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[Public Comment Period is open from December 16, 2024 – February 28, 2025]

SENT VIA ELECTRONIC MAIL

RE: CSWAB Public Comment on Proposed Plan to Remediate Site-Wide Groundwater at and near the Former Badger Army Ammunition Plant

For 35 years, the mission of Citizens for Safe Water Around Badger (CSWAB) has been to support, unify and strengthen citizens concerned for the safety of water resources in and around the Badger Army Ammunition Plant; to effect expedient cleanup of any contamination caused by negligent handling of toxic waste; and to exercise means as necessary to guarantee water resources are totally free of toxic contamination for us and the generations to follow.

The Army's preferred remedy for [widespread groundwater contamination](#) at and near Badger Army Ammunition Plant (Badger) is Monitored Natural Attenuation (MNA) and Bioremediation. The Army has proposed enhanced bioremediation of the carcinogenic explosive DNT that is migrating to groundwater from hazardous waste sites on and near the 10,000 acres seized from rural farm families in 1942. The currently proposed remedy for groundwater contamination would utilize Emulsified Vegetable Oil (EVO) injected into the subsurface to stimulate bioremediation as a means to degrade DNT present in groundwater.

At the October 19, 2024 public meeting of the Badger Restoration Advisory Board (RAB), CSWAB asked the Army to provide our community RAB with a detailed list of all possible degradation products of DNT that could be released to the environment, including health-based thresholds for each and the concentrations currently present in groundwater. Army representatives responded that they are no longer required to test for DNT degradation products in groundwater and drinking water supplies at and near the former munitions plant. A stunning response, given the Wisconsin DNR and the U.S. Department of Health and Human Services have identified at least [24 potential DNT degradation products](#).

CSWAB also questions the effectiveness of bioremediation to degrade all six forms of DNT present in soils and groundwater at Badger. According to studies by the Air Force Research Laboratory, "2,3- DNT does not decrease at the same rate as 2,4- and 2,6-DNT." Further, the [Air Force has found](#) that "2,3-DNT has not been demonstrated to be biodegradable and can thus be considered a conservative tracer that reflects the effects of abiotic processes." Moreover, at the northeast corner of Badger in the Town of Merrimac, the other 4 isomers of DNT are predominant in groundwater. Nonetheless, the fate and transport of 2,4-DNT and 2,6-DNT remain central to the Army's current remedy proposal.

Q1: Will a pilot study of Monitored Natural Attenuation and Bioremediation be conducted? If so, how much time will this likely take?

Q2: What evidence is there that vegetable oil is the best choice in terms of a groundwater amendment? What are the other alternative materials to promote bioremediation, for example Hydrogen Release Compound (HRC)?

Q3: How does the Army define what a reasonable timeframe for accomplishing remediation goals/criteria is and WHY is it reasonable?

Q4: What in-situ processes (biodegradation, dispersion, dilution, sorption, volatilization and chemical or biological stabilization, transformation or destruction) will be in play and how will they be measured?

Q5: What statistical evidence will be provided to show that the groundwater contaminant plumes are shrinking? Will there be a statistical model that shows that the plumes are shrinking? How will it be more than observational, i.e. more than just observing concentrations in certain groundwater monitoring wells which has routinely been the focus at public meetings of the Badger Restoration Advisory Board (RAB)?

Dinitrotoluenes (DNTs) have high energy bonds, making them very strong. Moreover, degradation of DNT is extremely complex based on the scientific papers that have been reviewed. Even if functioning to a degree at Nebraska's Cornhusker Army Ammunition Plant, for example, it is very difficult to make a direct correlation with other sites.

Additionally, "total DNT" is named as a "Contaminant of Concern" in the Army's draft proposal for groundwater remediation at and near Badger. It is important to note that Wisconsin Groundwater Enforcements Standards define "total DNT" as the summed total concentration of all 6 isomers (2,3-, 2,4-, 2,5-, 2,6-, 3,4-, and 3,5-DNT).

Q6: How is the Army and how is WDNR defining "total DNT" in the Alternative Feasibility Study (AFS) and the draft Proposed Plan?

Q7: Will there be a validated process to show what all six (6) DNT isomers degrade to and will there be continuous ongoing monitoring for these daughter products/compounds?

Q8: What media transfer may occur – such as movement of contaminants from soil to groundwater or groundwater to surface water – and how will this be monitored?

Q9: Is it possible that 1,4-dioxane is present particularly as it was used as a preservative in certain fuel products? How will this be addressed?

Q10: Is vinyl chloride a potential contaminant of concern now or in the future, for example from degradation of chlorinated compounds?

Q11: What are the "rates of transformation for biological and non-biological"?

Q12: How will the Army (a) define and (b) demonstrate a "clear and meaningful trend"?

Q13: For bioremediation, has there been a bench-scale study of the soil column and groundwater that indicate there the necessary indigenous microcosms are present? Will this be conducted prior to the pilot study and/or other phases?

Q14: Will the groundwater be returned its original beneficial use? Please describe in detail.

Q15: Could the presence of PFAS impact the success (or not) of MNA?

Q16: Have all the groundwater contaminant plumes and plume source areas been tested for PFAS?

Q17: What are the remediation goals for PFAS at and near Badger?

Q18: Will the proposed bioremediation/MNA remedy effectively treat PFAS?

Q19: What is the toxicity profile of this process (MNA/bioremediation)? How will the goal to reduce and not induce toxicity be accomplished?

Q20: Could sulfates interfere with biodegradation of TCE and other co-located contaminants?

Q21: What is the Army's backup contingency plan if the remedy is not moving us closer to the remedial goals?

Q22: What is the rate of transformation for each contaminant in all media?

Q23: Will the most protective remediation goals for all media (such as 10^{-6} cancer risk) be required and applied everywhere as consistent with recommendations and/or requests from the Wisconsin Department of Natural Resources?

On November 24, 2024, the U.S. Army Environmental Command informed the Wisconsin Department of Natural Resources (WDNR) that it will NOT comply with the State's enforceable groundwater standards for certain cancer-causing chemicals that have migrated to groundwater. For decades, contamination from Badger has been moving offsite and now poses a threat to as many as 300 residential drinking water wells in rural Sauk County.

As CSWAB has testified many times before, we object to the Army's blatant non-compliance with Applicable or Relevant and Appropriate Requirements (ARARs) identified by the State, most notably Wisconsin's groundwater protection rules and laws.

To date, the WDNR has submitted at least three formal requests for compliance with groundwater standards to the Army – letters were issued in June and October of 2023 and again in October 2024. As a responsible party, the Army is arguing that while promulgated state law requires a more protective 1×10^{-6} cancer risk threshold for ALL groundwater, the Army is demanding that the State accept a level of cleanup that is 100 times LESS protective of human health (1×10^{-4}) for the Badger land aquifers.

The Army's refusal to comply with Wisconsin's groundwater standards means that a number of toxic and cancer-causing chemicals found in our community will not be targeted as Chemicals of Concern (COCs) in the Army's final cleanup plan for the four groundwater contaminant plumes emanating from Badger. Ownership of the Badger lands has been transferred from the Army to the WDNR, U.S. Department of Agriculture, Ho-Chunk Nation and Town of Sumpter however the Army maintains that it remains fully responsible for cleanup and restoration.

If granted, the extreme precedent-setting exceptions sought by the Army will have significant ramifications for the health of Wisconsin's groundwater and other natural systems. For example, as proposed the Army will fail to address certain contaminants of concern identified by WDNR in groundwater including 1,2-dichloroethane, bromodichloromethane, naphthalene, benzene, and the explosive 2,6-dinitrotoluene – all of which are known or suspected human carcinogens.

Now entrenched as an uncooperative responsible party, the Army is digging in its heels. "Since (cancer risk) is the only comment received from WDNR on the Proposed Plan, the proposed (groundwater cleanup) plan therefore will be considered final and we will move to public comment," the Army's November 25, 2024 letter to WDNR declares.

If the U.S. Army at Badger successfully mows over the State and is not required to comply with promulgated state law, the action will set a far-reaching negative precedent compromising the cleanup of cancer-causing chemicals in host communities where **PFAS** is an insidious contaminant of concern.

PFAS chemicals are used in munitions production and have been detected in groundwater at Badger Army Ammunition Plant and military bases throughout Wisconsin, including:

- General Mitchell Air Reserve Station (BRAC) (Milwaukee, WI)
- General Mitchell State Air National Guard Base (Milwaukee, WI)
- Madison Army Aviation Support Facility #2 (Madison, WI)

- Truax Field State Air National Guard Base (Madison, WI)
- S. Army Garrison Fort McCoy (Sparta, WI)
- Volk Field State Air National Guard Base (Camp Douglas, WI)
- West Bend Army Aviation Support Facility #1 / Armory (West Bend, WI)

While Wisconsin groundwater standards for PFAS chemicals are pending, the WDNR is authorized to use Health Advisory Levels currently set by the Wisconsin Division of Health as site-specific cleanup goals in selecting the type and duration of an [NR 140](#) groundwater remedy.

The requirements for compliance with ARARs apply to both NPL and non-NPL federal facility CERCLA cleanups including Badger. State promulgated laws concerning removal and remedial actions apply to federal facility response actions if the State law is more stringent than federal law and is applied equally to federal facilities and private entities.

Like all responsible parties, federal agencies – including the Department of Defense – are required to meet the ARARs for an environmental remedy to be complete. Accordingly, the Wisconsin Department of Natural Resources has identified ARARs early in the process and revisited them often throughout the decades-long CERCLA process, notably through countless in-person meetings, consultations, email communications, formal written comments, public meetings, and participation in both the Badger Reuse Planning Process and the Badger Restoration Advisory Board.

If agreement is not reached, States have a number of tools that they can use to work towards consensus. For example, if a State does not agree with the Record of Decision (ROD) or the ROD does not include necessary State ARARs, the State may issue a non-concurrence letter, which is required to be included in the Proposed Plan (PP) and the administrative record for the federal facility. The State may also initiate dispute resolution under their cooperative agreement, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), a Memorandum of Agreement (MOA), Federal Facility Agreement (FFA) or another governing document. For issues related to compliance with State laws that would not interfere with the CERCLA remedy, the State may initiate an enforcement action for compliance with its laws. Finally, for property being transferred out of federal ownership, a State may withhold approval of the property transfer when the federal agency has not addressed site contamination issues identified by the State.

Through its refusal to comply, the military openly hopes and intends to shift its responsibility to restore groundwater to its original beneficial use from the Department of Defense to the State of Wisconsin and its citizens.

Q24: What State ARARs have been identified by the WDNR? Please identify, quantify and explain.

Q25: What State ARARs are incorporated into the Proposed Plan for Site-wide Groundwater at and near the Former Badger Army Ammunition Plant? Please identify, quantify and explain.

Q26: What State ARARs are NOT incorporated into the Proposed Plan for Site-wide Groundwater at and near the Former Badger Army Ammunition Plant? Please identify, quantify and explain.

Q27: What are the potential environmental and public health implications, outcomes and risks for NOT incorporating all requested State ARARs in the proposed remedy? Please identify, quantify and explain.

Q28: Please identify, quantify and explain any communications with U.S. EPA regarding the proposed remedy for groundwater at and near Badger.

Following is a summary of correspondence between WDNR and the Army regarding the Proposed Plan for Site-Wide Groundwater at the former Badger Army Ammunition Plant (DNR BRRTS #02-57-001002).

- 2/9/2023: Army submits a Draft Proposed Plan for Site-Wide Groundwater
- 6/2/2023: DNR provides comments on Draft Proposed Plan for Site-Wide Groundwater
- 8/8/2023: Army responds to DNR's comments and submits a Revised Draft Proposed Plan for Site-Wide Groundwater
- 10/19/2023: DNR provides comments on Revised Draft Proposed Plan for Site-Wide Groundwater

- 11/15/2023: Army responds to WDNR's comments on Revised Draft Proposed Plan for Site-Wide Groundwater
- 3/12/2024: Army and WDNR have a Microsoft Teams meeting to discuss the Army's 11/15/2023 letter, DNR's 10/19/2023 letter, and the applicability of state standards
- 7/16/2024: Army submits a Revised Draft Proposed Plan for Site-Wide Groundwater
- 7/17/2024: WDNR requests written response from Army on how they have engaged with Ho-Chunk Nation to-date, particularly pertaining to the Nitrocellulose Production Area Plume
- 10/17/2024: WDNR provides comments on Revised Draft Proposed Plan for Site-Wide Groundwater
- 11/6/2024: Army responds to DNR's 7/16/2024 letter regarding engagement with Ho-Chunk Nation
- 11/25/2024: Army responds to DNR's comments on Revised Draft Proposed Plan for Site-Wide Groundwater
- 12/11/2024: Army submits Revised Draft Proposed Plan for Site-Wide Groundwater for public comment

Copies of correspondence are available on BRRTS using the following link:

<https://apps.dnr.wi.gov/botw/GetActivityDetail.do?dsn=35660&siteId=1570800&crumb=1>

Moreover, while the Draft Proposed Plan identifies the Army's preferred remedial alternative to address contaminated groundwater in the Central, Deterrent Burning Ground, and Propellant Burning Ground Plumes, **NO** remedial alternatives were evaluated for the Nitrocellulose Production Area Plume and **NO** remedial action is proposed to be taken. In the Draft Proposed Plan, the Army stated that, based on its Human Health Risk Assessment, the Nitrocellulose Plume "does not pose a hypothetical future risk to groundwater usage by humans."

On July 17, 2024 the WDNR issued a formal letter stating that it **does not concur** with the Army's determination and in June and October 2023 provided comments on the Draft Proposed Plan requesting that the Army evaluate remedial alternatives to address groundwater contamination in the Nitrocellulose Plume.

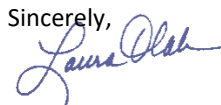
In a November 2023 response to WDNR's comments on the Draft Proposed Plan, the Army indicated that it would update the Draft Proposed Plan to include an evaluation of remedial alternatives and remedy selection for the Nitrocellulose Plume. Subsequently, the Army in March 2024 indicated to the WDNR that it does **NOT** intend to conduct this evaluation.

The Nitrocellulose Plume is located on land held in trust for the Ho-Chunk Nation and the groundwater plume may be migrating on to land owned by WDNR. The Army is addressing this site under CERCLA and is responsible for complying with any applicable requirements or policies regarding tribal consultation and environmental justice.

Consequently, the Army's intent seems apparent as when the more protective 10^{-6} risk factor is applied to the Nitrocellulose Production Area Plume, the WDNR has affirmed that the results of the risk assessment may suggest that a review for potential action or additional evaluation should be completed.

For all these reasons, CSWAB strongly supports the comments and recommendations from the WDNR and urges the Army to immediately and fully comply.

Sincerely,



Laura Olah, Citizens for Safe Water Around Badger (CSWAB)
Member, Badger Army Ammunition Plant Restoration Advisory Board

Attached as a separate PDF file:

CSWAB Public Comments Site-wide Groundwater Remedy Non-Concurrence ATTACHMENTS Binder Feb 2025