

<b>ATSDR's Substance-Specific Priority Data Needs – Filled</b>		
<b>Substances</b>	<b>PDN Description</b>	<b>Status<sup>(1)</sup></b>
<b>Aldrin/Dieldrin</b>	<ul style="list-style-type: none"> <li>• Dose-response data in animals for intermediate<sup>(2)</sup>-duration oral exposure</li> <li>• Bioavailability from soil</li> <li>• Exposure levels in humans living near hazardous waste sites and other populations, such as exposed workers</li> <li>• Exposure levels in children</li> </ul>	Filled
<b>Arsenic</b>	<ul style="list-style-type: none"> <li>• Exposure levels in humans living near hazardous waste sites and other populations, such as exposed workers</li> <li>• Bioavailability from soil</li> </ul>	Filled
<b>Asbestos</b>	<ul style="list-style-type: none"> <li>• Potential candidate for subregistry of exposed persons</li> <li>• Improved analytical methods for screening samples and determining the chemical structure of asbestos fibers. Also, techniques to normalize studies in which different analytical methods were employed</li> </ul>	Filled
<b>Benzene</b>	<ul style="list-style-type: none"> <li>• Epidemiologic studies on the health effects of benzene (special emphasis end points include immunotoxicity)</li> <li>• Exposure levels in humans living near hazardous waste sites and other populations, such as exposed workers</li> </ul>	Filled
<b>Beryllium</b>	<ul style="list-style-type: none"> <li>• Analytical methods to determine environmental speciation</li> <li>• Exposure levels in humans (adults) living near hazardous waste sites and other populations, such as exposed workers</li> <li>• Exposure levels in children</li> </ul>	Filled
<b>Cadmium</b>	<ul style="list-style-type: none"> <li>• Analytical methods for biological tissues and fluids and environmental media</li> <li>• Exposure levels in humans (adults) living near hazardous waste sites and other populations, such as exposed workers</li> <li>• Exposure levels in children</li> </ul>	Filled

<b>Carbon tetrachloride</b>	<ul style="list-style-type: none"> <li>• Immunotoxicology battery of tests via oral exposure</li> <li>• Half-life in soil</li> <li>• Exposure levels in humans living near hazardous waste sites and other populations, such as exposed workers</li> </ul>	Filled
<b>Chlordane</b>	<ul style="list-style-type: none"> <li>• Oral multigenerational studies to evaluate reproductive toxicity</li> <li>• Exposure levels in humans (adults) living near hazardous waste sites and other populations potentially exposed to chlordane</li> <li>• Exposure levels in children</li> </ul>	Filled
<b>Chlorinated dibenzo-p-dioxins (CDDs)</b>	<ul style="list-style-type: none"> <li>• Studies via oral exposure designed to assess childhood susceptibility</li> <li>• Exposure levels in humans (adults) living near hazardous waste sites</li> <li>• Exposure levels in children</li> </ul>	Filled
<b>Chloroform</b>	<ul style="list-style-type: none"> <li>• Dose-response data in animals for intermediate-duration oral exposure</li> <li>• Epidemiologic studies on the health effects of chloroform (Special emphasis end points include cancer, neurotoxicity, reproductive and developmental toxicity, hepatotoxicity, and renal toxicity)</li> <li>• Exposure levels in humans living near hazardous waste sites and other populations, such as exposed workers</li> </ul>	Filled
<b>Chromium</b>	<ul style="list-style-type: none"> <li>• Dose-response data in animals for acute<sup>(3)</sup>-duration exposure to chromium (VI) via oral exposure</li> <li>• Dose-response data in animals for intermediate-duration exposure to chromium (VI) via oral exposure</li> <li>• Multigeneration reproductive toxicity study via oral exposure to chromium (VI)</li> <li>• Prenatal developmental toxicity study via oral exposure to chromium (VI)</li> <li>• Exposure levels in humans living near hazardous waste sites and other populations, such as exposed workers</li> </ul>	Filled
<b>Cyanide</b>	<ul style="list-style-type: none"> <li>• Evaluation of the environmental fate of cyanide in soil</li> <li>• Exposure levels in humans living near hazardous waste sites and other populations, such as exposed workers</li> </ul>	Filled
<b>1,2-dibromo-3-chloropropane</b>	<ul style="list-style-type: none"> <li>• Exposure levels in humans living near hazardous waste sites and other populations, such as exposed workers</li> </ul>	Filled

<b>1,2-Dibromoethane</b>	<ul style="list-style-type: none"> <li>• Immunotoxicity battery studies via oral exposure</li> <li>• Dose-response data in animals for acute-duration exposure by the oral route</li> </ul>	Filled
<b>1,2-Dichloroethane</b>	<ul style="list-style-type: none"> <li>• Neurotoxicology battery of tests following inhalation exposure</li> <li>• Exposure levels in humans living near hazardous waste sites and other populations</li> </ul>	Filled
<b>1,1-Dichloroethene</b>	<ul style="list-style-type: none"> <li>• Dose-response data in animals for acute-duration exposure by the inhalation route</li> <li>• Dose-response data in animals for chronic<sup>(4)</sup>-duration exposure by the inhalation route</li> <li>• Dose-response data in animals for acute-duration exposure by the oral route</li> <li>• Dose-response data in animals for intermediate-duration exposure by the oral route</li> <li>• Prenatal developmental toxicity studies following oral exposure</li> <li>• Exposure levels in humans living near hazardous waste sites and other populations</li> </ul>	Filled
<b>DDT</b>	<ul style="list-style-type: none"> <li>• Epidemiologic studies on the health effects of DDT, DDD, and DDE (Special emphasis end points include immunotoxicity, and reproductive and developmental toxicity)</li> <li>• Bioavailability and bioaccumulation from soil</li> <li>• Exposure levels in humans (adults) living near hazardous waste sites and other populations, such as exposed workers</li> <li>• Exposure levels in children</li> </ul>	Filled
<b>Di(2-ethylhexyl) phthalate</b>	<ul style="list-style-type: none"> <li>• Epidemiologic studies on the health effects of DEHP</li> <li>• Dose-response data in animals for acute-duration oral exposure</li> <li>• Dose-response data in animals for intermediate-duration oral exposure</li> <li>• Multigeneration reproductive toxicity study via oral exposure</li> <li>• Comparative toxicokinetic studies (Studies designed to examine how primates metabolize and distribute DEHP as compared with rodents via oral exposure)</li> <li>• Exposure levels in humans (adults) living near hazardous waste sites and other populations, such as exposed workers</li> <li>• Exposure levels in children</li> </ul>	Filled

<b>Di-n-butyl phthalate</b>	<ul style="list-style-type: none"> <li>• Dose-response data in animals for acute- duration exposure via the oral route</li> <li>• <i>In vivo</i> genotoxicity studies</li> <li>• Environmental fate of di-n-butyl phthalate in environmental media</li> <li>• Exposure levels in humans (adults) living near hazardous waste sites and other populations, such as exposed workers</li> <li>• Exposure levels in children</li> </ul>	Filled
<b>Disulfoton</b>	<ul style="list-style-type: none"> <li>• Immunotoxicology testing battery following oral exposure</li> </ul>	Filled
<b>Endosulfan (<math>\alpha,\beta</math>, and sulfate)</b>	<ul style="list-style-type: none"> <li>• Data on the bioavailability of endosulfan from soil</li> <li>• Exposure levels in humans (adults) living near hazardous waste sites and other populations, such as exposed workers</li> <li>• Exposure levels in children</li> </ul>	Filled
<b>Endrin/endrin aldehyde</b>	<ul style="list-style-type: none"> <li>• Exposure levels in humans (adults) living near hazardous waste sites and other populations, such as exposed workers</li> <li>• Exposure levels in children</li> </ul>	Filled
<b>Ethylbenzene</b>	<ul style="list-style-type: none"> <li>• Dose-response data for acute-duration exposure by the inhalation - route</li> <li>• Dose-response data for chronic-duration exposure by the inhalation route</li> <li>• Dose-response data for intermediate-duration exposure by the oral - route</li> <li>• Multigeneration toxicity study examining reproductive end points and indicators of endocrine disruption following inhalation exposure</li> <li>• Studies for comparative toxicokinetics</li> <li>• Exposure levels in humans living near hazardous waste sites</li> <li>• Exposure levels in children</li> </ul>	Filled
<b>Heptachlor/ heptachlor epoxide</b>	<ul style="list-style-type: none"> <li>• Multigeneration reproductive toxicity studies via the oral route of exposure</li> <li>• Prenatal developmental toxicity studies via the oral route of exposure</li> <li>• Exposure levels in humans (adults) living near hazardous waste sites and other populations, such as exposed workers</li> <li>• Exposure levels in children</li> <li>• Dose-response animal data for acute- and intermediate-duration oral exposures, including immunopathology</li> <li>• Bioavailability from contaminated air, water, and soil and bioaccumulation potential</li> </ul>	Filled

<p><b>Hexachlorocyclohexane</b> (<math>\alpha</math>, <math>\beta</math>, and <math>\gamma</math>)</p>	<ul style="list-style-type: none"> <li>• Dose-response data for chronic-duration oral exposure</li> <li>• Mechanistic studies on the neurotoxicity of hexachlorocyclohexane</li> <li>• Mechanistic studies on the hepatotoxicity of hexachlorocyclohexane</li> <li>• Exposure levels in humans (adults) living near hazardous waste sites and other populations, such as exposed workers</li> <li>• Exposure levels in children</li> </ul>	<p>Filled</p>
<p><b>Lead</b></p>	<ul style="list-style-type: none"> <li>• Mechanistic studies on the neurotoxic effects of lead</li> <li>• Analytical methods for tissue levels</li> <li>• Exposure levels in humans (adults) living near hazardous waste sites and other populations, such as exposed workers</li> <li>• Exposure levels in children</li> </ul>	<p>Filled</p>
<p><b>Manganese</b></p>	<ul style="list-style-type: none"> <li>• Dose-response data for acute- and intermediate-duration oral exposures</li> <li>• Toxicokinetic studies on animals to investigate uptake and absorption, relative uptake of differing manganese compounds, metabolism of manganese, and interaction of manganese with other substances following oral exposure</li> <li>• Epidemiological studies on the health effects of manganese (special emphasis end points include neurologic, reproductive, developmental, immunologic, and cancer)</li> <li>• Exposure levels in humans (adults) living near hazardous waste sites and other populations, such as exposed workers</li> <li>• Exposure levels in children</li> </ul>	<p>Filled</p>
<p><b>Mercury</b></p>	<ul style="list-style-type: none"> <li>• Multigeneration reproductive toxicity study via oral exposure</li> <li>• Dose-response data in animals for chronic-duration oral exposure</li> <li>• Immunotoxicology studies via oral exposure</li> <li>• Exposure levels in humans (adults) living near hazardous waste sites and other populations, such as exposed workers</li> <li>• Exposure levels in children</li> </ul>	<p>Filled</p>
<p><b>Methoxychlor</b></p>	<ul style="list-style-type: none"> <li>• Evaluate neurologic effects after long-term, low-level oral exposure</li> <li>• Exposure levels in humans (adults) living near hazardous waste sites and other populations</li> <li>• Exposure levels in children</li> </ul>	<p>Filled</p>

<p><b>Methylene chloride</b></p>	<ul style="list-style-type: none"> <li>• Dose-response data in animals for acute- and intermediate-duration oral exposure. The intermediate-duration study should include extended reproductive organ histopathology, neuropathology, and immunopathology</li> <li>• Prenatal developmental toxicity study via the oral route</li> <li>• Exposure levels in humans living near hazardous waste sites and other populations, such as exposed workers</li> </ul>	<p>Filled<sup>(5)</sup></p>
<p><b>Nickel</b></p>	<ul style="list-style-type: none"> <li>• Epidemiologic studies on the health effects of nickel (Special emphasis end points include reproductive toxicity)</li> <li>• Prenatal developmental toxicity study via the oral route</li> <li>• Exposure levels in humans living near hazardous waste sites and other populations, such as exposed workers</li> </ul>	<p>Filled</p>
<p><b>Pentachlorophenol</b></p>	<ul style="list-style-type: none"> <li>• Exposure levels in humans (adults) living near hazardous waste sites</li> <li>• Exposure levels in children through play activities near contaminated environmental media</li> </ul>	<p>Filled</p>
<p><b>Polychlorinated biphenyls (PCBs)</b></p>	<ul style="list-style-type: none"> <li>• Epidemiologic studies on the health effects of PCBs (special emphasis end points include immunotoxicity, gastrointestinal toxicity, liver toxicity, kidney toxicity, thyroid toxicity, and reproductive/developmental toxicity)</li> <li>• Dose-response data in animals for acute-duration oral exposures</li> <li>• Dose-response data in animals for intermediate-duration oral exposures</li> <li>• Exposure levels in humans (adults) living near hazardous waste sites and other populations, such as exposed workers</li> <li>• Exposure levels in children</li> <li>• Chronic toxicity and oncogenicity via oral exposure<sup>(6)</sup></li> <li>• Aerobic PCB biodegradation in sediment<sup>(6)</sup></li> <li>• PCB congener analysis<sup>(6)</sup></li> </ul>	<p>Filled</p>

<p><b>Polycyclic aromatic hydrocarbons (PAHs)</b> <b>(Includes 15 substances)</b></p>	<ul style="list-style-type: none"> <li>• Dose-response data in animals for intermediate-duration oral exposures. The intermediate-duration study should include extended reproductive organ histopathology and immunopathology</li> <li>• Prenatal developmental toxicity study via inhalation or oral exposure</li> <li>• Mechanistic studies on PAHs, on how mixtures of PAHs can influence the ultimate activation of PAHs, and on how PAHs affect rapidly proliferating tissues</li> <li>• Dose-response data in animals for acute- and intermediate-duration inhalation exposures. The intermediate-duration study should include extended reproductive organ histopathology and immunopathology</li> <li>• Epidemiologic studies on the health effects of PAHs (Special emphasis end points include cancer, dermal, hemolymphatic, and hepatic toxicity)</li> <li>• Exposure levels in humans (adults) living near hazardous waste sites and other populations, such as exposed workers</li> <li>• Exposure levels in children</li> </ul>	<p>Filled</p>
<p><b>Selenium</b></p>	<ul style="list-style-type: none"> <li>• Epidemiologic studies on the health effects of selenium (special emphasis end points include cancer, reproductive and developmental toxicity, hepatotoxicity, and adverse skin effects)</li> <li>• Exposure levels in humans living near hazardous waste sites and other populations, such as exposed workers</li> </ul>	<p>Filled</p>
<p><b>1,1,2,2-Tetrachloroethane</b></p>	<ul style="list-style-type: none"> <li>• Exposure levels in humans living near hazardous waste sites and other populations</li> </ul>	<p>Filled</p>
<p><b>Tetrachloroethylene</b></p>	<ul style="list-style-type: none"> <li>• Dose-response data in animals for acute-duration oral exposure, including neuropathology and demeanor, and immunopathology</li> <li>• Exposure levels in humans living near hazardous waste sites and other populations, such as exposed workers</li> </ul>	<p>Filled</p>
<p><b>Toluene</b></p>	<ul style="list-style-type: none"> <li>• Dose-response data in animals for acute- and intermediate-duration oral exposures. The intermediate-duration study should include an extended histopathologic evaluation of the immune system</li> <li>• Comparative toxicokinetic studies (characterization of absorption, distribution, and excretion via oral exposure)</li> <li>• Mechanism of toluene-induced neurotoxicity</li> <li>• Exposure levels in humans living near hazardous waste sites and other populations, such as exposed workers</li> </ul>	<p>Filled</p>

<b>Toxaphene</b>	<ul style="list-style-type: none"> <li>Immunotoxicity studies for chronic-duration via oral route of exposure</li> </ul>	Filled
<b>Trichloroethylene</b>	<ul style="list-style-type: none"> <li>Dose-response data in animals for acute-duration oral exposure</li> <li>Epidemiologic studies on the health effects of trichloroethylene (special emphasis end points include cancer, hepatotoxicity, renal toxicity, developmental toxicity, and neurotoxicity)</li> <li>Exposure levels in humans living near hazardous waste sites and other populations, such as exposed workers</li> </ul>	Filled
<b>Vinyl chloride</b>	<ul style="list-style-type: none"> <li>Dose-response data in animals for acute-duration inhalation exposure</li> <li>Multigeneration reproductive toxicity study via inhalation</li> <li>Prenatal developmental toxicity study via inhalation</li> </ul>	Filled
<b>Xylenes</b>	<ul style="list-style-type: none"> <li>Dose-response data for chronic-duration exposure by the oral route. This study should be done in conjunction with the neurotoxicology battery of tests</li> <li>Prenatal developmental toxicity study that includes neurodevelopmental end points following oral exposure</li> <li>Exposure levels in humans living near hazardous waste sites and other populations</li> </ul>	Filled
<b>Zinc</b>	<ul style="list-style-type: none"> <li>Dose-response data in animals for acute- and intermediate-duration oral exposures. The intermediate-duration study should include an extended histopathologic evaluation of the immunologic and neurologic systems</li> <li>Multigeneration reproductive toxicity study via oral exposure</li> </ul>	Filled

<sup>(1)</sup> Filled: A priority data need is filled:

- If it has been referred to one of the implementation mechanisms and research has been initiated, or
- If an updated ATSDR toxicological profile contains relevant new studies, or if other relevant, peer-reviewed, and publicly available new studies (not included in the toxicological profile) have been identified since the finalization of the priority data needs document; and it is generally agreed that a priority data need no longer exists.

Furthermore, in the event a priority data need is considered *filled*, it does not necessarily mean that the study has been completed and that ATSDR has accepted the data. It does, however, indicate that the agency no longer considers it a priority to initiate additional studies at this time.

<sup>(2)</sup> Intermediate-duration exposure = 15 – 364 days.



- (3) Acute-duration exposure = 14 days or less.
- (4) Chronic-duration exposure = 365 days or more.
- (5) Neurotoxicity testing remains a priority data need in the EPA/ATSDR test rule.
- (6) Data need, not a priority data need.