Alaska Department of Environmental Conservation
Spill Prevention and Response Division
Contaminated Sites Program

November 2011 Fact Sheet

The Salt Chuck Mine – An Update

Description

The Salt Chuck Mine is an abandoned historic gold, silver, copper and palladium mine on the southeast side of Prince of Wales Island. The site is 4½ miles from Thorne Bay, and is accessible by a half-mile trail from the road or by water.

The mine and mill operated from 1905 to 1941, processing more than 326,000 tons of ore. The mine openings are about a half mile uphill from the mill area, which is on the northern shore of Salt Chuck Bay near the mouth of Lake Ellen Creek. The remnants of at least 25 of the mill's structures are on the site, as well as two large diesel tanks and four banks of diesel engines.

An extensive tailings deposit of an estimated 100,000 cubic yards is located mostly in the intertidal zone south of the mill, on state-owned tidelands. Additional tailings are located in the upland area, which is managed by the U.S. Forest Service. The tailings deposits on the whole site – in the intertidal zone and the upland area – cover 23 acres.

The contaminated upland area covers about 45 acres and includes various source areas: a large

The Salt Chuck Mine is on Prince of Wales Island in the Tongass National Forest and at the northern end of Kasaan Bay (map, top). The mill area is near the mouth of Lake Ellen Creek on the northern shore of Salt Chuck Bay, a smaller bay off Kasaan Bay. Thorne Bay (pop. 471) and Kasaan (pop. 49) are nearby communities.
(Map by and courtesy of the Sobay Company of Olympia, Wash.)

The mill area is shown in May 2009 (right). The mine openings are about a half mile uphill from the mill area. The contaminants from the Salt Chuck Mine include polychlorinated biphenyls (PCBs), copper, lead, mercury, selenium, vanadium, nickel, arsenic, petroleum and polycyclic aromatic hydrocarbons.
(DEC photo)

pit connected to the main adit (a nearly horizontal passage from the surface to a mine), two shafts, a tunnel and 13 waste rock dumps.

As with other abandoned historic mines, the sources of contamination at the mill area are a result of standard practices from an era before environmental regulations, when mines operated without today's permits and reclamation requirements.

The Alaska Department of Natural Resource's Prince of Wales Area Plan identifies the area around the site as "intensive public recreation use." The Forest Service has public-use cabins and a campground in the area, and Salt Chuck Bay is used for subsistence clamming and crabbing. Lake Ellen Creek supports five species of anadromous fish.

The U.S. Bureau of Land Management first investigated the Salt Chuck Mine's mill from 1995 to 1998. Those investigations led to a more in-depth one conducted by the Forest Service from 2002 to 2007. The Forest Service's Engineering Evaluation/Cost Analysis, which it finalized in 2010, summarized the previous sampling results.

In 2007, the DEC, Alaska Department of Health and Social Services (DHSS) and U.S. Environmental Protection Agency (EPA) reviewed the Forest Service's draft Engineering Evaluation/Cost Analysis. All three reviewing agencies agreed that the site needed additional site characterization, that all the ways people and the environment might be exposed to contamination needed to be evaluated, and that there needed to be an assessment of those exposure risks. The three agencies agreed that the additional work would provide the basis for cleanup levels and it would sufficiently protect multiple uses of the land in the future.

In the spring of 2009, DEC conducted an informal sounding of public opinion about resolving lingering contamination issues and the delayed cleanup progress by giving the site Superfund status through placement on the EPA's National Priorities List. In July 2009, DEC's Commissioner Larry Hartig sent a letter on behalf of Gov. Sarah Palin to the EPA saying the state did not object to the site being placed on the National Priorities List. The EPA held a public comment period on the proposed listing.

On March 2, 2010, the EPA announced it had added the Salt Chuck Mine site to its National Priorities List. The listing makes the site eligible to receive federal funds for long-term cleanup while the EPA seeks to recover costs from the responsible parties. Community involvement and tribal participation are also an important part of EPA's Superfund cleanup process. Background information on the Salt Chuck Mine site and other documentation are available on EPA's website (http://www.epa.gov/superfund/sites/npl/nar1812.htm).

The mill at the Salt Chuck Mine is shown in a photo taken in the mid-1970s (right). (Photo by Patricia Roppel, courtesy of the U.S. Forest Service)

The U.S. Forest Service built a short road to provide access to the site this summer, removed building debris, drums and tanks, excavated roughly 5,400 cubic yards of petroleum-contaminated soil and metals-contaminated tailings – 8,400 tons of contaminated material, which filled 300 containers averaging 28 tons per load. The material will go to a permitted landfill out of state. The agency set aside the historical mining equipment during the excavation, then grouped it in one area, as shown in the photos taken in October (left and bottom).
(Photos courtesy of the U.S. Forest Service)

Public Health and Environmental Concerns

The Engineering Evaluation/Cost Analysis outlined several areas of contamination both in the uplands and the intertidal area. The levels found were high enough for DEC and DHSS scientists to believe that there is a risk to human health. The site characterization, however, did not provide enough data to be sure whether food gathering or other activities should be officially restricted.

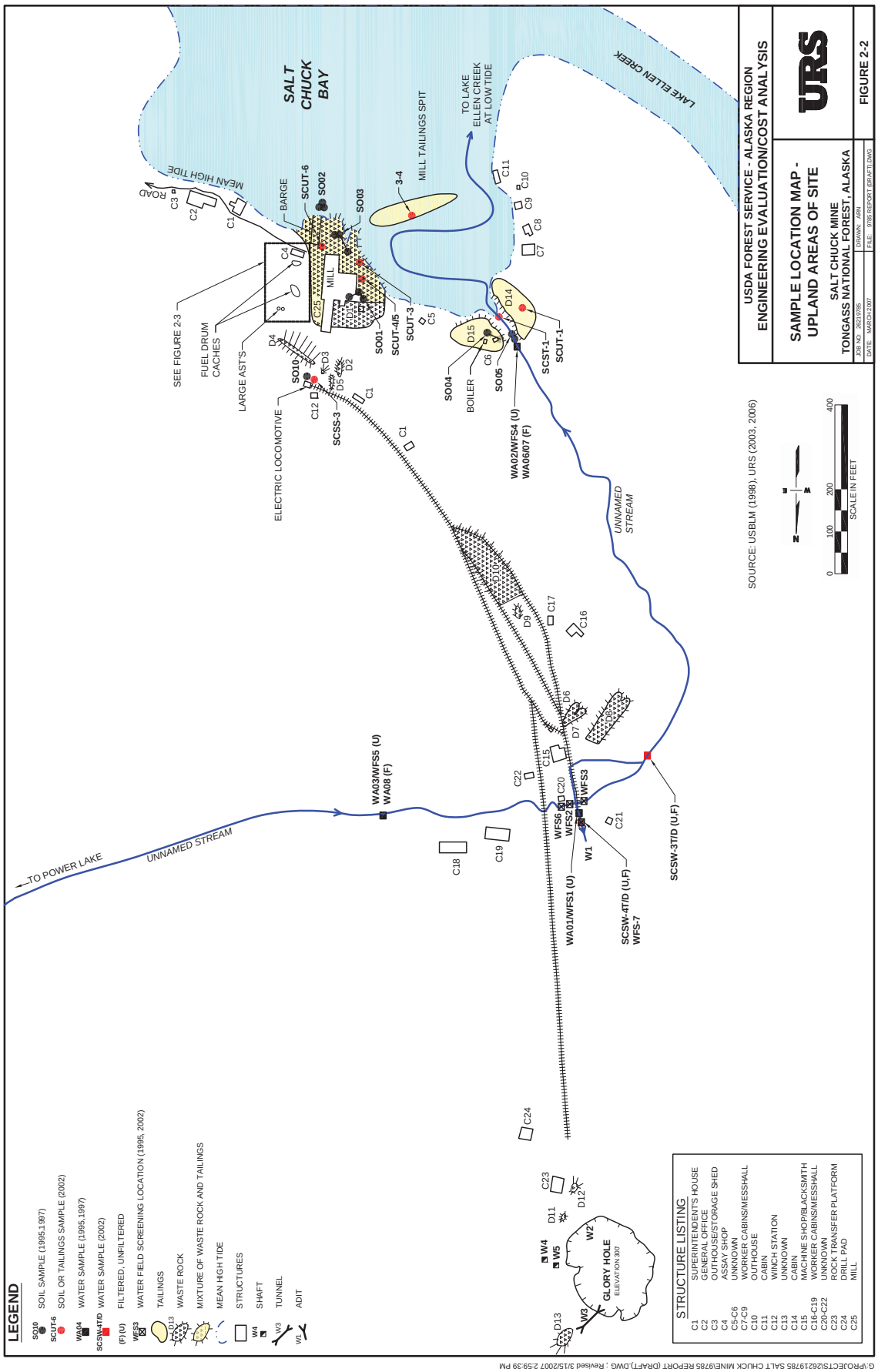
Polychlorinated biphenyls (PCBs) are present in the tailings around the mill and are suspected to be from former electrical equipment. Copper, lead and mercury were found in the soils around the former assay shop, and lead from batteries was found in the soils around the electric locomotive. Petroleum-contaminated soil is present near the above-ground storage tanks, drum caches and in the sludge on the floor of the mill.

The sludge has also migrated to the tailings and intertidal area. Several piles of tailings exist in the uplands area near the mill and next to the unnamed stream that flows through the site. Elevated levels of copper were found in all the tailings, and mercury, selenium and PCBs in tailings in various locations.

In the intertidal area, the main contaminants of concern in the extensive area of

The site's historical mining equipment is now collected in one area, as shown in this October photo (top).
(Photo courtesy of the U.S. Forest Service)

One of the main adits to the mine is shown in this May 2009 photo (left); the adit looked similar this summer. An adit is a nearly horizontal passage from the surface to a mine.
(DEC photo)



The layout of the Salt Chuck Mine is shown on this March 2007 map. (Map courtesy of the U.S. Forest Service)

tailings are copper, arsenic and vanadium (a metal). Samples were collected of tailings, sediment below and downgradient of the tailings, and biota, including several species of clams and mussels. PCBs are present in the tailings closest to the mill and tend to be less prevalent farther into the bay. The sediments below the tailings and out in Salt Chuck Bay also showed elevated levels of copper and vanadium as well as arsenic and isolated hotspots of mercury, PCBs and polycyclic aromatic hydrocarbons.

In general, the contaminant levels decreased as the sample locations extended into Salt Chuck Bay. The surface water of the bay showed levels of arsenic, copper, mercury, nickel and selenium significantly higher than samples collected from uncontaminated background locations.

Butter clams, little neck clams, softshell clams and blue mussels were collected and the tissue was analyzed for metals and PCBs. No PCBs were found, but arsenic, copper, mercury, selenium and vanadium were found in all the samples. Arsenic and vanadium were found in several samples at levels that exceed the human health risk-based screening level for ingestion. Copper was found at levels that exceed the ecological risk-based screening level. It was noted that no bivalves were present in the most contaminated tailings that are closest to the mill.

Current Status

In late August, the EPA held a public meeting in Kasaan, which is southeast of the site.

The EPA also conducted limited sediment sampling in the intertidal area of the site, and the results should be available this winter. Those results, and the results of previous sampling events, will be evaluated so that a comprehensive Remedial Investigation work plan can be developed and implemented in the summer of 2012.

Last summer, the Forest Service used funding from the American Recovery and Reinvestment Act, along with additional funding, to conduct a non-time critical removal action on the uplands. It was the selected alternative from its 2010 Engineering Evaluation/Cost Analysis.

The Forest Service built a short road to provide access to the site, removed building debris, drums and tanks, excavated roughly 5,400 cubic yards of petroleum-

The line of brown rocks and all the sediment on the nearby beach (right) are metals-contaminated tailings. The beach is near the mill area, on Salt Chuck Bay, and the photo was taken in May 2009. The main contaminants of concern in the intertidal area are copper, arsenic and vanadium. (DEC photo)

contaminated soil and metals-contaminated tailings, and will dispose of the excavated material in a permitted landfill out of state in the near term.

Although the Forest Service's removal action was substantial, additional contamination remains in the uplands on Forest Service-managed lands. It is anticipated that this contamination will be addressed under the EPA Superfund action. A report documenting the removal action will be available this winter.

Contacts

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For more information about hazardous substances that are listed in this fact sheet and the effects of exposure to those substances on human health:

Agency for Toxic Substances and Disease Registry
(ATSDR is within the U.S. Department of Health and Human Services.)
ATSDR ToxFAQs
http://www.atsdr.cdc.gov/toxfaq.html
(888) 42-ATSDR or (888) 422-8737