

**Attachment 1**

**Roscoe Moss Original Well Logs**

**Windsor Well**



No. of gallons per minute pumped when Test first started.....  
No. of gallons per minute pumped when Test completed 1450  
Draw down at completion of Test 88 ft.  
Hours Testing Well 102

Formation: Mention size of water gravel—

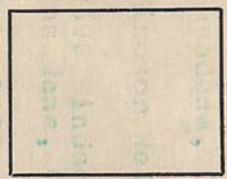
Depth (ft.)	Formation
0	7 ft. Soil
7	60 Gravel and boulders
60	146 Gravel, some sandy brown clay
146	210 Very muddy sand and gravel
210	270 Brown sandy clay, some gravel
270	318 Brown sandy clay, streaks of cemented gravel
318	344 Sand and gravel to 6"
344	372 Hard brown clay, streaks gravel
372	384 Gravel to 2", some brown clay
384	400 Hard brown clay, some gravel
400	408 Gravel to 2" and brown clay
408	423 Hard brown clay and gravel
423	451 Cemented sand, clay, and gravel 1-1/2"
451	472 Hard sandy brown clay
472	485 Sandy clay and gravel to 6"
485	495 Hard sandy brown clay, some 1/2" gravel
495	539 Tight sand and gravel to 10" some clay
539	555 Cemented sand and gravel to 10" plus
555	595 Sandy brown clay and gravel to 10" plus
595	600 Hard conglomerate

If reducing strings of casing were cut off, state how cut  
Depth from surface cut..... ft.  
Size of casing cut..... in.  
Lap in larger casing..... ft.

Was adapter or cement used?.....

If casing was swedged or repaired, state depth, describe repairs and condition in which casing was left and probable future effect:  
Swaged casing from 0 to 595 feet with hydraulic swage.

Make drawing of adapter in square, showing dimensions.



Is well straight, top to bottom? Practically  
If not, what is the variation?.....

Will there be any detrimental effect on pump? No  
If so, what effect?.....

No. of tons of gravel installed in well.....

			1-1/2"
451	" "	472	" Hard sandy brown clay
472	" "	485	" Sandy clay and gravel to 6"
485	" "	495	" Hard sandy brown clay, some 1/2" gravel
495	" "	539	" Tight sand and gravel to 10" some clay
539	" "	555	" Cemented sand and gravel to 10" plus
555	" "	595	" Sandy brown clay and gravel to 10" plus
595	" "	600	" Hard conglomerate
	" "		"
	" "		"
	" "		"
	" "		"
	" "		"
	" "		"
	" "		"
	" "		"

If reducing strings of casing were cut off, state how cut

Depth from surface cut..... ft.  
 Size of casing cut..... in.  
 Lap in larger casing..... ft.

Was adapter or cement used?.....

If casing was swaged or repaired, state depth, describe repairs and condition in which casing was left and probable future effect:

Make drawing of adapter in square, showing dimensions.

Swaged casing from 0 to 595 feet with hydraulic swage.



Is well straight, top to bottom? Practically

If not, what is the variation?.....

Will there be any detrimental effect on pump? No

If so, what effect?.....

No. of tons of gravel installed in well.....

Give any additional data which may be of future value. Placed 11 sacks of neat cement in bottom of well. 8 lbs of H.T.H chlorine tablets in well. There was 25' of sand after pumping.

Driller must fill in report as work progresses and report must be complete for his successor.

Date of report July 7, 1969  
 Jack Cannon and J. Vervoorn.

#44.

Driller

Type and Rig No. used.....



**Well 52**

# ROSCOE MOSS COMPANY

4360 WORTH STREET  
LOS ANGELES, CAL.

Form RM 114

Well No. 52 Job No. 476  
 Owner Water & Power Dept. City of Pasadena  
 Address 100 North Garfield,  
Pasadena, California 91109  
 Location T \_\_\_\_\_ R \_\_\_\_\_ Sec. \_\_\_\_\_  
¼ ¼ ¼  
Windsor Avenue  
 Started Work 9-30-1977  
 Completed Work 11-24-1977  
 Total Depth Drilled 647'  
 Depth Water First Encountered 170'

### MATERIALS

#### Conductor Casing

Material mild steel  
 Diameter (OD) (ID) 24 in. Wall Thickness 1/8 in.  
 Installed From 0' ft. To 50' ft.  
 Cemented From 12' ft. To 50' ft.  
 Size Shoe 24"x8"x1"

#### Well Casing

DIAMETER (OD)(ID)	WALL OR GAUGE	MATERIAL	FROM	TO
20	8x8	Kai-well	0'	640'
total - 644'				
4' left in job to be used for stickup				

Starter Used 23' ft. of 3 ply 8 wall or gauge  
 Size Shoe 20"x14"x 1 1/4"

### PERFORATIONS

Type of Perforator Used Hydraulic - Louver Cut

FROM	TO	WIDTH	LENGTH	HOLES PER FOOT	SQ. INCH PER FOOT
250	360	3/16	2-1/2	20	
360	367	3/16	2-1/2	10	
372	556	3/16	2-1/2	10	
556	630	3/16	2-1/2	20	

### Development & Test Record

Was Well Swabbed? Yes

Formation: Mention size of water gravel —

0	ft. to	15	ft.	Sandy clay, gravel & boulders
				to 24"
15		30		Sand, gravel, & boulders.
30		35		Sand, clay, & boulders.
35		50		Gravel & boulders.
50		75		Sand, clay, & gravel.
75		85		Sand, clay, gravel, & boulders
85		110		Gravel, & boulders.
110		130		Sand, gravel, some boulder
				clay - hard.
130		215		Sand, clay, & gravel.
215		252		Sand, gravel, clay streak - hard
252		268		Sand, gravel to 4" some clay
268		272		Clay and gravel to 2"
272		284		Sand, gravel to 4", some
				boulders to 10"
284		292		Sand, gravel, hard a little
				clay.
292		296		Sand and gravel - tight.
296		300		Sand & gravel to 6" loose.
300		312		Sand, gravel, little clay
				hard.
312		320		Sand, gravel, some boulder
320		324		Sand, gravel, tight.
324		336		Fine sand & gravel.
336		344		Sand, gravel & clay - hard.
344		348		Sand, gravel some clay.
348		352		Sand, gravel & clay - hard
352		356		Clay & small gravel to 3/16
				hard.
356		360		Clay & gravel to 1"
360		368		Hard clay.
368		372		Sand.
372		424		Hard clay.
424		444		Hard clay, some sandy clay
				streaks.
444		448		Sandy clay & small gravel
				to 1"

#### If Well Is Reduced, Indicate:

Amount of Lap at Reduction \_\_\_\_\_ ft.

Amount of Lap at Reduction \_\_\_\_\_ ft.

Amount of lap at Reduction \_\_\_\_\_ ft.

Method of Sealing at Reduction \_\_\_\_\_

Give any additional data which may be of future value \_\_\_\_\_

Cemented conductor pipe from 12' to 50'  
on outside, using 6yds of cement. Water level  
was up at 155' to depth of 360'

**MATERIALS**

**Conductor Casing**

Material mild steel

Diameter (OD) (ID) 24 in. Wall Thickness  $\frac{1}{8}$  in.

Installed From 0' ft. To 50' ft.

Cemented From 12' ft. To 50' ft.

Size Shoe 24"x8"x1"

**Well Casing**

DIAMETER (OD)(ID)	WALL OR GAUGE	MATERIAL	FROM	TO
20	8x8	Kai-well	0'	640'
4' left in job to be used for stickup				
total - 644'				

Starter Used 23' ft. of 3 ply 8 wall or gauge

Size Shoe 20"x14"x 1  $\frac{1}{4}$ "

**PERFORATIONS**

Type of Perforator Used Hydraulic - Louver Cut

FROM	TO	WIDTH	LENGTH	HOLES PER FOOT	SQ. INCH PER FOOT
250	360	3/16	2-1/2	20	
360	367	3/16	2-1/2	10	
372	556	3/16	2-1/2	10	
556	630	3/16	2-1/2	20	

**Development & Test Record**

Was Well Swabbed? Yes

Method Wire Line

No. of Hours 20

Total Material Removed \_\_\_\_\_

Water level when Test first started 157 ft.

Draw down from standing level 16 ft.

No. of gallons per minute pumped when Test first started 795

No. of gallons per minute pumped when Test completed 1040

Draw down at completion of Test 34 ft.

Hours Testing Well 141

272	" "	284	" Sand, gravel to 4", some boulders to 10".
284	" "	292	" Sand, gravel, hard a little clay.
292	" "	296	" Sand and gravel - tight.
296	" "	300	" Sand & gravel to 6" loose.
300	" "	312	" Sand, gravel, little clay hard.
312	" "	320	" Sand, gravel, some boulder
320	" "	324	" Sand, gravel, tight.
324	" "	336	" Fine sand & gravel.
336	" "	344	" Sand, gravel & clay- hard.
344	" "	348	" Sand, gravel some clay.
348	" "	352	" Sand, gravel & clay - hard
352	" "	356	" Clay & small gravel to 3/16 hard.
356	" "	360	" Clay & gravel to 1".
360	" "	368	" Hard clay.
368	" "	372	" Sand.
372	" "	424	" Hard clay.
424	" "	444	" Hard clay, some sandy clay streaks.
444	" "	448	" Sandy clay & small gravel to 1".

If Well Is Reduced, Indicate:

Amount of Lap at Reduction \_\_\_\_\_ ft.

Amount of Lap at Reduction \_\_\_\_\_ ft.

Amount of lap at Reduction \_\_\_\_\_ ft.

Method of Sealing at Reduction \_\_\_\_\_

Give any additional data which may be of future value \_\_\_\_\_

Cemented conductor pipe from 12' to 50' on outside, using 6yds of cement. Water level was up at 155' to depth of 360' started dropping down, at time of completion of well water was at 255'.

Driller Joe A Garcia

Date of Report 11-27-77

Type and Rig No. Used Cable tool rig # 44

CITY OF PASADENA  
Pasadena, California

Well No. 52

Driller - Joe Garcia

Date - 11-24-77

Cable Tol

DEPTH	DIAMETER	TYPE OF MATERIAL	REMARKS	NO. OF GALLONS	WATER USED
0	12"	GRAVEL			
10	12"	GRAVEL			
20	12"	GRAVEL			
30	12"	GRAVEL			
40	12"	GRAVEL			
50	12"	GRAVEL			
60	12"	GRAVEL			
70	12"	GRAVEL			
80	12"	GRAVEL			
90	12"	GRAVEL			
100	12"	GRAVEL			
110	12"	GRAVEL			
120	12"	GRAVEL			
130	12"	GRAVEL			
140	12"	GRAVEL			
150	12"	GRAVEL			
160	12"	GRAVEL			
170	12"	GRAVEL			
180	12"	GRAVEL			
190	12"	GRAVEL			
200	12"	GRAVEL			
210	12"	GRAVEL			
220	12"	GRAVEL			
230	12"	GRAVEL			
240	12"	GRAVEL			
250	12"	GRAVEL			
260	12"	GRAVEL			
270	12"	GRAVEL			
280	12"	GRAVEL			
290	12"	GRAVEL			
300	12"	GRAVEL			

**Attachment 10**

**Field and Pumping Logs  
(2012)**

**Windsor Well**

**MHTS Municipal Production Well Log Sheet - Windsor**

Date	Zone	Pump Start Time	Pump Finish Time	Method <sup>A</sup>	Minutes Pumped	GPM	Totalizer (x 100)		Destination (i.e. Containment, SB#5, or MHTS)	Generator Hour Meter		Comments
							Start	Finish		Beginning of Day	End of Day	
9/10/2012	325-335	9:19	9:35	DSAL	16	31.25	3,060	3,065	Containment	2,562	--	Top of Screen
	335-345	9:52	10:07	DSAL	15	46.67	3,065	3,072	Containment	--	--	--
	345 - 355	10:42	10:59	DSAL	17	35.29	3,072	3,078	Containment	--	--	--
	355-365	10:59	11:14	DSAL	15	60.00	3,078	3,087	Containment	--	--	--
	365 - 375	12:40	13:02	DSAL	22	55.32	3,087	--	Containment	--	--	--
	375 - 385	13:02	13:27	DSAL	25		--	3,113	Containment	--	--	--
	385 - 395	14:01	14:18	DSAL	17	47.06	3,113	3,121	Containment	--	--	--
	395 - 405	14:18	14:35	DSAL	17	58.82	3,121	3,131	Containment	--	--	--
	405 - 415	15:06	15:25	DSAL	19	52.63	3,131	3,141	Containment	--	2,656	--
9/11/2012	415 - 425	7:48	8:09	DSAL	21	52.38	3,141	3,152	Containment	2,656	--	--
	425 - 435	8:44	9:14	DSAL	30	50.00	3,152	--	Containment	--	--	--
	435 - 445	9:14	9:30	DSAL	16		--	3,175	Containment	--	--	--
	445 - 455	9:46	10:10	DSAL	24	58.33	3,175	3,189	Containment	--	--	--
	455 - 465	10:10	10:37	DSAL	27	55.56	3,189	3,204	Containment	--	--	--
	465 - 475	12:15	12:32	DSAL	17	51.11	3,204	--	Containment	--	--	--
	475 - 485	12:32	13:00	DSAL	28		--	3,227	Containment	--	--	--
	485 - 495	13:16	13:42	DSAL	26	42.31	3,227	3,238	Containment	--	--	--
	495 - 505	13:42	14:01	DSAL	19	63.16	3,238	3,250	Containment	--	--	--
	505 - 515	14:20	14:46	DSAL	26	46.51	3,250	--	Containment	--	--	Water brown color
	515 - 525	14:46	15:03	DSAL	17		--	3,270	Containment	--	--	--
525 - 535	15:18	15:49	DSAL	31	45.16	3,270	3,284	Containment	--	2,661	--	

**MHTS Municipal Production Well Log Sheet - Windsor**

Date	Zone	Pump Start Time	Pump Finish Time	Method <sup>A</sup>	Minutes Pumped	GPM	Totalizer (x 100)		Destination (i.e. Containment, SB#5, or MHTS)	Generator Hour Meter		Comments
							Start	Finish		Beginning of Day	End of Day	
9/12/2012	535 - 545	7:50	8:08	DSAL	18	55.56	3,284	3,294	Containment	2,661	--	Gravel at 311'
	545 - 555	8:31	8:56	DSAL	25	48.94	3,294	--	Containment	--	--	--
	555 - 565	8:56	9:18	DSAL	22		--	3,317	Containment	--	--	--
	565 - 575	9:33	10:05	DSAL	32	46.88	3,317	3,332	Containment	--	--	--
	575 - 585	10:05	10:31	DSAL	26	53.85	3,332	3,346	Containment	--	--	--
	585 - 593	10:53	11:25	DSAL	32	68.75	3,346	3,368	Containment	--	2,664	Stop
				<b>DSAL Total Volume:</b>		<b>30,800</b>						

Notes:  
 OEAL = Open End Air lift  
 DSAL = Dual Swab Air lift  
 SP = Submersible Pump

**MHTS Municipal Production Well Log Sheet - Windsor**

Date	Time	Totalizer (Rain for Rent) x 100	Totalizer (TigerMag) x 100	Flowrate (GPM) R4R	Flowrate (GPM) TigerMag	Pressure (PSI)	DTW (btoc)*	Comments; Destination (i.e. SB#5 or MHTS); Blending
9/27/2012	9:44	22,557	130,249	--	--	--	193.05	"Static" pre-lube running
	10:00	--	--	--	--	--	--	Did not start due to "UC"
	10:16	--	--	--	--	--	--	Attemp restart; no luck
	10:54	--	--	1000.00	858.00	--	NR	--
	11:22	--	--	1000.00	--	60 - 65	NR	Talk to Layne
	11:25	--	--	--	--	90.00	NR	Throttled discharge
	11:26	--	--	900.00	792.00	88 - 90	--	--
	12:54	23,712	131,269	0.00	0.00	0.00	--	Shut down due to PWL at bowls; Layne suggests lowering pump
	Total Volume:	115,500	102,000					

Pump Bowl Depth: 307.00 Feet

Hour Meter Start: 494.3 Hours

Personnel: D. Conner, S. Hayzlett, D. Ross, S. Whitaker, and R. Bridges

Airline Length: 307.00 Feet

Hour Meter Finish: 496.40 Hours

Pump Intake: 316.00 Feet

Total Hours: 2.1 Hours

\*btoc = below top of casing; South PVC casing is 3.69 feet above ground surface

### MHTS Municipal Production Well Log Sheet - Windsor

Date	Time	Totalizer (Rain for Rent) x 100	Totalizer (TigerMag) x 100	Flowrate (GPM) R4R	Flowrate (GPM) TigerMag	Pressure (PSI)	DTW (btoc)*	Comments; Destination (i.e. SB#5 or MHTS); Blending
10/4/2012	8:50	23,713	131,269	0.00	0.00	0.00	196.23	Pre-lube running
	9:51	--	--	--	--	--	--	"OLC" alarm on switchgear
	10:28	--	--	--	--	--	--	Layne electrician corrected issue
	12:00	24,641	--	950.00	--	130.00	At bowls	PWP de-chlor
	14:17	25,983	133,460	950.00	921.00	130.00	At bowls	--
	14:31	--	--	950.00	--	130.00	--	--
	14:32	--	--	0.00	0.00	--	--	Shutdown due to PWL at bowls
	14:33	26,101	133,586	0.00	0.00	0.00	--	--
	<b>Total Volume:</b>		<b>238,800</b>	<b>231,700</b>				

Pump Bowl Depth: 387.00 Feet

Hour Meter Start: 496.4 Hours

Personnel: D. Conner, C. Moseley, B. Porter, Garry, Ben

Airline Length: 387.00 Feet

Hour Meter Finish: 500.50 Hours

Pump Intake: 396.50 Feet

Total Hours: 4.10 Hours

\*btoc = below top of casing; South PVC casing is 3.69 feet above ground surface

### MHTS Municipal Production Well Log Sheet - Windsor

Date	Time	Totalizer (Rain for Rent) x 100	Totalizer (TigerMag) x 100	Flowrate (GPM) R4R	Flowrate (GPM) TigerMag	Pressure (PSI)	DTW (btoc)*	Comments; Destination (i.e. SB#5 or MHTS); Blending
10/31/2012	7:39	26,100	133,586	0.00	0.00	0.00	203.60	Start pre-lube
	11:28	--	--	--	--	--	202.00	PWP diverted plant; MHTS (Arroyo and Well 52) @ 3,232 gpm
	11:48	--	--	--	--	--	--	Start; discharge pipe wobbles upon startup
	11:57	--	--	1000.00	967.00	130.00	> 300	Slightly aerated water
	12:25	--	--	900 - 1000	933.00	130.00	> 300	Water slightly aerated
	12:35	--	--	900 - 1000	940.00	130.00	352.00	Bicycle pump
	13:21	--	--	1000.00	940.00	130.00	353.00	Slightly aerated water; AVAR periodically releases air
	13:55	--	--	1000.00	945.00	130.00	354.00	Slightly aerated water; AVAR periodically releases air
	14:10	--	--	1000.00	940.00	130.00	354-355	--
	14:12	27,489	134,904	--	--	--	--	Shutdown
	<b>Total Volume:</b>		<b>138,900</b>	<b>131,800</b>				

Pump Bowl Depth: 387.00 Feet

Hour Meter Start: 500.5 Hours

Personnel: D. Conner, D. Loera, and D. Ross

Airline Length: 387.00 Feet

Hour Meter Finish: 502.90 Hours

Pump Intake: 396.50 Feet

Total Hours: 2.40 Hours

\*btoc = below top of casing; South PVC casing is 3.69 feet above ground surface

### MHTS Municipal Production Well Log Sheet - Windsor

Date	Time	Totalizer (Rain for Rent) x 100	Totalizer (TigerMag) x 100	Flowrate (GPM) R4R	Flowrate (GPM) TigerMag	Pressure (PSI)	DTW (btoc)*	Comments; Destination (i.e. SB#5 or MHTS); Blending
11/2/2012	10:24	27,489	134,904	0.00	0.00	0.00	203.00	Pre-lube: 48 psi; DTW measured with AL: 200'; use south sounding tube for water level probe
	10:34	--	--	--	--	--	--	Turn pre-lube on (pressure drops to 14 psi); turn off; plumb garden hose connection
	10:45	--	--	--	--	--	--	Go to hardware store for supplies
	12:20	--	--	--	--	--	--	Garden hose and valve plumbed into discharge head; pre-lubing pump
	12:45	--	--	--	--	--	--	Pump call
	12:49	--	--	--	--	--	349.00	Water discharging to sandbox
	12:50	--	--	1000.00	990.00	130.00	350.00	Airline measurement; Rust colored water; extreme amounts of air in discharge, especially upstream of Cla-Val
	12:55	--	--	--	--	130.00	346.00	Rust colored water and air
	13:00	--	--	--	--	128.00	346.00	Clearing - Air
	13:10	--	--	1000.00	960.00	130.00	348.50/352.50	Water level probe and airline measurements
	13:15	--	--	--	--	128.00	352.00	Clear - Air
	13:30	--	--	--	--	130.00	352.50	Clear - Air
	13:37	--	--	1000.00	950.00	130.00	353.00	Airline
	13:40	--	--	--	950.00	130.00	353.00	Clear - Air
	13:40	27,993	135,384	--	--	--	--	Shutdown
<b>Total Volume:</b>		<b>50,400</b>	<b>48,000</b>	Pump operation not recommended due to air production; likely due to low water table.				Ron Webber (Layne) tightened water lube packing (less water) and added plastic drain line.

Pump Bowl Depth: 387.00 Feet

Hour Meter Start: 502.9 Hours

Personnel: D. Conner, R. Webber, and D. Ross

Airline Length: 387.00 Feet

Hour Meter Finish: 503.70 Hours

Pump Intake: 396.50 Feet

Total Hours: 0.80 Hours

\*btoc = below top of casing; South PVC casing is 3.69 feet above ground surface

**Well 52**

**MHTS Municipal Production Well Log Sheet - Well 52**

Date	Time	Totalizer (Rain for Rent) x 100	Totalizer (TigerMag) x 100	Flowrate (GPM) R4R	Flowrate (GPM) TigerMag	Pressure (PSI)	DTW (btoc)*	Comments; Destination (i.e. SB#5 or MHTS); Blending
9/19/2012	10:00	63,957	741,236	--	--	--	120.11	Static Water Level; Pump Hour Meter: 802.4
	10:02	--	--	--	--	--	--	To SB#5; MHTS diverted at 07:00 this morning
	10:05	--	--	--	--	--	196.90	--
	10:07	--	--	--	--	--	200.00	--
	10:09	--	--	--	--	--	--	16 psi on airline
	10:12	--	--	--	--	--	203.10	--
	10:19	--	--	--	1,800	37.99	205.25	--
	10:26	--	--	--	--	--	207.00	--
	10:48	--	--	--	1,780	36.50	209.20	--
	12:34	66,698	743,964	--	1,755	--	213.00	--
	12:39	--	--	--	1,740	36.28	--	Throttled well due to dropping water level
	14:07	--	--	--	1,746	36.50	213.70	--
	14:19	--	--	--	1,745	36.49	213.85	PWP sampling starting at 14:15
	14:29	--	--	--	1,742	36.49	213.95	--
	14:31	68,724	745,980	0	0	0.00	--	PWP completed sampling; Hour Meter: 806.9
<b>Pumping Totals:</b>	Volume (Raw):	<b>476,700</b>	<b>474,400</b>					
Pump Bowl Depth:	<u>247.00</u>	Hour Meter (Start):	<u>802.40</u>	Personnel:	<u>D. Conner, C. Moseley; S. Whitaker (PWP), Richard Bridges (Matt Chlor), and Garry Squires (Layne)</u>			
Airline Length:	<u>247.00</u>	Hour Meter (End):	<u>806.90</u>					
Pump Intake:	<u>261.92</u>	Total Hours:	<u>4.50</u>	*btoc = below top of casing; West PVC = 3.04' above ground surface; measured with Solinst Water Level Probe				

**MHTS Municipal Production Well Log Sheet - Well 52**

Date	Time	Totalizer (Rain for Rent) x 100	Totalizer (TigerMag) x 100	Flowrate (GPM) R4R	Flowrate (GPM) TigerMag	Pressure (PSI)	DTW (btoc)*	Comments; Destination (i.e. SB#5 or MHTS); Blending
9/26/2012	11:28	68,724	--	--	--	--	123.10	--
	13:49	68,724	745,980	--	--	--	107.70	Pre-lube on @ 13:44
	14:08	Pump Call		--	--	--	--	--
	14:11	--	--	--	--	--	--	Start
	14:14	--	--	--	--	--	190.85	--
	14:18	--	--	1,700	1,811	39.54	195.25	--
	14:22	--	--	1,700	1,806	39.47	197.25	--
	15:26	--	--	1,650	1,774	37.68	205.05	--
	15:30	--	--	--	--	--	--	Transition W52 to Ventura
	15:42	--	--	0	--	--	--	Transitioned
	15:43	70,268.5	--	0	1,768	37.80	206.65	All flow to Ventura Booster Station
	15:44	--	747,652	0	--	--	--	--
	15:46	--	--	0	1,764	37.96	206.30	--
	15:55	--	--	0	1,763	38.22	206.25	--
	16:10	--	--	0	1,755	38.36	206.45	--
16:14	--	--	0	1,756	38.36	--	Lock up site	
<b>Pumping Totals:</b>	Volume (Raw):	<b>154,450</b>	<b>167,200</b>					
Pump Bowl Depth:	<u>247.00</u>	Hour Meter (Start): <u>806.90</u>		Personnel: <u>D. Conner; S. Whitaker (PWP) and Alice Choi</u>				
Airline Length:	<u>247.00</u>	Hour Meter (End): <u>Running</u>						
Pump Intake:	<u>261.92</u>	Total Hours: <u>--</u>		*btoc = below top of casing; West PVC = 3.04' above ground surface; measured with Solinst Water Level Probe				

### MHTS Municipal Production Well Log Sheet - Well 52

Date	Time	Totalizer (Rain for Rent) x 100	Totalizer (TigerMag) x 100	Flowrate (GPM) R4R	Flowrate (GPM) TigerMag	Pressure (PSI)	DTW (btoc)*	Comments; Destination (i.e. SB#5 or MHTS); Blending
9/27/2012	8:50	70,268.5	765,363	0	1,702	40.224	208.20	MHTS with Arroyo; 825.6 Hrs
9/27/2012	9:22	70,268.5	765,883	0	1,708	40.176	208.20	--
9/28/2012	10:35	70,268.5	791,629	0	1,697	40.514	208.66	851.3 Hrs
10/1/2012	9:47	70,268.5	864,141.00	0	1688	40.390	209.40	922.5 Hrs
10/4/2012	12:58	70,268.5	940,472.00	0	1687	39.871	210.00	997.7 Hrs/with Layne
11/2/2012	9:55	--	1,609,681.00	0	1,657	39.675	211.50	1657.2 Hrs
Pump Bowl Depth: <u>247.00</u>		Hour Meter (Start): <u>Running</u>		Personnel: <u>D. Conner</u>				
Airline Length: <u>247.00</u>		Hour Meter (End): <u>Running</u>						
Pump Intake: <u>261.92</u>		Total Hours: <u>--</u>		*btoc = below top of casing; West PVC = 3.04' above ground surface; measured with Solinst Water Level Probe				

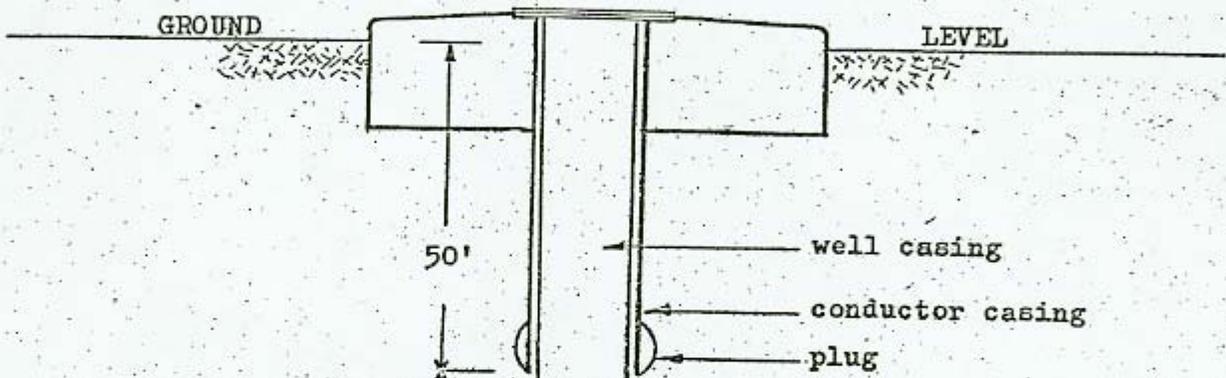
**Attachment 2**

**Original Well Completion Diagrams  
(City of Pasadena Records)**

**Windsor Well**

# PASADENA WATER DEPARTMENT

WELL WINDSOR NO. 48



## PERFORATIONS

FROM	TO
320'	344'
374'	384'
426'	450'
474'	485'
497'	585'

550'

## REMARKS

## WELL

DRILLED BY ROSCOE MOSS CO.

CONTRACT NO. 7822

DATE JULY 14, 1969

WORK ORDER 5865

CASING 20 IN DOUBLE NO. 8 GAUGE

Conductor casing	LENGTH	<u>50'</u>
	PLY	<u>1 7/8"</u>
	GAUGE	<u>1 7/8"</u>

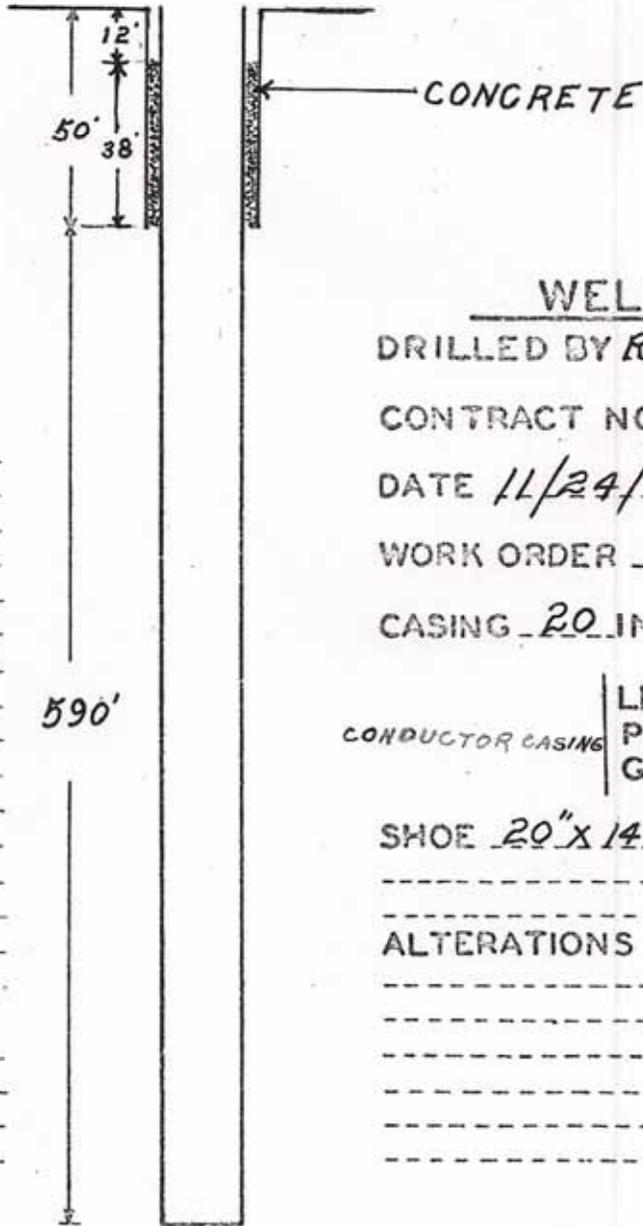
SHOE \_\_\_\_\_

ALTERATIONS \_\_\_\_\_

**Well 52**



PASADENA WATER DEPARTMENT  
WELL NO. 52



PERFORATIONS

FROM	TO
250'	360'
360'	367'
372'	630'

590'

REMARKS

WELL

DRILLED BY Roscoe Moss Co.

CONTRACT NO. \_\_\_\_\_

DATE 11/24/77

WORK ORDER \_\_\_\_\_

CASING 20 IN <sup>DOUBLE</sup> NO. 8 GAUGE

CONDUCTOR CASING | LENGTH 50'  
PLY \_\_\_\_\_  
GAUGE 1/4"

SHOE 20" x 14" x 1 1/4"

ALTERATIONS \_\_\_\_\_

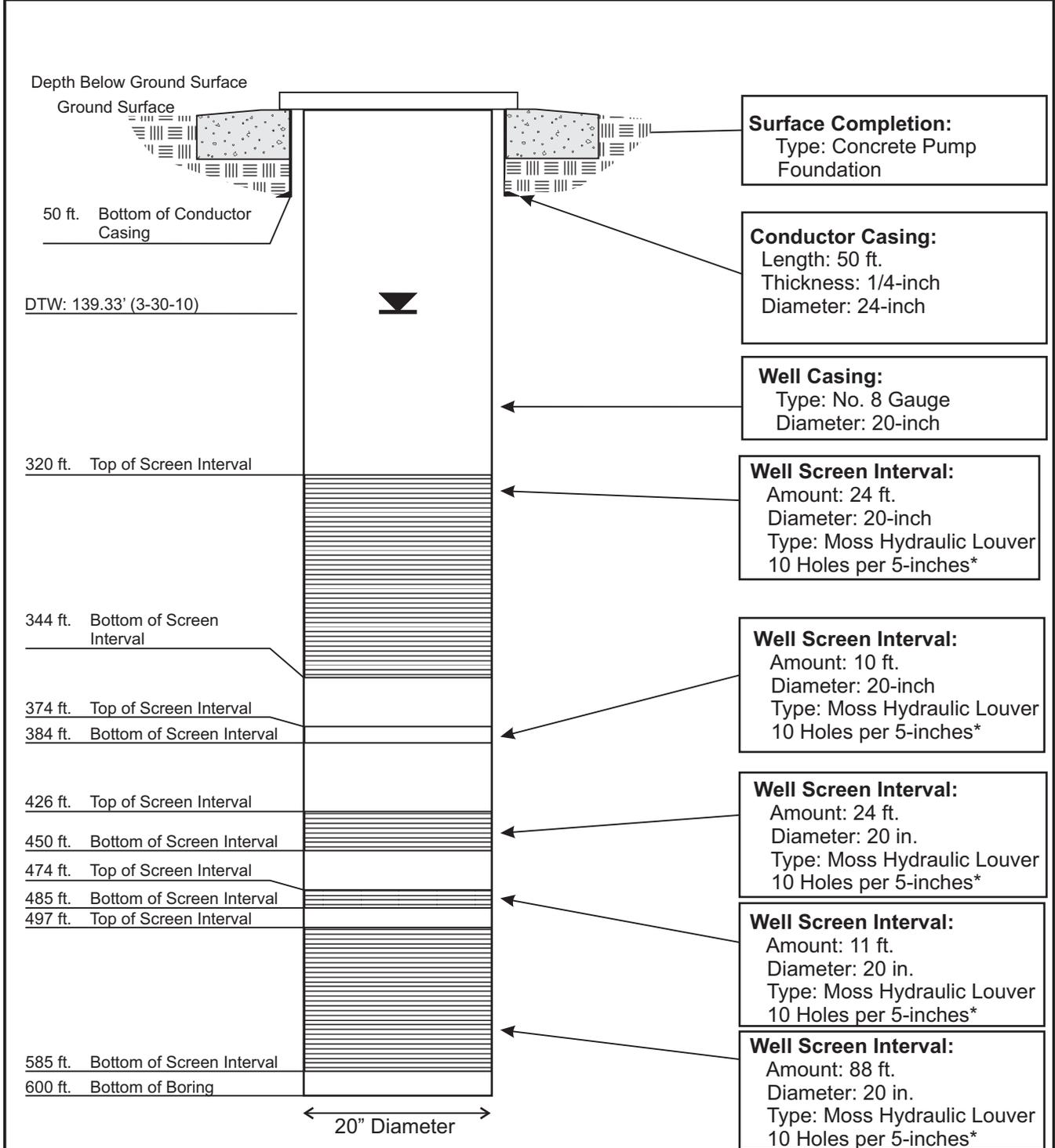
**Attachment 3**

**Well and Liner Diagrams (Battelle Drawings)**

**Windsor Well**

## Original Well Completion Diagram Pasadena, California WINDSOR-48

State Well ID#: 1910124-022	Site: City of Pasadena (MHTS)	Well #: WINDSOR-48	Dates: 3/28/69 - 7/1/69
Drilling Contractor: Roscoe Moss Co.	Rig Type/Drilling Method: Cable Tool	Total Depth: 600 feet	Driller: Jack Cannon and J. Vervoorn

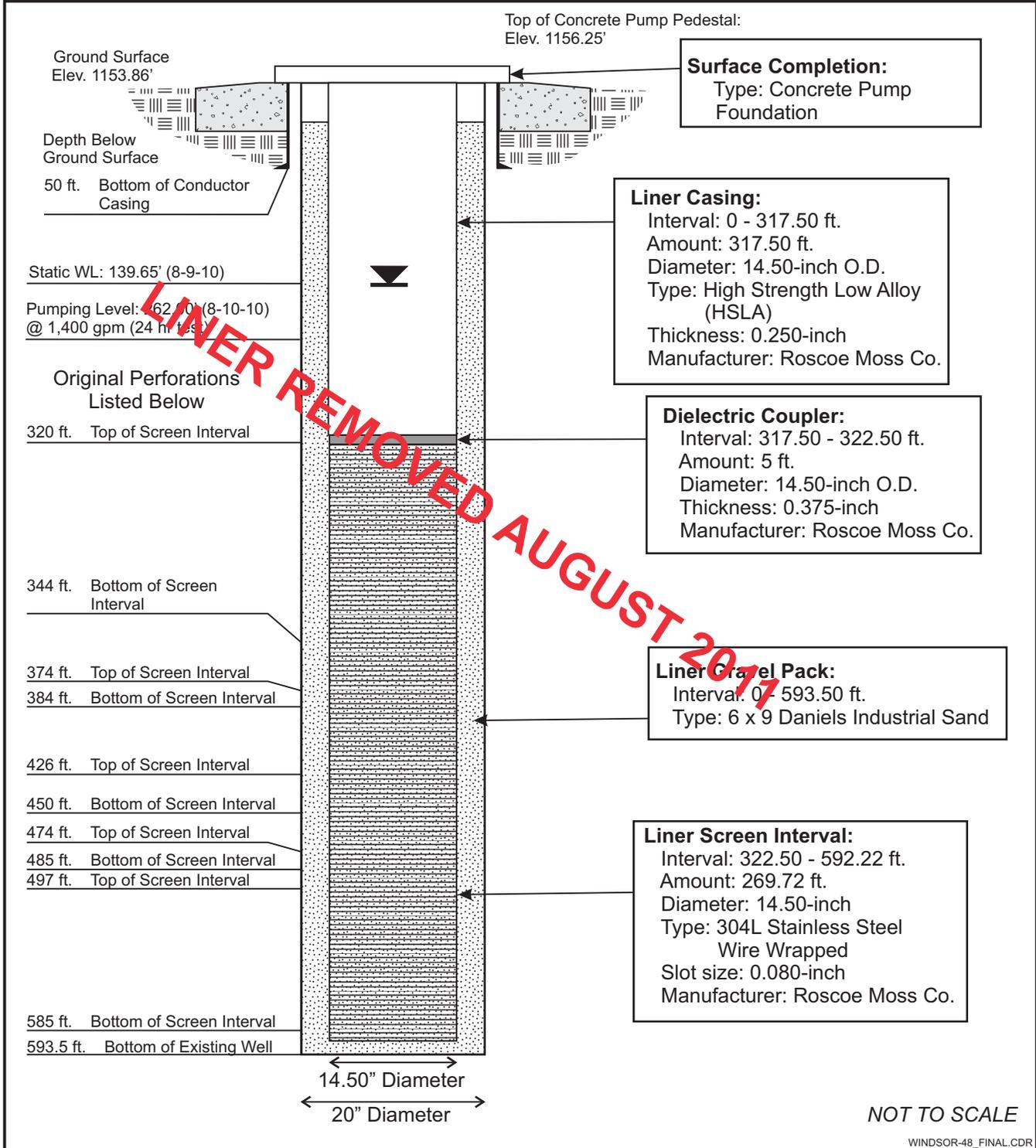


\*All Perforations: 3/16-inch (Diameter) x 2 1/2-inch (Length)

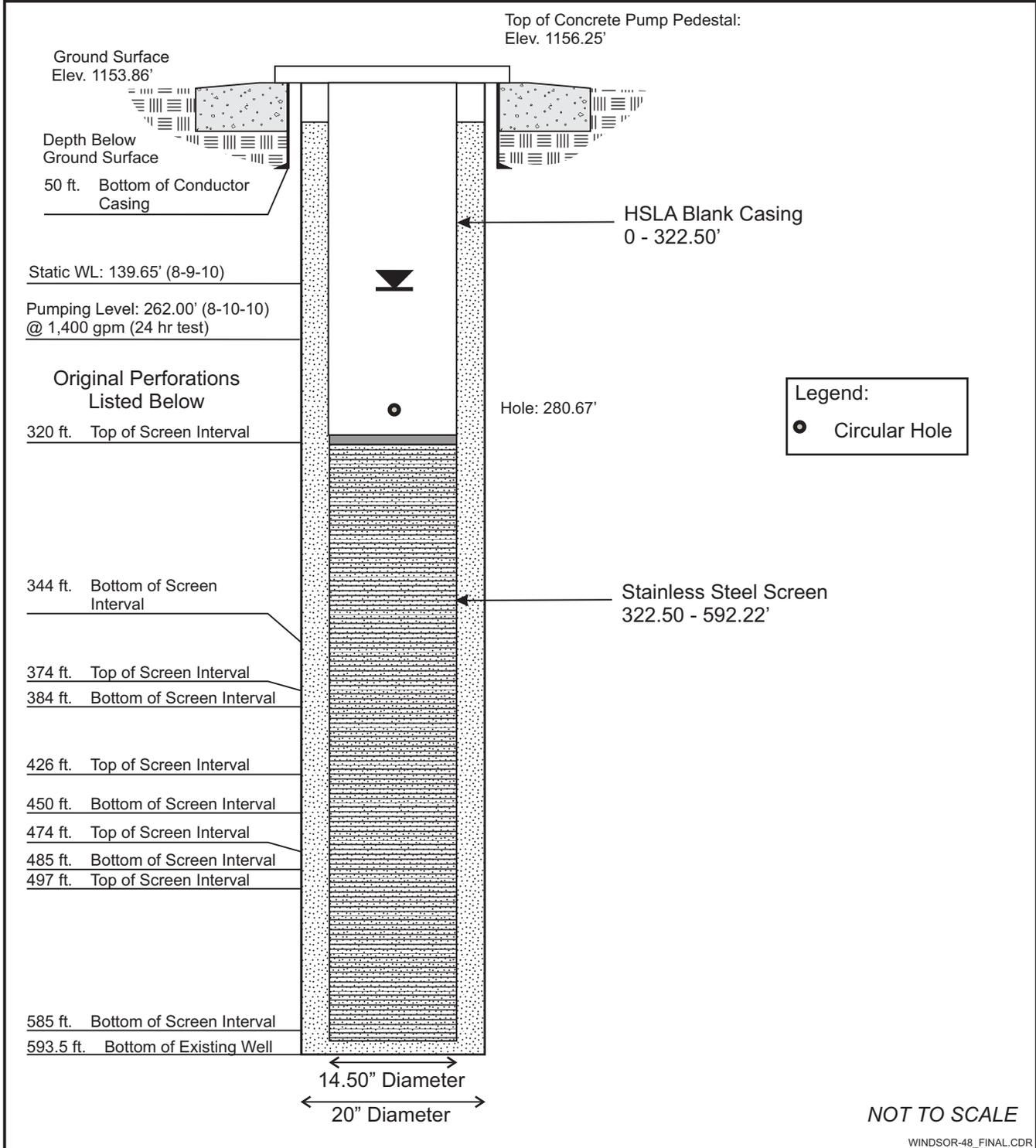
NOT TO SCALE

## Well Liner Diagram Pasadena, California WINDSOR-48

State Well ID#: 1910124-022	Site: City of Pasadena (MHTS)	Well #: WINDSOR-48	Northing: 1892155.945
Rehabilitation Contractor: Layne Christensen	Well/Liner Diameter: 20.00-inch/14.50-inch	Liner Install Date: 4/12/10 - 4/16/10	Easting: 6511051.010
Reviewed by: C. Shem Hawes	Installer/Welder: M. Evans/G. Frias	Geologist: D. Conner	Surface Elevation: 1153.86'

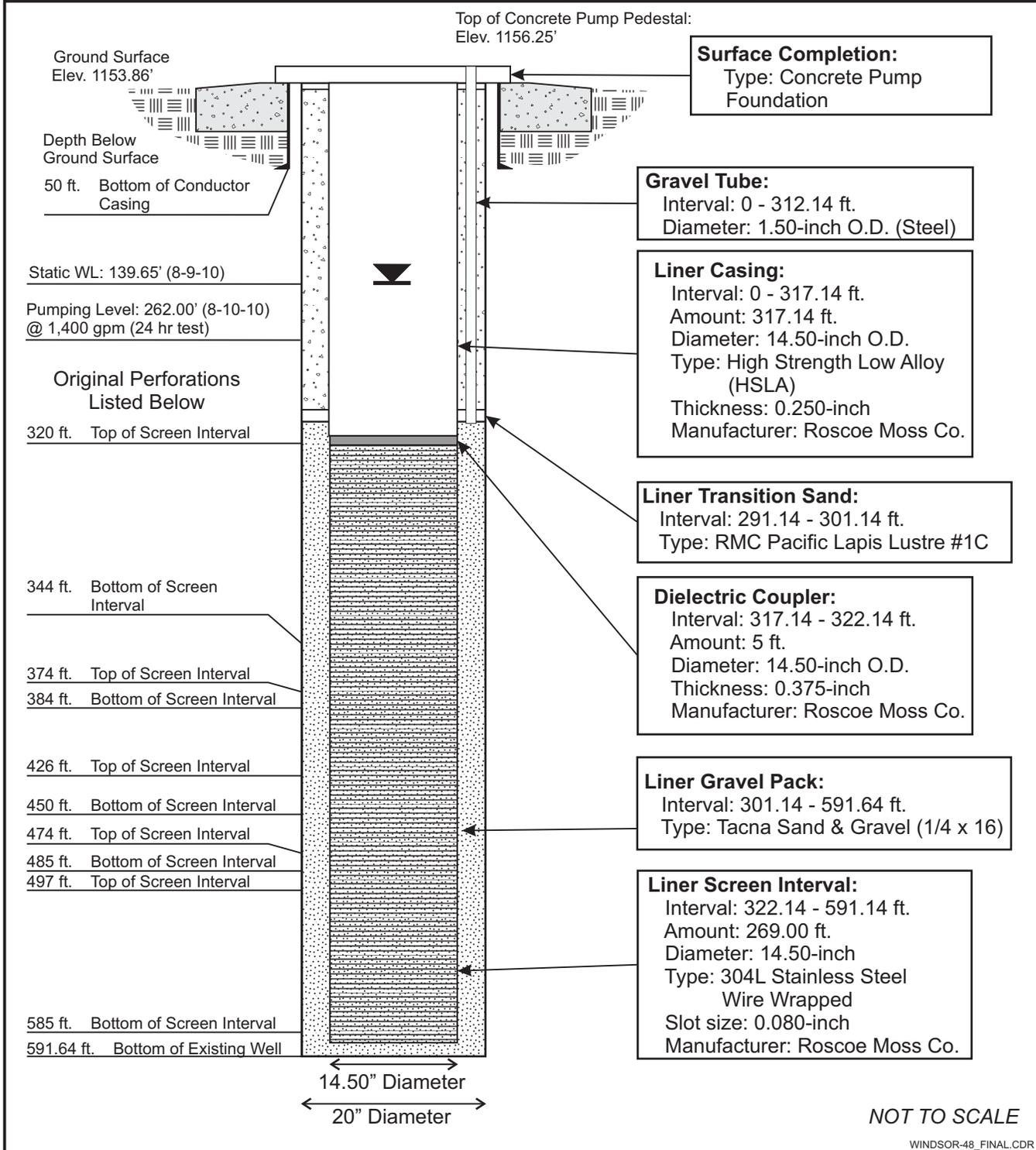


State Well ID#: 1910124-022	Site: City of Pasadena (MHTS)	Well #: WINDSOR-48	Northing: 1892155.945
Rehabilitation Contractor: Layne Christensen	Well/Liner Diameter: 20.00-inch/14.50-inch	Liner Install Dates: 4/12/10 - 4/16/10	Easting: 6511051.010
Geologist: D. Conner	Installer/Welder: M. Evans/G. Frias	Liner Removal Dates: 8/3/11 - 8/22/11	Surface Elevation: 1153.86'



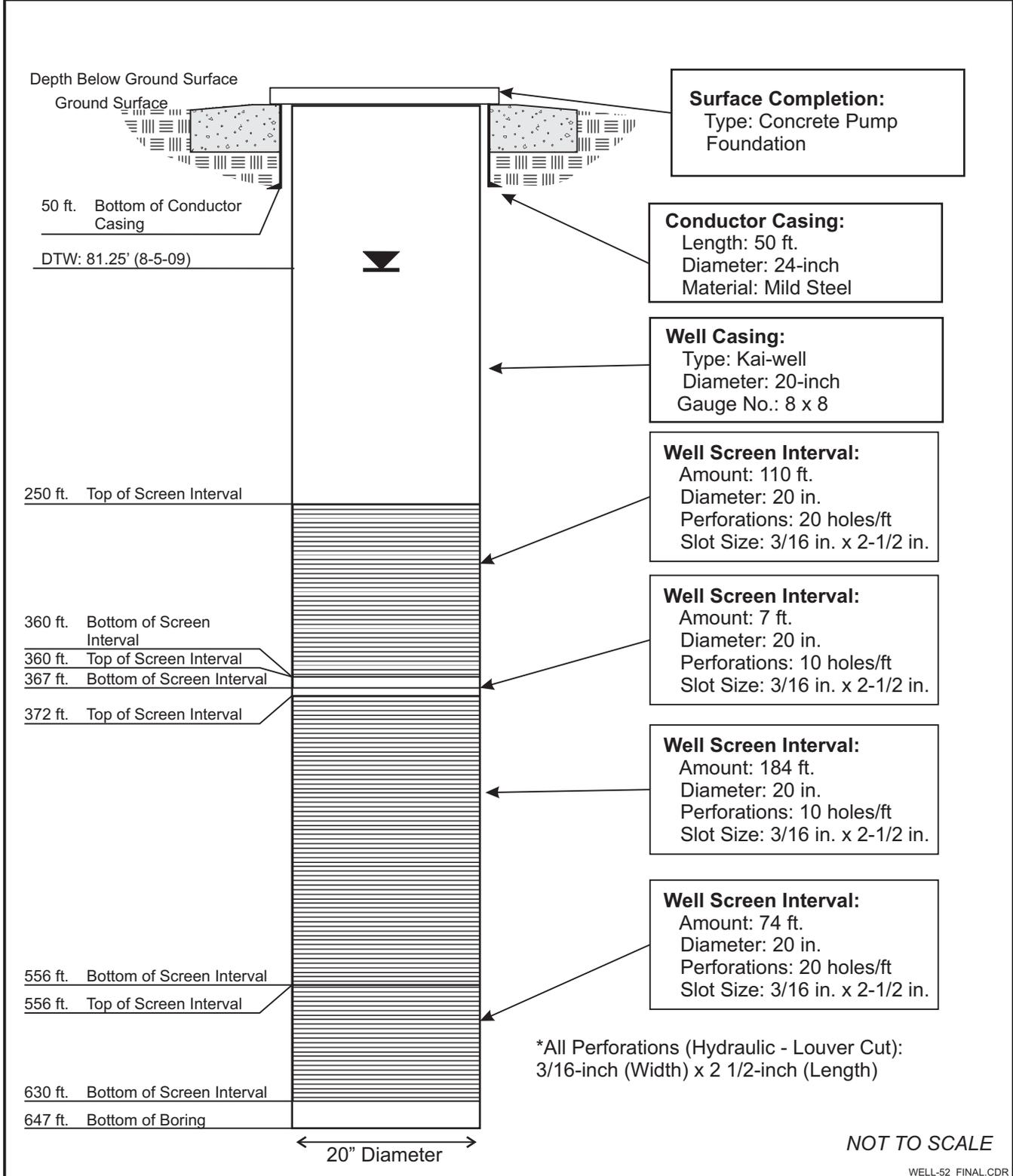
## Well Liner Diagram Pasadena, California WINDSOR-48

State Well ID#: 1910124-022	Site: City of Pasadena (MHTS)	Well #: WINDSOR-48	Northing: 1892155.945
Rehabilitation Contractor: Layne Christensen	Well/Liner Diameter: 20.00-inch/14.50-inch	Liner Install Date: 8/27/12 - 9/14/12	Easting: 6511051.010
Reviewed by: D. Conner	Installer/Welder: M. Evans/G. Frias	Geologist: D. Conner	Surface Elevation: 1153.86'

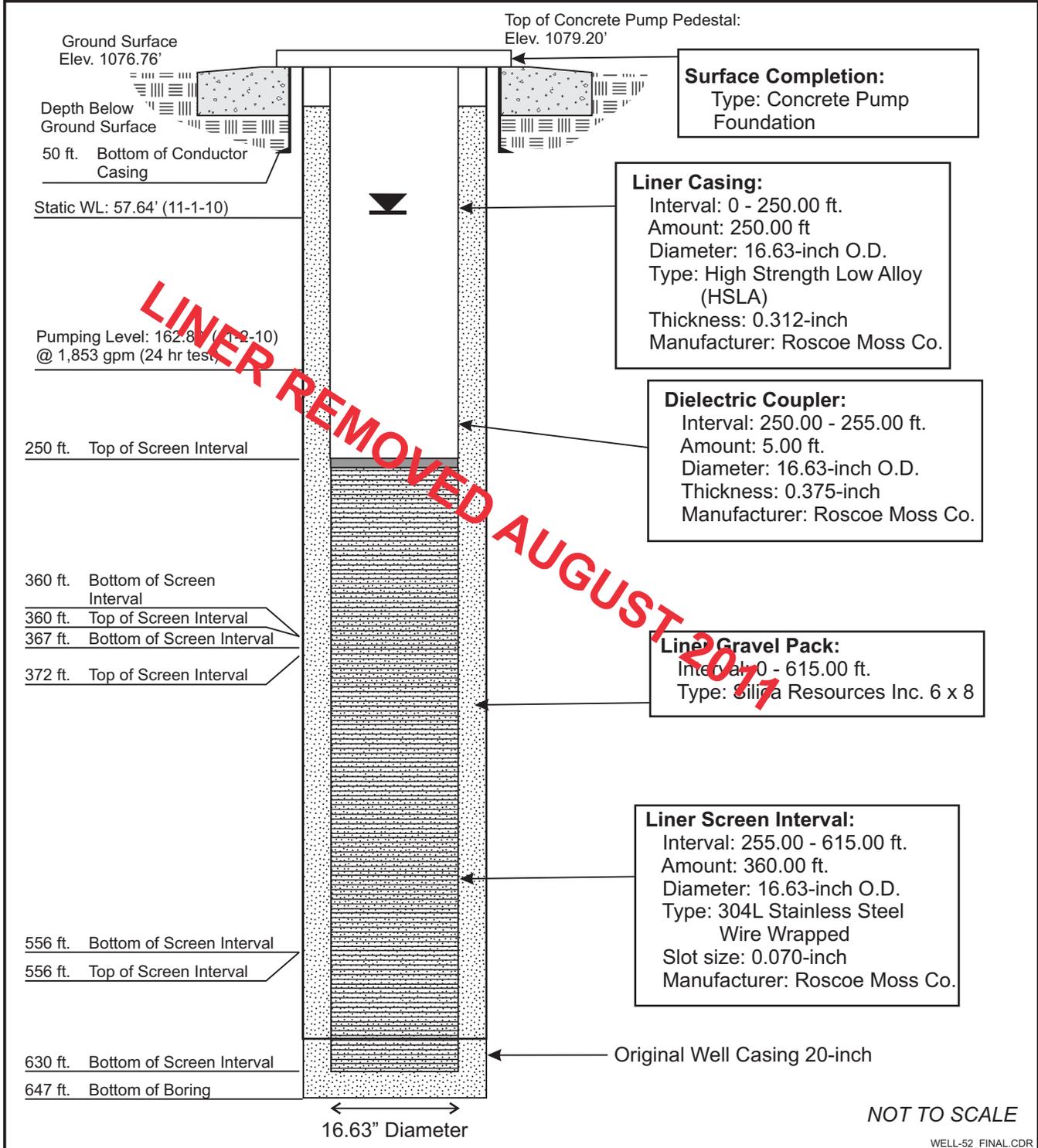


**Well 52**

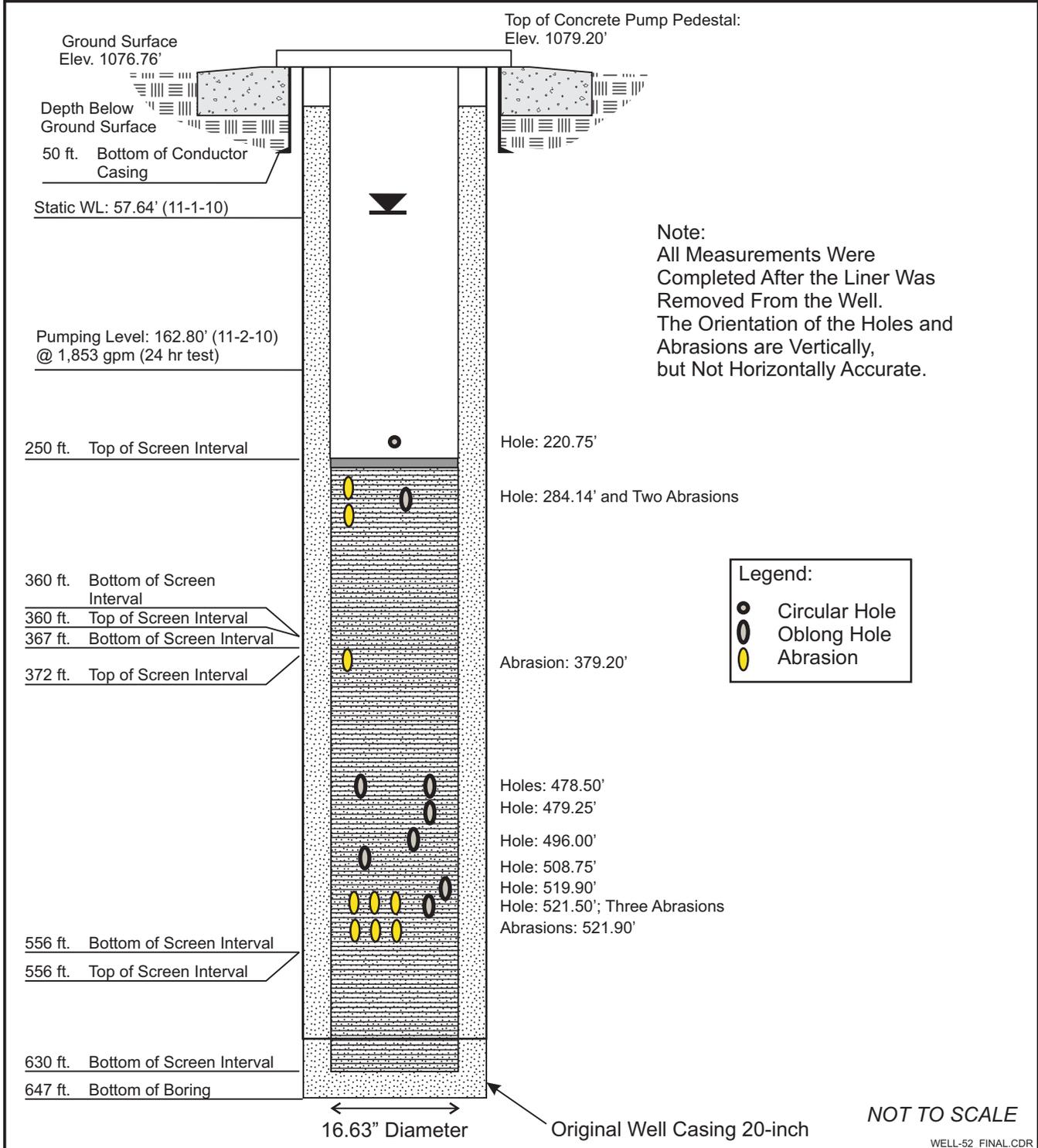
State Well ID#: 1910124-021	Site: City of Pasadena (MHTS)	Well #: WELL-52	Dates: 9/30/77 - 11/24/77
Drilling Contractor: Roscoe Moss Co.	Rig Type/Drilling Method: Cable Tool	Total Depth: 647 feet	Driller: Joe A. Garcia



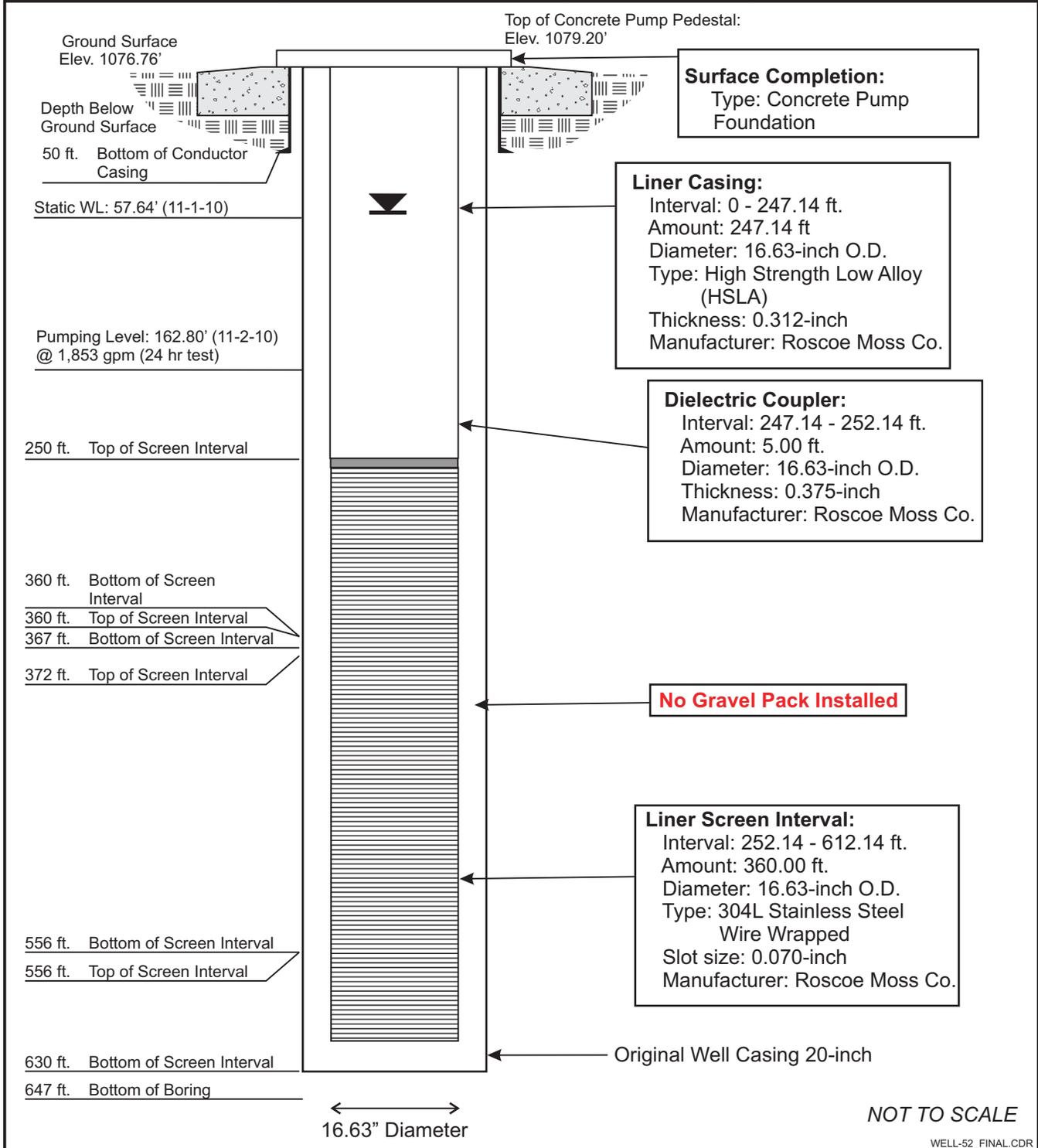
State Well ID#: 1910124-021	Site: City of Pasadena (MHTS)	Well #: WELL-52	Northing: 1893789.615
Rehabilitation Contractor: Layne Christensen	Well/Liner Diameter: 20.00-inch/16.63-inch	Liner Install Date: 10/6/10 - 10/11/10	Easting: 6510947.930
Reviewed by: C. Shem Hawes	Installer/Welder: M. Evans/G. Frias	Geologist: D. Conner	Surface Elevation: 1076.76'



State Well ID#: 1910124-021	Site: City of Pasadena (MHTS)	Well #: WELL-52	Northing: 1893789.615
Rehabilitation Contractor: Layne Christensen	Well/Liner Diameter: 20.00-inch/16.63-inch	Liner Install Date: 10/6/10 - 10/11/10	Easting: 6510947.930
Geologist: D. Conner	Installer/Welder: M. Evans/G. Frias	Liner Removal Dates: 8/3/11 - 8/18/11	Surface Elevation: 1076.76'



State Well ID#: 1910124-021	Site: City of Pasadena (MHTS)	Well #: WELL-52	Northing: 1893789.615
Rehabilitation Contractor: Layne Christensen	Well/Liner Diameter: 20.00-inch/16.63-inch	Liner Install Date: 8/13/12 - 8/17/12	Easting: 6510947.930
Reviewed by: D. Conner	Installer/Welder: M. Evans/G. Frias	Geologist: D. Conner	Surface Elevation: 1076.76'



**Attachment 4**

**Liner Installation Summaries (2010)**

**Windsor Well**

**Windsor Well Liner Install Photos (April 2010)  
and  
Pump Install (December 2010)**



Roscoe Moss 304L Stainless Steel (SS) Wire-Wrapped (WW) Screen Delivery (4/12/10)



14 1/2" O.D.; 304L SSWW Screen (4/12/10)



304L SSWW Screen Interior Rods Welded to wire-wrapped screen (4/12/10)



Liner Screen before Installation (4/13/10)



Layne Welding 304L SSWW Screen at 20' Intervals (4/13/10)



Close-up of Weld in Progress (4/13/10)



304L SSWW Screen in Foreground; Install in Background (4/13/10)



Roscoe Moss High-Strength Low-Alloy (HSLA) Steel Blank Casing Delivery (4/13/10)



Roscoe Moss (5 ft 3/8" thick Section) HSLA Casing (4/13/10)



Roscoe Moss 14 1/2" O.D. x 1/4-inch Thick HSLA Casing Interior (4/13/10)



Roscoe Moss HSLA Casing Installation (4/13/10)



Roscoe Moss HSLA Casing Weld in Progress (4/13/10)



Roscoe Moss HSLA Casing during Installation (4/13/10)



Roscoe Moss HSLA Casing Installation (4/14/10)



Liner Installed within Original Well Casing; Annular Space to be Filled with Gravel Pack  
(4/14/10)



Liner Gravel Pack (4/14/10)



Liner Gravel Pack Installation (4/15/10)



Gravel Pack Installation; Water Running through Super Sack (4/15/10)



Liner Casing Covered with Steel Plate Allowing Gravel Pack to Flow down Annular Space (4/15/10)



Gravel Pack Installation (4/15/10)



Gravel Pack Installation (4/16/10)



Liner inside of Original Casing; Jagged Edge Due to Silicon Caulk Used during Gravel Pack Placement (9/15/10)



Windsor Pump Pedestal (12/1/10)



Windsor 1,400 gpm Vertical Turbine Pump Column (12/10/10)



Pump Bowls Sitting on Top of Pump Column Pipe (12/10/10)



Close-up of Pump Column Pipe, Stainless Steel Drive Shaft, and Pump Bowls (12/10/10)



Suction Strainer (Pump Intake) before Installation into Well (12/10/10)



Pump Column Pipe Close-up (12/10/10)



Pump Install into Windsor Well (12/10/10)



Windsor Well Pump Installation (12/10/10)



Windsor Well Pump Installation; Drive Shaft Visible (12/10/10)



Windsor Well Pump Installation (4/10/10)



Windsor Well Temporary Motor and Discharge Piping (12/13/10)



Windsor Well Temporary Motor, Discharge Piping, Sound Panels (12/27/10)

**Well 52**

## Well 52 Liner (2010) and Pump Installation (2011) Summaries

### Tuesday 10/05/2010:

- Layne crew delivers liner

### Wednesday 10/06/2010:

- Layne begins installation of well liner

### Thursday 10/07/2010:

- Layne installs liner



Work Site with Crane

### Friday 10/08/2010:

- Layne continues liner installation
- Rain for Rent delivers pump and hose to site; connects weir tank to discharge piping to Ventura containment/filtration

### Saturday 10/09/2010:

- Layne continues liner installation (gravel pack)

### Monday 10/11/2010:

- Layne completes liner installation
- Layne installs dual swab airlift pumping system



**Liner Installed Inside Original Well Casing (Two Views); Before Pump Pedestal Installation**

**Tuesday 10/12/2010:**

- Layne performs dual swab airlift pumping (consolidate filter pack)



**Wednesday 10/13/2010:**

- No pumping activities due to Arroyo step test

**Thursday 10/14/2010:**

- Layne performs dual swab airlift pumping (consolidate filter pack)

**Friday 10/15/2010:**

- Layne performs dual swab airlift pumping (consolidate filter pack)

**Monday 10/18/2010:**

- No pumping activities due to 24 hour test at Arroyo

**Tuesday 10/19/2010:**

- No pumping activities due to 24 hour test at Arroyo

**Wednesday 10/20/2010:**

- Collect water level from Well 52 for CoP

- Layne setting test pump

**Thursday 10/21/2010:**

- Layne installs test pump

**Friday 10/22/2010:**

- Layne installs test pump

**Saturday 10/23/2010:**

- Layne performs pump development



**Development and Test Pump**



**Pump Pedestal**



**New Discharge Piping**

**2011**

**Thursday 1/6/2011:**

- Layne installs new pump



**Pump Column Pipe and Drive Shaft**



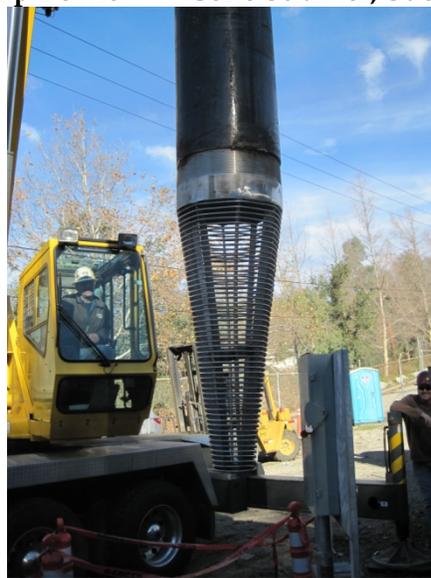
**Pump Column and Drive Shaft**



**4-Stage Pump Bowls**



**Cone Strainer, Suction Pipe, and Bowls**



**Cone Strainer Close-up View**

**Friday 1/7/2011:**

- Layne completes pump install

**Monday 1/10/2011:**

- RC Foster continues well discharge piping work

**Tuesday 1/11/2011:**

- Layne installs new 200 HP motor at Well 52



**200 HP Motor Delivery**



**200 HP Motor Plate**



**Water Lubrication Line Installation**



**Wiring Motor and Disconnect**

**Thursday 1/13/2011:**

*Well 52*

- Hunter Electric pulls wire for Well 52 pump

**Attachment 5**

**Video Log Inspection Reports**

**Windsor Well**





## Well Inspection Report

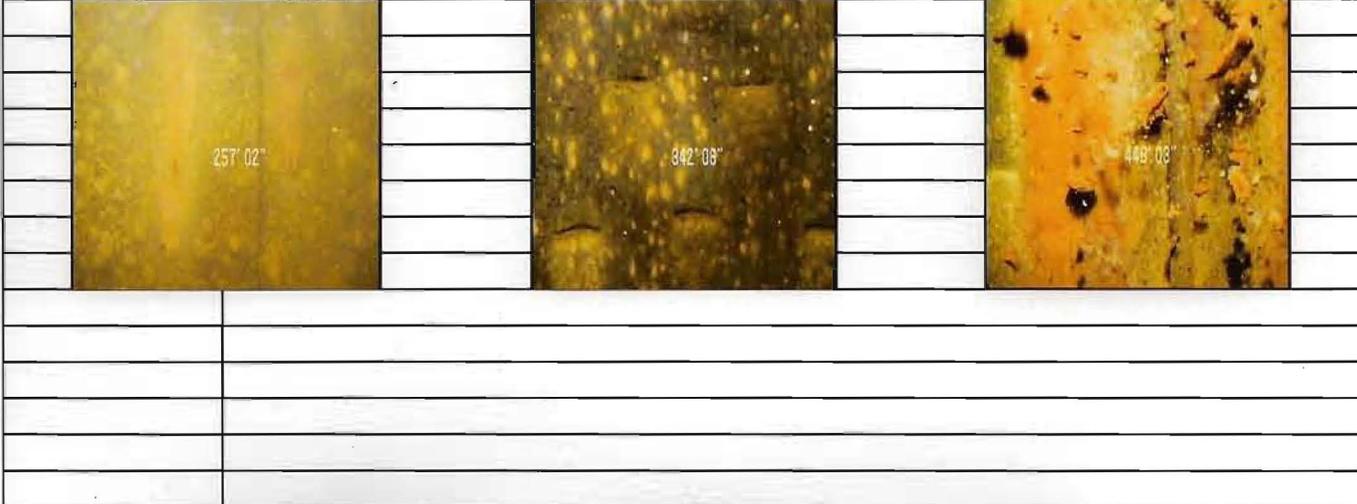
CLIENT: Battelle-JPL Pasadena  
 ADDRESS: Unknown  
 CONTACT: David Conner PHONE: 619-726-7311  
 JOB LOCATION: Pasadena, Ca.  
 GPS LOCATION: Latitude: N 34° 11' 30.0" Longitude: W 118° 10' 02.8"

WELL NUMBER: Windsor JOB NUMBER: 27-1221  
 SURVEYED BY: Tom Schuldheisz DATE: 5-Aug-09  
 REVIEWED BY: WATER LEVEL: 164' 01"  
 WATER CONDITION: Cloudy/Clear TOTAL DEPTH: Unknown  
 CASING DIAMETER: 20.50"ID SURVEY DEPTH: 540'

\*All Depths Shown are relative to the center of the side camera perspective.

Not correct

DEPTH	REMARKS		
0 - 164'	Casing appears to have mild scale and growth.	Perforation:	
		Vertical	300-320'
164' 01"	Camera enters static water level.	Mills Slot	
		Horizontal	320-344'
164' - 255'	Casing appears to have mild scale and growth.	Mills Knife	374-384'
			426-450'
255' - 258'	Casing appears to have a seam.		474-485'
			497-585'
258' - 300'	Casing appears to have moderate scale and growth.		
300' - 540'	Casing appears to have mild scale and growth.		
444' - 540'	Possible drop tube In well.		
540'	Camera comes to rest at the fill.		





## Well Inspection Report

**CLIENT:** Battelle-JPL Pasadena  
**ADDRESS:** Unknown  
**CONTACT:** David Conner **PHONE:** 619-726-7311  
**JOB LOCATION:** 2696 Windsor Ave. Alta Dena  
**GPS LOCATION:** Latitude: N 34° 11' 30.0" Longitude: W 118° 10' 02.8"

**WELL NUMBER:** Windsor **After Rehab** **JOB NUMBER:** 1000-1968  
**SURVEYED BY:** Jeff Conner **DATE:** 24-Mar-10  
**REVIEWED BY:** **WATER LEVEL:** 140' 10"  
**WATER CONDITION:** Cloudy **TOTAL DEPTH:** 600'  
**CASING DIAMETER:** 20.50" ID **SURVEY DEPTH:** 595' 2"

\*All Depths Shown are relative to the center of the side camera perspective.

DEPTH	REMARKS		
6"	Access port enters casing.	<b>Perforations:</b>	
0 - 140'	Casing appears to have mild scale.	<b>Hydraulic Louver</b>	322 - 346'
140' 10"	Camera enters static water level.		376 - 385'
140 - 380'	Casing appears to have mild scale and growth.		427 - 452'
380 - 595'	Camera experiences very poor visibility.		477 - 487'
526 - 595'	Air line in casing.		500 - 587'
595' 2"	Camera comes to rest at top of fill.		





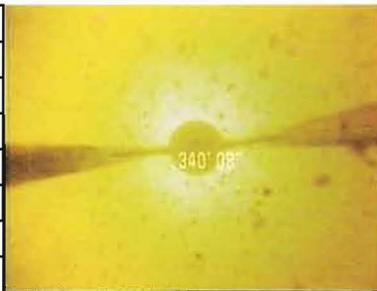

## Well Inspection Report

**CLIENT:** Battelle-JPL Pasadena  
**ADDRESS:** Unknown  
**CONTACT:** David Conner **PHONE:** 619-726-7311  
**JOB LOCATION:** 2696 Windsor Ave. Alta Dena  
**GPS LOCATION:** Latitude: N 34° 11' 30.0" Longitude: W 118° 10' 02.8"

**WELL NUMBER:** Windsor **After Rehab** **JOB NUMBER:** 1000-1968  
**SURVEYED BY:** Daniel De La Rosa **DATE:** 30-Mar-10  
**REVIEWED BY:** Jeff Conner **WATER LEVEL:** 139' 4"  
**WATER CONDITION:** Cloudy **TOTAL DEPTH:** 600'  
**CASING DIAMETER:** 20.50" ID **SURVEY DEPTH:** 594'

\*All Depths Shown are relative to the center of the side camera perspective.

DEPTH	REMARKS		
6"	Access port enters casing.	<b>Perforations:</b>	
0 - 139'	Casing appears to have mild scale.	<b>Hydraulic Louver</b>	322 - 346'
139' 04"	Camera enters static water level.		376 - 385'
139 - 594'	Camera experiences very poor visibility.		427 - 452'
594'	Camera comes to rest at top of fill.		477 - 487'
			500 - 587'










## Well Inspection Report

CLIENT: Battelle  
 ADDRESS: Unknown  
 CONTACT: David Conner PHONE: 619-726-7311  
 JOB LOCATION: 2696 Windsor Ave. Alta Dena  
 GPS LOCATION: Latitude: N 34° 11' 30.0" Longitude: W 118° 10' 02.8"

WELL NUMBER: Windsor JOB NUMBER: 1000-1968

SURVEYED BY: Jeff Conner DATE: 3-Jan-11

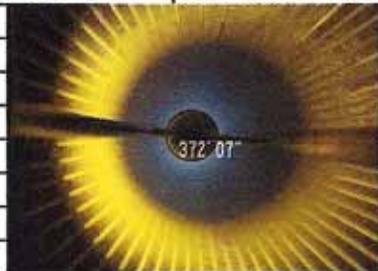
REVIEWED BY: WATER LEVEL: 134' 3"

WATER CONDITION: Cloudy/Clear TOTAL DEPTH: 600'

CASING DIAMETER: 14" SURVEY DEPTH: 575' 10"

\*All Depths Shown are relative to the center of the side camera perspective.

DEPTH	REMARKS		
1' 2"	Access port enters casing.	Perforations:	
1' 9"	Liner begins.		
5 - 134'	Casing appears to have mild scale and growth.	Stainless Steel	324 - 592'
134' 3"	Camera enters static water level.	Wire Wrap	
134 - 324'	Casing appears to have mild growth.		
318' 11"	Di-electric coupling.		
234 - 575'	Casing appears to have mild scaling.		
508' 2"	1 3/4" PVC		
529'	1 3/4" PVC		
539' 6"	1 3/4" PVC		
559' 5"	1 3/4" PVC		
568' 6"	1 3/4" PVC		
570' 10"	Stainless steel band.		
575' 10"	Camera light bulb comes to rest at fill.		









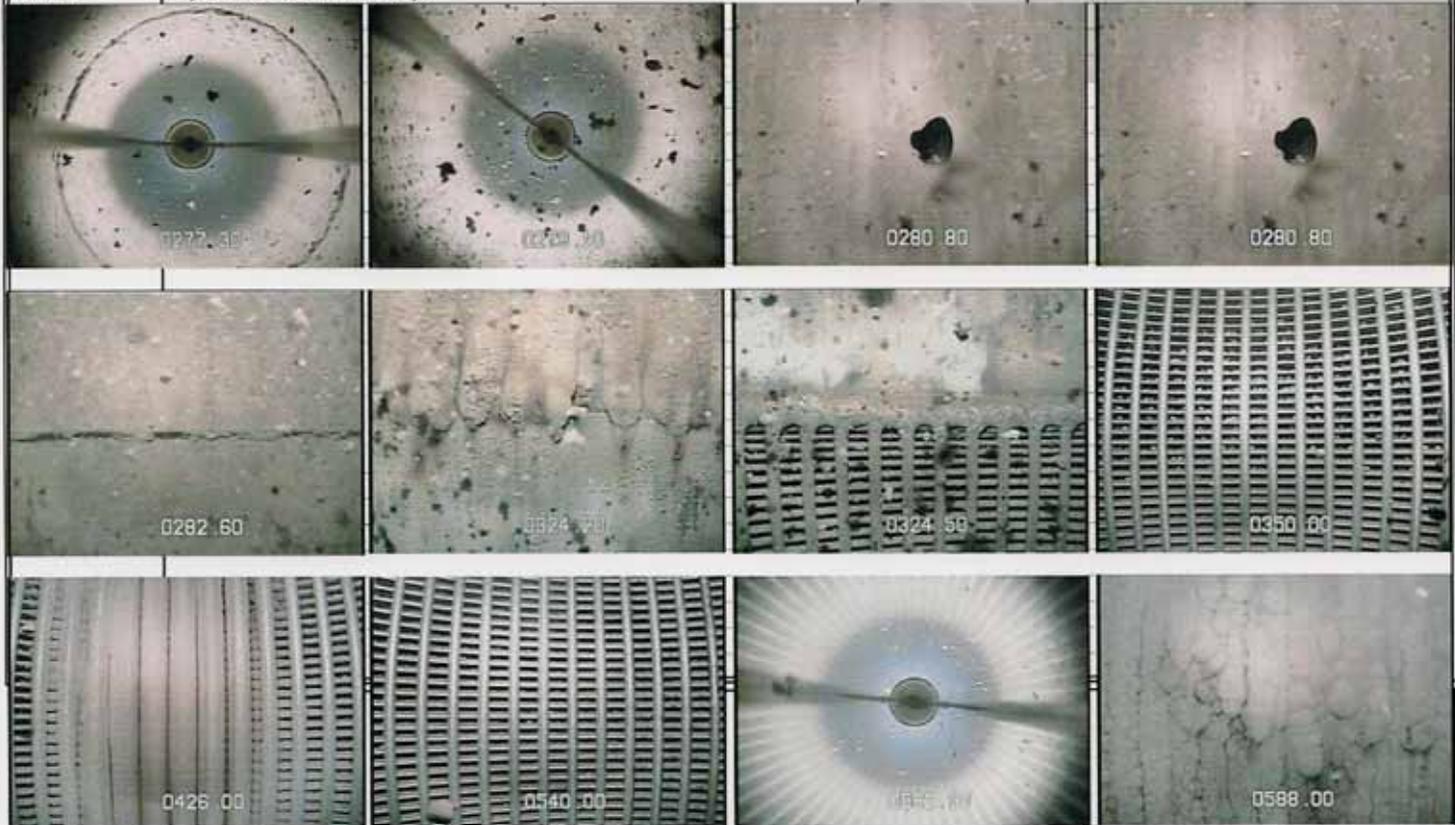
# Pacific Surveys

a full service geophysical well logging company

## Video Survey Report

<b>Company:</b> Battelle Institute	<b>Date:</b> 09-Mar-11	<b>Truck:</b> PS-4
<b>Well:</b> Windsor	<b>Run No.:</b> One	
<b>Field:</b> Altadena	<b>Job Ticket:</b> 15802	
<b>State:</b> California	<b>Total Depth:</b> 593 ft	
	<b>Water Level:</b> 128 ft	
<b>Location:</b> 2696 Windsor Ave.	<b>Oil on Water:</b> None	<b>Amount:</b> 0 ft
GPS N34°11'29.8" W118°10'03.1"	<b>Guides at:</b> 13.00 in	
<b>Zero Datum:</b> Top of CSG	<b>Tool Zero:</b> Side-Scan	<b>Operator:</b> Nelson-Ridder
<b>Reason for Survey:</b> General Inspection		

Depth	Remarks	Perforation:	
0.0 ft	Start survey at top of casing.	Stainless Steel	324.50 ft to ?
127.7 ft	SWL; Water clear.	Wire Wrap	
210.0 ft	Light to medium scale build-up		
260.0 ft	Small nodules.		
278.4 ft	Top of patch Bottom is at 282.6 ft. Patch appears in good shape.		
280.8 ft	Hole in liner. Water is jetting horizontally with discernible velocity. Bio-fouling material breaks apart as it passes the water jet. Staining is observed at bottom of patch that maybe be from water production.		
324.2 ft	Casing change to stainless steel.		
324.5 ft	Top of screen; appears open. Gravel pack is observed.		
350.0 ft	Screen appear open.	<b>Casing Size</b>	
364.6 ft	Bio-growth.	Steel	
377.0 ft	Bio-growth.	<b>13.75 in I.D.</b>	0.00 ft to 324.20ft
475.0 ft	Screen appear open.	<b>Stainless Steel</b>	
540.0 ft	Screen appear open.	<b>13.75 in I.D.</b>	324.20 ft to 592.60ft
588.0 ft	Heavy bio-growth.		
592.6 ft	Fill; still in screen. End survey.		



800.919.7555  
909.625.6262

4456 via st. ambrose  
claremont ca 91711  
www.pacificsurveys.com

fax: 909.399.3180



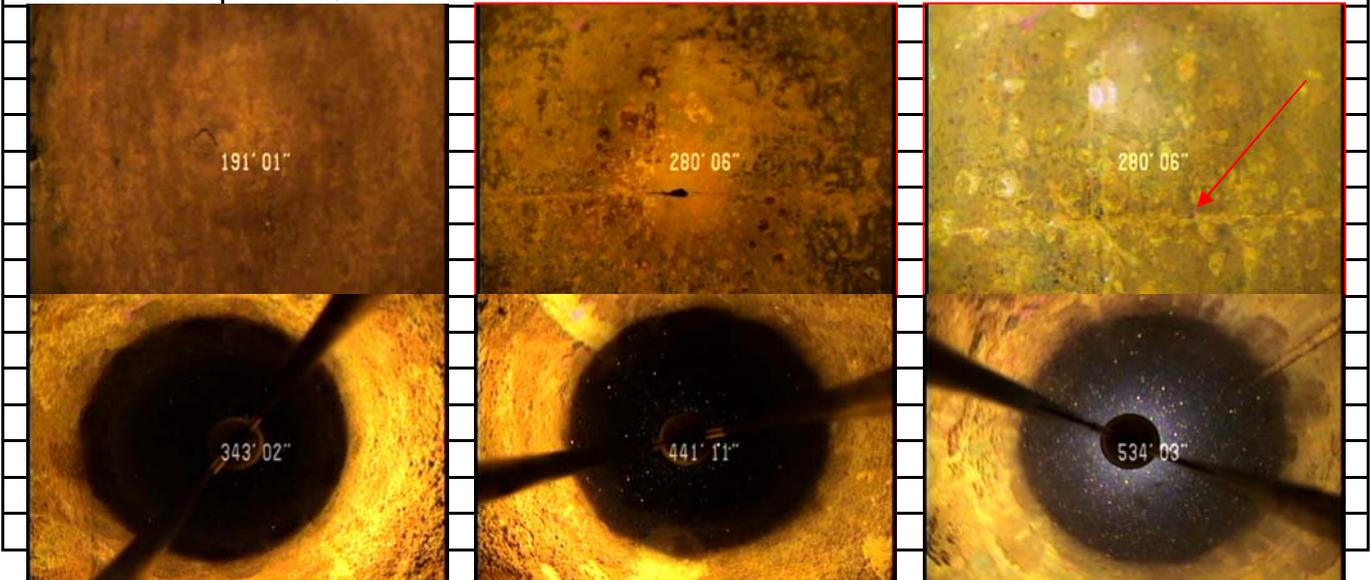
## Well Inspection Report

**CLIENT:** Battelle-JPL Pasadena  
**ADDRESS:** Unknown  
**CONTACT:** David Conner **PHONE:** 619-726-7311  
**JOB LOCATION:** 2696 Windsor Ave. Alta Dena  
**GPS LOCATION:** Latitude: N 34° 11' 30.0" Longitude: W 118° 10' 02.8"

**WELL NUMBER:** Windsor **After Liner Pull** **JOB NUMBER:** 13391  
**SURVEYED BY:** Jeff Conner **DATE:** 26-Aug-11  
**REVIEWED BY:** **WATER LEVEL:** 146' 5"  
**WATER CONDITION:** Clear/Cloudy **TOTAL DEPTH:** 600'  
**CASING DIAMETER:** 20.50" ID **SURVEY DEPTH:** 587' 10"

\*All Depths Shown are relative to the center of the side camera perspective.

DEPTH	REMARKS		
5 - 146'	Casing appears to have mild scale.	<b>Perforations:</b>	
146' 5"	Camera enters static water level.		
146 - 185'	Casing appears to have mild scale and growth.	<b>Hydraulic Louver</b>	322 - 343'
185 - 280'	Casing appears to have sings of pitting.		376 - 385'
280' 6"	Holes noticed at seam.		425 - 449'
280 - 322'	Casing appears to have mild scale and growth.		476 - 486'
322 - 343'	Casing appears to have heavy scale and growth with gravel pack from liner.		499 - 587'
343 - 376'	Casing appears to have mild scale and growth.		
425 - 449'	Casing appears to have heavy scale and growth with gravel pack from liner.		
449 - 476'	Casing appears to have moderate scale and growth.		
476 - 486'	Casing appears to have heavy scale and growth with gravel pack from liner.		
486 - 499'	Casing appears to have moderate scale and growth.		
499 - 587'	Casing appears to have heavy scale and growth with gravel pack from liner.		
530 - 587'	Pipe in casing.		
587' 10"	Camera light bar come to rest in fill.		





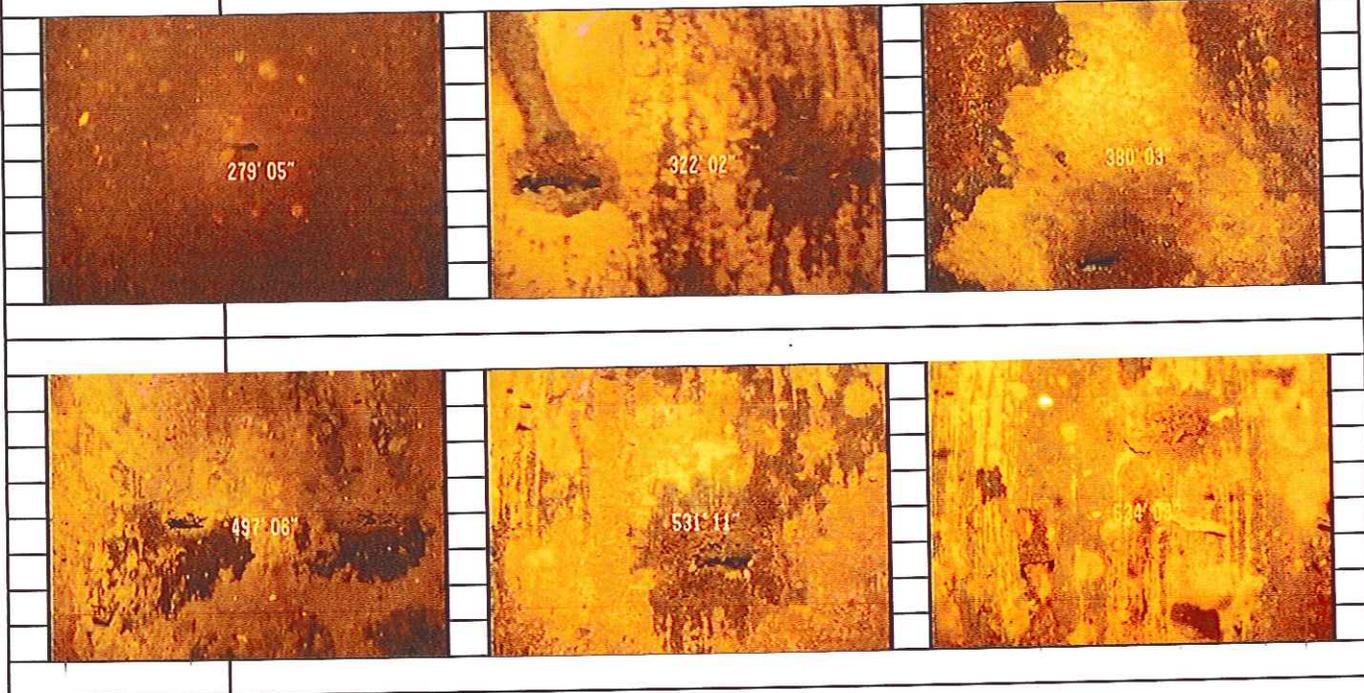
## Well Inspection Report

CLIENT: Battelle JPL  
 ADDRESS: \_\_\_\_\_  
 CONTACT: David Conner PHONE: 619-726-7311  
 JOB LOCATION: 2696 Windsor Ave, Altadena, CA  
 GPS LOCATION: Latitude: N 34° 11.501' Longitude: W 118° 10.054'

WELL NUMBER: Windsor Before Liner install JOB NUMBER: 13931  
 SURVEYED BY: Jose Rocha DATE: 20-Aug-12  
 REVIEWED BY: \_\_\_\_\_ WATER LEVEL: 193' 8"  
 WATER CONDITION: Cloudy / Clear TOTAL DEPTH: Unknown  
 CASING DIAMETER: 20.50" SURVEY DEPTH: 590'

\*All Depths Shown are relative to the center of the side camera perspective.

DEPTH	REMARKS	Perforations:	
0 - 193'	Casing appears to have mild scale and growth.		
193' 8"	Camera enters static water level.		
193 - 590'	Casing appears to have moderate scale and growth.	Hydraulic Louver	321 - 344
590'	Camera comes to rest on top of fill.		347 - 384'
279' 5"	Water appears jetting in though casing.		423 - 448'
321 - 531'	Appears to be multiple enlarge perforations.		474 - 484'
534 - 590'	Appears to be a piece of pipe.		497 - 590'





## Well Inspection Report

**CLIENT:** Battelle JPL  
**ADDRESS:** \_\_\_\_\_  
**CONTACT:** David Conner **PHONE:** 619-726-7311  
**JOB LOCATION:** 2696 Windsor Ave, Altadena, CA  
**GPS LOCATION:** Latitude: N 34° 11.501' Longitude: W 118° 10.054'

**WELL NUMBER:** Windsor **After liner install** **JOB NUMBER:** 13931

**SURVEYED BY:** Jose Rocha **DATE:** 13-Sep-12

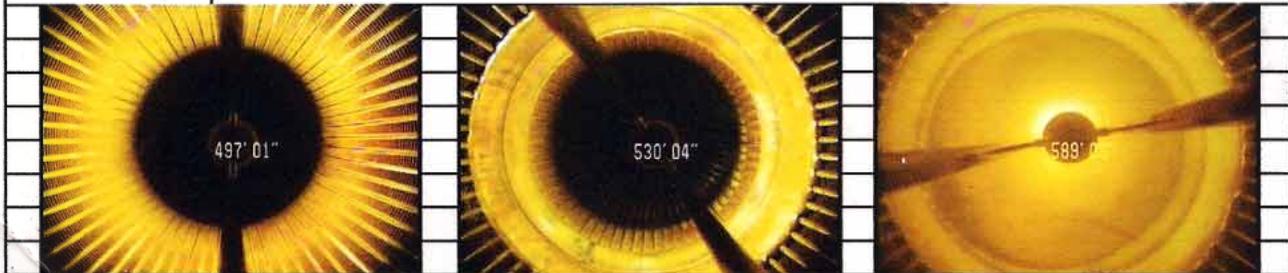
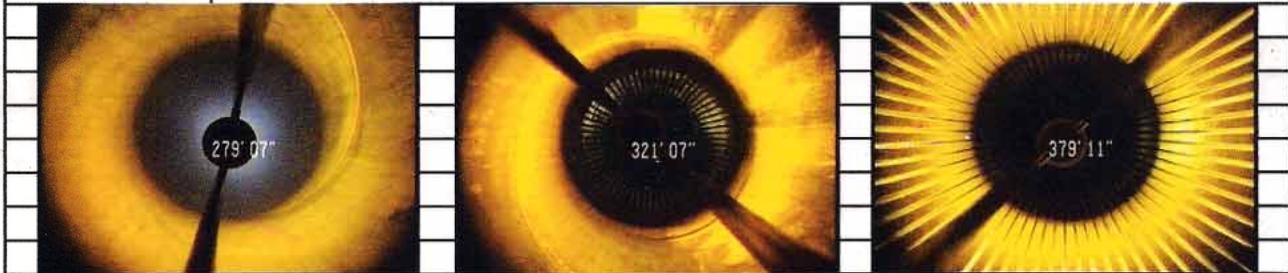
**REVIEWED BY:** **WATER LEVEL:** 191' 9"

**WATER CONDITION:** Clear **TOTAL DEPTH:** Unknown

**CASING DIAMETER:** 13.75" **SURVEY DEPTH:** 589' 9"

\*All Depths Shown are relative to the center of the side camera perspective.

DEPTH	REMARKS		
0 - 191'	Casing appears to have mild scale and growth.	<b>Perforations:</b>	
191' 9"	Camera enters static water level.		
191 - 589'	Casing appears to have mild scale and growth.	<b>Stainless Steel</b>	324 - 591'
589' 9"	Camera comes to rest on top of fill.	<b>Screen</b>	
	Add 20 inches from side perspective to bottom of light bar.		
318' 8" - 323' 9"	Transitional coupling.		



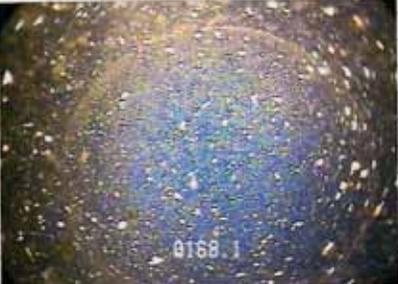
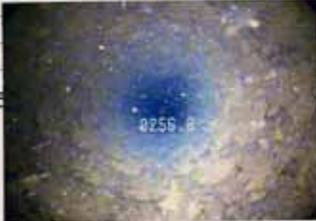
**Well 52**

# Pacific Surveys

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## Video Survey Report

<b>Company:</b>	Battelle	<b>Date:</b>	16-Sep-03
<b>Well:</b>	City of Pasadena #52	<b>Run No.:</b>	One
<b>Field:</b>	JPL	<b>Job Ticket:</b>	10997
<b>State:</b>	California	<b>Total Depth:</b>	621 ft
<b>Location:</b>	Upper Arroyo Canyon	<b>Water Level:</b>	83 ft
<b>Zero Datum:</b>	Top of Casing	<b>Tool Zero:</b>	Side-Scan
<b>Reason for Survey:</b>	General Inspection		

Depth	Remarks	Perforation:	
0.0 ft	Start of Survey ; T.O.C.	<b>Horizontal</b>	248.20 ft to 369.00ft
83.4 ft	Static water level; cloudy, moderate particles light scale	<b>Louvers</b>	374.00 ft to 620.50ft
120.0 ft	Scale increasing		
167.0 ft	Nodules increasing in size		
169.6 ft	Possible patch		
180.0 ft	Clearing, light particles	<b>Casing Size</b>	20" M/Steel
248.2 ft	Top of perfs; hydraulic horizontal louvers; mostly open clearing		0.00 ft to T.D.
338.0 ft	Jetting perf visible flow		
360.0 ft	Clearing		
369.0 ft	Bottom of perfs		
374.0 ft	Top of perfs; mostly plugged		
410.0 ft	Perfs mostly plugged, heavier nodules		
460.0 ft	Encrustation heavy		
500.0 ft	Getting darker casing; heavy nodules		
503.0 ft	Top of airline		
540.0 ft	Airline in center well		
580.0 ft	Black deposits on casing		
614.0 ft	2nd airline segment		
617.3 ft	3rd airline segment		
620.5 ft	Bottom; fill		
			
			
			

**Notes:** All depths are referenced to side-scan. Downview lense is 5" below side-scan.

800.919.7555  
909.625.6262

4456 via st. ambrose  
claremont ca 91711

fax: 909.399.3180





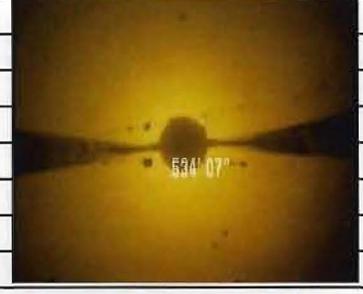
## Well Inspection Report

**CLIENT:** Battelle - JPL Pasadena  
**ADDRESS:** UNKNOWN  
**CONTACT:** David Conner **PHONE:** 619-726-7311  
**JOB LOCATION:** Pasadena Ca.  
**GPS LOCATION:** Latitude: N 34° 11' 46.2" Longitude: W 118° 10' 03.8"

**WELL NUMBER:** # 52 **JOB NUMBER:** 27-1227  
**SURVEYED BY:** Tom Schuldheisz **DATE:** 5-Aug-09  
**REVIEWED BY:** **WATER LEVEL:** 81' 03"  
**WATER CONDITION:** Clear/Cloudy **TOTAL DEPTH:** Unknown  
**CASING DIAMETER:** 20.00" ID **SURVEY DEPTH:** 611' 02"

\*All Depths Shown are relative to the center of the side camera perspective.

DEPTH	REMARKS		
0 - 81'	Casing appears to have mild scale and growth.	<b>Perforation:</b>	
		<b>Horizontal</b>	248 to 370'
1' 05"	Access port enters casing.	<b>Louver</b>	375 to 400'
81' - 100'	Casing appears to have mild scale and growth.		
100' - 270'	Casing appears to have moderate scale and growth.		
250' 05"	Casing appears to have corrosion at the seam.		
270' - 611'	Casing appears to have mild scale and growth.		
530' - 580'	Poor visibility in water.		
580' - 611'	Moderate visibility in water.		
611' 02"	Camera comes to rest at fill from the side perspective.		







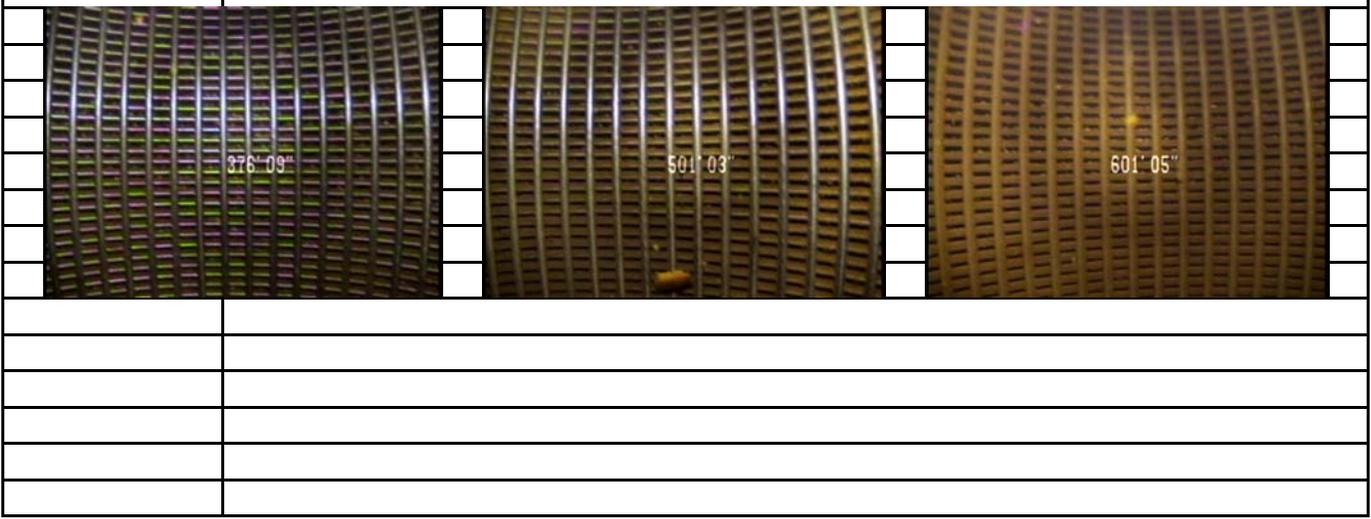
## Well Inspection Report

**CLIENT:** JPL - Battelle  
**ADDRESS:** Unknown  
**CONTACT:** David Conner **PHONE:** 619-726-7311  
**JOB LOCATION:** Pasadena Ca.  
**GPS LOCATION:** Latitude: N 34° 11' 46.2" Longitude: W 118° 10' 03.8"

**WELL NUMBER:** # 52 **After Liner** **JOB NUMBER:** 1000-1968  
**SURVEYED BY:** Jeff Conner **DATE:** 30-Nov-10  
**REVIEWED BY:** **WATER LEVEL:** 64' 1"  
**WATER CONDITION:** Clear **TOTAL DEPTH:** Unknown  
**CASING DIAMETER:** 15.75" ID **SURVEY DEPTH:** 638' 7"

\*All Depths Shown are relative to the center of the side camera perspective.

DEPTH	REMARKS		
1' 4"	Access port enters casing.	<b>Perforation:</b>	
1' 10"	Liner begins.	<b>Stainless Steel</b>	255 - 615'
1 - 64'	Casing appears to have mild scale and growth.	<b>Wire Wrap</b>	
64' 1"	Camera enters static water level.		
64 - 255'	Casing appears to have mild scale and growth.		
255'	Camera transitions from mild steel to stainless.		
255 - 613'	Casing appears to have mild growth, gravel is visible behind screen.		
613'	Camera comes to rest on top of fill.		







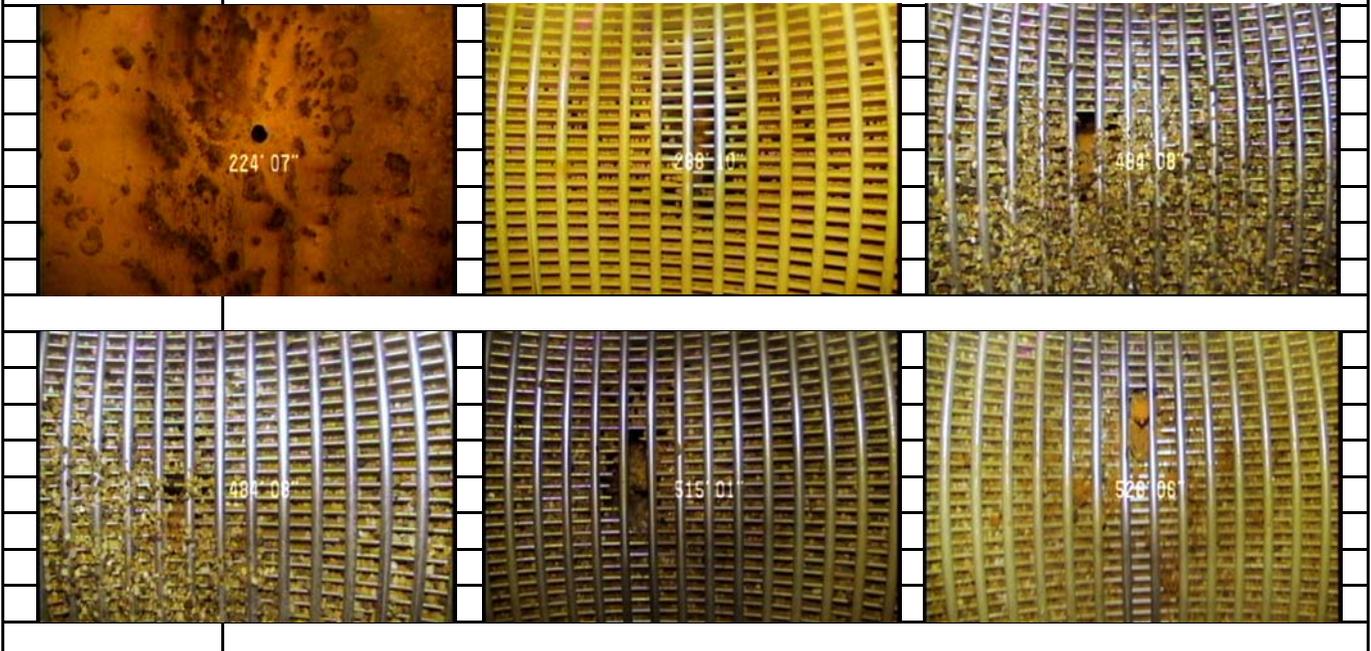
## Well Inspection Report

**CLIENT:** JPL - Battelle  
**ADDRESS:** Unknown  
**CONTACT:** David Conner **PHONE:** 619-726-7311  
**JOB LOCATION:** Pasadena Ca.  
**GPS LOCATION:** Latitude: N 34° 11' 46.2" Longitude: W 118° 10' 03.8"

**WELL NUMBER:** # 52 **After Air Lift** **JOB NUMBER:** 1000-1968  
**SURVEYED BY:** Jeff Conner **DATE:** 13-Jun-11  
**REVIEWED BY:** **WATER LEVEL:** 50' 8"  
**WATER CONDITION:** Clear **TOTAL DEPTH:** 615' (Liner)  
**CASING DIAMETER:** 15.75" ID **SURVEY DEPTH:** 617' 10"

\*All Depths Shown are relative to the center of the side camera perspective.

DEPTH	REMARKS		
1' 4"	Access port enters casing.	<b>Perforation:</b>	
1' 10"	Liner begins.		
1 - 50'	Casing appears to have mild scale and growth.	<b>Stainless Steel</b>	257 - 617'
50' 8"	Camera enters static water level.	<b>Wire Wrap</b>	
50 - 526'	Casing appears to have mild scale and growth.		
	Large voids of gravel pack behind screen.		
255'	Camera transitions from mild steel to stainless.		
224' 7"	Small hole in blank casing.		
288' 10"	Casing appears to have thinned.		
484' 8"	Casing appears to have thinned in 2 spots.		
515' 1"	Casing appears to have thinned a large hole.		
526' 6"	Casing appears to may have thinned behind debris.		
526 - 617'	Casing appears to have gravel pressed against it from the inside.		
617' 10"	Camera comes to rest at fill.		



# Pacific Surveys

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## Video Survey Report

<b>Company:</b> Layne Christensen	<b>Date:</b> 20-Jun-11	<b>Truck:</b> PS-4
<b>Well:</b> City of Pasadena Well # 52	<b>Run No.:</b> One	
<b>Field:</b> Upper Arroyo Canyon	<b>Job Ticket:</b> 15977	
<b>State:</b> California	<b>Total Depth:</b> 606 ft	
	<b>Water Level:</b> 40 ft	SWL
<b>Location:</b> GPS N34o11.770' W118o10.067'	<b>Oil on Water:</b> No	<b>Amount:</b> 0"
	<b>Operator:</b> Nelson	
<b>Zero Datum:</b> Top of Liner	<b>Side-Scan:</b>	<b>Dead Space:</b> 2.00 ft
<b>Reason for Survey:</b> General Inspection	<b>Guides Set @:</b> 15.00 "	

Depth	Observations	Perforation:	From Survey
0.0 ft	Start survey at top of liner.		
39.8 ft	SWL; Water clear.	Wire-Wrap	253.70 ft to ?
87.6 ft	Casing joint.		
221.4 ft	Hole in casing wall.		
253.4 ft	Casing change to stainless steel.		
253.7 ft	Top of screen; appears open.		
285.0 ft	Hole in screen.		
350.0 ft	Screen appear open.		
400.0 ft	Screen appears normal.		
480.7 ft	Hole in screen.		
498.3 ft	Possibly start of thinning of screen.		
511.0 ft	Hole in screen.	<b>Casing Size</b>	<b>From Survey</b>
522.2 ft	Hole in screen.	15.75 in	0.00 ft to 606.40ft
560.0 ft	Water becomes cloudy.		
561.0 ft	Fine material in screen.		
606.4 ft	Fill; fine material still in screen. End survey.		
		<b>Casing Material</b>	Mild Steel
		<b>Screen Material</b>	SST



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www.pacificsurveys.com

fax: 909.399.3180





# Layne Christensen Co.

11001 Etiwanda Ave.  
Fontana, Ca. 92337  
Phone: (909) 390-2833  
CA Lic.#: 510011

## Well Inspection Report

**CLIENT:** JPL - Battelle  
**ADDRESS:** Unknown  
**CONTACT:** David Conner **PHONE:** 619-726-7311  
**JOB LOCATION:** Pasadena Ca.  
**GPS LOCATION:** Latitude: N 34° 11' 46.2" Longitude: W 118° 10' 03.8"

**WELL NUMBER:** # 52 **General Inspection** **JOB NUMBER:** 13391  
**SURVEYED BY:** Jeff Conner **DATE:** 15-Aug-11  
**REVIEWED BY:** **WATER LEVEL:** 67' 11"  
**WATER CONDITION:** Clear/Cloudy **TOTAL DEPTH:** Unknown  
**CASING DIAMETER:** 15.75" ID **SURVEY DEPTH:** 612'

\*All Depths Shown are relative to the center of the side camera perspective.

DEPTH	REMARKS









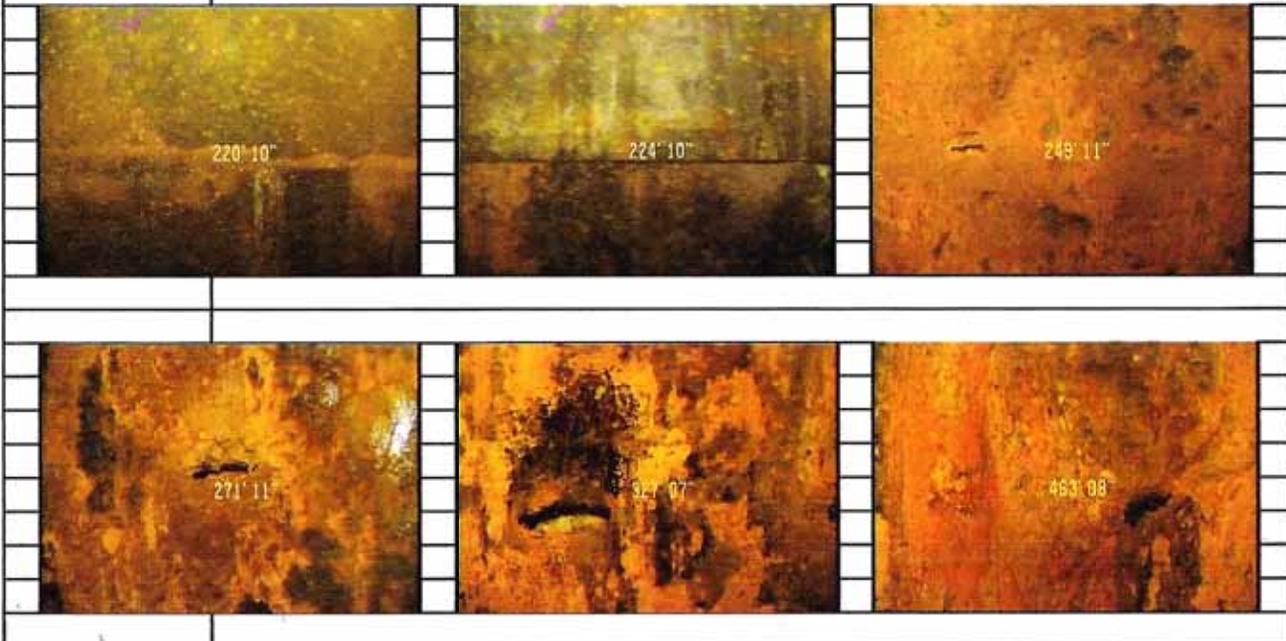
## Well Inspection Report

CLIENT: Battelle JPL  
 ADDRESS: \_\_\_\_\_  
 CONTACT: David Conner PHONE: 619-726-7311  
 JOB LOCATION: 2999 Sterling PL, Altadena, CA  
 GPS LOCATION: Latitude: N 34° 11.776' Longitude: W 118° 10.071'

WELL NUMBER: 52 After patch JOB NUMBER: 13931  
 SURVEYED BY: Jose Rocha DATE: 14-Aug-12  
 REVIEWED BY: WATER LEVEL: 112' 5"  
 WATER CONDITION: Cloudy / Clear TOTAL DEPTH:  
 CASING DIAMETER: 20.00" SURVEY DEPTH: 616' 10"

\*All Depths Shown are relative to the center of the side camera perspective.

DEPTH	REMARKS		
0 - 112'	Casing appears to have mild scale and growth.	Perforations:	
112' 5"	Camera enters static water level.		
112 - 616'	Casing appears to have moderate scale and growth.	Mills Knife	250 - 616'
616' 10"	Camera comes to rest on top of fill.		
220' 10" - 224' 10"	Patch.		
249' 11"	Possible water jetting.		
250 - 500'	Appears to be multiple enlarge perforation.		
251' 2"	Possible enlarge perforation.		
271' 11"	Possible enlarge perforation.		
327' 7"	Possible enlarge perforation.		
463' 8"	Possible enlarge perforation.		





**Attachment 6**

**Pacific Surveys Spinner Log, Temperature/Noise Log,  
and CITM Casing Inspection Results**

**Windsor Well**

# PACIFIC SURVEYS

## SPINNER DOWN RUNS PUMPING CONDITION

Job No. 15408  
 Company LAYNE CHRISTENSEN  
 Well WINDSOR  
 Field ALTADENA  
 County LOS ANGELES State CA

Location: 2696 WINDSOR AVE  
 GPS: N34o11'29.8" W118o10'03.1"  
 Sec. Twp. Rge.  
 Other Services: STOP COUNTS SPINNER ANALYSIS SAMPLING

Permanent Datum	G.L.	Elevation	
Log Measured From	G.L.	0'	above perm. datum
Drilling Measured From	G.L.		
Date	8-12-2010		
Run Number	ONE		
Depth Driller	593'		
Depth Logger	591'		
Bottom Logged Interval	590'		
Top Log Interval	320'		
Pump Set @	308'		
Time Pumping Prior to Survey	3 HOURS		
Pumping Water Level	262'		
Max. Recorded Temp.	N/A		
Pump Rate (GPM)	1410		
Time Well Ready	10:00 AM		
Time Logger on Bottom	10:20 AM		
Equipment Number	PS-1		
Location	L.A.		
Recorded By	ABREAU/NELSON		
Witnessed By	PORTER		
Perforation Record		Perforation Record	
Type	Slot Size	From	To
Wire-Wrap	.080	316"	591'
Casing Record	Size	Wgt/Ft	Top
Surface String			Bottom
Camera Tube			
Production String	14"	n/a	0'
Liner			593'

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All interpretations are opinions based on inferences from electrical or other measurements and Pacific Surveys cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Pacific Surveys' general terms and conditions set out in our current Price Schedule.

### Comments

SAMPLES COLLECTED @ 330', 440', 500', 580'

Database File: 15408.db  
 Dataset Pathname: spn7  
 Presentation Format: spinmerg  
 Dataset Creation: Wed Aug 11 10:44:25 2010 by Log Open-Cased 090629  
 Charted by: Depth in Feet scaled 1:240

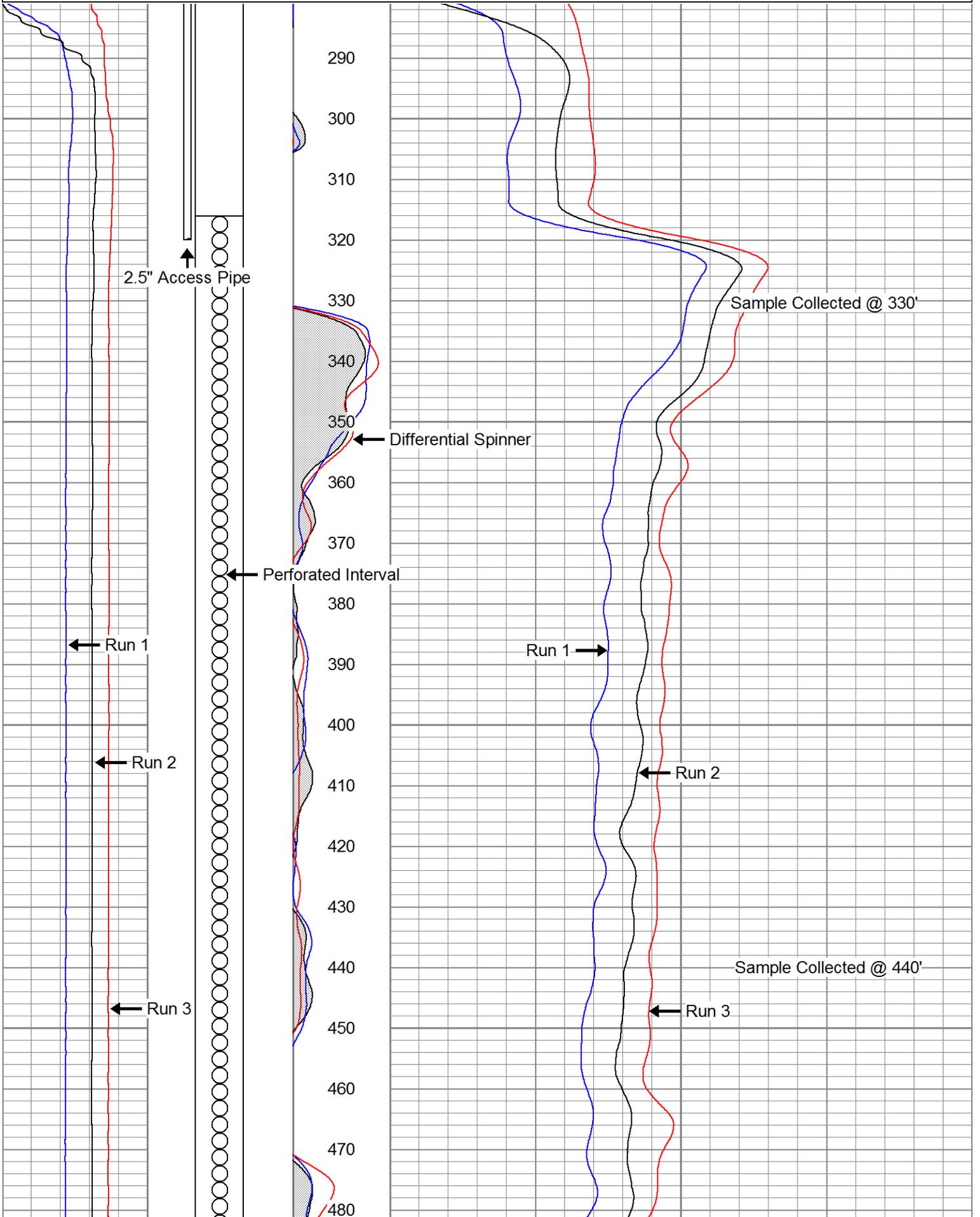
0	LS (ft/min) 200
0	LS (ft/min) 200
0	LS (ft/min) 200

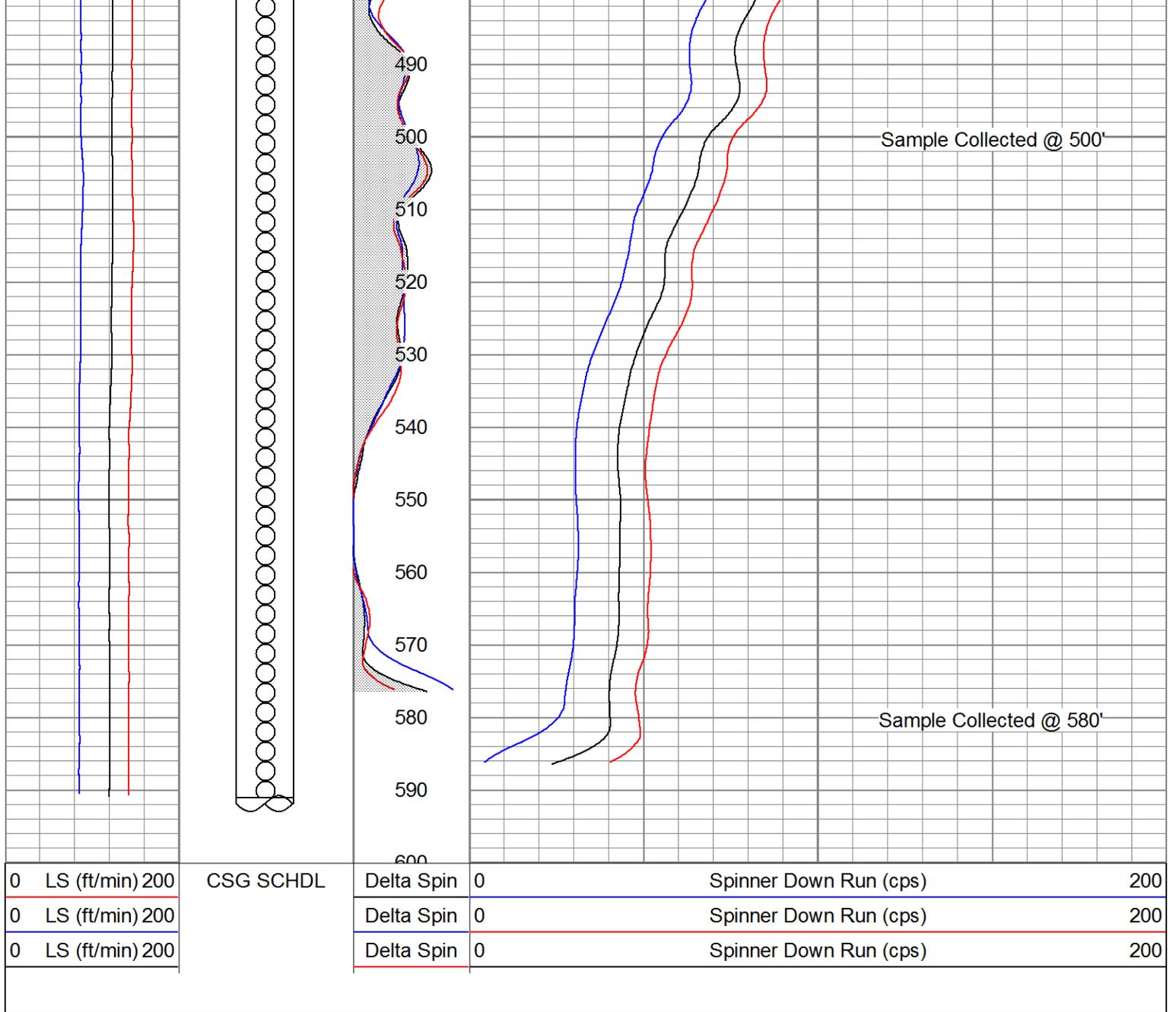
CSG SCHDL

Delta Spin	0
Delta Spin	0
Delta Spin	0

Spinner Down Run (cps)	200
Spinner Down Run (cps)	200
Spinner Down Run (cps)	200

200
200
200





## SPINNER STOP COUNTS PUMPING CONDITION

Job No. 15408  
 Company LAYNE CHRISTENSEN  
 Well WINDSOR  
 Field ALTADENA  
 County LOS ANGELES State CA

Location: 2696 WINDSOR AVE  
 GPS: N34o11'29.8" W118o10'03.1"  
 Sec. Twp. Rge.  
 Other Services: DYNAMIC SPINNER SPINNER ANALYSIS SAMPLING

Permanent Datum	G.L.	Elevation	
Log Measured From	G.L.	0'	above perm. datum
Drilling Measured From	G.L.		
Date	8-12-2010		
Run Number	ONE		
Depth Driller	593'		
Depth Logger	591'		
Bottom Logged Interval	590'		
Top Log Interval	320'		
Pump Set @	308'		
Time Pumping Prior to Survey	3 HOURS		
Pumping Water Level	262'		
Max. Recorded Temp.	N/A		
Pump Rate (GPM)	1410		
Time Well Ready	10:00 AM		
Time Logger on Bottom	10:20 AM		
Equipment Number	PS-1		
Location	L.A.		
Recorded By	ABREAU/NELSON		
Witnessed By	PORTER		
Perforation Record		Perforation Record	
Type	Slot Size	From	To
Wire-Wrap	.080	316"	591'
Casing Record	Size	Wgt/Ft	Top Bottom
Surface String			
Camera Tube			
Production String	14"	n/a	0' 593'
Liner			

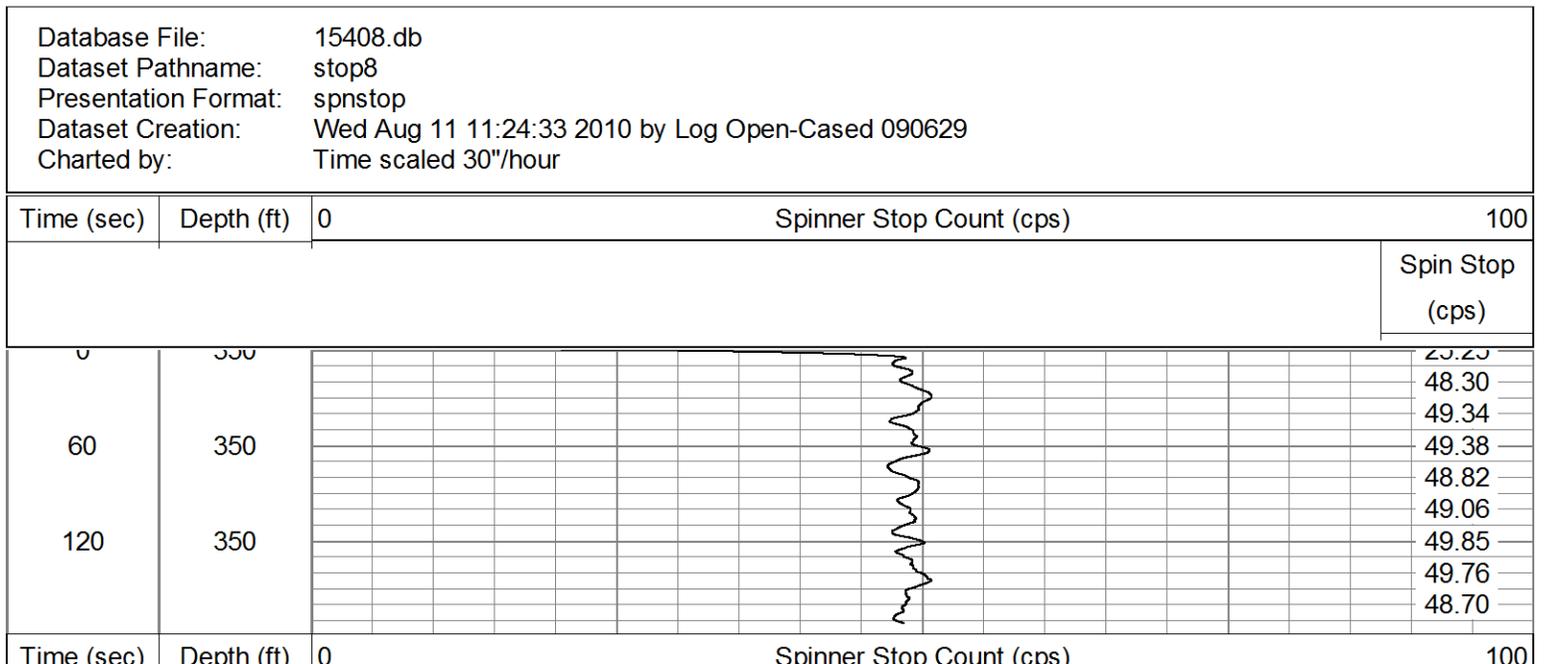
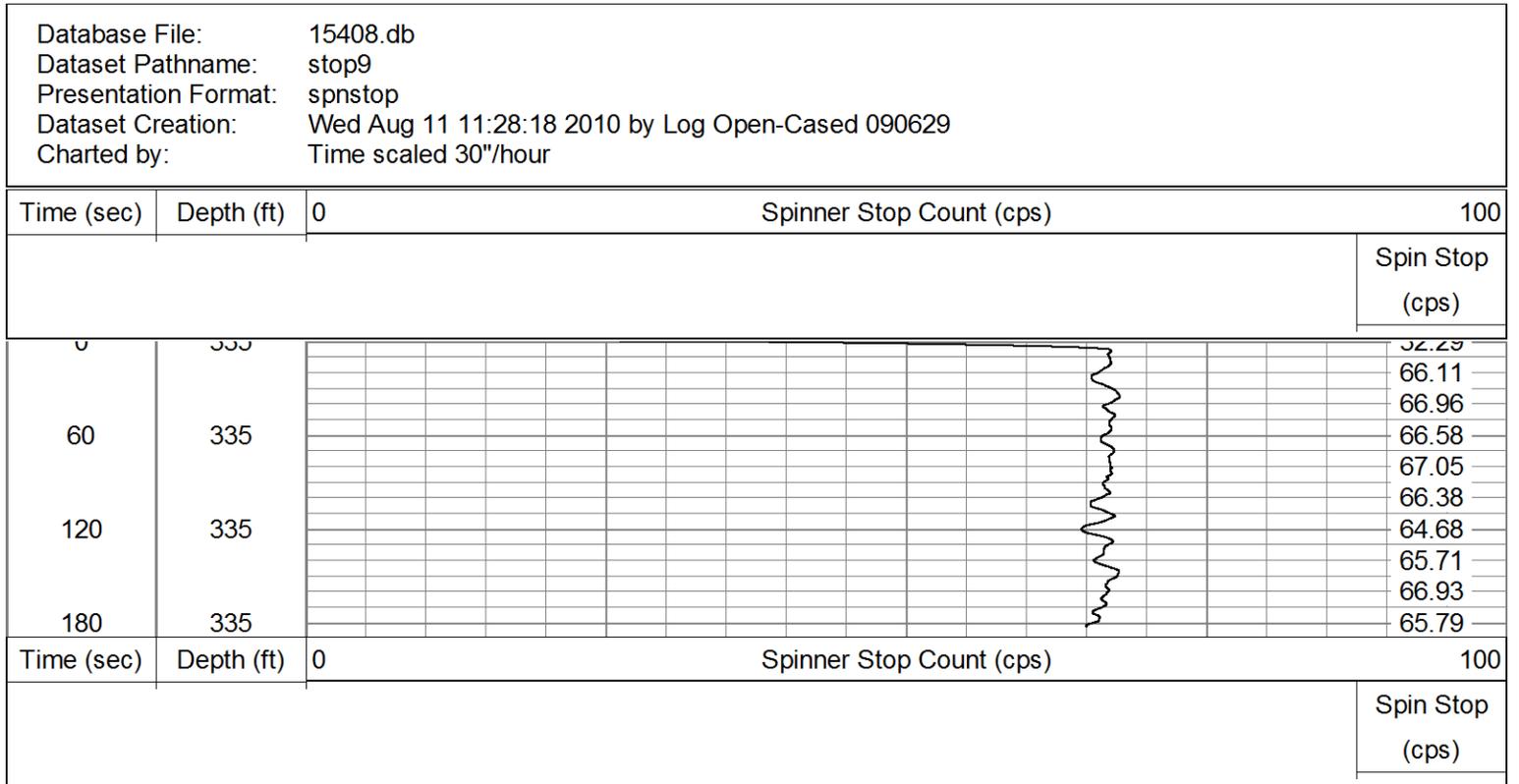
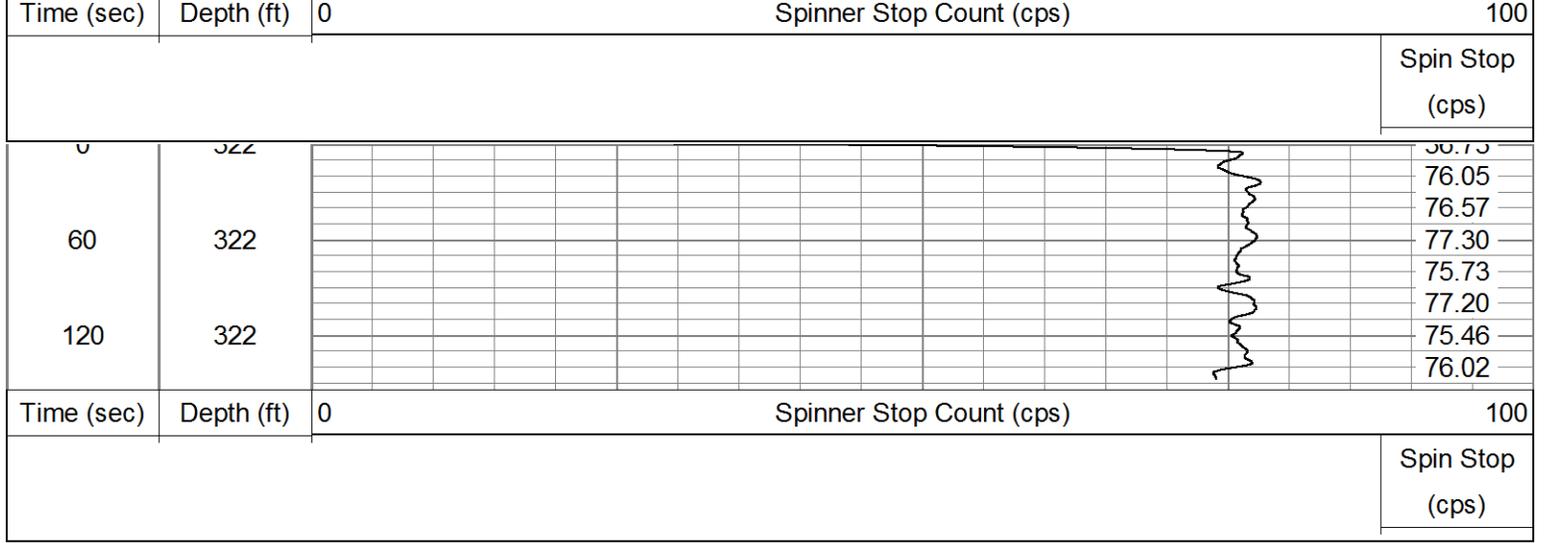
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All interpretations are opinions based on inferences from electrical or other measurements and Pacific Surveys cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Pacific Surveys' general terms and conditions set out in our current Price Schedule.

### Comments

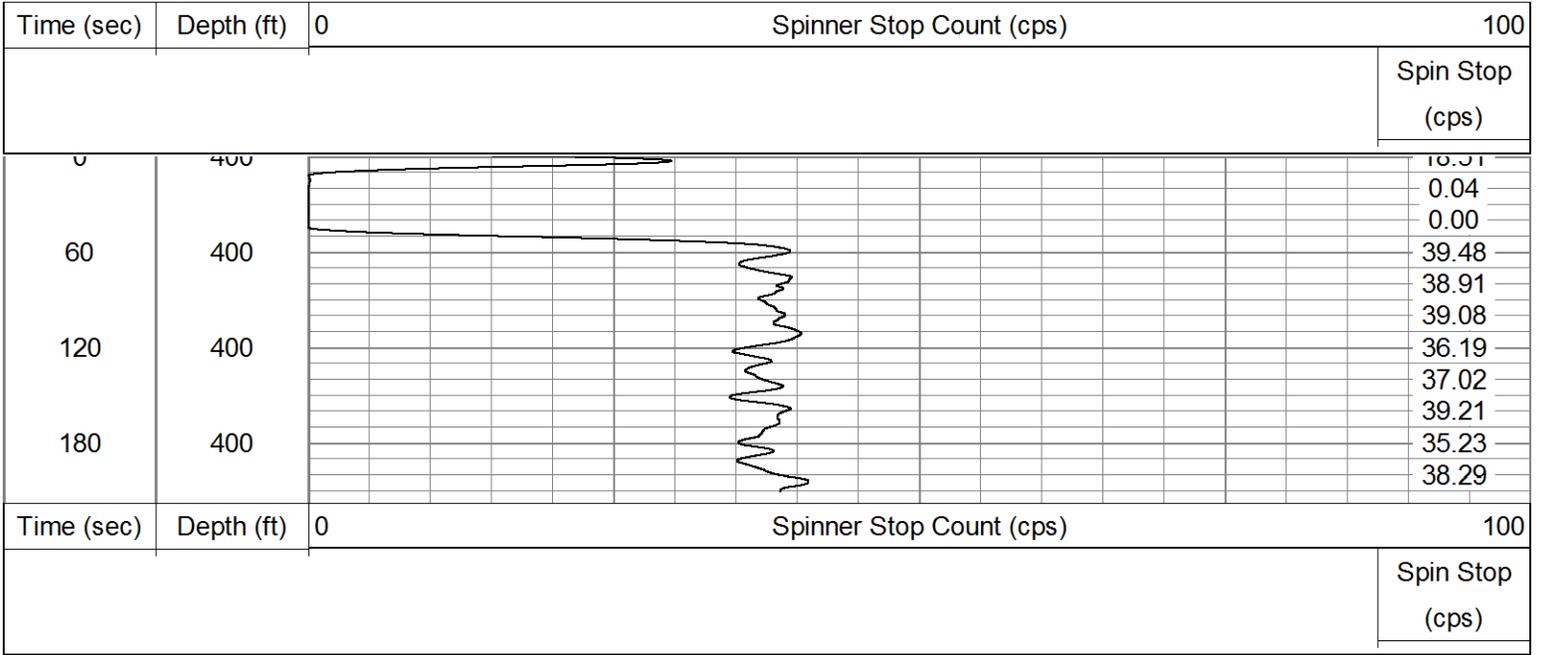
SAMPLES COLLECTED @ 330', 440', 500', 580'

Database File: 15408.db  
 Dataset Pathname: stop10  
 Presentation Format: spnstop  
 Dataset Creation: Wed Aug 11 11:32:30 2010 by Log Open-Cased 090629  
 Charted by: Time scaled 30"/hour

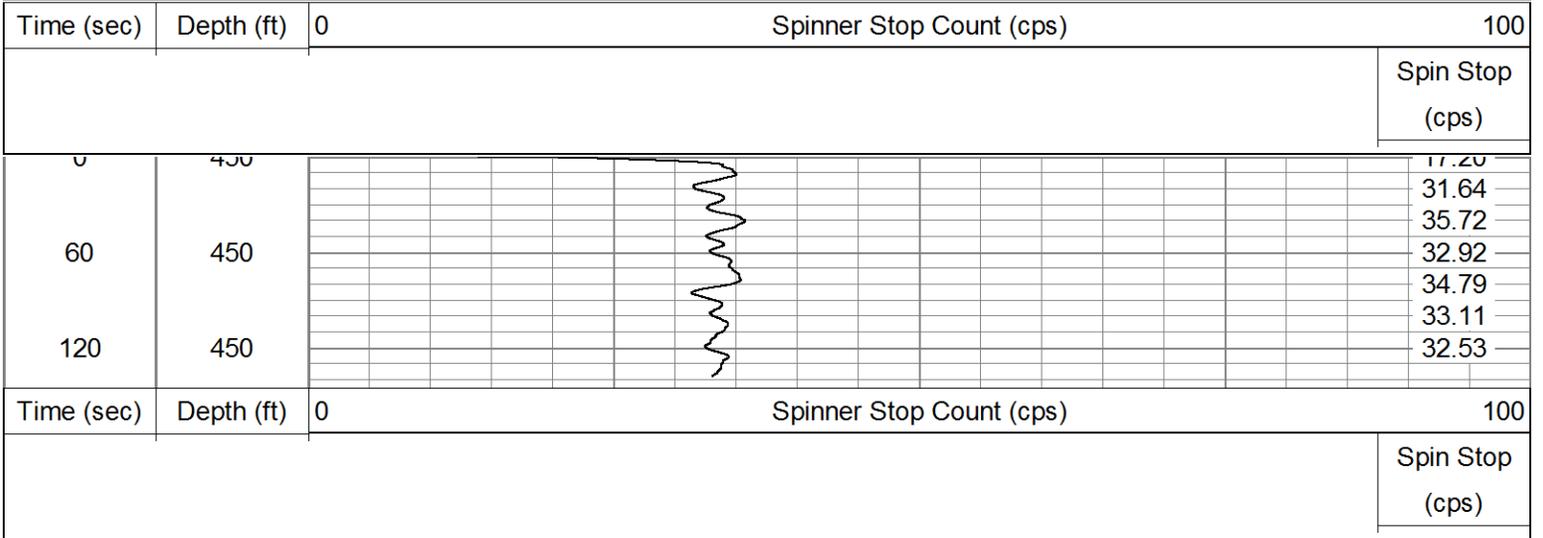


Time (sec)	Depth (ft)	Spinner Stop Count (cps)	100
			Spin Stop (cps)

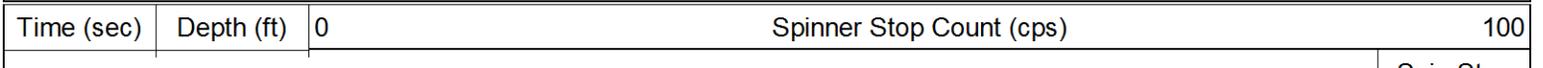
Database File: 15408.db  
 Dataset Pathname: stop7  
 Presentation Format: spnstop  
 Dataset Creation: Wed Aug 11 11:20:04 2010 by Log Open-Cased 090629  
 Charted by: Time scaled 30"/hour

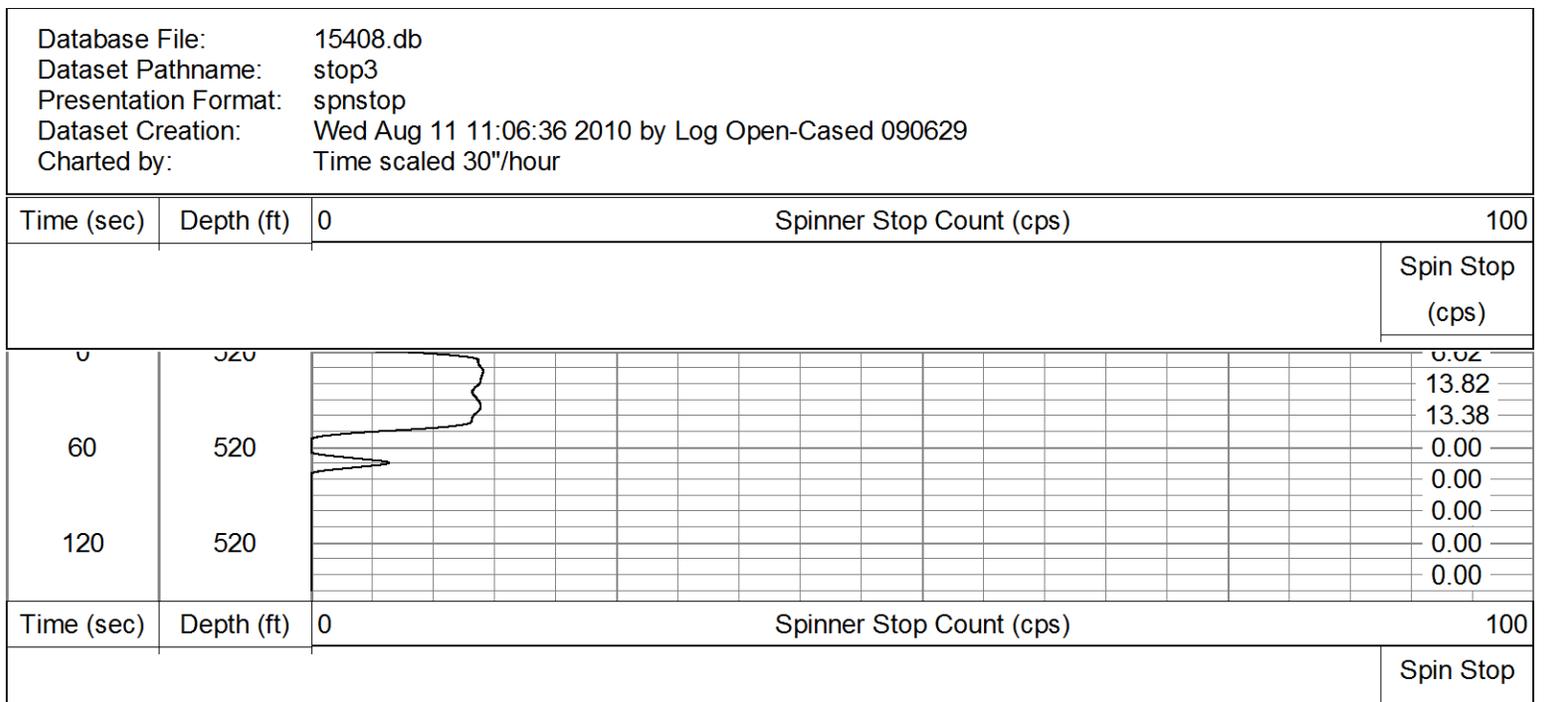
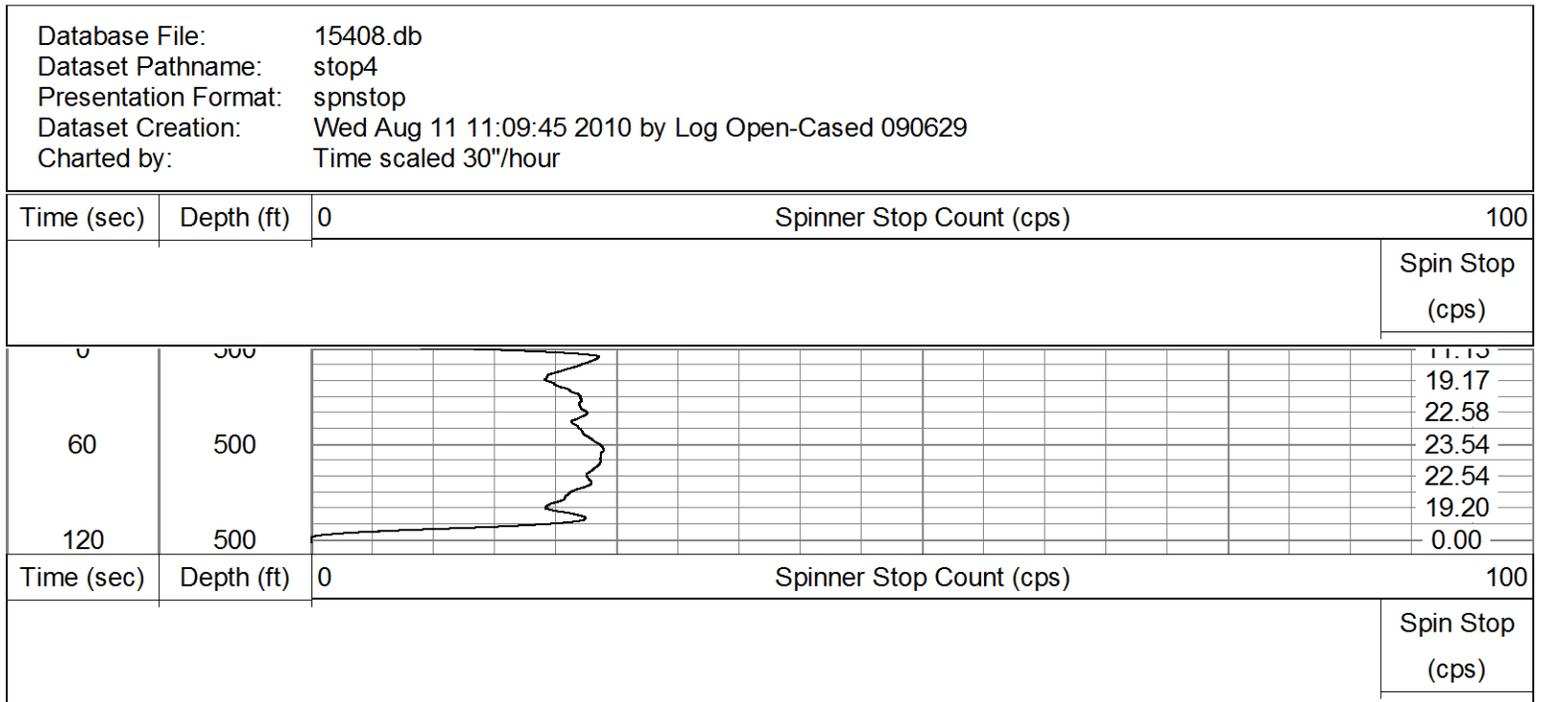
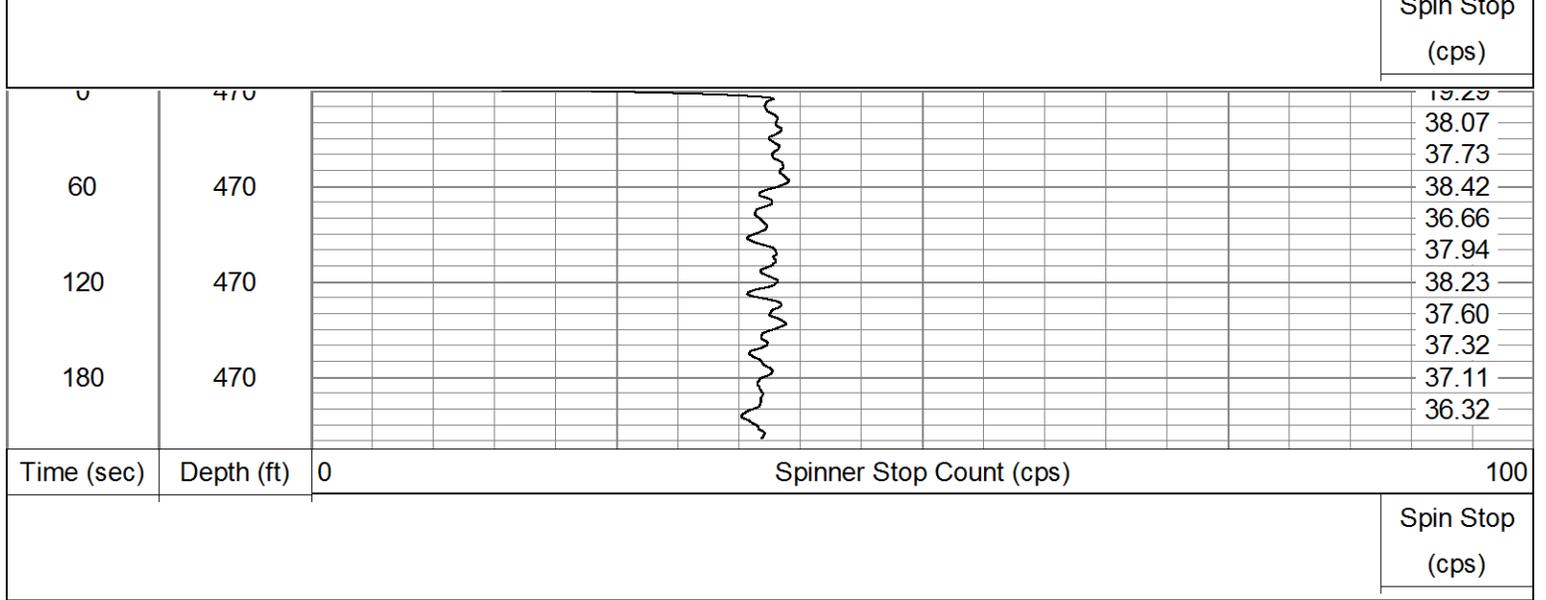


Database File: 15408.db  
 Dataset Pathname: stop6  
 Presentation Format: spnstop  
 Dataset Creation: Wed Aug 11 11:16:54 2010 by Log Open-Cased 090629  
 Charted by: Time scaled 30"/hour



Database File: 15408.db  
 Dataset Pathname: stop5  
 Presentation Format: spnstop  
 Dataset Creation: Wed Aug 11 11:12:31 2010 by Log Open-Cased 090629  
 Charted by: Time scaled 30"/hour





Database File: 15408.db  
 Dataset Pathname: stop2  
 Presentation Format: spnstop  
 Dataset Creation: Wed Aug 11 11:03:27 2010 by Log Open-Cased 090629  
 Charted by: Time scaled 30"/hour

Time (sec)	Depth (ft)	Spinner Stop Count (cps)										100
												Spin Stop (cps)
0	540											0.00
												0.69
60	540											0.00
												0.00
120	540											0.00
												0.00
												0.00

Time (sec)	Depth (ft)	Spinner Stop Count (cps)										100
												Spin Stop (cps)

Database File: 15408.db  
 Dataset Pathname: stop  
 Presentation Format: spnstop  
 Dataset Creation: Wed Aug 11 10:59:15 2010 by Log Open-Cased 090629  
 Charted by: Time scaled 30"/hour

Time (sec)	Depth (ft)	Spinner Stop Count (cps)										100
												Spin Stop (cps)
0	580											0.00
												0.00
60	580											0.00
												0.00
120	580											0.00
												0.00
												0.00

Time (sec)	Depth (ft)	Spinner Stop Count (cps)										100
												Spin Stop (cps)

# PACIFIC SURVEYS

## SPINNER FLUID VELOCITY SPINNER ANALYSIS PUMPING CONDITION

Job No. 15408  
 Company LAYNE CHRISTENSEN  
 Well WINDSOR  
 Field ALTADENA  
 County LOS ANGELES State CA

Location: 2696 WINDSOR AVE  
 GPS: N34o11'29.8" W118o10'03.1"  
 Sec. Twp. Rge.  
 Other Services: STOP COUNTS  
 DYNAMIC SPINNER  
 SAMPLING

Permanent Datum	G.L.	Elevation	
Log Measured From	G.L.	0'	above perm. datum
Drilling Measured From	G.L.		
Date	8-12-2010		
Run Number	ONE		
Depth Driller	593'		
Depth Logger	591'		
Bottom Logged Interval	590'		
Top Log Interval	320'		
Pump Set @	308'		
Time Pumping Prior to Survey	3 HOURS		
Pumping Water Level	262'		
Max. Recorded Temp.	N/A		
Pump Rate (GPM)	1410		
Time Well Ready	10:00 AM		
Time Logger on Bottom	10:20 AM		
Equipment Number	PS-1		
Location	L.A.		
Recorded By	ABREAU/NELSON		
Witnessed By	PORTER		
Perforation Record		Perforation Record	
Type	Slot Size	From	To
Wire-Wrap	.080	316"	591'
Casing Record	Size	Wgt/Ft	Top
Surface String			Bottom
Camera Tube			
Production String	14"	n/a	0'
Liner			593'

<<< Fold Here >>>

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### Comments

SAMPLES COLLECTED @ 330', 440', 500', 580'

Database File: 15408.db  
 Dataset Pathname: 15408fld  
 Presentation Format: spinmerg  
 Dataset Creation: Fri Aug 27 14:22:36 2010  
 Charted by: Depth in Feet scaled 1:240

Fluid Velocity

GPM

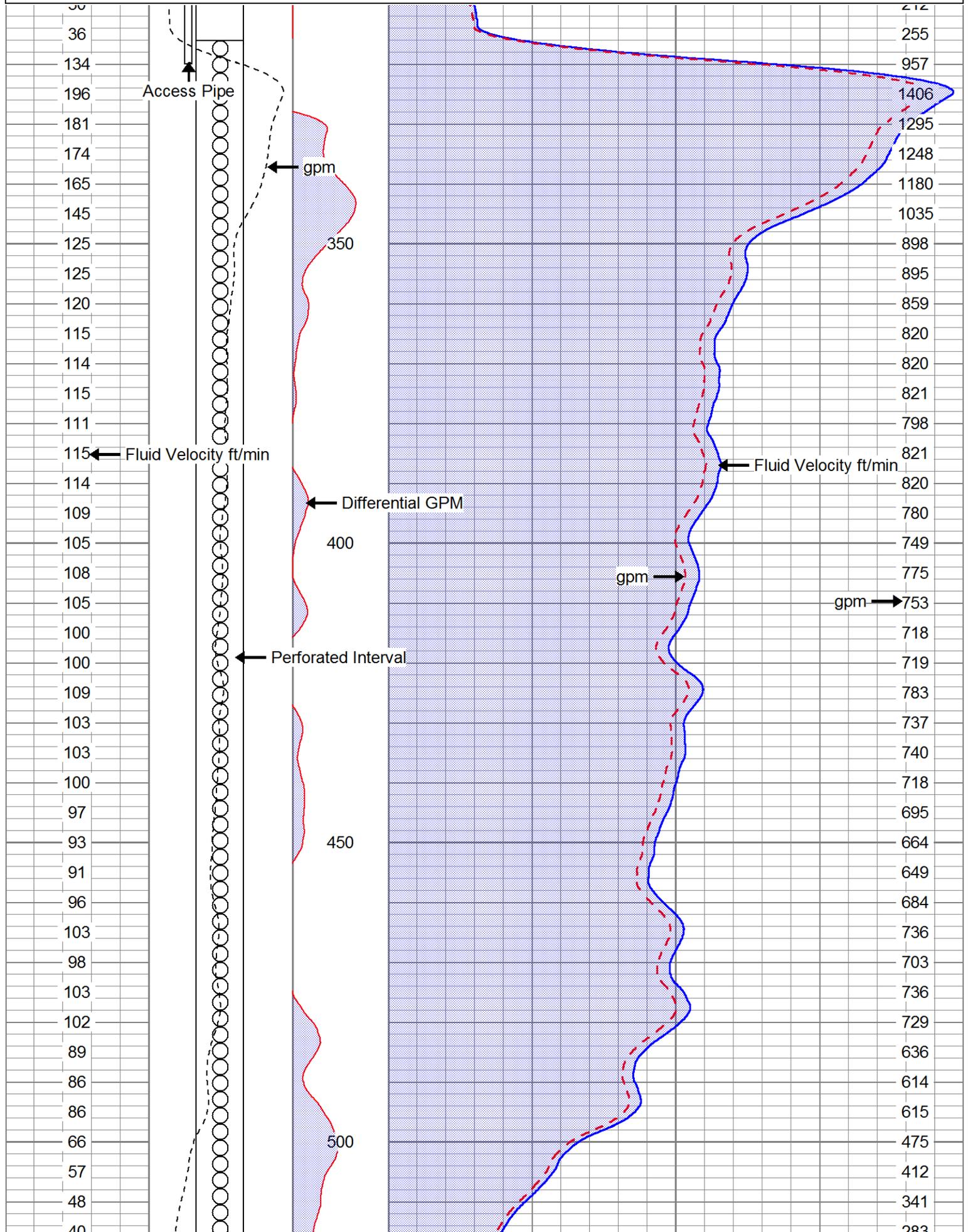
Delta GPM

Fluid Velocity

200

0 GPM (gallon) 1500

gpm



Access Pipe

gpm

350

Fluid Velocity ft/min

Differential GPM

400

gpm

Fluid Velocity ft/min

gpm

Perforated Interval

450

500

255

957

1406

1295

1248

1180

1035

898

895

859

820

820

821

798

821

820

780

749

775

753

718

719

783

737

740

718

695

664

649

684

736

703

736

729

636

614

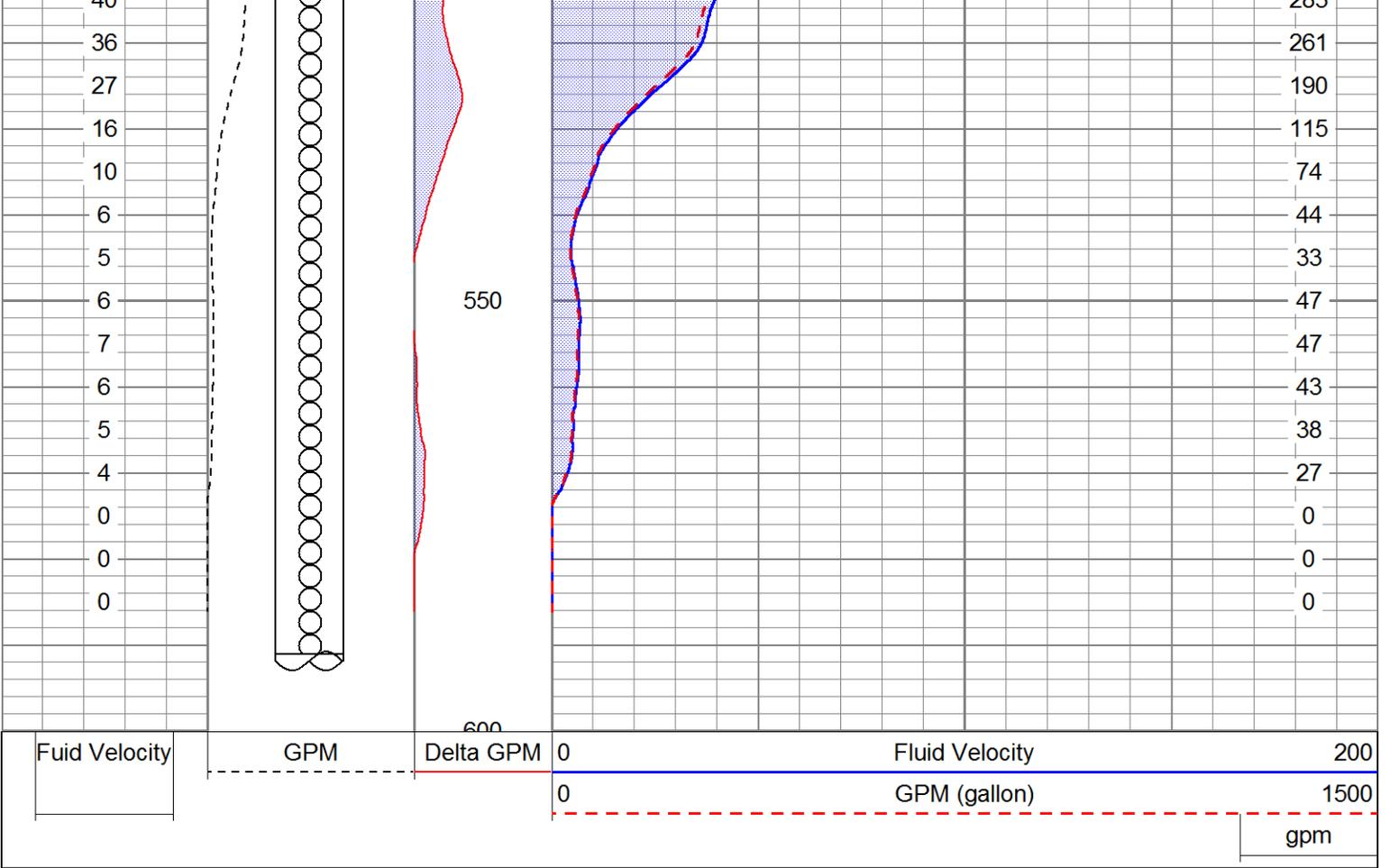
615

475

412

341

283

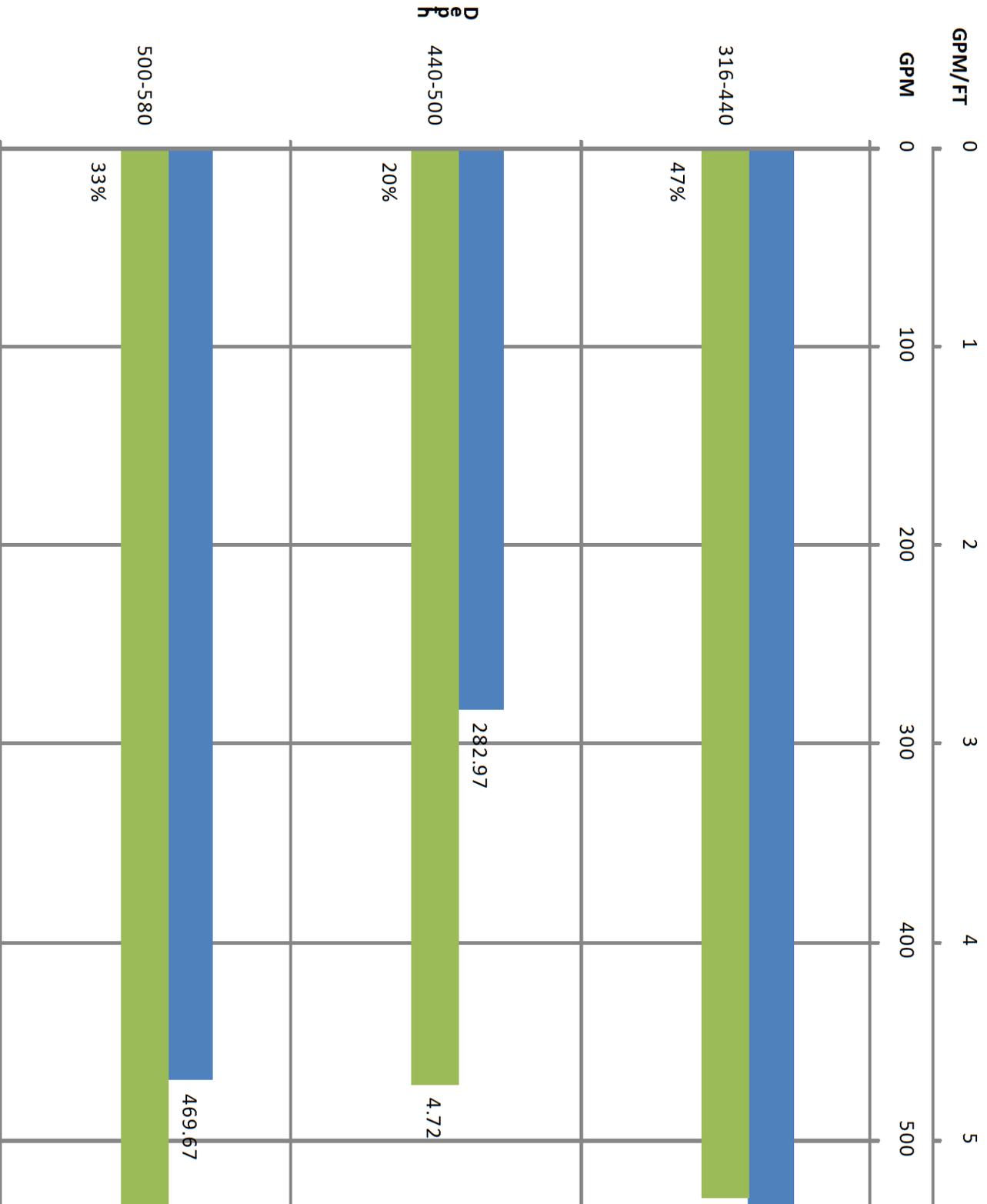


## SPINNER LOG ANALYSIS

MAX FLOW RATE 1408.27 GPM

PERFS DEPTHS	PRODUCTION GPM	% OF FLOW ZONES	GP
316-440	655.63	47%	5
440-500	282.97	20%	4
500-580	469.67	33%	5

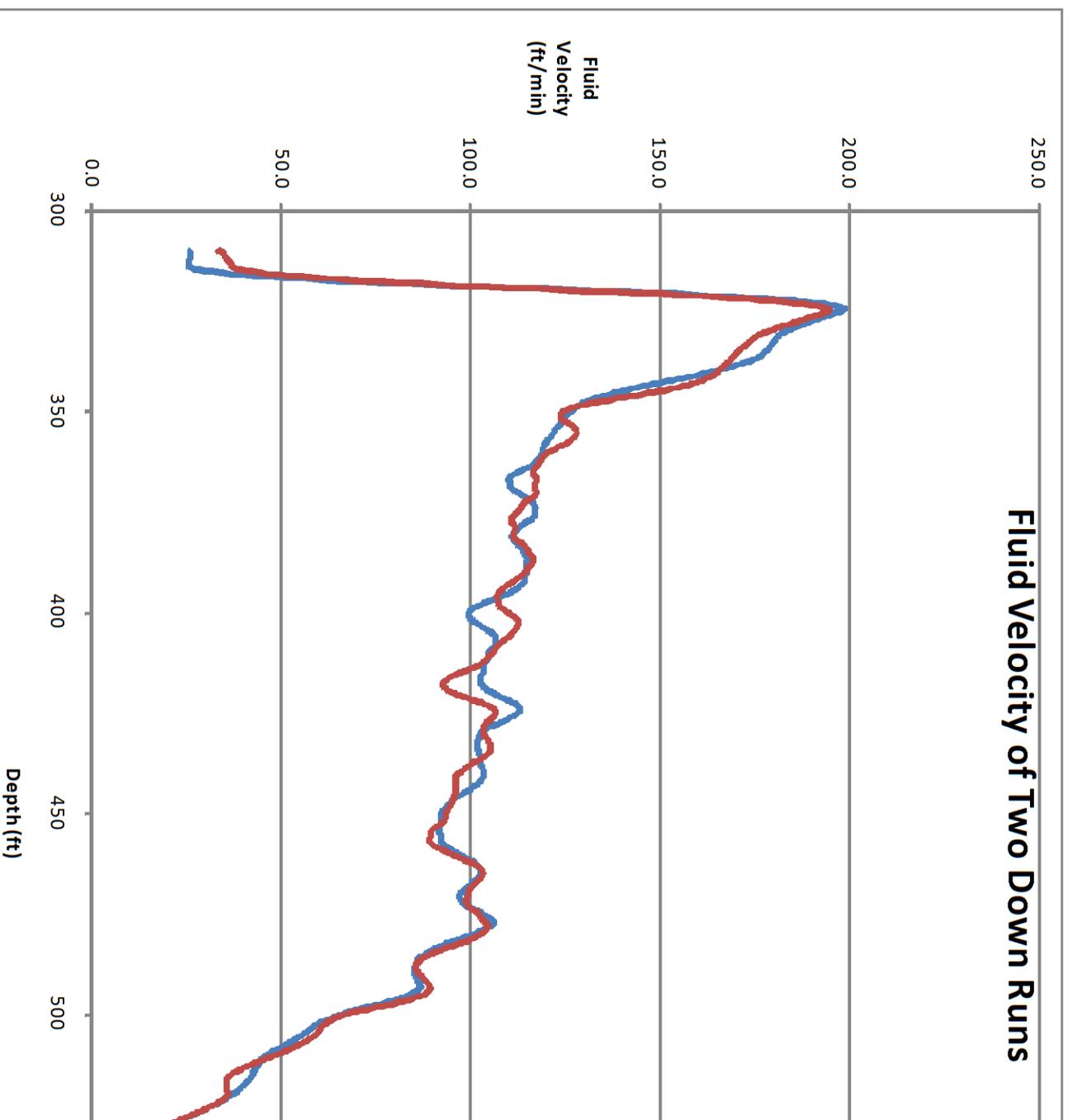
# PRODUCTION PROFILE



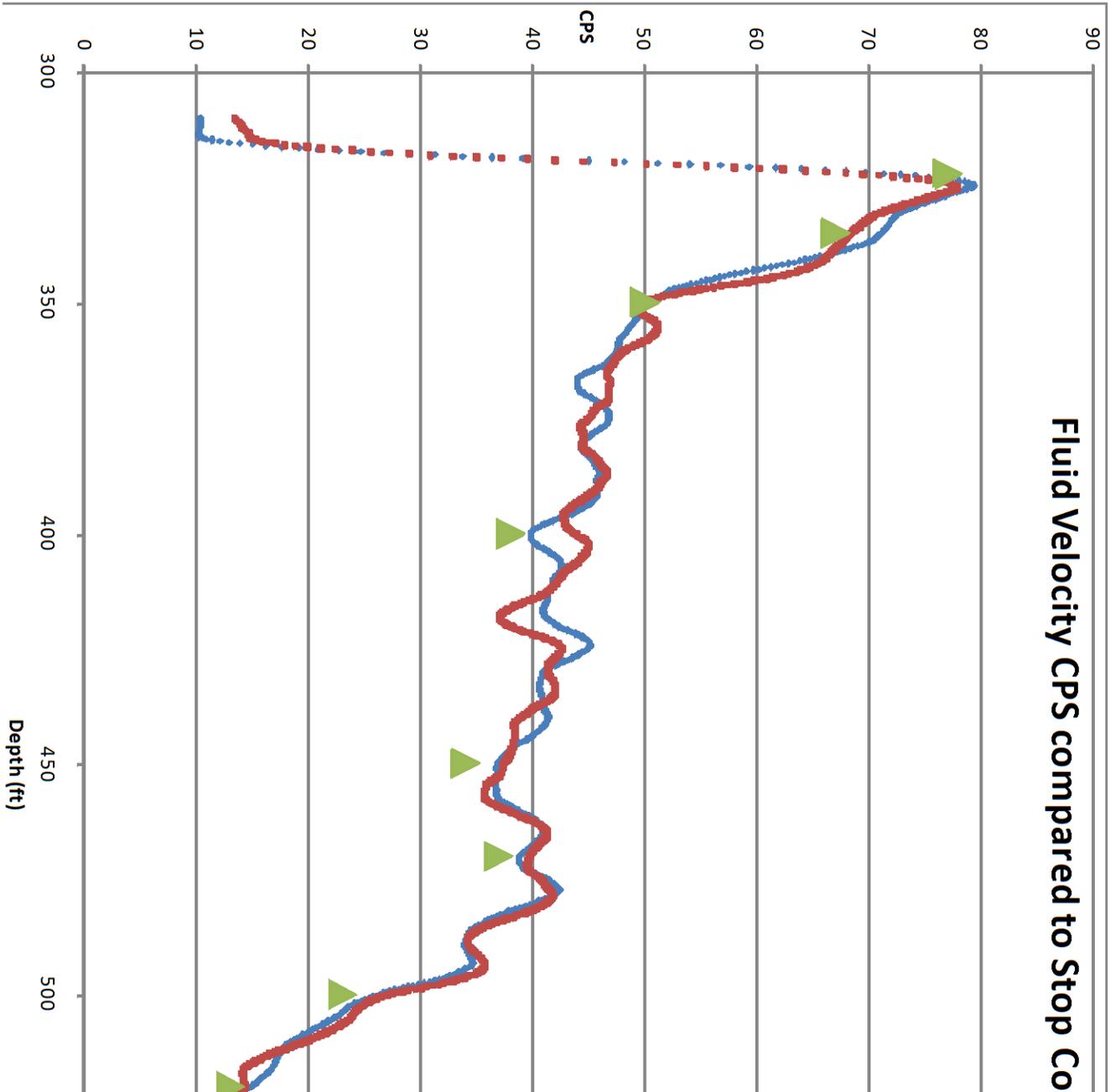
Pacific Surveys

## THICKNESS

M/FT	ft
.29	124
.72	60
.87	80



# Fluid Velocity CPS compared to Stop Co

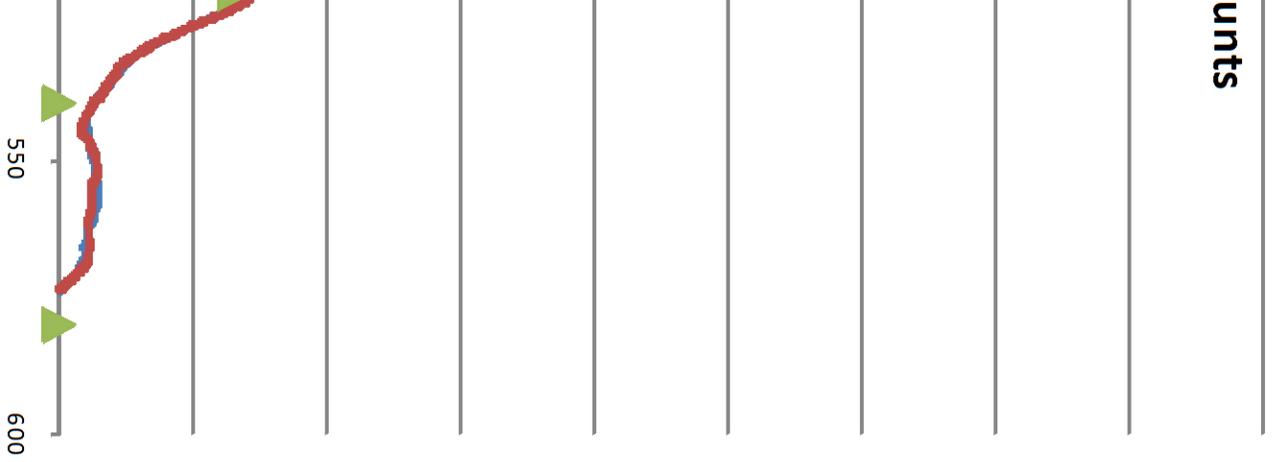


V1  
V2

550  
600



unts



- C1
- C2
- ▲ Stop

# PACIFIC SURVEYS

## SPINNER DOWN & UP RUNS NON-PUMPING CONDITION

Job No. 15802  
 Company BATELLE INSTITUTE  
 Well WINDSOR  
 Field ALTADENA  
 County LOS ANGELES State CA

Location: 2696 WINDSOR AVE.  
 GPS: N34o 11' 29.8" W118o 10' 03.1"  
 Sec. Twp. Rge.  
 Other Services: VIDEO SURVEY  
 CITM  
 NOISE/TEMP

Permanent Datum G.L. Elevation  
 Log Measured From Top of Casing above perm. datum  
 Drilling Measured From N/A K.B.  
 Date 03-09-2011 D.F.  
 Run Number ONE G.L.  
 Depth Driller 600'  
 Depth Logger 592'  
 Bottom Logged Interval 592'  
 Top Log Interval 140'  
 Pump Set @ N/A  
 Time Pumping Prior to Survey N/A  
 Pumping Water Level N/A  
 Max. Recorded Temp. 65.4 F  
 Pump Rate (GPM) N/A  
 Time Well Ready 08:00  
 Time Logger on Bottom 08:30  
 Equipment Number PS-4  
 Location L.A.  
 Recorded By RIDDER  
 Witnessed By D. CONNORS

Perforation Record		Perforation Record	
Type	Slot Size	From	To
Hydr-Louwer	N/A	320'	344'
Hydr-Louwer	N/A	374'	384'
Hydr-Louwer	N/A	426'	450'
Hydr-Louwer	N/A	474'	485'
Casing Record	Size	Wgt/Ft	Top
Surface String			Bottom
Camera Tube	20"	71 lbs/ft	0'
Production String	14"	47 lbs/ft	0'
Liner			600'

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### Comments

The casing schedule in the well sketch is based on the original well designed. The liner has SST wire-wrap screen from 325 to 595'

Database File: 15802\_spin.db  
 Dataset Pathname: spn\_dwn  
 Presentation Format: spinmerg  
 Dataset Creation: Wed Mar 16 10:19:36 2011  
 Charted by: Depth in Feet scaled 1:240

LS UP	(ft/min)	-100
0	LS (ft/min)	100
LS UP		
0	(ft/min)	-100

CSG SCHEDL

Delta Spin

-1

0

0

Spinner Up Run (cps)

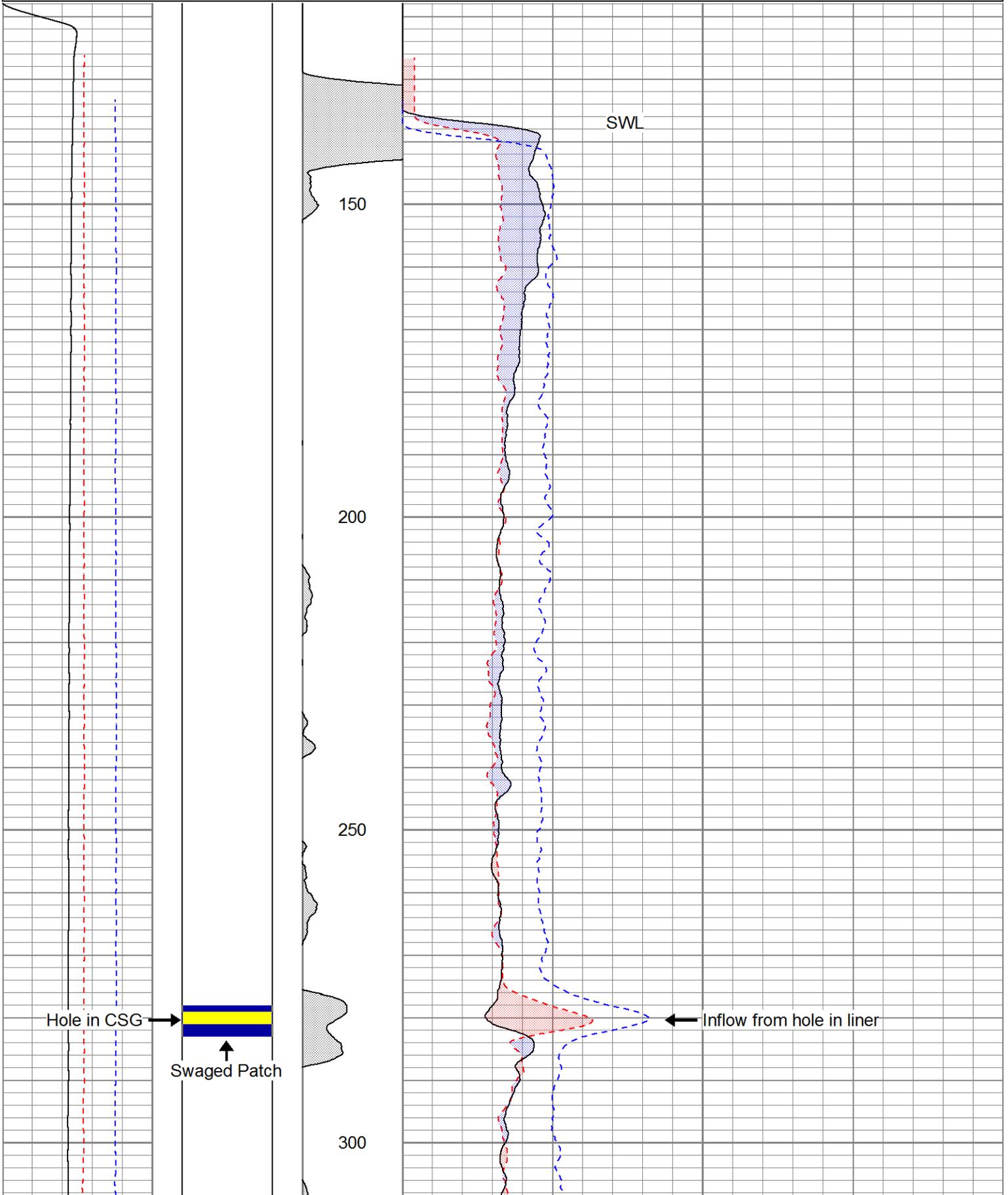
Spinner Down Run (cps)

Spinner Up Run (cps)

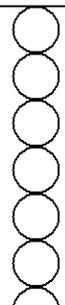
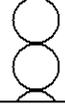
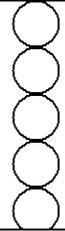
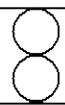
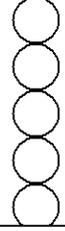
49

50

50



Perforated Interval



Down Flow



350

Spin Up Run

Spin Down Run



Spin Up Run



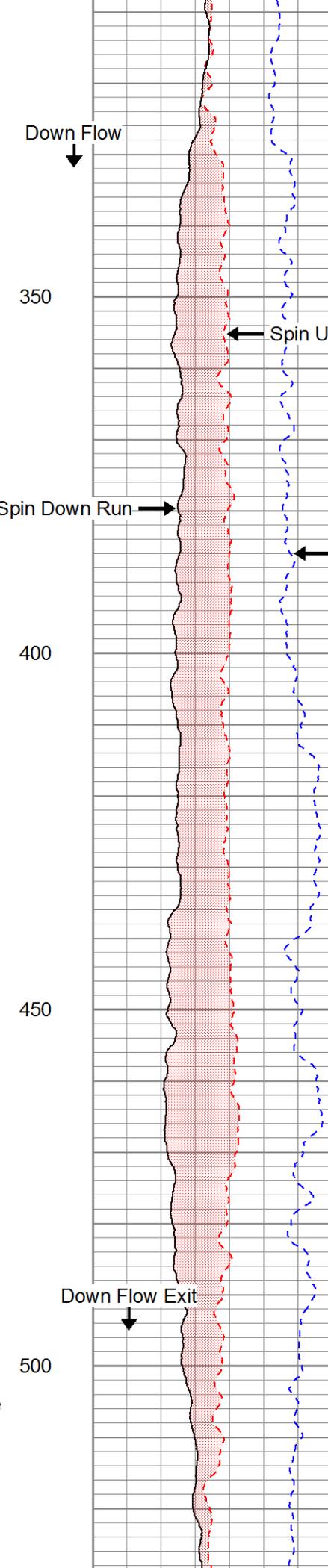
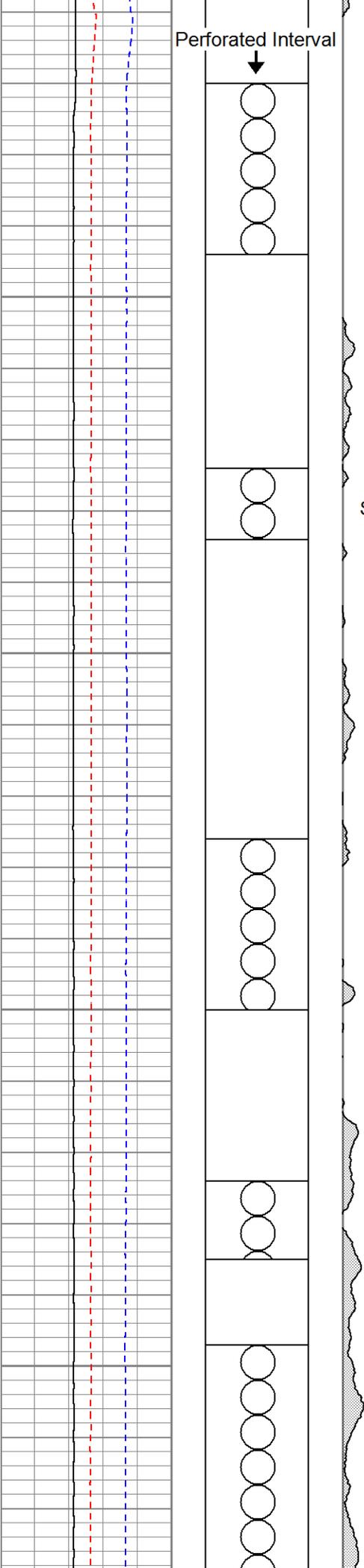
400

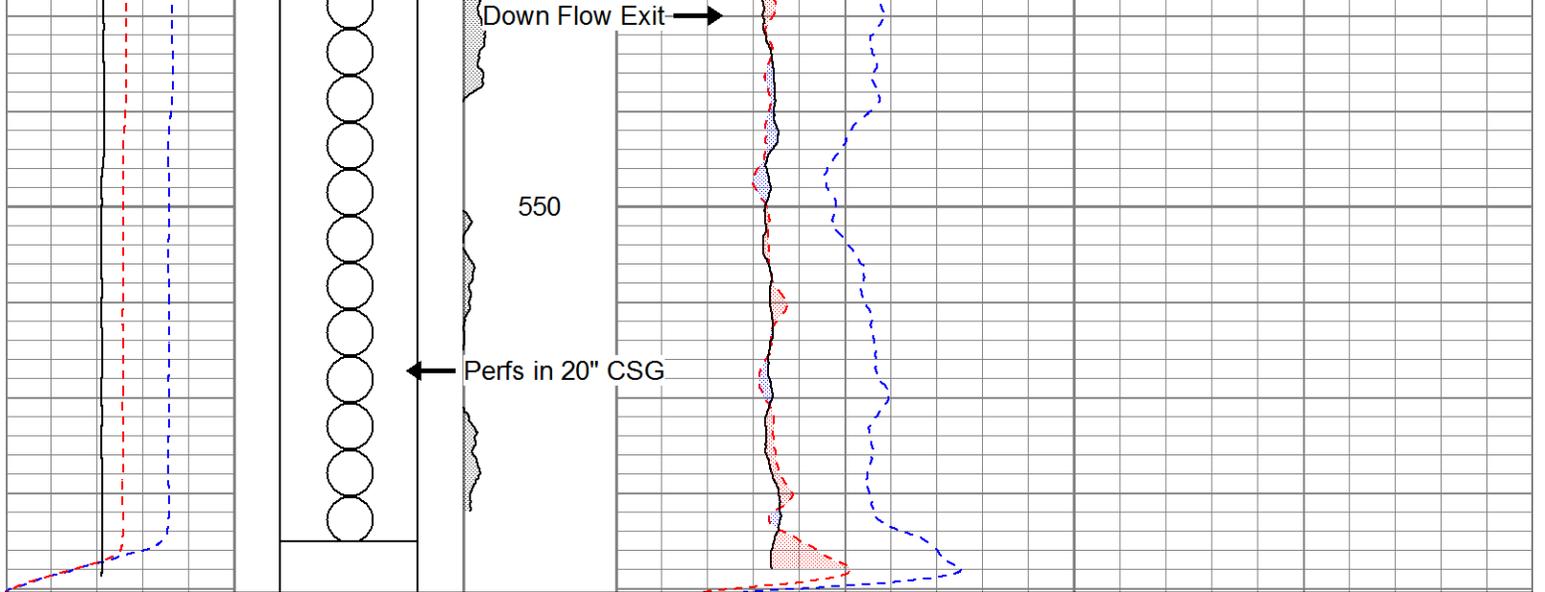
450

Down Flow Exit



500





LS UP	CSG SCHDL	Delta Spin	-1	<i>Spinner Up Run (cps)</i>	49
0 (ft/min) -100				<i>Spinner Down Run (cps)</i>	50
0 LS (ft/min) 100				<i>Spinner Up Run (cps)</i>	50
LS UP					
0 (ft/min) -100					

## SPINNER STOP COUNTS NON-PUMPING CONDITION

Job No. 15802  
 Company BATELLE INSTITUTE  
 Well WINDSOR  
 Field ALTADENA  
 County LOS ANGELES State CA

Location: 2696 WINDSOR AVE.  
 GPS: N34o 11' 29.8" W118o 10' 03.1"  
 Sec. Twp. Rge.  
 Other Services: VIDEO SURVEY  
 CITM  
 NOISE/TEMP

Permanent Datum G.L. Elevation  
 Log Measured From Top of Casing above perm. datum  
 Drilling Measured From N/A K.B.  
 Date 03-09-2011 D.F.  
 Run Number ONE G.L.  
 Depth Driller 600'  
 Depth Logger 592'  
 Bottom Logged Interval 592'  
 Top Log Interval 140'  
 Pump Set @ N/A  
 Time Pumping Prior to Survey N/A  
 Pumping Water Level N/A  
 Max. Recorded Temp. 65.4 F  
 Pump Rate (GPM) N/A  
 Time Well Ready 08:00  
 Time Logger on Bottom 08:30  
 Equipment Number PS-4  
 Location L.A.  
 Recorded By RIDDER  
 Witnessed By D. CONNORS

Type	Perforation Record		Type	Perforation Record			
	Slot Size	From		Slot Size	From	To	
Hydr-Louwer	N/A	320'	344'	Hydr-Louwer	N/A	497'	585'
Hydr-Louwer	N/A	374'	384'				
Hydr-Louwer	N/A	426'	450'				
Hydr-Louwer	N/A	474'	485'				
Casing Record		Size	Wgt/Ft	Top		Bottom	
Surface String							
Camera Tube							
Production String		20"	7.1 lbs/ft	0'		600'	
Liner		14"	4.7 lbs/ft	0'		600'	

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### Comments

The casing schedule in the well sketch is based on the original well designed. The liner has SST wire-wrap screen from 325 to 595'

Database File: 15802\_spin.db  
 Dataset Pathname: stop2  
 Presentation Format: spnstop  
 Dataset Creation: Wed Mar 16 10:19:34 2011  
 Charted by: Time scaled 30"/hour

Time (sec)	Depth (ft)	Spinner Stop Count Down Flow (cps)													40		
														Spin Stop (cps)			
0	280																0.00
																	0.00
60	280																0.00
																	0.00
Time (sec)	Depth (ft)	Spinner Stop Count Down Flow (cps)													40		
														Spin Stop (cps)			

Database File: 15802\_spin.db  
 Dataset Pathname: stop  
 Presentation Format: spnstop  
 Dataset Creation: Wed Mar 16 10:19:34 2011  
 Charted by: Time scaled 30"/hour

Time (sec)	Depth (ft)	Spinner Stop Count Down Flow (cps)													40		
														Spin Stop (cps)			
0	282																0.01
																	2.36
60	282																1.63
																	0.32
120	282																2.22
																	1.77
180	282																0.11
																	0.52
Time (sec)	Depth (ft)	Spinner Stop Count Down Flow (cps)													40		
														Spin Stop (cps)			

Database File: 15802\_spin.db  
 Dataset Pathname: stop4  
 Presentation Format: spnstop  
 Dataset Creation: Wed Mar 16 10:19:33 2011  
 Charted by: Time scaled 30"/hour

Time (sec)	Depth (ft)	Spinner Stop Count Down Flow (cps)													40		
														Spin Stop (cps)			
0	300																0.00
																	0.00
60	300																0.00
																	0.00
120	300																0.00
																	0.00
Time (sec)	Depth (ft)	Spinner Stop Count Down Flow (cps)													40		
														Spin Stop (cps)			





# PACIFIC SURVEYS

## CASING INSPECTION LOG

Job No. 15802  
 Company BATELLE INSTITUTE  
 Well WINDSOR  
 Field ALTADENA  
 County LOS ANGELES State CA

Location: 2696 WINDSOR AVE.  
 GPS: N34o 11' 29.8" W118o 10' 03.1"  
 Sec. Twp. Rge.  
 Other Services: VIDEO SURVEY  
 NOISE/TEMP  
 SPINNER

Permanent Datum G.L. Top of Casing Elevation above perm. datum  
 Log Measured From N/A  
 Drilling Measured From N/A  
 Date 03-09-2011  
 Run Number ONE  
 Depth Driller 600'  
 Depth Logger 592'  
 Bottom Logged Interval 592'  
 Top Log Interval 140'  
 Pump Set @ N/A  
 Time Pumping Prior to Survey N/A  
 Pumping Water Level N/A  
 Max. Recorded Temp. 65.4 F  
 Pump Rate (GPM) N/A  
 Time Well Ready 08:00  
 Time Logger on Bottom 08:30  
 Equipment Number PS-4  
 Location L.A.  
 Recorded By RIDDER  
 Witnessed By D. CONNORS

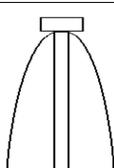
Type	Perforation Record		Type	Perforation Record	
	Slot Size	From		Slot Size	From
Hydr-Louwer	N/A	320'	Hydr-Louwer	N/A	585'
Hydr-Louwer	N/A	374'			
Hydr-Louwer	N/A	426'			
Hydr-Louwer	N/A	474'			
Casing Record	Size		Wgt/Ft	Top	Bottom
Surface String					
Camera Tube					
Production String	20"		7.1 lbs/ft	0'	600'
Liner	14"		4.7 lbs/ft	0'	600'

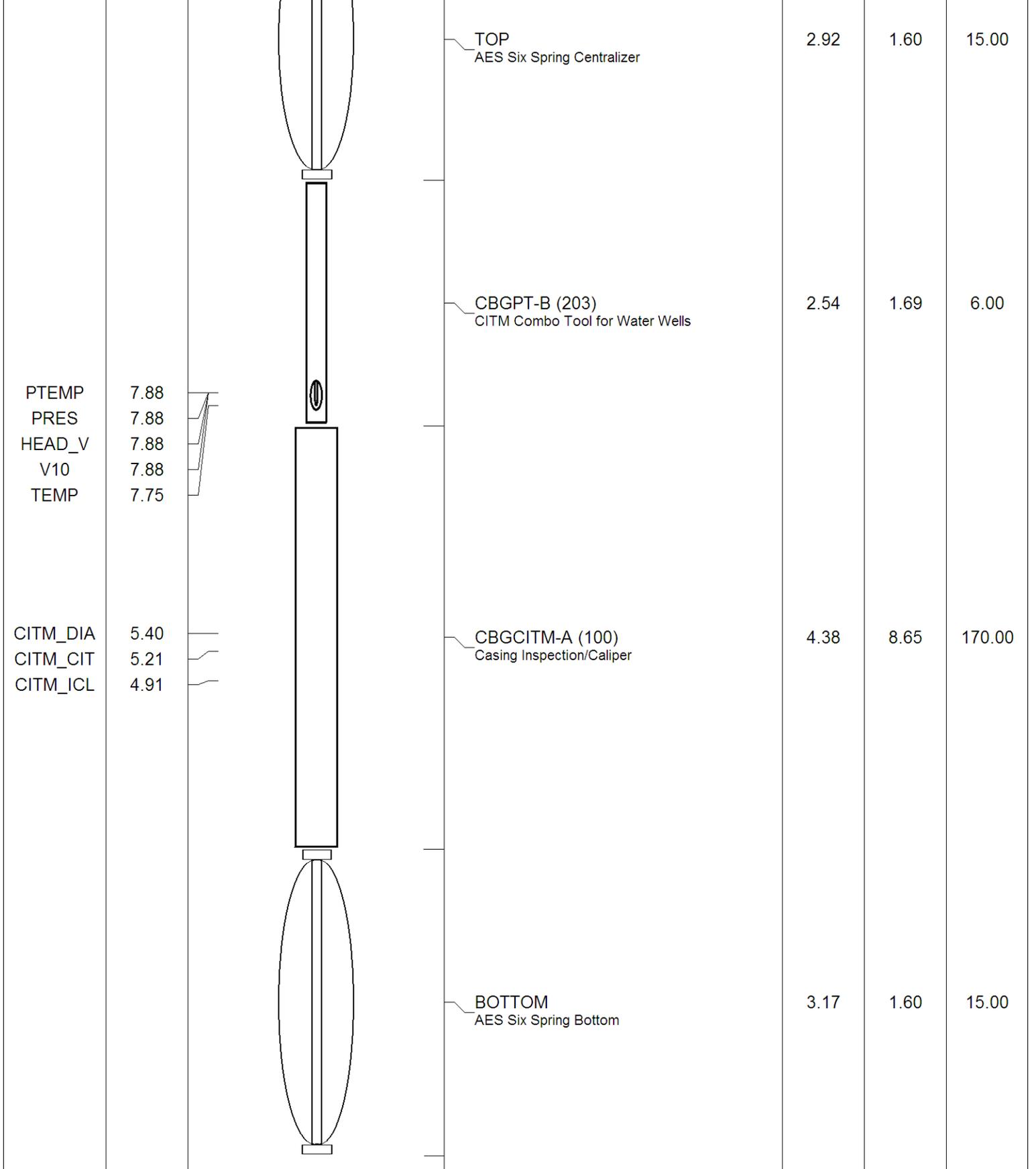
<<< Fold Here >>>

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### Comments

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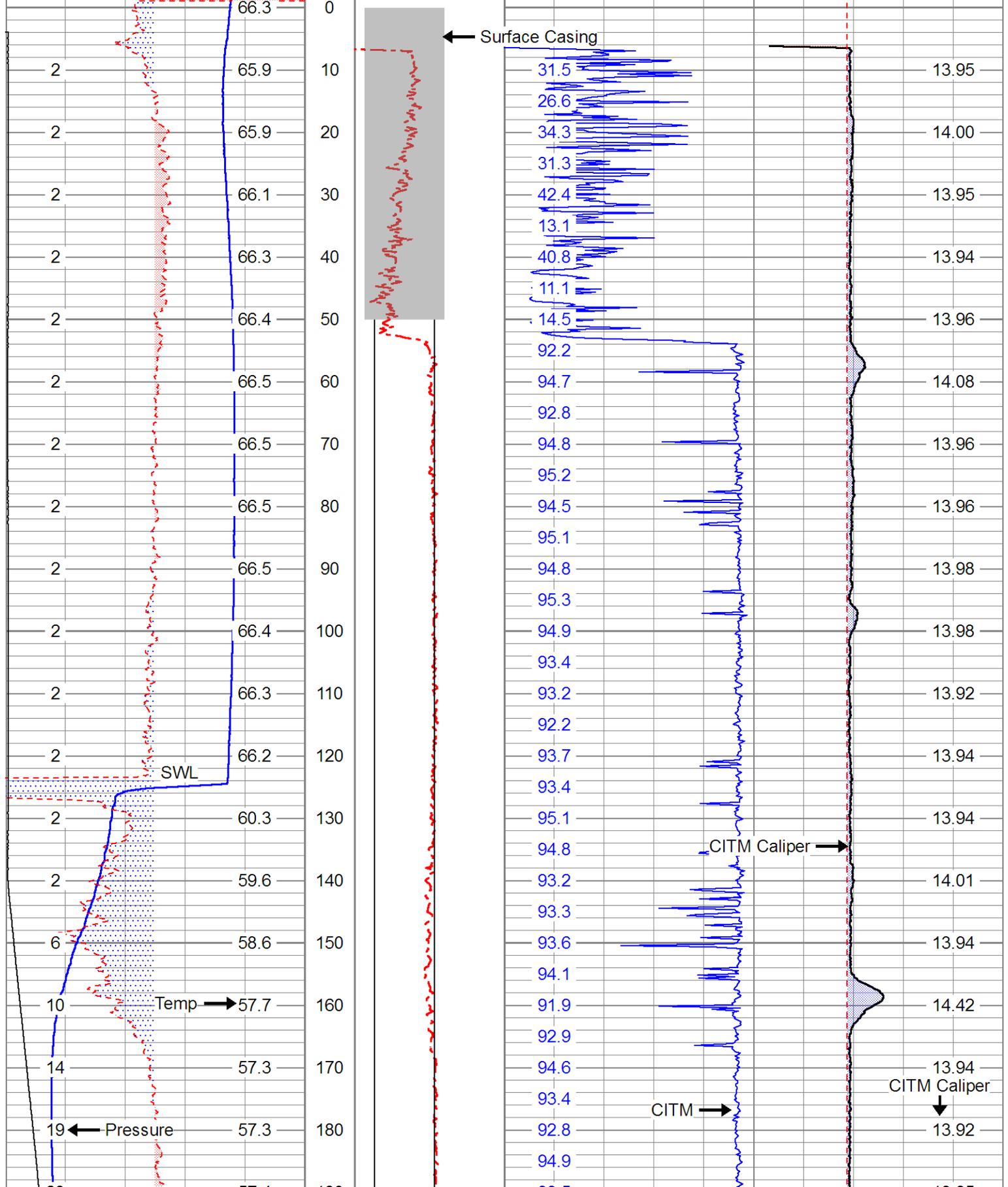
Sensor	Offset (ft)	Schematic	Description	Len (ft)	OD (in)	Wt (lb)
						

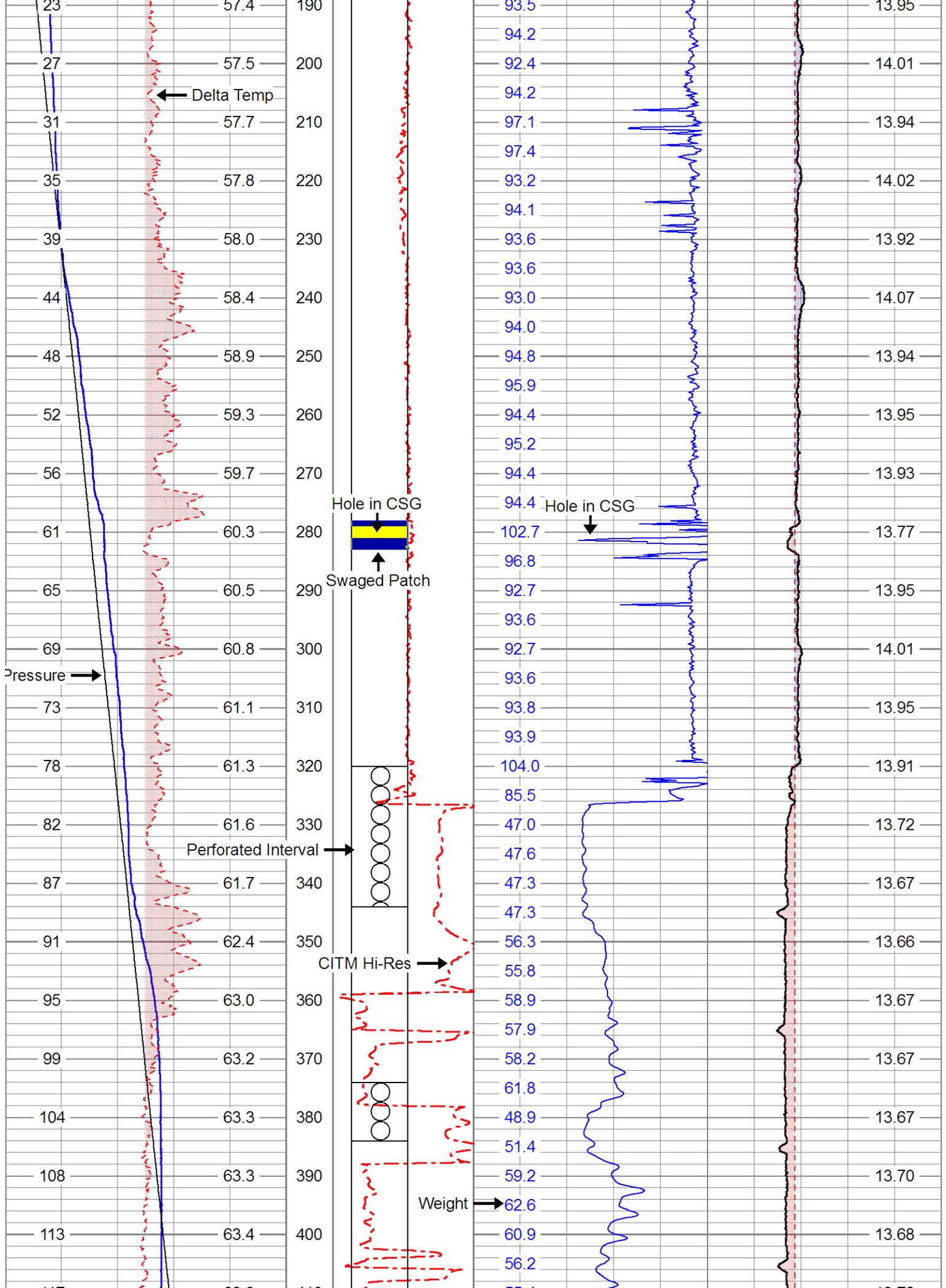


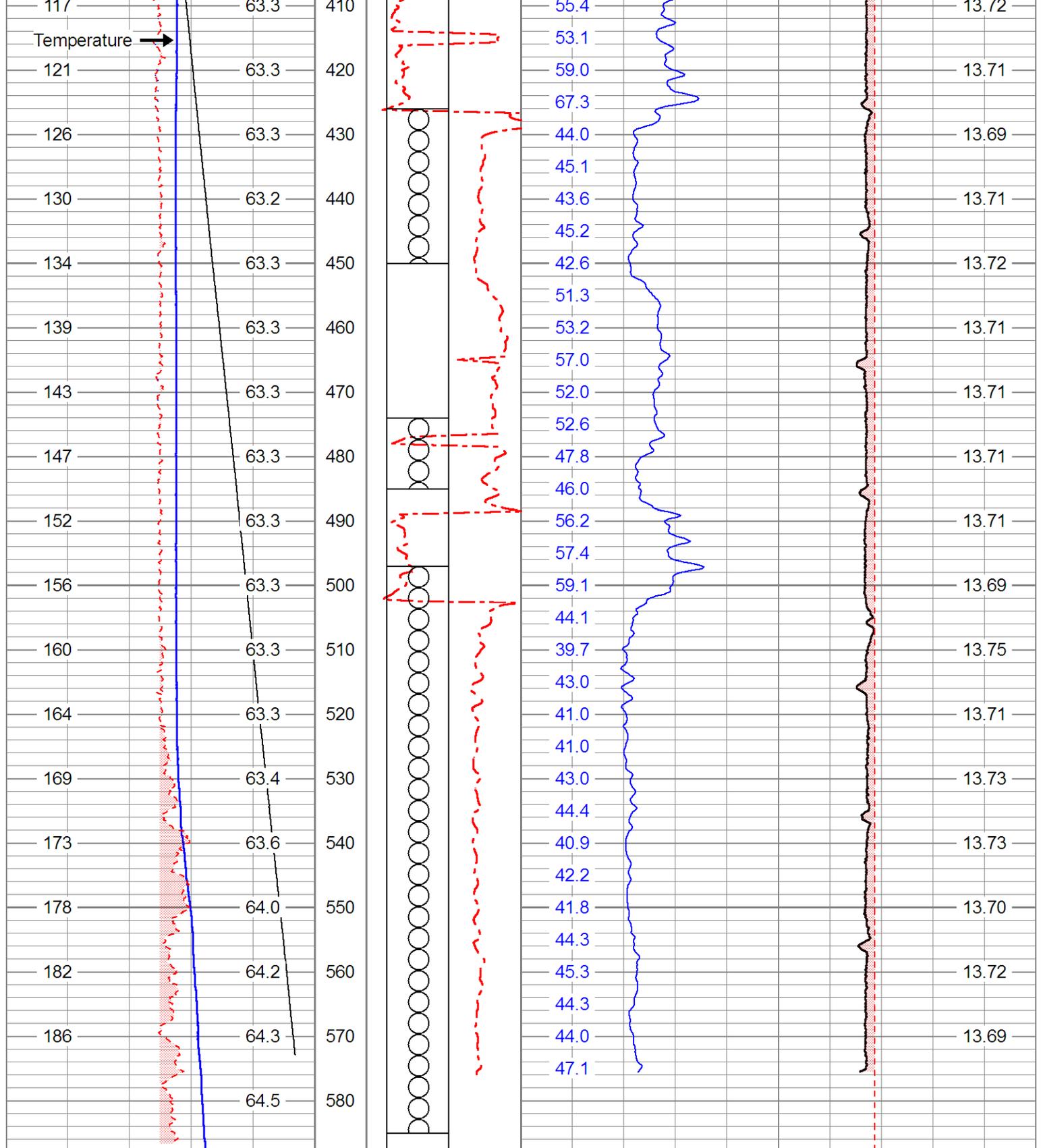
Dataset: 15802b.db: field/well/run1/CITMD3.1  
 Total Length: 13.00 ft  
 Total Weight: 206.00 lb  
 O.D.: 8.65 in

Database File: 15802b.db  
 Dataset Pathname: CITMD3.1  
 Presentation Format: citm  
 Dataset Creation: Sat Mar 19 11:51:34 2011 by Calc Open-Cased 100827  
 Charted by: Depth in Feet scaled 1:240

55	Temperature (degF)	70	Well Schematic	0	CITM (lb/ft)	100	12	CITM Caliper (in)	17
-0.25	Delta Temp (degF)	0.25		Weight (lb/ft)			12	Casing ID (in)	17
0	Pressure (psi)	200		CITM Hi-Res (back-up)					CITM Caliper (in)
Pres (psi)		Temp (degF)	0	(cps)	3000				







55	Temperature (degF)	70	Well Schematic	0	CITM (lb/ft)	100	12	CITM Caliper (in)	17
-0.25	Delta Temp (degF)	0.25	CITM Hi-Res (back-up)	Weight (lb/ft)			12	Casing ID (in)	17
0	Pressure (psi)	200							
Pres (psi)		Temp (degF)	0 (cps)	3000				CITM Caliper (in)	

# PACIFIC SURVEYS

## NOISE LOG TEMPERATURE NON-PUMPING CONDITION

Job No. 15802  
 Company BATELLE INSTITUTE  
 Well WINDSOR  
 Field ALTADENA  
 County LOS ANGELES State CA

Location: 2696 WINDSOR AVE.  
 GPS: N34o 11' 29.8" W118o 10' 03.1"  
 Sec. Twp. Rge.  
 Other Services: VIDEO SURVEY  
 CITM  
 SPINNER

Permanent Datum G.L.  
 Log Measured From Top of Casing  
 Drilling Measured From N/A  
 Elevation above perm. datum  
 Elevation K.B.  
 D.F.  
 G.L.

Date	03-09-2011			
Run Number	ONE			
Depth Driller	600'			
Depth Logger	592'			
Bottom Logged Interval	592'			
Top Log Interval	140'			
Pump Set @	N/A			
Time Pumping Prior to Survey	N/A			
Pumping Water Level	N/A			
Max. Recorded Temp.	65.4 F			
Pump Rate (GPM)	N/A			
Time Well Ready	08:00			
Time Logger on Bottom	08:30			
Equipment Number	PS-4			
Location	L.A.			
Recorded By	RIDDER			
Witnessed By	D. CONNORS			

Perforation Record		Perforation Record					
Type	Slot Size	From	To	Type	Slot Size	From	To
Hydr-Louwer	N/A	320'	344'	Hydr-Louwer	N/A	497'	585'
Hydr-Louwer	N/A	374'	384'				
Hydr-Louwer	N/A	426'	450'				
Hydr-Louwer	N/A	474'	485'				
Casing Record		Size	Wgt/Ft	Top		Bottom	
Surface String							
Camera Tube		20"	71 lbs/ft	0'		600'	
Production String							
Liner		14"	47 lbs/ft	0'		600'	

<<< Fold Here >>>

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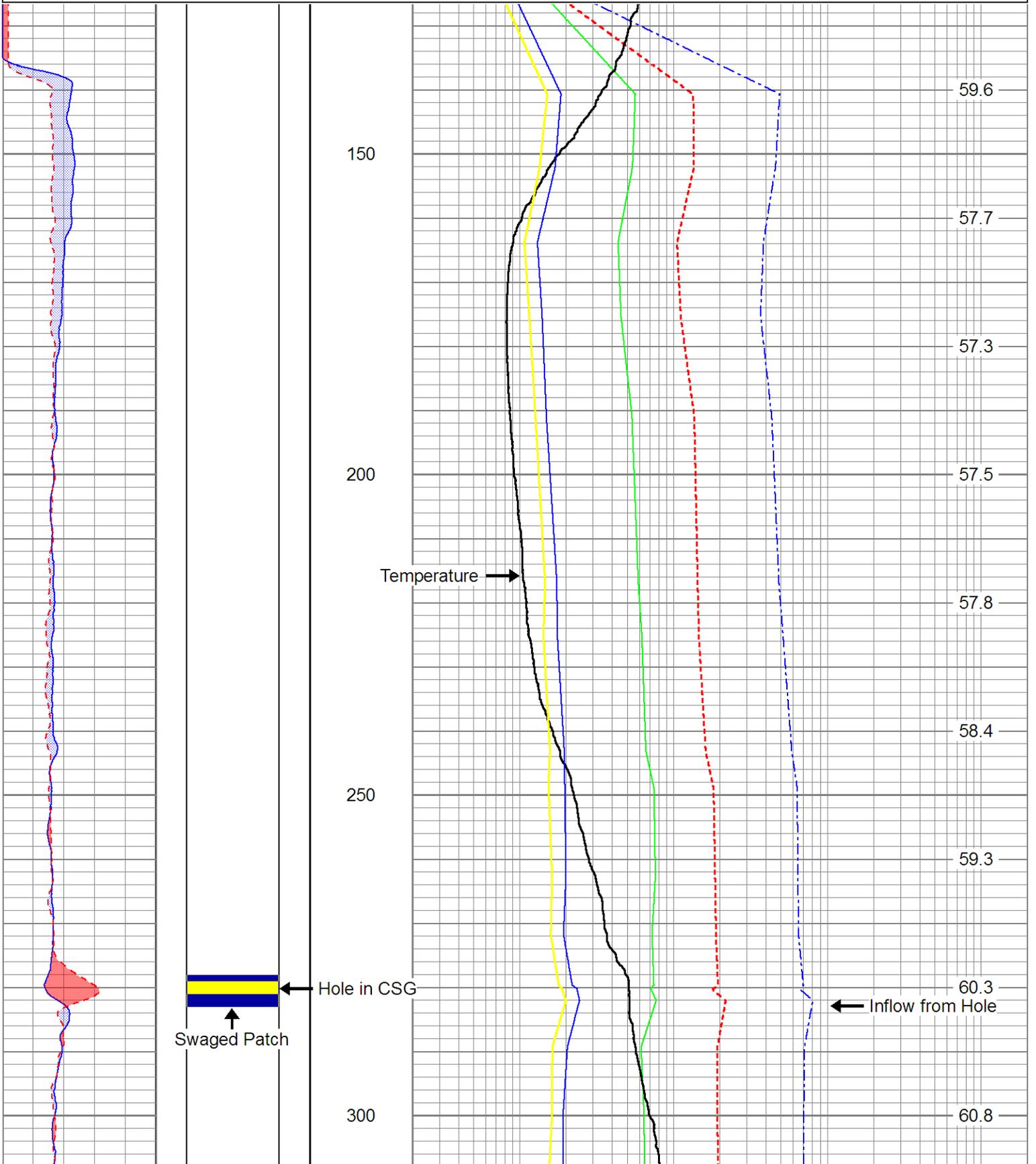
### Comments

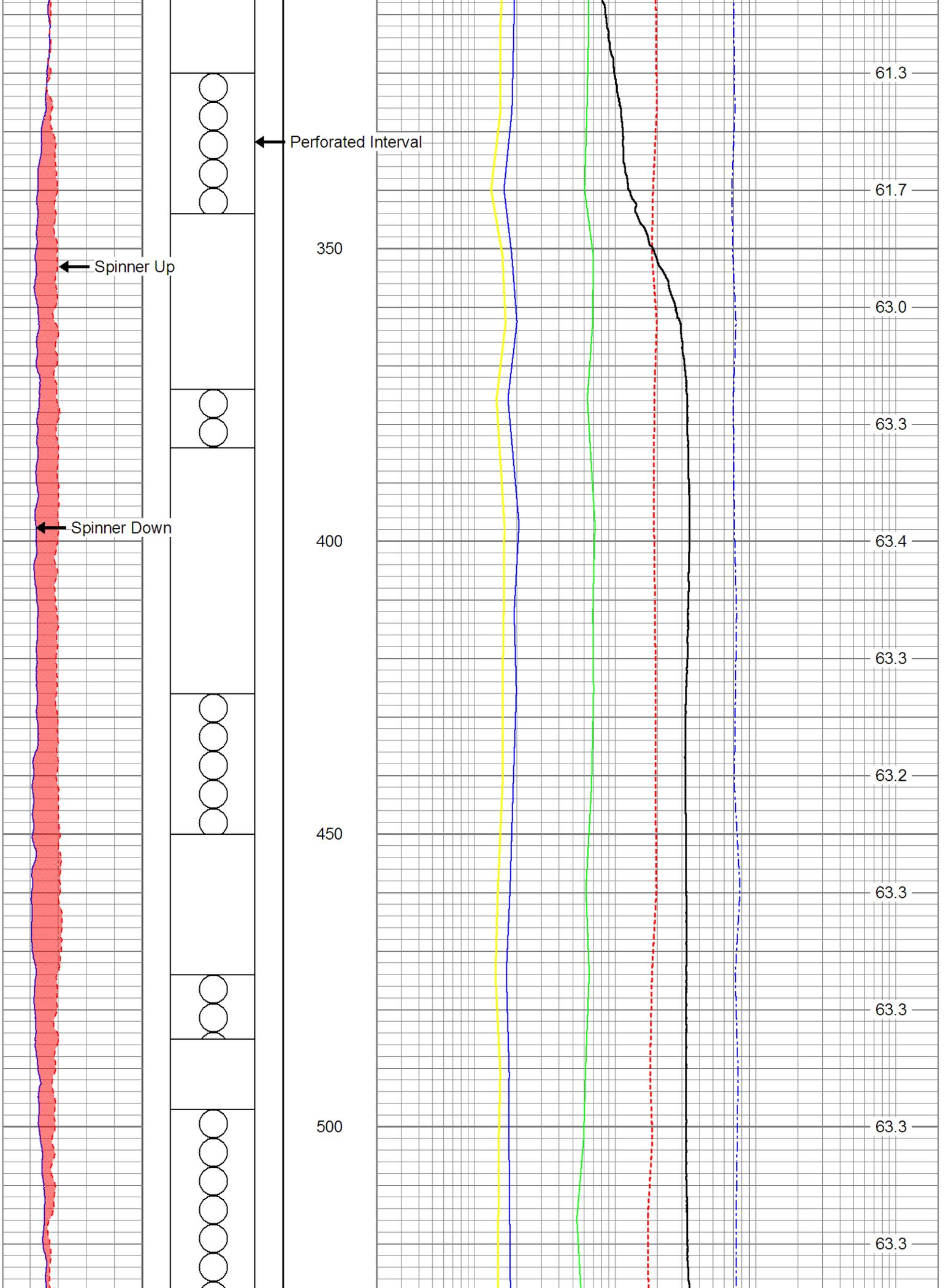
The casing schedule in the well sketch is based on the original well designed. The liner has SST wire-wrap screen from 325 to 595'

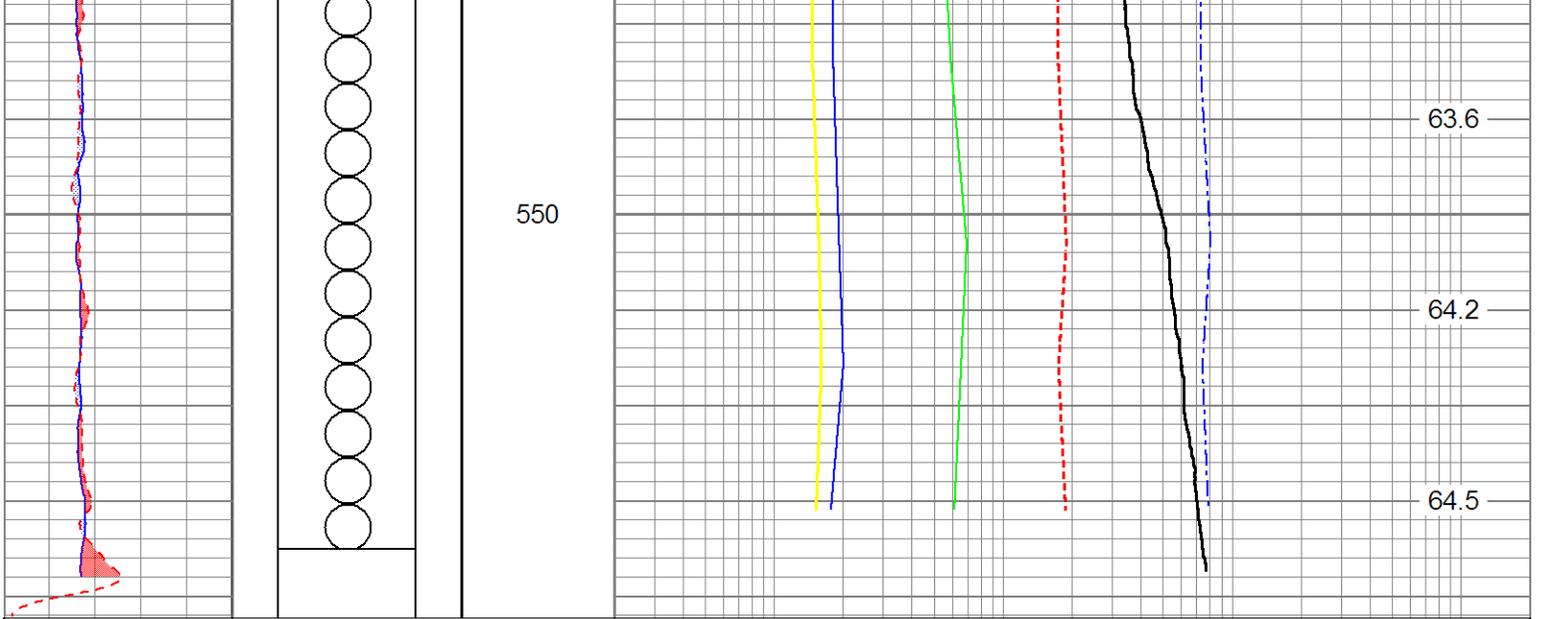
Database File: 15802b.db  
 Dataset Pathname: \_dlog3\_  
 Presentation Format: noise  
 Dataset Creation: Wed Mar 16 14:30:50 2011  
 Charted by: Depth in Feet scaled 1:240

Spin Down		
0	(cps)	25
Spin Up Run		
-1	(cps)	24

2	1000HZ (mV)	20000
2	600HZ (mV)	20000
2	200HZ (mV)	20000
55	Temperature (degF)	70
2	4000HZ (mV)	20000
2	6000HZ (mV)	20000
		temp (degF)







Spin Down		
0	(cps)	25
Spin Up Run		
-1	(cps)	24

2	1000HZ (mV)	20000
2	600HZ (mV)	20000
2	200HZ (mV)	20000
55	Temperature (degF)	70
2	4000HZ (mV)	20000
2	6000HZ (mV)	20000

temp (degF)
----------------

**Well 52**

# PACIFIC SURVEYS

## SPINNER DOWN RUNS PUMPING CONDITION

Job No. 15548  
 Company LAYNE CHRISTENSEN  
 Well #52  
 Field ALTADENA  
 County LOS ANGELES State CA

Location: GPS: N34o11.770' W18o10.067'  
 Sec. Twp. Rge.  
 Other Services: STOP COUNTS SPINNER ANALYSIS SAMPLING

Permanent Datum	G.L.	Elevation	
Log Measured From	G.L.	0'	above perm. datum
Drilling Measured From	G.L.		
Date	11/22/2010		
Run Number	ONE		
Depth Driller	612'		
Depth Logger	612'		
Bottom Logged Interval	610'		
Top Log Interval	240'		
Pump Set @	235'		
Time Pumping Prior to Survey	1 HOUR		
Pumping Water Level	162'		
Max. Recorded Temp.	N/A		
Pump Rate (GPM)	1855		
Time Well Ready	6:30 AM		
Time Logger on Bottom	7:00 AM		
Equipment Number	PS-1		
Location	L.A.		
Recorded By	ABREAU/NELSON		
Witnessed By	PORTER		
Perforation Record		Perforation Record	
Type	Slot Size	From	To
Wire-Wrap	.080	250'	612'
Casing Record		Perforation Record	
Surface String	Size	Wgt/Ft	Top
Camera Tube			
Production String	16"	N/A	0'
Liner			612'

<<< Fold Here >>>

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### Comments

SAMPLES COLLECTED @ 310', 430', 510'

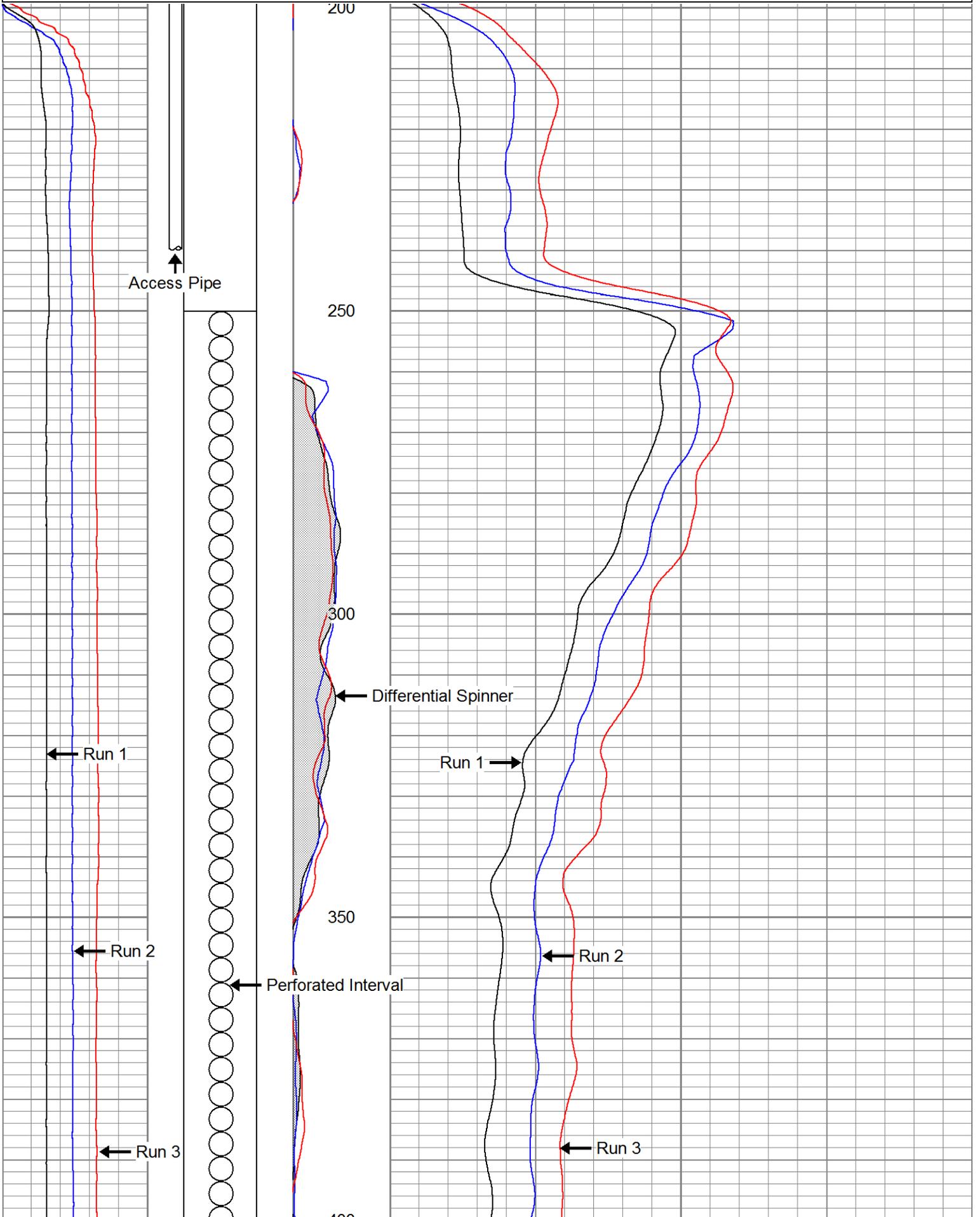
Database File: 15548.db  
 Dataset Pathname: spn  
 Presentation Format: spinmerg  
 Dataset Creation: Tue Nov 02 06:58:01 2010 by Log Open-Cased 090629  
 Charted by: Depth in Feet scaled 1:240

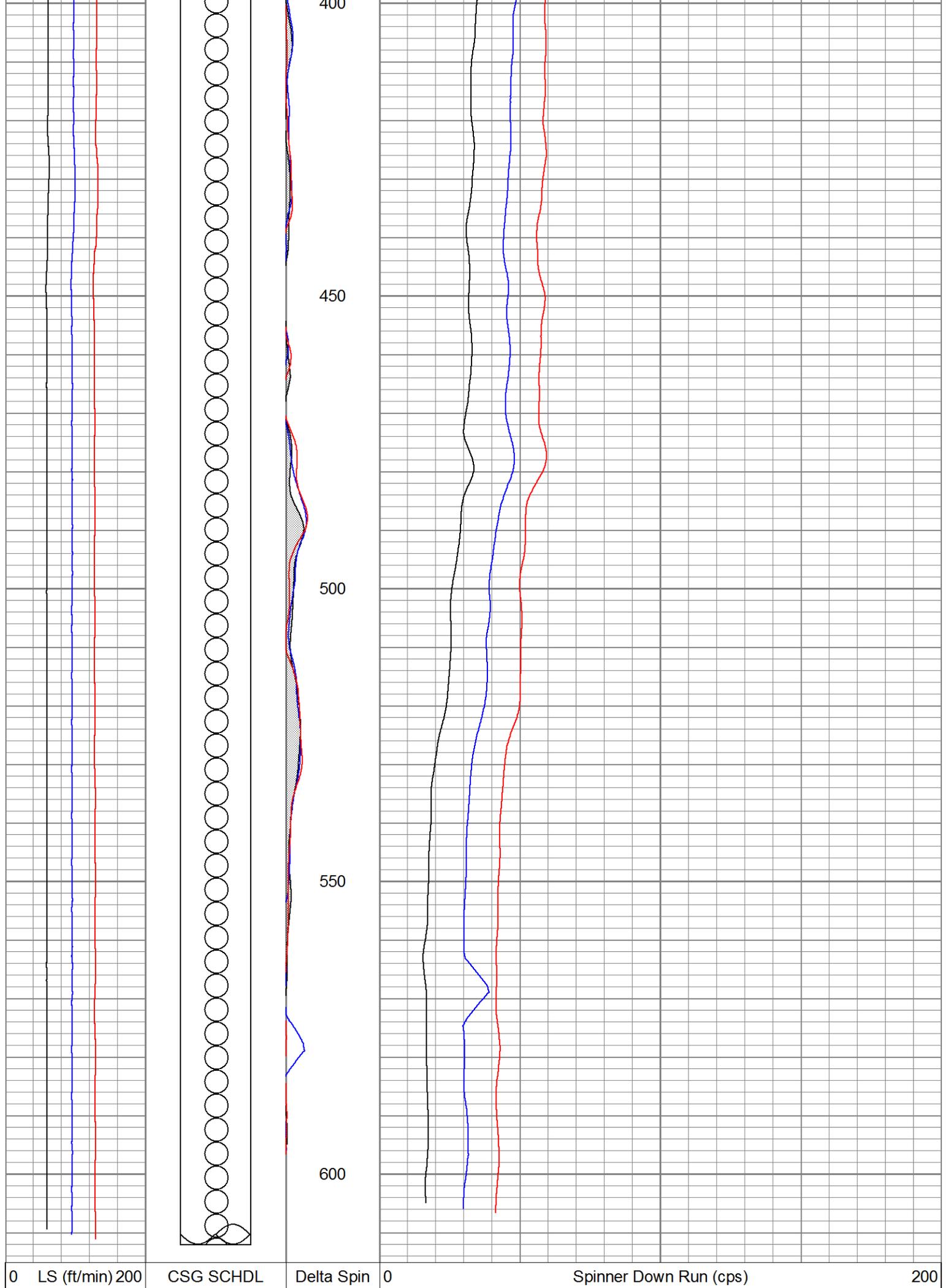
0	LS (ft/min)	200
0	LS (ft/min)	200
0	LS (ft/min)	200

CSG SCHDL

Delta Spin	0
Delta Spin	0
Delta Spin	0

Spinner Down Run (cps)	200
Spinner Down Run (cps)	200
Spinner Down Run (cps)	200





0 LS (ft/min) 200

CSG SCHDL

Delta Spin 0

Spinner Down Run (cps)

200

0	LS (ft/min) 200
---	-----------------

0	LS (ft/min) 200
---	-----------------

Delta Spin	0	Spinner Down Run (cps)	200
------------	---	------------------------	-----

Delta Spin	0	Spinner Down Run (cps)	200
------------	---	------------------------	-----

# PACIFIC SURVEYS

## SPINNER STOP COUNTS PUMPING CONDITION

Job No. 15548  
 Company LAYNE CHRISTENSEN  
 Well #52  
 Field ALTADENA  
 County LOS ANGELES State CA

Location: GPS: N34o11.770' W118o10.067'  
 Sec. Twp. Rge.  
 Other Services: DYNAMIC SPINNER SPINNER ANALYSIS SAMPLING

Permanent Datum	G.L.	Elevation	
Log Measured From	G.L.	0'	above perm. datum
Drilling Measured From	G.L.		
Date	11/2/2010		
Run Number	ONE		
Depth Driller	612'		
Depth Logger	612'		
Bottom Logged Interval	610'		
Top Log Interval	240'		
Pump Set @	235'		
Time Pumping Prior to Survey	1 HOUR		
Pumping Water Level	162'		
Max. Recorded Temp.	N/A		
Pump Rate (GPM)	1855		
Time Well Ready	6:30 AM		
Time Logger on Bottom	7:00 AM		
Equipment Number	PS-1		
Location	L.A.		
Recorded By	ABREAU/NELSON		
Witnessed By	PORTER		
Perforation Record		Perforation Record	
Type	Slot Size	From	To
Wire-Wrap	.080	250'	612'
Casing Record		Perforation Record	
Surface String	Size	Wgt/Ft	Top
Camera Tube			Bottom
Production String	16"	N/A	0'
Liner			612'

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All interpretations are opinions based on inferences from electrical or other measurements and Pacific Surveys cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Pacific Surveys' general terms and conditions set out in our current Price Schedule.

### Comments

SAMPLES COLLECTED @ 310', 430', 510'

Database File: 15548.db  
 Dataset Pathname: stop12  
 Presentation Format: spnstop  
 Dataset Creation: Tue Nov 02 09:15:17 2010 by Log Open-Cased 090629  
 Charted by: Time scaled 30"/hour

Time (sec)	Depth (ft)	Spinner Stop Count (cps)												100
														Spin Stop (cps)
0	550													0.00
60	550													0.00
120	550													0.00
Time (sec)	Depth (ft)	Spinner Stop Count (cps)												100
														Spin Stop (cps)

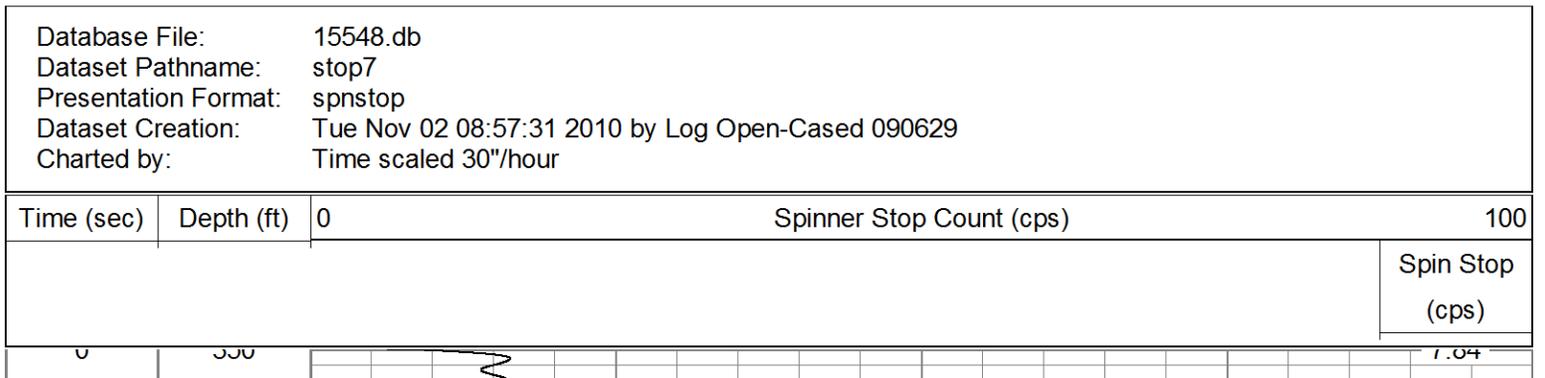
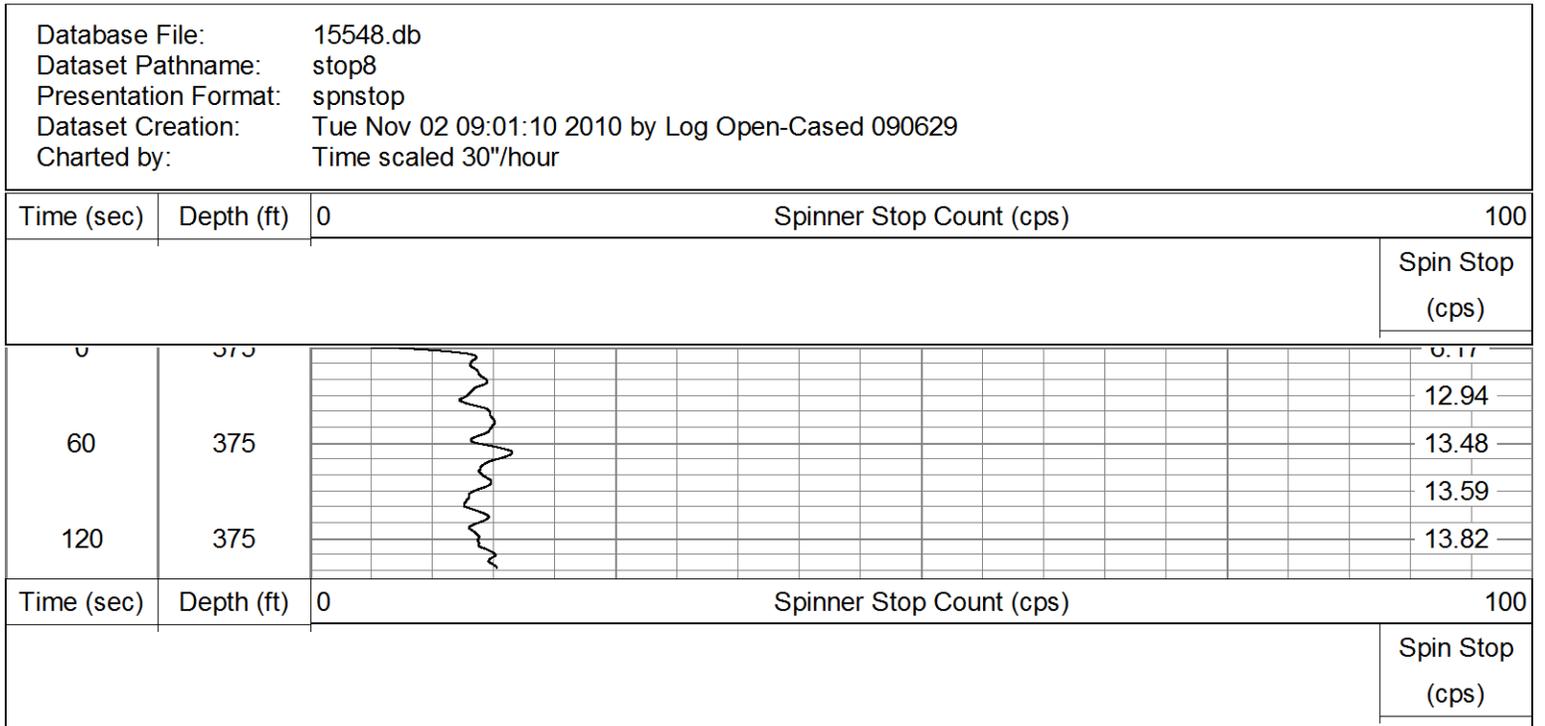
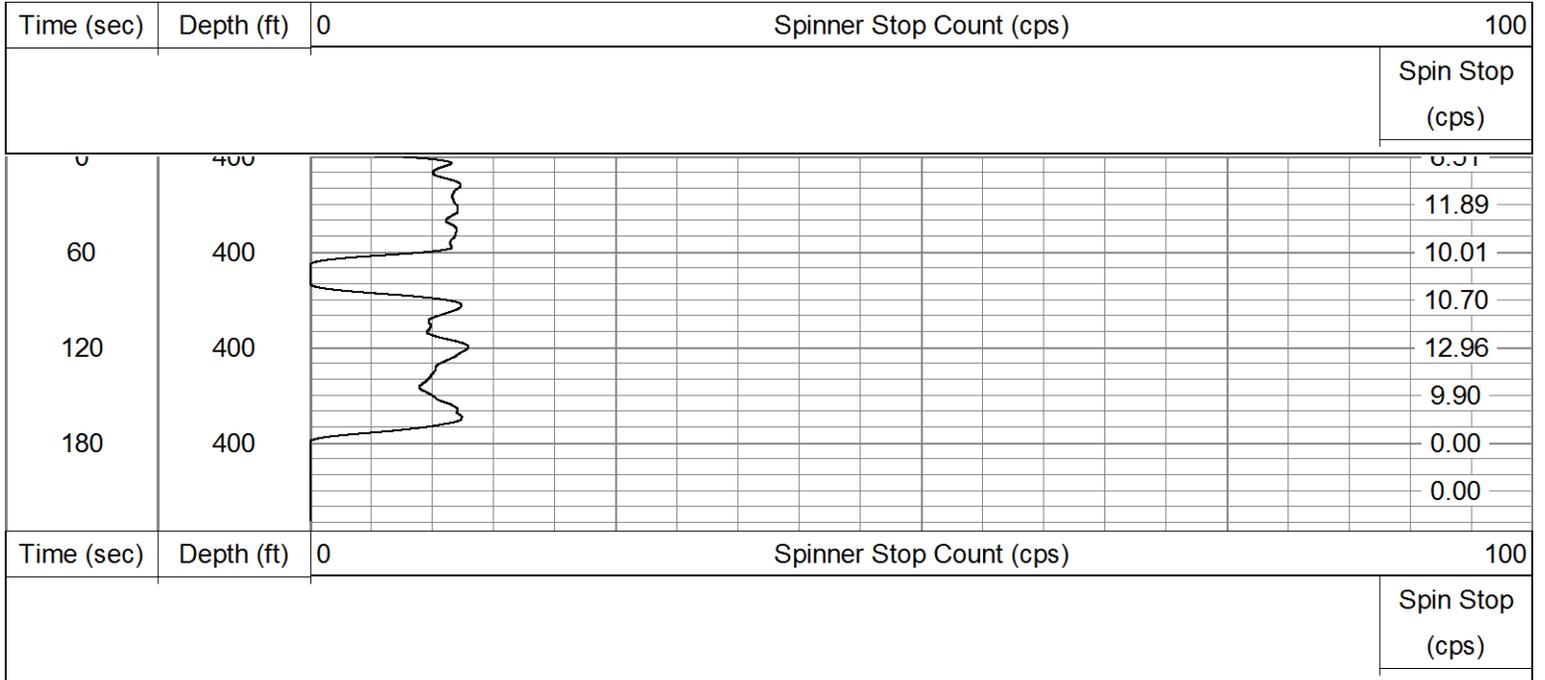
Database File: 15548.db  
 Dataset Pathname: stop11  
 Presentation Format: spnstop  
 Dataset Creation: Tue Nov 02 09:12:15 2010 by Log Open-Cased 090629  
 Charted by: Time scaled 30"/hour

Time (sec)	Depth (ft)	Spinner Stop Count (cps)												100
														Spin Stop (cps)
0	500													0.00
60	500													0.00
120	500													0.00
Time (sec)	Depth (ft)	Spinner Stop Count (cps)												100
														Spin Stop (cps)

Database File: 15548.db  
 Dataset Pathname: stop10  
 Presentation Format: spnstop  
 Dataset Creation: Tue Nov 02 09:08:52 2010 by Log Open-Cased 090629  
 Charted by: Time scaled 30"/hour

Time (sec)	Depth (ft)	Spinner Stop Count (cps)												100
														Spin Stop (cps)
0	450													4.55
60	450													10.97
120	450													10.41
														10.03
														11.14
Time (sec)	Depth (ft)	Spinner Stop Count (cps)												100
														Spin Stop (cps)

Database File: 15548.db  
 Dataset Pathname: stop9  
 Presentation Format: spnstop  
 Dataset Creation: Tue Nov 02 09:04:10 2010 by Log Open-Cased 090629  
 Charted by: Time scaled 30"/hour







# PACIFIC SURVEYS

## SPINNER FLUID VELOCITY SPINNER ANALYSIS PUMPING CONDITION

Job No. 15548  
 Company LAYNE CHRISTENSEN  
 Well #52  
 Field ALTADENA  
 County LOS ANGELES State CA

Location: GPS: N34o11.770' W118o10.067'  
 Sec. Twp. Rge.  
 Other Services: STOP COUNTS DYNAMIC SPINNER SAMPLING

Permanent Datum	G.L.	Elevation	
Log Measured From	G.L.	0'	above perm. datum
Drilling Measured From	G.L.		
Date	11/2/2010		
Run Number	ONE		
Depth Driller	612'		
Depth Logger	612'		
Bottom Logged Interval	610'		
Top Log Interval	240'		
Pump Set @	235'		
Time Pumping Prior to Survey	1 HOUR		
Pumping Water Level	162'		
Max. Recorded Temp.	N/A		
Pump Rate (GPM)	1855		
Time Well Ready	6:30 AM		
Time Logger on Bottom	7:00 AM		
Equipment Number	PS-1		
Location	L.A.		
Recorded By	ABREAU/NELSON		
Witnessed By	PORTER		
Perforation Record		Perforation Record	
Type	Slot Size	From	To
Wire-Wrap	.080	250'	612'
Casing Record	Size	Wgt/Ft	Top
Surface String			Bottom
Camera Tube			
Production String	16"	N/A	0'
Liner			612'

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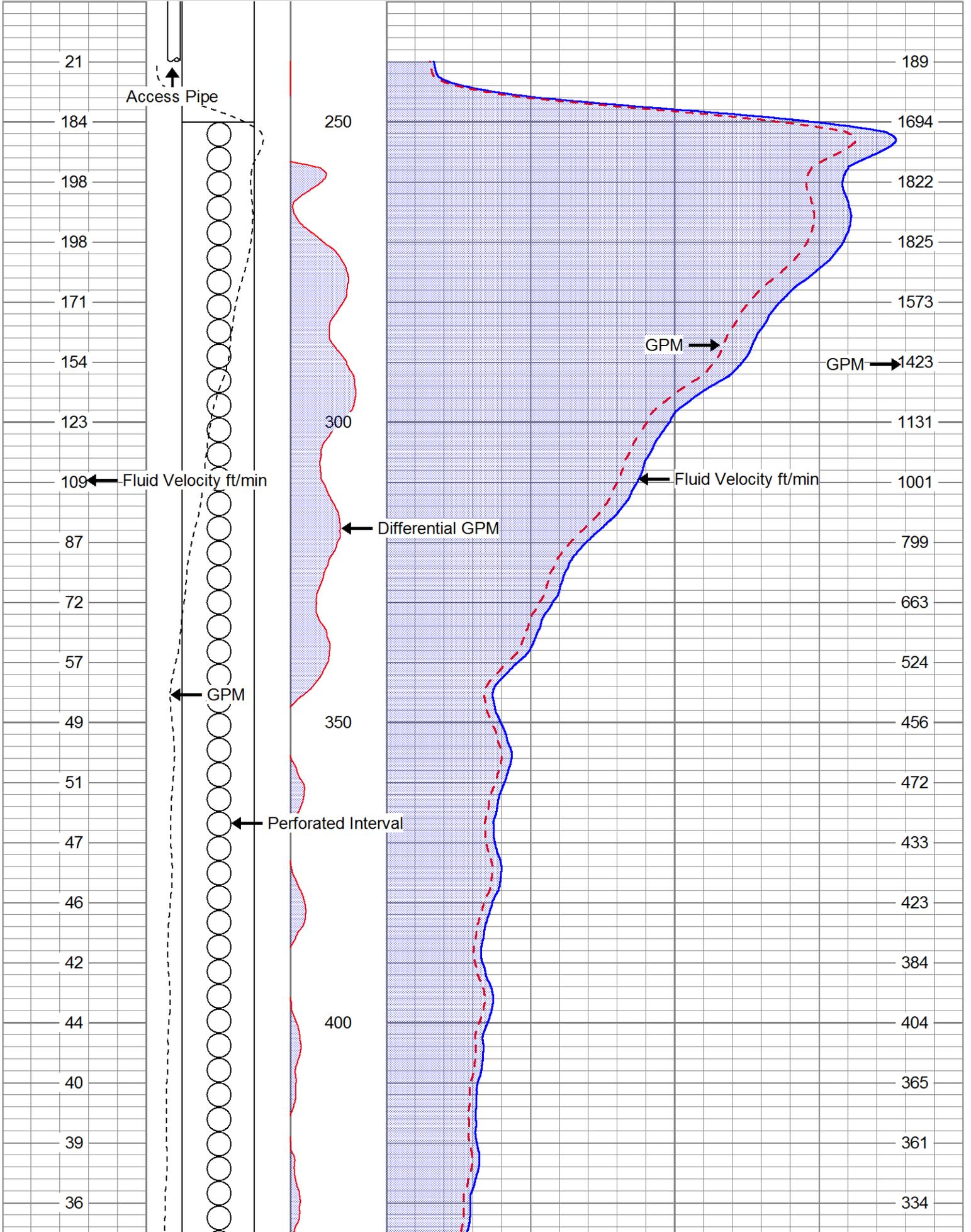
All interpretations are opinions based on inferences from electrical or other measurements and Pacific Surveys cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Pacific Surveys' general terms and conditions set out in our current Price Schedule.

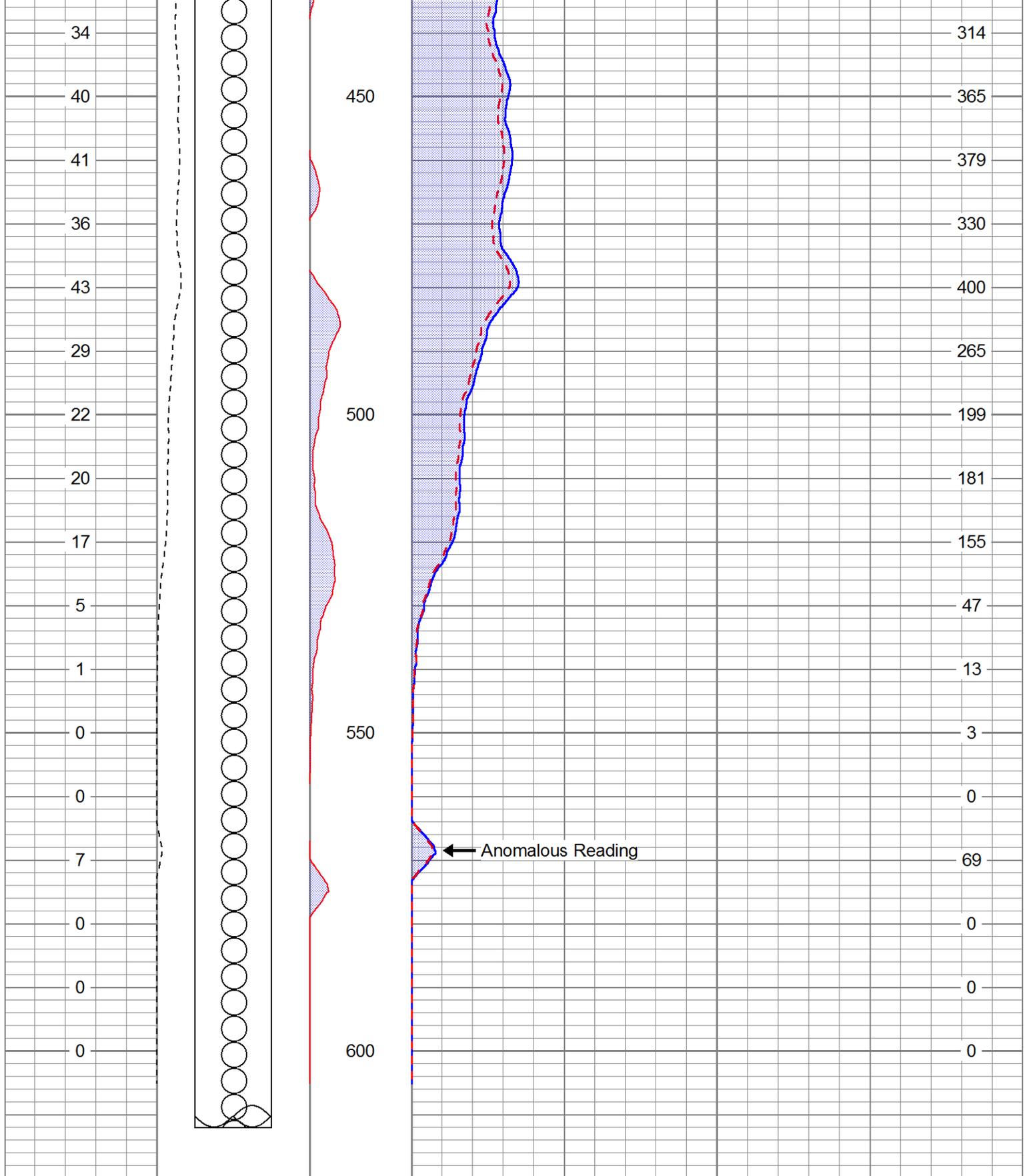
### Comments

SAMPLES COLLECTED @ 310', 430', 510'

Database File: 15548.db  
 Dataset Pathname: @00db4bf0  
 Presentation Format: spinmerg  
 Dataset Creation: Wed Nov 10 14:53:35 2010  
 Charted by: Depth in Feet scaled 1:240

Fluid Velocity	GPM	Delta GPM	0	Fluid Velocity	250
			0	GPM (gallon)	2500
					gpm





← Anomalous Reading

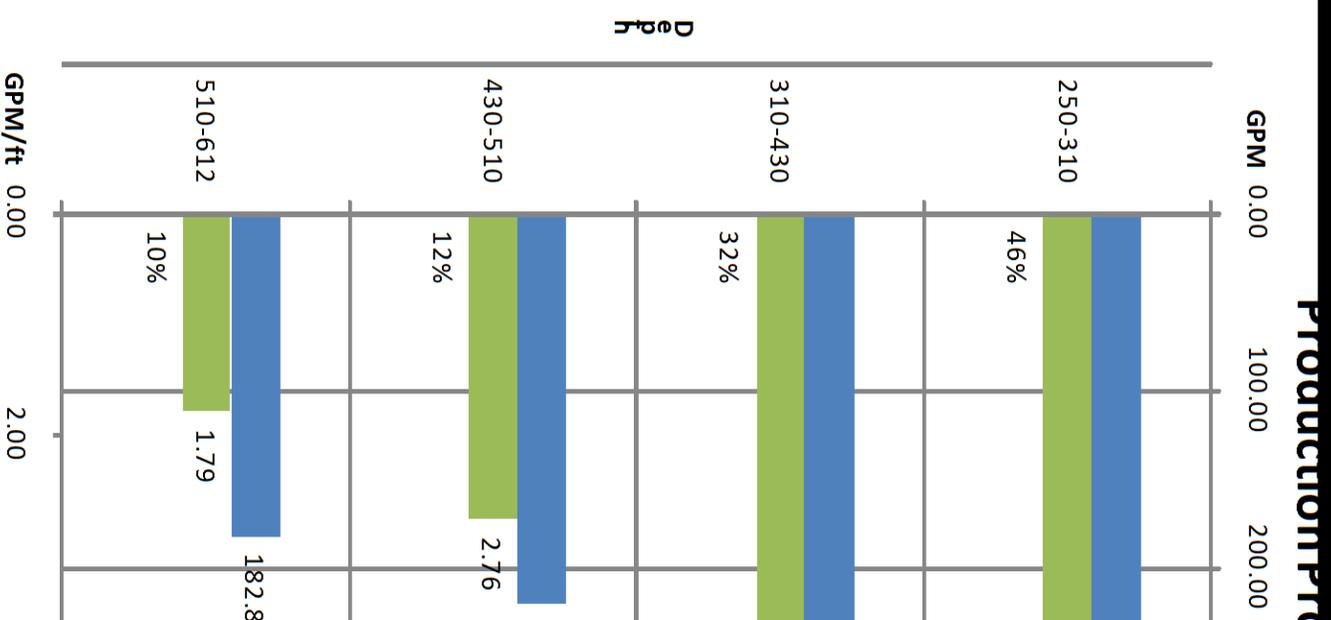
Fluid Velocity	GPM	Delta GPM	0	Fluid Velocity	250
			0	GPM (gallon)	2500
				gpm	

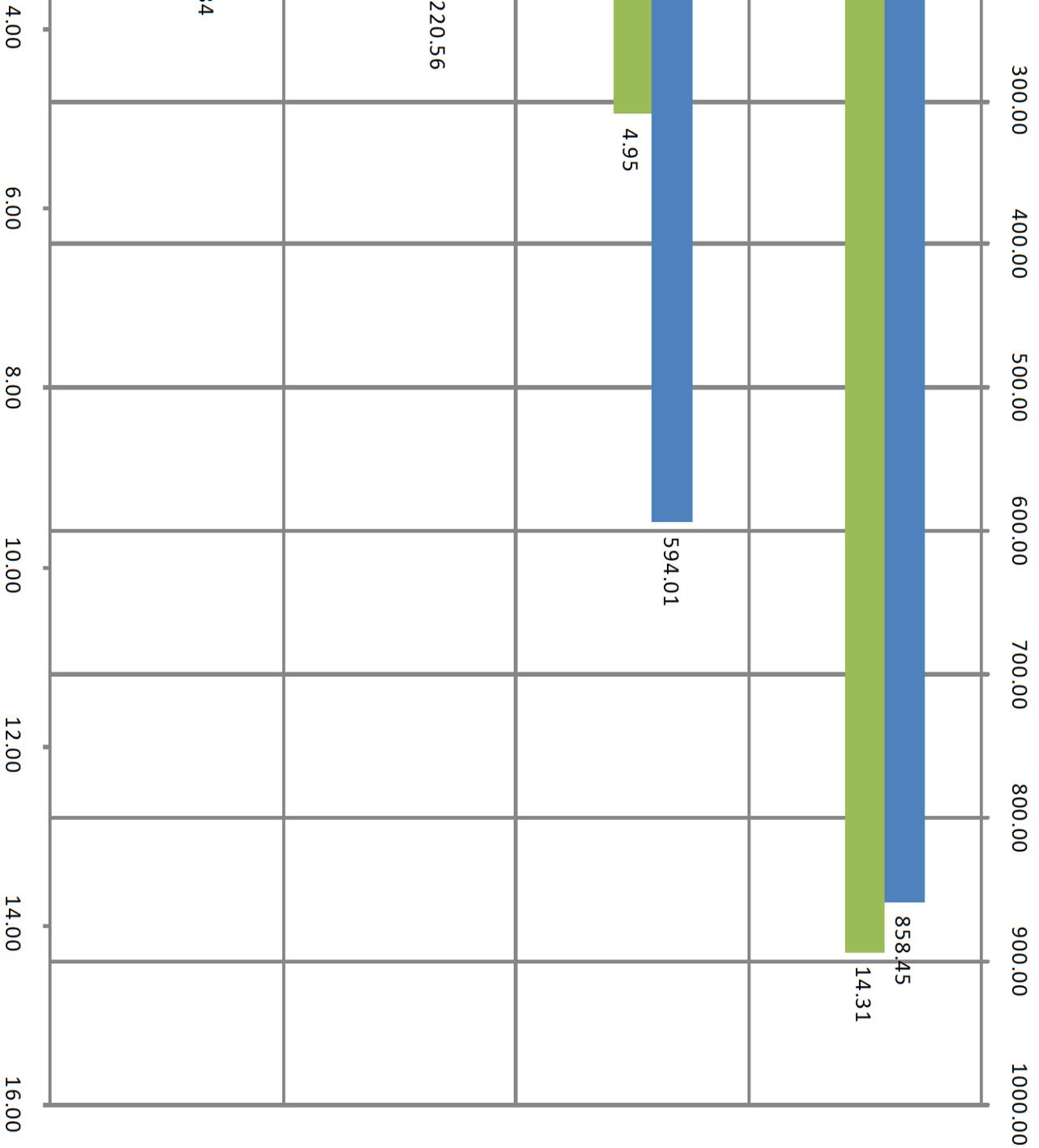
# SPINNER LOG ANALYSIS

Pacific Surveys

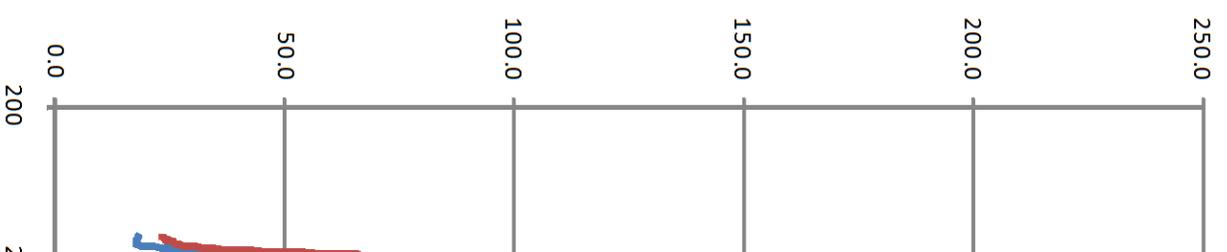
MAX FLOW RATE 1855.86 GPM

PERFS DEPTHS	PRODUCTION GPM	% OF FLOW ZONES	GPM/FT	THICKNESS ft
250-310	858.45	46%	14.31	60
310-430	594.01	32%	4.95	120
430-510	220.56	12%	2.76	80
510-612	182.84	10%	1.79	102

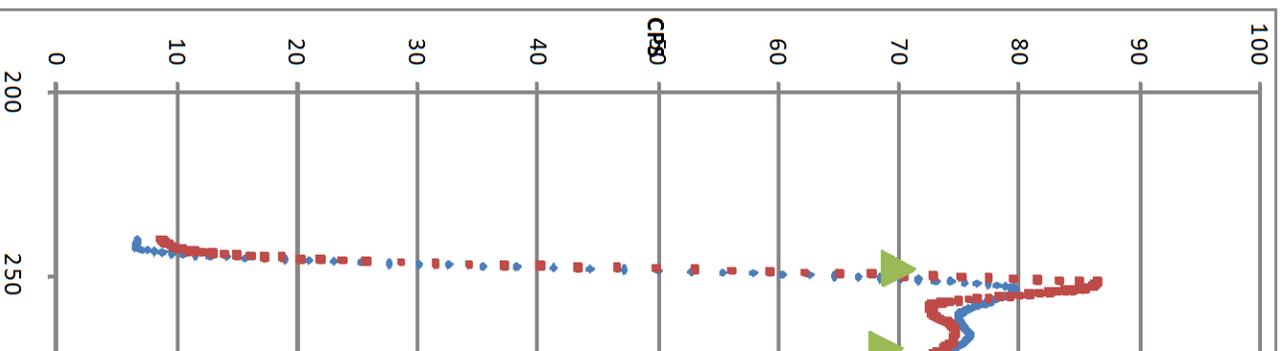
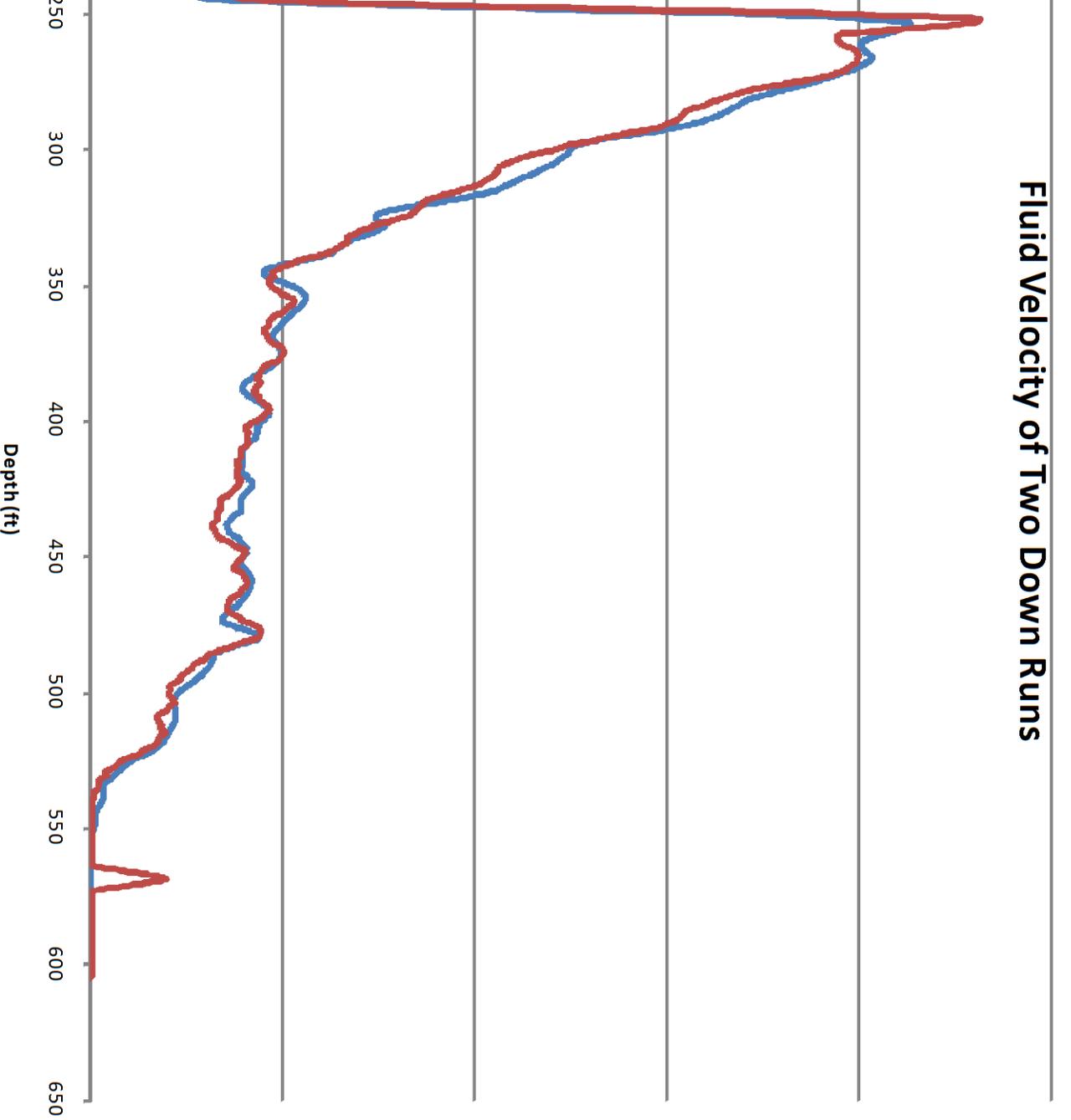




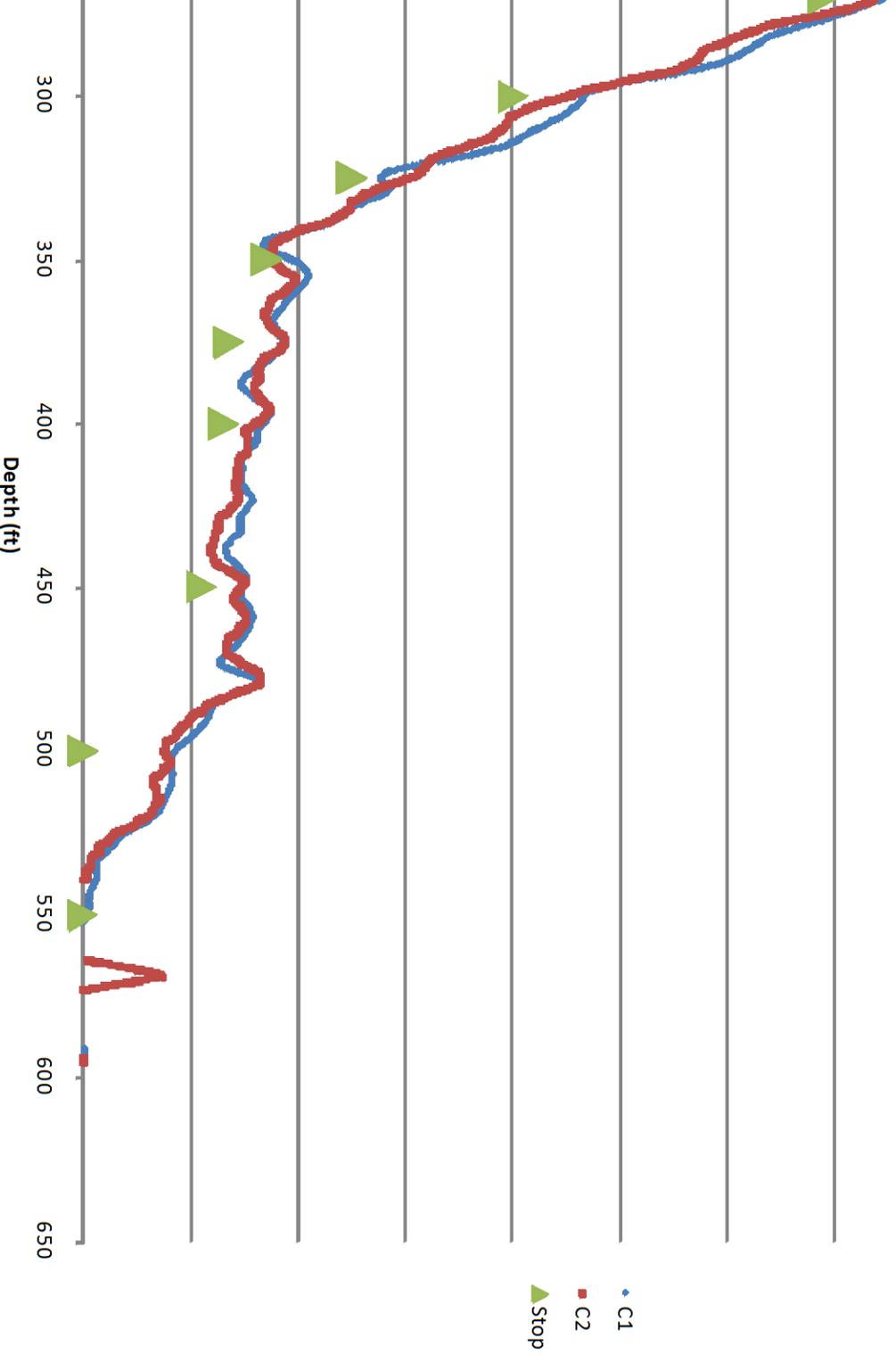
Fluid Velocity (ft/min)



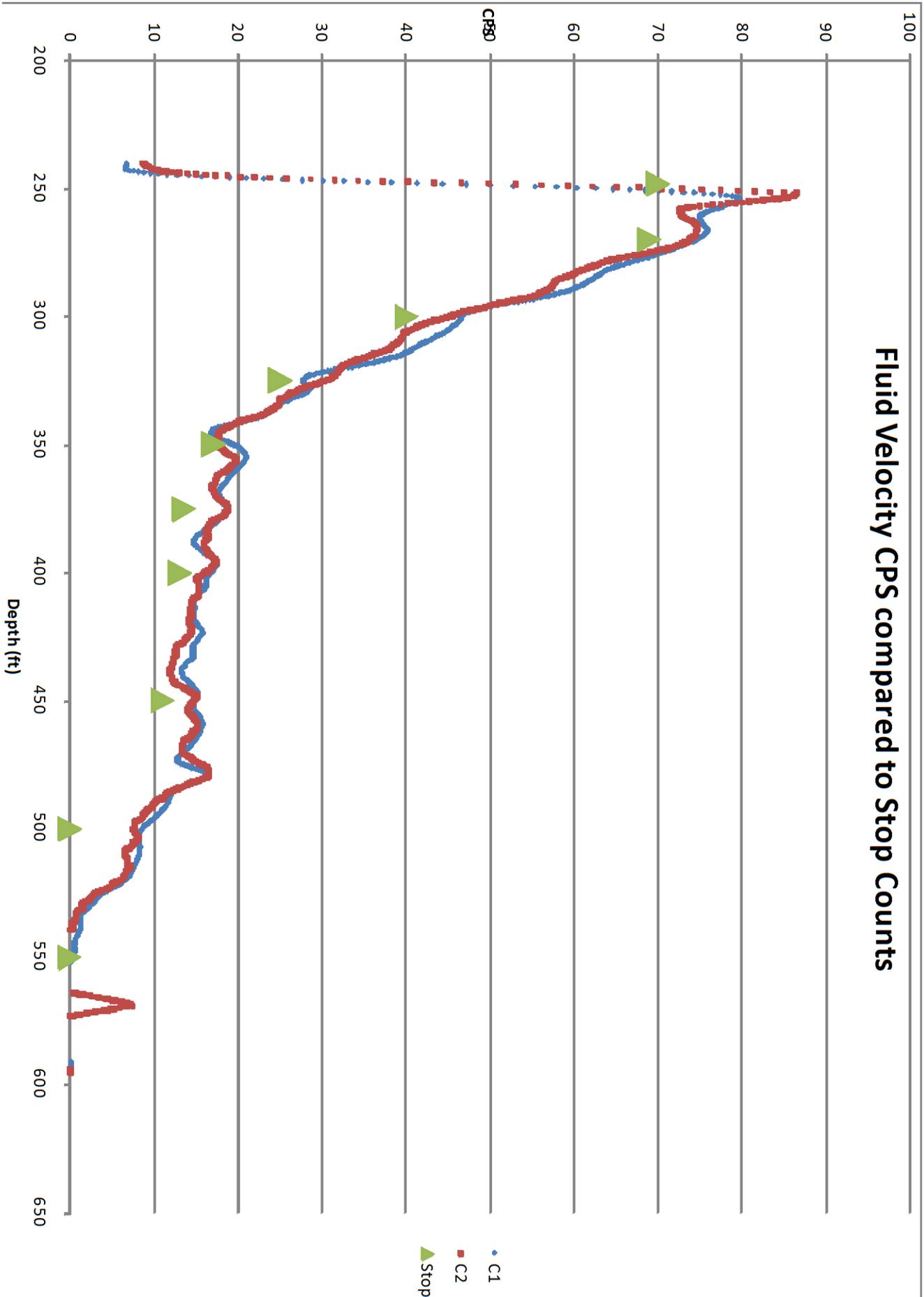
# Fluid Velocity of Two Down Runs



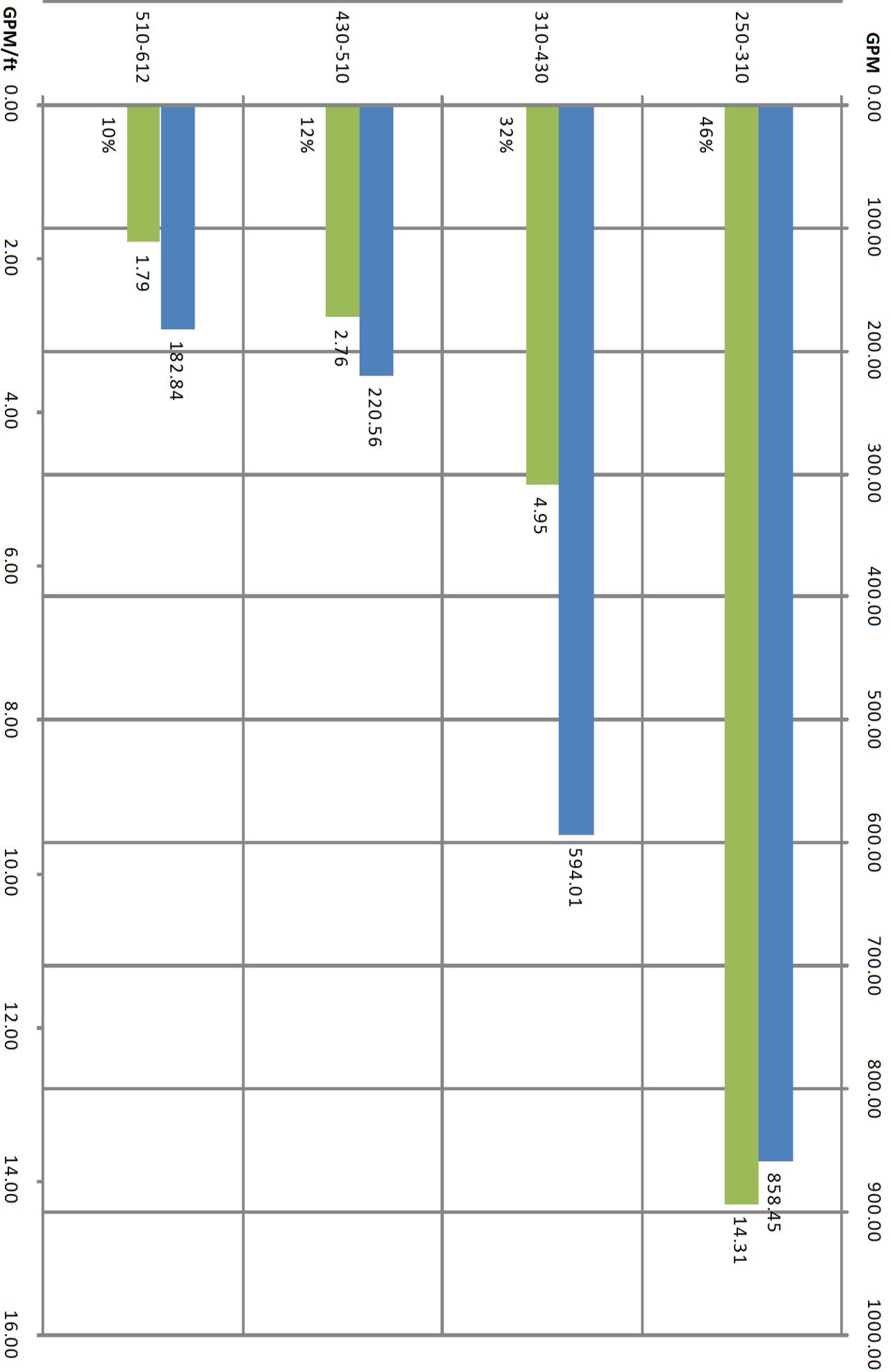
# Fluid Velocity CPS compared to Stop Counts



# Fluid Velocity CPS compared to Stop Counts



# Production Profile



# SPINNER LOG ANALYSIS

Pacific Surveys

MAX FLOW RATE 1855.86 GPM

PERFS DEPTHS	PRODUCTION GPM	% OF FLOW ZONES	GPM/FT	THICKNESS ft
250-310	858.45	46%	14.31	60
310-430	594.01	32%	4.95	120
430-510	220.56	12%	2.76	80
510-612	182.84	10%	1.79	102

**Attachment 7**

**Well Liner Removal Work Summaries  
(2011)**

**Windsor Well**

## Windsor Well Liner Removal Summary August 2011

**Wednesday 8/3/2011:**

*Windsor*

**Day 1**

- Layne mobilizes to the site with work over rig (50 ton smeal) and service truck
- Layne repositions equipment surrounding wellhead
- WACO (Layne subcontractor) installs scaffolding around wellhead
- TD: 592'; DTW: 145'; Gravel Depth: 281'
- Layne tests mills knife perforator in upper 10' of casing, and determines that tool diameter is ½" too small
- Layne sends mills knife tool back to facility for modification (welding)



**Smeal Rig (left) and Support Truck (right)**

**Thursday 8/4/2011:**

*Windsor*

**Day 2**

- Layne installs mills knife and tremie piping into the well; modified tool couldn't pass dielectric coupler (325') and was tripped out of the well
- Layne decreased diameter of tool, and re-installed it into the well to perforate screen
- Layne cut two one foot long perforations in the wire-wrapped screen at 590', 587', and 584' (six total cuts)
- Layne tripped out piping and cutting tool
- Layne received delivery of roll-off bin



**Mills Knife Tool**



**Mills Knife Tool Lowered into Well**

**Friday 8/5/2011:**

*Windsor*

**Day 3**

- Layne installed open end airlift (OEAL) pumping system into well and began airlift pumping; no gravel was produced, so will be removing tool to video log the well (Saturday)

**Saturday 8/6/2011:**

*Windsor*

**Day 4**

- Layne continues airlift system removal and prepares for Monday video log

**Monday 8/8/2011:**

*Windsor*

**Day 5**

- Layne continues liner work
- TD: 593'
- Layne performs video log (see inspection survey) to double-check mills knife perforations; mills knife did not cut screen only creased it
- Crew modifies mills knife and trips it into the liner
- Crew cuts five perforations in the screen, and on the last cut, the 2 ½" tremie pipe separated at the joint, tremie pipe and mills knife tool recovered
- Post mills knife TD: 588' (5' fill)



**Lowering Tremie Pipe and Mills Knife Into Well**

**Tuesday 8/9/2011:**

*Windsor*

**Day 6**

- Layne continues liner work activities
- TD: 587' (6' fill)
- Crew installed OEAL pumping system and began airlifting gravel
- Compressor blew diaphragm and unit was swapped out with compressor used at Well 52

**Wednesday 8/10/2011:**

*Windsor*

**Day 7**

- Layne continues well liner work
- TD: 591' (2' fill)
- Crew OEAL pumped well to remove gravel all day; removed approximately 6.5 cubic yards

**Thursday 8/11/2011:**

*Windsor*

**Day 8**

- Layne continues liner work
- TD: 591' (2' fill)
- Crew resumed airlifting gravel from well until gravel production ceased
- Crew removed OEAL pumping system
- TD: 591' (2' fill)
- Crew installed mills knife



**OEAL Pumping at Wellhead**

**Friday 8/12/2011:**

*Windsor*

**Day 9**

- Layne continues liner work
- TD: 592' (1' fill)
- Crew finishes the mills knife cutting tool installation
- Crew makes perforations with mills knife cutting tool at 590', 586', and 582'
- Layne trips mills knife cutting tool out of well
- Perforations successful due to additional gravel pack that flowed into liner
- Post mills knife TD: 580'; gravel depth: 446'
- Crew installs airlift pumping system with 12.5" OD swab 30' above last pipe joint, and begins airlift pumping gravel out of well

**Monday 8/15/2011:**

*Windsor*

**Day 10**

- Layne continues liner work
- TD: 592' (1' fill)
- Crew continued airlift pumping gravel and water; little fill recovered throughout day
- Received second roll-off bin for gravel containment
- Gravel depth: 519' (end of day)



**OEAL Pumping 8/15/11**

**Tuesday 8/16/2011:**

*Windsor*

**Day 11**

- Layne continues liner work activities
- Gravel depth: 508'
- Crew tripped out airlift pumping system
- Installed 12" OD swab and swabbed screened interval which produced gravel pack
- Post swab TD: 579' (14' fill)
- Crew began bailing bottom of well with a suction bailer; during bailing gravel depth dropping in annulus

**Wednesday 8/17/2011:**

*Windsor*

**Day 12**

- Layne continues well liner work
- Crew encounter equipment issues with work over rig (i.e. rigging sand line cable clamp wedged into sheave); began using CR 14 75 ton crane to bail well
- Continued bailing bottom of liner with limited gravel pack production
- Gravel depth: 587'
- Swabbed well with single line swab, little gravel pack production
- Bailed bottom with little success

**Thursday 8/18/2011:**

*Windsor*

- No site activities

**Friday 8/19/2011:**

*Windsor*

**Day 13**

- Layne continues liner work
- Welder welded stickup pipe to liner casing



**Liner Stickup and Lifting Apparatus (8/19/11)**

- Began pulling on liner with crane up to 34,000 lbs
- Liner was worked out of well approx. 5' of gravel in bottom of well
- Liner was hoisted out of well with crane and cut in 20' sections with a cutting torch
- 15 sections of blank liner casing were removed (section 1 through 15)
- Last section removed from well contained hole in liner and liner patch (viewed in Layne's 2/12/11 video log at 280.67')



**Hoisting Liner From Well (8/19/11)**



**Gravel Encrusted on Liner (8/19/11)**



Measuring Section of Liner (8/19/11)



Crane Placing Liner section on 4x4s (8/19/11)



Liner Loaded On Truck (8/19/11)



Soft Biofilm on Casing (8/19/11)



Marking Liner Section (8/19/11)



Liner hoisted from well (8/19/11)



**Patch Inside of Liner (Cut With Torch) 8/19/11**



**Close-up of Patch and Liner Casing (8/19/11)**



**Hole in Blank Section of Liner**



**Close-up of Hole in Liner and Patch**

**Monday 8/22/2011:**

*Windsor*

**Day 14**

- Layne continues liner work
- Layne removes remainder of liner from well (sections 16 through 31)
- Liner loaded on truck and taken back to Layne facility in Fontana



**Centralizer Located at Liner Screen Joint (8/22/11)**



**Liner Screen Section (8/22/11)**



**Liner Screen Section (8/22/11)**



**Welder Cutting Liner Screen Joint (8/22/11)**



**Windsor Liner Removed from Well (Intentionally Damaged with Mills Knife) 8/22/11**

**Tuesday 8/23/2011:**

*Windsor*

- No Layne activities

**Wednesday 8/24/2011:**

*Windsor*

- No Layne activities

**Thursday 8/25/2011:**

*Windsor*

- No Layne activities

**Friday 8/26/2011:**

*Windsor*

- Layne performs post liner removal video log (see Layne video log inspection report)

**Well 52**

## Well 52 Liner Removal Summary (August 2011)

**Wednesday 8/3/2011:**

*Well 52*

**Day 1**

- Layne mobilizes to the site with work over rig (50 ton smeal) and service truck
- WACO (Layne subcontractor) installs scaffolding around wellhead
- Well TD: 607'; DTW: 65'; Gravel Pack: 385'
- Layne single line swabs well to bring in gravel pack through holes in liner from 470 - 530'; swab: 15" OD; limited (4') gravel pack yield through holes in screen
- TD after swab: 603'



**Smeal Rig (left) and Pipe Truck (right)**

**Thursday 8/4/2011:**

*Well 52*

**Day 2**

- TD: 604'; DTW: 65'; Gravel Pack: 385'
- Layne installs mills knife and piping into the well and cuts three one foot long perforations at 600' and 596', as well as two one foot long perforations at 592' in the wire-wrapped screen
- Layne removed mills knife cutting tool from well and began installing the airlift pumping system into the well
- Ran water down annular space between liner and original well casing



**Mills Knife Blade Close-up**

**Friday 8/5/2011:**

*Well 52*

**Day 3**

- Layne installed open end airlift (OEAL) pumping system into well and began airlift pumping; gravel is coming out of the well
- OEAL pumped gravel down to 615' inside liner
- TD: 615' (end of day)



**Smeal Rig during OEAL Pumping**

**OEAL Pumping Tool and Compressor**

**Monday 8/8/2011:**

*Well 52*

**Day 4**

- Layne continues liner work activities
- Crew tripped out OEAL pumping tool from well
- Crew attempted to pull on liner which weighs approximately 25,000 lbs. at 34,000 lbs with 50 ton smeal rig; liner was able to move up and down only one inch
- Crew tripped in mills knife tool



**Lifting Apparatus during Initial Attempt**

**Tuesday 8/9/2011:**

*Well 52*

**Day 5**

- Layne continues liner work activities
- Crew installed mills knife tool and made two perforations at 607' and on the second cut, the pipe separated; tool and tremie pipe recovered from the liner
- Post mills knife TD: 603' (11' of fill)
- Crew installed OEAL pumping tool and began airlifting gravel and water from the well
- OEAL pumped from 603 - 614'

**Wednesday 8/10/2011:**

*Well 52*

**Day 6**

- Layne continues liner work
- TD: 614'
- Crew removed OEAL pumping system from well
- Crew attempted to lift liner out of well; pulled up to 42,000 lbs., and liner moved up and down 1 1/2"; additional gravel pack entered liner during lifts
- Crew installed the mills knife cutting tool and made one perforation at 602' and 2 perforations at 596'
- Crew removed mills knife cutting tool from well
- Post mills knife TD: 597'



**Attempting to Hoist Liner from Well (8/10/11)**

**Thursday 8/11/2011:**

*Well 52*

**Day 7**

- Layne continues liner work

- Crew installed OEAL pumping tool
- Layne airlift pumped water and gravel pack rest of day

**Friday 8/12/2011:**

*Well 52*

**Day 8**

- Layne continues liner work
- TD: 604'
- Crew continues OEAL pumping until gravel production ceases
- Crew trips out OEAL pumping tool from well
- Post OEAL pumping TD: 614'

**Monday 8/15/2011:**

*Well 52*

**Day 9**

- Layne performed video log of well liner (see Layne video log inspection report)

**Tuesday 8/16/2011:**

*Well 52*

**Day 10**

- Layne continues liner work activities
- TD: 614'
- Crew swabs liner screen with 14" O.D. single line swab from 250 – 600' bgs
- Crew attempted to pull on liner with a maximum pull of 42,000 lbs (including rigging)
- Layne continued pulling on liner and releasing tension, and ultimately freed the liner from the well
- Liner was lifted 7' above pump pedestal and secured for the night



**Liner Successfully Hoisted**

**Liner Hoisted and Secured Overnight**

**Wednesday 8/17/2011:**

*Well 52*

**Day 11**

- Layne continues liner work
- Liner was removed in 20' sections and cut with a cutting torch

- 20 joints were removed from the well by day's end
- Liner loaded on truck and taken back to Layne facility in Fontana



**Welder Cuts Liner Joints**



**Liner Loaded on Pipe Truck**



**3/8" Hole in Blank Casing (220.75')**



**Hole in Screen (284.14')**



**Thinning at 284.14' Hole (Right Side of Photo)**



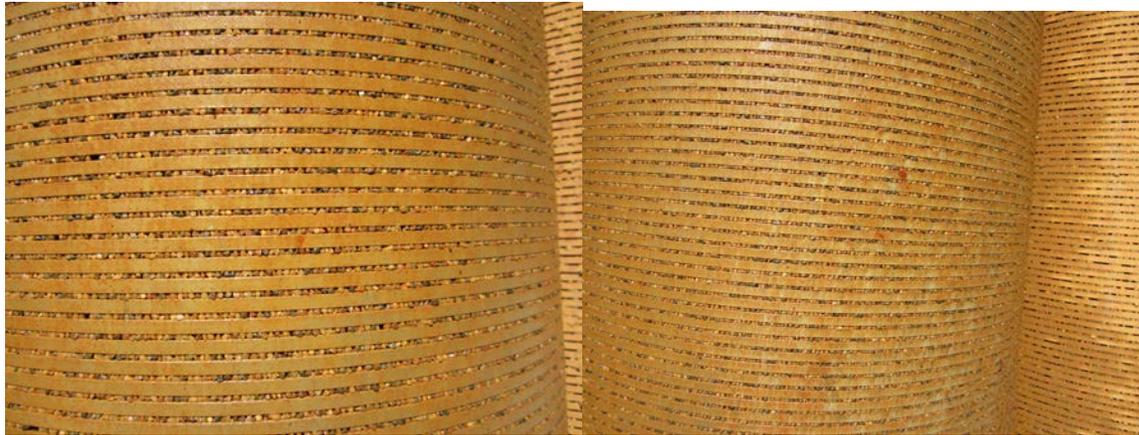
**Closer View of Thinning (~285')**

**Thursday 8/18/2011:**

*Well 52*

*Day 12*

- Layne continues liner work
- Liner was removed in 20' sections and cut with a cutting torch
- 13 joints were removed from the well by day's end
- Well 52 liner successfully removed from well
- Liner loaded on truck and taken back to Layne facility in Fontana
- Crew preps well for video log next week



**Section 24 Impacted Gravel Due to Airlifting (432.57 - 452.59');  
Both Photos Similar Details**



**Thinning and Hole (478.5'); Section 26**



**Holes at 478.5' and 479.25'; Section 26**



**Thinning and Hole at 508.75'; Section 27    Close-up of Hole at 508.75' (After Drying)**



**Section 28 Holes and Thinning (~520 - 522')    Close-up of Thinning at 521.90'; Section 28**



**Sect. 28 Close-up; Impacted Gravel in Screen; Sect. 29, No Impacted Gravel**



**Section 30 No Impacted Gravel**

**Sect. 31; Mills Knife Cuts on Last Screen Section**



**Liner Removed from Well 52 8/18/11**

**Friday 8/19/2011:**

*Well 52*

- No site activities

**Monday 8/22/2011:**

*Well 52*

- Layne performs post liner removal video log

**Tuesday 8/23/2011:**

*Well 52*

- No Layne activities

**Wednesday 8/24/2011:**

*Well 52*

- No Layne activities

**Thursday 8/25/2011:**

*Well 52*

- No Layne activities

**Friday 8/26/2011:**

*Well 52*

- No Layne activities

**Attachment 8**

**Well Liner and Pump Installation Summaries  
(2012)**

**Windsor Well**

## Windsor Liner and Pump Installation August - October 2012

Wednesday 8/1/2012:

Day 1

- Meeting with Rain for Rent regarding containment and filtration

Thursday 8/2/2012:

Day 2

- Layne mobilizes to Windsor from Well 52
- Install temporary sound curtains along fence line (adjacent to resident's homes)
- Begin brushing screened zone

Friday 8/3/2012:

Day 3

- Layne continues brushing screen zone
- Layne moves roll-off bin from Well 52 to Windsor
- Bail fill from bottom of well; sediment/water mixture contained in roll-off bin



Brushing and Bailing Well



Brush in Foreground



Bailing Bottom of Well

**Monday 8/6/2012 - Friday 8/10/2012:**

- No site activities (materials delay)

**Monday 8/13/2012:**

*Day 4*

- Rain for Rent delivers containment to Windsor
- Receive trash dumpster delivery

**Tuesday 8/14/2012:**

*Day 5*

- Rain for Rent delivers 21,000 gallon closed top tank
- Liner materials delivered and staged at site
- Beekeeper removes bee hive near Windsor well in irrigation vault

**Wednesday 8/15/2012:**

*Day 6*

- Rain for Rent installs hoses, filter, pump, and temporary pipeline
- Layne moves roll-off bin from Windsor to Well 52

**Thursday 8/16/2012 - Friday 8/17/2012:**

- No site activities

**Monday 8/20/2012:**

*Day 7*

- Layne performs pre-liner installation video log

**Tuesday 8/21/2012 - Friday 8/24/2012:**

- No site activities

**Monday 8/27/2012:**

*Day 8*

- Layne mobilizes equipment (i.e. crane, materials, etc.) to site



**Equipment Mobilization (Liner Screen)**



**Equipment Mobilization (Liner Blank Casing)**

**Tuesday 8/28/2012:**  
**Day 9**

- Layne bails bottom of original well to remove fill
- Layne begins liner installation



**Liner Installation**



**Welding Screen Sections Together**



**Liner Installation**



**Liner and Gravel Tube Materials**



**Liner Screen Staged for Installation**



**Liner Screen Centralizers**

**Wednesday 8/29/2012:**

**Day 10**

- Layne continues liner installation; all screen and di-electric coupler completed
- Begin liner blank casing and gravel fill tube installation



**Di-electric Coupler**



**Gravel Fill Tube Welded to Blank Casing**

**Thursday 8/30/2012:**

**Day 11**

- Layne continues blank liner casing and gravel fill tube installation



**Blank Liner Casing; Welded Centralizer**



**Lowering Blank Liner Casing and Gravel Fill Tube**

**Friday 8/31/2012:**

**Day 12**

- Layne completes liner installation and top end fabrication

**Monday 9/3/2012:**

Holiday; No Site Activities

**Tuesday 9/4/2012:**

**Day 13**

- Layne performs gravel pack installation; 7 super sacks total



**Gravel Pack Installation**



**Gravel Installation Close-up**

**Wednesday 9/5/2012:**

*Day 14*

- Layne continues gravel pack installation; 3 additional super sacks added
- Perform single line swabbing to consolidate gravel pack
- Bail fill from bottom of liner



**Liner Inside of Well**



**Containment and Filtration**

**Thursday 9/6/2012:**

*Day 15*

- Layne continues single line swabbing to consolidate gravel pack

**Friday 9/7/2012:**

*Day 16*

- Layne adds 1 super sack of gravel pack
- Layne continues single line swabbing to consolidate gravel pack
- Layne installs dual swab airlift pumping system
- Receive noise complaint from neighbor; NASA notified



**Dual Swab Airlift Tool (Minus Airline)**



**Dual Swab Airlift Tool Installation**



**Containment Filtration and Crane**



**Work Area with Crane and Pipe Truck**

**Monday 9/10/2012:  
Day 17**

- Layne performs dual swab airlift pumping to consolidate gravel pack



**Dual Swab Airlift Pumping and Swabbing**



**Monitoring Discharge to Settling Tank**

**Tuesday 9/11/2012:**

**Day 18**

- Layne continues dual swab airlift pumping to consolidate gravel pack

**Wednesday 9/12/2012:**

**Day 19**

- Layne completes dual swab airlift pumping
- Layne preps for video log

**Thursday 9/13/2012:**

**Day 20**

- Layne performs video log of well
- Layne adds gravel followed by the installation 10 feet of transition sand
- Prep for concrete placement tomorrow



**Transition Sand (RMC #1C)**

**Friday 9/14/2012:**

**Day 22**

- Layne installs cement seal in well via tremie pipe



**Concrete Truck and Pump**



**Concrete Pump Hose and Tremie Pipe**

**Monday 9/17/2012:**  
*Day 23*

- Layne begins pump installation



**Liner Completion Prior to Pump Installation; Two Views**



**9-Stage Pump Installation**

**PVC Sounding Tubes at Top of Bowls**

**Tuesday 9/18/2012:**  
*Day 24*

- Layne continues pump installation
- Collect annual discharge sample (Windsor containment blending with MHTS treated)



**Pump Installation**



**Pump and New Airline Installation**

**Wednesday 9/19/2012:**

*Day 25*

- EFR Environmental drops roll-off bin
- Collect soil samples for waste characterization
- Layne completes pump installation and discharge piping connections

**Thursday 9/20/2012:**

*Day 26*

- Layne cleans up site and demobilizes equipment
- Clean tube settler tank and transfers material to roll-off bin



**Pump and Motor Installation Complete (Northwest and Southeast Views)**

**Friday 9/21/2012:**

*Day 27*

- Layne picks up trash bin and forklift

**Monday 9/24/2012:**

*Windsor*

- No site activities

**Tuesday 9/25/2012:**

*Day 28*

- PWP electricians wire Windsor motor heater

**Wednesday 9/26/2012:**

*Day 29*

- EFR crew cleans Rain for Rent tube settler and 21,000 gallon tank
- PWP electricians trouble-shoot Windsor switchgear

**Thursday 9/27/2012:**

*Day 30*

- EFR crew cleans 2 x 21,000 gallon Rain for Rent tanks
- Well startup and de-chlorination (Matt Chlor)
- Discharge blending with MHTS treated (Arroyo and Well 52)
- PWP assists with well startup
- Stopped pumping due to pumping water level near bowls (pump needs to be lowered)
- Collect annual discharge sample

**Friday 9/28/2012:**

*Day 31*

- Site cleanup

**Monday 10/1/2012:**

*Day 32*

- Rain for Rent demobilizes equipment from site (i.e. 3 x 21,000 gallon tanks, 1 tube settler/roll-off bin, two transfer pumps, 1 bag filter unit; leave temporary pipeline in place)



**Rain for Rent Demobilizes Equipment**



**Site Cleaned Up**

**Tuesday 10/2/2012:**

*Day 33*

- Layne lowers pump to a deeper setting



**Pump Lowered 80 Feet**



**Motor Mounted and Ready for Electrician**

**Wednesday 10/3/2012:**

*Day 34*

- Layne electrician wires, bumps and couples motor to pump
- Disinfect well and surge three times

**Thursday 10/4/2012:**

*Day 35*

- Well startup and de-chlorination (w/PWP)
- Discharge blending with MHTS treated (Arroyo and Well 52)
- PWP assists with well startup
- Stopped pumping due to pumping water level near bowls (even after pump intake was lowered 80')
- Collect weekly spreading basin discharge sample

**Friday 10/5/2012:**

*Windsor*

- No site activities

**Tuesday 10/30/2012:**

*Day 36*

- EFR picks up soil roll-off bin, empty drums, and misc. waste from Windsor site

**Wednesday 10/31/2012:**

*Day 37*

- Collect weekly spreading basin discharge samples
- Run Windsor well and monitor flowrate, backpressure, and pumping water level; maintained sufficient bowl submergence

**Thursday 11/1/2012:**

- No site activities

**Friday 11/2/2012:**

*Day 38*

- Run Windsor well with Layne Christensen and monitor flowrate, backpressure, and pumping water level; maintained sufficient bowl submergence; determine pumping level is consistent with Arroyo well and continued operation of Windsor pump not recommended until basin water levels rise

**Well 52**

## Well 52 Liner and Pump Installation August - October 2012

**Wednesday 8/1/2012:**

*Day 1*

- Meeting with Rain for Rent regarding containment and filtration
- Layne mobilizes to site
- Brush screen zone
- Receive fork lift



**Mobilization and Set-up**



**Brush and Bailer**

**Thursday 8/2/2012:**

*Day 2*

- Layne completes brushing screened zone
- Receive delivery of roll-off bin
- Bail fill from bottom of well; sediment/water mixture contained in roll-off bin
- Mobilize to Windsor

**Friday 8/3/2012:**

- Layne moves roll-off bin from Well 52 to Windsor
- No well work (day not counted)

**Monday 8/13/2012:**

*Day 3*

- Longmire Swaging installs patch on original well casing (220.83' - 224.83')



**Longmire Swaging during Patch Install**



**4' Long Casing Patch**

**Tuesday 8/14/2012:**

*Day 4*

- Layne performs post patch installation video log
- Liner material stored at Windsor



**Previously Installed Screen (Cleaned and Ends Cut and Beveled); Staged at MHTS**



**Previously Installed Screen (Cleaned and Ends Cut and Beveled)**

**Wednesday 8/15/2012:**

**Day 5**

- Layne performs liner installation; 13 screen sections installed (10 old/3 new) today; no centralizers used due to patch on original casing
- 10 screen sections were acceptable for re-use; they were cleaned, ends cut and straightened, and beveled for re-installation and 8 brand new screen sections
- Layne places roll-off bin at site; old engineered gravel pack stored in super sacks will be placed in roll-off bin for containment and disposal



**Liner Installation Equipment**



**Bottom Cap Welded to Screen Section**



**Liner Screen**



**Liner Suspended by Elevator**



**Liner Screen Weld before Lowering into Well**



**Hoisting Screen Section**

**Thursday 8/16/2012:**

*Day 6*

- Layne continues liner installation
- Complete screen installation; 18 sections total
- Install dielectric coupler (previously used – cleaned, ends cut and beveled)
- Install blank casing (1 new section and 11 previously used sections – cleaned, ends cut and beveled)
- Layne drives to Roscoe Moss to pickup new section of pipe to be installed tomorrow



**Welding Liner Screen**



**Close-up View of Screen Joint before Welding**



**Liner Screen Close-up**



**Measuring Liner Screen Slot Size**



**Welding Di-electric Coupler  
(Between Screen and Casing)**



**Lowering Section of Blank Casing**



**Hoisting Blank Casing**



**Welder in Action**

Friday 8/17/2012:  
Day 7

- Layne completes liner installation including surface completion



**Lowering Final Blank Section**



**Site Overview; JPL in Background**



**Site Overview Close-up**



**Welding Gussets**



**Hanging Liner – 4” below Top of Flange**



**Top View Looking Down into Well**

**Monday 8/20/2012:**  
**Day 8**

- Layne performs post liner installation video log
- Layne begins pump installation



**Cone Strainer and 10' Long Suction Pipe**



**4-stage Pump**



**New Airline**



**Airline and Bottom of PVC Sounding Tubes**

Tuesday 8/21/2012:  
Day 9

- Layne continues pump installation



**Pump Shaft Installation**



**New Bearings**



**Shafts Flipped Due to Wear**



**Pump Shaft Installed**



**Tightening Drive Shaft**



**Pump Column and Drive Shaft**

Wednesday 8/22/2012:

Day 10

- Layne completes pump installation



Discharge Head with Drive Shaft



Hoisting Motor onto Drive Shaft



Motor Mounted on Drive Shaft



Drive Shaft Close-up View



Airline Pressure Gauge



Well 52 Pump Nearly Complete

**Thursday 8/23/2012:**

- No site activities

**Friday 8/24/2012:**

*Day 11*

- Layne electrician performs electrical connection (pump motor), bumps motor for rotation, and couples pump; pump is ready for operation (minus well disinfection and minor electrical connection in switchgear – PWP’s responsibility)
- Receive delivery of large construction waste bin; Layne performs site cleanup

**Thursday 8/30/2012:**

*Day 12*

- Rain for Rent installs temporary pipeline

**Monday 9/10/2012:**

*Day 13*

- Conner meets with Steve Hazlett (PWP) regarding Well 52 electrical panel
- PWP delivers sodium hypochlorite for next week’s well disinfection

**Tuesday 9/18/2012:**

*Day 14*

- Perform well disinfection and surge three times

**Wednesday 9/19/2012:**

*Day 15*

- Well startup and de-chlorination by Matt Chlor
- Discharge water blended with MHTS treated
- Collect annual discharge sample (Well 52 + MHTS treated)
- PWP collects bacteriological samples

**Thursday 9/20/2012:**

*Day 16*

- Well 52 passes bacteriological (well can be placed into service)

**Friday 9/21/2012:**

- No site activities

**Monday 9/24/2012:**

*Day 17*

- Install pre-lube line (backflow preventer, y-strainer, etc.)

**Tuesday 9/25/2012:**

- No site activities

**Wednesday 9/26/2012:**

*Day 18*

- Well startup and discharge to SB#5 blending with MHTS treated
- Monitor flowrates, backpressures, and pumping water levels
- Collect discharge sample (Well 52 + MHTS treated)
- Transition well to MHTS for drinking water production
- PWP collects well samples

**Thursday 9/27/2012:**

- Well running to MHTS with Arroyo
- Monitor flowrates, backpressures, and pumping water levels

**Friday 9/28/2012:**

- Well running to MHTS with Arroyo
- Monitor flowrates, backpressures, and pumping water levels



**Well 52 Running to MHTS (9/28/12)**

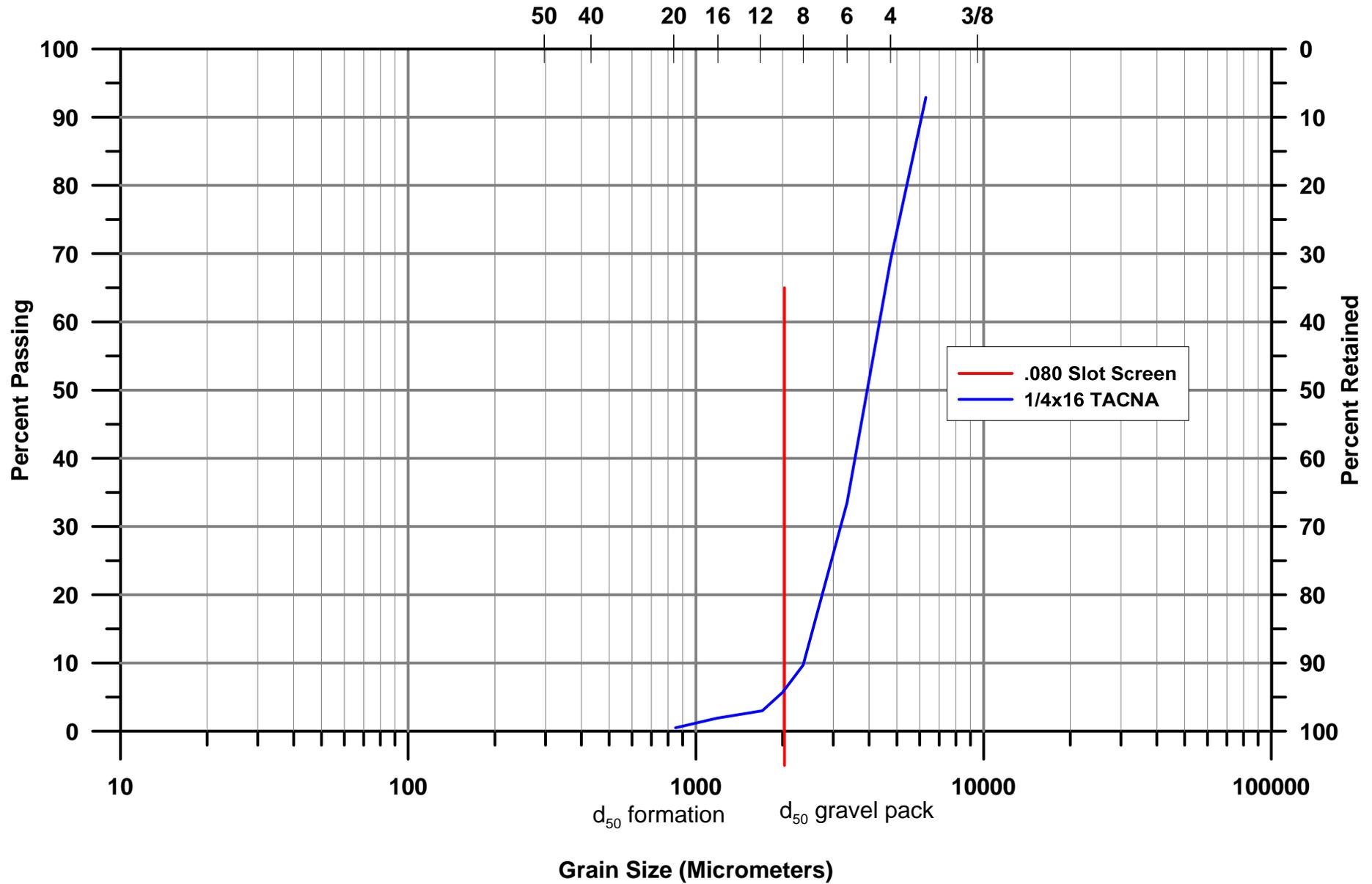
**Monday 10/1/2012:**

*Day 19*

- Rain for Rent demobilizes temporary pipeline
- Monitor flowrates, backpressures, and pumping water levels

**Attachment 9**

**Windsor Engineered Gravel Pack Sieve Analysis**



Grain-size distribution curve of the gravel pack in relation to the proposed screen and select intervals.

Grain Size Distribution