



June 16, 2016

Job No. 8596.001

Anna Louzon c/o Yolo County CSA Administrative Support Team  
625 Court Street, Room 202  
Woodland, CA 95695

**Subject: Willowbank County Service Area – Willowbank Farms, LLC Oakside Well Supplemental Well Evaluation**

Wood Rodgers, Inc. (Wood Rodgers) is pleased to provide the Water Subcommittee of the Willowbank County Service Area (CSA) with this supplemental well evaluation of an irrigation well (Oakside Well) owned by Willowbank Farms, LLC (Willowbank Farms). The purpose of this evaluation is to determine if the Oakside Well is a viable option to serve the estimated irrigation demands in the CSA (approximately 600 gallons per minute with a 55 horsepower motor). Previously owned by Nishikawa Farms, the well is located south of the CSA, approximately 1,200 feet south of Montgomery Avenue and 1,300 feet east of Drummond Lane, in Yolo County, as shown in Figure 1. Nishikawa Farms leased the land to tenant growers, most recently to Robben Farms. This report is intended to transmit research conducted to obtain data regarding the construction and operation of the agricultural well with respect to providing landscape irrigation water to the CSA. A site visit was not a part of this scope of work.

## **WELL RESEARCH**

Wood Rodgers' research consisted of submitting record requests of well construction to the State of California Department of Water Resources (DWR) and Yolo County, interviewing previous owner/operators, and groundwater well pump contractors. Our record request to both the DWR and Yolo County did not return a well record for this well, or any well on the land parcel.

On contact with Tim Ruff, manager of Willowbank Farms, he indicated he did not have any records on the well and was only able to relay that the well is decades old. Wood Rodgers was directed to Spencer Bei who previously managed the property for Robben Farms. Mr. Bei confirmed that the well in question was located approximately 1,200 feet south of Montgomery Avenue. Mr. Bei indicated the well is equipped with a 30 horsepower (hp) motor and was consistently pumped at a flow rate of approximately 1,000 gallons per minute (gpm) over three or four irrigation seasons. Mr. Bei also reported that approximately three or four years ago, AlSCO-Geyer Irrigation, of Arbuckle, California, installed a new motor, pump, and column pipe, with a pump setting depth of approximately 180 feet. He reported that there were no operational issues with the well.

Alsco-Geyer Irrigation was contacted to obtain records of the reported work. Wood Rodgers was provided a well video inspection report, dated January 16, 2013 and work invoices dated March 20, 2013 and August 29, 2013 (attached). Below is a summary for each of the records:

### ***Well Video Survey Report***

The well video report was conducted by Sullivan Subterranean Services, of Orland, California. The reason for the video inspection report is listed as “general inspection”.

- Static water level was observed to be 36.3 feet
- Well pump setting depth was 90 feet
- The well casing is 12-inch inside diameter
- The well casing was reported to be broken at depths of 113 and 114 feet
- Well is screened from 106 feet to 131 feet
- Total measured depth is 131 feet (top of sediment fill)
- The well casing was reported to have heavy buildup

### ***Alsco-Geyer Irrigation – Work Invoice Dated March 20, 2013***

- A 30 hp motor was installed (US Motor Mod/BF42 #H030525B)
- The pump was installed 90 feet of column pipe
- The pump bowls were reported to be repaired

### ***Alsco-Geyer Irrigation – Work Invoice Dated August 29, 2013***

- New pump bowls were installed (Model JP12” DC-3Stage)
- 120 feet of new column pipe was installed
- There is no line item for hp (it was noted on the email from Alsco-Geyer it may be a 60 hp motor)

## **SUMMARY & CONCLUSIONS**

Based on the available records and anecdotal information, the Oakside Well is constructed to a depth of at least 131 feet, with well screen starting at 106 feet below the top of casing and continuing to 131 feet, with a horizontal slot (possibly louver) pattern. The well casing is reported to have breaks (possible separation) at depths of 113 and 114 feet. The blank well casing and well screen have heavy encrustation, which is typical of older wells. The well was reported to produce upwards of 1,000 gpm over four irrigation seasons; however, no testing data (flow rate and pumping water level data) was available for review to assess this account.

The pump and bowls were repaired/replaced twice in 2013, with no explanation as to the reason. Additionally, the pump was lowered by 30 feet in August of 2013, from 90 feet to 120 feet (which is inconsistent with the anecdotal information). One possible reason for multiple pump/bowl replacements is that the well produces sand which can result in premature wear and failure of the pump bowls. The breaks in the casing could also result in sand production, as well as a source for fill material in the bottom of the well. As such, the well may deeper than recorded in the video survey.

From the available records, it appears the Oakside Well can provide the 600 gpm needed to service the Willowbank irrigation demand. It also appears the existing 30 hp pump motor may not provide sufficient water pressures during peak usage. However, it is difficult to provide a conclusion as to the remaining life of this well for landscape irrigation of the CSA. The age of the well structure is unknown (however reported to be decades old) and its condition is undetermined with regard to the reported casing breaks and unknown reason(s) for multiple replacement of the pump bowls. Well testing and production rates are currently unverified and water quality will still need to be assessed to determine if it is acceptable for the intended use. It is also difficult to determine if this well can meet the CSA objectives without further assessment.

### RECOMMENDATIONS

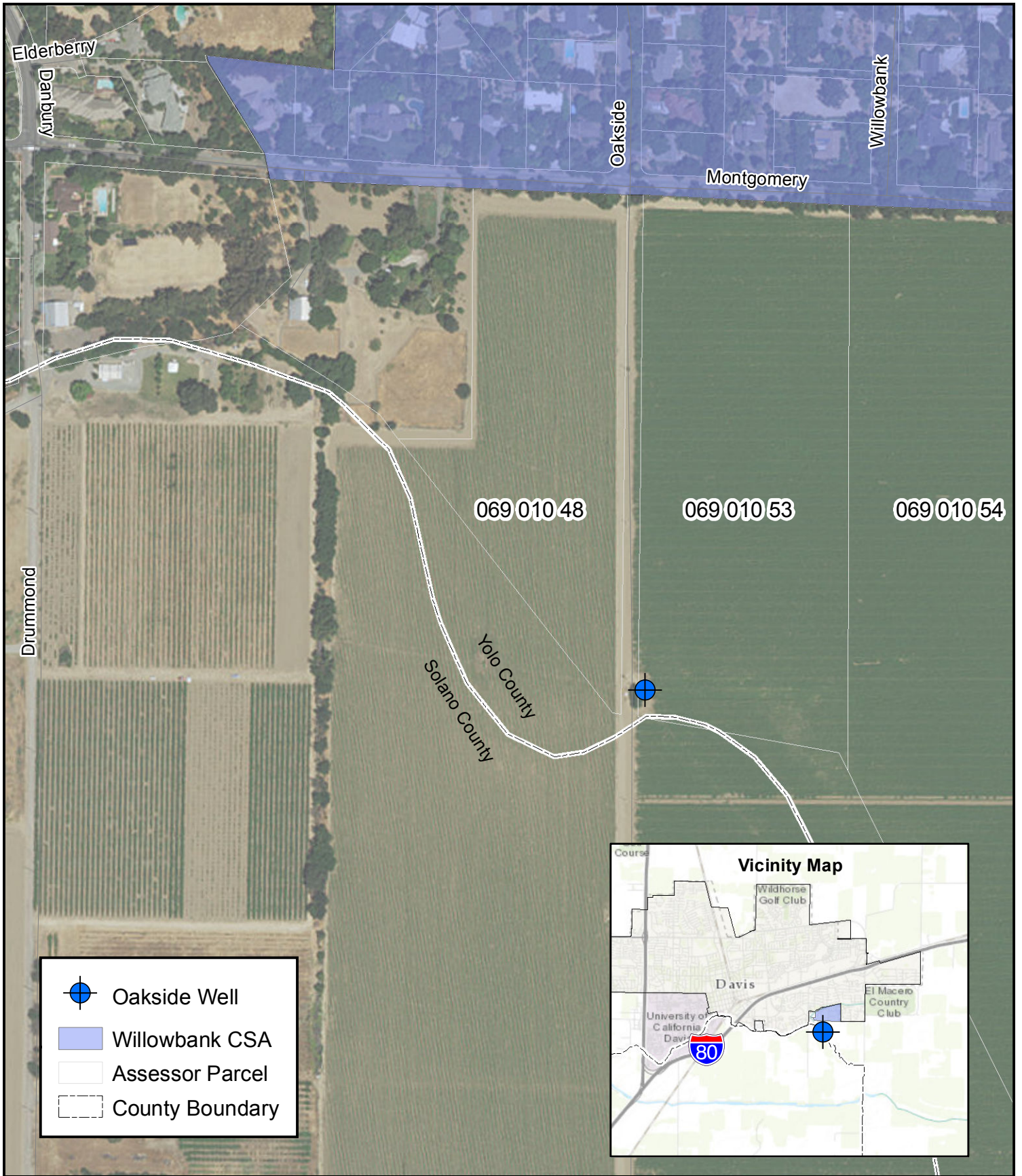
- A site visit should be conducted to confirm the motor horsepower and to visually assess the condition of the pumping station (i.e. motor condition, electrical, discharge piping).
- Assuming adequate access for water level measurements and an existing flow meter, conduct a pumping test with the existing pump to document groundwater levels (static and pumping), flow rate, specific capacity (gallons pumped per foot of water level drawdown), and sand production.
- Obtain water samples and analyze for suitability for landscape irrigation.
- Re-assess and prepare report to the feasibility of providing landscape irrigation from this well.

Estimated costs to conduct the additional assessment, as outlined above, would be approximately \$4,000. Wood Rodgers would be pleased to provide a scope of work to conduct the additional assessment. We look forward to assisting the Water Subcommittee of the Willowbank County Service Area with groundwater development to meet irrigation needs. If you have any questions or if you need any additional information, please contact me at (916) 326-5368.

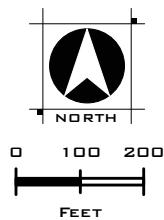
Sincerely,



Sean J. Spaeth, PG, CHG  
Project Hydrogeologist



WILLOWBANK CSA  
 OAKSIDE WELL LOCATION MAP  
 YOLO COUNTY, CALIFORNIA  
 JUNE, 2016



NOTES

# AlSCO-Geyer Irrigation, Inc.

700 5TH Street \* PO Box 111  
Arbuckle, CA 95912  
530/476-2253 Fax: 476-2256

**DUPLICATE  
INVOICE**

Invoice #	3225719
Date	03/20/13
Page #	1

<b>Bill To:</b> 14-6123 NISIKAWA FARMS P.O.BOX 1257 DAVIS, CA 95617	<b>Ship To:</b> CONNECT 30HP TURBIN
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Order #	Order Date	Customer	Sls	P/O #	Ship Via	Ship Date	Terms
0307711	03/20/13	146123	200			03/20/13	11
			GENE MARTINEZ				NET 10TH

Order	Ship	B/O	Item #/Description	UM	Cost	Extended
1	1	0	BOWLS REPAIR		1562.50	1562.50
1	1	0	HD NUT 1-3/16		56.25	56.25
4	4	0	8"X20'BUTT COLUMN PIPE		556.25	2225.00
4	4	0	2"X1-3/16"X20' T+S		425.00	1700.00
1	1	0	8"X10'TOE SUCTION PIPE		325.00	325.00
1	1	0	8"CONE STRAINER		87.50	87.50
1	1	0	8"DISCHARGE HEAD		1950.00	1950.00
1	1	0	US MOTOR 30HP MOD/BF42 #H03052B	LG	2625.00	2625.00
3	3	0	#32 TURBIN OIL		23.25	69.75
3	3	0	BESTOFLIFE GREASE		39.96	119.88
2	2	0	42-31004	EA	5.31	10.62
			8 X 2 BLACK WIDOW SPIDER			
1	1	0	AIM MACHINE HD SHFT		31.25	31.25
1	1	0	VIDEO SURVEY		600.00	600.00
10	10	0	1"SCH 40 CONDUIT		.44	4.40
2	2	0	1"SCH 40 EL		1.85	3.70
1	1	0	1" T-A		.51	.51
1	1	0	1"F-A		.58	.58
7	7	0	1"LIQUID TIGHT FLEX		3.83	26.81
2	2	0	1"LIQUID TIGHT STR CONN		6.05	12.10
3	3	0	#4 SPLIT BOLT CON		4.28	12.84
100	100	0	#6 COPPER		.59	59.00
			LABOR			3000.00

	<i>Sales Amount</i>	14482.69
	<i>Discount</i>	.00
	<i>Sales Tax</i>	229.65
	<i>Freight</i>	.00
	<b>Total Due</b>	<b>14712.34</b>

Mace Blvd.  
West  
304P Well

I-1 Field

**WELLBORE  
VIDEO REPORT**

**KNS Well Data**  
PO Box 54 Elverta, CA. 95626  
Phone: 530-774-6986

Client: AlSCO-Geyer Survey Date: January 16, 2013  
 Address: PO Box 111 Invoice: 551663 Run: 1  
 City: Arbuckle State: CA Zip: 95912 Well Name: Robbins Farm  
 Requested By: Gene Martinez P.O.: \_\_\_\_\_ Well Owner: Robbins Farm  
 Copy To: Charlie Sullivan Camera: CCV Color Flip Camera  
 Reason For Survey: General Inspection Zero Datum: Top Of Casing  
 Location: 1/4 Mile South of Montgomery Ave, 3/4 Miles West of CR 104, Davis  
 Field: \_\_\_\_\_ Depth: 131.0 Vehicle: \_\_\_\_\_  
 County: \_\_\_\_\_ Country: \_\_\_\_\_ Type Perfs: Horizontal Slots  
 Perf Intervals: 106-131  
 1st Csg I.D.: 12 in. Csg Weight: \_\_\_\_\_ From: 0 ft. To: 131.0 ft. 2nd Csg I.D.: \_\_\_\_\_ Csg Weight: \_\_\_\_\_ From: \_\_\_\_\_ To: \_\_\_\_\_  
 I.D Reference: Measured Casing Buildup: Very Heavy S.W.L.: 36.3 ft. P.W.L.: ft. Pump Depth: 90 ft.  
 Operator: Shaun Hayworth Latitude: 38° 32' 8.3112" N Longitude: 121° 42' 31.0932" W Section: \_\_\_\_\_ Range: \_\_\_\_\_ Township: \_\_\_\_\_  
 Other Information: \_\_\_\_\_

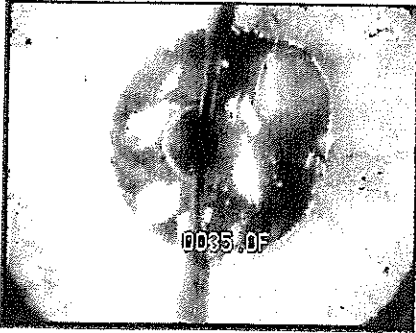
NOTE: Latitude and Longitude Values determined using a recreational GPS accurate to about +/- 45 feet.

WELLBORE SNAPSHOTS	DEPTHS (SideScan-Feet)	WELLBORE / CASING INFORMATION
	36.3	Static Water Level with Oil Layer
	106.2-131.0	Perforations
	113.2	Break
	114.3	Break
	131.0	Well Bottom with Fill

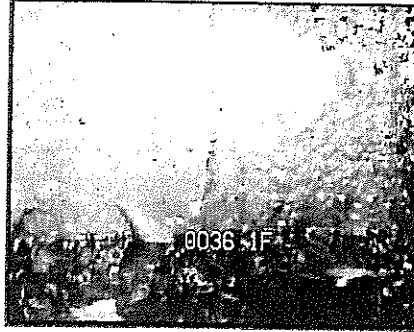
Notes: Breaks at 113.2 and 114.3

# WELLBORE SNAPSHOT(S)

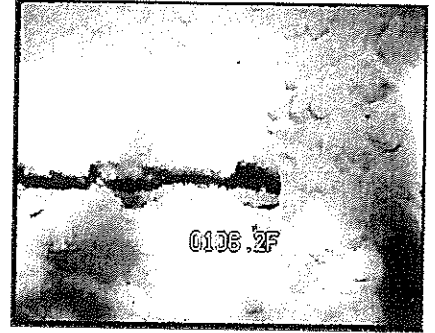
Depth: 35 Feet



Depth: 36.1 Feet



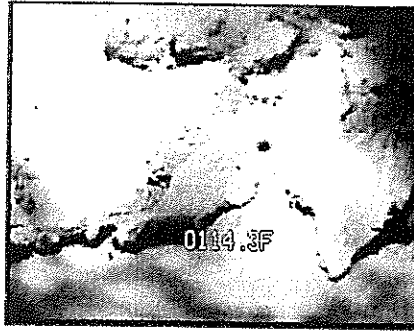
Depth: 106.2 Feet



Depth: 113.2 Feet



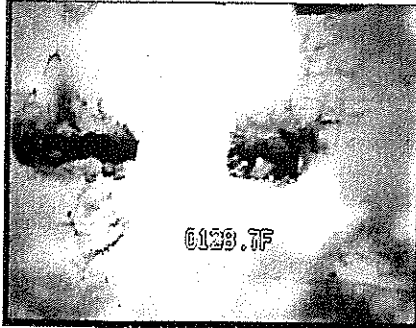
Depth: 114.3 Feet



Depth: 117.3 Feet



Depth: 128.7 Feet



Depth: 131 Feet



# AlSCO-Geyer Irrigation, Inc.

700 5TH Street \* PO Box 111  
Arbuckle, CA 95912  
530/476-2253 Fax: 476-2256

**DUPLICATE  
INVOICE**

Invoice #	3232261
Date	08/29/13
Page #	1

<b>Bill To:</b> 14-6123 NISIKAWA FARMS P.O.BOX 1257 DAVIS, CA 95617	<b>Ship To:</b> C/O ROBBEN FARMS REPAIR JOHNSTON PUMP
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Order #	Order Date	Customer	Sls	P/O #	Ship Via	Ship Date	Terms
0314429	08/29/13	146123	200			08/29/13	11 NET 10TH
				GENE MARTINEZ			

Order	Ship	B/O	Item #/Description	UM	Cost	Extended
1	1	0	NEW BOWL MODEL JP12" DC-3STAGE		3062.50	3062.50
1	1	0	8" CONE STRAINER		86.63	86.63
1	1	0	8"TOE SUCTION PIPE		325.13	325.13
6	6	0	10"X20 COLUMN BUTT PIPE		766.25	4597.50
1	1	0	10"X5' COLUMN BUTT PIPE		291.67	291.67
6	6	0	2-1/2X1-1/2X20' GOULDS		582.31	3493.86
1	1	0	2-1/2X1-1/2X5' GOULDS		281.21	281.21
3	3	0	#32 TURBIN OIL		20.96	62.88
3	3	0	BESTOFLIFE GREASE		39.96	119.88
2	2	0	71-90521	EA	3.75	7.50
			WD 40 11 OZ.			
1	1	0	50-03920	EA	12.78	12.78
			3M INSULATION PUTTY			
2	2	0	50-03910	EA	6.24	12.48
			33+ 3M TAPE			
12	12	0	02-23010	EA	3.13	37.56
			7/8 X 3 NUTS & BOLTS			
2	2	0	1/4 COPPER TUBING		3.49	6.98
2	2	0	COMPRESSION COUPLER		6.31	12.62
4	4	0	42-40210	EA	10.13	40.52
			2 1/2 X 10 BWS TURBIN SPIDER			
1	1	0	HD TUBE,HD SHFT+APCKING NUT BUS	HING	556.25	556.25
			LABOR			4250.00

Sales Amount	17257.95
Discount	.00
Sales Tax	260.16
Freight	.00
<b>Total Due</b>	<b>17518.11</b>

Accounting Copy