

CASE STUDY #2

UPSIDE OF OPTIMIZING A PUMPED-OFF WELL


The following dynamometer analysis report recommends changes to reduce equipment loading, improve production and decrease operating expenses.

After changes were made, a follow-up test indicate

- savings of \$3000 per month in power and operating costs
- 0.3 m3pd increase in oil production
- reduced equipment loading by 25%
- extended gearbox life by 10 years

Golden Company Ltd.
100/00-00-000-00 WOM/00
Surface: 00-00-000-00 WOM

Foreman's Report/Work Order

Work Ordered By: William Domore	Type of work: Dynamometer.
Date work completed: xxxx-06-24	Work completed by:  (403)309-2620
Reason for Dynamometer: Production optimization.	Comments: Well pumped-off. Good pump function. Gearbox heavily loaded (underbalanced).

Work requested:

Decrease pumping speed from 4.4 spm to 3.3 spm by replacing the existing 4C-8.0 inch prime mover sheave with a 4C-6.0 inch sheave. Please note gearbox wipers may be required when pumping speed is below 3.5 spm.

Replace the existing 60 hp prime mover with a 10 hp motor (savings of \$2650 per month in power bill).

The next time the well is serviced, land the pump intake deeper at 1540 mKB.

Work order requested by: _____
Date requested: _____
Work performed by: _____
Date completed: _____
Comments/results

100/00-00-000-00 WOM/00
Surface: 00-00-000-00 WOM

Prepared For
William Domore

Dynamometer Analysis

1. The well is producing all its available fluid. The downhole pump is functioning well. To match pump displacement to well inflow and reduce loading, consider decreasing the pumping speed from 4.4 spm to 3.3 spm by replacing the existing 4C-8.0 inch prime mover sheave with a 4C-6.0 inch sheave. Please note gearbox wipers may be required when pumping speed is below 3.5 spm. Monitor production, allow the well to stabilize and re-dyno to evaluate the equipment loading and counterbalance requirement.
2. Horsepower requirements at present time are 7.9 hp. Consider replacing the existing 60 hp prime mover with a 10 hp motor (savings of \$2650 per month in power bill).
3. Consider conducting a pressure survey to determine the causes of the pumped-off conditions, such as a declined reservoir pressure and/or a damaged wellbore.
4. The next time the well is serviced, to improve production, consider landing the pump intake deeper at 1540 mKB.
5. Under existing conditions the gearbox torque is at 110.3% of unit rating. This condition should improve with the speed reduction.

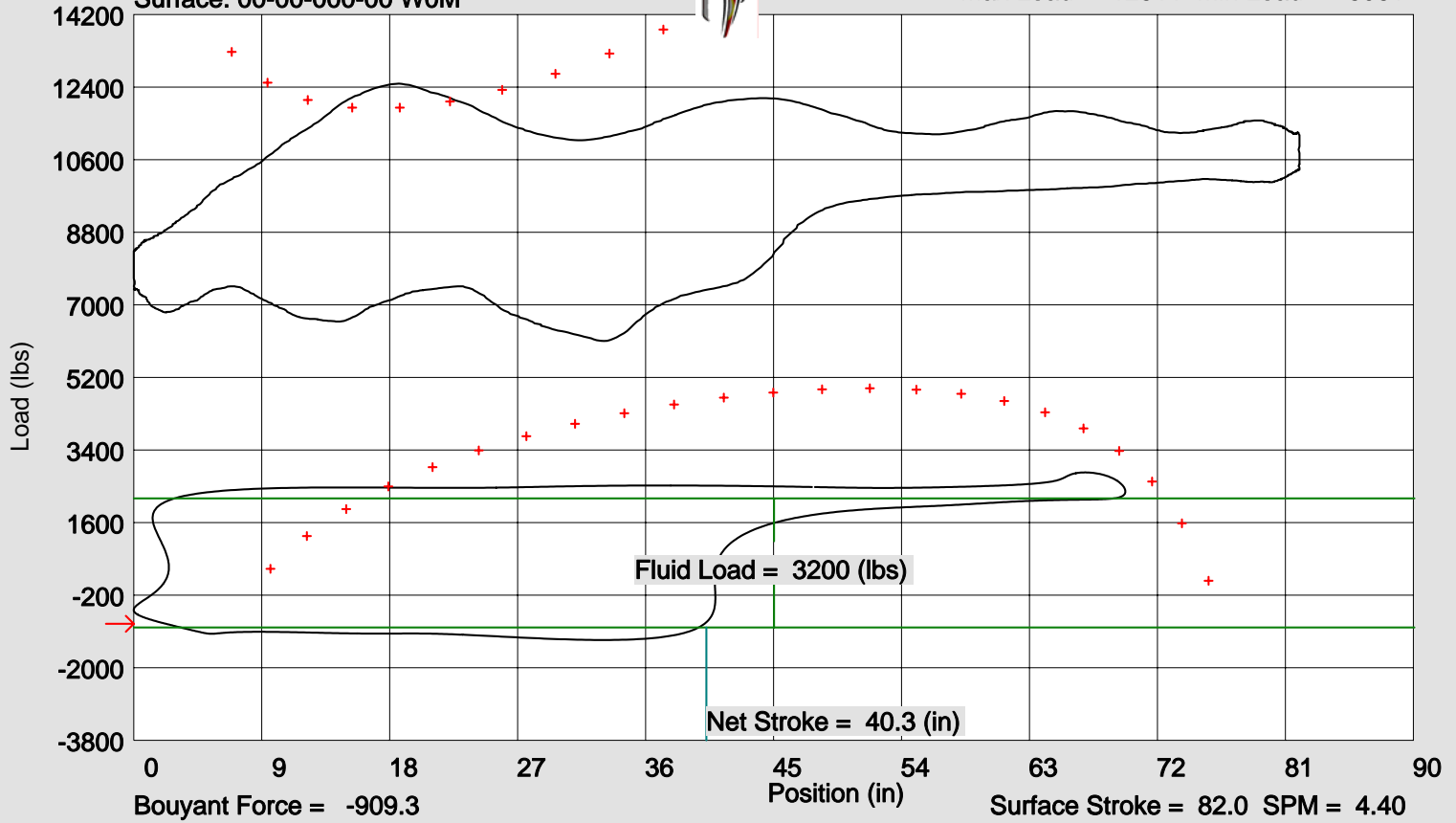
Field Observations
Belts are tight and in good condition.
Brakes are in good condition.
Gearbox backlash is not evident.
Polished rod is in good condition.
Check valve is holding properly.
The downhole pump pressured up from 415 kPa to 2214 kPa in 5 minutes before activating the high pressure shutdown.
Casing pressure: 416 kPa Tubing Pressure: 415 kPa Initial Fluid level was at 162.7 joints from surface.



Downhole: 100/00-00-000-00 WOM/00
Surface: 00-00-000-00 WOM



Max Load = 12511 Min Load = 6061



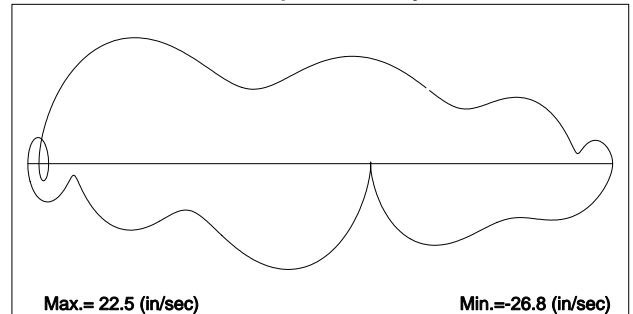
Rod Loading

Depth (m)	Rod Size (mm)	Loads		% Goodman Range Service Factor of		
		Max (lbs)	Min (lbs)	(1.0)	(0.9)	(0.8)
		0.00	31.8	12094.8	6560.8	22.4
7.92	19.0	11666.9	6801.5	50.0	60.3	75.8
1499.31	38.1	727.6	-3438.6	10.7	11.7	13.0
1522.17	19.0	2997.3	-1157.1	31.5	34.6	38.5
1522.47	19.0	2845.6	-1310.0	31.3	34.4	38.2

Current Production

Oil (m3/day):	4.90
Water (m3/day):	0.10
Gas (E3m3/day):	0.50

Pump Velocity

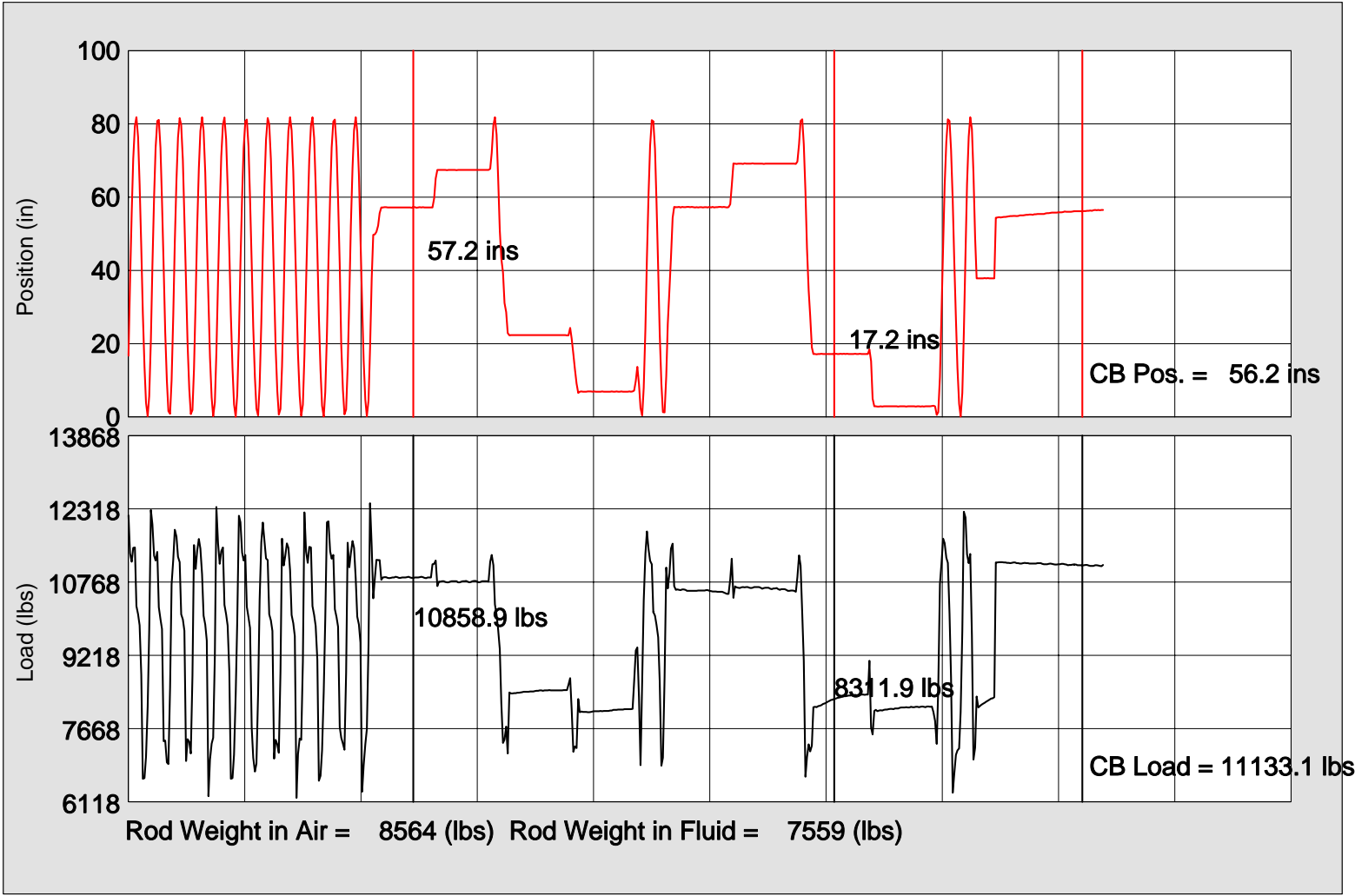


Pump Efficiencies

Pump Size (in): 1.50	Gross	Net
Downhole Stroke (in):	69.75	40.28
Displacement (m3/day):	12.80	7.39
Efficiency (%)	39.07	67.66

Comments

The downhole pumpcard indicates a good pump function with severe fluid pound. Stuffing box friction is evident and adds at least 500 lbs to the polished rod loading. Consider inspecting and lubricating stuffing box.



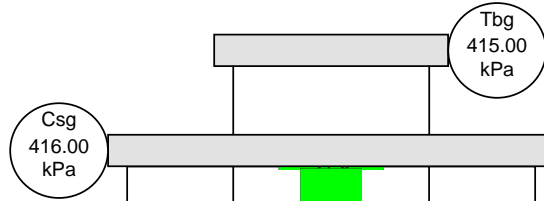
Comments

The valve checks indicate that the downhole pump is in good mechanical condition.

Golden Company Ltd.

Downhole: 100/00-00-000-00 WOM/00

Surface: 00-00-000-00 WOM



Elevations:
 KB (m): 1052.60
 CF (m): 1047.70

Casing:
 OD (mm): 139.70
 ID (mm): 122.58
 Weight(kg/m): 23.10
 Depth (mKB): 1778.00

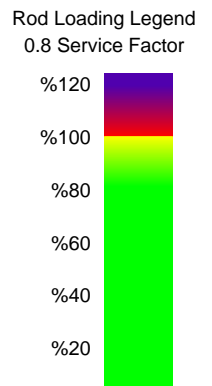
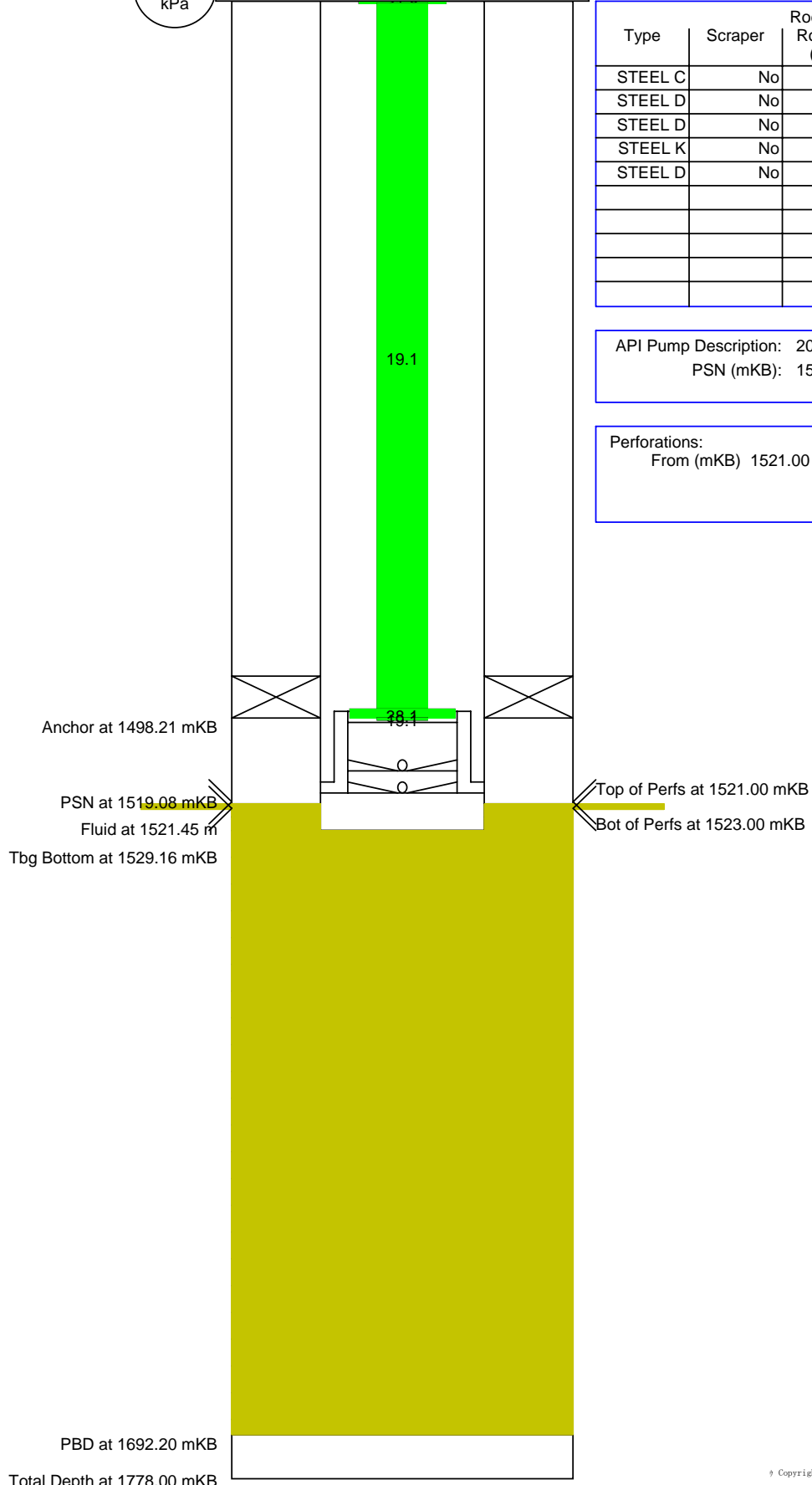
Tubing:
 OD (mm): 60.30
 ID (mm): 50.70
 Weight(kg/m): 6.97
 Depth (mKB): 1529.16
 Number of Jts: 163

Liner:
 ID (mm): 0.00
 Top (mKB): 0.00
 Bottom(mKB): 0.00

Type	Scraper	Rod String Rod Dia. (mm)	# Rods	Length (m)
STEEL C	No	31.80	1	7.92
STEEL D	No	19.10	3	5.49
STEEL D	No	19.10	195	1485.90
STEEL K	No	38.10	3	22.86
STEEL D	No	19.10	1	0.30

API Pump Description: 20-150 RWAC 16.0- 5.0- 0.0
 PSN (mKB): 1519.08

Perforations:
 From (mKB) 1521.00 to 1523.00



Downhole: 100/00-00-000-00 WOM/00

Surface: 00-00-000-00 WOM

