CSWAB

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SENT BY ELECTRONIC MAIL

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RE: CSWAB Public Comment on the development of an Environmental Assessment (EA) addressing construction and operation of a new 101-acre Dairy Forage Research Center (DFRC) complex in Prairie du Sac, Wisconsin and as relevant to Findings of Suitability for Transfer (FOSTs) and Deed/Use Restrictions

Dear Dr. Frank,

CSWAB was organized in 1990 when rural families near Wisconsin's Badger Army Ammunition Plant (Badger) learned that private drinking water wells were polluted with high levels of cancer-causing chemicals. For more than 30 years CSWAB has worked to empower, strengthen and unify communities whose lands and water resources have been contaminated by military or industrial pollution. Our accomplishments include gaining the Army's withdrawal of a proposal to incinerate 1,000,000 pounds of waste munitions, blocking a WDNR approval to open burn 1,400 contaminated buildings as part of base closure and obtaining comprehensive water testing for neighbors living near Badger.

While there is significant publicly-available information about known hazardous waste sites and structures on the former Badger lands, there is a tendency to assume that outside certain distinct areas there is little or no potential for residual contamination. We are writing to bring these potential environmental health considerations to the attention of the U.S. Department of Agriculture, future owners, site visitors, teachers, workers, and the public including children, expectant mothers, and other populations at risk. Becoming informed not only protects human health, it also serves as the **foundation for successful future use** for grazing, prairie restoration, agriculture, research, recreation and wildlife habitat.

For these reasons, in areas where site conditions are not well characterized, **CSWAB strongly recommends comprehensive and appropriate environmental testing before prescribed burning, ecological restoration, agriculture, grazing, road construction, and all other site disturbance activities occur.**

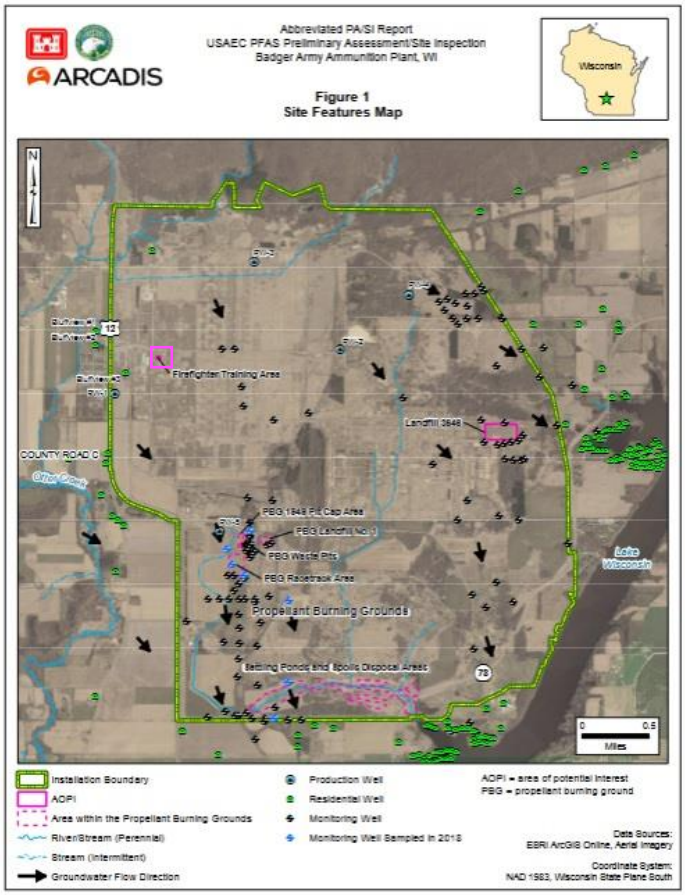
According to the draft Environmental Assessment (EA), short- and long-term, moderate, adverse impacts on geology and soils are expected from soil disturbance during construction and an increase in impervious surfaces, including associated erosion and sedimentation. Topsoil would be stripped within approximately 22.9 acres of the work limit, and 133,000 cubic yards of total earth would be moved to the site to support construction. Additionally, impervious surfaces would increase by approximately 21.8 acres, and approximately 60.6 acres of ground disturbance would occur.

In the past, **sludge** produced by Badger's Wastewater Treatment Plant (WWTP) was stored in an Imhoff tank for a period of months. It was disposed of by removal to on-site sludge drying beds, which removed water from the

sludge by gravity to an underdrain system that returns the liquid to the WWTP influent. Dried sludge was then applied to approved fields for "beneficial reuse" on Badger lands.[1] According to the 2018 Bluffview Sanitary District Facilities Plan, soil samples from these sludge beds were to be laboratory analyzed for Volatile Organic Compounds (VOCs), the explosive dinitrotoluene (DNT) and isomers, RCRA metals[2], and PCBs.[3]

Previous spot investigations of abandoned production area sewers below ground surface totaling approximately 68 miles at depths from 4 to 40 feet found DNT, lead, mercury, propellants, di-n-butyl phthalate, diphenylamine, and PCBs. Hazardous substances, pollutants or contaminants remain exceeding levels for unlimited use and/or unrestricted exposure.[4]

Identified contaminants of concern in soils and groundwater in and near Badger also include **PFAS**. In September 2018, more than 100 people, including members of the community's Restoration Advisory Board, signed a resolution asking that the Army test all public drinking water systems within a four-mile radius of Badger for PFAS. The resolution also asked that the Army include PFAS analysis in its then-upcoming testing of approximately 300 residential wells near the former military base. The Army has not agreed to conduct either, and state regulators have not mandated the testing.



PFAS are among the potential contaminants of concern for the dairy industry. PFAS can contaminate dairy products if the farm's water, feed, or soils are contaminated. Farms may be contaminated by PFAS from nearby military bases using aqueous film-forming foam (AFFF), fields being spread with contaminated **sludge**, and the handling disposal and treatment of industrial wastes. **All three potential pathways exist at Badger.** Given the cited importance of the dairy industry to Wisconsin, and the presence of known PFAS contamination pathways, this potential cost should be considered.

Moreover, we emphasize that environmental investigations by the Army are only conducted in areas where there is evidence that a spill or release to the environment was likely. Early environmental investigations by the Army, beginning in the 1970's, relied primarily on records searches and interviews with site personnel. Unfortunately, historical records for certain activities such as spills and other environmental releases are limited and, in many cases, do not exist. Prior to 1970, for example, there are no publicly-available records for chemical

[1] Wisconsin Department of Natural Resources, ENVIRONMENTAL ANALYSIS AND DECISION ON THE NEED FOR AN ENVIRONMENTAL IMPACT STATEMENT (EIS), Feasibility Report Contiguous Addition to Landfill 3646 Badger Army Ammunition Plant, Appendix G: Wastewater Treatment Plan for BAAAP, 2011.

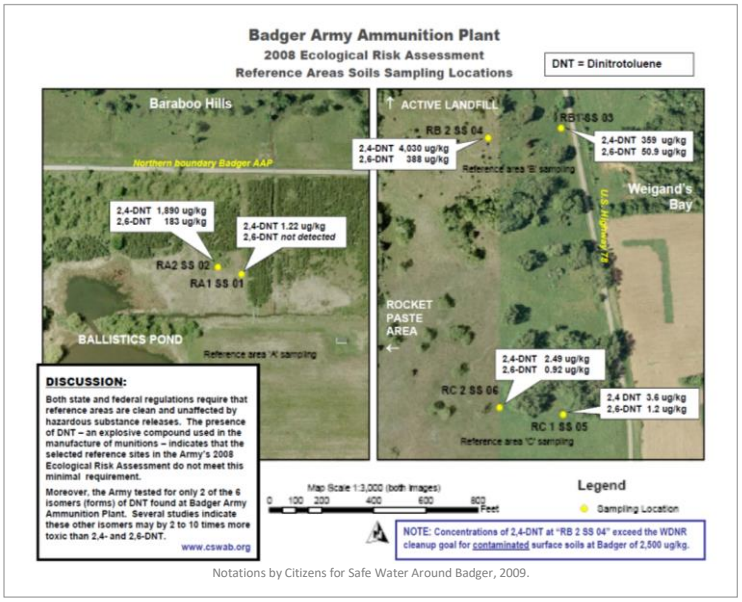
[2] RCRA Metals include arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver.

[3] Sampling Plan for Sludge Bed Facility, (a.k.a. part of former BAAP Sewage Disposal Plant), Bluffview Sanitary District Facilities Plan, Town of Sumpter dated 5 March 2018.

[4] U.S. Department of Army, Badger Army Ammunition Plant, Army Cleanup Program, *Installation Action Plan Final*, September 2023.

spills that may have occurred during active production and interim years. Environmental sampling has only been conducted in specific areas where there is sufficient evidence to justify the effort and associated costs.

CSWAB is not alone in recommending facility-wide testing for certain contaminants at Badger. In 1983, a facility-wide Hazardous Materials and Pesticide Management/Control Study was recommended by the Army. In accordance with Army Regulations 200-1, the Army recommended a special study to "define sources of pollution and develop remedial measures." The basis for the 1983 study was that "during normal operations and agricultural leasing over the past forty-plus years, many **potential toxic and/or hazardous chemicals and/or pesticides** have been used within Badger AAP's boundaries." The Army noted that "no accurate records exist as to type or quantities that may have found their way into the environment." The Statement of Work recommended a "systematic soil sampling and analysis study" for "all areas at Badger AAP." The responsibility for the use, control, and disposal of pesticides at Badger, including but not limited to insecticides, herbicides, and rodenticides, is the responsibility of the U.S. Army Armament Material Readiness Command.[5]



Notations by Citizens for Safe Water Around Badger, 2009.

It is not unusual to discover contamination in unexpected areas at Badger. For example, in 2009, environmental testing detected explosives contamination in areas that both regulators and the Army believed were completely unaffected by historical site activities. As part of an ecological risk assessment study by the Army, two areas were selected in a cooperative effort by the Army and the Wisconsin Department of Natural Resources. The Army's environmental consultants found the explosive DNT at levels above remediation goals in both areas even though there was no known history of manufacturing activities, spills, or disposal. According to all the information provided the Army, these sites should have been clean and unaffected by historical activities by the Army.[6] DNT is not naturally occurring and was used in the manufacture of military propellants at Badger. DNT is classified by the U.S. EPA as a probable human carcinogen. According to health officials, exposure to high levels of two forms of DNT (2,4-DNT and 2,6-DNT) may affect the nervous system and the blood. Both are known to cause cancer in laboratory animals.

The Army has tested soils for only 2 of the 6 isomers (forms) of DNT found at Badger. Unlike 2,4- and 2,6-DNT, these four other isomers have not been shown to biodegrade and are therefore expected to be more persistent in the environment. The Army maintains that testing has not been conducted, in part, because laboratory standards have not yet been developed.[7]

However, independent of Army environmental investigations at Badger, **soil** samples at the **Bluffview Sludge Bed Facility** (part of former BAAP Sewage Disposal Plant) were submitted to CT Laboratories in Baraboo, WI (WDNR Lab Certification # 157066030) in 2018 and were analyzed for a number of contaminants of concern including all six

[5] Department of Army, Headquarters, United States Army Armament, Munitions, and Chemical Command, Environmental Assessment for Total Plant Operations, BAAP, Introduction, Mission and Operations, page 6, July 1983.
[6] SpecPro, Inc./Exponent, Inc., Baseline Ecological Risk Assessment (BERA), Settling Ponds and Spoils Disposal Areas, Badger Army Ammunition Plant, October 2009.
[7] U.S. Army, Badger Army Ammunition Plant, e-mail from Joan Kenney to Laura Olah, CSWAB, November 19, 2008.

isomers 2,3-, 2,4-, 2,5-, 2,6-, 3,4-, and 3,5-DNT. **All six DNT isomers were detected at least one of the six soil boring soil samples.**[8]

In other areas where independent environmental testing has been conducted, results contradict those that the Army reported to the public and regulators. After dredging activities were completed the Army tested sediments at Gruber's Grove Bay on Lake Wisconsin and reported that all samples throughout the bay were below the approved cleanup goal of 0.36 parts per million (ppm). The WDNR conducted independent sampling of bay sediments and found that the majority of samples (6 out 8) failed to meet the cleanup goal of 0.36 ppm. The highest concentration found was 9.0 ppm, making it one of the worst mercury-contaminated sites in the state even after two remedial actions involving dredging and sediment removal.

In addition to soil and water contamination, the Army has documented specific risks to **children** associated with buildings. The draft Findings of Suitability for Transfer (FOSTs) prepared by the U.S. Army for the WDNR states a restriction precluding "any type of educational purpose for children/young adults in grades kindergarten through 12" for certain buildings. Even with this restriction, the FOSTs do not address risks to other populations at risk such as women of child-bearing age, the human fetus, and to children from birth to age 7. Other susceptible populations are expected to include persons with compromised immune systems. Unless altered, the FOSTs will relieve the Army of responsibilities to investigate and remediate environmental hazards that are present on the property that pose a measurable risk to human health, ecological receptors and systems, and the environment.

To the best of our knowledge, the WDNR has not determined whether or not **asbestos** detection methods and cleanup measures are sufficient to eliminate risks to children associated with direct contact with affected soils and inhalation of fugitive dust. For industrial applications, OSHA has defined an asbestos-containing material as any material with greater than 1% bulk concentration of asbestos. However, it is important to note that 1% (currently used by the Army) is not a health-based level, but instead represents the practical detection limit in the 1970s when the regulations were made.[9] Counting fibers using the regulatory definitions does not adequately describe the risk of health effects as fiber size, shape, and composition can contribute collectively to risks in ways that are still being studied. For example, shorter fibers appear to deposit preferentially in the deep lung, and longer fibers can disproportionately increase the risk of mesothelioma, a form of cancer caused by exposure to asbestos.[10]

Asbestos warning sign at a demolition landfill at the former Badger Army Ammunition Plant.

The effects of asbestos on children are thought to be similar to adults, however, children could be especially vulnerable to asbestos exposures because they are more likely to disturb fiber-laden soils or indoor dust while playing, they are closer to the ground and thus more likely to breathe contaminated soils or dust.[11] Children have faster breathing rates that may increase the level of exposure to asbestos and children could be more at risk than those exposed later in life because of the long latency period between exposure and onset of asbestos-related respiratory disease. Therefore, baseline testing and consultation with health officials concerning asbestos is recommended.

[8] MSA Professional Services, correspondence to J. Lowery, Wisconsin DNR, RE: Sludge Beds Subsurface Environmental Assessment Bluffview Treatment Plant and Facilities Plan, April 25, 2018.
[9] U.S. Agency for Toxic Substances and Disease Registry, Public Health Assessment, Libby Asbestos Site, Libby, Lincoln County, Montana, Current Standards, Regulations, and Recommendations for Asbestos, May 15, 2003.
[10] U.S. Agency for Toxic Substances and Disease Registry, Public Health Assessment, Libby Asbestos Site, Libby, Lincoln County, Montana, Methods for Measuring Asbestos Content, May 15, 2003.
[11] U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, Division of Health Assessment and Consultation, Health Consultation, W.R. Grace Newark Plant, Newark, California, September 22, 2005.

Activities such as prescribed burning may liberate certain contaminants that are found in soils at Badger, including those that are readily taken up by plants. **Toxic metals**, in particular, are a concern as burning does not destroy these contaminants and may cause the dispersal of soil and plant contamination to the air often as respirable particulates. Through inhalation, incidental ingestion, and, to a lesser degree, dermal exposure both adults and children may be exposed to emissions and fugitive dust.

In September 2008, WDNR representatives reported that the Army continues to find building foundations and other structure remnants where none were expected. Many of these areas were subsequently tested and required remediation.

U.S. Army records confirm that **road oil** was indeed present at Badger – and in extremely large quantities. A July 1983 report published by the U.S. Department of Army documents that Badger Army Ammunition Plant had a **52,000-gallon above ground tank that was used for storing road oil**.[12] A 1977 building inventory by the U.S. Army identified the same facility as "road oil storage."[13] By comparison, other used oil storage tanks at Badger held only 500 to 1,000 gallons. The Badger lands had an extensive network of more than 130 miles of roads.[14] While many of the roads in the core industrial area are paved, the majority of outlying roads at Badger were and are unpaved.

The term "road oil" refers to any heavy petroleum oil that is used as a dust suppressant and surface treatment on roads and highways.[15] The use of road oil has declined in recent years because of reductions in the proportion of unpaved roadways, the presence of highly toxic contaminants in used oils (PCBs, dioxins, furans), competition from other used oil end uses (re-refining), and new environmental regulations.[16] Used mineral-based crankcase oil (used motor oil or used engine oil) contains polycyclic aromatic hydrocarbons (PAHs) and may contain metals such as aluminum, chromium, copper, iron, lead, manganese, nickel, silicon, and tin.[17]

Deed restrictions on certain land parcels include no commercial, residential (including any type of educational purpose for children/young adults in grades kindergarten through 12), utility, or subsurface recreational use; no use of groundwater without United States Department of the Army and WDNR approval; and no digging or disturbance of soils within certain areas at Badger. **Prohibited ground intrusive activities in certain areas include raking, scratching, scraping, tilling, moving, digging, excavating, and plowing**.[18]

The Army excavated "hot spots" (shown here in this 2009 photo) to remove soils with the highest contaminant levels at the Settling Ponds. At the time, mercury was not identified as a contaminant of concern. However, recent testing has detected elevated levels in the soil.

[12] Department of the Army, Headquarter, United States Army Armament, Munitions, and Chemical Command, Environmental Assessment for Total Plant Operations, Badger AAP, July 1983.
[13] U.S. Army Toxics and Hazardous Materials Agency, Installation Assessment for Badger Army Ammunition Plant, May 1977.
[14] General Services Administration, Preliminary Highest and Best Use Analysis, Badger Army Ammunition Plant, May 15, 1998.
[15] County of Santa Barbara Planning and Development Energy Division, *Oil and Gas Glossary*, undated.
[16] United Nations Environment Programme, Secretariat of the Basel Convention, *Basel Convention Technical Guidelines on Used Oil Re-Refining or Other Re-Uses of Previously Used Oil, Basel Convention on the Control of Transboundary Movements on Hazardous Wastes and Their Disposal,* September 1995.
[17] U.S. Army Toxics and Hazardous Materials Agency, Public Health Statement for Used Mineral-based Crankcase Oil, September 1997.
[18] U.S. Army, Finding of Suitability to Transfer, (FOST), Badger Army Ammunition Plant (BAAAP), Parcels O, O1, O5, Q2, U2, and X1, October 2008.

Following are our recommendations specific to children, expectant mothers, and other populations at risk:

- Children, expectant mothers, and other susceptible populations such as the elderly and those with compromised immune systems should avoid certain areas and buildings at Badger that may contain lead, explosives, PCBs, asbestos, and other toxic substances.
- Children, expectant mothers, and other susceptible populations should avoid direct contact with soils and inhalation of fugitive dust in certain areas at Badger.
- Children, expectant mothers, and other susceptible populations should avoid exposure to sediments at Gruber's Grove Bay. Bay sediments contain elevated levels of mercury and other toxic metals.
- Children, expectant mothers, and other susceptible populations should avoid exposure to smoke and fumes from prescribed burning and decontamination activities in certain areas at Badger.
- All people should limit consumption of fish from the Ballistics Ponds and other ponds at Badger as consistent with guidance from the Wisconsin Division of Health.
- Children, expectant mothers, and other susceptible populations should not consume fish from the Ballistics Pond at Badger. This advisory extends to all ponds where data is unavailable.

CSWAB has long-advised present and future landowners to address these data gaps sooner rather than later. Once identified, risks are much more likely to be addressed while there is still some Army presence at the base. In such cases, **comprehensive independent environmental testing** may be the only means to define these risks and leverage adequate remediation.

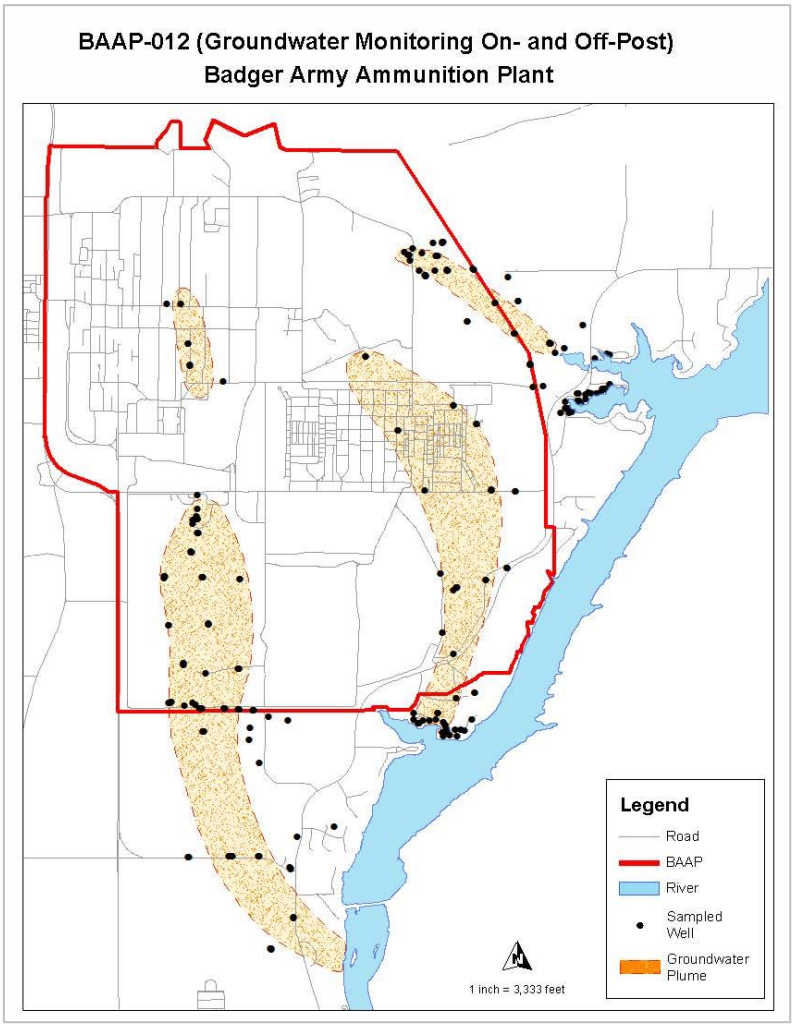
On former Badger lands transferred to the Wisconsin DNR, routine prescribed burn of vegetation by the Wisconsin Department of Natural Resources (WDNR) ignited an underground fire that burned from August 26-28, 2020. Despite millions spent on cleanup, residual soil contamination still poses a risk to human health and the environment. The **underground fire** happened on land that includes a series of interconnected settling ponds that received industrial and sanitary wastewater during the plant's active production years. The fire occurred within the 5.4-acre Settling Pond #2. One month after the fire, the WDNR issued a letter to the Army requesting a response action to include additional soil testing, describing the incident as producing "multi-colored smoke and high intensity flames."

Soil sampling in June 2021 detected two forms of DNT (2,4-DNT and 2,6-DNT) at concentrations as high as 87 mg/kg, exceeding the soil cleanup goal of only 11.4 mg/kg. According to the USEPA, DNT is "considered toxic to most organisms, and chronic exposure may result in organ damage."

Even more concerning, the total concentration of DNT in soil may actually be higher than the Army reports. The WDNR has still not required the Army to test contaminated soils for the additional four forms of DNT (2,3-DNT, 2,5-DNT, 3,4-DNT and 3,5-DNT) present at Badger. All six forms have been found in groundwater at levels exceeding Wisconsin's Groundwater Enforcement Standards. Today, post-cleanup concentrations of mercury in soil at the Settling Ponds are still more than 70 times higher than **ecological screening levels**.[19]

[19] Citizens for Safe Water Around Badger, Army Finds Contamination at Site of Underground Fire March 15, 2022 https://cswab.org/army-finds-contamination-at-site-of-underground-fire/

As recently as the October 19, 2023 public meeting of the Badger Restoration Advisory Board, the Army reported it will continue to sample and probably increase (groundwater) sampling for nitrate in the Propellant Burning Grounds, especially if there is an injection program implemented, after which time **nitrate and nitrite** will be high on the list for testing, officials said. However, before this testing occurs, there will likely be more work performed to evaluate where high nitrates could exist already in the water table from onsite farming activities, officials said. The (Propellant Burning Grounds) contaminant plume itself does not currently have a lot of nitrates onsite, officials added.



And finally, the Army recently proposed that the cleanup goals for restoration of groundwater within the footprint of the former ammunition plant will be **significantly less protective** of human health in terms of cancer risk (10^{-4} versus 10^{-6}) than in the surrounding community – challenging promulgated Wisconsin state environmental rules and regulations. If the military prevails, the implications will assuredly be far-reaching and significant for our shared community and environment.

Sincerely,

Laura Olah

Laura Olah, Executive Director