



## Proposal to Treat and Discharge VX Nerve Agent into the Delaware River

### Current Proposal

The U.S. Army is proposing to pre-treat stockpiles of VX nerve agent at its Newport Chemical Agent Disposal Facility in Newport Indiana, and then transport the resulting hydrolysate across the country to the Dupont Chambers Works facility at Carney's Point, Salem County, NJ for final treatment and disposal into the Delaware River.

### History

The Chemical Weapons Convention, in force as of April 29, 1997, requires destruction of chemical weapons by the year 2007. The US stopped production and shipment of chemical agent and weapons in the late 1960's. For nearly 40 years chemical weapons have been stored at the Newport Chemical Depot. Originally the Army agreed with its Indiana Citizens' Advisory Commission and planned to destroy and dispose of the VX nerve agent stored at the Depot on site, at the Newport Chemical Agent Disposal Facility. Following the attacks of September 11, 2001 the Army changed its mind, and decided to partially treat the nerve agent on site, turning it from VX nerve agent to VX hydrolysate, and then transport it to an alternative facility for final treatment and disposal.

The Newport Indiana community has repeatedly voiced its preference that the VX nerve agent be treated, destroyed and disposed of on site in Newport as originally agreed to by the Army. But the Army has, unilaterally, decided to veer from that agreed upon course of action.

First the Army proposed to ship the VX hydrolysate to a company in Ohio for further treatment and disposal. A strong public outcry against the proposal forced the Army to abandon it. By August 2003, the Army was already proposing to instead ship the VX hydrolysate to Dupont along the Delaware River although the proposal was only noticed publicly in December 2003.

### About VX and VX Hydrolysate

The Army is proposing to "neutralize" the VX nerve agent stored at the Newport, Indiana facility using a chemical neutralization process. The neutralization process results in a solution called VX hydrolysate or VXH. While VX hydrolysate is said by the Army to be much less toxic than VX, they agree that additional treatment is needed in order to meet requirements for disposal. Additional treatment is also necessary to meet the requirements of the Chemical Weapons Convention.

There are a number of concerns associated with VX hydrolysate. VXH is highly caustic and could be harmful to humans and materials. VXH has a very strong odor. It is possible that under the right conditions (if the pH were decreased below the 13 to 14 range) VX could be reformed. And the organic layer in VXH is flammable;

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therefore VXH must be kept sealed from the environment at all times. (Final Report, **Treatment of VX Hydrolysate by PermaFix of Dayton**, Report prepared for Montgomery County (OH) Commissioners by Dr. Bruce E. Rittmann, John Evans Professor of Environmental Engineering, Northwestern University)

Chemical neutralization of other chemical weapon agents such as mustard and nerve agents also produce hydrolysates. But the composition of each hydrolysate and the potentially viable treatment alternatives for each hydrolysate varies. Therefore, Dupont's history with treating mustard agents at this Chambers Works facility does not necessarily translate into a capability to handle VX hydrolysate.

The Army asserts that prior to transport the VX hydrolysate will "be analyzed and certified that it contains no detectable nerve agent before it leaves the destruction site in Indiana." (Letter from Colonel Jesse L. Barber, Department of the Army to Maya van Rossum, the Delaware Riverkeeper, January 16, 2004.) This does not mean that the VX hydrolysate will not contain any VX. The detectable limit being used by the Army is 20 ppb, therefore the Army will allow VX nerve agent to be shipped off site and to New Jersey as long as the VX in the hydrolysate is less than 20 ppb. .

According to an Ohio EPA study, VX at a level of 20 ppb after 17.4 hours killed half of the striped bass exposed. As a result of this and numerous other concerns, an agency toxicologist "strongly recommended" against discharge of treated VX hydrolysate into the local POTW and waterbody until there was "more information about the possible toxic effects of the treated hydrolysate discharge on aquatic life". (Interoffice Memo from John F. Estenik, DSW, Toxics Advisor, Subject Treated VX Hydrolysate Discharge Recommendation Technical Report, October 10, 2003, Ohio EPA)

Further, in an August 26, 2003 article in Chemical & Engineering News ("*Destroying Chemical Weapons, Army's Problem-Plagued Program More Costly than Originally Planned*", Lois R. Ember) Terry Arthur, a Newport spokeswoman said that while the Army committed not to ship VX hydrolysate off-site unless the VX levels were less than 20 ppb, it couldn't now honor such a commitment. She went on to say, "As measured, caustic neutralization produces a hydrolysate containing 40 to 80 ppb of VX."

After neutralization, the VX hydrolysate contains

- Ethylmethylphosphonic acid (EMPA),
- methylphosphonic acid (MPA),
- 2-(diisopropylamino) ethanethiol (thiolamine), and
- EA2192.

(Interoffice Memo from John F. Estenik, DSW, Toxics Advisor, Subject Treated VX Hydrolysate Discharge Recommendation Technical Report, October 10, 2003, Ohio EPA)

EMPA and MPA are "schedule 2 precursors" in the Chemical Weapons Convention, meaning they could potentially be reconverted to nerve agent. (**Using Supercritical Water Oxidation to Treat Hydrolysate from VX Neutralization**, 1998, Committee on Review and Evaluation of the Army Chemical Stockpile Disposal Program, Board on Army Science and Technology, Commission on Engineering and Technical Systems (CETS), National Research Council, National Academy Press, 1998, also found at [www.nap.edu/openbook/0309060435/html/7-10.htm](http://www.nap.edu/openbook/0309060435/html/7-10.htm))

EMPA and MPA are resistant to biological treatment. (Interoffice Memo from John F. Estenik, DSW, Toxics Advisor, Subject Treated VX Hydrolysate Discharge Recommendation Technical Report, October 10, 2003, Ohio EPA)

EA2192 is nearly as toxic as VX and is the most toxic degradation product from VX hydrolysis. (Interoffice Memo from John F. Estenik, DSW, Toxics Advisor, Subject Treated VX Hydrolysate Discharge Recommendation

Technical Report, October 10, 2003, Ohio EPA) It has a half-life 3,700 times greater than that of VX, compounding chronic impacts when discharged or released. (Groffen, "VX – Information Page")

Little is known about most VX hydrolysis degradation products – the products that result from neutralizing VX as proposed. (Interoffice Memo from John F. Estenik, DSW, Toxics Advisor, Subject Treated VX Hydrolysate Discharge Recommendation Technical Report, October 10, 2003, Ohio EPA)

There are no bioassay toxicity data for EA2192. But it is known that while EA2192 does not bioaccumulate it "retains its anticholinesterase [nerve-agent] activities and, therefore is a potential toxic threat to aquatic life". (Interoffice Memo from John F. Estenik, DSW, Toxics Advisor, Subject Treated VX Hydrolysate Discharge Recommendation Technical Report, October 10, 2003, Ohio EPA; **Final Report, Treatment of VX Hydrolysate by PermaFix of Dayton**, Report prepared for Montgomery County (OH) Commissioners by Dr. Bruce E. Rittmann, John Evans Professor of Environmental Engineering, Northwestern University.)

There do not appear to be any studies on the impacts of MPA, EMPA or EA2192 on the environment or aquatic resources. The toxicity effects of these chemical compounds needs research as all three compounds may be present in the discharge that enters the Delaware River as a result of Dupont's proposed treatment method. The fact that Dupont claims that the levels of these compounds will be non-detect does not guarantee that they will not be present below the detect limit.

To review Dupont studies on the proposal go to [www.set.dupont.com](http://www.set.dupont.com). (click on SET-U.S. Dept. of Defense Initiatives); to review the Army's Draft Revised FONSI, contact S. Gilman, Newport Stockpile Outreach Office 765-492-4445.

#### **Important Questions:**

- With regards to the proposed discharge and the environmental impacts of this proposal there are a number of important questions:
- Will the discharge contain phosphonate? At what level? What is environmental impact of this? What is the aquatic impact of this? What studies back up the assertions about impact?
- Will the discharge contain phosphate? At what level? What is environmental impact of this? What is the aquatic impact of this? What studies back up the assertions about impact?
- EA 2192 is very close to VX, and is toxic. Will this be in the discharge? What is environmental impact of this? What is the aquatic impact of this? What studies back up the assertions about impact? Can the detect limit for EA2192 be lowered? Considering its toxicity, isn't it important to monitor EA2192 to at least the same detect limit as VX?
- Will EMPA be in the discharge? What is environmental impact of this? What is the aquatic impact of this? What studies back up the assertions about impact?
- Will MPA be in the discharge? What is environmental impact of this? What is the aquatic impact of this? What studies back up the assertions about impact?
- What work has been done on fugitive emissions? What are the potential environmental and/or health impacts in terms of air pollution? Will there be toxic solids landfilled from VX hydrolysate handling at Dupont?
- What will Dupont's new or upgraded air permit allow them to emit? What are the potential environmental and/or health impacts?
- When will the truck/rail route be chosen and will all the communities along the route be consulted and will a public input process involve these communities? Will emergency preparedness plans be prepared for the communities along the route and will emergency systems, personnel, equipment, fire fighting and communication systems be supplied/funded to these communities?
- It has been stated publicly by the Army that 2 to 3 trucks per day for 2 to 3 years is the expected time needed to fully transport the proposed materials but this is not spelled out by the Army in the proposed transportation documents. When will this information be made public and will there be a public comment process on the proposal?

- Is the VX hydrolysate to be shipped finite or can stockpiles from other locations be added to the present stockpile at the Newport Indiana Facility? Are there approved systems in place in the U.S. to destroy other stockpiles of VX? How will the public know if amounts beyond the present Newport stockpile are added? Has Dupont stated that they want to continue to accept VX waste from other stockpiles?
- What is the statistical chance of an accident along this route with this number of trucks over this period of time (not just accidents caused by the trucking company, but any kind of accident)? Is there a highjack analysis done for the truck shipments? Has there been a Homeland Security analysis of the terrorism threat to these shipments and is there a plan for addressing this threat?
- Recent findings by the Army show that the VX hydrolysate at the Army's Newport Indiana facility is more caustic than previously estimated; the result has been recent leaks from the containment tanks there. How will the highly caustic nature of the waste be safely handled during transportation and stored and processed at Dupont if the Army has not successfully handled this presently?
- It has been revealed by the Army that the flammability of VX hydrolysate was miscalculated. The flashpoint is 68 to 88 F degrees, many times lower than estimated. How can VX hydrolysate be transported and processed safely with such a low flashpoint? Will this flashpoint change the classification of the waste by the Department of Transportation?
- NJDEP has stated that a new discharge permit is required in order for Dupont to accept the VX hydrolysate. A special treatment system may be required. New Jersey has stated that the proposal is "flawed and should be abandoned"; Acting Governor Codey has stated that the NJ Turnpike will not allow the transport of the VX waste. The Governors of New Jersey and Delaware and elected Congressional representatives from these states have taken strong positions against the proposal; many towns and counties have passed resolutions against the proposal. Residents and organizations have registered their determined opposition to the proposal. Why is the Army continuing to consider bringing VX hydrolysate to Dupont in New Jersey? Isn't this a waste of precious time--time that could be spent installing the permitted system in Newport Indiana?

### **Delaware Riverkeeper Network Position**

The Army should revert back to its original plan to treat and dispose of the VX Nerve Agent on site, at the Newport, Indiana facility. The Newport, Indiana community has been vocal in supporting this option and through an advisory committee worked for many years with the Army, scientists and chemical weapons experts on devising a safe and effective process acceptable to all; the state of Indiana has permitted it. Supercritical water oxidation (SCWO), the approved system, is the most environmentally safe means of destruction and does not require incineration (eliminating air pollution) or discharge to a waterway (eliminating VX waste effluent). There are also other known alternative systems that can be used on site in Newport. On site destruction avoids the dangers that accompany the transport of VX hydrolysate which contains toxic constituents and can contain any amount under 20 ppb of VX nerve agent.