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Kansas Missile Silo Investigated for Groundwater Contamination

The photo shows the ramp and the coffin bunker of the Atlas E Missile Site S-4 near Osage City, Kan. As seen in July 2016, the site is flooded with water. Samples of water and soil at this site show contaminants at levels below unacceptable risk levels.

The Atlas D missile shown in the photograph is very similar in design to the next-generation Atlas E missiles which were deployed in the nine missile silos manned by the 548th Strategic Missile Squadron, based at Forbes Air Force Base at Topeka, Kan. The Atlas E was improved from the Atlas D with a more enhanced engine design and a small guidance computer. Atlas D missiles were also used in manned, earth-orbiting Mercury missions.

On June 20, 2016, the United States Army Corps of Engineers (USACE) announced that they were taking comments from the public regarding a proposed plan to issue a Final Remedy to the S-4 Atlas E Missile Silo site in Osage County, Kansas. This site is approximately five miles from both Osage City and Burlingame. It was under the command of the 548th Strategic Missile Squadron based at the former Forbes Air Force Base in Topeka, Kan. A public meeting was held on July 14, 2016, at the Osage City Public Library to explain the situation and the proposed actions, and to take questions and comments. The deadline to submit written comments was July 21, 2016.

History of Atlas E

The Atlas E Missile was a short-lived U.S. weapon capable of delivering a nuclear warhead a distance of 11,500 miles. The construction of nine missile launch sites surrounding the Topeka area commenced in June 1959. This was during the second term of President Eisenhower. By October of 1960, missiles were in place in all nine silos. But because missile and rocket technology was expanding so quickly, the nine silos were obsolete by March 1965, a period of time of less than six years. The 548th Strategic Missile Squadron was responsible for manning these missile launch sites that were located near Holton, Wamego, Delia, Ozawkie, Dover, Bushong, Osage City, Waverly and Worden. While there were launch control rooms placed underground at

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these sites, the missiles themselves were stored in shallow bunkers, commonly called coffins, in a horizontal position. To launch one of these missiles, it was necessary for an earthen covered roof to open. The missile would be lifted to a vertical position and then fueled with liquid oxygen and kerosene. Future Atlas missiles, and those that followed them, were designed to be stored and fired from a vertical position.

In addition to the concrete and steel structures that remain to remind us of this era of American history, some environmental contaminants were also left behind. There was kerosene being stored onsite, and diesel fuel was stored in buried tanks to run generators. To confirm mission-readiness, the engines on the missiles were occasionally test-fired. After-firing maintenance included removal of impact-sensitive compounds. Fearing that the build-up of these compounds could cause an explosion onsite or in-flight, the engines were cleaned after every firing with chlorinated solvents, some of which dripped (or flowed?) to the lowest levels of the facilities. At least one launch facility had water wells to supply drinking water. The USACE report of June 16, 2016, for the S-4 location does not indicate the source of drinking water for the missile silo. The report does indicate that a septic system is present. It is not clear if the septic system was installed for the missile crew or the latter inhabitants of the site. Aerial photographs indicate that wastewater lagoons are also present.

History of Osage S-4

After decommissioning, the Osage City S-4 Missile Silo site was sold to a private landowner in 1967. The report does not indicate when it happened, but a mobile home was placed on the site sometime between decommissioning and before 1999. The mobile home burned in 2006.

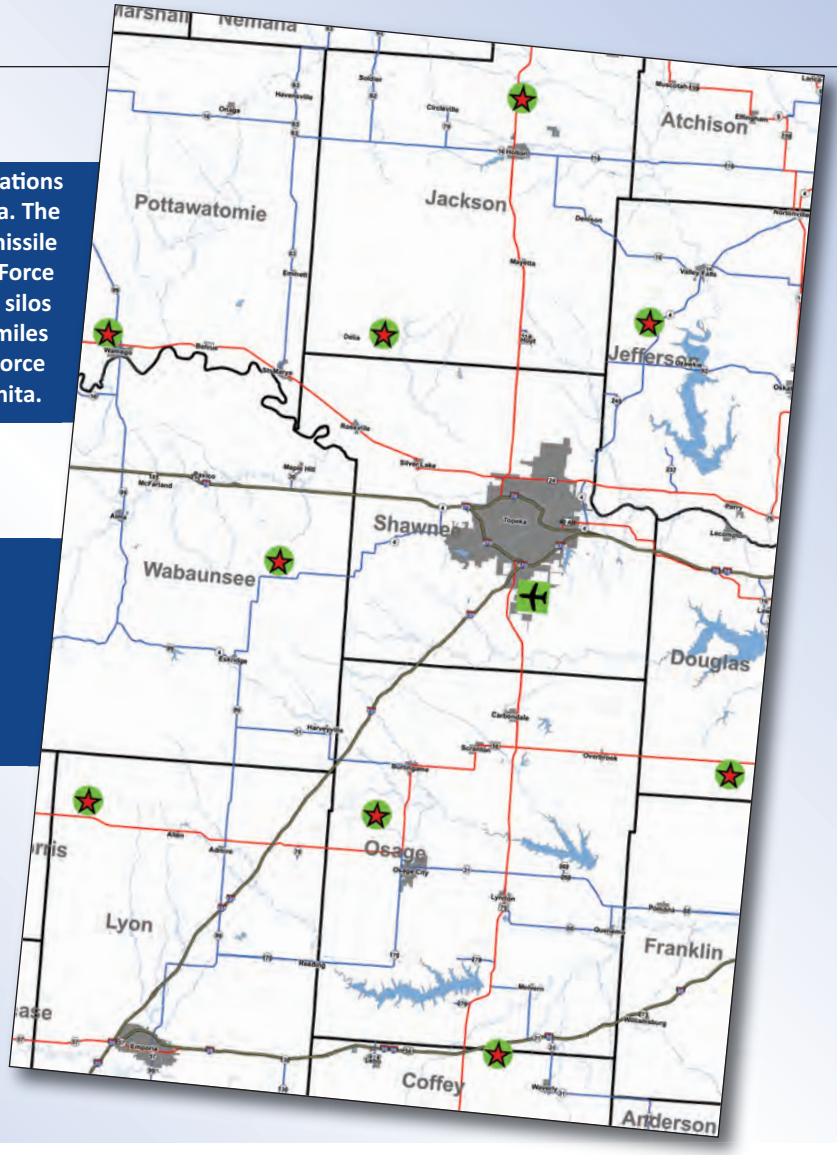
In 1986, environmental investigation and remediation actions were initiated by the Corps of Engineers. The investigation included the collection of soil, surface water samples and groundwater samples from monitoring wells drilled for that purpose. The results of the testing of these samples was given in a Final Engineering Report which was released in 1990. No unusual chemicals were detected in the soil or groundwater samples, however, chlorinated solvents were detected in surface water samples, likely collected from the low-lying ramp area outside the missile "coffin" silo doors.

Between July 1994 and April 1996, the Corps of Engineers removed:

- 732,692 gallons of water from the sump and flame pit
- 15 tons of sludge from the sump
- 2 underground fuel storage tanks
- 888 tons of hydrocarbon contaminated soil
- 246,800 gallons water from the sump and a recovery well which was treated by an air-stripper

The Minuteman Missile National Historic Site

It is the 100th Anniversary of the National Park Service this year. Kansas has ten features that are part of the National Park System and half of them are historical trails. If you haven't visited them all yet, you probably can before the year is over. If anyone has an interest in Cold War and military history, a new National Park facility to visit in a neighboring state is the Minuteman Missile National Historic Site near Phillip, South Dakota. At two different locations, visitors can tour the Launch Control Center where personnel who were responsible for nine missiles lived above ground and the Delta-09 Missile Silo with its underground living and work facilities. The silo contains a former Minuteman II missile. More than 100,000 people visited this historic site in 2015 and projections are for another record year in 2016. A formal grand-opening of the visitor center was held on September 24, 2016. More information is available at http://www.nps.gov/mimi/index.htm



Atlas D missiles were deployed at these nine locations around Forbes Air Force Base south of Topeka. The installations began in 1959. An additional twelve missile defenses (Atlas F) were deployed around Shilling Air Force Base at Salina and later there were 18 Titan II ICBM silos installed from twenty to fifty miles outside of McConnell Air Force Base at Wichita.

This is the shoulder patch worn by Air Force personnel manning the Atlas E Missile Silos near Forbes Air Force Base, Topeka, Kan.

The residents of the mobile home were suspected of using water from the monitoring wells or from the ramp area for, in the residents words, only laundry and bathing purposes. Because there was no contaminant-free, sanitary domestic water supply available at this site, a rural water connection was completed in 1999. This required installation of a pipeline 2.2 miles in length.

Environmental issues at other sites

The other eight Atlas E Missile Silo sites have been investigated to various degrees by the United States Army Corps of Engineers and the Kansas Department of Health and Environment. Each of these sites has some volatile organic compounds (VOC) present. Over half of them have detectable levels of heavy metals. It should be stated that none of them appear to have any impact on public water supply system water quality. This includes the S-4 site in Osage County.

Findings and Recommendation from USACE

In 2014, a Remedial Investigation Report was completed that said when VOC's were detected in samples, the levels were significantly less than the Maximum Contaminant Levels (MCL's) for drinking water. It is the conclusion of the USACE that based on the results, the remaining site-derived contaminants do not pose unacceptable risks to human health and the environment. With this determination, monitoring wells at the site were scheduled to be properly plugged in September 2016.

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To summarize . . .

The next action that will occur regarding this site is a Decision Document. It will repeat the findings of the Final Proposed Plan and weigh those findings against any written correspondence submitted and any verbal comments stated at the public meeting in July. The USACE has stated that the Decision Document will be released by June 30, 2017.

These nine Atlas E Missile Sites are just a few of many Formerly Used Defense Sites (FUDS) that may have impacted existing or future sources of groundwater for Kansas. At the very least, these sites have caused the resources of state and federal agencies to be deployed to investigate the impact of these sites. Because many (most) water system professionals were young or not even born when these sites were active, it is imperative that attention be paid to the public notices that are published in local newspapers or mailed directly to nearby water systems. Let KRWA know if you learn of any "identified sites" that may receive attention of any state or federal agency, if there might be any impact to a water system.

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