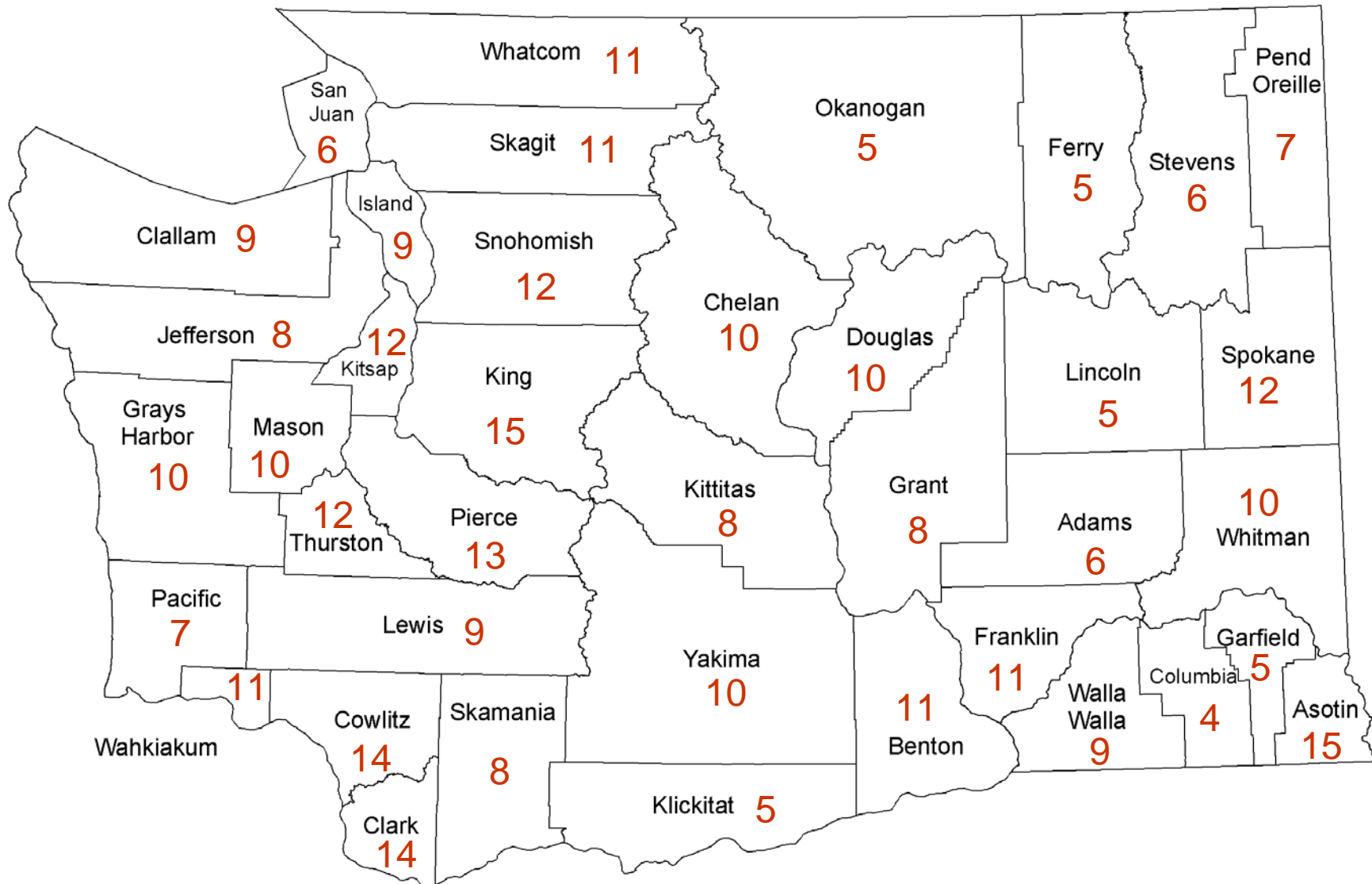


1999 NATA List of Top Toxic Air Pollutants in Washington State



1999 NATA List of Toxic Air Pollutants Modeled in Washington State

The 1999 NATA identifies these 19 pollutants as the air toxics of highest concern in Washington State.

Top Chemicals	Source
Acrolein This is the only non-cancer causing chemical on the list.	Wood burning (forest fires, field burning, fireplaces); vehicle/engine exhaust; pulp/paper mills
<i>Listed in order of importance</i>	
Diesel particles ¹	Exhaust from diesel engines
Formaldehyde ²	Vehicle/engine exhaust, wood burning; other combustion; pulp/paper/plywood mills
Benzene	Vehicle/engine exhaust; petroleum refineries; gasoline fueling; other combustion
Top Chemicals	
Source	
Ethylene dibromide	Historically used in leaded gasoline; pesticides; Projected at a similar background level in each county in Washington
Butadiene	Vehicle/engine exhaust; wood burning; industrial processes – mainly petroleum refineries
Chloroform	Publicly owned treatment works (sewage treatment plants); consumer products
Carbon tetrachloride	No longer in use; historical use as a solvent or degreaser; Projected at a similar background level in each county in Washington
Acetaldehyde	Vehicle/engine exhaust; pulp/paper mills; wood burning; other combustion
Tetrachloroethane	Rarely used today to produce other chemicals; historical use in paints, solvents, and pesticides; Projected at a similar background level in each county in Washington
Naphthalene	Burning of wood and fossil fuels; moth repellants; industrial discharges; vehicle/engine exhaust

¹ Diesel is evaluated using the California EPA toxicity value.

² Formaldehyde is evaluated using the EPA IRIS toxicity value.

Top Chemicals	Source
Chromium VI	Industries – largely chrome electroplaters
Bis (2-ethylhexyl) phthalate (DEHP)	Plasticizer used in industry in most plastic containers; Projected at a similar background level in each county in Washington
Polycyclic Organic Matter Group 1	Fires; burning fossil fuels; vehicle/engine exhaust; aluminum plants. POM compounds are formed primarily from combustion and are present in the atmosphere as particles.
Ethylene dichloride	Chemical manufacturing, production of vinyl chloride
Quinoline	Aluminum plants (shut down)
Trichloroethylene	Industrial degreaser
Tetrachloroethylene (PERC)	Dry cleaning; solvent for metal degreasing
Arsenic Compounds	Burning coal or fuel oil; metals production; refineries; pulp/paper mills

County Distribution

The chemicals appear in order of importance.

1. Adams County: 6

Diesel particles; Formaldehyde; Benzene;
Acetaldehyde; Carbon tetrachloride; Bis (2-ethylhexyl) phthalate;

2. Asotin County: 15

Acrolein : Diesel particles; Formaldehyde; Benzene;
Butadiene; Ethylene dibromide; Acetaldehyde; Naphthalene; Chloroform; Carbon tetrachloride; Tetrachloroethane; Bis (2-ethylhexyl) phthalate; Tetrachloroethylene; Trichloroethylene; Arsenic Compounds

3. Benton County: 11

Acrolein; Diesel particles; Formaldehyde; Benzene;
Butadiene; Ethylene dibromide; Acetaldehyde; Chloroform; Carbon tetrachloride; Tetrachloroethane; Bis (2-ethylhexyl) phthalate

4. Chelan County: 10

Diesel particles; Formaldehyde; Benzene;
Ethylene dibromide; Acetaldehyde; Chloroform; Carbon tetrachloride; Tetrachloroethane; POM Group 1; Bis (2-ethylhexyl) phthalate

5. Clallam County: 9

Diesel particles; Formaldehyde; Benzene;
Ethylene dibromide; Acetaldehyde; Chloroform; Carbon tetrachloride;
Tetrachloroethane; Bis (2-ethylhexyl) phthalate

6. Clark County: 14

Diesel particles; Formaldehyde; Benzene;
Butadiene; Ethylene dibromide; Chromium VI; Naphthalene; Chloroform; Carbon
tetrachloride; Tetrachloroethane; POM Group 1; Bis (2-ethylhexyl) phthalate;
Tetrachloroethylene; Acrolein

7. Columbia County: 4:

Diesel particles; Formaldehyde;
Carbon tetrachloride; Bis (2-ethylhexyl) phthalate

8. Cowlitz County: 14

Acrolein; Diesel particles; Formaldehyde; Benzene;
Butadiene; Ethylene dibromide; Chromium VI; Naphthalene; Chloroform; Carbon
tetrachloride; Tetrachloroethane; POM Group 1; Bis (2-ethylhexyl) phthalate; Quinoline

9. Douglas County: 10

Diesel particles; Formaldehyde; Benzene;
Ethylene dibromide; Acetaldehyde; Chloroform; Carbon tetrachloride;
Tetrachloroethane; POM Group 1; Bis (2-ethylhexyl) phthalate

10. Ferry County: 5

Diesel particles; Formaldehyde; Benzene;
Carbon tetrachloride; Bis (2-ethylhexyl) phthalate

11. Franklin County: 11

Acrolein; Diesel particles; Formaldehyde; Benzene;
Butadiene; Ethylene dibromide; Acetaldehyde; Chloroform; Carbon tetrachloride;
Tetrachloroethane; Bis (2-ethylhexyl) phthalate

12. Garfield County: 5

Diesel particles; Formaldehyde; Benzene;
Carbon tetrachloride; Bis (2-ethylhexyl) phthalate

13. Grant County: 8

Diesel particles; Formaldehyde; Benzene;
Ethylene dibromide; Acetaldehyde; Carbon tetrachloride; Tetrachloroethane; Bis (2-
ethylhexyl) phthalate

14. Grays Harbor County: 10

Diesel particles; Formaldehyde; Benzene;
Ethylene dibromide; Acetaldehyde; Chloroform; Carbon tetrachloride;
Tetrachloroethane; Tetrachloroethane; Bis (2-ethylhexyl) phthalate

15. Island County: 9

Diesel particles; Formaldehyde; Benzene;
Ethylene dibromide; Acetaldehyde; Chloroform; Carbon tetrachloride;
Tetrachloroethane; Bis (2-ethylhexyl) phthalate

16. Jefferson County: 8

Acrolein; Diesel particles; Formaldehyde; Benzene;
Acetaldehyde; Chloroform; Carbon tetrachloride; Bis (2-ethylhexyl) phthalate

17. King County: 15

Acrolein; Diesel particles; Formaldehyde; Benzene;
Butadiene; Ethylene dibromide; Chromium VI; Acetaldehyde; Naphthalene; Chloroform;
Carbon tetrachloride; Tetrachloroethane; POM Group 1; Bis (2-ethylhexyl) phthalate;
Tetrachloroethylene

18. Kitsap County: 12

Acrolein; Diesel particles; Formaldehyde; Benzene; Butadiene; Ethylene dibromide;
Chromium VI; Naphthalene; Tetrachloroethane; Chloroform; Carbon tetrachloride; Bis
(2-ethylhexyl) phthalate

19. Kittitas County: 8

Diesel particles; Formaldehyde; Benzene;
Acetaldehyde; Chloroform; Carbon tetrachloride; Tetrachloroethane; Bis (2-ethylhexyl)
phthalate

20. Klickitat County: 5

Diesel particles; Formaldehyde; Benzene;
Carbon tetrachloride; Bis (2-ethylhexyl) phthalate

21. Lewis County: 9

Diesel particles; Formaldehyde; Benzene;
Ethylene dibromide; Acetaldehyde; Chloroform; Carbon tetrachloride;
Tetrachloroethane; Bis (2-ethylhexyl) phthalate

22. Lincoln County: 5

Diesel particles; Formaldehyde; Benzene;
Carbon tetrachloride; Bis (2-ethylhexyl) phthalate

23. Mason County: 10

Acrolein; Diesel particles; Formaldehyde; Benzene;
Ethylene dibromide; Acetaldehyde; Chloroform; Carbon tetrachloride;
Tetrachloroethane; Bis (2-ethylhexyl) phthalate

24. Okanogan County: 5

Diesel particles; Formaldehyde; Benzene;
Carbon tetrachloride; Bis (2-ethylhexyl) phthalate

25. Pacific County: 7

Diesel particles; Formaldehyde; Benzene;
Acetaldehyde; Chloroform; Carbon tetrachloride; Bis (2-ethylhexyl) phthalate

26. Pend Oreille County: 7

Acrolein; Diesel particles; Formaldehyde; Benzene;
Acetaldehyde; Carbon tetrachloride; Bis (2-ethylhexyl) phthalate

27. Pierce County: 13

Acrolein; Diesel particles; Formaldehyde; Benzene;
Butadiene; Ethylene dibromide; Chromium VI; Naphthalene; Tetrachloroethane;
Chloroform; Carbon tetrachloride; POM Group 1; Bis (2-ethylhexyl) phthalate

28. San Juan County: 6

Diesel particles; Formaldehyde; Benzene;
Acetaldehyde; Carbon tetrachloride; Bis (2-ethylhexyl) phthalate

29. Skagit County: 11

Acrolein; Diesel particles; Formaldehyde; Benzene;
Butadiene; Ethylene dibromide; Acetaldehyde; Chloroform; Carbon tetrachloride;
Tetrachloroethane; Bis (2-ethylhexyl) phthalate

30. Skamania County: 8

Acrolein; Diesel particles; Formaldehyde; Benzene;
Acetaldehyde; Chloroform; Carbon tetrachloride; Bis (2-ethylhexyl) phthalate

31. Snohomish County: 12

Diesel particles; Formaldehyde; Benzene;
Butadiene; Ethylene dibromide; Chromium VI; Naphthalene; Tetrachloroethane;
Chloroform; Carbon tetrachloride; Bis (2-ethylhexyl) phthalate

32. Spokane County: 12

Acrolein; Diesel particles; Formaldehyde; Benzene;
Butadiene; Ethylene dibromide; Acetaldehyde; Naphthalene; Tetrachloroethane;
Chloroform; Carbon tetrachloride; Bis (2-ethylhexyl) phthalate

33. Stevens County: 6

Diesel particles; Formaldehyde; Benzene;
Acetaldehyde; Carbon tetrachloride; Bis (2-ethylhexyl) phthalate

34. Thurston County: 12

Acrolein; Diesel particles; Formaldehyde; Benzene;
Butadiene; Ethylene dibromide; Acetaldehyde; Naphthalene; Tetrachloroethane;
Chloroform; Carbon tetrachloride; Bis (2-ethylhexyl) phthalate

35. Wahkiakum County: 11

Diesel particles; Formaldehyde; Benzene;
Chromium VI; Acetaldehyde; Chloroform; Carbon tetrachloride; POM Group 1; Bis (2-ethylhexyl) phthalate; Tetrachloroethylene; Quinoline

36. Walla Walla County: 9

Diesel particles; Formaldehyde; Benzene;
Ethylene dibromide; Acetaldehyde; Chloroform; Carbon tetrachloride;
Tetrachloroethane; Bis (2-ethylhexyl) phthalate

37. Whatcom County: 11

Acrolein; Diesel particles; Formaldehyde; Benzene;
Butadiene; Ethylene dibromide; Acetaldehyde; Chloroform; Carbon tetrachloride;
Tetrachloroethane; Bis (2-ethylhexyl) phthalate

38. Whitman County: 10

Acrolein; Diesel particles; Formaldehyde; Benzene;
Ethylene dibromide; Acetaldehyde; Chloroform; Carbon tetrachloride;
Tetrachloroethane; Bis (2-ethylhexyl) phthalate

39. Yakima County: 10

Acrolein; Diesel particles; Formaldehyde; Benzene;
Butadiene; Ethylene dibromide; Acetaldehyde; Chloroform; Carbon tetrachloride; Bis (2-ethylhexyl) phthalate

Questions? Please contact:

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NATA Pollutants in Washington State

The National Air Toxics Assessment or NATA evaluated the effects of pollutants known or suspected of causing cancer or other serious health problems, such as birth defects. This latest assessment estimated cancer and/or non-cancer health effects for 133 air toxics. The goal of the national-scale assessment is to identify those air toxics which are of greatest potential concern, in terms of contribution to population risk.

The toxic air pollutants on this list in Washington State may either:

- 1) Cause harm from cancer based on at least a 1-in-a-million risk; or
- 2) Cause harm other than cancer (They have a potential for adverse health effects).

What is a 1 in a million risk?

EPA explains that “[a] risk level of 1 in a million implies a likelihood that up to one person, out of one million equally exposed people would contract cancer if exposed continuously (24 hours per day) to the specific concentration over 70 years (an assumed lifetime). This would be in addition to those cancer cases that would normally occur in an unexposed population of one million people. Note that this assessment looks at lifetime cancer risks, which should not be confused with or compared to annual cancer risk estimates. If you would like to compare an annual cancer risk estimate with the results in this assessment, you would need to multiply that annual estimate by a factor of 70 or alternatively divide the lifetime risk by a factor of 70.

How does EPA estimate risks for health effects other than cancer?

“The EPA typically expresses dose-response relationships for effects other than cancer in terms of the inhalation reference concentration (RfC). The RfC is a concentration of the compound in air thought to be without adverse effects even if a person is exposed continuously. In other words, exposures below the RfC will probably not cause adverse noncancer health effects.

To express noncancer hazards the EPA uses the RfC as part of a calculation called the hazard quotient (HQ), which is the ratio between the concentration to which a person is exposed and the RfC. A value of the HQ less than one indicates that the exposure is lower than the RfC and that no adverse health effects would be expected. A value of the HQ greater than one indicates that the exposure is higher than the RfC. However, because many RfCs incorporate protective assumptions in the face of uncertainty, an HQ greater than one does not necessarily suggest a likelihood of adverse effects. Furthermore, the HQ cannot be translated to a probability that adverse effects will occur and is not likely to be proportional to risk. An HQ greater than one can best be described as indicating that a potential exists for adverse health effects.

The EPA has developed RfCs for many substances, and continues to re-examine and update them as knowledge improves. More information on RfCs can be found in the EPA's Integrated Risk Information System. The RfCs (and equivalent values) used in the NATA assessment, along with associated uncertainties and a summary of the EPA's risk assessment guidelines for effects other than cancer, are included on the Health Effects Criteria page.”

Refer to the NATA web site for more information: <http://www.epa.gov/ttn/atw/nata1999/>