

THE WELL BUBBLER

REMOTE, SECURE WELL MONITORING



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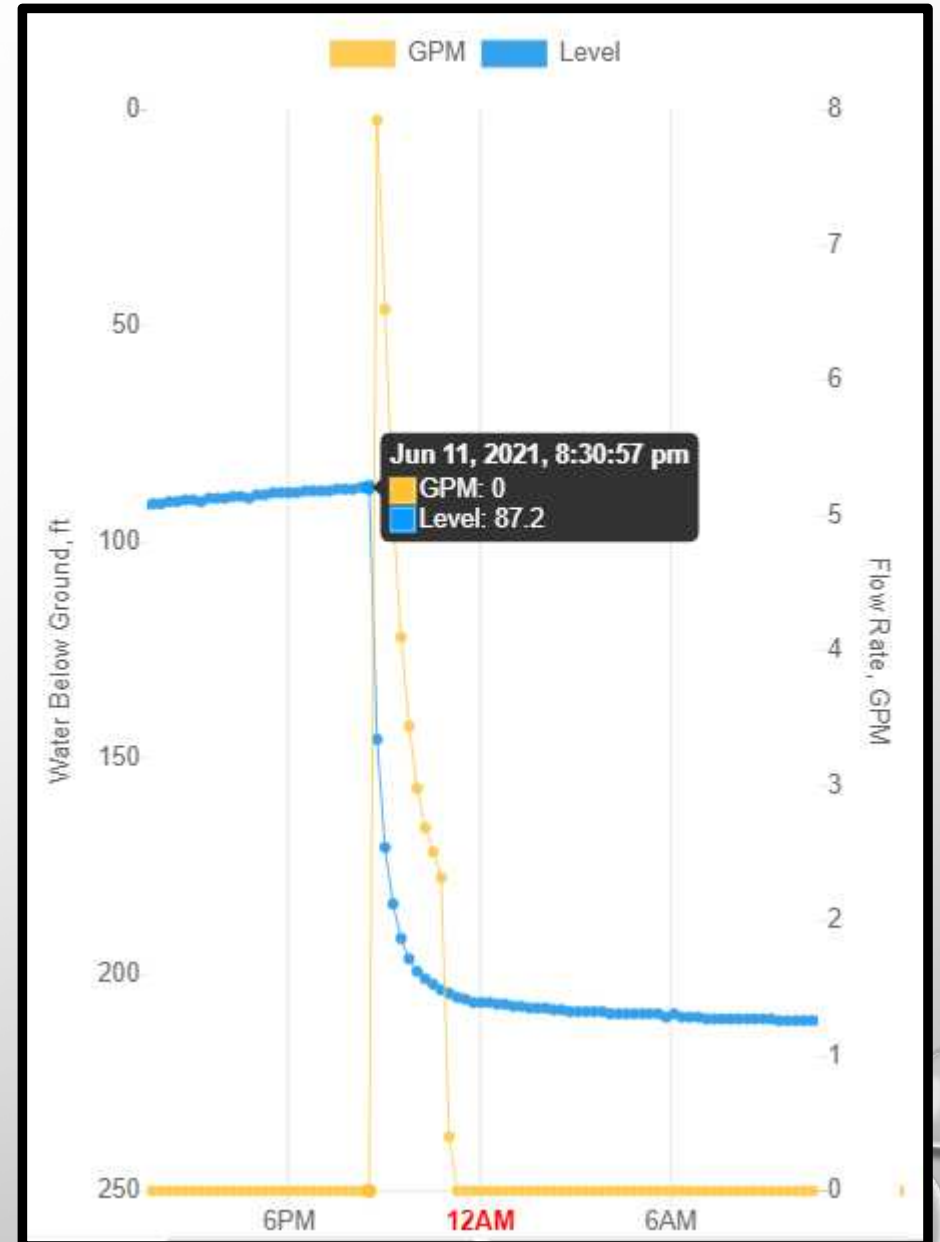


WHY MONITOR MY WELL?

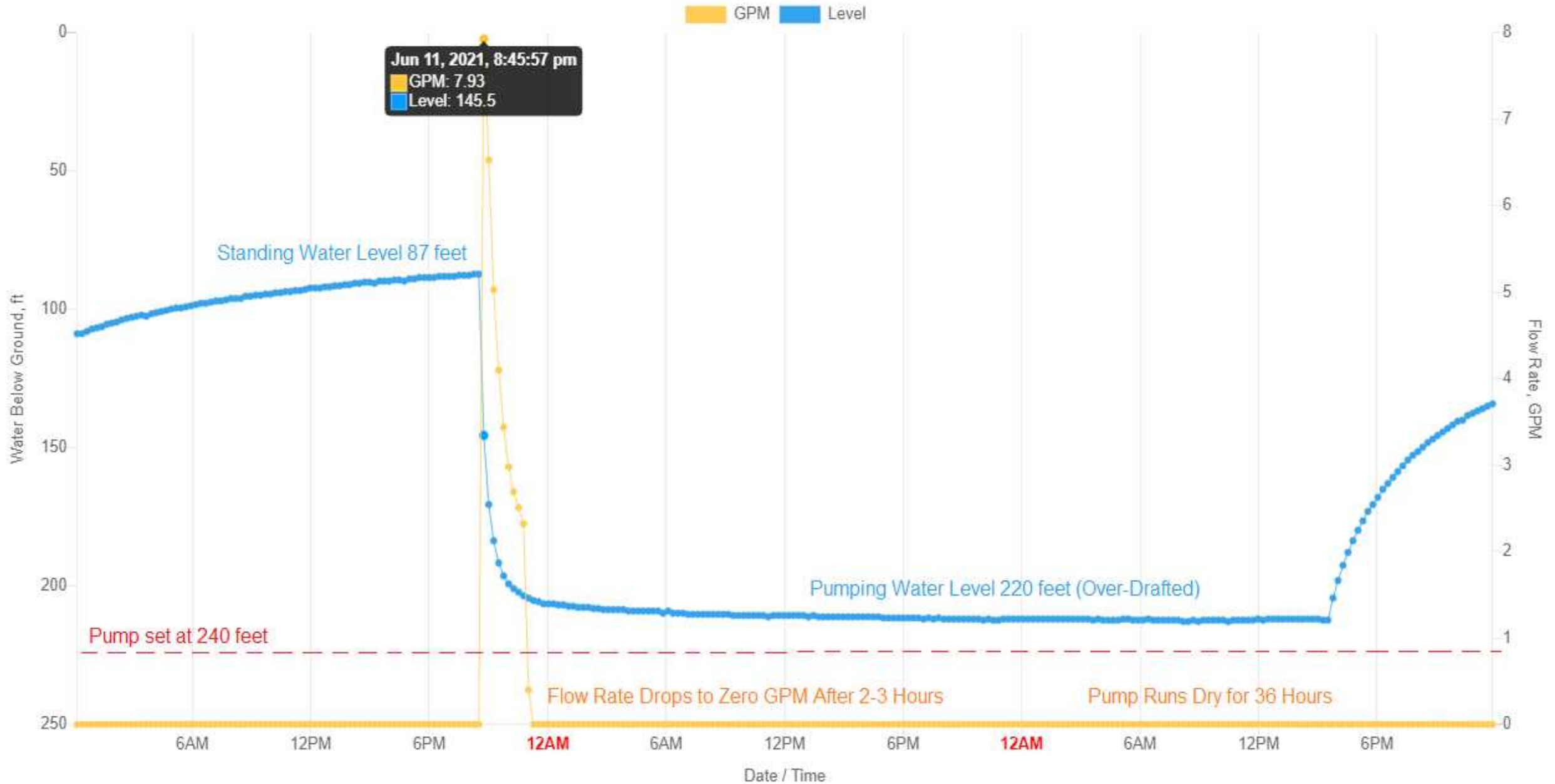
When the water level in a well falls too low, the well is “over-drafted”. The pump can be damaged or destroyed, and will need replacement.

Over-drafting also reduces the well's capacity to produce water. The cost and delay of a pump replacement are significant, particularly during a drought. The cost of drilling a new well in California can exceed \$50 per foot.

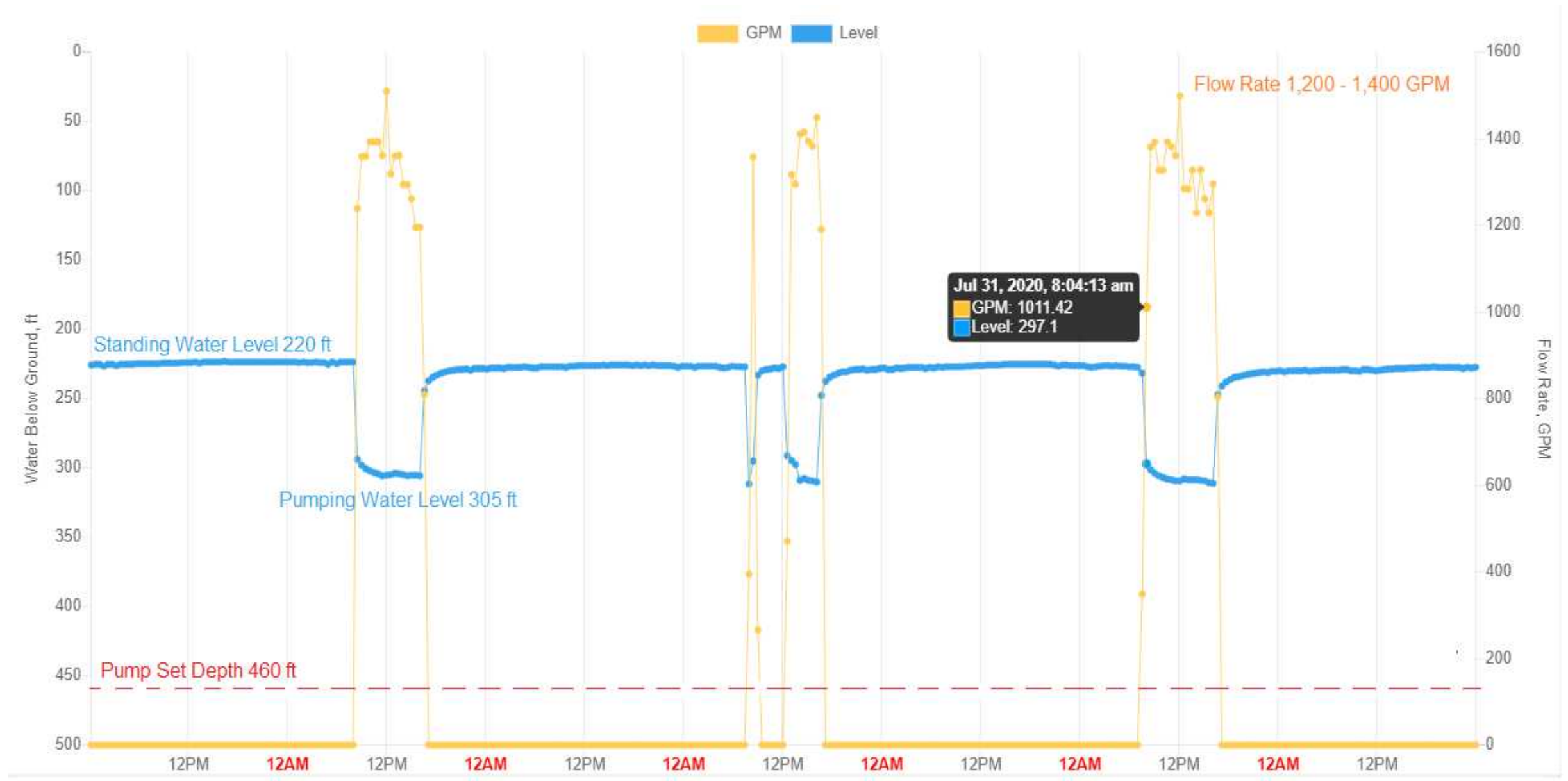
Monitoring your well provides insurance against pump failure, and protects the well.



EXAMPLE: OVER-DRAFTED WELL



EXAMPLE: BALANCED WELL

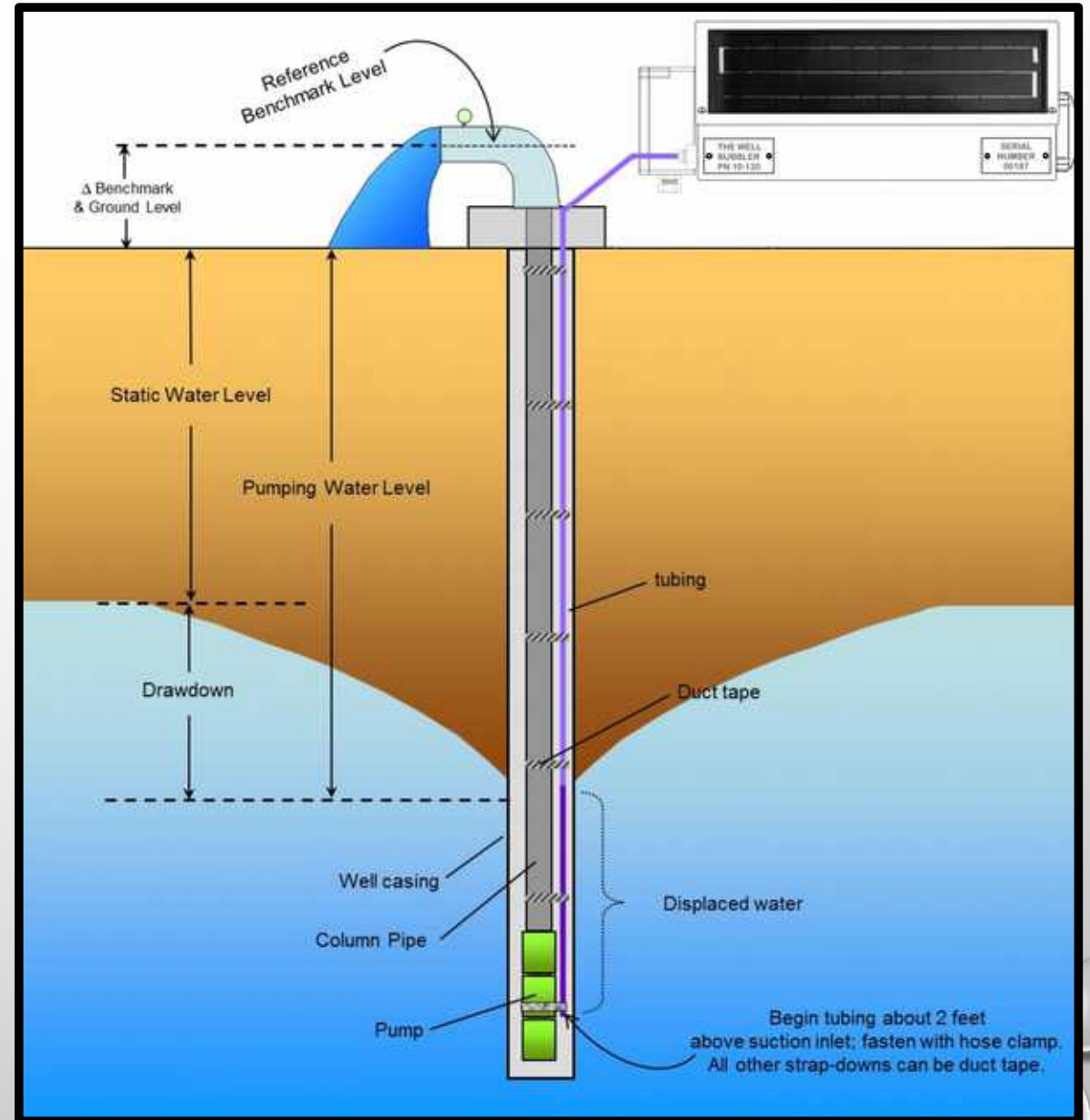


HOW DOES IS WORK?

The Well Bubbler automatically measures the well level, flow rate, and other important parameters in your well, every fifteen minutes.

If the well level is too low, the Well Bubbler will send an alert to your smart phone or email.

It can also turn off the well pump until the water level recovers, protecting the pump.



FEATURES

- Built-in cellular data reporting, including text and email alerts
- Monitors flow rate, discharge water pressure and pump current
- Secure data logger, free software
- Built-in solar power - no wiring, assembly or AC power needed
- LCD display - visible in bright sunlight, and at night
- Relay output - stop the pump when level is low
- Telemetry output - 4 to 20mA and 0 to 5Vdc, compatible with all telemetry and SCADA
- Immune to engine noise & electrical noise

OTHER WELL MONITORS

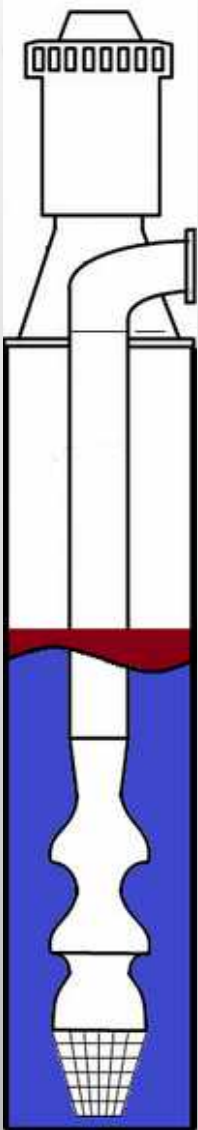
The Well Bubbler was developed after years of struggling with transducers and acoustic well level sensors.

Submersible pump motor wiring and tight clearances cause transducers to snag during installation. Turbine pump motors drip oil into the well, clogging and fouling the sensor. The pump can be damaged by "swallowing" the sensor body and wiring, while VFD noise can make pressure sensors unreadable. Splashing water during well recharge, deviated well geometry, and engine noise affect the accuracy of acoustic sensors.

The Well Bubbler can be safely installed with all pump and motor types- it is not affected by oil in the well, VFD noise, or engine noise.



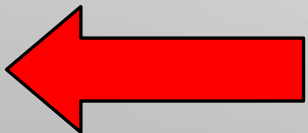
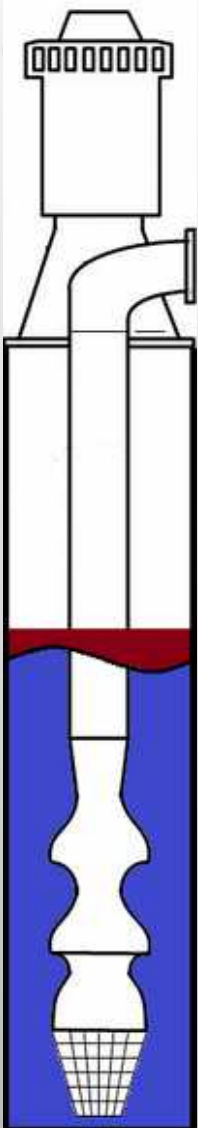
TRANSDUCERS AND LUBRICATION OIL



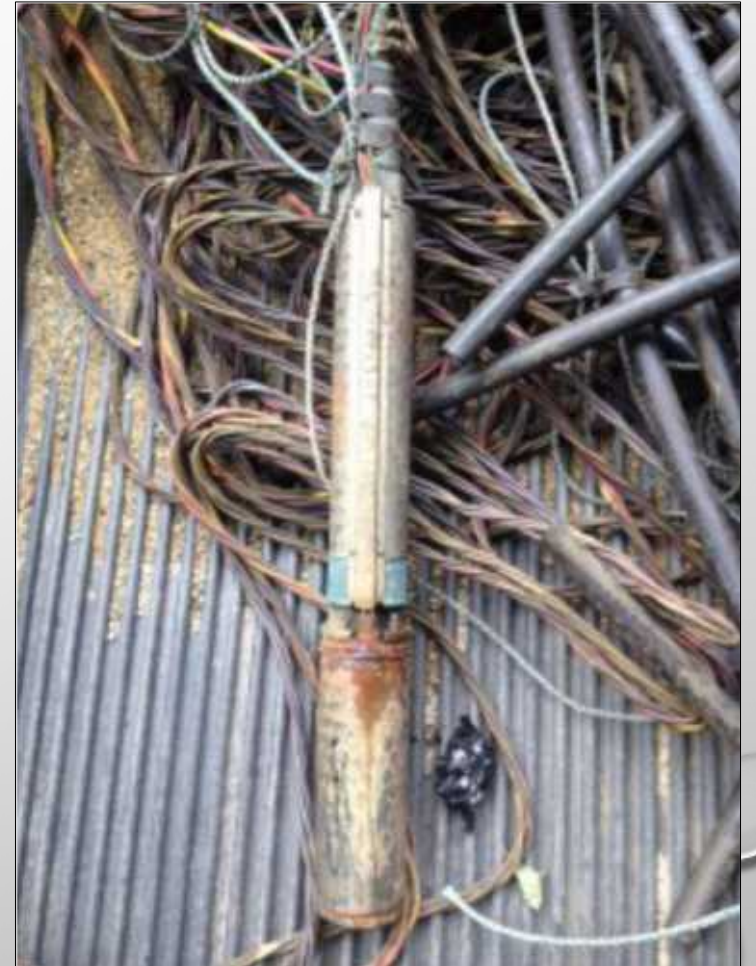
- Lubrication oil drips into well
- Collects on top of water, congeals
- Transducer has small holes to measure pressure
- Sensor clogs with oil during installation
- Bubbler tubing not affected by oil



TRANSDUCERS AND PUMP INGESTION



- Pump set depth unknown
- Sensor set too deep
- Sensor and wire ingested by pump
- Pump damaged
- Well Bubbler uses plastic airline



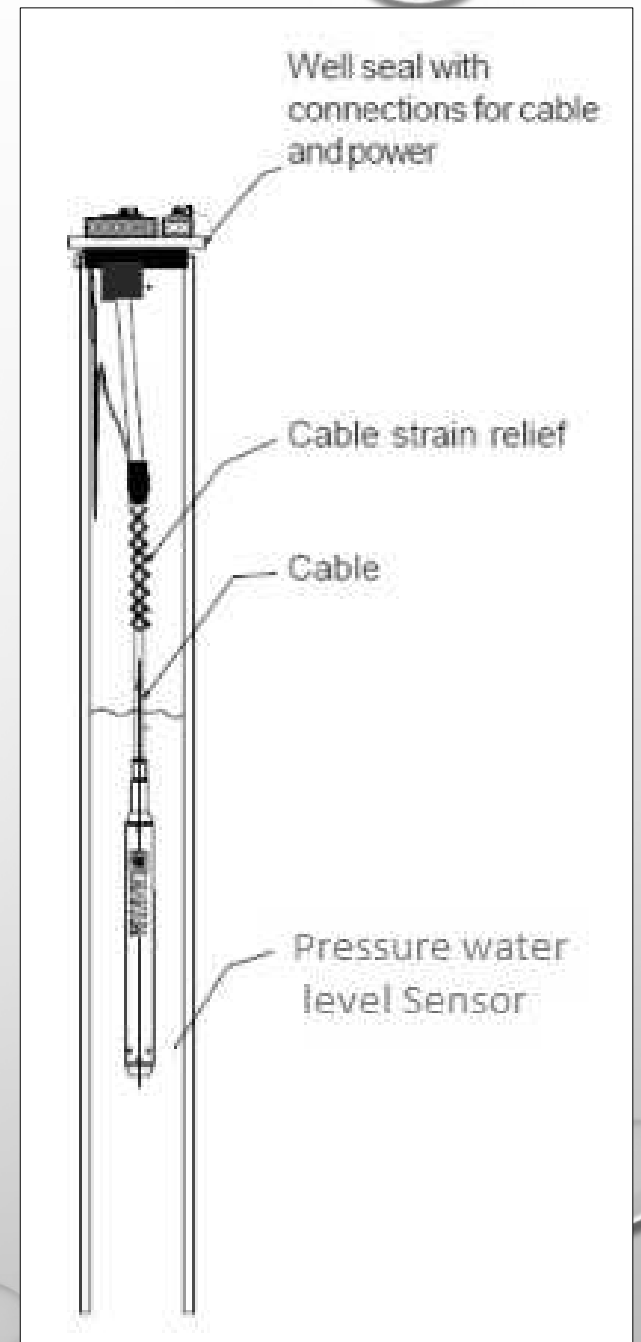
TRANSDUCERS AND PUMP WIRING



- Motor wiring taped to discharge pipe
- Over time, wiring comes loose
- Sensor wire becomes tangled
- Sensor cannot be removed
- Pump must be pulled to retrieve sensor
- Well Bubbler airline uses tear-away design

TRANSUDUCERS AND VFD NOISE

- VFD creates electrical noise
- Motor wiring is long and not shielded
- Sensor wire runs along motor wiring
- Sensor picks up VFD electrical noise
- Pumping level cannot be measured
- Well Bubbler airline immune to electrical noise



TRANSDUCERS AND WELL ACCESS

- Well cap has poor access to casing
- Existing ports obstructed
- Existing ports too small for transducer
- Discharge piping is in the way
- Well Bubbler weight beads are 3/8" diameter
- Well Bubbler airline has 1/2" bend radius
- Air line already present



ACOUSTIC SENSORS AND ENGINES



- Engine-driven gear head
- Severe noise and vibration
- Acoustic sensor accuracy affected
- Well Bubbler mounted remotely
- Well Bubbler not affected by noise

ACOUSTIC SENSORS AND SPLASHING WATER

- Water level falls during pumping
- Well recharges through casing perforations
- Recharge water causes splashing & noise
- Acoustic sensor inaccurate when pumping
- Unable to measure pumping water level
- Well Bubbler is not affected by splashing noise

