



RIVERSIDE PUBLIC UTILITIES • Riverside, California

Since March 2010, the Gage Canal pipeline in Riverside, California has been the test bed for long-term research and development of the LucidPipe™ Power System. Working closely with the team at Riverside Public Utilities (RPU), Lucid Energy piloted three versions of the unique in-pipe hydropower system that uses a patented, spherical turbine to recapture the energy of fast-flowing water inside large-diameter, gravity-fed water pipelines. Through real-world testing of LucidPipe, Lucid Energy was able to refine the turbine design and optimize the system for durability, reliability and energy output, while ensuring that LucidPipe operates seamlessly within a working water system environment, with no disruption to flow. Lucid Energy completed the first commercial installation of a 42", single-turbine system at RPU in January 2012 and is using the site to conduct ongoing in-system testing of turbine design refinements.



Riverside Public Utilities (RPU), a leading Southern California leading water utility, collaborated with Lucid Energy to become the first pilot and deployment site for the LucidPipe Power System. The system has enabled RPU to turn a gravity-fed water pipeline with excess head pressure into a generator of renewable, carbon-free electricity. RPU uses the electricity to power their water operations during the day and city streetlights at night.

The system earned RPU an "Outstanding Energy Management Award" from the California-Nevada section of the American Water Works Association (AWWA) and has garnered the attention of media and global leaders in both the energy and water fields who visit RPU to see and evaluate the system in action.

The LucidPipe test site in Riverside, CA continues to serve a role in the development and testing of new turbine refinements, as Lucid Energy continues its R&D to drive higher power output and lower costs, making the LPS accessible to a wider range of water utilities worldwide.

PROJECT FACTS:

Location: Gage Canal pipeline in Riverside, California, USA.

System: A single, 42", 20kW LucidPipe turbine inside a 60-inch diameter water pipeline.

Placement: Upstream from a valve used for flow control.

Reliability: 97.8% availability during test period in 2013.

Output: Can produce 50-60 MWh per year. Electricity is fed directly to the utility.

SYSTEM BENEFITS:

Clean energy: turns water infrastructure into a source of renewable energy (LCOE: 5-12 cents per kWh).

Sustainable: operates seamlessly with no impact on water delivery.

Consistent: not weather-dependent, power production is under water agency control

Environmentally-friendly: hydropower that doesn't harm ecosystems.

Reduces valve wear: through a slight reduction in pressure in the pipeline.

LUCIDPIPE SYSTEM INFORMATION:

- Tested and certified to ANSI/NSF Standard 61 for use in potable drinking water systems.
- LPS pipe sections comply with AWWA C200.
- Gross system weight ~6,500 lbs.
- Rated output - 50 kW per 42" turbine.
- Turbine materials: Composite and stainless steel.
- Inverters tested to UL 1741.
- 120 PSI max working pressure.