



February 7, 2013

Ms. Joan Kenney - Commander's Representative  
Badger Army Ammunition Plant  
S7560 Highway 12  
North Freedom, WI 53951

**Subject:** Preliminary Determination of Feasibility for an Alternative Remedial Strategy for Soil of Final Creek, the Settling Ponds, and the Spoils Disposal Areas of the Badger Army Ammunition Plant

Dear Ms. Kenney:

The Department of Natural Resources (the Department) has reviewed the Army's request to modify the remedial goals and the preferred clean-up strategy for Final Creek, the Settling Ponds, and the Spoils Disposal Areas that were approved by the Department on June 1, 1995. The request for these modifications is included in "Alternative Feasibility Study, Final Creek, Settling Ponds, and Spoils Disposal Areas, Badger Army Ammunition Plant" (herein called the AltFS), received by the Department on October 5, 2012.

With this letter, the Department is notifying you that we have made a preliminary determination in the document attached to this letter. Your recommended alternative, alternative 3 of the AltFS, is feasible. Components of alternative 3 include:

- remediation goals that are intended to revise and amend those that were approved by the Department in the June 1, 1995 approval document;
- the remedial action of soil excavation of areas where contamination is found to be above remediation goals and disposal of the impacted soil in the on-site construction and demolition waste landfill; the characterization of the soil prior to removal as hazardous or non-hazardous; and the proper disposal of all soil characterized as hazardous at an appropriate site.

The proposed revised remediation goals are related to anticipated land use of these areas. The use of Final Creek and Settling Pond 1 by Bluffview Sanitary District is conservatively assumed to be similar to industrial settings when comparing days of exposure and ingestion rates to those in s. NR 720.19, Wis. Adm. Code. For the other three settling ponds and all five spoils disposal areas, the Department agrees with the Army's assumptions about the maximum number of days of exposure and rates of ingestion for a recreator on the property, considering that these areas will be used as part of the Sauk Prairie Recreation Area.

Soil excavation was already implemented by the Army beginning in 2009 and was concluded in 2012, based on the Army's use of the proposed remediation goals to determine the extent of the excavation. Although proposing a remedial action that is considered by the Army to be complete may seem unusual, the Department's administrative code that pertains to contaminated soil is intended to be "self-implementing", without any required reporting to the Department or Department approval necessary prior to or during implementation. The eventual necessary compliance with Department requirements of the remedial action will be evaluated on the basis of remaining risk to humans by direct contact with the remaining soil and to the food chain and terrestrial ecosystems.

The attached preliminary determination includes the Department's determination on the proposed remedy, background information on investigation and regulatory actions related to the areas, and the Department's response to the proposed remedy's components.

The Department will accept comments on the proposed remedy during a public comment period between February 7, 2013 and March 11, 2013. A public informational open house will be held on February 20, 2013 at the River Arts Center Galley, 105 9<sup>th</sup> Street, Prairie du Sac, from 5:00 to 7:00 p.m. The Department will accept only written comments, by letter or e-mail, during the comment period. After the public comment period has ended, the Department will respond to comments received and make its final determination. Please refer to the attached preliminary determination for more information.

Please contact me if you have any questions regarding this letter, either at the address listed above or as indicated below.

Respectfully,



Linda Hanefeld  
Remediation & Redevelopment Program South Central Region Supervisor  
Wisconsin Department of Natural Resources  
3911 Fish Hatchery Road  
Fitchburg, WI 53711  
Ph. 608-275-3310  
linda.hanefeld@wisconsin.gov

c: Mike Sitton – U.S. Army, S7560 Highway 12, North Freedom, WI 53951  
Claire Ruenger – SpecPro, Inc., S7560 Highway 12, North Freedom, WI 53951  
Laura Olah – CSWAB, E12629 Weigands Bay South, Merrimac, WI 53561  
Gregory Rudloff – USEPA Region 5, 77 W. Jackson Blvd., Chicago, IL 60604  
Mark Giesfeldt – WDNR Remediation and Redevelopment Bureau Director  
Will Myers – WDNR Project Manager, SCR Fitchburg  
Hank Kuehling – WDNR LTE Hydrogeologist, SCR Fitchburg

PRELIMINARY DETERMINATION OF FEASIBILITY  
FOR AN ALTERNATIVE REMEDY FOR  
FINAL CREEK, THE SETTLING PONDS, AND THE SPOILS DISPOSAL AREAS  
AT THE BADGER ARMY AMMUNITION PLANT

The Department of Natural Resources (Department) has made a preliminary determination to approve a modification to the clean-up strategy for Final Creek, Settling Ponds, and Spoils Disposal Areas soil contamination (herein referred to collectively as “the Areas”) at the Badger Army Ammunition Plant (BAAP). The request to modify the clean-up strategy (herein called the Alt FS) is included in the “Alternative Feasibility Study, Final Creek, Settling Ponds, and Spoils Disposal Areas, Badger Army Ammunition Plant” report and plan, dated October 4, 2012, prepared by Badger Technical Services, LLC, and submitted by the U.S. Department of the Army.

The Army considered three alternative remedial strategies and has proposed alternative 3 as its chosen remedy, as described in the Alt FS. The Department’s determination is that the Army’s proposed remedy is feasible. The proposal includes:

- remediation goals that are intended to revise and amend those that were approved by the Department in a June 1, 1995 approval document;
- the remedial action of soil excavation of areas where contamination is found to be above remediation goals and disposal of the impacted soil in the on-site construction and demolition waste landfill; the characterization of the soil prior to removal as hazardous or non-hazardous; and the proper disposal of all soil characterized as hazardous at an appropriate site.

The Army states in the Alt FS that the excavation and disposal work of the proposed remedy was begun by the Army in 2009 and was completed in 2012. Prior to the Alt FS and prior to implementation of this remedy, the Army had not requested Department review or approval of this action and none was given. Note that the Department has reviewed the Alt FS without consideration of the Army’s preferred alternative having already been implemented.

The Department concludes that the components of the selected soil remedial strategy for the Areas are acceptable. A discussion of this determination is included in the Department Response section below.

**Public Comment Period and Informational Open House**

The Department is inviting the public to comment on this preliminary determination and on the proposed remedy for contaminated soil of the subject areas. The Department will accept comments on the proposed remedy during a 33 day public comment period between February 7, 2013 and March 11, 2013. The Department will accept only written comments, by letter or e-mail, during the comment period.

Copies of the October 4, 2012, “Alternative Feasibility Study – Final Creek, Settling Ponds, and Spoils Disposal Areas, Badger Army Ammunition Plant” are available at:

Sauk City Public Library, 515 Water Street  
Ruth Culver/Prairie du Sac Public Library, 540 Water Street  
Badger Army Ammunition Plant, 2 Badger Road, Baraboo  
WDNR, 3911 Fish Hatchery Road, Fitchburg

To provide information on the Department’s alternative feasibility study review and approval process and on the proposed soil remedial action as proposed by the Army, the Department will jointly host, with the Army, a public informational open house on February 20, 2013 from 5:00 until 7:00 p.m. at the River

Arts Center Gallery, 105 9<sup>th</sup> Street, Prairie du Sac. Representatives of the Department, the Army and its contractor Badger Technical Services, and Department of Health Services will be available to respond to attendees' questions and comments.

After the public comment period has ended, the Department will respond to comments received and will issue its final determination.

### **Background Information**

Previous investigations and other source-area-related activities associated with the subject Areas were considered in making this determination. These activities are described below.

- In 1984, a near-surface soil investigation was performed in BAAP areas, including the area of the Settling Ponds. Di-n-butyl phthalate, dinitrotoluene (DNT), and various metals were detected in the soil of the Settling Ponds area.
- In 2001, a field sampling report was completed for the settling ponds and spoils disposal areas, based on extensive soil sampling and analysis performed in 1997 and 2000.
- Site-specific soil residual contaminant levels (RCLs) were developed for the subject areas in 2002 to protect human health from direct contact exposure and also to protect the groundwater contamination pathway. Adoption of these proposed RCLs was not completed.
- In 2005, microcosm and soil column studies were completed to determine if microorganisms in the area soils were capable of degrading 2,4-DNT and 2,6-DNT in the surface and subsurface soil and to evaluate the rate and extent of this natural attenuation of these DNT isomers. The results were that 2,4-DNT and, to a lesser extent, 2,6-DNT were biodegraded in the soil columns.
- A draft Baseline Ecological Risk Assessment (BERA) was submitted to the Department in June 2008 to address the ch. NR 720, Wisconsin Administrative Code, requirements to evaluate the potential of the contaminated soil of the area to concentrate through plant uptake and adversely affect the food chain and to consider potential impacts to the terrestrial ecosystems of the Areas. The Army revised the BERA after receiving comments from the Department and the United States Environmental Protection Agency (USEPA) and submitted the final report in October 2009. A USEPA ecologist concluded that the scientific approach of the assessment is reasonable and that the risk conclusions are acceptable. The Department reviewers requested additional information and field work. The Army responded that the more recent emphasis on contaminated soil removal negated the need to continue the BERA effort. (See the "Discussion" section below for more information.)
- The Army submitted to the Department, in November 2009, a draft revised remediation goals proposal for Final Creek, the Settling Ponds, and the Spoils Disposal Areas. Considering statewide consistency and compliance with the NR700-series administrative codes, the Department responded, in August 2010, that it had no objection to the draft proposed remediation goals. (See the Department Response section below for more information.)

### **Department Response**

The components of the proposed remedial action, listed in the introductory section above are discussed in more detail in this section.

### **Revised Remediation Goals**

The evaluation of compliance with Department remedial action requirements of the proposal will involve comparing investigative and confirmation soil sample analytical results with remediation goals approved for BAAP. The Department stated, in an August 11, 2010 letter, that it had no objections to draft remediation goals that had been proposed by the Army in a letter to the Department dated November 16, 2009. The Army proposed remediation goals for the Areas in the Alt FS that are the same as or similar to

those that were proposed for some contaminants of concern (COCs) in 2009 and accepted by the Department in 2010.

In the Alt FS, the Army also removes from consideration some of the contaminants of concern that were listed in the Department's June 1, 1995 plan modification approval document. Reasons for removal include: no exceedances of current clean-up objectives occurred in soil analytical results [as was the case for aluminum, tin, zinc, diphenylamine (DPA), diethylphthalate (DEP)]; or a contaminant does not occur in the soil above a remediation goal with enough frequency to be considered a COC (arsenic and total carcinogenic polyaromatic hydrocarbons). (See Table 4 of the Alt FS.)

To determine site-specific soil RCLs, the Army considered several factors, one being future land use. Parcels T and T1 contain Final Creek and Settling Pond 1 as well as the wastewater treatment facility and the IRM and MIRM groundwater treatment systems. These parcels have been transferred to the Bluffview Sanitary District. The Army assumes that current and future uses of these parcels will be similar to industrial use when considering the rate of exposure to contaminated soil. Parcel M1 contains Settling Ponds 2, 3, and that part of Settling Pond 4 northwest of the recently reconstructed STH 78 (not mentioned in the Alt FS). This parcel will eventually be transferred to the WDNR for use as a recreation area, with an associated exposure rate that will be significantly less than that of an industrial setting.

Soil remediation goals for two COCs, 2,4-dinitrotoluene (2,4-DNT) and the 2,4/2,6-DNT mixture, were calculated using an USEPA calculator and assumptions about risk; specifically, days of exposure and rates of ingestion. The Army assumes that there is little reason for a worker of the Bluffview Sanitary District to enter onto Final Creek or Settling Pond 1 but assumes that a conservative estimate of exposure would be one-third of the assumed days of exposure in ch. NR 720, Wis. Adm. Code, of 250 days for an industrial land use; i.e., 83 days. The future use of Parcel M1, which includes the other three settling ponds noted above and the five spoils disposal areas, is intended to be recreational, as part of a State-owned recreation area. When using the USEPA calculator, the USEPA allows the use of a nationwide default number of 75 days of use (exposure) annually for a recreator. The Army assumes that a more accurate number of exposure days is 55 days, considering the number of days per year that the soil is snow-covered and frozen (up to four months each year) at the facility. Similarly, the Army proposes to reduce the USEPA default soil ingestion factor because of limited hours of exposure that a recreator would experience.

#### Remedial Action - Soil Excavation

Excavation of contaminated soil and disposal in a licensed landfill is a common and accepted remedial action at Badger Army Ammunition Plant (BAAP) as well as throughout Wisconsin and can reasonably be assumed to be effective in bringing the soil of the Areas into compliance with Wisconsin Administrative Code. Proposed soil characterization to determine whether or not it should be considered hazardous or non-hazardous is acceptable and necessary.

#### The BERA

The underlying basis for the BERA was the assumption that, if its conclusions were that the food chain was not impacted in the subject areas and that the terrestrial ecosystem was not impacted by the contaminated soil in the areas, no further action would be needed. However, the Army decided that it needed additional soil for daily cover at the facility's construction and demolition waste landfill and that the nonhazardous contaminated soil of the subject Areas would be usable as the necessary cover material. As a result, reliance on the conclusions of the BERA has been de-emphasized by the Army and the emphasis placed on the remedial action of contaminated soil source removal.

**Institutional controls**

Institutional controls will be implemented for the source areas and other portions of the site, as needed. These institutional controls include listing of sites on the Department's GIS Registry for Soil and Groundwater Contamination as well as placing restrictions on land use included on the property deeds. For the Soil Registry, the Army must determine the boundaries of the residual contamination, using Global Positioning System (GPS) coordinates. Restrictions on future property uses will likely be required by the Army, and will be included on the quitclaim deeds for the former BAAP parcels. Responsibility for any continuing obligations will also be addressed, in accordance with ss. 292.12, Wis. Stats.

Comments regarding the Alt FS and selected remedy can be sent by letter or e-mail to:

Will (Woody) Myers  
Wisconsin Department of Natural Resources  
3911 Fish Hatchery Road  
Fitchburg, WI 53711  
(608) 273-5613  
will.myers@wisconsin.gov