

# TILLAMOOK BAY AND BAR

Local Sponsor: Port of Garibaldi

## Project Description

The project includes an entrance channel 18 feet deep and as wide as can be practically and economically maintained across the ocean bar to deep water in the bay.

The authorized project also provides for an 18 foot-deep, 200-foot wide channel from deep water in the bay to Miami Cove. However, present uses do not require such dimensions. The Corps maintains an authorized channel 12 feet deep, 100 feet wide, and approximately 1,200 feet long from deep water to the Garibaldi public boat basin near RM 8.2.

An 18 foot-deep, 500-foot wide turning basin used during construction of the jetties is no longer needed and is not maintained to these authorized dimensions. A channel eight feet deep, 75 feet wide, and approximately 1,600 feet long was dredged in the past along the north edge of the old turning basin to provide access to the small boat basin at Old Mill Marina. However, this channel is not currently maintained as the marina is now a privately owned recreation facility and not a public moorage.

## Maintenance

Before completion of the south jetty in 1979, two shoals formed at the entrance to Tillamook Bay each year during late winter and spring. The channel in this reach was maintained by small hopper dredges from June through September. Since completion of the south jetty, maintenance dredging on the bar has not been needed. Deep water in the bay extends to approximately RM 3.0. Moderate shoaling occurs between RM 3.0 and RM 3.2.

The estimated volume and frequency for the dredging the boat basin access channel is 30,000 cy every five to eight years.

## Sediment

In the area of RM 3.2, near the entrance to the boat basin, the sediment is sand and silty sand with an average in-place density of 1,600 grams/liter. From RM 3.2 to RM 3.5, the sediment is generally silt and organic silt, with an average in-place density of 1,500 grams/liter. Sediment samples in 1985 and 1990 were tested for physical and chemical properties including grain size, volatile solids, heavy metals, pesticides/PCBs and PAHs, respectively. The material has been found suitable for unconfined in-water disposal.



## **Sediment Evaluation**

**1980 December**, sediment samples were obtained for elutriate, chemical, and physical analysis from the Tillamook Bay entrance channel and the Garibaldi Boat Basin access channel. Water was collected and chemically analyzed for comparison with the navigation channel elutriates.

**1985 May and July**, sediment was collected from the Garibaldi Boat Basin access channel for physical and chemical analysis.

**1990 March**, sediment samples were collected at 6 stations along the channel fronting the Garibaldi Boat Basin and the entrance to the basin. Sediments outside the entrance were predominately sandy material with increasing amounts of gravel towards the mouth of the Miami River. Samples from the boat basin entrance channel were fine grained material (fines 50.3% to 71.5%) with volatile solids ranging from 7.3% to 11.6%. Material was similar to material collected in 1980 and 1985. Arsenic, copper, and nickel were elevated compared to other Oregon locations but not above established concern levels. All other potential contaminants for which analyses were conducted were below method detection limits. All material was considered to be acceptable for unconfined in-water placement.

**September 1999**. Six sediment samples were collected in Tillamook Bay at Garibaldi Boat Basin, September 15, 1999. All 6 samples were sent to Sound Analytical Services, Inc. laboratory in Tacoma, WA, for physical analyses and for the following chemical analyses: metals, total organic carbon (TOC), pesticides/polychlorinated biphenyls (PCBs), phenols, phthalates, chlorinated organic compounds, miscellaneous extractables, and polynuclear aromatic hydrocarbons (PAH). Samples from 3 stations within the boat basin were composited for tributyltin (TBT).

Median grain size for all samples is 0.07mm, with 54.1% sand and 47.5% fines. The chemical analyses, for all but one contaminate of concern, were below screening levels of the DMEF. The non-carcinogenic PAH, fluoranthene, exceeded the 1700 ug/kg (ppb) screening level with a concentration of 2900 ug/kg level in the TB-BC-05 sample. The DEQ cleanup level for fluoranthene in soil is 8,000 mg/kg (ppm).

All sediments tested were placed in an upland site with monitoring of return water to Tillamook Bay during the 84-hour period of time the dredge was operating in the vicinity of the material represented by the sample of concern.

Fourteen water samples were collected during the 84-hour period and were composited into 3 samples for analysis of all PAHs. The laboratory report showed non-detect (ND) at the method detection limit (MDL) for all samples.

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**August 2007.** One (1) gravity core sample and 4 surface grab samples were collected in the Tillamook Bay federally maintained channel near the boat basin. All samples were submitted for physical analyses, with grain-size ranging from 68.4% to 32.5% (mean 43.3%) poorly graded sand (includes shell hash), silt and clay ranged from 67.5% to 31.6% (mean 56.7%), with total organic carbon content ranging from 3.6% to 1.5% (mean 2.6 %). All samples were submitted for chemical analyzes to include: metals, total organic carbon (TOC), pesticides/polychlorinated biphenyls (PCBs), phenols, phthalates, miscellaneous extractables, polynuclear aromatic hydrocarbons (PAHs) and organotin (TBT) (total) analysis.

The chemical analyses indicated only very low levels of contamination in any of the samples. Laboratory detection levels were sufficiently low enough to evaluate material proposed for dredging.

Sediment represented by samples collected during this sampling event meet the guidelines established in the SEF for unconfined in-water placement without further characterization.