



## Worrell Water Technologies, LLC

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### INTEGRATED WATER DESIGN + LIVING MACHINE® SYSTEMS QUALIFICATIONS, AWARDS, PROJECTS, AND REFERENCES

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Worrell Water Technologies, LLC (WWT) specializes in integrated water design and innovative wastewater treatment solutions. WWT's engineers and ecologists **combine conventional and natural systems design criteria** for decentralized treatment of wastewater as well as stormwater management. Our staff has designed, installed, and operated innovative treatment facilities for municipalities, institutions, industries, developments and residences. Our projects have a **track record of 100% approval in the permitting process**. Because we have commissioned and ramped-up every system we have designed in the past 7 years, we understand how to design operator-friendly, robust systems and can provide commissioning and ongoing support for project success.

Living Machine Systems are a family of technologies based on sound principles of environmental and ecological engineering. WWT believes that **good engineering is based on both design experience and good science**. Since 1998, we have systematically researched ideas that have emerged from our design experience. Our staff has developed several innovative wetland-based technologies for wastewater and stormwater treatment. We have received **9 U.S. patents** for Living Machine Systems and have published technical papers to advance both public knowledge and our business position. The combination of WWT's project experience and deep commitment to research and science-based design distinguishes Living Machines within the natural systems technology industry.

WWT's staff includes two Registered Civil and Environmental Engineers with many years of project experience and diverse backgrounds. Staff personnel have experience in wastewater treatment, ecological systems modeling, ecological design, construction oversight, and treatment systems operation. Our staff also includes certified wastewater treatment operators in certain states. Through WWT, resources include legal staff, architects, drafters, and educators.

#### KEY PERSONNEL

##### **Will Kirksey, M.S., P.E., Vice President of Engineering**

Mr. Kirksey oversees the engineering division and helps direct business development. He has over 30 years of experience in environmental engineering and management with Battelle, SAIC, the Civil Engineering Research Foundation, the Tennessee Valley Authority, and the Florida Governor's Office. Mr. Kirksey has an MS in Environmental Systems Design from Southern Illinois University and a BS in Civil Engineering from Tennessee Technological University. He is a registered Professional Engineer in the State of Florida.

##### **David Maciolek, M.S., P.E., Senior Environmental Engineer**

Mr. Maciolek is WWT's senior design engineer and has over 17 years of experience in water, wastewater and environmental engineering. Mr. Maciolek joined Living Technologies, Inc., the forerunner of WWT/Living Machines, in 1997 and has been central to the design of over 18 Living Machine Systems since then. He has NCEES National Registration and P.E. Certification in California, Washington, New Mexico, Oregon, Nevada, Texas, Florida and West Virginia.

##### **Eric Lohan, M.S., Project Manager**

Mr. Lohan is a Project Manager with 7 years of experience in the research and development of Living Machine technologies. He has an MS in Environmental Science from The Ohio State University, is a LEED

Worrell Water Technologies - Living Machine®  
Statement of Qualifications

and ZERI accredited design professional, and holds three patents on ecological wastewater treatment technology.

## AWARDS ASSOCIATED WITH LIVING MACHINE PROJECTS

1. AIA 2005 Green Building Top Ten Award, Las Vegas Regional Animal Campus, Las Vegas NV, awarded to Tate Snyder Kimsey Architects. The onsite wastewater recycling system was done by WWT.
2. AIA 2002 Green Building Top Ten Award, Islandwood Environmental Learning Center, awarded to Mithun Partners and Project Team.
3. AIA 2002 Green Building Top Ten Award, Oberlin College, awarded to William McDonough & Assoc. and Project Team.
4. ACEC/VT Engineering Excellence Award, 1999. For the Guilford Welcome Center Living Machine system. Awarded to Living Machines and the State of Vermont.
5. Environmental Merit Award, U.S. EPA, 1996. For Ethel M. Chocolates' food processing wastewater reclamation and reuse Living Machine system. Awarded to Ethel M Chocolates and Living Machines.

## REPRESENTATIVE RECENT LIVING MACHINE PROJECTS

### **Las Vegas Regional Animal Campus, Nevada, 2005**

The Animal Foundation located in Las Vegas, Nevada significantly expanded the animal holding and adoption facilities at the Regional Animal Campus (RAC). The increased number of kennels and runs for the dogs require up to 20,000 gpd of water for wash down. As part of an overall sustainable design approach, wastewater generated from the RAC is treated and reused for kennel wash down and other appropriate uses. A Tidal Flow Wetland Living Machine system for treatment of the collected wastewater is providing required levels of treatment in an aesthetically attractive manner. The Living Machine also provides opportunities for public education and interaction.

### **Guilford County, Northern Middle & High Schools, Greensboro, North Carolina, 2007**

A Hybrid Wetland Living Machine system is used to treat 30,200 gpd of wastewater for the new campus of the Guilford County Northern Middle and High Schools. Consistent with the school district's commitment to sustainable design and resource conservation, treated effluent from the system is reused for athletic field irrigation. The Hybrid Wetland Living Machine system in operation since spring of 2007 will also provide on-site educational opportunities for students when the high school opens in January, 2008.

### **El Monte Sagrado Resort, Taos, New Mexico, 2004 and 2006**

El Monte Sagrado is a 32 unit luxury resort and spa in Taos, NM. As part of the resort's showcase for sustainable design technologies, a Living Machine system treats 4,000 gpd of wastewater to reuse standards. Wastewater treated by the Living Machine is displayed in an indoor pond and waterfall which are integrated into a lush indoor garden space. Treated and disinfected effluent is reused for site irrigation.

In addition, a wetland system to treat collected stormwater for reuse was completed in the fall of 2006. WWT engineering staff designed an innovative 2-stage wetland system to maximize treatment in a relatively small space.

### **YMCA Camp Seymour, Gig Harbor, Washington, 2002**

YMCA Camp Seymour in Gig Harbor, Washington is a residential camp which serves over 8,000 youth, teens, and adults per year. In keeping with the Camp's philosophy of promoting and teaching environmental stewardship, they chose Living Machines, Inc. to design a 10,000 gpd system that reclaims water for irrigation of a playfield while simultaneously providing a multifaceted education tool.

**Noorder Dierenpark Zoo, Emmen, Netherlands, 2001**

The Noorder Zoo is host to 1,500,000 visitors annually. A Living Machine system at the zoo treats 220,000 gpd of wastewater generated by visitors and the maintenance of the housed animals. Treated wastewater is reused on-site for toilet flushing and other non-potable uses, including animal basins. The Zoo has reduced water consumption by 84% as a result of using the Living Machine. Living Machines produced the process design for a Dutch engineering firm that completed final design and construction.

**Conserve School, Land o’ Lakes, Wisconsin, 2000**

Conserve School is a private boarding high school located on 1,200 wooded acres in northern Wisconsin that emphasizes environmental stewardship, ethics and leadership, and innovative uses of technology. Their Living Machine system is designed to treat 40,000 gpd of wastewater generated by the school community. In conjunction with its main function of cleansing water and protecting the local environment, the Living Machine system serves as a living laboratory and classroom for Conserve’s environmental education program.

**Dallas Animal Shelter, Dallas, TX, 2007 (under construction)**

The Living Machine System at the Dallas Animal Campus will treat up to 10,000 gpd of combined wastewater from all site facilities. The water will be treated to a high degree, filtered, disinfected and re-used for washing the indoor dog kennels at the facility. The system will also serve as an attraction and educational feature.

**SELECTED REFERENCES** Others references available on request.

Reference	Note
<p><b>Guilford County Northern Middle and High School</b> 616 Simpson Calhoun Rd Greensboro, NC 27455</p>	<p><b>Owner Contact:</b> Guilford County Schools, (336) 370-8100 System commissioned in Spring 2007 <b>Operator:</b> R. David Hicks, R.David Hicks, LLC, Tel. (336) 340-5514</p>
<p><b>YMCA Camp Seymour</b> 9725 Cramer Rd, KPN Gig Harbor, WA 98329</p>	<p><b>Owner Contact:</b> Geoff Ball, Executive Director, <b>Tel. 253-460-8900</b></p> <p>System operational since 2002.</p>
<p><b>Conserve School</b> 5400 North Black Oak Lake Rd. Land O Lakes, WI 54540</p>	<p><b>Contact: Dale Mattson</b> (715) 547-0002 or (715) 547-1314 WWT/Living Machines provided construction management, start-up services, training, and ongoing operations oversight.</p> <p>System operational since year 2000.</p>
<p><b>Las Vegas Regional Animal Campus</b> Architect: Tate Snyder Kimsey Architects 709 Valle Verde Court Henderson, NV 89014 Contact: Randy Spitzmesser (702) 456-3000</p>	<p><b>Owner Contact:</b> Darin Landrum, (702) 384-3333 System commissioned in Spring 2006 and fully operational as of June 2006. <b>Operator:</b> Matt Thomas, ECOS Inc., Tel. (702) 813-6052</p>