



PORTLAND INTERNATIONAL AIRPORT

Deicing System Enhancement

 PORT OF PORTLAND

Portland International Airport (PDX) Operations Overview

The Port of Portland operates PDX, which serves more than 14 million travelers annually. PDX is the 34th largest passenger airport and 24th largest cargo airport in the United States. Fourteen passenger airlines provide nonstop service to 42 domestic destinations and four international cities.

Portland is served by 11 all-air cargo carriers, including a non-stop cargo link to Asia. The airport is also home to the 142nd Fighter Wing of the Oregon Air National Guard.



Why do we deice?

The Federal Aviation Administration (FAA) regulates aircraft and airfield deicing for flight safety. Airlines apply anti-icing and deicing materials to prevent or remove ice and snow from aircraft. The Port applies anti-icing and deicing materials to pavement when freezing precipitation is imminent or occurring.

What is the PDX deicing system?

The Port constructed a \$31 million system, financed by PDX airlines and the FAA, to collect deicing runoff for monitoring, treatment, and controlled release into the Columbia Slough; the system began operating in the fall of 2003. PDX airlines pay the approximately \$1 million in annual operating costs of the system, which the Port operates.

What happens to the deicing materials after they're applied to aircraft and runways?

When deicing occurs at PDX, some of the material is collected by Glycol Recovery Vehicles, which vacuum up concentrated runoff from aircraft deicing and anti-icing operations. The remainder of the runoff is collected by the airport's drainage system except in Basin 1, which is not currently collected. The deicing material passes through the drainage system, where it is tested by Biochemical Oxygen Demand ("BOD") meters. The meters determine if the material goes to the concentrated system (and to the City of Portland's wastewater treatment plant) or the dilute system. The dilute system discharges into the Columbia Slough under the conditions of a National Pollutant Discharge Elimination System (NPDES) permit issued by the Oregon Department of Environmental Quality (DEQ).

What is ultimately discharged into the Slough?

The discharge consists of dilute deicing materials that have mixed with stormwater to create runoff. The discharge contains glycol, a form of alcohol, plus other deicing materials (formates and acetates). Although deicing materials are biodegradable, the biodegradation process can temporarily reduce the amount of dissolved oxygen in water. The reduced levels of dissolved oxygen can be unhealthy for aquatic life.

Why do we need to enhance the PDX deicing system?

The system has proven effective at collecting deicing runoff from around the terminals and the majority of runways and taxiways. However, the system does not currently collect runoff from Basin 1, which includes the western half of the airfield. This situation, in combination with low or non-existent water flows in the Columbia Slough, has caused exceedances of permit limits. The Port completed and the airlines paid for \$4 million in improvements to the system since operation began in 2003, but more significant infrastructure enhancements are necessary to ensure permit compliance. In 2006, DEQ issued a Mutual Agreement and Order (MAO) to the Port to bring the deicing system into compliance with environmental requirements.

What kinds of improvements are being added?

- On-airport treatment facility using anaerobic treatment technology that will treat concentrated effluent prior to discharge to the Columbia River in compliance with permit requirements
- Increased storage capacity for both concentrated and dilute runoff
- A new, permitted Columbia River outfall
- Expansion of the area collected within the system to include the west airfield at PDX

The enhanced system will be able to capture more of the available deicing material for treatment and metered discharge. With the enhanced system, the Port will see, on average, an 89 percent reduction in biochemical oxygen demand discharged to the Columbia Slough.

Which regulatory agencies are involved?

The Port consults with local, state, and federal regulatory agencies to ensure the PDX deicing system meets all applicable requirements to protect human health, the environment, and aquatic life. The U.S. Army Corps of Engineers is the lead federal agency for environmental review of the project under the National Environmental Policy Act and will be issuing a permit to the Port under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act in fall 2009.

The Oregon Department of Environmental Quality oversees the system's National Pollution Discharge Elimination System permit. DEQ approved the NPDES permit in June 2009 after a 45-day public comment period and public hearing. The permit sets limits on discharges to the Columbia Slough and Columbia River, establishes monitoring and reporting requirements, and requires the Port to submit Standard Operating Procedures for the Deicing System to DEQ by October 1, 2010.

The National Marine Fisheries Service is responsible for reviewing the project for potential impacts to endangered species. In September 2009, NMFS issued a Biological Opinion that found no significant impacts from project construction to endangered salmon in the Columbia or Lower Willamette rivers.

What's next in the project?

Construction began in fall 2009. Work is anticipated to continue into the early winter of 2010 and includes modifying two existing pump stations and adding six miles of underground pipe, three new pump stations, a new treatment facility, and new storage facilities. With the enhanced system, storage capacity for both dilute and concentrated deicing runoff will double. After the construction period, the contractor will commission the new system over the 2010-2011 winter. During the 2011-2012 winter, the Port will conduct start-up testing. We are required to have a fully operational expanded system by April 2012, our compliance date with DEQ.

May 2007	June 2009	November 2009	January 2010	December 2010	August 2011	April 2012
<i>Enhancement alternative selected; schematic design begins</i>	<i>Final system design complete</i>	<i>In-water work begins in Columbia River</i>	<i>Treatment facility construction begins</i>	<i>Enhanced system and new outfall construction complete</i>	<i>Treatment system operational; system commissioning complete</i>	<i>System start-up complete</i>

Need more information?

To join the project's e-mail list, please visit the PDX Deicing page under the Projects and Plans section on the Port of Portland's Web site at www.portofportland.com and sign up for e-mail notification, or call Rachel Wray at 503-944-7047.