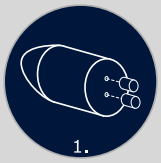
Program Manager Assembled Chemical Weapons Alternatives

Pueblo Chemical Agent-Destruction Pilot Plant Technology

A Partnership for Safe Chemical Weapons Destruction

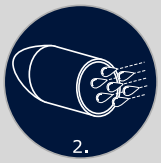
Neutralization followed by biotreatment uses hot water to neutralize the chemical agent, effectively destroying the mustard agent molecules. Ordinary bacteria then consume the neutralization by-product.

Neutralization followed by Biotreatment:



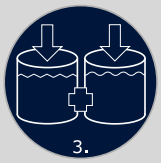
1. Removing the Energetics

Robotic equipment will remove the weapon's energetic components, including the fuse and burster.



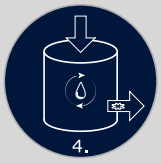
2. Removing the Mustard Agent

To remove the agent, the body is robotically accessed and then the agent is washed out with pressurized water.



3. Neutralizing the Energetics and Mustard Agent

After the energetics and agent have been separated from the metal parts, they will be treated in separate tanks with a caustic solution and water respectively. The by-product from this process is called hydrolysate. The energetics hydrolysate and agent hydrolysate are then combined and further processed in Step Four.



4. Biotreatment

The hydrolysates will go through the biotreatment process, which consists of large tanks containing microbes that digest and further break down the solution. Water released from this process will be recycled, leaving various salts and biosludge. Biosludge, which is made up of microbe waste products and other bacterial matter, will be filtered to remove water and shipped offsite to a permitted treatment, storage and disposal facility.

5. Disposing of the Metal Parts

Although the metal parts were cleansed of energetics and agent in Step One and Step Two, they still may contain trace amounts of energetics and agent and need to be decontaminated to a higher level. This level is called "5X," a military standard of decontamination that ensures the metal is clean and safe for disposal. To reach this level of decontamination, the metal parts will be heated to 1,000° F for 15 minutes. The metal can then be recycled.

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