



January 16, 2017
Project No. 2015.0171

Mr. Jim Bennett, CHG
County of San Diego
Planning and Development Services
5510 Overland Avenue
San Diego, CA 92123

MONTHLY GROUNDWATER MONITORING REPORT – DECEMBER 2016
TULE WIND CONSTRUCTION PROJECT
EAST SAN DIEGO COUNTY, CALIFORNIA

On behalf of Avangrid Renewables, LLC (Avangrid), Geo-Logic Associates (GLA) is pleased to provide this letter presenting daily water level data and weekly flowmeter readings from project construction-related wells (production wells 6, 6a, and 8, and piezometer PZ-1) on Rough Acres Ranch. In accordance with the requirements established in the County of San Diego Planning and Development Services in the Major Use Permit 3300 09-019, weekly groundwater production data must be recorded from wells 6, 6a and 8, and daily water level data measured in the piezometer (PZ-1) and in wells 6 and 8. This report presents a summary of the collected data obtained beginning on December 6, 2016 when the project began through December 20, 2016, when construction operations were suspended for the Christmas and New Years holidays; no measurements were obtained during the period from December 21 through December 31 when there were no construction activities.

For this work, initially GLA met with representatives of Avangrid, LG Equipment, and Rough Acres Ranch and provided training and instruction on water level and flowmeter protocols for the Tule Wind construction project. Daily water levels and weekly flowmeter readings are being obtained by Carol Brady with LG Equipment. Additionally, wells 6, 8, 8a and PZ-1 are equipped with a pressure transducer to measure and record water level data, which can be uploaded to corroborate the manual measurements throughout the course of the construction program. Well 6a is a non-community public water supply well, supplying water to Rough Acres Ranch, and a pressure transducer cannot be inserted into this well; collection of water levels in this well is not required.

Weekly Flow Meter Readings. Flowmeter readings at each well are recorded on field forms, provide in Attachment 1. Based on the flow meter readings obtained during the December 2016 period, the following water volumes were pumped, and stored or applied:

December 2016 Water Production Totals

Well	Gallons Pumped	Acre-Feet Pumped
Well 6	1,322,965	4.06
Well 6a	467,500	1.43
Well 8	385,938	1.18

Note: Total volumes represent water pumped to storage (lake or tanks)

Daily Water Level Data. During the December 2016 period, water levels were measured manually in Wells 6, 8, and PZ-1 each construction day and recorded on field forms (Attachment A). However, an obstruction in Well 8 at a depth of about 240 feet, the top of the pressure transducer, prevented collection of water level data during most of the month, when the well was pumping. In lieu of measurements from Well 8, Ms. Brady measured water levels in Well 8a located 286 feet east of Well 8. Table 1 presents a summary of the manual measurements obtained during the month. Quarterly pressure transducer charts are provided in Attachment A.

CLOSING

This monthly report pertains to the Avangrid Tule Wind Project. It may not be appropriate for other projects or for other sites. If you have any questions, please contact me.

Sincerely,
Geo-Logic Associates



Sarah J. Battelle, CHG 609
Principal Geologist

Attachments:

Table 1 – Manual Water Level Measurements

Attachment A - Groundwater Production Weekly Flowmeter Readings

Water Level Charts – Wells 6, 8, and PZ-1

Table 1
Manual Water Level Measurements
Tule Wind Project Monitoring Wells

Well Information				
	6	8	8a	PZ-1
Depth below TOC:				
11/18/2016	30.68	242.90	30.70	31.30
Construction Begins				
12/6/2016	106.50	156.10	30.00	30.00
12/7/2016	105.10	212.35	31.90	31.90
12/8/2016	117.10	>240	31.20	31.20
12/9/2016	123.80	>240	33.90	33.90
12/12/2016	122.30	>240	35.30	32.20
12/13/2016	125.80	>240	35.70	32.30
12/14/2016	129.40	>240	37.80	32.40
12/15/2016	128.90	>240	38.00	32.30
12/16/2016	Rain Day No Construction			
12/19/2016	120.30	>240	36.00	32.30
12/20/2016	48.50	>240	37.30	32.30
Construction Suspended from 12/21/2016 to 1/3/2017 for Holiday				

ATTACHMENT A

Groundwater Production Weekly Flowmeter Readings

Water Level Charts – Wells 6, 8, and PZ-1

GROUNDWATER PRODUCTION
WEEKLY FLOWMETER RECORD SHEET

	Piezometer P8-1	Piezometer 8A
Date	Depth to Water	Depth to Water
11/18/2016	31.30	30.70
12/6/2016	31.70	30.00
12/7/2016	31.90	31.90
12/8/2016	31.80	31.20
12/9/2016	31.09	33.90

Total Gallons	Total Daily Average
990,463	165,077.18
Days Left (Max 19 Mil)	109
Total Acre Foot	3.039616

Well Location: WELL 6						
Date	Time	Meter Reading	Total Gallons	Average Daily Use	Depth to Water	Comments
11/18/2016		664,935	-		30.68	This Well feeds the Lake and
12/6/2016		1,145,800	480,865		108.5	the 3 towers at Well 6
12/7/2016		1,222,070	76,270		105.1	
12/8/2016		1,287,100	65,030		117.2	
12/9/2016		1,362,200	75,100		123.8	
Total for week			697,265	99,609.29		

Well Location: WELL 6 A						
Date	Time	Meter Reading	Total Gallons	Average Daily Use	Depth to Water	Comments
11/18/2016		30,740,255	-		31.05	This Well feeds the Ranch and
12/6/2016		30,841,200	100,945		40.06	1 tower at Rough Acres
12/7/2016		30,841,200	-			
12/8/2016		30,878,100	36,900			
12/9/2016		30,947,200	69,100			This Well has a blockage
Total for week			206,945	29,563.57		

Well Location: Rough Acres						
Date	Time	Meter Reading	Total Gallons	Average Daily Use	Well 6A	Comments
12/5/2016		4,335,200	-			
12/7/2016		4,349,600	14,400			
12/8/2016		4,358,900	9,300			
12/9/2016		4,416,300	57,400			
12/10/2016		4,450,500	34,200			
12/11/2016		4,508,000	57,500			
Total for week			172,800	24,685.71		
Ranch Use			34,145			

Well Location: WELL 8						
Date	Time	Meter Reading	Total Gallons	Average Daily Use	Depth to Water	Comments
11/18/2016		1,054	-		242.9	This Well feeds the 3 towers
12/6/2016		4,780	27,870		156.1	at well 8
12/7/2016		7,420	19,747		212.35	
12/8/2016		11,260	28,723			This Well has a blockage at 240ft
12/9/2016		15,100	28,723			
12/10/2016		17,150	15,334			
Total for week			120,398	17,199.73		

GROUNDWATER PRODUCTION
WEEKLY FLOWMETER RECORD SHEET

Piezometer PZ-1

Date	Depth to Water	
11/18/2016	31.30	
12/12/2016	32.20	
12/13/2016	32.30	
12/14/2016	32.40	
12/15/2016	32.30	
12/19/2016	32.30	
12/20/2016	32.30	

Total Gallons	1,185,940
Total Acre Foot	3.639511

Well Location: WELL 6						
Date	Original Reading	Meter Reading	Total Gallons	Average Daily Use	Depth to Water	Comments
11/18/2016	664,935	1,362,200	-		30.68	This Well feeds the Lake and
12/12/2016		1,569,800	207,600		122.3	the 3 towers at well 6
12/13/2016		1,699,000	129,200		125.8	
12/14/2016		1,780,200	81,200		129.4	
12/15/2016		1,853,100	72,900		128.9	
12/16/2016		1,853,100	-		120.3	
12/19/2016		1,871,400	18,300		48.5	
12/20/2016		1,987,900	116,500			
Total for week			625,700	89,385.71		

Well Location: WELL 6 A						
Date	Original Reading	Meter Reading	Total Gallons	Average Daily Use	Depth to Water	Comments
11/18/2016	30,740,255	30,947,200	-		31.05	This Well feeds the Ranch and
12/12/2016		31,051,800	104,600			the one tower Rough Acres
12/13/2016		31,108,100	56,300			
12/14/2016		31,168,700	60,600			
12/15/2016		31,233,400	64,700			
12/16/2016		31,233,400	-			
12/19/2016		31,272,500	39,100			
12/20/2016		31,284,500	12,000			
Total for week			337,300	48,185.71		

Well Location: Rough Acres						
Date	Original Reading	Meter Reading	Total Gallons	Average Daily Use	Well 6A	Comments
12/5/2016	4,335,200	4,508,000	-			This is the meter for the tower at
12/12/2016		4,561,700	53,700			Rough Acres
12/13/2016		4,567,700	6,000			
12/14/2016		4,632,700	65,000			
12/15/2016		4,655,100	22,400			
12/16/2016		4,749,500	94,400			
12/19/2016		4,769,800	20,300			
12/20/2016		4,802,700	32,900			
Total for week			294,700	42,100.00		
Ranch Use			42,600			

Well Location: WELL 8		Cubic Feet				
Date	Original Reading	Meter Reading	Total Gallons	Average Daily Use	Depth to Water	Comments
11/18/2016	1,054	17,150	-		242.9	This Well feeds the 3 towers
12/12/2016		24,700	56,474			at well 8
12/13/2016		28,590	29,097			
12/14/2016		33,960	40,168			This well has a blockage at 240ft
12/15/2016		38,190	31,640			
12/16/2016		42,710	33,810			
12/19/2016		50,830	60,738			
12/20/2017		52,650	13,614			
Total for week			265,540	37,934.29		

GROUNDWATER PRODUCTION SUMMARY

Piezometer PZ-1

Date

Depth to Water

11/18/2016	31.30	
12/20/2016	32.30	

Production Summary		Total Acre Foot
WELL 6/6A	1,790,465	5.494728
WELL 8	385,938	1.184399
TOTAL	2,176,403	6.679126949
RANCH USE	76,745	

Well Location: WELL 6

Date	Meter Reading	Date	Meter Reading	Total Gallons	Depth to Water
11/18/2016	664,935	12/20/2016	1,987,900	1,322,965	30.68
				-	
				-	
				-	
			-	-	
			-	-	
			-	-	
TOTAL			-	1,322,965	

Well Location: WELL 6A

ROUGH ACRES

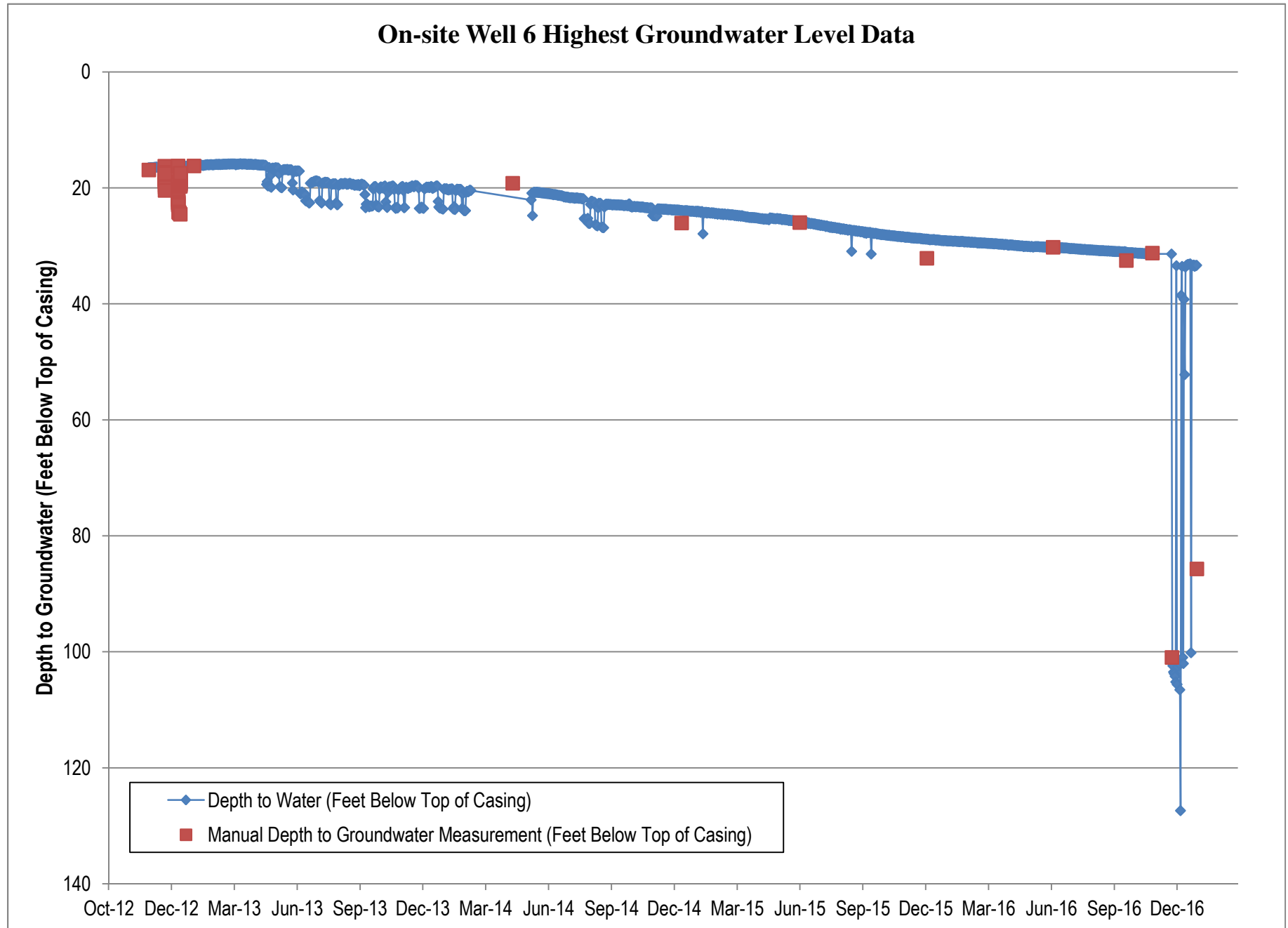
Date	Meter Reading	Date	Meter Reading	Total Gallons	Depth to Water
12/5/2016	4,335,200	12/20/2016	4,802,700	467,500	31.05
			-	-	
			-	-	
			-	-	
TOTAL			-	467,500	

Well Location: WELL 8

Cubic Feet

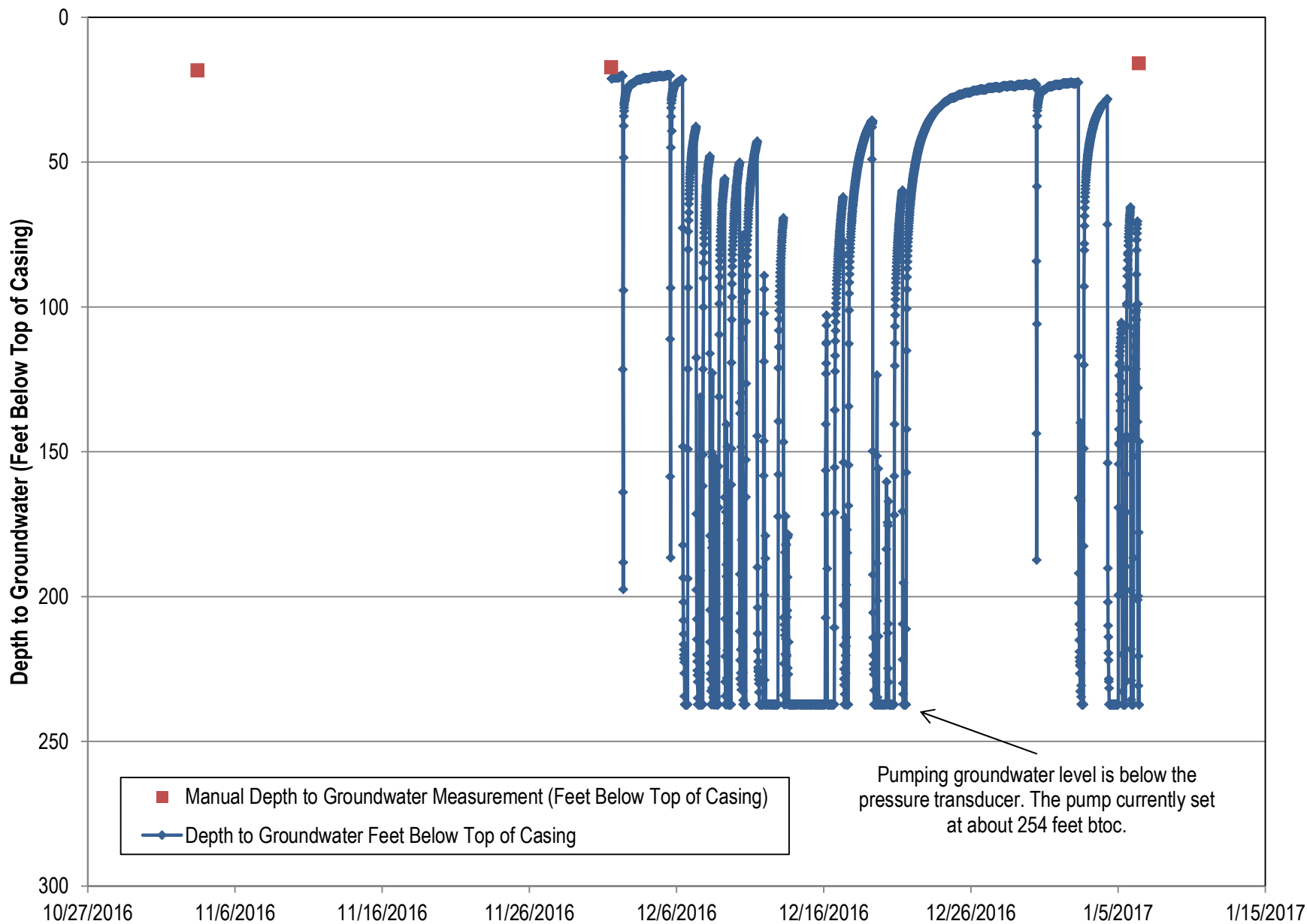
Date	Meter Reading	Date	Meter Reading	Total Gallons	Depth to Water
11/18/2016	1,054	12/20/2016	52,650	385,938	242.9
			-	-	
			-	-	
			-	-	
TOTAL			-	385,938	

Long-Term Groundwater Level Monitoring - Rough Acres Ranch



Long-Term Groundwater Level Monitoring - Rough Acres Ranch

On-site Well 8 Groundwater Level Data - 2016



Long-Term Groundwater Level Monitoring - Rough Acres Ranch

