DHS Science and Technology Directorate

The Assessment of Risk—An Introduction to the NBAF Updated Risk Assessment

The Updated Site-Specific Risk Assessment proactively measures the risks of operating the NBAF in Manhattan, Kansas.

The United States needs to be on the frontline of livestock animal health research to defend against foreign animal, emerging, and zoonotic diseases. The National Bio and Agro-Defense Facility (NBAF) is envisioned as a state-of-the-art bio-safety level (BSL) 3 & 4 facility to enable the U.S. to conduct comprehensive research, develop vaccines and anti-virals, and provide enhanced diagnostic capabilities to protect our country from numerous foreign animal and emerging diseases.

As part of its on-going risk management process and to comply with recent Congressional requirements, the Department of Homeland Security (DHS) updated the 2010 NBAF Site-Specific Risk Assessment (SSRA) by incorporating recommendations from the National Academy of Sciences (NAS) and the most recent design plans. The Updated SSRA satisfies the Congressional requirements for demonstrating how calculated risks have been significantly reduced by incorporating mitigation measures into the risk assessment and updating the analysis to allow for a cumulative risk calculation.

The significant changes in the Updated SSRA include:

- A more systematic approach to the assessment of potential accidents and characterization of uncertainties;
- Incorporation of tornado modeling;
- Additional data (susceptible populations, outbreak control measure resources, etc.) collected for the NBAF location and used in the epidemiological and economic modeling;
- An assessment of cumulative risk of foot-and-mouth disease (FMD) release over the predicted lifetime of the NBAF; and
- An assessment of the unique risks of a large animal high containment laboratory (ABSL-4).

The Updated SSRA shows that the NBAF design is sound.

The Updated SSRA assessment found that the current NBAF design is sound and can incorporate best practices used in other animal and zoonotic pathogen laboratory facilities. The NBAF design incorporated significant design changes beyond the industry standard to reduce risk including additional redundancies in the filters, water supply, waste disposal and implementing nuclear industry level standards on structural and containment building integrity in a tornado event.

The Updated SSRA shows the risks to operating NBAF in Kansas.

The Updated SSRA estimates the expected probability of an accidental release of viable Foot and Mouth Disease (FMDv) resulting in a subsequent outbreak during the NBAF's 50-year operating lifetime is de minimis- approximately one tenth of one percent. This includes the likelihood of a catastrophic event like a tornado or earthquake.

DHS found that the relatively low risk observed across the various potential release events, originating locations, and pathways are reflective of the design, operational plans, and response practices that have been adopted or improved upon since the initial Design and SSRA in 2010.

As plans and processes advance, S&T will continue to further plans for risk mitigation.

As the design, mitigation plans and response strategies for the NBAF develop, S&T will continue to review and update its strategies to mitigate the risks of operating a high-containment laboratory. NAS will also provide an independent review of S&T's risk assessment.

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To learn more about the National Bio and Agro-Defense Facility or the Updated Site-Specific Risk Assessment, please email

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