

WATER PETAL CASE STUDY

OMEGA INSTITUTE CENTER FOR SUSTAINABLE LIVING

It was 2005 and Skip Backus, chief executive officer at the Omega Institute, was facing an impending wastewater problem. Located on the hillside of a lake in Rhinebeck, NY, the Omega Institute campus relied on an aging septic system established in 1982. Skip knew that the system would begin to fail in the coming years, a dilemma that he framed as an opportunity for Omega to demonstrate its commitment to environmental systems thinking and public education. Rather than replacing the septic system with a newer model, he and his team began thinking of ways to treat this water as a resource. They wanted a system that was low energy, accessible to visitors and free from chemicals. The Eco Machine™ they constructed not only meets these criteria; the Omega Center for Sustainable Living (OCSL) that they built to house the system has come to define the values of the Omega Institute as a whole and is a shining example of Net Positive Water.

SYSTEMS

POTABLE WATER

Potable water for the OCSL and the rest of the Omega Institute is collected from private wells located on the campus. Demand reduction in OCSL is achieved via low-flow fixtures and a waterless urinal.

RAINWATER HARVESTING

Rainwater is harvested and treated on-site before it is used for the OCSL toilets and hose bibs.

GREYWATER + BLACKWATER TREATMENT

The OCSL facility treats the wastewater of their own building, along with the wastewater from the rest of the Omega Institute campus using an Eco Machine™. The system has a capacity of 52,000 gallons per day and is powered 100% by solar energy generated on-site. The water is purified via microscopic algae, fungi, bacteria, plants, and snails before it is returned to the aquifer. The system consists of six stages:

- 1) Solid Settlement Tanks
- 2) Equalization Tanks
- 3) Anoxic Tanks
- 4) Constructed Wetlands
- 5) Aerated Lagoons
- 6) Land Application

LOCATION

RHINEBECK, NY

TYPE

EDUCATION CENTER

SIZE

6,250 SQUARE FEET

DAILY VISITORS/DAY

6 - 30

WATER TREATED/DAY

APPROX. 25,000 GALLONS

CLIMATE

HUMID CONTINENTAL

44 inches of rain/year

83 days of precipitation/year

OCSL CONSTRUCTED WETLANDS



DIAGRAM COURTESY OMEGA INSTITUTE

WATER PETAL CASE STUDY POLICY SOLUTIONS

POLICY PROCESS

Permitting the wastewater treatment system was a tedious but ultimately rewarding process for the team. From the outset, they needed to make the case to replace a system that wasn't broken. The Omega Institute had not yet received any Health Code violations for their existing septic system, and regulators were unwilling to modify a currently working system. At the time, there were very few examples of successful on-site waste management in New York, let alone an innovative system like the Eco Machine™.

The team approached each agency and meeting with a collaborative problem-solving mentality. Though they had a plan in mind, they laid out their site context and goals at each meeting, and allowed the regulators to work with them to arrive at the same solution. This strategy put them all on the same team, and helped to form lasting relationships.

WASTEWATER TREATMENT

Ultimately, because the existing code requires that projects with the ability to connect to municipal wastewater do so, the OCSL was permitted under an alternate compliance route. As a commercial facility, the primary licensing agency responsible for issuing this permit was the New York Department of Environmental Conservation. The team submitted their licenses and were approved, but the required water quality testing was no longer funded by the county due to budget cuts.

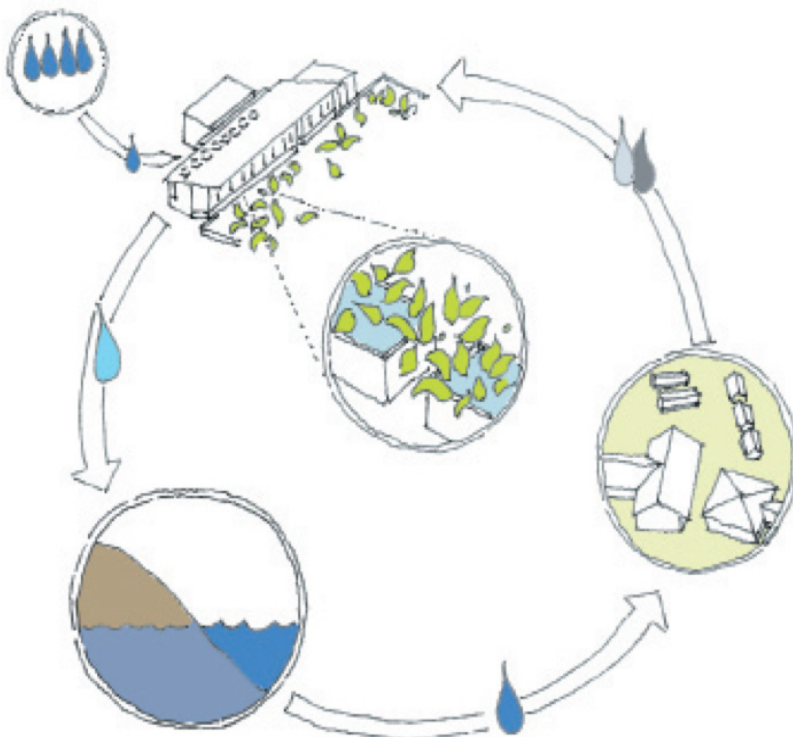
The Omega Institute agreed to fund this testing, an operational cost that added to an already expensive process. They found that most of the agencies they worked with were under-resourced and understaffed, resulting in additional costs for the team. They were required to pay for an engineer review at the city, county and state level, and they ended up providing additional educational resources to those unfamiliar with their specific technology.

CONTINUED IMPACT

All of the testing and effort paid off. The OCSL consistently hosts tours for the public and project teams looking to replicate their success. The Omega Institute now holds seven years' worth of water quality testing results without a single violation - valuable performance data for regulators and project teams around the world.

TIPS + TRICKS

- Model out your proposed system before going to the municipality
- Design redundancies to ensure occupant health and safety
- Know your local representatives and make it political
- Keep a paper trail - people that approve your system may leave



OCSL WATER BALANCE DIAGRAM