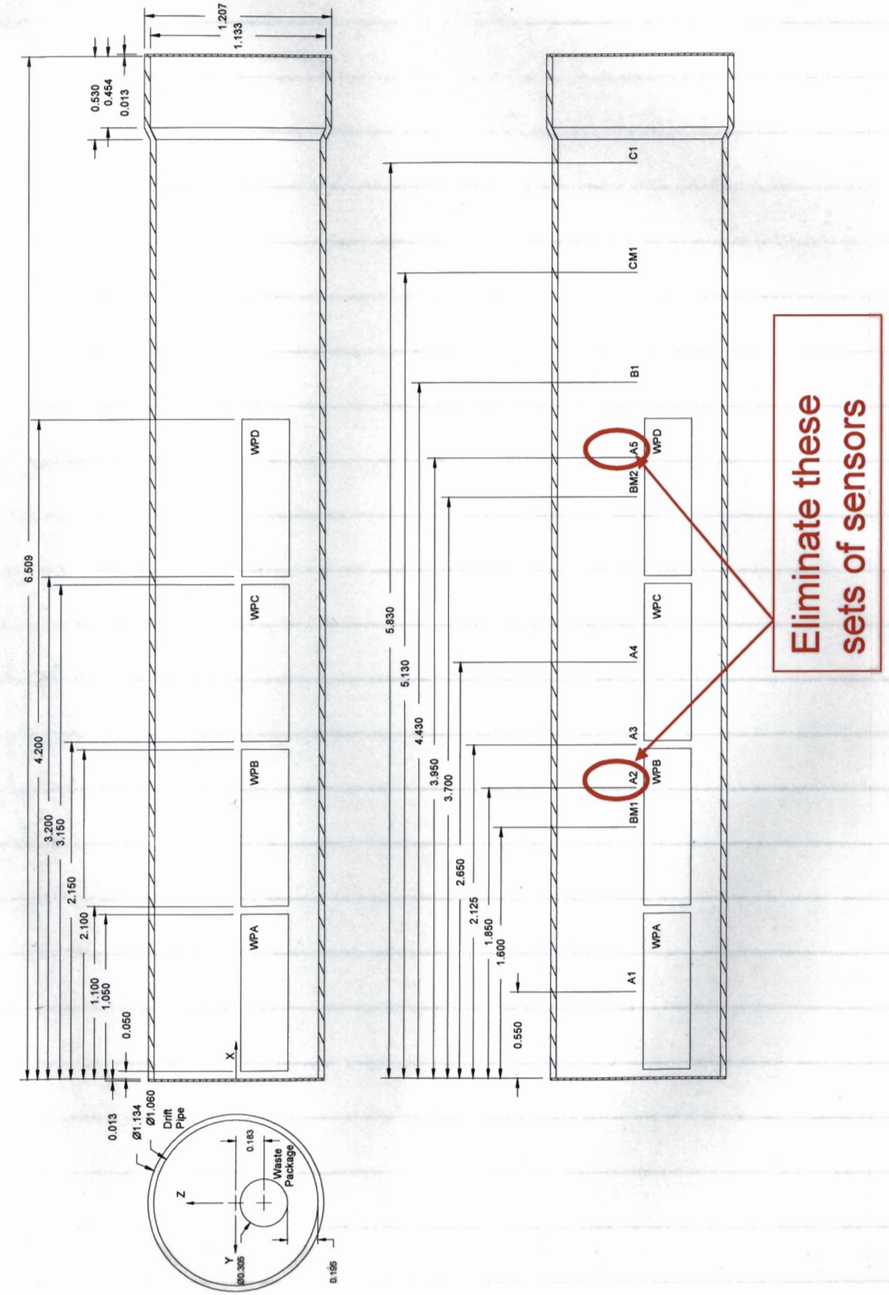
15MAY2006 0013

TABLE1: Channel Number, Corresponding Thermocouple/Thermistor and Corresponding Slope and Intercept Configuration in HP Data Logger

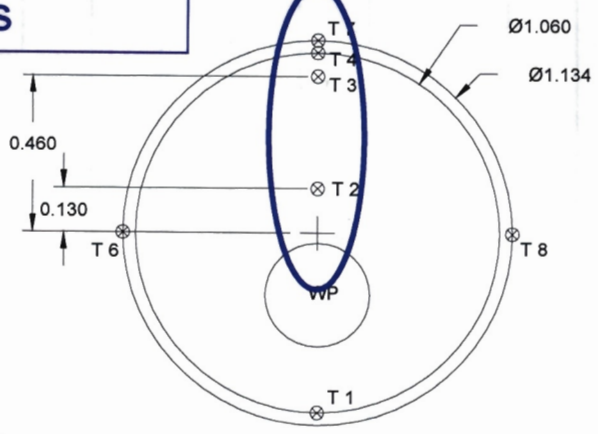
Channel			Measurement	Scaling (Mx+B)				Comment
ID	Scan	Name	Function	Scale	Gain(M)	Offset(B)	Label	
313	☒	Cmod1-01	Temp (type T)	☒	1.0020	0.7329	C	Mounted in Drift
314	☒	Cmod1-02	Temp (type T)	☒	1.0016	0.8112	C	Mounted in Drift
315	☒	Cmod1-03	Temp (type T)	☒	1.0016	0.9717	C	Mounted in Drift
316	☒	Cmod1-04	Temp (type T)	☒	1.0010	0.9778	C	Mounted in Drift
317	☒	Cmod1-05	Temp (type T)	☒	1.0014	0.9570	C	Mounted in Drift
318	☒	Cmod1-06	Temp (type T)	☒	1.0026	1.0846	C	Mounted in Drift
319	☒	Cmod1-07	Temp (type T)	☒	1.0026	1.2025	C	Mounted in Drift
320	☒	C1-06	Temp (type T)	☒	1.0027	1.1810	C	Mounted in Drift
321	☒	C1-07	Temp (type T)	☒	1.0001	1.5823	C	Mounted in Drift
322	☒	Cmod1-10	Temp (type T)	☒	1.0002	1.4160	C	Mounted in Drift
323	☒	Cmod1-11	Temp (type T)	☒	1.0010	1.2482	C	Mounted in Drift
324	☒	C1-01	Temp (type T)	☒	1.0002	1.2050	C	Mounted in Drift
325	☒	C1-02	Temp (type T)	☒	1.0007	0.8488	C	Mounted in Drift
326	☒	C1-T3	Temp 5K Therm	☒	1.0030	-0.0554	C	Mounted in Drift
327	☒	C1-T4	Temp 5K Therm	☒	1.0015	-0.1084	C	Mounted in Drift
328	☒	C1-T5	Temp 5K Therm	☒	1.0016	0.0075	C	Mounted in Drift
329	☒	HotIn-01	Temp (type T)	☒	1.0005	0.3567	C	Mounted in Drift
330	☒	HotIn-02	Temp (type T)	☒	1.0019	0.2709	C	Mounted in Drift
331	☒	HotIn-03	Temp (type T)	☒	1.0017	0.1993	C	Mounted in Drift
332	☒	HotOut-01	Temp (type T)	☒	1.0012	0.1973	C	Mounted outside Drift
333	☒	HotOut-02	Temp (type T)	☒	1.0024	0.7665	C	Mounted outside Drift
334	☒	HotOut-03	Temp (type T)	☒	1.0019	0.8818	C	Mounted outside Drift
335	☒	ColdIn-01	Temp (type T)	☒	1.0009	0.9451	C	Mounted in Drift
336	☒	ColdIn-02	Temp (type T)	☒	1.0010	0.9862	C	Mounted in Drift
337	☒	ColdIn-03	Temp (type T)	☒	1.0016	0.9585	C	Mounted in Drift
338	☒	ColdOut-01	Temp (type T)	☒	1.0026	1.1657	C	Mounted outside Drift
339	☒	ColdOut-02	Temp (type T)	☒	1.0025	1.2144	C	Mounted outside Drift
340	☒	ColdOut-03	Temp (type T)	☒	1.0031	1.1976	C	Mounted outside Drift

May 15, 2006

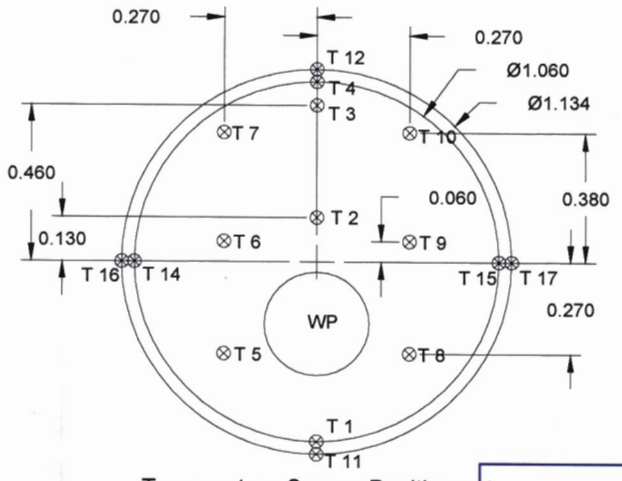
STB 5/15/06



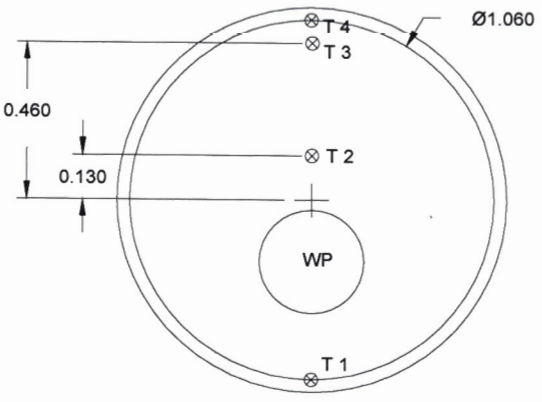
Add thermistors about 1/2" from T'couples



Temperature Sensor Positions at Location A1

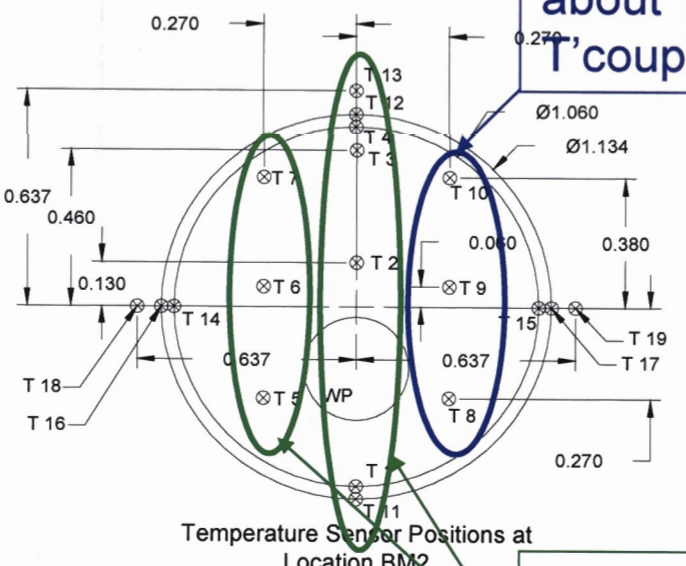


Temperature Sensor Positions at Location BM1



Temperature Sensor Positions at Locations A2, A3, A4, and A5

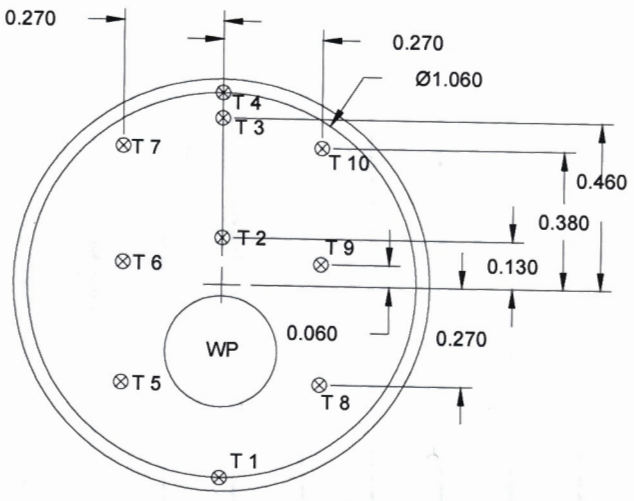
Add thermistors about 1/2" from T'couples



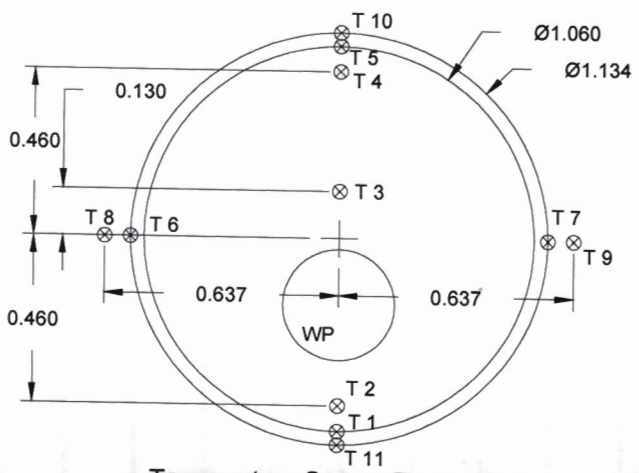
Temperature Sensor Positions at Location BM2

Eliminate these sets of sensors

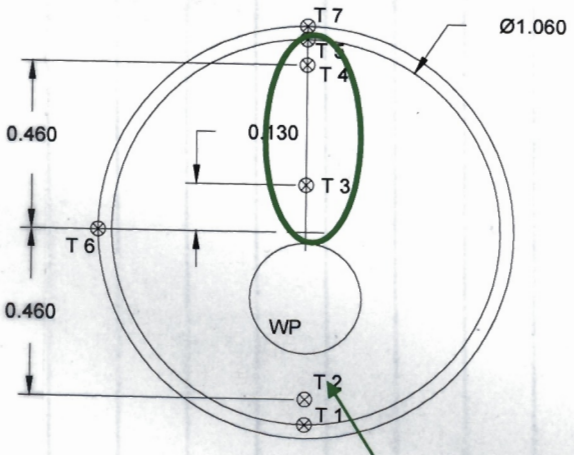
Replace these with thermistors



Temperature Sensor Positions at Location B1

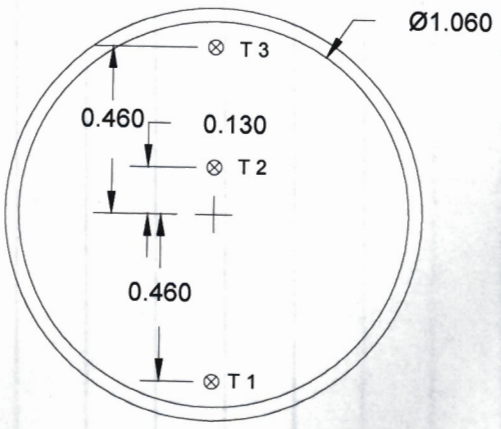


Temperature Sensor Positions at Location CM1



Temperature Sensor Positions at Location C1

Replace these with thermistors



Temperature Sensor Locations on the Inside and Outside Surfaces of the Hot End Wall

STB 5/15/05

- Eliminate Thermocouples:
  - Location A2
    - T1,T2, T3, T4
  - Location A5
    - T1,T2, T3, T4

- Replace Thermocouples with Thermistors:
  - Location BM2
    - T1,T2, T3, T4, T5, T6, T7, T11, T12, T13
  - Location C1
    - T3, T4, T5

- Add Thermistors about ½" from Thermocouples:
  - Location BM2
    - T8,T9, T10
  - Location A1
    - T2, T3, T4, T7

Monday 6-5-06 STB

~~Observe~~ STB 6/5/06

~~9:00 A.M.~~ STB 6/5/06

10:30 A.M. Looked @ data. Some channels varying by more than 0.05°C overall for last 20 hrs. Cannot see more than the last 20 hrs on strip chart views.. Decided (C. Marquelly & S. Green) to leave running dry for another 24 hrs. Review data & decide later when to activate water.

Tuesday 6-6-06 STB

9:30 A.M. Data look very similar to yesterday's w.r.t. trends. Can't say if values are similar. Peak in temps about 12-16 hrs prior to current (i.e., about 5-9 PPM previous day).

Checked WP. vacuum 0.14 psia
Turned on vacuum pump to return to lower pressure.
Got to 0.127 psia – turned off pump and isolated WP's..

Stopped scans to ~~[illegible]~~ save data files so Flavia & S Green could review.

Left running dry. Decide later today whether to activate water.

STB 6/6/06

2:45-3:15 P.M. STB & Mark installed Teritaulds on WPA to prepare for water drip.
Pump set @ 0.03 × 4 ml/hr by front panel.
Delivered 2 ml in 6 min = 20 ml/hr.

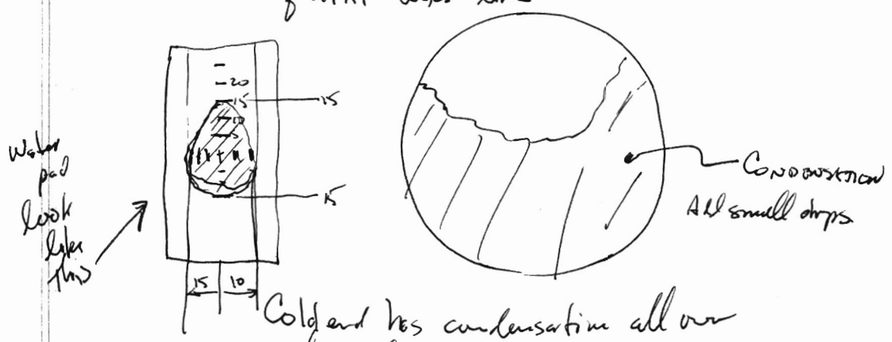
6/6/06 STB 6/6/06

2:45-3:15 pm — D.I. water reservoir level
Continued — @ ~~3:19~~ pm. @ ~~800~~ ml.
3:35 pm. 793

Heaters back on @ 3:20 P.M.

Started Drip into WP @ 3:35 P.M.

Wednesday 6/7/06 STB Room feels humid. Need to get humidish sensor or chart back in room
7:30 A.M. ~~6/6/06 WHEN END OF DRIFT~~ Cover @ WPA end
of drift looks like

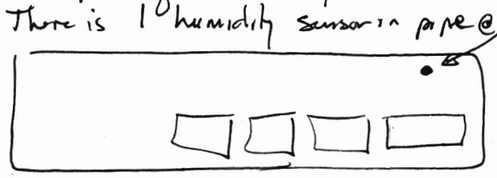


Cold end has condensation all over
All small droplets - no runs.

Cannot detect any condensation on pipe walls.

Cylinder @ 648 ml @ 7:30 A.M.
3:35 pm to 7:30 AM = 16 hrs. } 9.06 ml/hr.
793 - 648 = 145 ml

Took photos of drift ends & drip pads on WPA.
There is 1 humidity sensor in pipe @?



Reads 88.4% as of Approx 6:00 AM (last scan)

6-7-06 STB 6/7/06
10:30 - 11:30

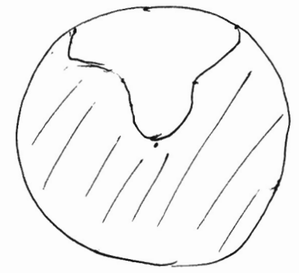
Stopped dataloggers to get data.
Restarted @ 11:20 @ 15 minute intervals.
This will help us decide how long to
take humidity data @ each location/site.
Water level is 598 ml @ 11:20 A.M.

Condensation profiles look similar to
those of 7:30 A.M.

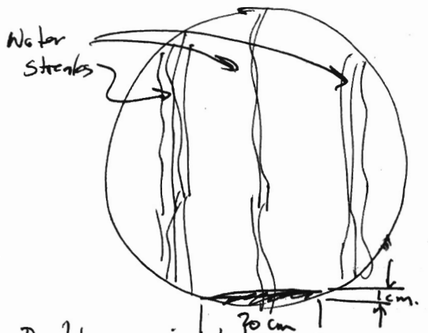
6-8-06 STB 6/7/06
10:15 - 10:45

Cylinder @ 392 ml @ 10:30 A.M.
Added water to bring level to 850 ml

WP end looks like
Tends look very similar
to sketch of 6/7/06

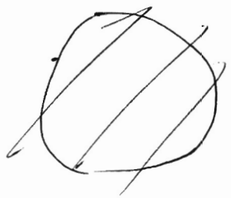


Cold end looks like - covered with condensate

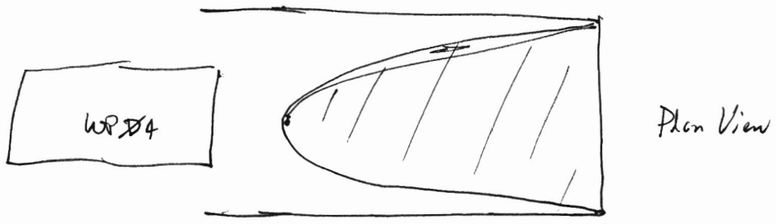


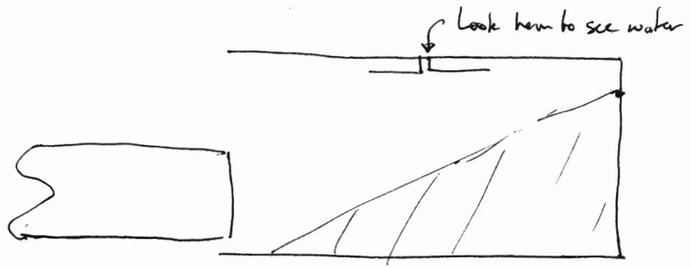
Build up in gap between cover
and pipe ~~end~~

6.8.06 Continued



Cold end of tube has different looking surface



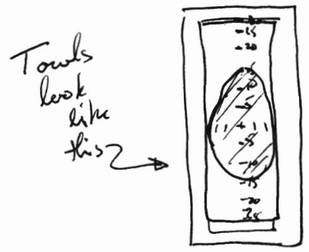


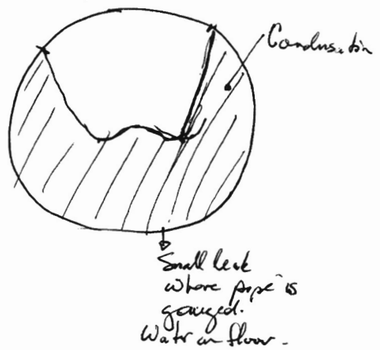
This is definitely water - can see it from top through PH probe top. hole @ top
This pattern was seen yesterday but not recorded in this log. Was not sure it was water Then - but now it is confirmed.

Stopped daily system.
Transferred the latest data sets to jump drive.
Restarted @ 10:20 @ 2 hr intervals.

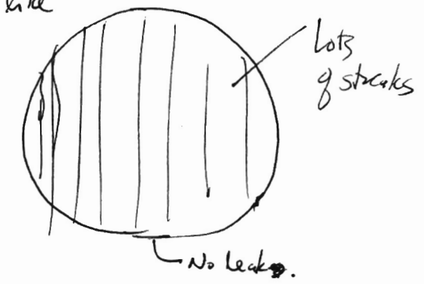
6-9-06
11:30 A.M.

Cylinder @ 5% ml @ 11:30 A.M.
Replaced batteries in ParoScientific.
WPS @ approx 0.14 psia
Ran Vac. Pump until pressure is 0.138 psia
Stopped DAS to export data
. Restarted @ 2 hr intervals.
W.P. end wall looks like.

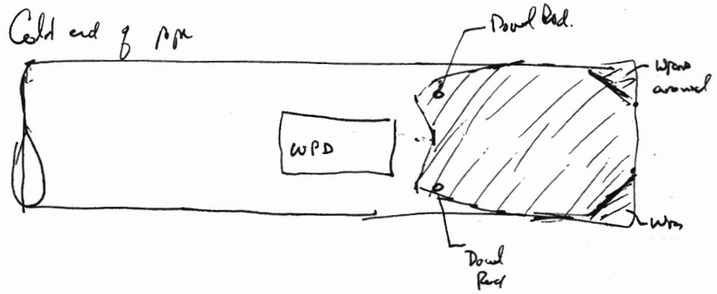


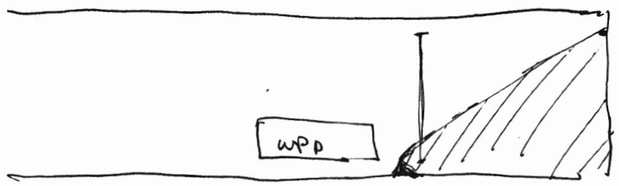


Cold end looks like



Cold end of pipe





6-11-06 STG 6/11/06
5:10 A.M.

Cylinder @ 235 ml @ 5:11 A.M.
Added water to bring level to 832 ml.

Shut Down DAS to install
Humidity Sensors.

STG 6/11/06

~~Channel~~	~~Sensor~~	~~A/N~~	~~Location~~
~~Hum 001 Temp 8~~	~~HS 1~~	~~011850~~	~~Between C1 & CM1~~
	~~HS 2~~	~~011851~~	~~BM01~~
	~~HS 3~~	~~011849~~	

	Channel		A/N	M	b	VDC Amp
%RH = 100×V	1	HS1 Hum	011850 ✓	100	0	↓
°F = 100×V	8	HS1 Temp	011850 ✓			
	11	HS2 Hum	011851 ✓			
°F	14	HS2 Temp	011851 ✓			
	15	HS3 Hum	011849 ✓			
°F	16	HS3 Temp	011849 ✓			
	17	HS4 Hum	006296			
°C	18	HS4 Temp	006296			
	19	HS5 Hum	003634			
°C	20	HS5 Temp	003634	100	b	

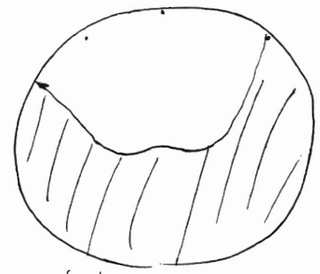
7:23 Restart DAS
Attached only HS1 in channels
1 & 8 Remount of time-event hammer.

6-12-06 STG 6/12/06
~~5:52~~

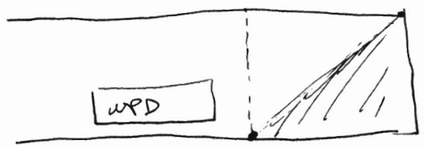
5:53 Stopped DAS to complete wiring

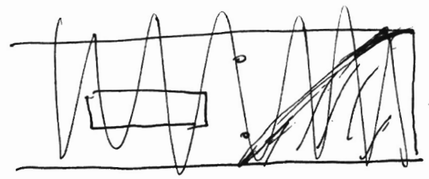
6:43 Restart DAS @ 3-min Intervals.
Cylinder @ 595 ml @ 6:44
6:50 Removed shields from RH probes.
∴ First Readings probably no good.

7:00 WP. End cap looks like



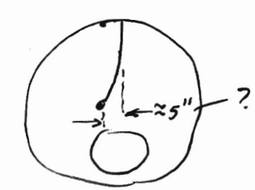
Cold end is covered & streaks





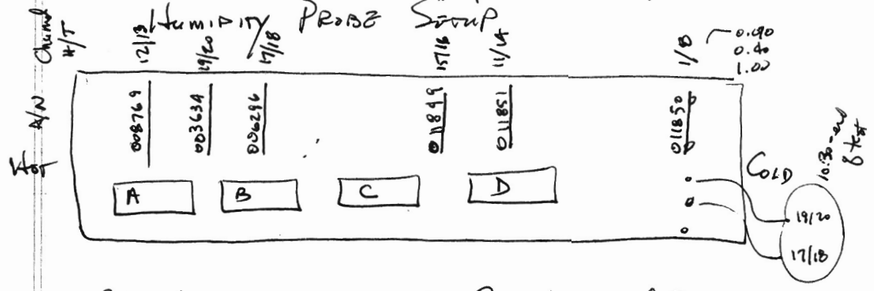
STG 6/12/06

8:30 Moved all 6 probes to
40 cm from top.
8:41 Move Complete
Sensor @ BM1 off axis ~~[illegible]~~



(STR) 6/12/06

6-12-06 8:45 Checked WP vacuum. 0.170 psia
Ran pump to 0.11 psia @ 10:10 A.M.



Channels 8, 14, 16 are Hum Probe Temps in °F
Channels 13, 18, 20 are " " " °C

(STR) 6/12/06 10:25 A.M. Starting Moving Probes
A/N 003634 Moved to Cold end @ 0.8 m
A/N 006296 Moved to Cold end @ 0.6 m
A/N 11850 from 0.4 m to 1.0 m

(STR) 6/12/06 1:08 P.M. Stopped DAS to collect water
Cylinder @ 538 ml @ 13:20

6-12-06 TIME

	Probe A/N & Datalogger Channel									
	011850		011851		008769		011849		006296		003634	
	1	8	11	14	12	13	15	16	17	18	19	20
	%RH	°F	%RH	°F	%RH	°C	%RH	°F	%RH	°C	%RH	°C
7:00-8:30	Near Cl 7cm		BM2 7cm		A1 7cm from top		C-D Gap 7cm		BM1 7cm		Gap WPA-WPB 7cm	
8:30-10:25	Near Cl 40cm		BM2 40cm		A1 40cm		C-D Gap 40cm		BM1 40cm		A-B Gap 40cm	
10:25-1:00PM	Near Cl 100cm		BM2 40cm		A1 40cm		C-D Gap 40cm		Near Cl 60cm		Near Cl 80cm	

6-12-06 (STR) 6/12/06 Placed end caps on after mapping up the water
2:30 P.M.

Restarted DAS on 2-hour intervals. Deactivated Fluke channels 17, 18, 19, 20 to return Vaisala sensors to the owner (R. Pitman) that we borrowed them from.

6:00 P.M. Moved all remaining Humidity Sensors to ~~0.7 cm~~ 7 cm from top of pipe. (STR) 6/12/06

9:35 P.M. Don e-mailed — end cap thermocouple connectors not connected after covers were put back on. Have reconnected

Mass, (M)₁ 53.2 g

M₂ 51.4 g

M₃ 51.4 g

M₄ 51.5 g

M₅ 50.2 g

M₆ 51.6 g

M₇ 51.8 g

M₈ 50.1 g

M₉ 51.4 g

M₁₀ 50.2 g

M_{tot} 512.8 g

÷ 10

= $\overline{M}$ 51.3 g

1L plastic Beakers

- Mark Silver
6/12/06

12 JUN 2006 DRB

Wt of Beakers

B1	51.6
B2	50.2
B3	51.5
B4.	51.9
B5	50.3
B6	51.5

avg = 51.166 gm.

Paper Towel

T1	- 9.3
T2	- 9.3
T3	- 9.3.
T4	9.2
T5	- ~~9.3~~ 9.3
T6	- 9.3

avg. = 9.3 gm.

Note: Did not count number of towels.

Beaker #

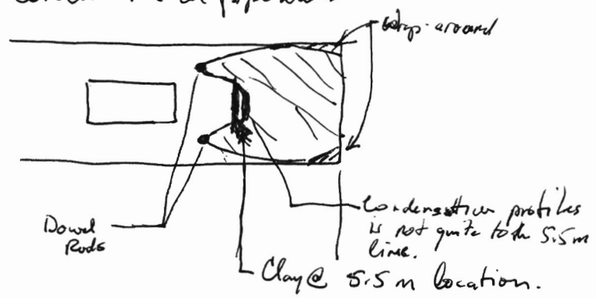
*	Hot End Cap →	483 gms.
4	6m – 5.5 m →	173.6 gms
1	Cold End Cap I →	283.3 gms.
2	Cold End Cap II →	310.8 gms.
7	4 – 4.5 m →	64.1 gms
*	Under WPA →	80.7 gms
6	4.5 – 5 m →	85.2 gms
5	5.5 – 5 m →	145.3 gms
3	Gasket to 6m →	210.9 gms

SR 6/13/06

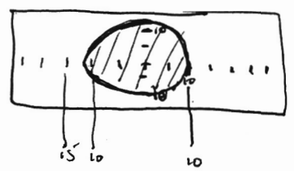
6-13-06 8:30 A.M. Heater powers @
A 76.3 W
B 25.9
C 25.9
D 76.4

Cylinder @ 359 ml @ 8:30 A.M.

Condensation on pipe walls



Towlon WPA

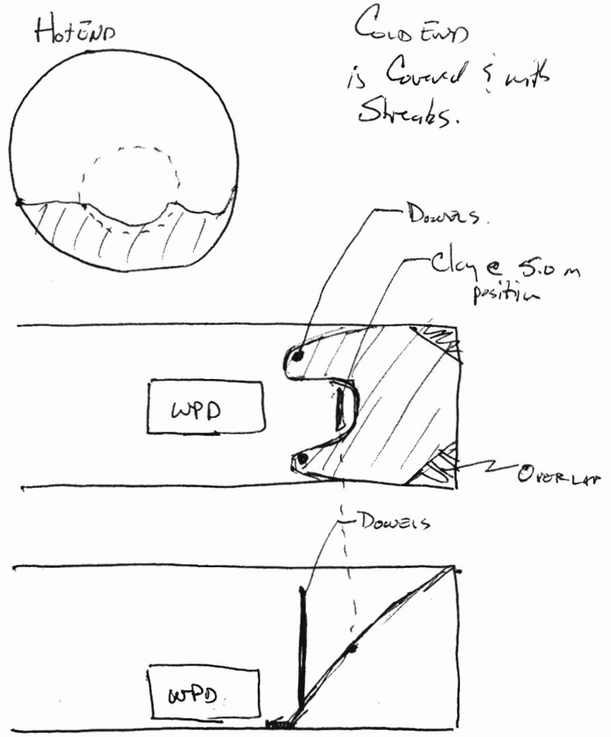


Stopped DAS & restarted to get data and synchronize scans closer.
Saved Data files df0601206a.dat
75-25-25-75_wet-6-12-6-13.dsv
New Fluke file df060130b.dat

6-14-06 SR 6/14/06 Cylinder @ 60 ml @ 4:15 P.M.

6-14-06 ARB Added 440 ml for total of 500 ml. DI H2O

6:50 SR Replaced battery in Hum Sensor A/N 0x850
Unit was dead @ 6:40 A.M.
This sensor is @ cold end
Took photos of Condensation on end cap caps and inside tube.



DAS Stopped & restarted to get data
Heaters @ A 76.5
B 26.0
C 25.9
D 76.6
Cylinder @ 362 ml @ ~~5:2~~ 7:20 A.M.
SR 6/15/06

6-16-06 STB 11:15 AM Replaced 9V battery in A/N 011849. Cylinder @ 100 ml @ 11:21 A.M. Filled Cylinder to 1000 ml

6-19-06 STB 8:00 A.M. Replaced batteries in A/N 011850 and 011849 Humidity Sensors ~~Yes~~ / ~~Stopped & restarted DAS to get Data.~~ STB 6/19/06

Cylinder @ 350 ml @ 8:01 A.M. Condensation patterns look the same @ 5 am 6-15-06

6-19-06 STB 1:40 P.M. Installed Hum Sensors A/N 006296 & A/N 003634 in previous slots to get ready for test scans tomorrow.

6-20-06 STB 5:40 A.M. Programmed change of Fluke for °C
Stopped & Restarted DAS @ 3 min intervals.
Cylinder @ 158 ml @ 5:45
Added water to 896 ml.
Channel 20 still looks bad.

7:40 A.M. Started moving ~~Hum~~ Humidity Sensors to 40 cm from top of pipe.

7:44 A.M. Completed moving.
Fresh batteries on A/N 011849 & 011850
Broke battery Connector on 011850. Rigged it back together but will have to fix later.

6-20-06 STB 10:06 A.M. ~~Moved A/N 011850~~ 1 STB 6/20/06
Moved A/N 006296 to Cold end @ 60 cm from top
Moved A/N 003634 to Cold end @ 80cm
Moved A/N 011850 to 1.0 m
Colored @ Cold end.

6-20-06 STB 1:20 P.M. STOPPED DAS to export data and prepare for water collection.
Cylinder @ 820 ml @ 1:50 P.M.

6-20-06 DRB

		# of Towels
Hot End Cap #1	145.6 gm	6
Cold End Cap #1	922.9 gm	9
Gasket to 6m	399.4 gm	6
6m to 5.5	289.6 gm	5
5.5 ~~5~~ DRB 6-20-06 to 5	219.9 gm	4
5 to 4.5	114.6 gm	2
4.5 to 4	64.3 gm	1

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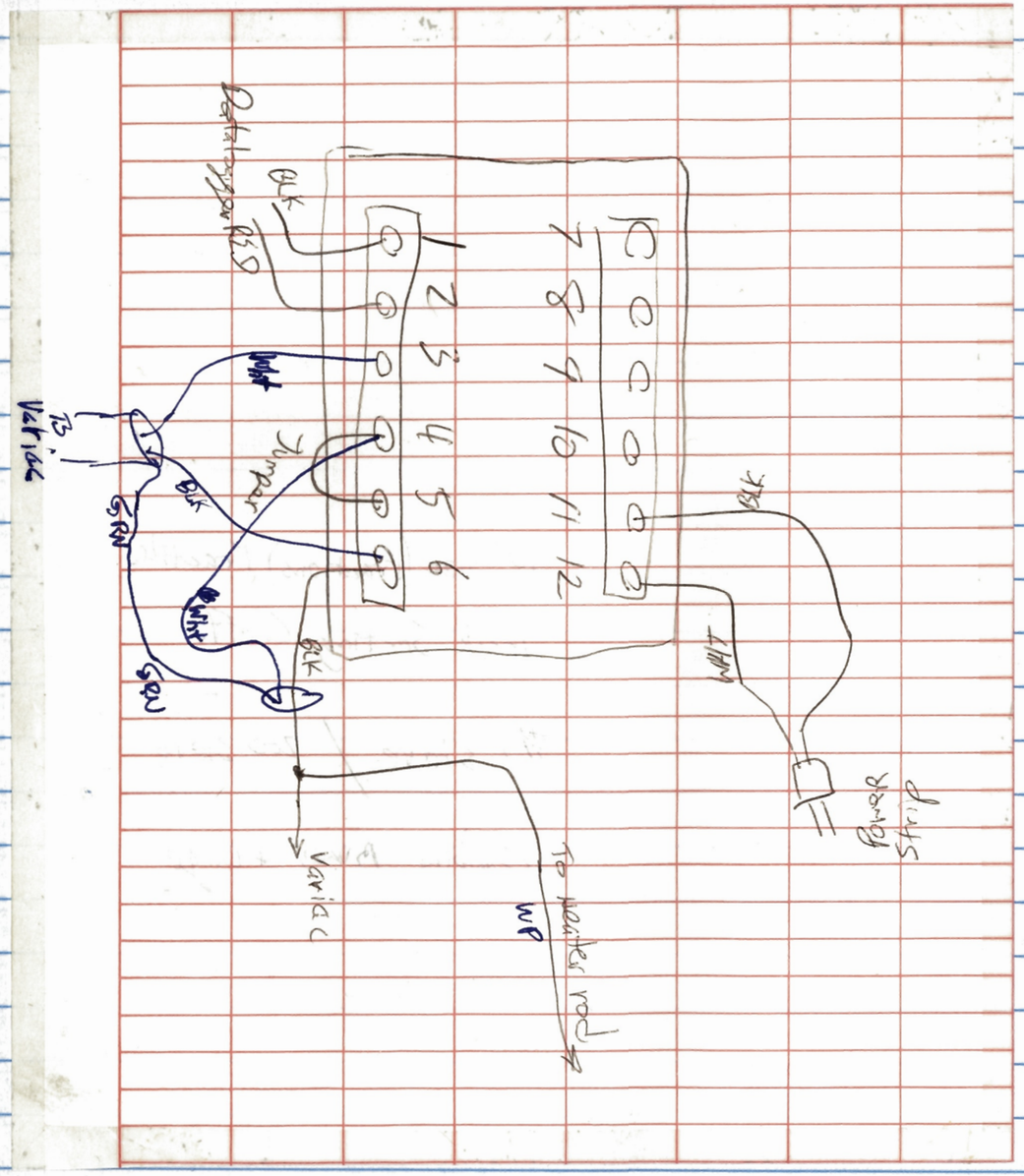
Wiring diagram: Variac, heater rod, power strip, data logger, power transducer connections.



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Work on this project is believed to have ended, therefore, this notebook is closed.

8/11/2008
RL