (ft) 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bottom of Hole</td>
<td></td>
<td></td>
<td>Rock Cored (ft) 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Water</td>
<td></td>
<td></td>
<td>Samples 3s</td>
</tr>
</tbody>
</table>

**Field Tests:**

- Dilatancy: R - Rapid  
- Plasticity: N - Nonplastic  
- Toughness: L - Low  
- Dry Strength: N - None  

**Note:** Maximum particle size is determined by direct observation within the limitations of sampler size.  
**Note:** Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.
**Test Boring Report**

**Project:** UConn-USDA Animal Health Research Center, Mansfield, Connecticut  
**Client:** STV, Inc.  
**Contractor:** Seaboard Drilling, Inc.

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Sample No. &amp; Rec. (in.)</th>
<th>Sample Depth (ft)</th>
<th>USCS Symbol</th>
<th>Visual-Manual Identification and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>S1 6</td>
<td>0.0</td>
<td>SP-SM</td>
<td>Loose dark brown silty fine SAND, some roots no odor, dry</td>
</tr>
<tr>
<td>2.0</td>
<td></td>
<td></td>
<td>SP-SM</td>
<td>FOREST MAT</td>
</tr>
<tr>
<td>2.0</td>
<td>S2 24</td>
<td>2.0</td>
<td>SP-SM</td>
<td>Dense brown silty medium fine SAND, some gravel, no odor dry</td>
</tr>
<tr>
<td>4.0</td>
<td></td>
<td></td>
<td></td>
<td>Auger refusal at 5.5ft, Offset boring 6ft SW</td>
</tr>
<tr>
<td>5.3</td>
<td>S3 15</td>
<td>5.0</td>
<td>B4A</td>
<td>Auger to 5ft, Similar to S2, except red brown</td>
</tr>
<tr>
<td>5.3</td>
<td></td>
<td></td>
<td></td>
<td>gray GNEISS fragments, some brown silty medium fine SAND, no odor, moist</td>
</tr>
<tr>
<td>10.0</td>
<td>S4 13</td>
<td>10.0</td>
<td></td>
<td>Auger Refusal at 13ft, End of Boring: 13ft</td>
</tr>
</tbody>
</table>

**Water Level Data**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time Elapsed Time (hr)</th>
<th>Depth (ft) from Bottom of Hole</th>
<th>Water Level Data</th>
</tr>
</thead>
</table>

**Summary**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time Elapsed Time (hr)</th>
<th>Depth (ft) from Bottom of Hole</th>
<th>Water Level Data</th>
</tr>
</thead>
</table>

**Field Tests:**

- **Dilatancy:** R - Rapid, S - Slow, N - None  
- **Plasticity:** N - Nonplastic, L - Low, M - Medium, H - High  
- **Toughness:** L - Low, M - Medium, H - High  
- **Dry Strength:** N - None, L - Low, M - Medium, H - High, V - Very High

**Note:** Maximum particle size is determined by direct observation within the limitations of sampler size.

**Note:** Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.
TEST Boring REPORT

Boring No. B5/5A

File No. 36034-000
Sheet No. 1 of 1
Start August 20, 2009
Finish August 20, 2009
Driller F. Harrington
H&A Rep. J. Buchanon

Elevation 509.4
Datum NGVD
Location See Plan

Casing Sampler Barrel Drilling Equipment and Procedures
Type NA S - Rig Make & Model: CME ATV
Inside Diameter (in.) NA 1 3/8 - Bit Type: Auger
Hammer Weight (lb) NA 140 - Drill Mud: None
Hammer Fall (in.) NA 30 - Casing: None
Hoist/Hammer: None / Automatic Hammer
PID Make & Model: None

Depth (ft) Sample No. Sample & Project USCS Symbol Sample Depth (ft) Elev/Depth (ft)
0 1 1 S1 0.0 SP-SM
1 2 2 2.0
2 7 14 S2 2.0 SP-SM
18 27 2.5 Similar to S1
506.9 4.0 -FOREST MAT-
5 84/4" 23 5.0 SP
23 5.8 Similar to S2 (below 2.5 ft), except dense
503.4 6.0 Note: very hard drilling 5.5 to 6 ft
5.8 -GLACIAL TILL-

Auger Refusal at 6 ft
End of Boring: 6 ft
Offset boring 9 ft N
BQA: very hard grinding 3.5 to 5 ft
Auger Refusal at 5 ft
End of Boring: 5 ft

Water Level Data Sample ID Well Diagram Summary
Date Time Elapsed Time (hr.) Depth (ft.) Bottom of Casing Bottom of Hole Water O: Open End Rod T: Thin Wall Tube U: Undisturbed Sample S: Split Spoon Sample Riser Pipe Screen Filter Sand Cuttings Grout Concrete Bentonite Seal

Overburden (ft) 6
Rock Cored (ft) 0
Samples 3S

Boring No. B5/5A

Field Tests:
Distancy: R: Rapid S: Slow N: None
Toughness: L: Low M: Medium H: High
Plasticity: N: Nonplastic L: Low M: Medium H: High
Dry Strength: N: None L: Low M: Medium H: High V: Very High

Note: Maximum particle size is determined by direct observation within the limitations of sampler size.
Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.
## Test Boring Report

**Project:** UCONN-USDA Animal Health Research Center, Mansfield, Connecticut  
**Client:** STV, Inc.  
**Contractor:** Seaboard Drilling, Inc.

<table>
<thead>
<tr>
<th>Depth (ft.)</th>
<th>Sampler Blown Per Unit</th>
<th>Sample Blown</th>
<th>Sample Depth (ft.)</th>
<th>Stratum Change</th>
<th>USCS Symbol</th>
<th>Visual-Manual Identification and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>S1 6</td>
<td>0.0</td>
<td>2.0</td>
<td>SP-SM</td>
<td>Loose dark orange brown silty medium to fine SAND, some roots, no odor, moist</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>S2 18</td>
<td>2.0</td>
<td>4.0</td>
<td>510.8 3.0</td>
<td>Similar to S1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>20 75 786*</td>
<td>5.0</td>
<td>6.5</td>
<td>SP</td>
<td>Medium dense tan brown medium to fine SAND, some silt, some gravel, no odor, dry</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>14 42 64 41</td>
<td>10.0</td>
<td>12.0</td>
<td>SP</td>
<td>Very dense brown medium to fine SAND, some silt, some gravel, no odor, dry</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>30/4* 15</td>
<td>15.0</td>
<td>15.3</td>
<td>No Recovery</td>
<td>End of Boring: 15.3 ft</td>
<td></td>
</tr>
</tbody>
</table>

### Water Level Data

- **Date:**  
- **Time:**  
- **Depth (ft.) to:**  
  - **Bottom of Casing:**  
  - **Bottom of Hole:**  
  - **Water:**

### Summary

- **Overburden (ft):** 15.3 ft  
- **Rock Cored (ft):** 0 ft  
- **Samples:** 5S

### Field Tests:

- **Dilatancy:** R - Rapid, S - Slow, N - None  
- **Plasticity:** N - Nonplastic, L - Low, M - Medium, H - High  
- **Toughness:** L - Low, M - Medium, H - High  
- **Dry Strength:** N - None, L - Low, M - Medium, H - High, V - Very High

*Note: Maximum particle size is determined by direct observation within the limitations of sampler size.*  
*Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.*
# TEST BORING REPORT

**Project:** UCONN-USDA Animal Health Research Center, Mansfield, Connecticut  
**Client:** STV, Inc.  
**Contractor:** Seaboard Drilling, Inc.  

<table>
<thead>
<tr>
<th>Casing</th>
<th>Sampler</th>
<th>Barrel</th>
<th>Drilling Equipment and Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>S</td>
<td>-</td>
<td>Rig Make &amp; Model: CME ATV</td>
</tr>
<tr>
<td>NA</td>
<td>1 3/8</td>
<td>-</td>
<td>Bit Type: Auger</td>
</tr>
<tr>
<td>NA</td>
<td>140</td>
<td>-</td>
<td>Drill Mud: None</td>
</tr>
<tr>
<td>NA</td>
<td>30</td>
<td>-</td>
<td>Casing: None</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hoist/Hammer: None</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PID Make &amp; Model: None</td>
</tr>
</tbody>
</table>

**H&A Rep.:** J. Buchanon  
**Elevation:** 509.4  
**Datum:** NGVD  
**Location:** See Plan

## VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION

(Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions  
GEOLOGIC INTERPRETATION)

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Sample</th>
<th>Sample No. &amp; Prec. (in.)</th>
<th>Stratum Elev/Depth (ft)</th>
<th>USCS Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>S1</td>
<td>2</td>
<td>0.0</td>
<td>SP</td>
<td>Loose dark brown medium to fine SAND, some silt, no odor, dry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>2.0</td>
<td>SM</td>
<td>Note: cobble fragment in tip of sampler.</td>
</tr>
<tr>
<td>507.4</td>
<td>S2</td>
<td>14</td>
<td>2.0</td>
<td>SP</td>
<td>Very dense orange brown medium to fine SAND, some silt, trace gravel, nor odor, moist</td>
</tr>
<tr>
<td>503.4</td>
<td>S3</td>
<td>30</td>
<td>4.0</td>
<td></td>
<td>Similar to S2</td>
</tr>
</tbody>
</table>

**End of Boring: 8ft**

## Water Level Data

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Elapsed Time (hr.)</th>
<th>Depth (ft) to:</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bottom of Boring</td>
<td>Bottom of Hole</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>O - Open End Rod</td>
<td>T - Thin Wall Tube</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Riser Pipe</td>
<td>Screen</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Overburden (ft)</td>
<td>Rock Cored (ft)</td>
</tr>
</tbody>
</table>

**Note:** Maximum particle size is determined by direct observation within the limitations of sampler size.  
**Note:** Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.
TEST BORING REPORT

Project: UCONN-USDA Animal Health Research Center, Mansfield, Connecticut
Client: STV, Inc.
Contractor: Seaboard Drilling, Inc.

<table>
<thead>
<tr>
<th>Casing</th>
<th>Sampler</th>
<th>Barrel</th>
<th>Drilling Equipment and Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>S</td>
<td>-</td>
<td>Rig Make &amp; Model: Marooka ATV</td>
</tr>
<tr>
<td>NA</td>
<td>1 3/8</td>
<td>-</td>
<td>Bit Type: Auger</td>
</tr>
<tr>
<td>NA</td>
<td>140</td>
<td>-</td>
<td>Drill Mud: None</td>
</tr>
<tr>
<td>NA</td>
<td>30</td>
<td>-</td>
<td>Casing: None</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>Hoist/Hammer: Winch/Safety Hammer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>PID Make &amp; Model: None</td>
</tr>
</tbody>
</table>

Type
Inside Diameter (in.)
Hammer Weight (lb)
Hammer Fall (in.)

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Sampler Blow &amp; Rec. (in.)</th>
<th>Sample No. &amp; Rec. (in.)</th>
<th>Depth (ft)</th>
<th>USCS Symbol</th>
<th>Sample Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>S1</td>
<td>8</td>
<td>0.0</td>
<td>SP-SM</td>
<td>Loose brown to red brown silty fine SAND, some roots, no odor, dry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>S2</td>
<td>22</td>
<td>2.0</td>
<td>SP-SM</td>
<td>Similar to S1</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td>4.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td>512.5</td>
<td>SP-SM</td>
<td>Forest Mat</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td>3.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>S3</td>
<td>15</td>
<td>4.0</td>
<td>SP</td>
<td>Medium dense tan brown silty fine SAND, some gravel, no odor, dry</td>
</tr>
<tr>
<td>35</td>
<td></td>
<td></td>
<td>6.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
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<td></td>
<td>509.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
<td>6.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

End of Boring: 60 ft

Water Level Data
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Elapsed Time (hr)</th>
<th>Depth (ft) to:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bottom of Casing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bottom of Hole</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Water</td>
</tr>
</tbody>
</table>

Sample ID
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Elapsed Time (hr)</th>
<th>Depth (ft) to:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bottom of Casing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bottom of Hole</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Water</td>
</tr>
</tbody>
</table>

Well Diagram

Summary
- Overburden (ft): 6
- Rock Cored (ft): 0
- Samples: 3S

Boring No.: CB-2

Note: Maximum particle size is determined by direct observation within the limitations of sampler size.

Field Tests:
- Dilatancy: Rapid
- Plasticity: N-Nonplastic
- Toughness: L-Low
- Dry Strength: N-None

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.
# TEST BORING REPORT

**Boring No.** IT-1

**Project** UCONN-USDA Animal Health Research Center Mansfield, Connecticut

**Client** STV, Inc.

**Contractor** Seaboard Drilling, Inc.

**File No.** 36034-000

**Sheet No.** 1 of 1

**Start** August 24, 2009

**Finish** August 24, 2009

**Driller** F. Harrington

**H&A Rep.** J. Buchanon

**Elevation** 512.0 (est.)

**Datum** NGVD

**Location** See Plan

### Water Level Data

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Elapsed Time (hr)</th>
<th>Depth (ft) to Bottom of CASING</th>
<th>Depth (ft) to Bottom of Hole</th>
<th>Well Diagram</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/24/2009</td>
<td>1200</td>
<td>0.5</td>
<td>8</td>
<td>8</td>
<td>Riser Pipe Screen Filter Sand Grout Concrete</td>
<td>Overburden (ft) 8 Rock Cored (ft) 0 Samples 3S Boring No. IT-1</td>
</tr>
</tbody>
</table>

**Field Tests:**

- **Dilatancy:** R - Rapid
- **Plasticity:** N - Nonplastic
- **Toughness:** L - Low
- **Dry Strength:** N - None

**Note:** Maximum particle size is determined by direct observation within the limitations of sampler size.

**Note:** Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.
TEST BORING REPORT

Project: UCONN-USDA Animal Health Research Center Mansfield, Connecticut
Client: STV, Inc.
Contractor: Seaboard Drilling, Inc.

Boring No. IT-2

Driller: F. Harrington
H&A Rep.: J. Buchanan

File No. 36034-000
Sheet No. 1 of 1
Start: August 24, 2009
Finish: August 24, 2009
Elevation: 512.2
Datum: NGVD
Location: See Plan

Drilling Equipment and Procedures
- Rig Make & Model: Marooka ATV
- Bit Type: Auger
- Drill Mud: None
- Casing: None
- Hoist/Hammer: Winch / Safety Hammer
- PID Make & Model: None

Visual-Manual Identification and Description
(Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions)

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Sample No. &amp; Rec. (in.)</th>
<th>Sample No. &amp; Rec. (in.)</th>
<th>Scraper Elev Depth (ft)</th>
<th>USCS Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>S1 12</td>
<td>0.0</td>
<td>2.0</td>
<td>SP-SM</td>
<td>Loose orange brown silty fine SAND, some roots, no odor, dry</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-FOREST MAT-</td>
</tr>
<tr>
<td>2</td>
<td>S2 20</td>
<td>2.0</td>
<td>4.0</td>
<td>SP-SM</td>
<td>Medium dense brown silty medium to fine SAND, some gravel, no odor, dry</td>
</tr>
<tr>
<td>5</td>
<td>S3 12</td>
<td>5.0</td>
<td>7.0</td>
<td>SP</td>
<td>Very dense gray medium to fine SAND, some silt, some gravel, no odor, dry</td>
</tr>
<tr>
<td>10</td>
<td>S4 0</td>
<td>10.0</td>
<td>10.0</td>
<td></td>
<td>Auger Refusal at 10ft</td>
</tr>
<tr>
<td>50/0&quot;</td>
<td></td>
<td></td>
<td></td>
<td>&lt;GLACIAL TILL&gt;</td>
<td>No Recovery</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>End of Boring: 10ft</td>
</tr>
</tbody>
</table>

Water Level Data

<table>
<thead>
<tr>
<th>Date</th>
<th>Time Elapsed (hr)</th>
<th>Depth (ft) to:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>O - Open End Rod</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T - Thin Wall Tube</td>
</tr>
<tr>
<td></td>
<td></td>
<td>U - Undisturbed Sample</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S - Split Spoon Sample</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Riser Pipe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Screen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Filter Sand</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cuttings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Grout</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Concrete</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bentonite Seal</td>
</tr>
</tbody>
</table>

Summary
- Overburden (ft): 10
- Rock Cored (ft): 0
- Samples: 4S

Field Tests:
- Dilatancy: R - Rapid, S - Slow, N - None
- Plasticity: N - Nonplastic, L - Low, M - Medium, H - High
- Toughness: L - Low, M - Medium, H - High
- Dry Strength: N - None, L - Low, M - Medium, H - High, V - Very High

Note: Maximum particle size is determined by direct observation within the limitations of sampler size.
Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.
# Test Boring Report

**Project:** UCONN-USDA Animal Health Research Center, Mansfield, Connecticut  
**Client:** STV, Inc.  
**Contractor:** Seaboard Drilling, Inc.  

**Boring No.:** IT-3  
**File No.:** 36034-000  
**Sheet No.:** 1 of 1  
**Start:** August 20, 2009  
**Finish:** August 20, 2009  
**Driller:** F. Harrington  
**H&A Rep.:** J. Buchanon  
**Elevation:** 497.2  
**Datum:** NGVD  
**Location:** See Plan

### Drilling Equipment and Procedures
- **Rig Make & Model:** CME ATV  
- **Bit Type:** Auger  
- **Drill Mud:** None  
- **Casing:** None  
- **Host/Hammer:** None / Automatic Hammer  
- **PID Make & Model:** None

### Visual-Manual Identification and Description
(Density/consistency, color, GROUP NAME, max. particle size*, structure, odor, moisture, optional descriptions)

- **Depth (ft):** 0  
  - **Sample No. & Roll (in.):** S1  
  - **Sample Depth (ft):** 0.0  
  - **USGS Symbol:** SP  
  - **Description:** Medium dense brown medium to fine SAND, some silt, some gravel, no odor, dry

- **Depth (ft):** 2.0  
  - **Sample No. & Roll (in.):** S2  
  - **Sample Depth (ft):** 2.0  
  - **USGS Symbol:** SP  
  - **Description:** Medium dense gray brown medium to fine SAND, some silt, trace fine gravel, no odor, moist

- **Depth (ft):** 4.0  
  - **Sample No. & Roll (in.):** S3  
  - **Sample Depth (ft):** 4.0  
  - **USGS Symbol:** SW  
  - **Description:** Very dense brown coarse to fine SAND, some gravel, trace silt, no odor, dry

- **Depth (ft):** 6.0  
  - **Sample No. & Roll (in.):** S4  
  - **Sample Depth (ft):** 6.0  
  - **USGS Symbol:** SP  
  - **Description:** Dense orange brown medium to fine SAND, some silt, no odor, moist

- **Depth (ft):** 8.0  
  - **Sample No. & Roll (in.):** S5  
  - **Sample Depth (ft):** 8.0  
  - **USGS Symbol:** SP  
  - **Description:** Very dense orange brown medium to fine SAND, some silt, some gravel, no odor, wet

- **Depth (ft):** 10.0  
  - **Sample No. & Roll (in.):**  
  - **Sample Depth (ft):** 10.0  
  - **USGS Symbol:** SW  
  - **Description:** Very dense orange brown coarse to fine SAND, some silt, some gravel, no odor, wet

  **GLACIAL TILL**

**End of Boring: 10ft**

### Water Level Data

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Elapsed Time (hr)</th>
<th>Depth (ft to Water)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/20/2009</td>
<td>0930</td>
<td>0</td>
<td>7</td>
</tr>
</tbody>
</table>

### Summary
- **Overburden (ft):** 10  
- **Rocks Cored (ft):** 0  
- **Samples:** 5S

**Boring No.:** IT-3

**Field Tests:**
- Dilatancy: R - Rapid, S - Slow, N - None
- Plasticity: N - Nonplastic, L - Low, M - Medium, H - High
- Toughness: L - Low, M - Medium, H - High
- Dry Strength: N - None, L - Low, M - Medium, H - High, V - Very High

*Note: Maximum particle size is determined by direct observation within the limitations of sampler size.*

*Note: Soil identification based on visual-manual methods of the USGS as practiced by Haley & Aldrich, Inc.*
APPENDIX B

Laboratory Test Results
<table>
<thead>
<tr>
<th>Expl. No.</th>
<th>Sample No.</th>
<th>Depth (ft.)</th>
<th>LL</th>
<th>PL</th>
<th>PI</th>
<th>Water Content (%)</th>
<th>Cc</th>
<th>Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT-1</td>
<td>S2</td>
<td>2-4</td>
<td></td>
<td></td>
<td></td>
<td>8.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sample Description

Remarks:

UCONN - USDA Animal Health Research Center
Mansfield, Connecticut

GRAIN SIZE DISTRIBUTION

Date: 9/1/2009  File No.: 36034-000


**COBBLES**

<table>
<thead>
<tr>
<th>Expl. No.</th>
<th>Sample No.</th>
<th>Depth (ft.)</th>
<th>LL</th>
<th>PL</th>
<th>PI</th>
<th>Water Content (%)</th>
<th>Cc</th>
<th>Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT-3</td>
<td>S3</td>
<td>4-6</td>
<td></td>
<td></td>
<td></td>
<td>4.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**

- Sample Description

**UCONN - USDA Animal Health Research Center**

Mansfield, Connecticut

**GRAIN SIZE DISTRIBUTION**

Date: 9/1/2009

File No.: 36034-000
ATTACHMENT C
List of Preparers
LIST OF PREPARERS

The following personnel have contributed to the preparation of this Environmental Assessment:

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  1. Louis Welker: Chief, Facilities Engineering Branch
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  3. Carlos Santoya: Research Program Manager (RPM)
  4. Luis Rodriguez: Research Program Representative (RPR)
  5. Bill Golde: Senior Scientist
  6. Manuel Borch: Senior Scientist

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  1. Ian Hart: Assoc. Dean of Research
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  3. Cecile Baccanale: Attending Veterinarian
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  6. Jason Coite: Environmental Compliance Analyst
  7. Paul Ferry: Environmental Compliance Analyst
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Ahneman Kirby (Survey)
  1. Ben Graviano: Civil Engineer

Haley & Aldrich (Geotechnical)
  2. John Dugan: Geotechnical Engineer
ATTACHMENT D
Draft Finding of No Significant Impact (FONSI)