

Fact Sheet for the Swinomish Lime Storage Site Cleanup Project

Background:

In 2010 the Swinomish Tribe received a brownfields cleanup grant from the U.S. Environmental Protection Agency for the cleanup of a site on the Swinomish Reservation. Brownfields cleanup grants assist in cleaning up contaminated areas to minimize the threat to the public and the environment, and facilitate a site's productive re-use.

The planned cleanup project is associated with an approximately one acre site located on Tribal trust land in the northern Tribal economic zone of the Swinomish Indian Reservation. This site, referred to as the Swinomish Lime Storage Site, is directly adjacent to the Swinomish Channel near the Tribe's Chevron gas station. The site was contaminated during several decades of use as an agricultural chemical storage and processing facility operating on land leased from the Tribe (Fig. 1). A concrete slab and several piles of debris remain from a building demolished in 2003. The slab is sometimes used as a skateboarding area. The cleanup project involves the excavation and disposal of approximately 160 cubic yards of contaminated upland soil, as well as the removal and disposal of approximately 100 non-functional creosote-treated wood pilings and some associated structures from a barge pier in the site's tidelands.

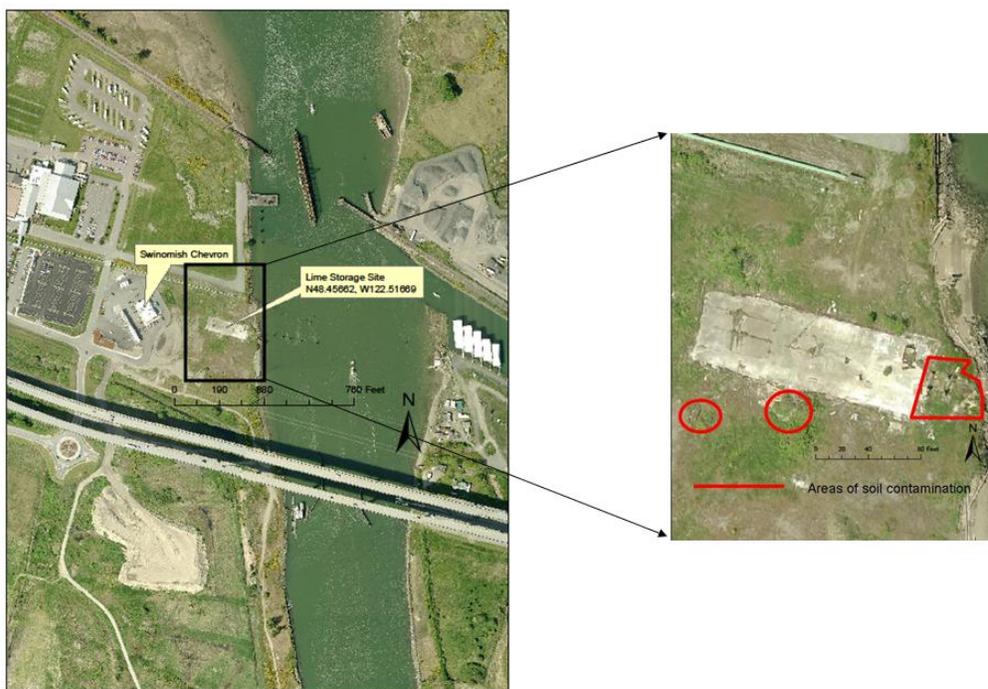


Fig. 1 Swinomish Lime Storage Cleanup site

The Lime Storage Site lies on sandy spoils dredged from the Swinomish Channel by the Army Corps of Engineers in the first half of the 20th century. Before the deposition of these spoils, the entire site was intertidal, either mudflat or salt marsh. During the subsequent channel dredging, the upland area of the site increased in size westward as spoils continued to be deposited on the Reservation.

The initial BIA lease agreement for an area that includes this site dates from 1964, and indicates the intended use was to store “lime, fertilizer, gravel and other materials”. The Lime Storage Site operated for 20 to 30 years, from the mid-1960s to the late 1980s. Other than as the property owner, the Swinomish Tribe had no connection with its operation. Demolition of the building on the site took place *ca.* 2003. A burn pile near the foundation is apparently from an uncontrolled burn of some of the demolition debris.

The environmental concerns associated with this site are the presence of contamination resulting from its use as an agricultural amendment storage area. A Phase II environmental site assessment in 2009 confirmed contamination of the site. The Phase II assessment revealed soil from the largest soil and debris pile south of the building foundation slab contained several contaminants exceeding soil contamination levels accepted by the Tribe as “Applicable or Relevant and Appropriate Requirements” (ARARs) for unrestricted land use. Cadmium in several samples was two orders of magnitude above the ARARs. Moderately high levels of lead and arsenic also exceeded the ARARs. These contaminants likely originated from the agricultural amendments stored at the site.

Samples from a burn pile southwest of the slab contained cadmium above ARARs cleanup levels and also dioxin/furan contamination above the risk-based carcinogen criteria accepted by the Tribe. Dioxins/furans are a complex combination of compounds that are highly poisonous, even in extremely small quantities, and are considered carcinogenic. Dioxin/furan contamination is frequently found where wood debris previously soaked in salt water has been burned. The combustion of chlorine compounds with organic material is believed to be a mechanism for dioxin/furan production.

The areas of the site contaminated above soil cleanup levels appear to be limited to the large debris pile and a smaller burn pile south of the foundation, and the soil matrix at the east end of the foundation, beneath where a conveyor system unloaded material from the channel. No petroleum or pesticide contamination was detected at the site.

Contamination pathways for the contaminant metals and dioxins found at this site are through dermal contact and ingestion as a result of dermal contact. Heavy metals and dioxins are bioaccumulative toxins; therefore the pathway to marine waters is of concern (potentially via surface water runoff or via the shallow water table into the adjacent Swinomish Channel). Contamination of potable groundwater is not a factor at this site. All contaminants of concern found at the site have low solubility in water. Samples of the contaminated soil matrix showed a very low tendency to leach, and the sandy dredge spoils of the site minimize runoff, factors which have apparently tended to keep the contamination localized on site.

In addition to the soil contamination, a substantial amount of creosote-treated wood debris is located on the site. Non-functional creosote-treated wood debris in marine waters is considered to be a contaminant. The Lime Storage Site has approximately 100 creosote-treated pilings within its intertidal area that are non-functional and abandoned marine structures. This project does not involve the larger pier structure just north of the site.

Project objectives:

- 1) Reduce the threat to human health and the environment caused by contaminants at the site or leaving the site.
- 2) Facilitate economic development of the area by the Tribe by removing contamination that may interfere with development of the area.

3) Restore greenspace in the vicinity of currently operating Tribal economic activities (casino, gas station and RV park) and future potential economic activities (hotel and retail stores) currently blighted by the site's building and pier detritus.

Project goals:

- 1) Clean up the site by removing and disposing of contaminated soils until priority contaminants are below ARARs (priority metals) or risk-based criteria (dioxin/furans).
- 2) Clean up the intertidal area of the site by removing and disposing of unused creosote treated-pilings and associated structures.

Project timeline:

The Tribe intends to conduct the cleanup in two phases. In the first phase a contractor will be solicited to remove and dispose of contaminated upland soils. This phase is projected to be completed by the spring of 2011. After the soil cleanup phase is complete, another contractor will be solicited to remove the intertidal creosote pilings and debris associated with the site. The piling removal phase is expected to be completed by the fall of 2011.

Public participation:

On October 12, 2009, a public information meeting on the proposed cleanup was held in the Swinomish Senate conference room. Since then the proposal was accepted by the EPA and a grant awarded.

In addition to material posted on the Swinomish web site (Environmental Management section), an information repository connected with this ongoing project will be maintained at the Swinomish Planning Office, 11430 Moorage Way in La Conner. For information or to comment on the project, interested parties are encouraged to contact the Swinomish Environmental Management program at 360-466-2631, 7299.

Summary of comments and responses from the initial public meeting on the cleanup proposal

1. What was stored at the site?

Site investigation revealed that the predominant use of the site was to store lime amendments for use on surrounding farmlands. Most farmland in the area consists of diked and drained former wetlands. As this soil type is drained, the large amount of organic material in the soil decomposes at a much faster rate, and soil acidity often increases. Lime was used to neutralize this acidity. It is likely that large amounts of agricultural lime were received at this site from barges and redistributed for local use.

2. What is the origin of the contamination found?

Lime itself is not a hazardous material; even though so much of it remains at the site that typical soil pH exceeds 9.0. Site sampling revealed contaminants that likely were the result of processing or storing other types of fertilizers or amendments. Yellow granules visible in the soil matrix are likely sulfur compounds which originated from sulfates. Metals contamination may have originated from hard rock phosphate processed at the

site, an amendment potentially used in quantity on local farmlands over more than 100 years of cultivation. Cadmium, in particular, is known to originate from hard rock phosphate. Dioxins found in the burn pile likely originated from burning wood that had been soaked in salt water (combustion of chlorine compounds with organic material produces dioxins).

2. Where did material from the site come from?

This was not clear. The San Juan Islands historically produced lime, and this location would have been convenient for distribution. Given the large quantities of agricultural amendments used in the area, barge transportation was likely the most economical transport available, regardless of the material's origin, and this location on the channel was ideal for distribution of the material to local farms.

3. What was the site history?

The site was originally an intertidal area at the mouth of the Swinomish Slough on Padilla Bay. The site was converted to uplands by spoils deposited when the Army Corps of Engineers dredged the old Swinomish Slough to create a permanently navigable Swinomish Channel. The Lime Storage Site area was leased to a non-tribal member between 1964 and 1989. During this time a building and pier on the site was used for receiving and storing lime and other agricultural amendments used on local farmland. In the late 1970s adjacent intertidal Reservation areas to the north and west were filled as part of a U.S. Economic Development Administration project. This area eventually became the location of the current Tribal casino, RV park and Chevron gas station. In 2003 the building on the Lime Storage Site was demolished.

4. What are the hazards of the contamination found?

The predominant contaminants above cleanup level were cadmium, lead, arsenic, and dioxin/furans. Dermal contact, but particularly ingestion of the metals resulting from dermal contact, produces heavy metals poisoning, a serious hazard. Dioxin compounds are considered one of the most hazardous environmental contaminants and are carcinogenic even in extremely low concentrations. If any of these contaminants enter the adjacent waters or otherwise enters food webs, they are bioaccumulative in fish, shellfish and wildlife. Creosote-treated wood structures in the water are known to leach a variety of hazardous compounds, the most common being Polycyclic Aromatic Hydrocarbons (PAHs). These compounds are carcinogens and also bioaccumulative.

5. What would be cleaned up?

Soil contamination that is applicable or relevant and appropriate requirements accepted by the tribe for unrestricted land use and debris piles that may contain chemical debris, along with non-functional creosote-treated wood pilings. The foundation slab will not likely be removed during the brownfields cleanup since it is relatively intact and it is not likely to have contaminated soil below it.

6. What is the contamination risk from creosote piling removal?

The risk is relatively low. Sediment around creosote-treated piles is contaminated to a varying degree by material that has leached or physically detached from the piling. Pilings are removed by a vibratory hammer that minimizes sediment disturbance and allows the sediment to collapse into the hole as the piling is removed, thus burying the contamination in sediments that are mostly deeper than the biologically active zone. This is generally considered the best method for piling removal and has been extensively used in the region. Once the

pilings are removed they may be re-cycled for an approved use or transported to and disposed of in an approved landfill.

7. Post-cleanup use of the site.

This was not a question but rather a discussion. Meeting participants agreed this site has high potential for economic development and were aware of discussions for hotel siting. The rehabilitation of a small pier to the north of the site was discussed. The potential addition of a marine fueling capability for both the Tribal fishing fleet and the public at the end of the channel (given the close vicinity of the Tribal gas station) was also suggested as a possible economic improvement with a high payoff.