April 6, 2018

Ms. Christel Johnson,
Environmental Engineer, NGB/A
4AM Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews, MD 20762 – 5157

Dear Ms. Johnson:

The Midwest Environmental Justice Organization is a 501c3 organization that works collectively with citizens to identify and understand health and environmental effects of toxic pollution in our community, and organizes with them to try to reduce and eliminate this pollution.

MEJO's comments for the Draft Environmental Impact Statement (EIS) being prepared by the Air National Guard regarding the potential beddown of F-35A aircraft at the Wisconsin Air National Guard (WANG) base at Madison's Truax Field are enclosed.

In sum, we ask that the following issues be addressed in the Draft EIS:

1. Environmental justice
2. Soil, groundwater, and vapor contamination resulting from F-16s and F-35s
3. Impacts of stormwater runoff from Truax WANG on Starkweather Creek
4. Environmental, health, safety consequences of F-35 crashes
5. Emergency Planning Community Right-to-Know (EPCRA)
6. Noise impacts on health & environment
7. Air emission impacts on health & environment
8. Native American mounds and artifacts on or near the WANG base
9. Effects of the above on adjacent wetlands and wildlife
10. Flooding/climate change effects

Thank you for considering these issues in the Draft Environmental Impact Statement.

Sincerely,

/s/Maria Powell, PhD
President, Midwest Environmental Justice Organization
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Background and specific questions to be addressed in Draft EIS:

1. Environmental justice

The placement of F-35s at Madison's Truax Wisconsin Air National Guard (WANG) base raises significant environmental justice issues that should be fully evaluated in the EIS process. Low income people living at the Truax apartments (about ½ mile southeast of the base), including a large percentage of people of color, will be disproportionately exposed to the noise and other pollution emitted from F-35s during their ongoing operations at Truax WANG and during jet landings and takeoffs. Given their proximity to the site, Truax residents are more at risk from jet crashes during takeoff and landing than people living further from the site. Starkweather Creek, which flows right next to the neighborhood, receives all the runoff from the base and is contaminated with chemicals from stormwater runoff from it (see below). The Darbo Worthington neighborhood about a bit over a mile south of the base, with a high proportion of low income minorities, is right under a frequent landing path for the fighter jets. Starkweather Creek also flows through this neighborhood. Low income and minority subsistence anglers, including some from these neighborhoods, eat fish from this creek downstream of the site along the creek and where it discharges to Lake Monona. People living at the trailer park (Oak Park Terrace) about 1/2 mile west of the ANG site, and low-income apartments just west of that (Tennyson), will also be disproportionately affected by the noise, air pollution, and other pollution from these jets.

The Truax, Darbo Worthington, Tennyson and Oak Park Terrace neighborhoods are already exposed to a number of environmental health risks and score very high on the EPA EJSCREEN indices. Locating supersonic F-35s at Truax WANG will further add to these risks.

According to the Title 32 (National Defense) Code of Federal Regulations (CfR) §989.33 (Environmental justice): "During the preparation of environmental analyses…the EPF should ensure compliance with the provisions of E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and Executive Memorandum of February 11, 1994, regarding E.O. 12898. Further, CfR PART 989—Environmental Impact Analysis Process (EIAP) states that during the Draft EIS process, "Where analyses indicate that a proposed action will potentially have disproportionately high and adverse human health or environmental effects on minority populations or low-income populations, *the EPF should make special efforts to ensure that these potentially impacted populations are brought into the review process*."

The following multi-agency document describes in detail current, state-of-the-art approaches in evaluating disproportionately impacted communities *along with strategies on how to effectively outreach to and meaningfully engage them*: Promising Practices for EJ Methodologies in NEPA Reviews.

The Draft EIS should include:

a. A comprehensive evaluation of the potential health effects of the noise, air, stormwater, potential crashes, and all other types of pollution created by the F-35s on the low income and minority communities living very near the WANG base and/or under its landing/take off routes (see points below).
b. Description of how the Air National Guard will outreach to and meaningfully engage people in low income neighborhoods most affected by the placement of F-35s in the Draft EIS review and public comment process (per the "Promising Practices" guidance linked to above).

2. Soil, groundwater, and vapor contamination resulting from F-16s and F-35s

Petroleum compounds, lubricants, solvents, de-icing chemicals, metals, and many other chemicals required for jet maintenance and operations have already made their way via spills, leaks, and stormwater discharges into soils and groundwater at the Truax Air National Guard base (and likely well beyond it). Though some

contaminated areas at the site have been remediated partially, remediation was not comprehensive and many areas were left to "natural attenuation" (doing nothing). Though the Wisconsin Department of Natural Resources approved closure and "no further action" for the eight identified contaminated areas in 2012, many of DNR's NR 700 laws were not followed for these areas or at the site overall. For instance, the vertical and horizontal extents of the groundwater contamination beneath the site, and its extent offsite, were never fully delineated, violating NR 716. Vapor intrusion has never been assessed at the site as required by NR 716.

Further, many toxic chemicals known to be used and/or released at the site were inadequately assessed in soils and groundwater, or not measured at all. The solvents tetrachloroethylene (PCE) and trichloroethylene (TCE), as well as polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), perfluorooctane sulfonate (PFOS) and perfluoroactnoid acid (PFOA), radioactive compounds, and other toxic chemicals very likely to be present in the soils and groundwater at the site were minimally assessed or not assessed at all. The base still uses solvents (probably including TCE) as well as lubricants and fire-fighting chemicals, but they are not identified in any DNR or WANG documents available to the public.

Madison Truax WANG base was identified in the 2017 DoD Aqueous Film Forming Foam Report to Congress as one of the sites that had a "known or suspected" release of PFOS or PFOA. The report states that $115,700 has been spent to investigate this. What were the results of this investigation? PFOA and PFOS are not mentioned in any of the documents in the DNR remediation and redevelopment files.

Finally, several of the issues above, could affect the health and safety of Air Force personnel (especially vapor intrusion). According to the Title 32 CfR §989.27 Occupational safety and health, the EIS should "Assess direct and indirect impacts of proposed actions on the safety and health of Air Force employees and others at a work site."

The Draft EIS should include:

a. A complete list of all the chemicals, solvents, lubricants, etc. required for F-16 and F-35 maintenance and operations.
b. A full delineation of the vertical and lateral extents of the groundwater contamination currently at the site and how far it has traveled offsite in all directions.
c. Analysis of the potential for existing groundwater VOC plumes at the site to reach Madison Water Utility Well 15.
d. Complete testing for chemicals used and/or released on the site that have not been assessed or inadequately tested to date, including: TCE, PCE, PAHs, PCBs, metals, PFOA/PFAS, radioactive compounds.
e. Evaluation of how the chemicals used/spilled/released at the site (including those in "d" above) migrated (via ditches, storm drains, utilities, sewers, etc.) and how they could affect humans, waterways, wildlife and other receptors.
f. Thorough assessment of vapor intrusion in WANG base buildings where military staff live and/or work and potential for vapor intrusion in residential, school, and other buildings adjacent to the site.
(Most of the above are required by Wisconsin NR 700 laws, but were not adhered to at WANG base).

3. Impacts of stormwater runoff from Truax WANG on Starkweather Creek

Starkweather Creek, a highly impaired 303(d) listed waterway, surrounds the Air National Guard site on three sides. All stormwater runoff from the site discharges to the creek, which then flows to Lake Monona (also highly impaired) about 2.5 miles south. The airport and WANG base were built on drained wetlands,

and many ditches and culverts were built to drain the base's stormwater runoff to the west branch of the creek to prevent flooding. Air National Guard investigative reports explicitly state this.

Toxic chemicals and petroleum compounds used and released at WANG have already traveled via stormwater drains and ditches to Starkweather Creek. Sparse data available on Starkweather Creek indicate that stormwater runoff from the airport/WANG site has significantly and negatively affected it. Although EPA/DNR stormwater laws were put into place in the 1990s to better manage stormwater at the airport and WANG base, these laws are limited and allow much discretion in implementation and enforcement. The existing WANG stormwater permit (the base is a co-permittee with the Dane Co airport) requires only sporadic and limited testing of stormwater releases from the WANG base. Very few chemicals are assessed and the permit doesn't require any testing of stormwater released from the base directly into the creek. The most toxic chemicals known or likely to be at the site (chlorinated solvents, PFOS/PFOA, metals, radioactive materials, and more) are not assessed in stormwater discharged from the site. Several DNR stormwater laws are not being followed.

According to Title 32 Code of Federal Regulations (989.31 Pollution prevention), per the Pollution Prevention Act of 1990, 42 U.S.C. 13101(b), the Draft EIS "should analyze potential pollution that may result from the proposed action and alternatives and must discuss potential pollution prevention measures when such measures are feasible for incorporation into the proposal or alternatives."

The Draft EIS should include:

a. Comprehensive assessment of how contaminated stormwater runoff from the WANG site has already affected water, sediments, fish, wildlife etc. in Starkweather Creek (needed as baseline to assess point b)
b. Complete assessment of how F-35 operations and maintenance, and new facilities constructed for the F-35s, could affect Starkweather Creek (water, sediments, fish, and other wildlife) via stormwater runoff and other emissions (including air emissions).
c. Thorough description of how stormwater runoff and other toxic pollution from the WANG base into Starkweather Creek and nearby wetlands will be prevented.

4. Environmental, health, safety consequences of F-35 crashes

Since the 1950s, there have been over 20 crashes of military planes from Truax base in or near Madison and surrounding areas. Many of these crashes killed jet pilots and some killed or injured civilians. Several jets crashed into the lakes and released fuel and other chemicals into them. These crashes are clearly risks to the environment and the community, especially to people living very close to the base, where the jets take off and land and the risk of crashes is highest. As described above, there are several low income neighborhoods close to the base or under the landing/takeoff routes that are most vulnerable to potential crashes. According to analyses we have seen, the F-35s are predicted to crash at a higher rate than the F-16s, especially during their early years of operation.

F35 and other high-tech military jet crashes also pose significant environmental and public health risks beyond killing people from the crash itself—especially if the crash creates a fire. According to the 2015 Air Force Research Laboratory's *Composite Material Hazard Assessment at Crash Sites* (called "Composite Material" report hereafter): "Aircraft crash sites have numerous potential hazards. The types of hazards vary depending on the type of aircraft, whether or not casualties were involved, type of cargo, whether or not fire was involved, etc. If a fire was involved, more toxic substances will be created and released than a crash not involving a fire….

The Composite Material report delineates specific compounds that could be released by burning composite materials. "Potential contaminants/hazards include the following: jet fuel, unexploded ordnance, isocyanates, blood-borne pathogens, radioactive material, plastics, polymers composed of organic material, and composite fibers. Aircraft structural alloys include, but are not limited to, beryllium, aluminum, zinc, hydrazine (F-16), magnesium, titanium, and copper released in the form of metallic oxides, which pose an inhalation hazard to unprotected responders. Potential exposure to the civilian population depends upon their proximity to the crash site…"'

As the quote above highlights, the materials that the F-35s are composed of can be released at the crash site, especially if the plane burns. The "advanced composite materials" used in F-35s, in particular, pose heightened risks in a crash that results in a fire. According to the Composite Materials report, the F-35 will include 42% advanced composites (compared to 13% composites in the F-16s) that will include carbon fibers in the micron and nano-sized ranges. Numerous scientific studies have shown that carbon fibers in this size range, when inhaled, can have health effects similar to asbestos.

Several other toxic chemical byproducts can be generated when these composites burn, as described in the Composite Material report: "During an aircraft accident/mishap it is important to know that transformative processes take place and chemical byproducts are formed. The transformative process may create toxic materials that were not part of the original manufacture of the advanced composite. Chemical extraction analysis indicates a significant number of toxic substances are adsorbed on the fibers, several of which are known carcinogens." The report concludes: "Some aircraft should automatically be in the high-risk category due to the high percentage or large quantity of composite materials within the airframe. For example, the B-2, F-22, AV-8B, **and F-35** would be in this category."

Further, in addition to advanced composite materials, F-35s will have a stealth coating made of "advanced aerospace materials" that F-16s do not have. According to the 1995 U.S. Air Force report, "Mishap Risk Control for Advanced Aerospace/Composite Materials" (hereafter called the "Mishap" report), advanced aerospace materials" can include "Radar Absorbent Material (RAM), Beryllium, Depleted Uranium" (radioactive materials). The report notes that "Although advanced composite/aerospace materials represent only one of the many hazards associated with an aerospace mishap (fuel, weapons, metals), they do merit increased awareness because of their hazard potential and persistence. Exposures to the potentially harmful vapors, gases, composite particulates, and airborne fibers generated in a composite mishap need to be controlled because of the symbiotic effect of the dispersion forces and complex chemical mixtures."

The "Mishap" report states that "potential health and environmental effects from damaged advanced composites include dermal and respiratory problems, toxic products, contamination, and, in the case of advanced aerospace materials, **radiation**…. Off-gassing, toxic products in the smoke plume, smoldering debris, and airborne fire-damaged particulates are the primary respiratory hazards. Examples of combustion products include: Hydrogen cyanide, sulfur and silicon dioxide, formaldehyde, hydrogen fluoride, ammonia, hydrochloric acid, hydrogen sulfide, isocyanates, halogenated compounds and aromatics."

Another critical concern is the amount of time it takes to extinguish burning advanced composite materials and the preparedness of fire departments and fire fighters. The Composite Materials report includes a detailed description (and video) of what happened in 2008 when a military plane with advanced composite materials crashed and burned. Debris from the crash covered nearly 19,000 square meters. The debris burned and smoldered for nearly three days. Analyzing the crash, the report concluded that "[a]aircraft composite fires differ from metal aircraft fires because they add fuel to the fire by increasing the fuel load... Fires involving thick composite fires will require extensive time to extinguish." The analysis of the incident

concluded that local fire departments were overwhelmed by and unprepared for the incident, and concluded that firefighting units need to "develop new tactics and firefighting strategies specific to composite aircraft fires" and "start training to address this new type of fire threat…"

Further, if planes crash, the weapons carried by the planes can explode and/or release toxic materials from the munitions into the environment, posing risks to wildlife, soils, groundwater, surface water, and public health and safety. F-35s are capable of carrying nuclear weapons, and nuclear weapons have been carried by fighter planes at Truax in the past (as well as stored at the base and also likely at the nearby Armory—next to the low income Truax apartments). If F-35s will carry nuclear weapons, crashes could release radioactive materials into the environment, exposing people and ecosystems and contaminating ecosystems irreversibly.

Last but not least, the health and safety of Air Force personnel who will be intimately involved with F-35 crashes and responses to them are a critical concern that the ANG should address CfR §989.27, Occupational safety and health.

In light of the above, the Draft EIS should include:
a. Full assessment of which Madison residents and environmental resources (land, water, wildlife, wetlands, etc.) would be most at risk for a crash and the nature of the consequences to people and the environment.
b. Complete assessment of all chemicals, fuels, and other toxic materials that could be released if an F-35 crashes and burns, and the environmental and public health effects of these releases (including those related to the burning of the F-35's composite materials and stealth coatings).
c. Full analysis of all of the kinds of munitions/weapons that will be carried on these planes (including nuclear munitions) and what would be released from these munitions if the planes crash and/or burn and the environmental and public health effects caused by these releases.
d. Full assessment of the preparedness of local fire departments to deal with a crash of an F-35 at or near the base, into a residential area, or into Madison lakes.
e. Full assessment of how the health and safety of Air Force personnel will be protected in the case of F-35 crashes, explosions, burning, etc.—and responses to these incidents.

5. Emergency Planning Community Right-to-Know (EPCRA)
Related to #4, EPCRA laws are critical in assuring the community is protected from hazards related to toxic chemical, munitions, and fuel use and storage, operations and maintenance of the jets, potential crashes, and others that could occur at and near the Truax base. EPCRA laws also address the community's access to information about these issues and plans to inform the community in the case of toxic spills, fires, explosions, crashes, and other incidents at the base that pose risks to people living nearby.

It is not clear that EPCRA laws have been followed at the Truax WANG base.

The Draft EIS should address:
a. How all EPCRA laws are being followed to assure that that people near the base (at MATC, and adjacent neighborhoods) are protected in the case of a crash, chemical release, or other emergency at the site, how these people will be informed of such releases and emergencies, and what kinds of access they have to information about chemicals at the site.
b. How all EPCRA requirements will be met for new chemicals involved with operations and maintenance of F-35s, and potential crashes of these jets.

6. Noise effects

Like the F-16s do already, the F-35 supersonic fighter jets will produce significant noise that will affect many people on Madison's east and north sides, but will disproportionately affect the low income people living nearest to the base. Analyses show that the F-35s will be louder than the F-16s, especially on takeoff and landing.

There is a strong and growing body of studies showing the effects of noise on health. Studies show significant connections between noise (including at levels even noise below the hearing damaging criterion) and sleep disturbance, cognitive impairment, physiological stress reactions, endocrine imbalance, and cardiovascular disorders. High noise levels also cause psychological stress. Studies show that noise-induced physiological changes can promote the development of chronic disorders such as atherosclerosis, hypertension, and ischemic heart diseases in the long run.

Children are especially at risk. According to the World Health Organization's 2011 report, "*Environmental Health and Cognitive Impairment in Children*," over 20 studies have shown negative effects of noise on reading and memory in children. The report notes that "exposure during critical periods of learning at school could potentially impair development and have a lifelong effect on educational attainment." Noise induced cognitive impairment in children is thought to be the result of hearing loss, hormonal and neurotransmitter disruption, and psychological disorders that collectively affect brain development, structure and function.

There are also numerous studies showing that high noise levels negatively and significantly affect the health and reproduction of birds and wildlife.

The Draft EIS should include:
a. Comprehensive and state-of-the-art assessment of the types and levels of noise produced by the full range of operations of the F-35 jets (afterburner, in fight, take off, landing, etc.).
b. Thorough evaluation of the physical, social/psychological and neurological effects to Madison residents, especially to those people living closest to the base.
c. Thorough evaluation of the effects of noise on birds and wildlife in Cherokee Marsh, nearby wetlands, along Starkweather Creek, and other areas near the base.

7. Air emissions
Military jets emit numerous air pollutants, including volatile organic chemicals (VOCs), particulates (in the 5 and 10 micron range, as well as the < 1 micron or ultrafine range), metals, dioxins, carbon dioxide, sulfur dioxide, nitrogen dioxide, carbon monoxide, polycyclic aromatic hydrocarbons (PAHs), black carbon, and many more. These air emissions will be highest in areas very near the airport where the planes take off/land and afterburner is performed. People living in these neighborhoods already experience high levels of air pollution and the F-35 emissions from the base nearby will likely add to these exposures.

The Draft EIS should include:
a. Analysis of full range of types and levels of air pollutants F-35s will emit during all modes of operation.
b. Assessment of human exposures to these air pollutants, especially among those people living nearest to the base.
c. Effects of air pollution emitted from F-35s on the environment, fish and wildlife.
d. How air emissions from WANG military aircraft and their effects on human and environmental health will be mitigated.

8. Native American mounds and artifacts

The 2004 Air National Guard *"Preliminary Final Environmental Assessment for Proposed Construction Projects"* at the Truax Air National Guard stated that: "Archaeological surveys of potential development areas conducted at the airport in 1993 recorded two archaeological sites (FAA 1996)"and "Two historic mound sites are found between l and 2 miles away from the airport. A previously recorded mound site is located within the southern portion of the airport… The airport is considered to have a high potential for archeological materials in undeveloped areas (FAA 1996)." Since this report was published, it has been confirmed that Truax Field is home to a native burial mound termed "Truax Air Park Mound."

The draft EIS should consider:

a. Potential effects on the identified mound and all Native American artifacts, mounds, and other traditional resources on or near the ANG site that could be affected by site operations, pollution, jet crashes, etc.
b. Maps of where these mounds and other Native artifacts are and detailed plans for how they are being protected.

9. Ecological effects on adjacent wetlands and wildlife

The Truax WANG site is built on filled, former wetland and small remnant wetlands surround the site. Cherokee Marsh, a large wetland area, is just northwest of the base. These wetlands are critical for fish and wildlife habitat, filtering runoff to prevent water pollution, flood prevention, and numerous other critical ecological functions. According to Executive Order 11990 (Protection of Wetlands), "In furtherance of the National Environmental Policy Act…in order to avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands…Each agency shall provide leadership and shall take action to prevent the destruction, loss or degradation of wetlands, and to preserve and enhance natural and beneficial values of wetlands in carrying out the agency's responsibilities."

The Draft EIS should include:

a. A full evaluation of how wetlands near the base—and the birds, fish and wildlife that depend on them for food and habitat—will be affected by the noise, air, water, and other pollution related to the F-35 maintenance and operations, flights, and potential crashes.
b. How existing impacts on these wetlands are addressed and effects from operations and maintenance of F-35s will be mitigated.

10. Flooding/climate change

The Truax WANG site is in the floodplain of Starkweather Creek. People living near the base have observed the ditches and storm drains from the base practically overflowing their banks during heavy rain events, which will be exacerbated by climate change. Floods in at WANG will disturb existing contaminated soils and groundwater, releasing these contaminants into Starkweather Creek and adjacent wetlands. Per Executive Order 11998, "Before taking an action, each agency shall determine whether the proposed action will occur in a floodplain" and "Each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities…"

The Draft EIS should include:

a. Assessment of how future extreme weather events exacerbated by climate change could cause flooding at the Air National Guard base
b. Evaluation of potential consequences of such flooding on F-35 and base operations as well as potential releases of contaminated soils, groundwater, munitions and other toxic materials at the site into Starkweather Creek, adjacent wetlands, and residential and public areas adjacent to the base (MATC).