Using Solar Power in Grazing Systems

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Forum on Energy Efficiency in Agriculture

November 15, 2005 Des Moines, Iowa

Topography of the Farm

- Rolling hills of D and E slopes (10-18%)
- Slopes lengths of ~200 ft.
- Elevation changes of 50'+ from ridge to drainageway

Drinking Directly from a Pond or other Surface Water

Pros

- Cheapest - No fencing
- Many animals water at once

Cons

- Poor water quality
- Shoreline erosion
- Animal safety
- Shortening of pond life
- Poor Wildlife Habitat

Nose Pumps

Pros

- Cattle pump their own water
- Water can be pumped uphill
- Cattle never reach the pond
- Improved water quality

Cons

- Only adult cattle can push the pump
- Only one cow drinks at a time
- Lead cow drinks first
- Can only lift water 20'

Solar Powered Pumping

Pros

- "Free" energy
- Fewer moving parts
- Panels & Pump can be near water supply
- Choice of pumps for your supply needs

Cons

- Must stockpile water for nights and cloudy days
- Panels expensive and targets for vandalism
- Winter use would be difficult and could be expensive

Solar Pump Types

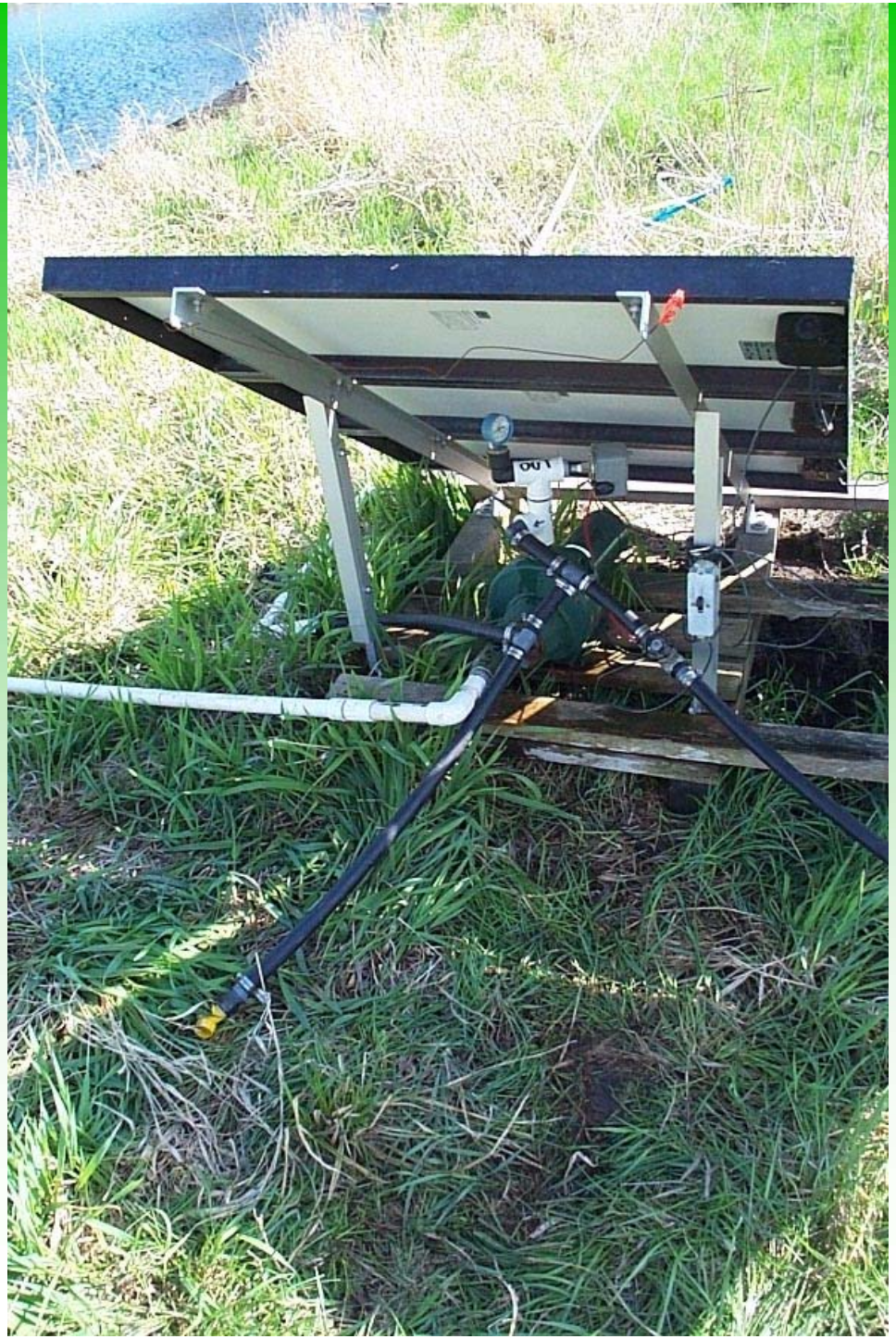
1. Submersible Pumps
2. Jet Pumps
3. Diaphragm Pumps

Submersible Pumps

- Pump is underwater pushing up
- Best for wells
- Can hang off a floating dock in ponds
- High head pressure, can lift water to high elevations and long distances
- More expensive
- Not good maintenance access
- Wires must be underwater

Jet Pumps

- Sits on shore, usually near panels
- Has fair suction pressure
- Can pump large flows at a time
- Lacks head pressure, so cannot push water very far uphill
- Works well as long as waterlines are nearly on contour or lower than the pump



Diaphragm Pumps

- Most inexpensive by far (~$250)
- Pumps only low volumes (1.4 to 3.6 gal/min)
- But pumps with high head pressure
- So low flows can go to high and distant locations
- Best when used with water storage tank
- Sits near shore, easily accessible or can be placed on a floating dock
- Low inlet suction pressure

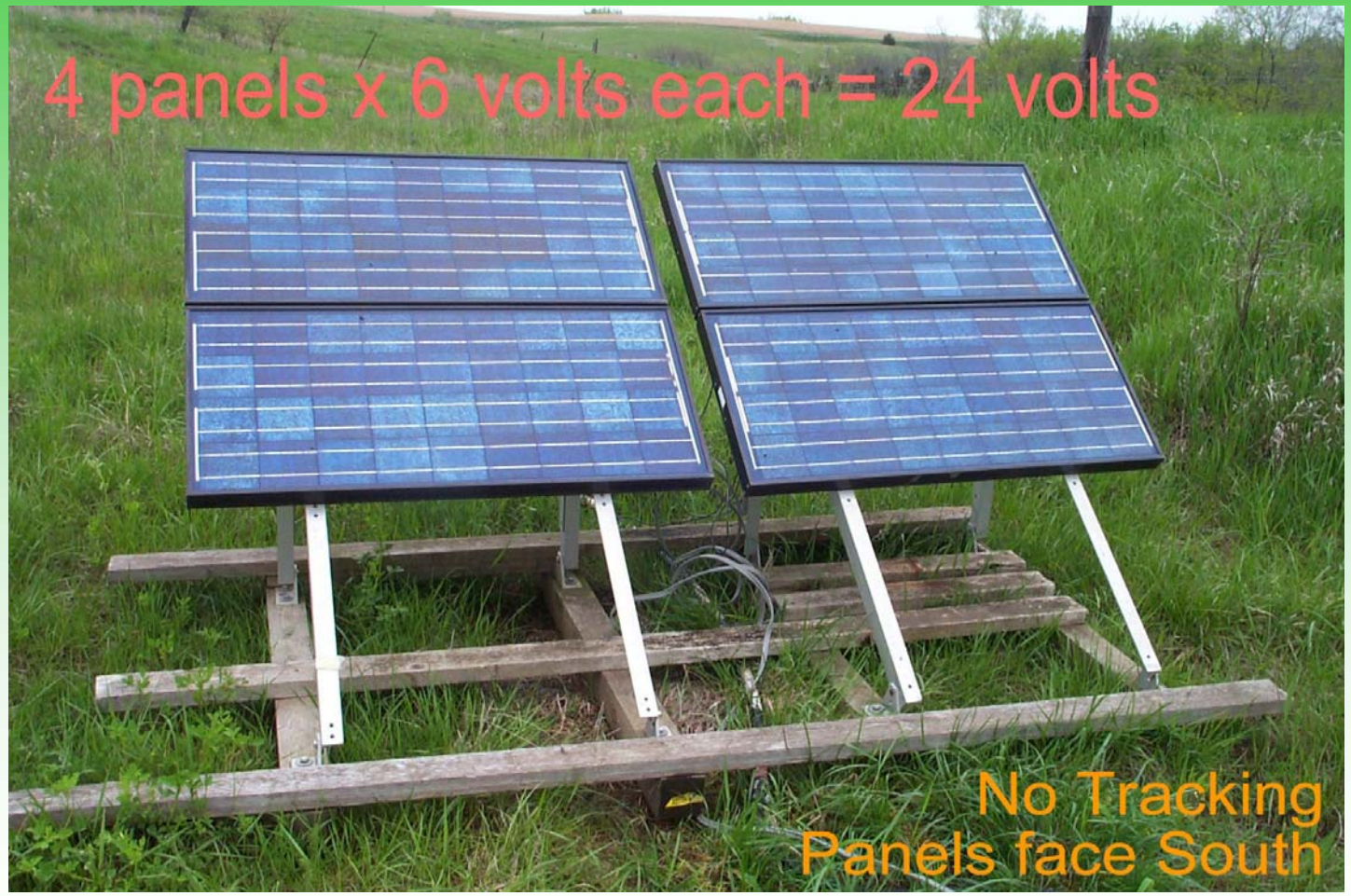
Shurflo 8000 Diaphragm Pump

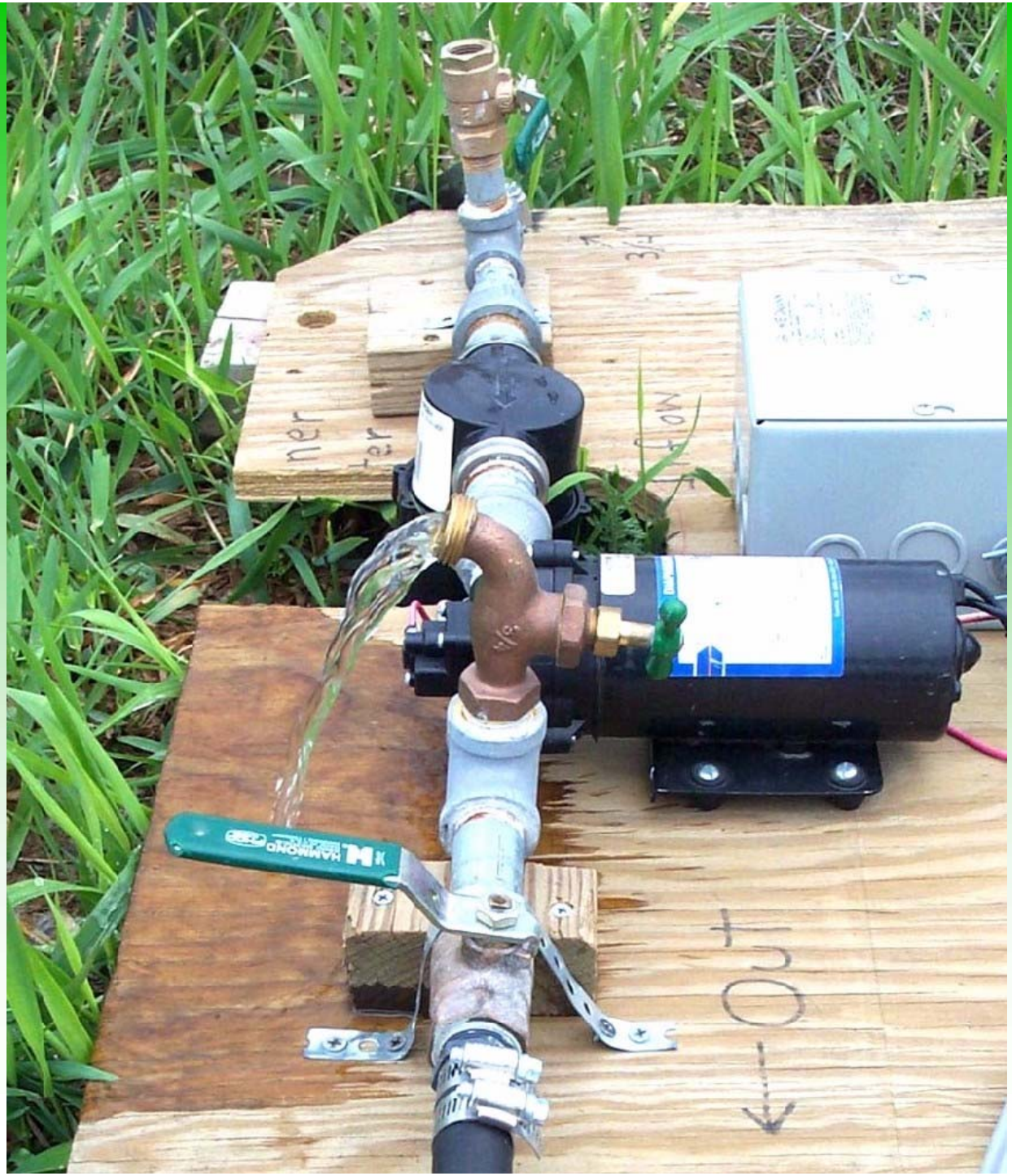
- Only 1.4 gal per min.
- Cost $250
- 24 Volt D.C.

Solar Pumping System

- Inlet 18" below float
- Rigid PVC Pipe to shore
- Priming valve
- Strainer
- Gray box holds controller
- Pump
- Hose bib
- Shut off valve
- Pipe to storage tank

Solar Panels




HAMMOND
OUT

Water Storage Tank at top of Hill

- Hold's 3 days supply
- Gravity feed to 5 tanks
- 56' vertical lift & 487' horz from pond

Hose, Pipe, & Tanks

- Oval tank under fence serves 2 paddocks
- Gravity feeds water from storage tank

Summary of Costs

Solar Panels $280 ea. X 4 = $1,120

Diaphragm Pump $250

Controller $135

Strainer $25

Storage Tank $180 (used)

Electrical wiring $37

Water Pipe $278

Frame for solar panels $115

Other fittings, connections, misc. $144

TOTAL = $2,284

Solar Powered Electric Fence

- Solar panels charge a battery
- System has been in place since 1991
- Battery has been replaced 2 or 3 times
- System has worked very well


B150
New
May 2000

Solar Water System Summary

- Have had some problems with the system losing it's prime
- System "sucks' directly from pond so need a strainer to filter foreign matter
- Lack of expertise on solar pump systems at the local level
- Refill rate of reservoir is slow

On the Plus Side

- A solar system can help get water to locations that might be inaccessible with other systems
- Can be cheaper if power lines are
- > $\frac{1}{2}$ mile away
- It is an environmentally friendly system

Solar power has a place in some grazing systems, but it is not a "***silver bullet***"