4/5/07

Powerline Irrigation well ~~Pump Test~~ Geometry:

Irr. well	obs well 1	obs well 2	obs well 3
0	47′	49′	192′
wl = 34.05′ blw LSD	= 35.58′	38.69 − 2.1 = 36.59′	40.68 − 2.4 = 38.28 ft
r = 0 ft	r = 47 ft	96 ft	288 ft
Power meter = 7993.5 x ? KW Hr	NA	NA	
Sounds: NA	122 ft	118 ft	68 ft (soft)
MP: 0.8 abv	1.8 ft abv	2.1 ft abv	2.4 ft abv
mp w. cap: NA	2.1 ft abv	2.4 ft abv.	2.7 ft abv
casing Diam: 16 in	2.0 in	2.0 in	2.0 in
Alt: 4079	4080	?	?
Lat: 38 53 42.1	38 53 42.6	38 53 43.0	38 53 44.8
Long: 118 47 31.1 (NAD 83)	118 47 31.0	118 47 30.8 ± 15 ft	118 47 30.1 ± 17 ft
Logger Installed: NA	Global	Greenspan	NA
Time:	1030 PST	1308 PST	
Initial read:	12.69 ft	4.48	
Calib verified:	Yes ✓	No.	
cable length:	~~48.27 ft~~ 35.58 + 2.1 + 12.69 = 50.37 ft	36.59 + 2.4 + 4.48 = 43.47	
Logging Interval:	15 min.	15 min	
reads	12.77 ft @ 1303 PST	No Post verify	
WL: blw LSD	35.76′ @ 1305 PST	36.49 @ 1316	

(4/5/07 (cont))

Powerlite Irrigation well Geometry (Cont).

circumference of discharge pipe = 34.0"
Diam = 34.0/π = 10.82"

Flow meter mounting bracket fits nicely.
unknown thickness of pipe. Has painted surfaces
needs to be sanded.
circum of well is 51" Diam = 16.23 in.

Center of pivot crop is at 38 53 29.1; 118 47 36.8 ± 13 ft (NAD83)
Outside edge of pivot crop is at 38 53 41.7; 118 47 31.6 ± 13 ft
Field is very dry & does not appear to have been
watered at all this year. Some small little patches
of alfalfa have grown but appear to be volunteer
and surviving on residual soil moisture.

Pix: 1809: Powerlite Irr well & discharge pipe w/ flow meter ~~mount~~ installed
1810: Same, but closeup of flow meter mount
1811: Same, different angle
812: Obs wells w/ respect to Irr well - looking north
813: Same, zoomed in some
814: Obs well 1 w/ cap & Global Water Installed.
815: Obs well 2 w/ cap & Greenspan Installed
816: Same, a little further away
817: looking north towards obs well 3 f/ obs well 2

14/5/07 (cont)

Pix (cont)

1818: Near center of pivot crop looking at pivot sprinkler - view is to the South

1819: Another view of pivot sprinkler system

1820: Looking north at Irrigation well c/ center of pivot.

1821: A look at one of the pivot sprinklers tires and drive shaft.

1822: other tire w/ electric motor that drives the ~~dr~~ shaft and tires, electric cable runs along inside of discharge pipe along top of sprinkler system

1823: A look at an individual sprinkler head on the pivot sprinkler system.

1824: Looking down the inside of the pivot sprinkler system. View is to the South.

1825: Same, but looking opposite direction (north).

1826: Looking south at Irr well, obs wells 1 & 2 from Powerline Rd.

1827: Obs well 3 w/ installed cap.

1828: Obs well 3 w/ respect to Irr well, other obs wells, & Powerline Rd. (looking south)

3/27/08

Installation of Pressure Transducers in Irrigation well OBS wells: Crew: Kip Allander

water level Pumping Irrigation well:

	wl	-	mp	=	blw LSD	
@ 1135	35.42 ft	-	0.8	=	34.62	T KA ✓

wl OBS well 1

	wl	-	mp w/ cap	=	blw LSD	
@ 1140	35.06	-	2.1	=	32.96	T KA ✓ ?

Anticipated drawdown for pump test is 35 ft so set P.T. ~50 ft blw water surface (≈ 85 ft blw mp)

Installed P.T. (Instrumentation NW Inc PS 9/05) to about ~90' blw mp. In doing so could hear what sounded like water level collapsing?

wl:

@ 1205 38.32 - 2.1 = 36.22 ft blw LSD T KA ✓

Therefore P.T. should read on the order of 51.6 ft

@ 1208 PT reads 51.67 ft - excellent

~~Cable~~ w/ wl of 38.27 ft blw mp is equal to cable length of 89.94 ft

@ 1245 started logging on 15 min interval.

3/27/08 (cont)

obs well 2

wl - MP w/cap

@ 1300 39.62 - 2.4 = 37.22 ft blw LSD T KA ✓

Anticipated drawdown for pump test is 20 ft so set P.T. as low as possible considering that it can only be under water surface by a maximum of 5 m. (May have to adjust length during pump test). Want to leave connecter ~ 2 ft above water surface which is equivalent to P.T. being 15 ft blw W.S. So total cable length needs to be about 54.6 ft long

Installed P.T. (Greenspan 0-5 m range) to about 54.5 ft (±) cable length

wet blw MP

@ 1351 wl = 45 - 5.57 = 39.43 - 2.4 S KA

Therefore P.T. should read on the order of 15.07 ft @ 1351

@ 1351 PT reads, didn't read, must be exceeding 5 m pressure. More, P.T. is not logging. Tried second P.T. It too is not logging. Unable to install Greenspan P.T.'s because they have both failed.

obs well 3

wl - MP @ TOC blw LSD

Sounded at a soft 39.2 ft blw MP (only 1.6 ft of water in well)

@ 1515 37.59 - 2.4 = 35.19 T KA ✓

4/17/08

Water levels at Powerline Irrigation wells
Kip Allander

Powerline Irrigation well:
wl − mp = blw LSD
@ 1430 35.45 − 0.8 = 34.65 T KA ✓

Powerline observation well 1:
wl − mp =
@ 1436 38.23 − 2.1 = 36.13 ft blw LSD T KA ✓
- battery voltage upon arrival = 12.55 volts
- f/ last visit P.T. cable length = 89.94 ft;
therefore current P.T. reading should be
about 89.94 − 38.23 = 51.71 feet

@ 1445 P.T. reads 51.79 feet;
@ 1456 changed out battery, new batt v = 12.77 volts
& reset clock (only off by ~ 15 seconds)
@ 1450 Downloaded data file, all there & looks good
(File name ~~obswell1.dat~~) obswell1.20080417.dat

@ 1500 P.T. reads 51.80 feet;
new cable length = 38.23 + 51.80 = 90.03 ft

4/17/08 (cont)

Powerline obs well 2

Time Hold - MP = blw LSD

@ 1508 39.73 - 2.4 = 37.33 T KA ✓

@ 1511 installed Global water w/ ~ 50 ft cable.
so P.T. should read ~ 50-39.73 = 10.27 ft

@ 1514 PT reads 11.03 ft so actual
cable length is 39.73 + 11.03 = 50.76 ft

@ 1518 Started logging using 15 min interval

@ 1531 appears to be logging fine

Powerline obs well 3

Time Hold - MP = blw LSD

1522 37.20 - 2.4 = 34.80 T KA ✓

4/27/2008

Crew: Kip Allander
Lindsay Burt

Powerline Irrigation Well Pump Test
K. Allander / L. Burt

Powerline Irrigation well

WL - MP = blw LSD

@ 1005 35.49 - 0.8 = 34.69 LB T ✓

Powerline Observation well #1

@ 1050 38.23 - 2.1 = 36.13

WL - MP = blw LSD

f/ last site visit P.T. length was 90.03 ft blw MP,
therefore current P.T. readings should be ~~53.90~~ 51.80

@ 1100 P.T. reads 51.75

@ 1100 Batt V = 12.7 Volts - Battery file

@ 1110 downloaded data file obswell1.20080427.dat
- data looks real good

New cable length = 38.23 + 51.75 = 89.98 ft

@ 1700 · Started Loggers
- Pump failed initially

@ 1711:15 started pump

4/27/08 (cont)

powerline OBS well 2.

P.T. reads 11.01 ft @ 1116 (blw mp)
Batt = 17.1 V ; WL should be 50.76 - 11.01 = 39.75 ft

W.L. Hold - MP = blw LSD
① 1118 39.73 - 2.4 = 37.33 ✓ LB

~~Cable length ok~~
② 1122 P.T. reads 11.01
Cable length unchanged = 50.76 ft
(39.73 + 11.01 = 50.74)
Clock on logger is good
@ 1125 Download data (History) filename: obswell2.20080427.csv
saved to GW → aquifer test

Powerline
Observation well #3

@1143	37.25	- 2.4	= 34.85 ft	✓ LB
(1645)	Hold	- MP	= blw LSD	
@1645	37.20	- 2.4	= 34.80 ft	✓ LB
@1713	37.20	- 2.4	= 34.80	✓ LB
@1715	37.20	- 2.4	= 34.80	✓ LB
@1717	37.18	- 2.4	= 34.78	✓ LB
@1719	37.16	- 2.4	= 34.76	✓ LB
@1721	37.15	- 2.4	= 34.75	✓ LB
@1724	37.14	- 2.4	= 34.74	✓ LB
@1728	37.12	- 2.4	= 34.72	✓ LB
@1733 (1733)	37.12	- 2.4	= 34.72	✓ LB

4/27/08 (cont)

Continued from last page Obs. well #3 @ 4-27-08

@ 1740 : 37.12 - 2.4 ft = 34.72 ft

Time	Hold	- M.P.	= B/W LSD
@ 1745 :	37.12	- 2.4	= 34.72
@ 1800 :	37.14	- 2.4	= 34.74
@ 1821 :	37.16	- 2.4	= 34.76
@ 1854 :	37.20	- 2.4	= 34.80

Powerline obs well 1 :

@ Time	Hold - cut = depth b/w MP	- MP = WL
1815	40 - 1.67 = 38.33	- 2.1 = 36.23 S LB ✓

@ 1815 P.T. reads 51.58 ft

new cable length = 51.58 + 38.33 = 89.91 ft.

Batt V = 12.8

Download data. File name

Powerline obs well 2 :

Time	Hold	MP
@		- 2.4

P.T. reads 8.35 ft @ 1824

Hold - MP = WL

@ 1826 42.25 - 2.4 = 39.85 T LB ✓

@ 1829 P.T reads 8.30 ft

cable length ≈ 50.58 ft

@ 1826 Download data File: obswell2.20080427.182

4/27/08 (Cont)

Irrigation well

- Downloaded flowmeter data - file: ~~QIRR~~ Qirrwell.log @ 1840
- changed flowmeter recording interval c/ every 5 seconds to 60 seconds

@ 1845 88.12 − 0.8 = 87.32 ft
W.L. − MP blw CSD

4/28/08

Irrigation Pump well Test continued

Arrived in AM ≈ 0930 - Pump is pumping just fine
- Flow meter off, Battery drained down.
  Put it on generator. Flow meter now working
- Center pivot stopped rotating at some time
  in the night, started it moving again.

Observation well #3

	Hold - M.P. = Depth b/w LSD	Meas w/ ET	Model RST 3001 checked w/ steel tape 4/27/08
@1002	38.30 - 2.4 = 35.90 ft	✓ LB	
@1130	38.40 - 2.4 = 36.00 ft	✓ LB	

Observation Well #1 (Power line)

W.L. - M.P. b/w L.S.D.

@1011 40.38 - 2.1 = 38.28 ft

Previous cable length = 89.91 ft

@ P.T. ~~reads~~ should read ≈ 49.53 ft

@ 1018 P.T. reads 49.70 ft

New cable length ≈ 90.08 ft

- downloaded data: filename: obswell1, 20080428.1017.dat

Obs Well #2

@1029 P.T. reads 3.98 ft

@1030 46.58 - 2.4 = 44.18

@1035 P.T. reads 3.98 ft

Cable 50.58 prev

4/28/08 (cont)

Obs well #2 (cont)

@1030: Changed logging interval to every 10 min

Cable should read 50.58 − 46.58 = 4.00

Cable length = 46.58 + 3.98 = 50.56 ft

downloaded data: 20SSwell2.20080428.1030.dat

Flow meter

- is working, downloaded data Qirrwell.20080428.1050.log

- Tried to get tape down on Irr well (pumping well)
  - Not very successful, tape hanging up & coming up w/ grease on it (probably fl inside surface of casing & not fl water.
  No more tape downs will be made.

Powerline obs well #3

Time	W.L.	- M.P	=	B/W LSD		
@ 1637	38.52	- 2.4	=	~~38.~~ 36.12	T	LB ✓
1745	38.59	- 2.4	=	36.19	T	LB ✓

Powerline obs well #1

Time	Hold	- M.P.	=	B/W LSD		
1705	40.83	- 2.1	=	38.73	T	KA ✓

Previous cable length = 90.08 ft, P.T. should read 90.08 - 40.83 = 49.25 ft.

1711 P.T. reads 49.25 ft.
Cable length still is 90.08 ft ?
Downloaded data: obswell1.20080428,1715.dat

~~Powerth~~

→

4/28/08 (cont)

Powerlite obs well 2

P.T. reads 3.15 ft @ 1725
means w.l. should be 50.56 - 3.15 = 47.41 ft

Time Hold - mp = blw LSD.
1727 47.41 - 2.4 = 45.01 ft T KA ✓

cable length remains unchanged at 50.56 ft

Downloaded datafile: obswell2.20080428.1730.~~dat~~ csv

1735 P.T. reads 3.16 ft

1645 - 1730: Flowmeter is not working right.
Not recording flow now or overnight tonight.

Irrigation well
Pump Test continued.

4/29/08

Powerline Observation Well 3

W.L. − MP = Depth blw LSD

@ 0827 39.19 − 2.4 = 36.79 ft − Current depth of well

− At this depth the ET probe hit soft wet sediment

WL is > 36.79 ft

0830: Flowmeter still not working. Fuse assembly broke, out of service.

Obs well 2

@ 0845 P.T. reads 1.93 ft. we should be 50.56 − 1.93 = 48.63

Time Hold − MP = Depth blw LSD

0848 48.63 − 2.4 = 46.23 T ~~LB~~

@ 0851 P.T reads 1.95 ft, still close enough to use cable length of 50.56 ft blw MP

Downloaded data: obswell2.20080429.0848.csv

Obs well 1:

Time WL − MP = blw LSD

0856 41.64 − 2.1 = 39.54 T LB ✓

~~0857 P.T. reads 48.42 ft~~

P.T. should read 90.08 − 41.64 = 48.44

0858 P.T reads 48.42 ft, still close enough to use cable length of 90.08 ft

0900 Downloaded data! obswell1.20080429.0900.dat

4/29/08 (cont)

0900
Irr well is not lubricating properly, oil is backing up instead of lubing turbine shaft. Need to ~~start~~ shut down pump, will end pump test at 0930 and start recovery test.

0910, programmed obswell 2 to start logging logarithmically at 0930.

0930:00 Manually started obswell 1 sampling logarithmically.

0930:30 Stopped pumping (Q = 0)

Obs well 1

1226 41.26 - 2.1 = 39.16 T LB ✓
P.T. should read 90.08 - 41.26 = 48.82
1228 P.T. reads 48.88.
New cable length = 48.88 + 41.26 = 90.14 ft
Downloaded data: obswell1.20080429.1230.dat

Obs well 2

1236 P.T. reads 5.58; w.l. should be 50.56 - 5.58 = 44.98.
1237 45.00 - 2.4 = 42.60 T LB ✓; cable length is good at 50.56 ft
1238 P.T. still reads 5.58 ft
Downloaded data: obswell2.20080429.1240.csv

4/29/08 (cont)

Powerline Irrigation Well

W.L - M.P. = Blw LSD.

@1240 - 58.37 - 0.8 = 57.57 T LB

Double Springs cont.

End Time	Bucket	Time to fill (s)	GPM	
13:37:20	5.4 gals	13.33		
13:38:34	"	13.49		
13:40:16	"	13.15		
13:42:22	"	12.96		
13:45:13	"	13.04		
13:51:07	"	13.64		
14:01:53	"	13.45		
14:02:25	"	13.44		
14:03:00	"	13.69		
14:18:05	"	13.63		
14:18:57	"	13.44	good	msmnt
14:19:44	"	13.40	"	"

End test @ ~1420

Volumetric flow msmnts not very good due to extreme wind & blowing dust event. (white caps in Bucket).

5/8/08 Kip Allander

Powerline Irrigation well

Time	wl - MP	=	B/w LSD		
1150	36.16 - 0.8	=	35.36	T	KA ✓

Powerline Irr Observation well 1

1152 38.38 - 2.1 = 36.28 T KA ✓

P.T. should read 90.14 - 38.38 = 51.76 feet

1157 P.T. reads 51.63 feet.

New cable length = 51.63 + 38.38 = 90.01

1200 Downloaded datafile

1205 stopped logging & retrieved P.T.

Powerlite obs well 2

1210 P.T. reads 10.82 feet.

W.L. should be 50.56 - 10.82 = 39.74 ft.

1212 downloaded data. Filename obswell2, 20080508.csv

1218 39.75 - 2.4 = 37.35 T KA ✓

1230 stopped logging & retrieved P.T.

Powerlite obs well 3

1225 37.09 - 2.4 = 34.69 T KA ✓