

Ranch #3

Pond details:

- Licensed water right (1960)
- 70 acre-feet collection to storage
- 1 outlet split to 2 uses: crop irrigation, livestock watering

Regulatory requirements:

DIVERSION (to storage)	
Measurement	Weekly
Reporting	Annual (April) w/ monthly numbers Jan-Dec
Method	+/- 15% accuracy Equipment installed by "individual experienced with measurement & reporting"
USAGE	
Measurement	Monthly
Reporting	Annual (April) w/ monthly numbers Jan-Dec
Method	Reasonable means

Solution:

- **Diversion** measured by pressure transducer (water level sensor) at 18-hour intervals with data uploaded to data logger. Downloaded to laptop on demand.
 - **Alternatives:**
 1. Use pressure transducer, download data via direct to laptop on regular basis (-\$)
 2. Use staff gauge, note changes in water level every week (-\$)
- **Usage** measured by flow meter on pond outlet, uploaded to data logger. Downloaded to laptop on demand.
 - **Alternatives:**
 1. Track total hours pump operates each month, multiply by pump's rate (gallons/minute), combine with number of head watered each month (-\$)

Devices	Source	Price
Onset U30 NRC Data Logger	www.onsetcomp.com	\$830
Stevens SDX Pressure Transducer	www.stevenswater.com	\$1200
McCrometer 8" DuraMag Flow Meter	www.mccrometer.com	\$2250
Miscellaneous materials: conduit, pvc pipe, hardware	Hardware stores (various)	\$650
	TOTAL:	\$4930

Installation (water level sensor):

1. Acquire Depth Capacity Curve (DCC) from State Water Board
 - Call or email the State Division of Water Rights: 916-341-5300, DWR@waterboards.ca.gov
 - Ask for the "Field File" for your water right. They will copy up to 30 pages for free
2. Establish depth from spill to lowest typical drawdown – DCC can be helpful with this
3. Measure distance from lowest point to dry, accessible onshore location for data logger
4. Order SDX Pressure Transducer with depth range matching #2 and cable length matching #3
5. Assemble 2" pvc line matching #2 above, perforate with holes, mount to dock
6. Lower sensor into pvc pipe, affix to top of pipe, pull remaining cable through conduit to shore, trench conduit onshore to data logger location
7. Mount U30 data logger to galvanized pipe
8. Connect shore end of SDX cable to U30 data logger

9. Establish depth from spill to current water level – this is “Reference Level”, set up data logger accordingly

Installation (flow meters):

1. Establish minimum flow rate in pipe (gallons per minute)
2. Select meter to match pipe size, water quality and minimum flow rate
3. Install air vent upstream of meter in highest point of line
4. (If necessary) install foot valve or check valve upstream and downstream of meter
 - *Note: Many meters can be installed vertically with flow going upwards to achieve full pipe*
5. Install meter in straight stretch of pipe (note upstream and downstream straight-pipe requirements for your meter)
6. Connect flow meter output to U30 data logger
7. Configure U30 data logger according to meter’s pulse units (gallons or acre feet per pulse - see flow meter specs)