

SMITHSONIAN INSTITUTION  
NATIONAL MUSEUM OF NATURAL HISTORY  
ROOFTOP LABORATORY EXHAUST SYSTEM

12<sup>th</sup> Street and Constitution Avenue, NW, Washington, D.C.

Finding of No Significant Impact

JUL 1 2009

I have evaluated the preliminary and final building plans for the proposed installation of a laboratory exhaust system on the penthouse roof of the west wing of the Smithsonian Institution's National Museum of Natural History in Washington, DC, as shown on NCPC Map File No 1.41(38.00)42807. The purpose of the exhaust system is to support the laboratories within the museum and it is a component of the Smithsonian Institution's comprehensive renovation of the museum, including the modernization of its laboratories. I find that the mitigation, as noted, is adequate to establish that the project will not significantly affect the human environment. The necessary mitigation action is the installation and use of a noise attenuation system (nozzle silencers) within the new rooftop vent stacks in order to reduce sound levels of the fan exhaust system, according to the project's environmental assessment.

The District of Columbia State Historic Preservation Officer has reviewed the project plans in accordance with the requirements of Section 106 of the National Historic Preservation Act, and has determined that the project will have No Adverse Effect on cultural resources, including the National Museum of Natural History and the Mall.

Consequently, after review of the prepared environmental assessment, I have determined pursuant to Section 102(2)(C) of the National Environmental Policy Act, the Council on Environmental Quality Regulations (40 CFR, Parts 1500-1508), and Section 10 of the Commission's Environmental and Historic Preservation Policies and Procedures, that the project would not significantly affect the quality of the human environment with the required mitigation measure.

  
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Marcel C. Acosta  
Executive Director

### Background

This project has been initiated by the Smithsonian Institution (SI) to improve the museum's work environment in conjunction with modifications to the building's interior. The proposed action consists of a make up air unit, two small exhaust fans, three larger induction-type laboratory fume exhaust fans, and associated ductwork to transmit the exhaust of interior fume hoods. The proposed exhaust fans mix large volumes of outdoor air with the lab exhaust air in order to substantially dilute the exhaust and discharge it at high velocities, safely dispersing it into the outside air and preventing it from re-entering the building. The proposed fans were selected for their modular construction, low-profile design, low maintenance, low noise levels, and lower energy and operational costs.

NCPC has adopted the Environmental Assessment (EA) prepared by the Smithsonian to assist in decision-making by evaluating the potential impacts on the environment resulting from the proposed exhaust fan improvements. This environmental documentation is consistent with the National Environmental Policy Act (NEPA) of 1969, as amended, the Council on Environmental Quality (CEQ) regulations implementing NEPA [40 Code of Federal Regulations (CFR) 1500-1508], the National Historic Preservation Act (NHPA) of 1966, as amended, and NCPC's Environmental and Historic Preservation Policies and Procedures (adopted April 1, 2004).

The District of Columbia State Historic Preservation Office (DC SHPO) has reviewed the project and completed its analysis, concurring with the Smithsonian Institution that the undertaking will have No Adverse Effect on cultural resources, including the National Museum of Natural History and the Mall.

NCPC will announce its Finding of No Significant Impact (FONSI) on its website. The EA and public comments about the assessment are available for review at the Commission's office in compliance with the requirements of the National Environmental Policy Act and the Commission's implementing Environmental and Historic Preservation Policies. Additionally, the Commission's Tentative Agenda for the Commission's July 9, 2009 meeting contains a notice regarding review of the proposed project.

NCPC's requirements for a FONSI are set forth in the Environmental and Historic Preservation Policies and Procedures at Section 10(E).

#### The proposed action

The proposed action is the implementation of an exhaust system composed of a make up air unit, two small exhaust fans, three larger induction-type laboratory fume exhaust fans, and associated ductwork to transmit the exhaust of interior fume hoods from the laboratories to the building's exterior.

The exterior fume exhaust system receives diluted chemical fumes from its associated interior fume hoods. The air is moved from the fume hood through ductwork to a roof-mounted system that consists of an induction mixing plenum, exhaust fan, entrainment wind band, sound attenuator and exhaust nozzle. As laboratory fume exhaust proceeds from the duct into the fan mixing plenum, outdoor air is induced into this suction area, providing dilution before the mixture reaches the fan. Mixed air is discharged from the fan up a fume stack with attenuator and additional outdoor air is entrained at the wind band section. Air is then discharged at high velocities through the exit nozzle or cone. The ratio of induced/entrained air to exhaust air from the laboratories is typically in the range of 3 to 1.

#### Alternatives considered in the EA review

The EA examines in detail seven alternatives: the No Build Alternative and six alternate project designs.

#### Potential impacts

NCPC staff has found no significant environmental impacts with the proposed action, with implementation of the required mitigation. The most prevalent effects are short term construction effects addressed by mitigation through project construction process actions, which are presented in the EA, and a long-term moderate operational impact from sound levels of the system that is not significant and which can be reduced by implementing noise attenuation design within the exhaust system. The attenuation measures are fully described within the environmental document and are considered by NCPC to be necessary for the project. The final project plans as submitted include provisions for an attenuation element in the exhaust fan system, and the attenuation is required by NCPC to be fully implemented in the construction of the project by the Smithsonian Institution as a condition of the Commission's approval.

Sound level analysis of the exhaust system was conducted in the environmental review by the Smithsonian Institution design consultants, who determined that the sound spectrum for the non-attenuated large fans exhibited levels of noise that may be characterized as a bright or “hissing” type sound. An attenuated sound level with these units would be characterized as more of a bland sound similar to a low level breeze. Also, at the 63 hertz frequency band (low frequency), there is a tonal component to the noise that may be perceived as a drone type noise and is more pronounced in the non-attenuated fan model. The difference between the non attenuated fans and the attenuated fans at the Mall ground level is approximately 8 dBA. At the IRS building the difference is 7 dBA. These differences are considered perceptible to the human ear. Background levels in the vicinity of the project at the street level during the day were measured at 55 dBA on the Mall, which is slightly over 10 times higher than the level from the non-attenuated fans. This fan noise would not be considered disruptive but may be noticeable by most people due to the tonal nature. The noise levels would be more noticeable in the evening hours. The mitigation action for this moderate effect will require installation of exhaust nozzle silencers at each stack as described by the analysis.

Changes to cultural components of the environment are limited and have been addressed by the DC SHPO’s completion of Section 106 review in May 2009, which concurred with the Smithsonian’s Institution’s determination of No Adverse Effect.

#### Standard for evaluation.

Under NEPA, the Council on Environmental Quality (CEQ) regulations, and the Commission’s Environmental and Historic Preservation Policies and Procedures, an EA is sufficient and an Environmental Impact Statement need not be prepared if the EA supports a finding that the federal action will not significantly affect the human environment. The regulations of the Council on Environmental Quality define “significantly” as used in NEPA as requiring consideration of both context and intensity of impacts as noted by 40 CFR §1508.27.

Applying the standards, factors, and analysis here, the Executive Director must make an assessment of whether approval of the submitted building plans will “significantly” affect the human environment based on the EA and the mitigation specified by the document and staff analysis. As to the context, this is a site-specific action, and the Executive Director looks at the effects on the locale. In regard to intensity, with the mitigation specified in the EA and exhibited in the design drawings, the proposal minimizes and does not present any major or significant adverse effects with mitigation of the sound levels as cited above.

NCPC is taking a federal approval action on the final building plans, which requires adoption of the EA that analyzes attributes and issues of possible environmental impacts, in accordance with Section 102(2)(c) of the National Environmental Policy Act of 1969, and the Environmental Policies and Procedures implemented by NCPC.