

Solving Spokane River's Dissolved Oxygen Shortage

The Spokane River Water Quality Improvement Plan

The Department of Ecology's public responsibility is to ensure our water is clean enough to support a healthy ecosystem. In a healthy ecosystem, people can drink from our aquifer, eat fish from the river, swim, kayak, boat, and just enjoy the beauty of our river and lake. Ecology is working with others to ensure that we leave a legacy of clean, cool, and adequate supplies of water for future generations.

Allowing Lake Spokane and the Spokane River to deteriorate is neither wise nor legal.

Used as a sewer decades ago, the Spokane River is now the premier community asset and is marketed under the "Near Nature-Near Perfect" banner. It is an inspiring tag line for this region in support of a clean and healthy aquifer, Spokane River and Lake Spokane. Ecology supports the community in this broad-based effort to protect resources so we are truly near nature and near perfect.

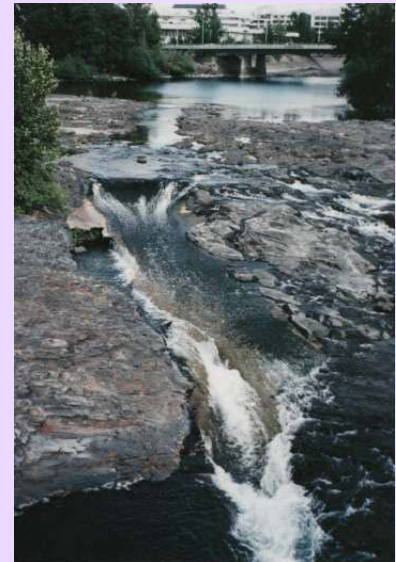
To that end, a new water-quality improvement plan for the Spokane Rivers and Lake Spokane's dissolved oxygen shortage is finished and we are ready to put its content into action. It addresses phosphorus and other nutrients with a plan that requires new phosphorus-removal technology for point-source dischargers; strategies to reduce nutrient pollution from other, more diffuse sources; requirements for a hydroelectric dam to improve dissolved oxygen; and provides timeframes for these changes.

Too much phosphorus and other nutrients in the Spokane River and Lake Spokane have caused a depletion of dissolved oxygen in the river, which is essential for fish and other aquatic life. 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. In addition, excess nutrients cause toxic algae blooms that are harmful to human health.

MORE INFORMATION

You will find more information on this topic at:

www.ecy.wa.gov/geographic/spokane/spokane_river_basin.htm



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Special accommodations

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Q: What does “total maximum daily load” mean?

A: Water-quality improvement plans are sometimes called total maximum daily loads, or TMDLs. Those terms will be used interchangeably throughout this document. A TMDL establishes the amount of a pollutant a body of water can receive and still meet water quality standards. It includes direct pollutants from industries or municipal plants that discharge into the river and Lake Spokane. It also includes indirect pollution such as from stormwater and other runoff. The water quality improvement plan must account for all potential sources of pollution into the body of water as well as seasonal fluctuations. The standards are set by the Department of Ecology (Ecology) and approved by the U.S. Environmental Protection Agency (EPA) under the authority of the federal Clean Water Act.

Newly revised water quality permits for four municipalities and industries in Washington will limit how much phosphorus and other nutrients each of them are allowed to discharge without violating water quality standards. The EPA also issues new permits to Idaho dischargers.

Q: Why are nutrients like phosphorus a problem?

A: When a lake 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 Spokane River and Lake Spokane and, therefore, not enough oxygen to meet water quality standards. In addition, excess nutrients can cause toxic algae blooms, particularly in Lake Spokane, where they are a human health threat.

Q: What does the water-quality improvement plan do?

A: The plan is aggressive and progressive. It calls for periodic check-ins to monitor progress because scientists will be gathering additional information as the plan is implemented.

What we get as a result of this water quality improvement plan:

- Ninety percent reductions in the amount of phosphorus going into the river from point sources (wastewater discharge pipes).
- Requirements to reduce stormwater discharges.
- The most stringent limits known for nutrient pollution in the effluent of industries and municipalities in the country.
- An average 66 percent reduction in the amount of phosphorus that goes into Lake Spokane during the warmer months, March to October.
- A plan to address the amount of dissolved oxygen for which Avista is responsible.
- Unique to this draft TMDL, the point-source dischargers are required to help reduce phosphorus from other diffuse “non-point” sources during the summer season.
- A plan that provides strong incentives for investing in wise water use.
- A long-term monitoring program for the river and Lake Spokane.

Q: When is this supposed to happen?

A: The draft water-quality improvement plan would be implemented over a 10-year period with an assessment after that first 10 years and again in 20 years. Permit compliance schedules will be set for 10 years. However, actions to reduce phosphorus have already been taken by the dischargers. Biennial public reviews of the progress and success of the plan elements are planned.

Q: How did we find out in the first place that we had such low dissolved oxygen levels in the river and Lake Spokane?

A: Many scientific studies have researched the problems affecting the Spokane River and Lake Spokane over the past four decades. The latest is a scientific report completed in early 2004 entitled Spokane River and Lake Spokane Pollutant Loading Assessment for Protecting Dissolved Oxygen ([Ecology publication #04-03-006](#)). This study used monitoring data and computer modeling to evaluate how changing pollution discharges into the river might affect the concentrations of dissolved oxygen. The report came 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.
- 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 needs 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 industries and municipalities that discharge effluent to the river through a pipe 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 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's Advanced Wastewater Treatment Plant (serving the City of Spokane, City of Spokane Valley, Airway Heights, and large unincorporated areas of the Spokane Valley), Liberty Lake Sewer and Water District, Kaiser Aluminum in Trentwood, and Inland Empire Paper. Idaho dischargers include the cities of Coeur d' Alene, Hayden, and Post Falls wastewater treatment plants. The EPA will issue new, more restrictive permits to those cities to substantially reduce phosphorus from those sources.

Some non-point source pollution from fertilizers, animal waste, septic systems, and other sources also makes its way into the ground water underlying the lands along the Spokane River and then eventually enters into the river itself.

Tributaries to the Spokane River are the Little Spokane River, Hangman Creek, and Coulee Creek. They also carry wastewater discharges from smaller outlying point sources such as Rockford, Fairfield, Tekoa, Spangle, Cheney, Medical Lake, Spokane Fish Hatchery, and Spokane County's Colbert Landfill. The effluent from these dischargers contains varying amounts of phosphorus and other pollutants. In addition, runoff in these sub-basins carries pollution from stormwater, agricultural runoff, timber harvesting, fertilizers, animal waste, and leaking septic systems. These sources will be more fully addressed in water quality improvement plans for the tributary waters.

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 point sources (large pipes).

Some "background" sources of phosphorus naturally occur in the rocks and soils found in the Spokane and Coeur d'Alene river basins.

Q: Does the new Spokane River water-quality improvement plan address pollution in the tributaries?

A: The water-quality improvement plan requires nutrient reductions in the tributaries (the Little Spokane River and Hangman Creek). Separate plans are being conducted for each of the tributaries. These plans are at various stages of development.

Q: What is the water quality standard for dissolved oxygen?

A: The Washington standard for dissolved oxygen in Lake Spokane is that there can be no more than a 0.2 milligram per liter (mg/L) decrease below what is considered the baseline or background level when dissolved oxygen is below levels that are necessary for aquatic life. In the past, the background level was figured at the Idaho/Washington state line. Now, the background level is figured at the outlet of Lake Coeur d'Alene.

Q: Won't there be more phosphorus in the water with a new county treatment plant?

A: Spokane County is building a new treatment plant that must meet water quality standards on the day the plant begins operating. The county's wastewater is currently treated at the city of Spokane plant. That portion of wastewater will receive higher treatment at the new county plant than it currently receives. In addition, the county may use its Septic Tank Elimination Program or other pollution reduction efforts to "offset" any discharge above standards. The county will be required to submit proof that its programs are effective. Then they may use the pounds of phosphorus that are prevented from going to the river as an offset for the new treatment plant. It is important to note that a new Spokane County plant would divert a portion of effluent currently

being sent to the city, and it would treat that effluent to a higher level. Therefore, it's not truly "more" phosphorus.

Q: How will the dischargers know what they are supposed to do?

A: It will be spelled out in a water quality permit, called a National Pollutant Discharge Elimination System permit. 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 will be issued in early 2010 to reflect the new water-quality improvement plan and will include monthly limits that meet the TMDL requirements.

Q: What level of treatment does the draft improvement plan say the dischargers need to meet now?

A: The wastewater management and end-of-pipe pollution controls of the past are not adequate to protect the river. Therefore, permitted point sources of pollution now must achieve a higher level of treatment. These higher levels of treatment will be phased in over the next ten years.

The point source dischargers along the Spokane River need to reduce their phosphorus and other nutrients by at least 90 percent. The final "waste load allocation," or the amount of phosphorus that the dischargers will be allowed to send to the Spokane River will be based on a summer season monthly average of 50 parts per million. The point source dischargers are expected to use the best treatment available in addition to reducing nonpoint sources of phosphorus and pursuing conservation and reusing effluent to meet the final wasteload allocation. These final wasteload allocations, combined with tributary nonpoint source reductions, assumed reductions in Idaho point source discharges, and Avista Corp.'s dissolved oxygen responsibility will result in meeting water quality standards in the Spokane River and Lake Spokane.

Q: How will Avista's dissolved oxygen responsibility be monitored?

A: Following EPA's approval of the Spokane River Water Quality Improvement Plan, Ecology will amend Avista's 401 Certification to require that the company develop a Water Quality Attainment Plan within two years. The 401 certification was issued by Ecology after an analysis of the effects the dam system has on water quality. It was required as part of the re-licensing process Avista underwent in 2007-2009. This plan will specify how Avista intends to address its dissolved oxygen responsibility as identified in the water quality improvement plan, and will likely focus on nonpoint pollution reduction in Lake Spokane. The plan also will describe monitoring protocols. Actions completed by Avista will be analyzed as part of the 10-year assessment.

Q: Are citizens responsible for doing anything to reduce this pollution?

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

Municipal 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.

Residents may take a number of actions at home to help. These include using phosphorus-free laundry and automatic dishwashing detergents, which are illegal to sell in Spokane County. Use compost instead of fertilizers that contain phosphorus. Scoop, bag, and trash pet poop, and make sure septic systems are properly maintained.

To learn more about how citizens can help, visit our Washington Waters – Ours to Protect website at www.ecy.wa.gov/washington_waters.