



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 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



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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 cancelled 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.



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



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

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. Cancelled nuclear tests are locations where some site activities were conducted, but the planned nuclear test was cancelled. 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 site will include preserving records and responding to public inquiries about the sites.

Contacts

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.

For more information, contact:

U.S. Department of Energy
Office of Legacy Management
2597 Legacy Way, Grand Junction, CO 81503

(970) 248-6070 (monitored continuously)
(877) 695-5322 (toll-free)

Table 1 – Sites with AEC Activities

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