River In A Concrete Box

Mother Nature has been purifying and recycling water since the beginning of time. All water on earth is recycled through the hydrologic cycle, which is the movement of water through the earth's surface and atmosphere (condensation, infiltration, runoff, evaporation and precipitation). One part of the hydrologic cycle is the purification of water. Lakes, streams and rivers serve as the earth's natural purification system. Remember, of all the water on the planet – less than 3% is fresh water, 2% of it is trapped in ice glaciers in unusable condition, and only 1% is available for people to use. Therefore, always conserve water and be water-wise.

As our population grew and urban areas built up, Mother Nature no longer was able to purify our wastewater by herself. Wastewater treatment facilities borrow nature's technology and simply place river's purifying processes into a concrete box. Instead of the months or years that Mother Nature takes to purify waste, the wastewater treatment facility does it in a matter of hours.

For more information contact the **Sanitation Districts of Los Angeles County** at **(562) 699-7411** extension 2310 or visit us at **www.lacsd.org**

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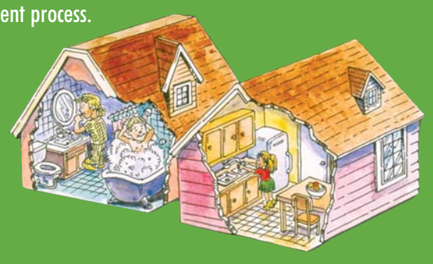
The Source

In nature* - *Where does it go, after bears and animals go in the woods?

Where did all that dinosaur poop go?

Rain runoff forces everything to flow into a nearby stream or river. Everything, even bear poop, can end up in the river.

At the treatment plant – Wastewaster, the water from your home, businesses and industries, travels through a system of hundreds of miles of sewer pipes underneath the ground and arrives at the treatment plant. Once the wastewater arrives at the treatment plant, it is pumped into the plant to begin the treatment process.



1 Primary Treatment

In nature – Heavier, solid particles settle to the bottom of the river while lighter materials float to the top and are carried away by the current.

At the treatment plant – Long concrete tanks act the same as the river. The solid materials settle to the bottom and are removed along with the floating materials for additional treatment. The remaining wastewater consists of cloudy looking dissolved and suspended materials (mostly organic).

2 Secondary Treatment

In nature – The remaining dissolved and suspended materials flow downstream where naturally occurring microorganisms (tiny organisms of bacteria and protozoa) in the river feed on them. The water splashes over the river's rapids and rocky bottoms allowing oxygen to enter so the organisms can breathe and grow.

At the treatment plant – Wastewater from primary treatment, containing mostly dissolved organic materials, flows into tanks filled with microorganisms, the same kind as in the river, but a lot more. Air is bubbled into the tanks so the organisms can breathe. The bacteria then eat the wastewater solids and dissolved material and make more bacteria. Some of the bacteria are recycled in the treatment plant to treat more wastewater.

3 Tertiary Treatment

In nature – Water filters through the ground beneath the river and joins the underground water supply. Some of the clear clean water continues to flow into nearby lakes or oceans.

At the treatment plant – Filters, much like those in a fish aquarium, remove any remaining suspended materials.

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4 The Final Product

In nature –The ultraviolet rays of the sun kill the harmful bacteria, viruses, or microorganisms. The river has cleaned the water through Mother Nature's own processes and is capable of maintaining the health of fish and other animals.

At the treatment plant – Treated water is mixed with a disinfectant to kill any harmful bacteria, viruses, or microorganisms remaining in the water. The disinfectant is removed before the water leaves the plant so that the final water product is as clean and free of chemicals as water in nature. The treated water is now recycled and available for all kinds of uses.

Uses of Recycled Water

When does recycled water stop becoming recycled water?

All water is recycled, either by Mother Nature or at a treatment plant. Recycled water from a treatment plant is used in a variety of ways including landscape and agricultural irrigation, recreational uses, industrial reuse, artificial snowmaking, and groundwater recharge. Recycled water distribution systems can be identified by their purple pipes and pumps. As the availability of drinkable water becomes scarce, recycled water continues to fill the demand, provide numerous economic benefits and aids in "drought-proofing" our communities.

Nature's Way

So where does all the bear and dinosaur poop go?

Nature recycled it. Nature has shown us the way to clean water by putting the processes of a river into the concrete boxes we call wastewater treatment plants.