

PCB Monitoring and Assessment in New Mexico

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History of PCBs

- Polychlorinated Biphenyls (PCBs) are a man-made organic chemical.



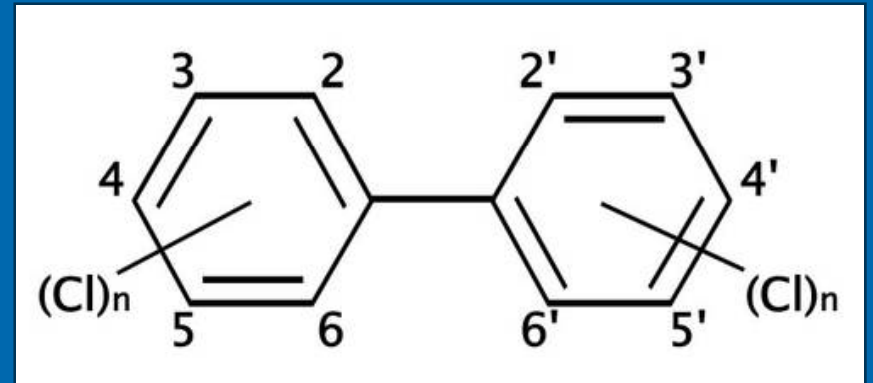
- They were domestically manufactured from 1929 until they were banned in the United States under the Toxic Substances Control Act of 1976.
- They were used in industrial and commercial applications related to electricity, heat transfer, and hydraulic equipment.
- PCB mixtures are known by their industrial trade names, i.e. Aroclor.



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What are PCBs?



- Each PCB molecule consists of two 6-carbon rings. Chlorine atoms can be attached to the 10 free carbon atoms.
- There are 209 possible arrangements, called congeners.
- Congeners with the same number of chlorines are called homologs.
- The number and position of the chlorine atoms determine its chemical and physical properties.



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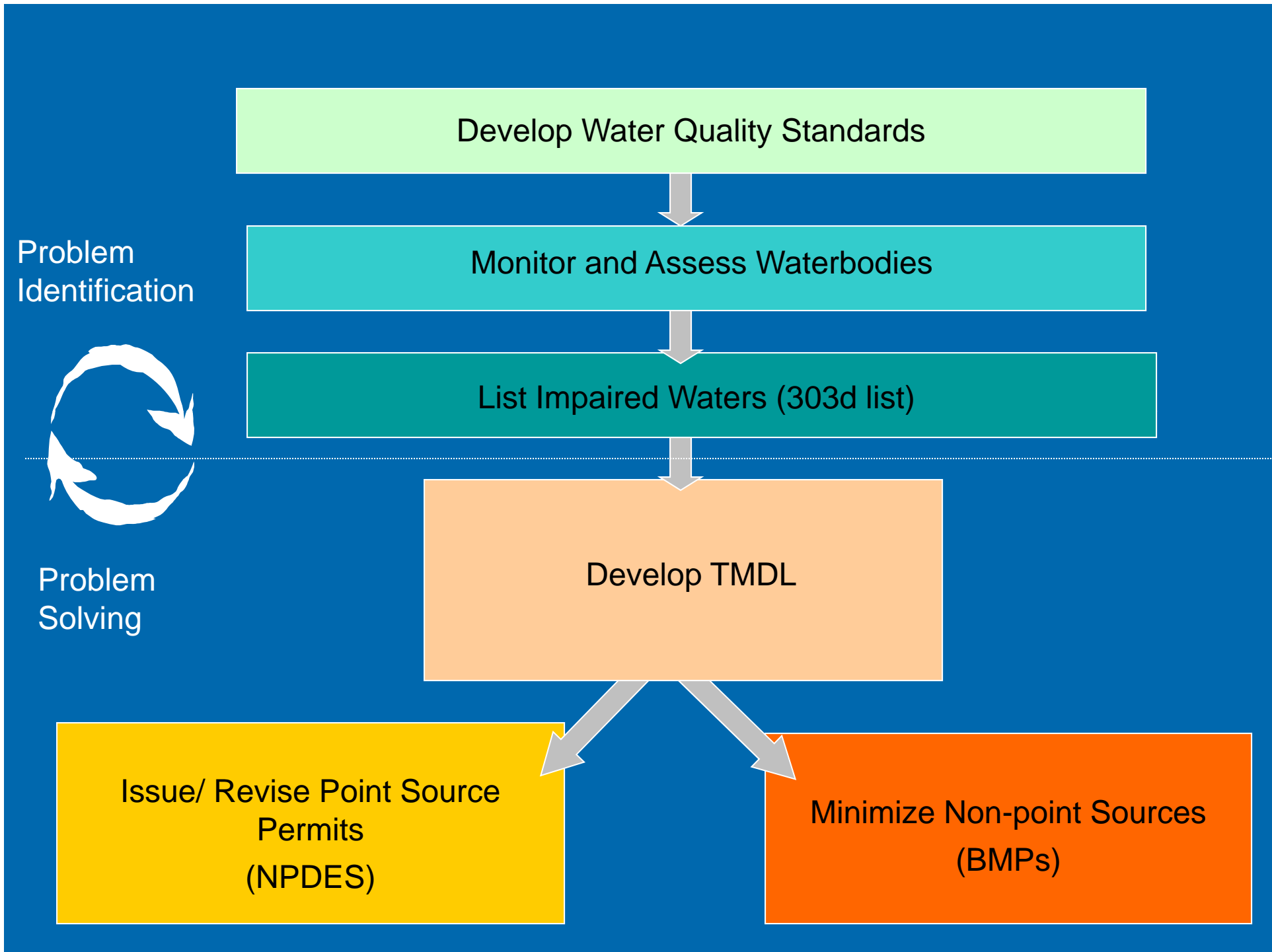
PCBs as an Environmental Concern

- PCBs adsorb to sediments and organic materials and have relatively low solubility in water.
- Congeners with lower chlorine content are more volatile and bioaccumulation through the food chain tends to concentrate congeners with higher chlorine.
- PCBs are persistent and carcinogenic.
- PCBs can be carried long distances via atmospheric deposition.
- In surface waters, bioaccumulation of PCBs up the food chain is a human health concern.



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PCB Surface Water Quality Standards

The 2011 State of New Mexico surface water quality standards contain water quality criteria for PCBs in Subsection J of 20.6.4.900 NMAC-

Designated Use	Numeric Criterion
Aquatic Life Use- acute	2 µg/L
Aquatic Life Use- chronic	0.014 µg/L
Aquatic Life Use- HH-OO	0.00064 µg/L
Domestic Water Supply	0.50 µg/L
Wildlife Habitat	0.014 µg/L



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PCB Surface Water Quality Standards

- Human Health-Organisms Only (HH-OO) is intended to protect the health of humans who ingest fish or other aquatic organisms from waters containing pollutants.
- HH-OO criteria apply to waters with a designated, existing, or attainable aquatic life use.
- PCBs are a known persistent toxic pollutant. Per 20.6.4.11 Subsection G, the HH-OO criteria for persistent toxic pollutants also applies to all tributaries of waters with a designated, existing, or attainable aquatic life use.
- The PCB criteria apply to the sum of all congeners.



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PCB Data Collection and Analysis

- PCBs can be analyzed and quantified as Aroclor mixtures or individual congeners. The Aroclor method determines the presence of a subset of congeners whereas the Congener method determines the concentration of each PCB congener.
- The Congener method provides the detection limit necessary to assess PCB data against the PCB criteria but it is expensive. The State Laboratory Division at UNM does not offer the Congener method.
- SWQB performed limited PCB monitoring in targeted watersheds statewide. Will continue to use DOE-OB and LANL data.



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PCB Data Collection and Analysis

- In 2005-2007, SWQB received CWA funding for a PCB study-
 - MRG (2005)- limited PCB monitoring
 - Santa Fe River (2005)- limited stormwater-based PCB monitoring
 - Pajarito Plateau (2006-2007)- stormwater-based PCB, metals, gross alpha monitoring
- SWQB also collects PCB data from fish tissue for fish consumption advisories in coordination with NM Department of Game & Fish.
- Portions of the Rio Grande and surrounding reservoirs have current fish consumption advisories based on PCB data from fish tissue.



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PCB Data Assessment

- Data are assessed using the most recently approved standards and current SWQB assessment protocol.
- Assessment protocols are described per designated use. For example:

Designated Use	Assessment Protocol
Wildlife Habitat	not supporting if there is more than one exceedence of the criterion.
Human Health	for data sets with 1-10 samples, the use is not supporting if there is more than one exceedence of the criterion.
Aquatic Life Use	not supporting if more than one exceedence of the acute criterion or more than one exceedence of the chronic criterion in 3 years.



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New Mexico PCB Impairments

- 22 stream segments are listed as impaired due to the presence of PCBs in surface water on the 2010-2012 CWA 303(d)/305(b) Integrated List.
- All but one of these listings is for the Pajarito Plateau. The remaining one is for the Santa Fe River, from WWTP upstream to Nichols Reservoir.
- When the presence of PCB in fish tissue is high enough to warrant a fish consumption advisory, the water body is listed as impaired for PCBs in fish tissue.
- Portions of the Rio Grande and Pecos River as well as 4 reservoirs are listed for PCB in fish tissue.



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TMDLs and Category 4B

- Stream segments included on the 303(d) Integrated List of impaired waterbodies are generally scheduled for TMDL development.
- A TMDL is a planning document that discusses the maximum amount of a pollutant that can enter a stream without causing an impairment or a violation of the water quality standard.
- PCB TMDLs are in development for the Santa Fe River. SWQB has no plans at this time to develop TMDLs for PCB in fish tissue.
- SWQB plans to consider moving some of the Pajarito Plateau PCB listings into Category 4B. Per EPA, this category is utilized when a TMDL is not needed because other pollution control requirements are already in place and expected to meet standards attainment.



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SWQB Pajarito Plateau assessment-

<http://www.nmenv.state.nm.us/SWQB/303d-305b/2010-2012/Pajarito/index.html>

SWQB Fish Consumption Advisories Homepage:-

<http://www.nmenv.state.nm.us/swqb/advisories/>



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