



## Section 319

# NONPOINT SOURCE PROGRAM SUCCESS STORY

# Alaska

## Activated Carbon and Soil Treatment Restores Water Quality

### Waterbody Improved

Historical leaking storage tanks and the demolition of a seal rendering plant resulted in water quality impairments in the St. Paul Salt Channel. As a result, the channel was placed on Alaska's 2002 303(d) list of impaired waters for petroleum hydrocarbons, oil and grease. Efforts to restore water quality in the channel involved two remediation actions—excavating and treating 9,234 cubic yards of soil by the National Oceanic and Atmospheric Association (NOAA), and installing sandbags, filled with activated carbon, around the periphery of the channel in two parallel trenches to filter the remaining groundwater flowing into the channel. In response to NOAA's remediation action plan, Alaska's Department of Environmental Quality (ADEC) moved this waterbody to a Category 4b ("impaired water with other pollution controls") in its 2002 Integrated Report. Sampling in August 2007 showed no contamination and that the channel met Alaska's water quality standards (WQS) for petroleum hydrocarbons, oil and grease. Consequently, this pollutant was removed from the list of impairments in 2008.

### Problem

St. Paul Island lies in the Bering Sea, approximately 800 miles southwest of Anchorage, Alaska. The St. Paul Salt Channel (also known as the Salt Lagoon Channel) is tidally connected to the Salt Lagoon, St. Paul Harbor and the Bering Sea. A contaminated site (called the Salt Lagoon Diesel Seep) along the east bank of the St. Paul Salt Channel contributed petroleum products to the water.

The Salt Lagoon Diesel Seep area was formerly the location of a seal by-products processing plant that dated to 1918. The plant rendered fur seal carcasses to oil and animal feed or meal. In 1977 the Tanadgusix (TDX) Corporation took control of the plant. In 1984 the United State's decision not to extend the Interim North Pacific Seal Convention ended commercial seal harvests. Consequently, TDX ended operation of the by-products plant in 1984 and demolished the building in 1988. During the demolition, the plant's boiler system spilled and leaked diesel fuel at the site. This added contamination on top of what had accumulated over the previous 70 years. For example, in 1957 a cracked valve on a fuel line released 10,000 gallons of diesel fuel—only 2,000 gallons of which was recovered. By the time the site was abandoned in 1988, contamination spread across an area approximately 120 feet by 120 feet, and at a depth of 3 to 5 feet (surface to groundwater).

NOAA acknowledged that it was responsible for the site. Therefore, ADEC's Division of Spill Prevention and Response, Contamination Sites Program issued a notice of Violation/Request for corrective action by

NOAA. In 1999 NOAA discovered that the contamination was more widespread than previously thought.

Persistent oil sheens on the channel prompted tests, which found that total aqueous hydrocarbons (TAQH) exceeded the state numeric WQS of 15 micrograms per liter ( $\mu\text{g/L}$ ). Additionally, the channel failed to meet Alaska's narrative WQS for petroleum hydrocarbons, oil and grease, which states, "there may be no concentrations of petroleum hydrocarbons, animal fats, or vegetable oils in shoreline or bottom sediments that cause deleterious effects to aquatic life, and surface waters and adjoining shorelines must be virtually free from floating oil, film, sheen, or discoloration." As a result, ADEC listed 0.23 acres of St. Paul Salt Channel on the 2002 303(d) list of impaired waters for not supporting its designated uses of growth and propagation of fish, shellfish, other aquatic life and wildlife.

### Project Highlights

In 2004 NOAA excavated 9,234 cubic yards of petroleum-contaminated soil down to the water table and thermally treated it off-site to volatilize, desorb and combust the petroleum contaminants. NOAA restored the bank of the channel with rock, sand, and filter fabric and restored vegetation on the top of the shoreline. The second major remediation effort involved installing two parallel rows of granulated activated carbon on the downward slope of the former by-products plant site. The activated carbon in the sandbags filters any remaining pollutants from the groundwater before they can enter the channel (Figures 1 and 2). NOAA continues to monitor the St. Paul Salt Channel for visual and chemical signs of contamination.

## Results

NOAA's efforts to restore St. Paul Salt Channel were successful. Water quality monitoring showed that the channel met Alaska's WQS for petroleum hydrocarbons, oil and grease. On February 13, 2006, ADEC concurred with NOAA that no further actions are needed for the Salt Lagoon Diesel Seep site. Continued semiannual monitoring, as well as visual inspections for sheens on the channel, confirmed that concentrations of petroleum hydrocarbons remain below 15 µg/L and that no animal fats or vegetable oils remain in shoreline or bottom sediments that cause deleterious effects on aquatic life. Therefore ADEC removed petroleum hydrocarbons, oil and grease from the list of impairments in 2008.

## Partners and Funding

In October 2007, NOAA completed the successful cleanup of all 58 sites on St. Paul Island to protect human health, welfare, safety and the environment. ADEC oversaw the cleanup to ensure that it adhered to Alaska state standards. Local communities, in cooperation with NOAA and ADEC, also helped the restoration process by raising awareness of the problem and offering assistance in solutions. Since 1996, \$64 million in federal monies were approved as a special appropriation for the Pribilof Islands, of which St. Paul Island is a part.



Figure 1. The Salt Lagoon Diesel Seep area after NOAA removed contaminated soil and restored the St. Paul Salt Channel shoreline.

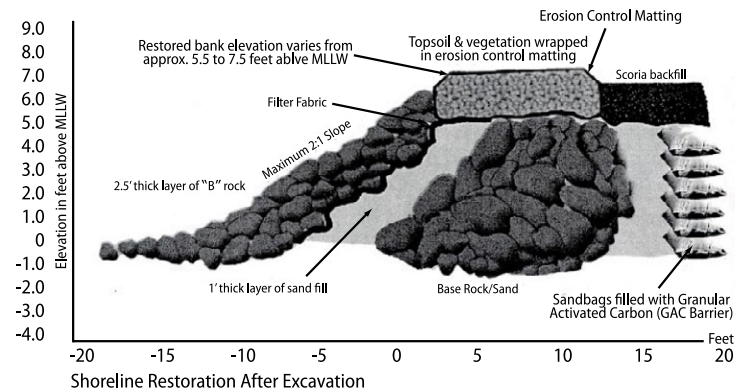
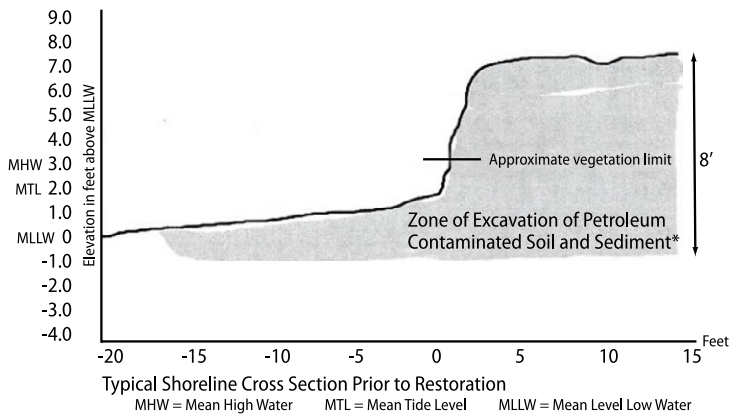


Figure 2. Cross-section of the shoreline in the contaminated area before (left) and after (right) restoration efforts. The contaminated soil was removed and replaced with rock, sand and a granular activated carbon barrier.



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