Fact Sheet

U.S. DEPARTMENT OF ENERGY | Legacy Management

Plowshare and Vela Uniform

This fact sheet provides information about the **Plowshare and Vela Uniform Program Sites.** The sites are managed by the **U.S. Department of Energy Office of Legacy Management.**

Plowshare Program History

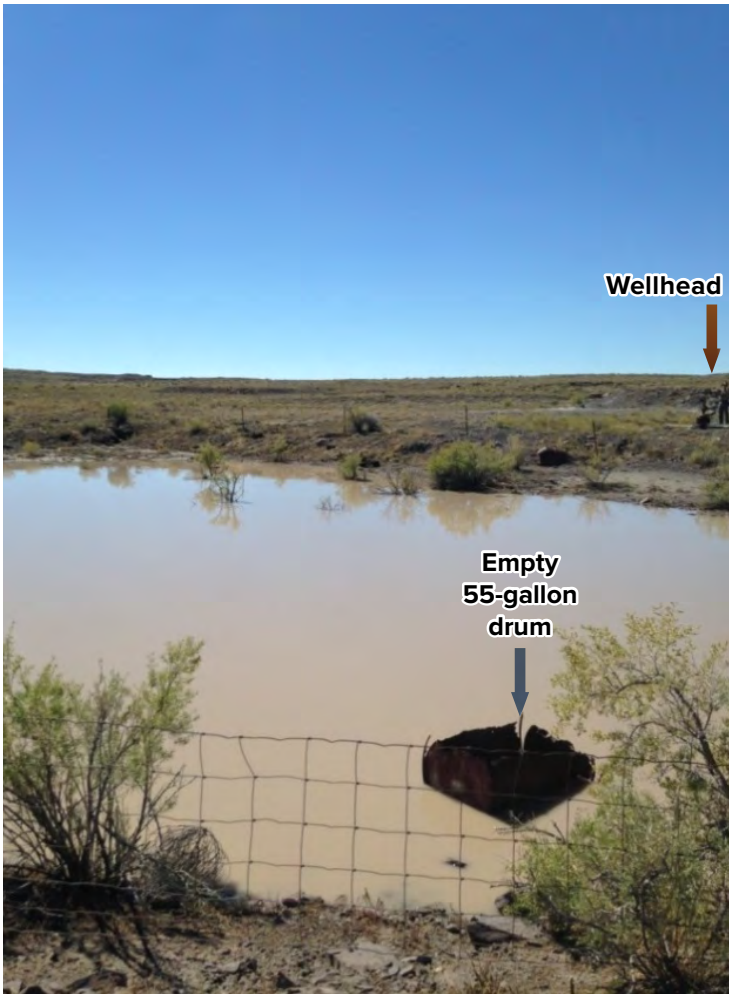
On June 6, 1958, the existence of the Plowshare Program and its goal to utilize nuclear explosives for peaceful purposes were unveiled to the public. The program's name is a biblical reference to "beating swords into plowshares."

Scientists proposed using nuclear detonations for civil works projects and industrial applications. Examples of proposed civil works projects included the construction of dams, harbors, canals, highways, and railroads. Proposed industrial applications, in general, involved increasing the production of ore, oil, and gas.

Vela Uniform History

Vela Uniform was an element of Project Vela conducted jointly by the U.S. Atomic Energy Commission (AEC) and Department of Defense. Its purpose was to develop the technological capability of detecting and identifying underground and underwater nuclear detonations. The program was the result of treaty negotiations that discussed the termination of nuclear weapons testing. The United States maintained a position that, to reach this type of agreement, there would have to be a proven method of verifying that no nuclear tests were being conducted. Vela Uniform incorporated seven underground nuclear tests in the continental United States and Alaska from October 1963 to July 1971. Seismic traces from multiple locations were analyzed for each of these events to develop methods for differentiating underground nuclear tests from other seismic events (such as earthquakes) and for determining the location of the test site. The program also included experiments using conventional high explosives.

Plowshare and Vela Uniform Program Sites



Utah, Utah, Site Mud Pit, Looking South, September 27, 2016

Utah, Utah, Site Wellhead, Looking South, September 27, 2016

Plowshare and Vela Uniform Program Work Under U.S. Department of Energy (DOE) Office of Environmental Management (EM)

The Energy Reorganization Act of 1974 abolished the AEC and established the Energy Research and Development Administration (ERDA). In 1977, ERDA was abolished and replaced by DOE, bringing together a dozen departments and agencies under one umbrella organization tasked with the responsibility for the nuclear weapons program.

In the mid-1990s, EM began identifying Plowshare and Vela Uniform projects, documenting the histories of these projects, and determining if there was a potential for environmental or other liabilities. This effort was led by the Desert Research Institute (DRI), which developed a collection of project documents and ultimately published a series of project summaries in the 2011 report *The Off-Site Plowshare and Vela Uniform Programs: Assessing Potential Environmental Liabilities Through an Examination of Proposed Nuclear Projects, High Explosive Experiments, and High Explosive Construction Activities*.

In total, DRI identified over 150 sites or proposed projects. These include sites where nuclear tests were planned but canceled and sites where non-nuclear explosives tests were conducted. Many of the projects identified by DRI were proposed projects that never left the planning phase, with no associated field work. Of the projects identified, only 30 sites had activities with the potential for remaining liabilities.

These 30 sites are grouped by purpose in Table 1. Non-nuclear explosive tests were conducted to gather data that could be used during the planning process for later nuclear tests. Public works projects were also non-nuclear and used to gather data that could be applied to nuclear tests, but these also were part of larger projects that resulted in the construction of harbors, roads, and quarries. Canceled nuclear tests are locations where some site activities were conducted, but the planned nuclear test was canceled. These sites may have features such as boreholes drilled for the purpose of characterization and associated debris. One site, Iki, does not fit in any of these categories. At this site, a drilling project was conducted to investigate the thermal energy potential of molten rock.

Plowshare and Vela Uniform Program Work Under DOE Office of Legacy Management (LM)

In 2016, DOE Office of Legacy Management (LM) began investigating the Plowshare and Vela Uniform Programs in anticipation of transferring responsibility of the sites from EM. LM conducted a preliminary review of the projects based on the 2011 DRI report. That review considered not only environmental liabilities, but also any physical hazards or other factors that might generate concerns at the sites.

Of the 30 sites with the potential for remaining liabilities, extended reviews were conducted that included analysis of historical documents and current information, such as aerial photography. Based on the results of these reviews site visits were performed as needed to document the current condition of the site. Remnants of test activities found at sites include craters, mud pits, debris, and open boreholes. Open boreholes are currently being plugged and abandoned in accordance with state regulatory standards. Other issues are being addressed in accordance with the requests and preferences expressed by land owners, as well as state regulations. Following the completion of maintenance activities, LM management of the sites will include preserving records and responding to public inquiries about the sites.

CONTACT INFORMATION

IN CASE OF AN EMERGENCY AT THE SITE, CONTACT 911.

Information about the Plowshare and Vela Uniform Program is available at **www.energy.gov/lm/plowsharevela-uniform-program-sites**.

Information about LM is available at **www.energy.gov/lm**.

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Table 1 – Sites with AEC Activities

Name	AEC Project Description
Non-Nuclear Explosives Tests	
CHASE III and IV, Atlantic Ocean, Virginia	Long-range seismic monitoring experiments
CHASE V, Pacific Ocean, California	Long-range seismic monitoring experiment
CHASE VI, Pacific Ocean, Alaska	Long-range seismic monitoring experiment
Cowboy and Plowboy, Louisiana	Seismic monitoring experiments
Operation Breakup, Alaska	High explosive ice cratering experiment
Pinot, Colorado	Oil shale stimulation research
Pre-Dribble, Mississippi	Seismic effects research
Pre-Gondola and Trencher, Montana	Waterway construction experiments
Pre-Gnome, New Mexico	Seismic experiment
Pre-Schooner II, Idaho	Cratering experiment
Sergius Narrows, Alaska	Explosive studies for channel improvement
Non-Nuclear Civil Works Projects	
Drum Inlet, North Carolina	Channel excavation
Libby, Montana	Highway cut
Lost Creek, Oregon	Experimental mounding and controlled blasting series in quarry
R.D. Bailey, West Virginia	Dam spillway excavation experiment
Trinidad, Colorado	Railroad construction
Tugboat, Hawaii	Harbor construction
Canceled Nuclear Tests	
Bronco, Colorado	Nuclear explosives for fracturing oil shale underground
Dragon Trail, Colorado	Nuclear explosives for gas stimulation
Excavator and Travois, Idaho	High explosive calibration experiment and nuclear quarrying
Excavator and Travois, California	High explosive calibration experiment and nuclear quarrying
Excavator and Travois, Oregon	High explosive calibration experiment and nuclear quarrying
Rufus, Amchitka Island, Alaska	Surface detonation of nuclear explosives
Rufus, Brooks Range, Alaska	Surface detonation of nuclear explosives
Rufus, Chirikof Island, Alaska	Surface detonation of nuclear explosives
Thunderbird, Wyoming	Nuclear explosives for coal extraction
Utah, Utah	Nuclear explosives to fracture oil shale for underground retorting
Wagon Wheel, Wyoming	Nuclear explosives for stimulation of underground natural gas reservoirs
WASP, Wyoming	Nuclear explosives for stimulation of underground natural gas reservoirs
Other	
Iki, Hawaii	Geothermal energy experiment