WASHINGTON STATE DEPARTMENT OF ECOLOGY

Frequently Asked Questions about Spokane River's dissolved oxygen shortage

from Ecology's Water Quality Program

The water-quality improvement plan (or TMDL)

Too much phosphorus and other nutrients in the Spokane River and Lake Spokane have caused a depletion of dissolved oxygen in the river. This shortage resulted in the river being placed on the federal list of impaired bodies of water that require water-quality improvement plans or "total maximum daily load" (TMDL) plans.

Q: What does "total maximum daily load" mean?

A: Water-quality improvement plans are sometimes called total maximum daily loads, or TMDLs. This is the amount of pollutants a body of water can receive and still meet water quality standards. It includes direct pollutants, such as from industries or municipal plants that discharge into the river and Lake Spokane. It also includes indirect pollution, such as from storm water and other runoff. The TMDL must account for all potential sources of pollution into the water body as well as seasonal fluctuations. The standards are set by the federal Clean Water Act.

Q: Why are nutrients like phosphorus a problem?

A: When the river contains too much phosphorus or other "nutrient" pollution, algae and other water plants thrive. The pollution acts like fertilizer, stimulating the growth of aquatic plants. When these plants die, their decomposition uses up the oxygen in the water. There's too much nutrient pollution in the river and, therefore, not enough oxygen. Oxygen levels in the river or Lake Spokane are currently too low for a healthy fish population.

Q: How do we know about the problem of low dissolved oxygen in the river and Lake Spokane?

A: A scientific report completed in early 2004, *Spokane River and Lake Spokane Pollutant Loading Assessment for Protecting Dissolved Oxygen* (Publication #04-03-006), used monitoring data and computer modeling to evaluate how changing pollution discharges into the river might affect the concentrations of dissolved oxygen. The report comes to four major conclusions:

- A cleanup plan for phosphorus, approved by the U.S. Environmental Protection Agency (EPA) in 1992, set pollutant-loading allocations that are not strict enough to protect water quality.

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- Some parts of the Spokane River and Lake Spokane continue to be low in dissolved oxygen during the summer and violate water quality criteria.

- To solve the problem, the current loading of pollutants that affect dissolved oxygen would need to be significantly reduced or eliminated (if the concentrations can't be lowered enough) during crucial times of the year.

- The sources of the pollutants that deplete oxygen include the major direct sources to the river (industries or cities that discharge effluent to the river) and runoff sources, such as fertilizers, animal waste, and failing septic systems. They also include direct and runoff sources in the tributaries (such as Hangman [Latah] Creek and the Little Spokane River), agricultural runoff, and stormwater runoff from small communities.

Q: Where are these pollutants coming from?

A: Washington facilities that discharge treated wastewater directly into the main stem of the Spokane River include the city of Spokane wastewater treatment plant, Liberty Lake Sewer and Water District, Kaiser Aluminum in Trentwood, and Inland Empire Paper. Spokane River tributaries also carry wastewater discharges from smaller outlying point sources such as Rockford, Fairfield, Tekoa, Spangle, Cheney, Medical Lake, Spokane Fish Hatchery, and the Spokane County Colbert Landfill. The effluent from these dischargers contains varying amounts of phosphorus and other pollutants.

Some of the pollution from runoff comes from the sub-basins of the Little Spokane River, Hangman (Latah) Creek, and seasonally from Coulee Creek. Some typical runoff sources of pollution are storm water, agricultural runoff, timber harvesting, fertilizers, animal waste, and leaking septic systems.

The percentage of phosphorus coming from these sources varies with the time of year. For example, pollution from runoff represents a higher percentage of the total phosphorus load to Lake Spokane during the spring, when tributary and river flows are high and carry pollution caused by soil erosion; the pollution settles to the bottom and uses more oxygen. During summer, most of the pollution that causes algae blooms that deplete oxygen in the upper layers of the reservoir is from direct sources (large pipes).

Q: What about pollutants from Idaho? Why should Washington clean those up?

A: Part of the cleanup plan is to make sure water quality standards are met as the water comes across the border. The EPA and Idaho Department of Environmental Quality are working together to see that pollution is reduced to meet the requirements of the cleanup plan at the state line.

Q: Currently, what are the requirements that point sources have had to meet?

A: Each of the point sources to the Spokane River must have a water-quality permit, which is issued by the Department of Ecology. These permits restrict the amount of pollution that a municipality or an industry is allowed to discharge to the river. Those permits are being renewed in the fall-winter of 2007 to reflect the new water-quality improvement plan.

Q: What level of treatment are dischargers likely to be expected to meet when the cleanup plan is finished?

A: The Spokane River's dissolved oxygen water-quality improvement plan acknowledges that the current, commonly accepted wastewater management and end-of-pipe pollution controls will not be adequate to protect the river. Therefore, permitted point sources of pollution will need to achieve a higher level of treatment. These higher levels of treatment will be phased in over the next several years, and will be referred as "water-quality-based" effluent limits in the permits.

The engineering technologies, and other management options, available for effectively treating wastewater, are changing from traditional to more innovative approaches. This is especially true in areas that have significant water quality and quantity challenges, such as the Spokane River. Preliminary indications are that the wastewater will have to be treated to a very high level to meet upcoming requirements. Alternatives have been considered for the Spokane River and are outlined in the *Foundational Concepts for the Spokane River TMDL Managed Implementation Plan*.

Q: What are alternatives to discharging to the river?

A: Because phosphorus is not a problem for drinking water, one option is to treat water to a very high standard and either let it sink back into the aquifer (recharge) or use it for irrigation. Wastewater also can be treated to a high standard and used again in other ways, such as for industrial purposes. However, emerging treatment options that use more-intensive filtration may allow continued discharge to the river. This new technology allows water to reach very low levels of phosphorus and is currently being used in New York's drinking-water system. It is too early to know which technologies or combination of technologies will be necessary to meet our future needs. These engineering options and alternatives will need to be identified, evaluated, and implemented as permits and facilities are upgraded. We also need to consider ways to generate less wastewater in the first place.

Q: Is Ecology considering how the amount of water flowing in the river affects efforts to control pollution?

A: Yes. Numerous studies indicate that the amount of water (stream flow) is an important factor in maintaining a healthy stream, river, or lake. Some *loss* in flow might even be beneficial if the majority of pollution can be removed along with it. In the case of the Spokane River, 60 percent of the phosphorus that enters the river in the summer comes from only 10 percent of the flow contributed by wastewater. Stream flows in the Spokane River are steadily decreasing over time. If this trend continues, it will limit our ability to use the river and to protect the uses of the river we've come to take for granted. Therefore, maintaining adequate flow in the river, including flow from highly treated waste water, and replacing water withdrawn from the aquifer with re-used wastewater will be important considerations as we evaluate our options for sustainable water management.

Q: What about more diffuse, or "nonpoint" sources of phosphorus?

A: We all are part of the problem and need to work together for a lasting solution.

City and industrial dischargers are not alone responsible for pollution in the river and lake. We all have a responsibility to stop doing the things that contribute to the problem.

We are taking a multi-dimensional approach to the problem in the river and lake. We are enforcing the laws we are required to enforce to decrease wastewater pollution from industries and cities, but we also are tackling other sources of pollution that feed algae growth.

We are conducting water-quality cleanup studies and will begin implementing best management practices on the Little Spokane River and Hangman Creek to minimize polluted runoff from those areas, which are heavily affected by nonpoint sources of pollution.

The water-quality improvement plan requires controls to reduce polluted runoff caused by soil erosion, primarily from agriculture and forest practices. The water-quality improvement plan requires that 85-95 percent of the tributary sources of polluted runoff be eliminated along with the end-of-pipe, "point source" loads.

We also have begun a polluted runoff water-quality education program for residents of the area so they understand their responsibilities and change behaviors, such as reducing yard chemical and fertilizer use and maintaining septic systems. Workshops will be planned for various communities along the river to educate the community about fertilizers and pesticides, natural vegetation along the shoreline, landscaping, and other issues that affect water quality. *(Contact Brook Beeler, at 509-329-3478.)*

Information on this topic can be accessed through Ecology's website. The address is:
http://www.ecy.wa.gov/programs/wq/wqhome.html

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