

Petroleum Refineries

Petroleum refineries process crude oil into many types of fuels and other useful products.

There are 22 facilities that fall under SIC code 2911 Petroleum Refining (Ecology, 1/20/98). The largest petroleum refineries in Washington are under the jurisdiction of the Northwest Air Pollution Authority (NWAPA).

Description of Process

Petroleum refineries are best represented by the Standard Industrial Classification (SIC) of 2911 *Petroleum Refining*. Other SIC codes which apply to petroleum processing include 2800 *Chemicals and Allied Products*, 4491 *Marine Cargo Handling*, and 5171 *Petroleum Bulk Stations and Terminals*.

Oil refineries are comprised of a series of complex processes which vary according to crude oil processing design, the technology which is utilized, and a number of other factors. Crude oil can be converted into thousands of products such as gasoline, kerosene, jet fuel, diesel fuel, and a myriad of other products. Refinery processes can be characterized by five major operations: (AP-42¹)

- I. Separation
- II. Petroleum conversion
- III. Petroleum treating
- IV. Feedstock and product handling
- V. Auxiliary facilities

These operations consist of an integrated system of distillation towers, boilers, process heaters, blowdown systems, cooling towers, catalytic crackers, pumps, valves, drains, flanges, storage tanks, and a variety of other equipment and processes. Please see the Cooling Towers section for related information.

Methods of Determining Emissions

If no source-specific source tests are available, it is recommended to use emissions factors from AP-42.

MACT standards apply or are being developed for specific emission units at petroleum refineries. Among them are:

- Petroleum refineries NESHAP (July 31, 1995): Includes standards for petroleum refinery process units, marine tank vessels loading operations, gasoline loading rack operations, equipment leaks, and VOC emissions from petroleum refinery wastewater systems.
- Standards for catalytic cracking, catalytic reforming, and sulfur plant units (scheduled for proposal in June 1998 and promulgation in September 1999).

¹ U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emissions Factors Volume 1: Stationary Point and Area Sources*, Fifth Edition with Supplements, October 1997, Document No. AP-42.

References

Keel, Lester, Northwest Air Pollution Authority, 360-428-1617. Personal communication.

U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emissions Factors Volume 1: Stationary Point and Area Sources*, Fifth Edition with Supplements, January 1995, Document No. AP-42. (Section 5.1 Petroleum Industry, January 1995)
(available by section on Internet at <http://www.epa.gov/ttn/chief/ap42.html>)

Washington State Department of Ecology, *Facility/Site on the Web*, accessed 1/20/98.
(<http://www.wa.gov/ecology/iss/fsweb/fshome.html>)