

ATTACHMENT 5: WATER LEVEL MEASUREMENTS

This attachment contains water level measurements for the JPL relatively shallow standpipe monitoring wells (MW-1, MW-5 through MW-10, MW-13, MW-15, and MW-16) and the Westbay™ multiport wells (MW-3, MW-4, MW-11, MW-12, MW-14, and MW-17 through MW-26) obtained during the 4th Quarter 2018. Water level measurements were recorded before the sampling event on October 12, 2018 for the relatively shallow standpipe monitoring wells and October 12, 17, 18 and 23, 2018 for the Westbay™ multiport wells. Water level measurements were recorded after the sampling event on October 26, 2018 for the relatively shallow standpipe monitoring wells and October 26, 2018 for the Westbay™ multiport wells. Water levels for the shallow wells were measured using a Solinst™ water level meter. In the deep multiport wells, the hydraulic head at each sampling port was measured with a Westbay™ MOSDAX sampling probe. Water level measurements were conducted by Blaine Tech Services, Inc.

Note: During the fourth quarter 2018, the shallow standpipe well MW-13 was inaccessible due to ongoing construction activities.

WELL GAUGING DATA

Project # 181012-HH Date 10/12/18 Client Tidewater

Site JPL, Pasadena, CA

Well ID	Well Size (in.)	Time Gauged	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC	
MW-1	4	0930					41.61	Ded pump		
MW-5	4	1405					131.10	Ded pump		
MW-6	4	1055					DRY	232.80	(Top of pump)	
MW-7	4	1339					DRY	263.91	(Top of pump)	
MW-8	4	1355					196.74	Ded pump		
MW-9	4	0935					36.73	Ded pump		
MW-10	4	1211					146.15	Ded pump		
MW-13	— unable to access due to construction									
MW-15	4	1243					47.38	Ded pump	↓	
MW-16	4	1350					284.60	284.81	↓	

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-3
 DATE: 10/12/18
 LOCATION: JPL
 ELEV. TOP OF WASTBAY CASING 1100.34
 WEATHER: Clear

PROBE TYPE Westbay Sampler 0-500psi
 SERIAL NO. EMS 8502
 PROJECT JPL Pasadena
 OPERATOR(S) T. Haas
 ATM. PRESSURE (Patm): (start) 14.01 (finish) 14.05

DTW-175.51'

Temp: 22.27°C 20.49°C

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
5	653	650	221.67	220.41	221.67	22.53	476.16	176.84	653	0946
4	558	556	180.40	180.16	180.40	22.82	383.31	174.69	558	0948
3	346	343	88.19	88.53	88.19	21.93	171.92	174.08	346	0950
2	252	250	47.30	48.45	47.30	21.26	79.45	172.55	252	0952
1	172	170	14.13	17.32	14.13	20.23	7.64	164.36	172	0954

Comments: Collar Detect is 2' above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-4
 DATE: 10/23/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1082.84
 WEATHER: Clear

PROBE TYPE: Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT: JPL Pasadena
 OPERATOR(S): T. Hooley
 ATM. PRESSURE (P_{atm}): (start) 14.05 (finish) 14.06

DTW - 149.95

Temp: 21.50°C 19.80°C

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-P _{atm})*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (oC)				
5	513	512	172.86	171.13	172.86	21.32	362.38	150.62	513	1045
4	392	390	120.04	118.71	120.04	21.59	241.45	150.55	392	1047
3	322	320	89.46	88.32	89.46	21.36	171.34	150.66	322	1049
2	240	238	53.65	52.88	53.65	20.89	89.58	150.42	240	1051
1	150	148	14.20	16.44	14.20	19.81	5.51	144.49	150	1053

Comments: Collar Detect is 2' above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-11
 DATE: 10/12/18
 LOCATION: JPL
 ELEV. TOP OF WASTBAY CASING 1139.3
 WEATHER: Clear

PROBE TYPE Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT JPL Pasadena
 OPERATOR(S) T. Hoarby
 ATM. PRESSURE (Patm): (start) 13.97 (finish) 13.99
 Temp: 22.02°C 20.47°C

DTW - 198.24'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (oC)				
5	639	638	204.58	191.18	204.58	22.16	408.82	230.18	639	1258
4	524	522	155.14	157.09	155.14	21.94	330.18	193.82	524	1300
3	429	426	114.20	113.39	114.20	20.97	229.36	199.64	429	1302
2	259	256	40.55	42.96	40.55	19.69	66.88	192.12	259	1304
1	149	146	14.06	20.26	14.06	19.06	14.51	134.49	149	1306

Comments: Collar Detect is 6" above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-12
 DATE: 10/12/18
 LOCATION: JPL
 ELEV. TOP OF WASTBAY CASING 1102.14
 WEATHER: Clear

PROBE TYPE Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT JPL Pasadena
 OPERATOR(S) T. Hoang
 ATM. PRESSURE (Patm): (start) 14.02 (finish) 14.01
 Temp: 24.11°C 22.08°C

DTW - 159.48'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
5	548	546	183.79	168.65	183.79	22.55	356.73	191.27	548	1228
4	436	435	135.01	128.44	135.01	21.64	263.97	172.03	436	1230
3	323	321	85.95	80.39	85.95	20.66	153.12	169.88	323	1232
2	243	241	51.10	46.49	51.10	19.85	74.91	168.09	243	1234
1	140	138	14.09	14.08	14.09	19.02	0.14	139.86	140	1236

Comments: Collar Detect is 6" above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-14
 DATE: 10/12/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1173.47
 WEATHER: Clear

PROBE TYPE: Westbay Sampler 0-500psi
 SERIAL NO.: 10/12/18
 PROJECT: JPL Pasadena
 OPERATOR(S): J. Hoary
 ATM. PRESSURE (Patm): (start) 13.97 (finish) 13.99
 Temp: 25.68°C 20.53°C

DTW - 192.47'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
5	540	538	165.92	151.01	165.92	23.75	316.15	223.85	540	1126
4	456	455	130.24	114.79	130.24	22.46	232.59	223.41	456	1128
3	382	380	96.41	82.72	96.41	21.78	158.61	223.39	382	1130
2	277	275	51.50	37.13	51.50	20.99	53.43	223.57	277	1132
1	207	205	20.97	14.07	20.97	20.46	0.23	206.77	207	2134

Comments: Collar Detect is 6" above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-17
 DATE: 10/17/18
 LOCATION: JPL
 ELEV. TOP OF WASTBAY CASING: 1191.21
 WEATHER: Clear
DTW - 208.25'

PROBE TYPE: Westbay Sampler 0-500psi
 SERIAL NO.: EMS 2502
 PROJECT: JPL Pasadena
 OPERATOR(S): T. Hoary
 ATM. PRESSURE (Patm): (start) 74.06 (finish) 14.08
 Temp: 26.74°C 16.85°C

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
5	726	723	239.47	205.57	239.47	20.52	441.81	284.19	726	1102
4	582	581	172.11	143.41	177.11	20.19	298.41	283.59	582	1104
3	468	467	127.61	99.56	127.61	19.07	197.25	270.75	468	1106
2	370	368	85.05	59.60	85.05	17.98	105.06	264.94	370	1108
1	250	248	32.84	14.22	32.84	16.91	0.37	249.63	250	1110

Comments: Collar Detect is 6" above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-18
 DATE: 10/12/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1225.41
 WEATHER: Clear

PROBE TYPE: Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT: JPL Pasadena
 OPERATOR(S): T. Harris
 ATM. PRESSURE (Palm): (start) 1397 (finish) 14.01
 Temp: 20.61°C 18.25°C

DTW - 293.85'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
5	684	681	184.31	169.74	184.31	20.71	359.36	324.64	684	0903
4	564	561	132.22	121.56	132.22	20.90	248.21	315.79	564	0905
3	424	422	71.39	66.90	71.39	20.03	122.11	301.89	424	0907
2	330	327	30.35	30.30	30.35	18.97	37.67	292.33	330	0909
1	270	268	14.11	14.13	14.11	18.31	0.37	269.63	270	0911

Comments: Collar Detect is 6" above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-19
 DATE: 10/12/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1142.94
 WEATHER: Clear
 DTW - 140.13'

PROBE TYPE: Westbay Sampler 0-500psi
 SERIAL NO. EMS2502
 PROJECT: JPL Pasadena
 OPERATOR(S): T. Hoarey
 ATM. PRESSURE (Patm): (start) 14.00 (finish) 14.02
 Temp: 17.70°C 18.95°C

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (oC)				
5	498	496	169.38 170.27	130.43	169.38 170.27	19.27	268.60	229.40	498	0835
4	444	442	145.99	107.16	145.99	19.39	214.92	229.08	444	0837
3	392	389	123.32	90.86	123.32	19.41	177.32	214.68	392	0839
2	314	312	90.35	57.16	90.35	19.28	99.57	214.43	314	0841
1	242	240	58.19	27.34	58.19	19.09	30.78	211.22	242	0843

Comments: Collar Detect is 6" above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-20
 DATE: 10/12/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1165.05
 WEATHER: Clear

PROBE TYPE: Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT: JPL Pasadena
 OPERATOR(S): T Hoag
 ATM. PRESSURE (Patm): (start) 73.99 (finish) 94.03
 Temp: 18.99°C 18.01°C

DTW - 240.04

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
5	900	896	301.34	299.52	301.34	20.20	658.72	241.28	900	0803
4	700	696	214.63	201.13	214.63	21.32	431.73	268.27	700	0805
3	562	559	154.70	143.25	154.70	21.01	298.20	263.80	562	0807
2	392	389	80.57	75.41	80.57	19.00	141.70	250.30	392	0809
1	230	228	14.12	14.11	14.12	18.06	0.28	229.72	230	0811

Comments: Collar Detect is 6" above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-21
 DATE: 10/12/18
 LOCATION: JPL
 ELEV. TOP OF WASTBAY CASING: 1059.10
 WEATHER: Clear

PROBE TYPE: Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT: JPL Pasadena
 OPERATOR(S): T. Hoenig
 ATM. PRESSURE (Patm): (start) 13.97 (finish) 17.06
 Temp: 23.77°C 19.58°C

DTW - 115.62'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
5	372	370	126.49	126.17	126.49	22.17	258.85	113.15	372	1032
4	310	309	99.39	99.33	99.39	21.49	196.93	113.07	310	1034
3	240	239	69.53	69.45	69.53	20.50	127.99	112.01	240	1036
2	161	161	35.03	35.31	35.03	20.00	49.23	111.77	161	1038
1	90	89	14.09	14.11	14.09	19.67	0.32	89.68	90	1040

Comments: Collar Detect is 2' above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-22
 DATE: 10/18/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1176.98
 WEATHER: Clear

PROBE TYPE: Westbay Sampler 0-500psi
 SERIAL NO.: EMS2502
 PROJECT: JPL Pasadena
 OPERATOR(S): T. Hoag
 ATM. PRESSURE (Patm): (start) 14.01 (finish) 14.03
 Temp: 17.51°C 18.31°C

DTW - 230.76'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
5	588	587	170.83	163.49	170.83	20.65	344.85	243.15	588	0714
4	467	467	118.18	112.97	118.18	21.36	228.30	238.70	467	0716
3	389	389	84.20	81.89	84.20	21.27	156.60	232.40	389	0718
2	329	328	58.03	55.75	58.03	20.97	96.29	232.71	329	0720
1	245	244	20.97	19.64	20.97	20.48	12.99	232.01	245	0722

Comments: Collar Detect is 1' above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-23
 DATE: 10/12/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1108.84
 WEATHER: Clear

PROBE TYPE: Westbay Sampler 0-500psi
 SERIAL NO.: FMS 2502
 PROJECT: JPL Pasadena
 OPERATOR(S): T. Hawkins
 ATM. PRESSURE (Patm): (start) 14.02 (finish) 14.03
 Temp: 23.07°C 20.86°C

DTW - 140.09'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
5	542	539	188.54	172.64	188.54	22.90	365.94	176.06	542	1156
4	445	443	146.91	130.70	146.91	22.73	269.18	175.82	445	1158
3	319	317	91.94	79.44	91.94	22.25	150.92	168.08	319	1200
2	254	252	63.73	51.30	63.73	21.72	86.00	168.00	254	1202
1	174	172	29.05	17.68	29.05	20.94	8.44	165.56	174	1203

Comments: Collar Detect is 1' above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-24
 DATE: 10/18/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1200.94
 WEATHER: Clear
 DTW -212.44'

PROBE TYPE: Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT: JPL Pasadena
 OPERATOR(S): T. Hockley
 ATM. PRESSURE (Patm): (start) 14.11 (finish) 14.13
 Temp: 21.56°C 20.55°C

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
5	678	677	215.49	187.66	215.49	22.41	400.38	277.62	678	1115
4	554	552	162.48	137.19	162.48	22.28	283.95	270.05	554	1117
3	435	434	111.82	88.58	111.82	21.93	171.80	263.20	435	1119
2	373	372	83.99	61.98	83.99	21.83	110.44	262.56	373	1121
1	279	279	43.15	23.05	43.15	22.05	20.62	258.38	279	1123

Comments: Collar Detect is 1' above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-25
 DATE: 10/12/18
 LOCATION: JPL
 ELEV. TOP OF WASTBAY CASING 934.53
 WEATHER: Clear

PROBE TYPE Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT JPL Pasadena
 OPERATOR(S) T. Honey
 ATM. PRESSURE (Patm): (start) 14.01 (finish) 14.04
 Temp: 15.91°C 20.02°C

PTW - 245.33'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (oC)				
5	713	710	217.32	205.09	217.32	18.86	440.82	272.18	713	0732
4	633	631	183.09	169.88	183.09	19.80	359.59	273.41	633	0734
3	503	501	126.64	117.18	126.64	20.17	238.01	264.99	503	0736
2	423	421	92.19	86.29	92.19	20.15	166.75	256.25	423	0738
1	358	356	63.82	59.86	63.82	20.04	105.78	252.22	358	0740

Comments: Collar Detect is 2' below sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-26
 DATE: 10/12/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING 1059.08
 WEATHER: clear

DTW - 66.05'

PROBE TYPE Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT JPL Pasadena
 OPERATOR(S) T. Hoang
 ATM. PRESSURE (Patm): (start) 14.60 (finish) 13.99
 Temp: 22.02°C 21.53°C

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
2	215	211	78.43	51.50	78.43	21.61	86.51	128.49	215	1012
1	135	132	43.61	17.63	43.61	20.86	8.37	126.63	135	1014

Comments: Collar Detect is 2' below sample port

WELL GAUGING DATA

Project # 181012-HH1 Date 10/20/18 Client Tidelwater

Site JPL, Pasadena, CA

Well ID	Well Size (in.)	Time Gauged	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC	
MW-1	4	1024					42.54	Ded pump	↓	
MW-5	4	0755					133.55	Ded pump		
MW-6	4	0752					DRY	239.00		
MW-7	4	0758					DRY	267.35		
MW-8	4	0751					197.91	Ded pump		
MW-9	4	1028					37.45	Ded pump		
MW-10	4	0747					147.40	Ded pump		
MW-13	— unable to access due to construction —									
MW-15	4	0846					48.31	Ded pump		
MW-16	4	0854					284.65	284.80		

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-3
 DATE: 10/26/18
 LOCATION: JPL
 ELEV. TOP OF WASTBAY CASING 1100.34
 WEATHER: Clear

PROBE TYPE Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT JPL Pasadena
 OPERATOR(S) T. Hoan
 ATM. PRESSURE (Patm): (start) 14.12 (finish) 14.13

DTW - ~~187.68~~ 187.58

Temp: 24.56°C 20.45°C

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (oC)				
5	653	650	217.05	218.59	217.05	23.60	471.71	181.29	653	1038
4	558	556	175.81	179.71	175.81	23.57	382.02	175.98	558	1040
3	346	343	83.64	88.13	83.64	23.63	170.74	175.26	346	1042
2	252	250	42.75	48.04	42.75	21.56	78.25	173.75	252	1044
1	172	170	14.23	16.84	14.23	19.87	6.28	165.72	172	1046

Comments: Collar Detect is 2' above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-4
 DATE: 10/20/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING 1082.84
 WEATHER: Clear

PROBE TYPE Westbay Sampler 0-500psi
 SERIAL NO. EMS2502
 PROJECT JPL Pasadena
 OPERATOR(S) T. Hoenig
 ATM. PRESSURE (Patm): (start) 19.19 (finish) 19.16
 Temp: 17.36°C 19.51°C

DTW ~~149~~ ¹⁵⁰ 156.25

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/(psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
5	513	512	169.89	171.08	169.89	19.72	362.06	150.94	513	0808
4	392	390	117.22	118.63	117.22	20.59	241.06	150.94	392	0810
3	322	320	86.70	88.29	86.70	20.77	171.06	150.94	322	0812
2	240	238	50.95	52.84	50.95	20.40	89.28	150.72	240	0814
1	150	148	14.24	16.31	14.24	19.55	5.01	144.99	150	0816

Comments: Collar Detect is 2' above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-11
 DATE: 10/26/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING 1139.3
 WEATHER: Clear

PROBE TYPE Westbay Sampler 0-500psi
 SERIAL NO. EMS2502
 PROJECT JPL Pasadena
 OPERATOR(S) T. Hoang
 ATM. PRESSURE (P_{atm}): (start) 14.10 (finish) 14.08
 Temp: 18.66°C 18.59°C

DTW - 198.35'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-P _{atm})*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (oC)				
5	639	637	204.05	190.72	204.05	19.95	407.46	231.54	639	0904
4	524	522	154.69	156.77	154.69	20.58	329.14	194.86	524	0906
3	429	426	113.71	113.02	113.71	20.12	228.21	200.79	429	0908
2	259	256	40.03	42.58	40.03	19.47	65.70	193.30	259	0910
1	149	146	14.23	19.64	14.23	18.66	12.78	136.22	149	0912

Comments: Collar Detect is 6" above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-12
 DATE: 10/26/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING 1102.14
 WEATHER: Clear

PROBE TYPE Westbay Sampler 0-500psi
 SERIAL NO. EMS2502
 PROJECT JPL Pasadena
 OPERATOR(S) T. Hays
 ATM. PRESSURE (Palm): (start) 74.14 (finish) 14.12
 Temp: 17.71°C 19.31°C

DTW - 159.48'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
5	548	546	183.97	168.20	183.97	18.91	355.42	192.58	548	0835
4	436	435	135.41	128.09	135.41	19.80	262.88	173.12	436	0837
3	323	321	86.02	79.99	86.02	19.43	151.92	171.08	323	0839
2	243	241	51.29	46.05	51.29	18.91	73.62	169.38	243	0841
1	140	138	14.21	14.17	14.21	18.37	0.07	139.93	140	0843

Comments: Collar Detect is 6" above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-14
 DATE: 10/26/18
 LOCATION: JPL
 ELEV. TOP OF WASTBAY CASING 1173.47
 WEATHER: Clear

PROBE TYPE Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT JPL Pasadena
 OPERATOR(S) T. Hooley
 ATM. PRESSURE (Patm): (start) 19.09 (finish) 14.10
 Temp: 21.07°C 20.77°C

DTW - 192.59'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (oC)				
5	540	538	1165.90	150.44	165.90	21.23	314.56	225.44	540	0930
4	456	455	129.47	114.21	129.47	21.20	230.98	225.02	456	0932
3	382	380	97.10	82.12	97.10	20.94	156.95	225.05	382	0934
2	277	275	51.53	36.60	51.53	20.12	51.93	225.07	277	0936
1	207	206	20.98	14.16	20.98	19.80	0.16	206.84	207	0938

Comments: Collar Detect is 6" above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-17
 DATE: 10/26/18
 LOCATION: JPL
 ELEV. TOP OF WASTBAY CASING: 1191.21
 WEATHER: Clear
 DTW - 208.34'

PROBE TYPE: Westbay Sampler 0-500psi
 SERIAL NO.: EMS 2502
 PROJECT: JPL Pasadena
 OPERATOR(S): T. Hoarey
 ATM. PRESSURE (Patm): (start) 19.09 (finish) 19.10
 Temp: 23.49°C 22.05°C

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (oC)				
5	726	723	239.25	195.70	239.25	19.58	418.97	307.03	726	1117
4	582	581	176.77	140.24	176.77	19.84	291.03	290.97	582	1120
3	468	467	127.02	98.23	127.02	19.17	194.11	273.89	468	1122
2	370	368	84.97	58.85	84.97	18.36	103.26	266.74	370	1124
1	250	248	32.74	14.21	32.74	17.47	0.28	249.72	250	1126

Comments: Collar Detect is 6" above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-18
 DATE: 10/20/18
 LOCATION: JPL
 ELEV. TOP OF WASTBAY CASING 1225.41
 WEATHER: Clear

PROBE TYPE Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT JPL Pasadena
 OPERATOR(S) T. Hoang
 ATM. PRESSURE (Patm): (start) 17.06 (finish) 14.08
 Temp: 23.93°C 19.95°C

DTW - 293.99'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
5	684	681	184.31	169.55	184.31	22.26	358.72	325.28	684	1227
4	564	562	132.26	121.02	132.26	21.87	246.76	317.24	564	1229
3	424	421	71.35	66.46	71.35	20.65	120.89	303.11	424	1231
2	330	327	31.25 30.85	27.94	31.25 30.35	18.39	32.02	297.98	330	1233
1	270	268	14.19	14.16	14.19	17.85	0.23	269.77	270	1235

Comments: Collar Detect is 6" above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-19
 DATE: 10/26/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING 1142.94
 WEATHER: clear

PROBE TYPE Westbay Sampler 0-500psi
 SERIAL NO. EMS2502
 PROJECT JPL Pasadena
 OPERATOR(S) T. Hoas
 ATM. PRESSURE (Patm): (start) 14.07 (finish) 14.09
 Temp: 26.12°C 22.39°C

DTW - 140.22'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (oC)				
5	498	495	169.22	129.87	169.22	23.02	267.15	230.85	498	1204
4	444	442	145.93	106.60	145.93	21.97	213.47	230.53	444	1206
3	392	390	123.47	90.37	123.47	21.32	176.02	215.98	392	1208
2	314	312	89.51	56.68	89.51	20.79	98.30	215.70	314	1210
1	242	240	58.22	26.84	58.22	20.24	29.46	212.54	242	1212

Comments: Collar Detect is 6" above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-20
 DATE: 10/26/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1165.05
 WEATHER: Clear
 DTW - 240.85'

PROBE TYPE: Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT: JPL Pasadena
 OPERATOR(S): J. Hoang
 ATM. PRESSURE (Patm): (start) 74.02 (finish) 14.03
 Temp: 26.09°C 27.85°C

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (oC)				
5	900	896	301.15	299.11	301.15	23.30	657.70	242.30	900	1317
4	700	696	214.72	200.96	214.72	22.54	431.27	268.73	700	1321
3	562	560	154.82	142.36	154.82	21.59	296.08	265.92	562	1323
2	392	390	80.75	75.05	80.75	19.99	140.80	251.20	392	1325
1	230	227	14.22	14.19	14.22	18.53	0.39	229.61	230	1327

Comments: Collar Detect is 6" above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-21
 DATE: 10/26/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1059.10
 WEATHER: Clear

PROBE TYPE: Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT: JPL Pasadena
 OPERATOR(S): J. Hourney
 ATM. PRESSURE (Patm): (start) 14.14 (finish) 14.15
 Temp: 21.50 °C 19.46 °C

DTW - 115.73'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (oC)				
5	372	370	126.62	125.69	126.62	20.99	257.35	114.65	372	0951
4	310	309	100.32	98.84	100.32	20.59	195.40	114.60	310	0953
3	240	238	69.58	68.98	69.58	20.14	126.52	113.48	240	0955
2	161	160	35.17	34.85	35.17	19.76	47.78	113.22	161	0957
1	90	89	14.23	14.18	14.23	19.47	0.09	89.91	90	0959

Comments: Collar Detect is 2' above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-23
 DATE: 10/26/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING 1108.84
 WEATHER: Clear

PROBE TYPE Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT JPL Pasadena
 OPERATOR(S) T. Hickey
 ATM. PRESSURE (Patm): (start) 14.08 (finish) 14.09
 Temp: 20.24°C 20.22°C

DTW - 140.20'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
5	542	540	188.76	172.27	188.76	20.77	364.94	177.06	542	0723
4	445	443	146.76	130.31	146.76	21.12	268.14	176.86	445	0725
3	319	318	91.88	78.98	91.88	20.79	149.72	169.28	319	0727
2	254	253	63.86	50.85	63.86	20.58	84.83	169.17	254	0729
1	174	172	29.17	17.25	29.17	20.26	7.31	166.69	174	0731

Comments: Collar Detect is 1' above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-24
 DATE: 10/26/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1200.94
 WEATHER: Clear

PROBE TYPE: Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT: JPL Pasadena
 OPERATOR(S): J. H...
 ATM. PRESSURE (Palm): (start) 14.08 (finish) 14.11
 Temp: 16.99°C 18.95°C

DTW - 212.60'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
5	678	677	215.68	186.64	215.68	20.68	398.10	279.90	678	0701
4	554	552	162.05	136.42	162.05	21.30	282.24	271.76	554	0703
3	435	433	110.39	88.16	110.39	21.38	170.90	264.10	435	0705
2	373	372	83.49	61.53	83.49	21.43	109.47	263.53	373	0707
1	279	279	42.79	22.62	42.79	21.80	19.70	259.30	279	0709

Comments: Collar Detect is 1' above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-25
 DATE: 10/26/18
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 934.53
 WEATHER: Clear

PROBE TYPE: Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT: JPL Pasadena
 OPERATOR(S): T. Hoang
 ATM. PRESSURE (Patm): (start) 14.10 (finish) 14.13
 Temp: 26.55°C 24.05°C

DTW - 245.49'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (oC)				
5	713	710	217.50	204.92	217.50	24.112	440.22	272.78	713	1355
4	633	631	183.26	169.66	183.26	23.53	358.88	274.12	633	1357
3	503	501	126.84	116.98	126.84	22.61	237.34	265.66	503	1359
2	423	421	92.25	86.12	92.25	21.86	166.15	256.85	423	1401
1	358	356	63.93	59.67	63.93	21.39	105.13	252.87	358	1403

Comments: Collar Detect is 2' below sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-26
 DATE: 10/26/18
 LOCATION: JPL
 ELEV. TOP OF WASTBAY CASING 1059.08
 WEATHER: Clear

PROBE TYPE Westbay Sampler 0-500psi
 SERIAL NO. EMS 2502
 PROJECT JPL Pasadena
 OPERATOR(S) T. Hoang
 ATM. PRESSURE (Patm): (start) 14.10 (finish) 14.07
 Temp: 28.11°C 23.31°C

DTW - 66.25'

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
2	215	211	78.32	50.93	78.32	25.45	84.97	130.03	215	1256
1	135	132	43.51	17.12	43.51	23.51	6.97	128.03	135	1258

Comments: Collar Detect is 2' below sample port