

Case | Arizona, US

Sustaining life under the desert sun

How Grundfos solar pumps revived Cienega Ranch

In the high desert of southeastern Arizona, Josiah T. Austin rejuvenated a degraded landscape by managing water with care. With thoughtful land management and Grundfos solar pumping solutions, Cienega Ranch now delivers reliable water across tens of thousands of acres – enabling a viable cattle operation and restoring the grassland's rich biodiversity for the long term.

GRUNDFOS 

Possibility in every drop



Bringing degraded land back from the brink

When Josiah first purchased 9,000 acres (36 km²) of Chihuahuan Desert near Willcox, Arizona in 1989, the land he inherited was in a sorry state. “It was an overgrazed, degraded ranch that needed help,” Josiah recalls. “We’ve spent the last 40 years trying to get it back into shape.”

To Josiah, getting Cienega Ranch back into shape would mean restoring the rich biodiversity this Sky Island area of southeastern Arizona is renowned for – while running a viable cattle operation. The problem was water. During the June to mid-September monsoon season where “it’s not unusual to get 10 to 20% of your annual rainfall in 45 minutes,” water simply ran off the degraded desert grassland, eroding the soil and never finding its way into to the ground.



Over time, as Josiah expanded his ranch to around 70,000 acres (280 km²), he committed to repairing the land, using earthen berms, gabions, brush piles, ‘leaky weirs’ and loose rock structures, all designed to slow the water down and let the soil recover.

**“When that rain hits,
it just runs off the
ground.”**

Josiah T. Austin

Owner and Operator, Cienega Ranch and Cattle
Company LLC



A need to pump water with no power grid

Yet even with these structures in place, restoration of the ranch was contingent on one key factor: a dependable water solution to serve both cattle and wildlife.

“There’s no surface water,” explains Josiah. “There are no rivers, ponds or lakes. What the cattle and wildlife rely on are the water troughs I put in. And they’re all serviced by wells, pumps, pipelines.”

Served initially only by a single well, the ranch’s water was moved via portable pumps and 1¼-inch poly lines, limiting coverage and underscoring the challenges ahead in rehabilitating the land.

With no grid power, windmills and diesel generators were initially used to power the pumps, but their onerous maintenance demands, and concerns about the generators’ environmental impact, left Josiah seeking a more dependable solution that could ensure water efficiently reached every storage tank and trough on his expanding ranch.

Local groundwater specialists Ingle Well & Pump – a fourth-generation Arizona family business – worked with Josiah to assess the wells, pipeline distances and total dynamic head requirements.

The conclusion was clear: Grundfos solar-powered submersible solution would offer the most reliable and sustainable solution for moving water around the ranch. “They said the only pump to put in would be a Grundfos,” remarks Josiah.





“Solar has literally changed this ranch.”

Josiah T. Austin

Owner and Operator, Cienega Ranch and Cattle Company LLC

Dependable solar supply, smart control

Today, Josiah's water solution consists of twelve Grundfos pumps: boosters, and SP submersible pumps for the wells, ranging from smaller one- and two-horsepower all the way up to ten-horsepower pumps. With assistance from the Ingle brothers, each is sized appropriately for its location.

Solar power is supplied by Grundfos RSI (Renewable Solar Inverters), connected to arrays that range from small 6-panel installations delivering single-phase 110 V power, to a large 76-panel array operating at three-phase 480 V – “the largest

pump installed in the southwest” when first put in, according to Josiah. “When the sun comes up, it pumps. And then gravity flows down... it's just wonderful.”

Because the distances from well to tank to trough across the ranch vary from under 100 ft (30 m) to as far as four miles (6.5 km), the solution's ability to adapt to changing demand is essential. The RSI's variable-speed capability ensures the pump adjusts automatically, maintaining constant pressure across long, friction-heavy lines.



“The constant pressure capability is a game changer.”

David Ingle

Solution installer, Ingle Well & Pump

The pipeline, stretching over 500,000 feet (150km) in total, is now mainly 2-inch, preferred by Josiah to the original 1¼-inch for “a lot more volume, a lot less drag.” Automatic floats sense when a trough needs water, which can be directed accordingly through a valve network.

A remote monitoring solution gives Josiah easy access to information on water flow, storage levels and alerts on any potential issues, and the network is built for redundancy, too: if any well goes down, valves can be turned so another can take over, ensuring water always flows where it’s needed.



“My cattle don’t have to go any further than half a mile for water. The same thing with wildlife.”

Josiah T. Austin

Owner and Operator, Cienega Ranch and Cattle Company LLC

Life returns with reliable water

With reliable pumping and thoughtful distribution, no animal – cattle or wildlife – needs to travel more than half a mile (800 m) for water at Cienega Ranch.

“Without pumps and without water troughs, this land could support probably 20% of what I have now,” says Josiah, explaining his herd of around 1,000 mother cows would drop to around 150–200 without the infrastructure he’s put in place.

With the ranch an “island in the desert” uniquely situated at the confluence of four bioregions, Josiah is effusive about the wildlife that flourishes on the revitalised land. “I’ve seen a huge increase in bird species and the numbers of wildlife on the ranch.”

“We have more bee species here than almost anywhere in the world,” he enthuses, and from the jaguar all the way down the food chain, native upland wildlife such as black bears, mountain lions, coatimundis, turkey, quail and deer roam the landscape.



All rely directly or indirectly on the water, as do Chiricahua leopard frogs, and Josiah's favourites – the fairy shrimp whose eggs survive decades until conditions are just right, and “my little yaqui topminnows,” an endangered, mosquito larvae-eating fish now inhabiting “probably 85%” of his water troughs.

Josiah's conservation and wildlife support efforts, involving collaboration with groups such as the Natural Resources Conservation Service, Trust for Public Land and the New Mexico Land Conservancy, have been profiled and recognised many times over the years.





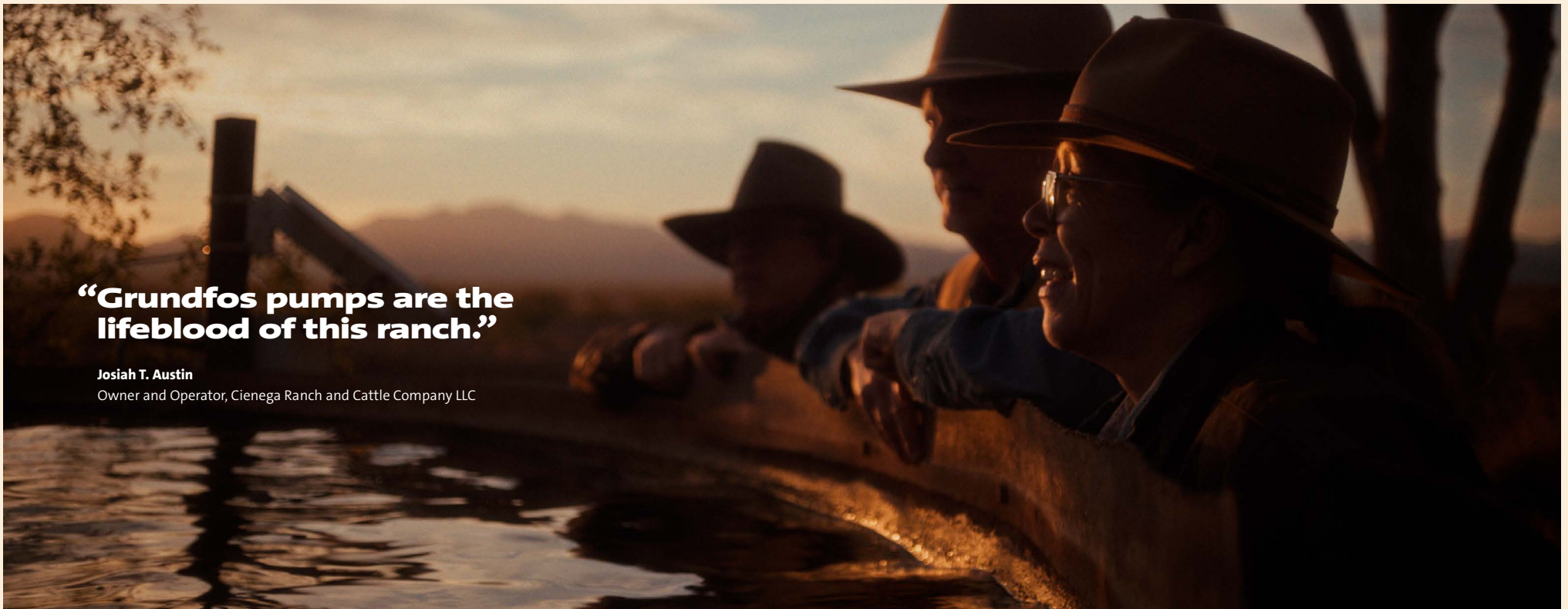
Stewardship that outlasts a lifetime

Josiah has now placed the entire ranch under conservation easements to ensure it will always remain open grassland, permanently protected from subdivision and development.

“Everything I do on this ranch is geared towards future generations,” he muses when asked to reflect on his legacy. “I don’t prune a tree thinking it’s going to be better in two years. I prune a tree thinking that it’s going to be better in 200 years. It’s the same thing with the water solution, the pump. Grundfos pumps are going to outlast me: they’re the only pump that I would buy. The water solution is geared towards the next 20, 30, 40, 50 – 100 years.”

Today, Josiah T. Austin and Cienega Ranch stand as a testament to what can happen when long-term vision, dedication and care meet dependable engineering: a working landscape restored, a water-scarce region made resilient, and a ranch rebuilt not only for productivity, but the preservation and continued thriving of the ecosystem that surrounds it.

“I would like this land to improve with every generation,” concludes Josiah. “I want it to stay productive, wild... a refuge for the wildlife that is here now and has been here in the past, and hopefully will be here in the future.”



**“Grundfos pumps are the
lifeblood of this ranch.”**

Josiah T. Austin

Owner and Operator, Cienega Ranch and Cattle Company LLC

Grundfos Americas
Brookshire, TX 77423
www.grundfos.us
www.grundfos.ca
www.grundfos.mx

GRUNDFOS 