City Waste Water May Aid Industrial Waste Heat

Can the waste water of cities be used to dissipate the waste heat of industry?

The idea will be given its first test this summer at The Pennsylvania State University on fields soaked with sewage.

The project is supported by the NSF'S RANN program: Reasearch Applied to National Needs.

The need is national--and it's urgent· every year a vast quantity of water is used to carry off the heat generated by the steel, basic manufacturing, and, above all, electric power industires.

As more nuclear power reactors go on-line that quantity will be greatly increased.

Dumped into rivers, at temperatures near 100 degrees F, it constitutes a "thermal load" capable of causing ecological havoc.

Passed through wet cooling towers, it can affect the weather, enhancing the formation of fog or clouds.

Penn State scientists and engineers will test the feasibility of pumping such effluent through pipes that are buried in moist soil. The principle involved is familiar to any parent who has even tried to reduce a child's fever by putting a wet towel on his forehead.

The moist soil will hopefully act like that wet towel; it will pull the heat out of the pipes to the surface, where it will be dissipated in the atmosphere.

Two kindred experiments are under way in Oregon and North Carolina. There, however, the soil has to be soaked for the purpose.

The essence of the Penn State experiment is to use soil that is already being moistened for another purpose, in this case, to purify waste water.

Spray irrigation of sewage has been under investigation at the University for over ten years in a project that has been dubbed the Living Filter. It makes available a round-the-clock, round-the-year supply of moist soil.

If the new spin-off proves out, it would enable cities to solve two serious waste-disposal problems at one stroke.

It could also extend the growing season for consumer crops or animal feed all over the northern U.S and even into Canada

"A city of a million people," says project co-ordinator Dr. Dave DeWalle, of the School of Forest Resources, "would require about 7500 acres to cool the water from its power plants alone. At least, this is our preliminary estimate. One purpose of the field test is to verify that figure."

DeWalle acknowledges that 7500 acres is "a lot of land. However, spray irrigation systems now in the planning stages for Chicago and Muskegon County, for example, will make use of even larger acreages."

A network of plastic piping is now being set up in a small plot on the Penn State farms. The pipes are being buried one foot deep in rows that are two feet apart.

Water heated to the temperature of coolant discharged from a typical electric power plant will be forced through the system.

"If that water comes back to the network head 20 degrees cooler than it went out," says DeWalle, "and if there are no serious effects to soil, crops, wildlife, the air, or man, we will have demonstrated that the technique is feasible."

At the same time a computer analysis will be made of the economics of a full-scale system.

If the experiment is conducted with the thoroughness that has characterized the parent project, the results should be highly dependable. For the Living Filter, sometimes known as the "granddaddy of spray irrigation experiments," is serving as a model for actual installations now being planned in many parts of the world.

Associated with Dr. DeWalle on the project is an interdisciplinary team composed of Drs. Louis Kardos, Daniel D. Fritton and Guy W. McKee, with the Department of Agronomy; Drs. Archibald J. McDonnell and Thomas Rachford, Department of Civil Engineering; Prof. M. L. Schultz and Dr. Warren F. Witzig, Nuclear Engineering; and Dr. J. D. Martsolf, Department of Horticulture.

Replacement tires should be put on the rear wheels for better traction, rather than the front, according to the Tire Industry Safety Council.