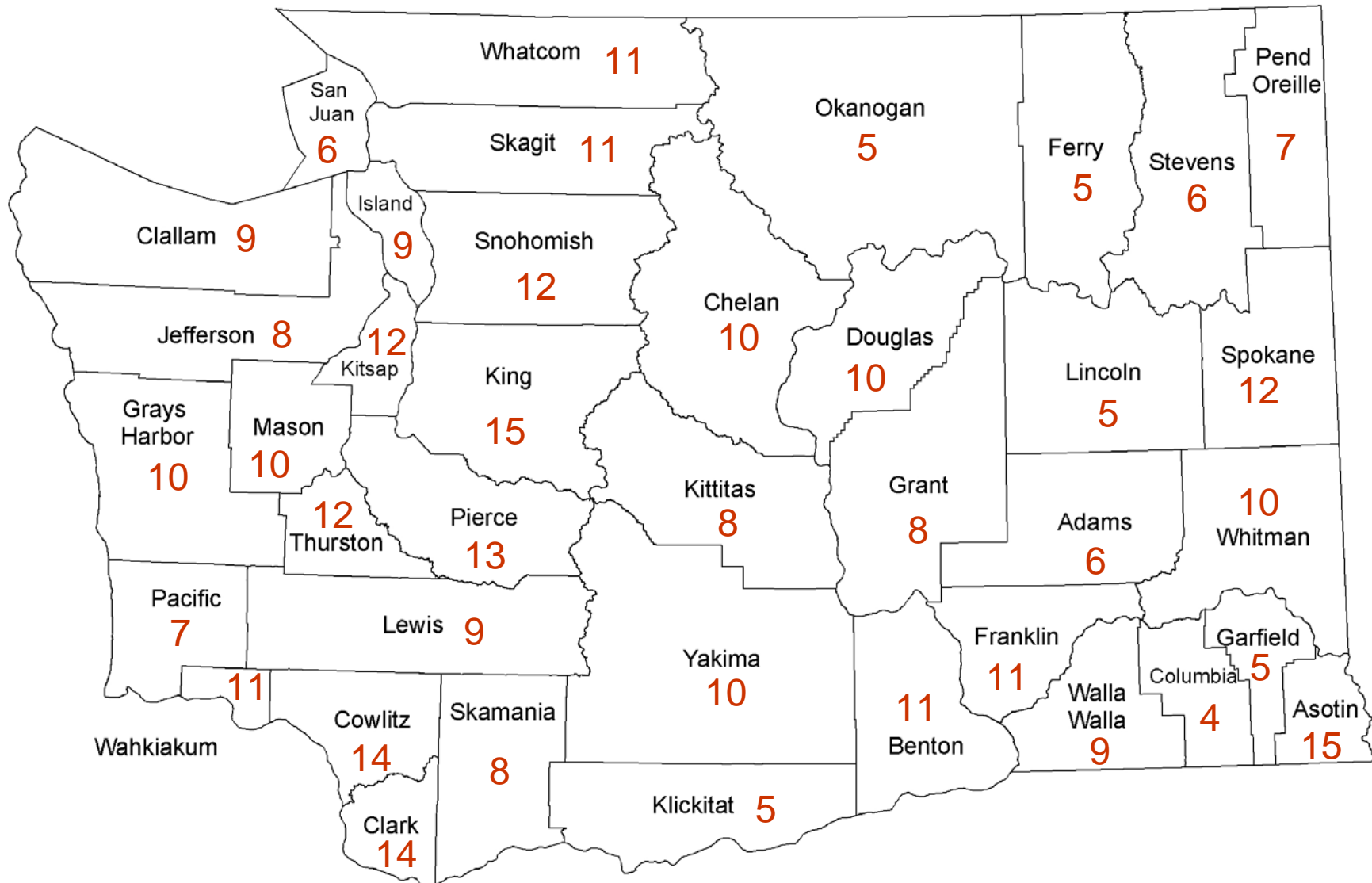


# 1999 NATA List of Top Toxic Air Pollutants in Washington State



## 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.

| <b>Top Chemicals</b>  | <b>Source</b>  |
|---|--|
| Acrolein<br>This is the only non-cancer causing chemical on the list. | Wood burning (forest fires, field burning, fireplaces);<br>vehicle/engine exhaust; pulp/paper mills  |
| <i>Listed in order of importance</i>                                  |  |
| Diesel particles <sup>1</sup>   | Exhaust from diesel engines  |
| Formaldehyde <sup>2</sup>   | Vehicle/engine exhaust, wood burning; other combustion;<br>pulp/paper/plywood mills  |
| Benzene   | Vehicle/engine exhaust; petroleum refineries; gasoline fueling;<br>other combustion  |
| <b>Top Chemicals</b>  |  |
| <b>Source</b>   |  |
| 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   |

<sup>1</sup> Diesel is evaluated using the California EPA toxicity value.

<sup>2</sup> Formaldehyde is evaluated using the EPA IRIS toxicity value.

| <b>Top Chemicals</b>                | <b>Source</b>  |
|-------------------------------------|--|
| 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/>