# YAQUINA BAY AND HARBOR

Local Sponsor: Port of Newport

## Project Description

The entrance channel, authorized at 400 feet wide and 40 feet deep, runs from deep water approximately one mile to RM 0.0. In the past, this area was dredged to a depth of 35 feet, but since the return of deeper draft vessels in 1988, dredging is to the authorized depth of 40 feet.

From RM 0.0, the authorized channel is 30 feet deep and 300 feet wide to the turning basin at McClean Point at RM 2.0. The turning basin is authorized at 30 feet deep, 900 to 1,200 feet wide, and 1,400 feet long. The channel from the turning basin (RM 2.4) to Yaquina (RM 4.0) is 18 feet deep and 200 feet wide.

The project includes a small 10-foot-deep boat basin ("north basin") at Newport. East of the highway 101 bridges is the South Beach Marina with an authorized access channel 10 feet deep, 100 feet wide, and 2,035 feet long.

## Maintenance: Yaquina Bay Entrance

A cross channel shoal develops at the entrance to Yaquina Bay. The shoal builds off the ends of the jetties during the winter and spring, between RM -0.6 and 0.0. A hopper dredge removes the sediment from May through October. The entrance is dredged to between 42 and 44 feet to ensure that the full depth is available between dredging operations. Adverse sea and weather conditions typically prevent dredging during the rest of the year. The south side of the channel between RM 0+05 and RM 0+22 is not dredged deeper than 40 feet due to the presence of a rock outcropping.

## Maintenance: Yaquina Bay

Shoaling occurs along the outside quarter of the channel between RM 1.3 and RM 1.6, and around the periphery of the turning basin. The shoals will be removed using hopper dredges or clamshell dredges and barges. The Corps does not currently maintain the channel from the turning basis to RM 4.0. Dredging to 32 to 33 feet ensures the needed year-round depths of 30 feet.

The access channel to the South Beach Marina boat basin is dredged as needed.

Sediment

The sediment at the entrance is sand, with an average in-place density of 2,000 grams/liter. The sediment from RM 1.0 to 2.4 is poorly graded sand and silty sand, having an average in-place density ranging from 1,500 to 1,900 grams/liter. Sediment from the Southbeach Marina is composed of silty sand and sandy silt with median grain size ranging from 0.09 mm to 0.15 mm. Resuspended density ranges from 1361 to 1628 grams/liter. Sediment evaluations have included physical, chemical, and biological testing and have showed the material suitable for unconfined in-water disposal.

**Sediment Evaluation**

**1980 June**, Sediments were subjected to elutriate, benthos, and/or physical analyses from the Yaquina River and Bay navigation channel from RM 0.0 to RM 14.0. Sediments were also collected from Depot Slough. Sediments from RM 0.0 to RM 2.8 are very clean sands and could be excavated and placed without restriction. Material from Yaquina River and Depot Slough would require further evaluation including bioassays.

**1981 March**, Sediments from Depot Slough were subjected to "jar tests" to determine the best flocculent to use for settling sediments discharged into an upland disposal facility. Disposal facility design and flocculent application methods were presented.

In **1986 July** sediments were taken at various locations from the mouth of the Yaquina River to the turning basin at river mile 2.4. Eleven sediment samples were collected. Sample #11 was collected from the boat harbor, the rest from shoals that were to be dredged. Physical and chemical analyses were performed on all samples except #11 (no chemical analysis).

**1990 April**, 11 samples were collected from the federal channel between RM -0.5 to RM 2.4. All samples were subjected to physical analysis while samples YQ-BC-9 & 10 were also subjected to chemical analyses. Based upon the analyses performed all material to be dredged from the main federal channel was considered to be suitable for unconfined in-water disposal.

**1990 April**, 14 samples were collected outside of the federal channel at the same time as the federal channel sediment mentioned above. Funded by EPA, Region 10 the purpose for these samples was to provide basin wide sediment characterization at Yaquina Bay. Sampling stations were located in marinas, backwater areas, and up river. These sediments were finer (38.6% fines) and had higher organic content (6.5% volatile solids). Due to contamination by TBT and phenols the Southbeach Marina sediments required additional testing and evaluation prior to dredging and disposal.

**1991 May**, 6 sediment samples were collected along the federal navigation channel in the Southbeach Marina and subjected to physical, chemical, and biological analyses. The material was composed of silty sand and sandy silt. Median grain size ranged from 0.09 mm to 0.15 mm, percent fines ranged from 15.9% to 65.4% with a mean of 33.9%. Volatile solids ranged from 2.2% to 9.4% with a mean of 5.52%. All chemical analyses indicated chemical contamination was below established levels of concern. Biological testing further indicated that no unacceptable adverse environmental impacts would be expected due to dredged material disposal. The material was subsequently dredged by a small pipeline dredged and the material placed upland.

**1995 March**, 7 sediment samples were collected from various locations in the federal channel and Southbeach Marina. Two samples from the Southbeach Marina and 1 sample from the turning basin at RM 2.5 were subjected to chemical as will as physical analysis. Material from the main federal channel was sandy with low volatile solids (0.7% to 1.2 %). Material from Southbeach Marina and the turning basin were finer (median grain size 0.03 mm, 0.07 mm & 0.15 mm) and had higher organic content (7.2%, 8.5%, & 3.6% volatile solids) than the federal

channel. Chemical analyses included 8 metals, 19 pesticides, 7 PCB arochlors, 18 PAHs, 14 phenols, butyltins, AVS, and TOC. Contaminate levels were all below established levels of concern and the material determined to be suitable for unconfined in-water or upland disposal.

**May 31, 2000.** Prior to potential maintenance dredging, nine sediment samples and 1 QC duplicate were collected from Yaquina Bay and South Beach Marina on May 31, 2000. All samples were submitted to Sound Analytical Services for physical analyses, with 4 samples analyzed for metals (9 inorganic), total organic carbon (TOC), pesticides/polychlorinated biphenyls (PCBs), phenols, phthalates, miscellaneous extractables, polynuclear aromatic hydrocarbons (PAHs) and 3 samples submitted for organotin (TBT) analysis.

Materials represented by all samples collected during this sampling event met Tier II guidelines of the Dredge Material Evaluation Framework (DMEF) and have been determined suitable for open inwater, unconfined placement without further characterization.

**2005 September**, On September 12, a total of 10 samples were collected from shoaling areas at 7 stations within the federally maintained entrance channel and harbor and 3 additional stations within South Beach Marina channel. All samples were submitted for a full suite of physical and chemical parameters as outlined in the DMMF (1998) Tier II a & b. Federal Navigational Channel (FNC) samples submitted were classified as "poorly graded sand". Mean grain-size for FNC samples is 0.18 mm, with 0.2% gravel (0.0%-1.2% range), 91.6% sand (62.3%-99.3% range) and 8.4% silt/clay (0.7%-37.6% range). Mean volatile solids were 2.7%, with a 0.4% to 13.8% range. Sample from the South Beach Marina channel had a mean grain-size of 0.09mm, with 0.6% gravel (0.0%-1.7% range), 48.2% sand (12.1%-71.7% range) and 42.8% silt/clay (28.3%-86.2% range). Mean volatile solids were 8.0%, with a 5.8% to 9.2% range.

The chemical analyses indicated only very low levels of contamination in any of the samples, with all levels well below their respective DMEF screening levels (SLs). Detection levels were sufficiently below the SL to evaluate material proposed for dredging.

Monobutyltin, which does not have an established DMEF SL, was detected in 2 samples within the South Beach Marina federally maintained channel. The levels (0.937ug/L and 0.166ug/L) are below calculated effects level concentrations*(see reference). Sediment data, from samples collected within the South Beach Marina federally maintained channel, has been submitted to the Regional Sediment Management Team for their determination as to suitability for in-water placement. The $K_{ow}$* is very low for monobutyltin, so it would take high environmental concentrations for any significant amounts to be bioaccumulated (ref. NOAA fisheries, J. Meador).

Sediments represented by all samples in Yaquina Bay FNC are determined to be suitable for unconfined, in-water placement without further characterization.

# YAQUINA RIVER

Local Sponsor: Port of Toledo

## Project Description

The authorized project in the Yaquina River consists of a channel 10 feet deep running from approximately RM 4.0 (at the town of Yaquina) to RM 14.0. Generally, the channel is 150 feet wide. At Toledo, the channel widens to 200 feet, and extends into Depot Slough. A turning basin at RM 14.0,350 feet wide and 500 feet long, completes the project.

## Maintenance

The Yaquina River shoals very slowly and requires little maintenance. The following aerial photos show the usual patterns of shoaling.

The Yaquina River has required maintenance about every 10 or 15 years. Pipeline dredges have worked the Yaquina River in the past. Dredging in the river segment itself is not anticipated in the near future.

## Sediment

The average in-place density of sediment in the Yaquina River ranges from 1,700 to 1,800 grams/liter. Sediment in Depot Slough has an average in-place density of 1,175 grams/liter; if further dredging is needed here, chemical testing will determine appropriate disposal alternatives.

**Sediment Evaluation**

**1980 June**, Sediments were subjected to elutriate, benthos, and/or physical analyses from the Yaquina River and Bay navigation channel from RM 0.0 to RM 14.0 and from Depot Slough. Material from Yaquina River and Depot Slough would require further evaluation including bioassays.

**1981 March**, Sediments from Depot Slough were subjected to "jar tests" to determine the best flocculent to use for settling sediments discharged into an upland disposal facility by pipeline dredge. Disposal facility design and flocculent application methods were presented.

**1994 February**, 6 sediment samples were collected between RM 6.0 and RM 11.0 for physical analyses and to determine if the material was suitable for oyster habitat. The sediments were found to be predominantly clean sand (80.6 to 97.6%) with a small amount of silt (2.7 to 19.4%). Mean median grain size was 0.29 mm, a medium sand. Sediment samples were also collected from Depot Slough and subjected to physical as well as bulk and elutriate chemical analyses. Chemical analyses included 8 metals, 19 pesticides, 7 PCB arochlors, 18 PAHs, 14 phenols, butyltins, AVS, and TOC. Contaminate levels were all below established levels of concern and the material determined to be suitable for unconfined in-water or upland disposal.