

# CSWAB

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Citizens for Safe Water Around Badger  
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3911 Fish Hatchery Road  
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## VIA ELECTRONIC MAIL AND U.S. MAIL

November 7, 2007

Dear Mr. Ales,

In accordance with Chapter NR 160 (Wisconsin Groundwater Protection Standards), CSWAB hereby petitions the Wisconsin Department of Natural Resources (WDNR) to establish Interim Health Advisory Levels for *p*-nitrotoluene, *m*-nitrotoluene, *o*-nitrotoluene, 2-amino-4,6-dinitrotoluene, and nitrobenzene.

**Regulatory authority.** The WDNR is the lead agency for the cleanup and remediation of the Badger Army Ammunition Plant which is the source of these environmental contaminants.

**Lack of federal or state regulations.** It is our understanding that there are no federal drinking water standards or Wisconsin groundwater or drinking water standards for these contaminants.

**Confirmed presence in state waters.** Recent testing by the U.S. Army at Badger has detected these contaminants in groundwater near and downgradient from the Propellant Burning Grounds (a hazardous waste disposal site) including groundwater monitoring wells at the southern plant boundary.<sup>1</sup> Samples were collected from onsite groundwater monitoring wells in September of this year. A summary table of these results is enclosed.

With the exception of nitrobenzene, these are new contaminants of concern as they have not and are not included in the WDNR-required regime for groundwater monitoring at Badger. The recent "special event" testing was conducted in response to concerns raised by CSWAB.<sup>2</sup>

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<sup>1</sup> H. Kuehling, Division of Air and Waste Remediation and Redevelopment, Wisconsin Department of Natural Resources, teleconference call with Laura Olah, Citizens for Safe Water Around Badger, November 6, 2007.

<sup>2</sup> J. Kenney, U.S. Army, Badger Army Ammunition Plant, Badger Restoration Advisory Board meeting, September 24, 2007.

According to the WDNR's Groundwater & Environmental Monitoring System (GEMS) database, *p*-nitrotoluene, *m*-nitrotoluene, *o*-nitrotoluene, and 2-amino-4,6-dinitrotoluene are also not included in required current or historical testing protocols for residential drinking water wells near Badger.

CSWAB is currently working with the WDNR, Wisconsin Division of Public Health, and U.S. Army to assure that these additional parameters are included in private well testing scheduled to begin later this month.

**Confirmed long-term presence of “parent products” in state waters.** Four (4) compounds – *p*-nitrotoluene, *m*-nitrotoluene, *o*-nitrotoluene, and nitrobenzene – have been identified by the Wisconsin Division of Public Health as potential degradation compounds of Dinitrotoluene (DNT).<sup>3</sup> 2-amino-4,6-dinitrotoluene is a primary reduction product of 2,4,6-trinitrotoluene (TNT).<sup>4</sup> The Propellant Burning Grounds is a known profound source of DNT contamination in subsurface soils. Historical testing of subsurface soils at the site also detected TNT.

The presence of DNTs in offsite groundwater has been well established through many years of environmental monitoring conducted by the Army. All six (6) isomers of DNT have been detected in groundwater both inside and far beyond the plant boundaries to the Wisconsin River.

DNTs were first detected in private drinking water wells in 2002 and have been confirmed utilizing improved analysis techniques. Low levels of DNT continue to be detected in private drinking water wells as far away as the Dam Heights neighborhood in the rural township of Prairie du Sac. Two residential wells, which have been replaced by the U.S. Army at Badger, had DNT concentrations exceeding state standards.

**Detected levels exceed guidelines for drinking water.** While there are no federal or state drinking water standards, detected levels of *o*-nitrotoluene exceed comparable drinking water quality guidelines cited by the Wisconsin Division of Public Health (WDPH).<sup>5</sup> Concentrations of *o*-nitrotoluene in groundwater at the southern plant boundary were reported as high as 0.54 ug/l (micrograms per liter), exceeding the EPA Region 9 Preliminary Remediation Goal for Drinking Water of 0.29 ug/l.

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<sup>3</sup> U.S. Department of Health and Human Services Public Health Service Agency for Toxic Substances and Disease Registry, Division of Health Assessment and Consultation Atlanta, Georgia, Health Consultation, DINITROTOLUENE IN PRIVATE WELLS BADGER ARMY AMMUNITION PLANT BARABOO, SAUK COUNTY, WISCONSIN EPA FACILITY ID: WI9210020054, Table 2: Health-Based Comparison Values for Dinitrotoluene Isomers and Potential Degradation Products, Revised January 2007.

<sup>4</sup> USACHPPM Health Effects Research Program, Environmental Risk Assessment Program, Wildlife Toxicity Assessment for 2-Amino-4,6-Dinitrotoluene and 4-Amino-2,6-Dinitrotoluene, Draft Report, August 10, 2001. Webpage address: <http://chppm-www.apgea.army.mil/erawg/tox/wta24aug01.pdf>

<sup>5</sup> U.S. Department of Health and Human Services Public Health Service Agency for Toxic Substances and Disease Registry, Division of Health Assessment and Consultation Atlanta, Georgia, Health Consultation, DINITROTOLUENE IN PRIVATE WELLS BADGER ARMY AMMUNITION PLANT BARABOO, SAUK COUNTY, WISCONSIN EPA FACILITY ID: WI9210020054, Table 2: Health-Based Comparison Values for Dinitrotoluene Isomers and Potential Degradation Products, Revised January 2007.

The *o*- isomer of nitrotoluene yielded clear evidence of carcinogenic activity in recent animal studies, producing skin and mammary gland neoplasms in male and female rats and hemangiosarcomas and large intestine carcinomas in male and female mice.<sup>6</sup> The *p*- isomer of nitrotoluene yielded some evidence of carcinogenic activity in female rats (clitoral gland neoplasms) and equivocal evidence of carcinogenic activity in male rats and male mice.<sup>7</sup>

Nitrobenzene and *m*-nitrotoluene are absorbed through contact with skin and can cause methemoglobinemia.<sup>8,9</sup>

**Additive risks associated with multiple contaminants.** It follows that given the confirmed long-term presence of DNT in groundwater outside Badger that degradation products of DNT such as nitrotoluenes could also be present offsite and could therefore present a public health risk.

The presence of additional contaminants such as nitrotoluenes could result in excessive human health risk when combined with risks associated with exposure to DNTs that have contaminated residential well water.

**Preliminary Remediation Goals cited by the WDPH serve as a reference value but do not suffice as health advisory levels for well water.** In addition to other considerations, Preliminary Remediation Goals focus on common exposure pathways and may not consider all exposure pathways encountered at CERCLA/RCRA sites.<sup>10</sup>

**Groundwater is the sole source of drinking water for area residents.** Rural neighbors of Badger Army Ammunition Plant rely on groundwater for their drinking water.

Interim Health Advisory Levels for *p*-nitrotoluene, *m*-nitrotoluene, *o*-nitrotoluene, 2-amino-4,6-dinitrotoluene, and nitrobenzene will provide important health-based information about water quality in our community. This is especially true for unborn children and infants – the population at greatest risk for harm if exposed to even low levels of environmental toxins.

Interim Health Advisory Levels will also be critical in developing and improving environmental monitoring/remedial designs and site closures at Badger, including major hazardous waste sites such as the Propellant and Deterrent Burning Grounds.

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<sup>6</sup> Mary S. Wolfe, *NTP announces bioassay results*, Environmental Health Perspectives, NIEHS News, August, 2001.

<sup>7</sup> Mary S. Wolfe, *NTP announces bioassay results*, Environmental Health Perspectives, NIEHS News, August, 2001.

<sup>8</sup> NIOSH [1977]. Occupational diseases, a guide to their recognition, revised ed., 235-238, 280-281, U.S. Department of Health, Education, and Welfare, DHEW (NIOSH) Publication No. 77-157-C.

<sup>9</sup> NIOSH [1981]. NIOSH/OSHA Occupational Health Guidelines for Chemical Hazards, Nitrobenzene-, Nitrochlorobenzene and Nitrotoluene, U.S. Department of Health and Human Services, Publ. (NIOSH) 81-123.

<sup>10</sup> UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION IX, Stanford J. Smucker, Ph.D., Regional Toxicologist (SFD-8-B), Memorandum, Region 9 PRGs Table 2002 Update, October 1, 2002. Webpage address: <http://www.waste.ky.gov/NR/rdonlyres/F9AA38F4-D69E-42B4-9D0D-E45AE04CBDBB/0/Region9PRGs.pdf>

For all these reasons, your prompt attention to this matter is required and appreciated.

Sincerely,

*SIGNATURE ON ORIGINAL*

Laura Olah  
Executive Director

ENCLOSURES:

- WDPH Health Consultation, Table 2, revised January 2007.
- SpecPro, Groundwater “All Hits” Table, BAAP, September 2007.

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