FACTSheet

Former Nebraska Ordnance Plant ▪ Mead, Nebraska

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Chemical Warfare Materiel (CWM) - Mustard Agent

History of the CWM Investigation

The US Army has been aware of Chemical Warfare Materiel (CWM) at the Former Nebraska Ordnance Plant (NOP) since 1989, as reported in a 1991 Preliminary Assessment of Ordnance Contamination. Information was also reported in a 1993 Supplementary Archives Search Report. Site visits and interviews in 1994 and 1995 resulted in a 1996 Engineering Evaluation/Cost Analysis (EE/CA). In 2001-2002, U.S. Army Corps of Engineers (USACE) conducted an Ordnance and Explosives (OE) Recurring Review to assess the protectiveness of previous OE response action items at the Former NOP.

The 1996 EE/CA recommended "no further action" for the following reasons:

- Uncertainty over a specific burial location
- Any potential burial location would now be at a depth of more than 20 feet due to additional waste being put in the landfill and placement of a final cover
- No presence of the mustard agent breakdown product thiodiglycol in groundwater near the landfill
- Intrusive investigations into landfills are inadvisable and not typically productive due to the presence of other waste material.

Mustard Agent

The CWM suspected to be buried at the Former NOP is a type of Chemical Agent Identification Set (CAIS). A CAIS is used to train military personnel in the identification and handling of CWM. CAIS came in several configurations:

The most common were the K941 Toxic Gas Set which consisted of a steel cylinder with four sheet metal cans, each can containing four bottles of 3 ½ ounces of mustard agent totaling 84 ounces of mustard agent.

The other most common CAIS is the K951/2, consisting of a steel cylinder with four sheet metal cans. Each can held 12 each 40 ml Pyrex vials containing a highly diluted solution of chemical agent.

See other side

Typical CAIS Vial

Typical CAIS Storage Cylinders

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Chemistry of Mustard Agent

Mustard agent has low volatility and does not readily dissolve in water, so its chance of migration through groundwater or air from a buried location is low. Mustard agent is only hazardous through direct contact to skin or inhalation of aerosol. Its primary breakdown product, thiodiglycol, is described as non-toxic (Material Safety Data Sheet). If mustard agent were present in the landfill, exposure to humans under current or reasonable conditions in the future would be remote.

Series of Events for Suspected Burial

In 1960, a number of CAIS cylinders (described as 2 to 4 each) were discovered leaking at Offutt Air Force Base in Omaha, Nebraska. Base Disaster Control personnel responded to the incident and verified the leaking substance was mustard agent. Base personnel also stated that there were five or six cans, which is consistent with a CAIS description. These cylinders (between 2 and 4) were wrapped in plastic and placed in sealed 55-gallon drums to prevent further leaking. The barrels may have temporarily been buried at Offutt before being transported for reburial to an unspecified site, possibly the Nebraska Ordnance Plant. Offutt personnel, when interviewed and shown pictures, confirmed they dealt with CAIS items during the incident.

Also in 1960, former NOP employees were present when military personnel arrived at the landfill area with leaking cylinders of purported mustard agent. The description of the barrels seems to match that reported in the Offutt incident.

In 1994, the Army interviewed Former NOP and University of Nebraska (current landowner) employees involved in the incident and identified a general area in the vicinity of the landfill where the burial may have occurred.

Mustard Agent Response Actions

In 1994 the Army paid the landowner to install a barbed wire fence with warning signs around the suspected burial site.

From 1994 to 2000, the Army monitored groundwater near the suspected burial site for thiodiglycol, a mustard agent break-down product.

Thiodiglycol was deemed the best indicator of the presence of mustard agent and was not detected in any of the groundwater samples collected.

The absence of thiodiglycol does not rule out the presence of mustard agent, however its detection could trigger additional investigations.

Ordnance & Explosives Recurring Review

USACE reviews the project and site history every five years, examining any new information available, such as changes in land use, new physical conditions, or site access issues. For this review, USACE conducts interviews with community members, local leaders, and regulatory agencies to identify their concerns. The previous OE Recurring Review, conducted in 2002, concluded that previous response actions and other measures in place were still protective. The 2007 OE Recurring Review will be completed later this year.

USACE CWM Path Forward

Due to the levels of uncertainty and community concern, USACE will resume groundwater sampling in the vicinity of the landfill to monitor mustard agent breakdown products, including, but not limited to thiodiglycol. In addition, USACE will evaluate the feasibility of non-intrusive detection methods such as ground penetrating radar or magnetometers to detect the presence of anomalies that could be attributed to the mustard agent burial. USACE plans to merge the OE and CWM aspects of the site into the ongoing Former NOP Comprehensive Environmental Compensation and Liability Act (CERCLA) process. This will provide additional consideration of OE and CWM in actions being addressed in a final Record of Decision.