Today, Utahns eat either of the tree of life or the tree of death.

It's a day destined to go down in history - assuming no unforeseen accident or delay prevents startup of the $400 million chemical arms incinerator at Tooele Army Depot. This day either starts the destruction of a vast stockpile of some of the most diabolical weapons man ever constructed, or it's the day when the burn plant begins spreading toxic pollution. Think of what happened in World War I. October, 1918, on the Belgium Front: British soldiers in gas masks unscrew canisters that spew a yellowish mist along the ground. The clouds are carried across No Man's Land, a quagmire of tangled barbed wire, shell holes and mud, and drift into the enemy's position.

For two or three hours nothing happens. Then soldiers in trenches begin to sneeze, blood coming from their noses. Others dig at their stinging eyes. Suddenly, realizing that they have been gassed, some panic and scream, while others run. A few are thrashing in agony, coughing a red foam, as the blister agent attacks their lungs.

The mustard attack kills some and disables many. Some are blinded for life. Some develop lung infections because of tissue damage.

Others - like a brave young corporal in a Bavarian regiment - suffer temporary blindness. Hospitalized, half-blind when the war ends a month later, he rages at the cessation of hostilities. Like thousands of others gassed on both sides, he is never the same again.

In World War I, chemical agents used by both sides - phosgene, mustard and chlorine gas - injure a million soldiers. About 79,000 of them die because of gas attacks.

Now consider the lethal legacy that has built up since World War II, the conflict started years later by that same corporal in the Bavarian regiment, Adolph Hitler.

At TAD alone, the U.S. military has stockpiled 1.1 million containers of chemical munitions, including mustard (or blister) agent and nerve gas. As terrible as mustard is, in terms of deaths per liter, the VX and GB nerve agent are far worse. Developed later, they are so potent that a drop of either can kill.

Stored inside bunkers called igloos at TAD's Chemical Limited Area adjacent to the incinerator are 14,000 tons of VX, GB, mustard and a material called Lewisite, which was made by mixing mustard agent with arsenic. They are in one-ton steel containers or in battlefield weapons ready for use: in spray tanks that can be mounted on aircraft; in projectiles, cartridges, mines and rockets.

Arguably, chemical weapons are more dangerous to their possessors than to potential targets. During World War II, when the United States began to build up today's stockpile, neither side gassed the other. But the weapons themselves are aging, which poses an immediate threat. As U.S. District Judge Tena Campbell, wrote, of the 30,000 rockets containing nerve agent at TAD, about 1,000 are leaking. That tally doesn't include the other types of munitions with leakers.

Until recent decades, many of the containers were piled on the ground outside, where any mishap would immediately release toxins to the atmosphere. Later they were stored inside scores of low bunkers called igloos, which have sensitive monitors inside to detect minuscule
concentrations of agent.

Whenever leakers are discovered - and that seems to happen weekly - they are packed in special protective devices called overpacks. But that obviously is not a permanent solution to the stockpiles, which are at eight bases across the country and an American outpost on the Pacific Ocean's Marshall Islands, Johnston Atoll.

The Army stopped manufacturing chemical weapons in 1968. It began a program to dump what it had into the ocean. But public outcry was so great that the government decided to destroy the toxic material by incineration.

The TAD stockpile represents 44 percent of the country's total of approximately 30,000 tons of chemical warfare agent. Congress has ruled that the weapons must be destroyed where they are stored. The prototype incinerator is called the Chemical Agent Disposal System (CAMDS) pilot facility, also at TAD.

Many Utahns don't realize that between 1979 and 1988, the CAMDS plant in this state had incinerated 75,000 pounds of GB, 8,000 pounds of VX and 38,000 munitions. It continues to be used for testing.

At Johnston Atoll, the Army has destroyed over 2 million pounds of agent and more than 9 million pounds of drained containers and debris, she noted.

The destruction of the stockpile in Utah will begin with M55 rockets, as they are the most dangerous to store.

``Before they open an igloo, they of course monitor it to be sure that the igloo is clean," said Marilyn Tischbin, program manager for the country's chemical demilitarization program. If not, moon-suited technicians react as they always do when a leaker is found, going into the igloo and putting the device in an overpack.

If the igloo is clean, the rockets are taken outside and loaded into a carrier called an ``on-site container," Tischbin said.

These 19,000-pound containers are specially designed to resist punctures, fires and crashes. They are sealed airtight and taken to the plant on a flatbed truck. They don't have far to go. The rockets stored in the midst of a field of igloos only 1 1/2 miles away.

At the incinerator plant, ``there's an unloading dock where the container is taken off the back of the truck and moved into the container handling building.

The rockets are placed on a conveyor system, which moves them through the building, into an elevator, and to the second floor.

Next it goes into the unpack area. In the unpack area the container is again monitored to make sure there's no leakage within the container. If there is some, it's taken back downstairs to the other side of the building, where there is an airlock. There, the container is opened in a ventilated room.

Agent that has been seeping from a leaker inside the building is circulated to the plant's filter system - nine charcoal filter units, with seven operating at a time. Each filter draws 16,000 cubic feet of air per minute.

The whole plant is kept at what is termed ``negative pressure" - not the vacuum that the term implies, but just less air pressure than the atmosphere outside - keeping any agent from escaping outside. Assuming the rockets aren't leaking, they go into an explosive containment room. At this point, the munitions are handled strictly by machinery.

The explosive containment room has walls that are about two feet thick, made of steel-reinforced concrete - sufficient to contain any explosion that could be set off by munitions at TAD.
A nerve-agent rocket at Johnston once exploded during processing and the room did exactly what it was supposed to - sealing itself off. Equipment was damaged but no person was injured and no agent was released outside.

In the explosive containment room, two holes are punched in the rocket. The agent is drained out and the rocket body is cut into eight segments with a guillotinelike sheer and fed into the deactivation furnaces on the first floor. This purifies them of any remaining agent.

Meanwhile, the agent that was drained from the rocket goes into a storage tank on the second floor. The tank is sealed and has sumps to contain the chemicals if an earthquake shakes the building.

Agent builds up in the storage tank until the facility has enough to pump into the liquid incinerator for disposal.

The liquid incinerator, powered by natural gas, first burns the agent at 2,700 degrees. Gases from this primary chamber goes into the secondary chamber, or afterburner, which operates at 2,000 degrees. By comparison, a temperature of 700 degrees will destroy the chemical agent.

Gases from the incinerator flow into a pollution abatement system. "We cool the gasses down . . . remove any acid gasses that may have been in there with a neutralizing scrub." The hot gasses are quenched with a spray of mist, then they go into a particulate remover that takes out fine particles.

What will go up the plant's stack? "Primarily carbon dioxide and water," in the form of steam, she said. Traces of other material are so dilute that they are far below federal safety standards, according to the plant's design.

In the meantime, the cut-up rocket and its propellant go to a deactivation furnace. This is a rotating kiln that operates at 1,100 degrees. An afterburner burns up toxins left from that, operating at 2,200 degrees.

"The rocket pieces themselves fall onto a heated discharge conveyor," she said. The conveyor, operated at 1,100 degrees, assures that no traces of agent are left on the pieces of the rocket. From there the pieces goes into a waste bin, destined for a hazardous waste facility.

The plant will start with one shift a day. Within a few months, it is expected to go to three shifts. The incinerator will burn chemical agent for seven years.

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ADDITIONAL INFORMATION

Name has changed - numerous times

The incinerator that was built at Tooele Army Depot technically no longer is at TAD. Not that the facility has moved; it's a bit hefty for that - constructed with enough concrete to fill six football fields 6 feet deep. No, it's not at TAD because the Army has been playing a name-change game. "The thing was Deseret Chemical Depot when it was built back in 1952," said Jon Pettebone, chief spokesman for the incinerator. "Then it came under Tooele Army Depot and started being called South Area." TAD took over the chemical depot sometime in the 1970s, he said. Last September the region around the incinerator and the adjacent chemical weapons igloos was renamed Tooele Chemical Activity. It was separated from TAD and got its own commander, with the North Area continuing to be known as TAD. "As of last week, we got the approval to go back to the Deseret Chemical Depot as the official title, Pettebone said. It is now official." A ceremony marking that change is scheduled for Sept. 2, but the date may change.
Stockpiles: CHEMICAL WEAPONS

Percent of total storage.
Umatille, Ore. 12%
Tooele, Utah 44%
Pueblo, Colo. 10%
Pine Bluff, Ark. 12%
Anniston, Ala. 7%
Lexington, Ky. 2%
Aberdeen, Md. 5%
Newport, Ind. 4%

M55 rocket

The M55 rocket is first chemical-weapon scheduled for destruction at TAD.
LENGTH: 78 inches
WEIGHT: 58 pounds
NERVE AGENTS: GB (inhaled) and VX (absorbed through the skin). Both attack the central nervous system.
Each rocket contains 10 pounds of nerve agent.
NUMBER OF ROCKETS: 28,945.

Incinerators: HOW THEY WORK

1. Rockets are transported from storage igloos to incinerators in specially designed containers. It is approximately a two-mile journey.
   TRUCK TRAVELS ONLY 20 MPH

2. Trucks are unloaded and the rockets enter the plant on a conveyor system. Containers are checked for leaks. Containers with leaks are moved into an airlock where they can be opened.

3. Containers go into a ventilation area. These areas are equipped with charcoal filters to contain any accidental escape of chemicals.
   THIS IS THE LAST TIME HUMANS WILL COME IN CONTACT WITH THE ROCKETS. FURTHER MANIPULATION IS DONE WITH ROBOTS.

EXPLOSIVES
4. In the explosive containment room (equipped with 28-inch reinforced concrete walls) rockets are punctured and drained of chemical agents.

5. The rocket is then chopped into pieces and fed into the deactivation furnace.
6. LIQUID INCINERATOR DEACTIVATION FURNACE
   CHEMICAL DISPOSAL ROCKET DISPOSAL
   Powered with natural gas Powered with natural gas
   TEMPERATURE: 2,700 degrees F TEMPERATURE: 1,100 degrees F
   Chemical agents are destroyed Remaining rocket pieces are
   at 700 degrees. disposed of at hazardous
   waste facility.