

Portland District

To link a rapidly developing and sprawling nation, the Congress in 1824 delegated the responsibility for building canals and improving natural harbors and waterways to the U.S. Army Corps of Engineers. Since that time, a major role of the Corps of Engineers has been to develop and maintain rivers and harbors to accommodate the expansion of waterborne commerce.

The importance of the Columbia and Willamette rivers to the economy of the Northwest led to the establishment of the Portland District in 1871. At first, one of the main goals of the District was to remove obstacles to navigation in the two rivers.

Today, the region's commercial development is still dependent on safe passage of sea-going ships across the bars and up the waterways. The Portland District's hopper dredges, *Yaquina* and *Essayons*, help maintain the harbors and river inlets for navigation. Contractor-owned pipeline

and bucket dredges perform the majority of dredging in the river channels.

In addition to working the Oregon harbors and others in California, Washington and Alaska, the District's dredges are assigned as needed to the Hawaiian Islands.



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US Army Corps
of Engineers®

Portland District



BUILDING STRONG®

About the dredge

The U.S. Army Corps of Engineers' hopper dredge *Essayons*, operated by a merchant marine crew, was delivered to the Portland District in 1983. The *Essayons* helps maintain the entrance bars, rivers and harbors on the coasts of California, Oregon, Hawaii, Alaska and, in emergencies, the Mississippi River. Because of its size and dredging depth, the *Essayons* is particularly well-suited for dredging the larger coastal entrances.

Designed to operate anywhere in the world, the *Essayons* is automated for operation with a semi-automatic dragarm handling system.

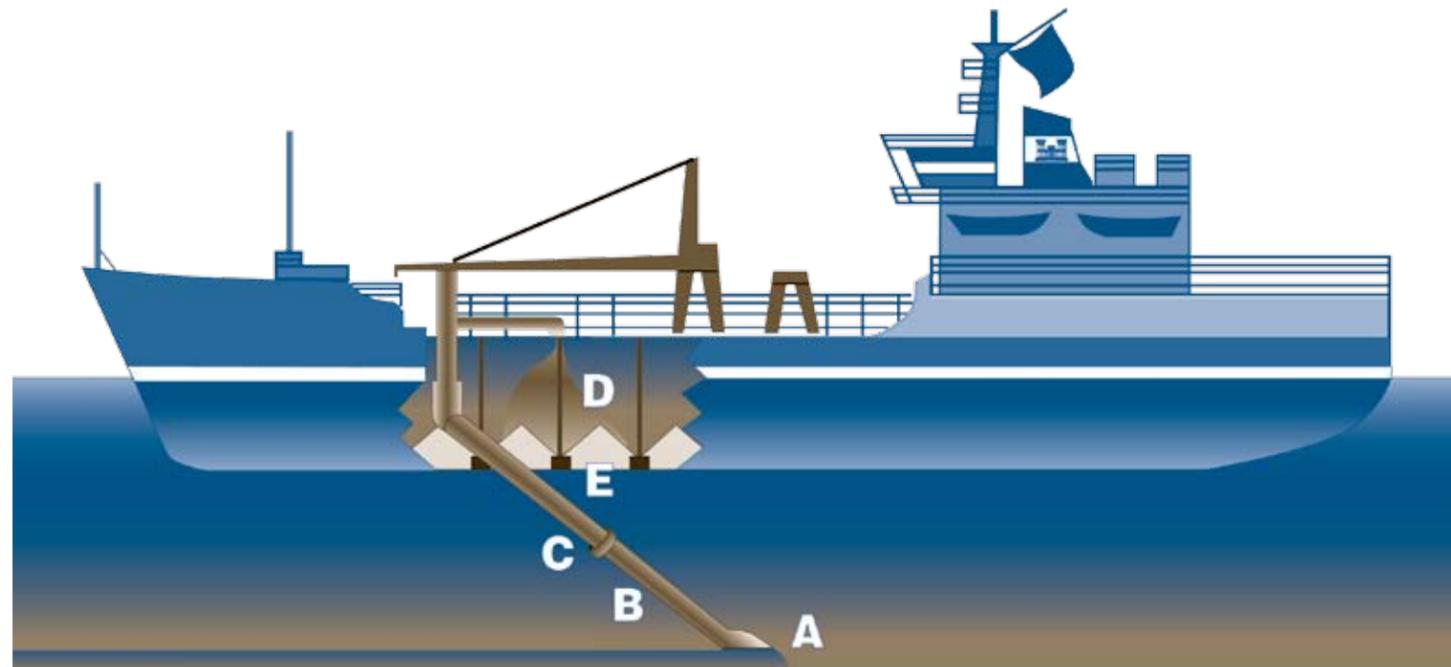
Sophisticated instrumentation allows constant production monitoring and enables the dredge crew to maintain maximum dredging efficiency 24 hours a day. The *Essayons* also is equipped for direct pumpout.

The *Essayons*' crew consists of 46 civil service mariners. The crew is divided into two operating tours each of 23 men and women. Each tour normally alternates an 8-day-on/6-day-off schedule of 10 hours a day, with both crews working the day shift on crew change days.



Hopper dredge dragarm

Hopper Dredge *Essayons*



Hopper dredge components

Hopper dredges are seagoing vessels designed to dredge and transport dredged material to open-water relocation areas. The working of a hopper dredge is similar to that of a vacuum cleaner.

Dragheads (A) with dragarms (B) extend from each side of the ship's hull. The dragheads are lowered to the channel bottom and slowly pulled over the area to be dredged. The submerged pumps (C) create suction in the dragarm and the silt or sand is drawn up through the arms and deposited in hopper bins (D) in the vessel's midsection. When the bins are full, the dredge sails to the designated disposal area and empties the dredged material through large hopper doors (E) in the bottom of the hull.

Hydrographic survey boats, using sophisticated electronic equipment, survey the river and harbor bottoms to determine if dredging is required and, after dredging is completed, to ensure that the desired channel depths have been attained.

The *Essayons* was designed by the U.S. Army Corps of Engineers and constructed by the Bath Iron Works of Bath, Maine, in 1982.



Hopper dredge physical features

Dredge *ESSAYONS*

Hull

Length over all.....	350'
Beam.....	68'
Height (Keel to Mast).....	126'
Minimum Height Clearance.....	110'
Mean draft.....	18.5'

Draft

Light.....	22'
Loaded.....	32'
Displacement.....	7,248 Long tons
Deadweight Tonnage.....	9,500 Long tons
Hopper Volume.....	6,423 cy

Dredging Depth

Normal Dredging Depth.....	from 35'..... to 80'
Extended Dragarms.....	from 80'..... to 94'
Minimum Disposal Depth.....	4' keel clearance
(Calm Condition - Min 36' depth of water required at zero tide)	

Main Propulsion Engines

Two - Tier II C-280-12 Diesels	4,640 hp each (900 RPM)
Manufacturer.....	Caterpillar
Reduction Gears 5.792 to 1.....	Haley

Ship Service Generator Engines

Three - Tier II C-3512.....	1,207 h.p. (1030 KW) Each
Manufacturer.....	Caterpillar / KATO

Dredge Pumps

Pumps, two -Tier II C-280 Diesels.....	4,640 h.p. each
Generators, two mounted on dragarm 600 V KATO.....	1650 h.p. each
Two, mounted inboard.....	3000 h.p.
Intake.....	28"
Discharge.....	26"

Vessel Speed

Light.....	13.8 Knots
Loaded.....	13.5 Knots

