

## The Lease Pumper's Handbook

### Chapter 19 Record-keeping

#### Section C

#### PETROLEUM PRODUCTION RECORDS

##### C-1. Production Record-keeping.

The lease pumper's primary job is to produce and sell the most possible oil and gas economically. In addition, the pumper has other responsibilities, such as not abusing the wells by producing them in a manner that will damage their integrity, pull in water, or conate the gas.

Each production company varies in their frequency and method of reporting, forms used, and lease responsibility. Usually, the smaller the company, the more responsibility the pumper carries. As production information is recorded and submitted, these records continually indicate field and production conditions. The pumper needs to become an expert in reading and understanding what these records mean and take appropriate action to meet these changing conditions.

In this age of personal computers and instant communication capabilities, methods of recording and entering lease records are rapidly changing. With some companies tank gauges are phoned in to the office as they are taken, and all accounting is computed in the office and posted instantly.

The lease pumper, however, is the person on the firing line. As a dedicated employee, the pumper must be instantly aware of whether the production is over, short, or just right as a tank is gauged. Since the pumper is at the operation, if action is needed it can begin immediately.

For this reason this section begins with older field procedures and typical pumper responsibilities. If production is all from marginally producing wells, chances are that many of the older procedures are still in use and have some appropriate content. Parts of these procedures are still relevant. In any event, the pumper should follow whatever part is applicable.

##### C-2. Typical Lease Operation Records.

Records regarding activities on the lease that the lease pumper makes may include:

- Daily and monthly oil production records for every lease tank battery.
- One daily production test record each month for every well on every lease listing all oil, gas, and water produced.
- A report of all oil and gas sold on the lease.
- A record of any oil hauled for special purposes, such as well chemical batch treatment, hot oiling, etc.
- A record of all produced water injected or transported off the lease.
- A record of the number of every seal removed and added.
- Records of every well problem and wells pulled.
- With some operators pipe tallies of any downhole changes and a transfer record of all material, pipe, or rod changes if the pumper oversees the well servicing.

- A materials transfer ticket for every piece of equipment or pipe that is moved and its new location on the lease.
- A monthly chemical record of opening and closing inventory for the month, as well as accounting for consumption and needs for the near future.
- A number reading for all meters on the leases.
- Any appropriate environmental records of spills or other problems.
- Time sheets for the pumper and any special labor that is under the pumper's supervision.
- Reports for any special projects.
- Vehicle mileage, repair, service, or fuel tickets.

### C-3. Production Reports.

To report daily production, the lease pumper may use any of a variety of methods, including:

- By written reports for daily, seven-day, eight-day, or monthly production.
- By computerized systems.
- By telephone or radio.

#### **Types of written oil production reports.**

The company may require the pumper to write a daily record of all oil produced at each tank battery. Once the *seven-day report* was the most common. Production reports were pulled every Monday morning and on the first day of the month. They represented a midnight gauge (taken at day gauging time), although the true gauge time was recorded.

With the seven-day report, as many as six sets of records can be reported each month. To reduce paperwork, the eight-day report became more common, and records were

submitted four times a month, on the 1<sup>st</sup>, 9<sup>th</sup>, 17<sup>th</sup>, and 25<sup>th</sup> of every month. An example of an eight-day report is included at the end of this section. This is still a common method because with the radio and telephones, the pumper usually talks to the office immediately when urgent problems arise.

**Gas production records.** Gas production records, other than special tests, are recorded from the lease either on a chart or by computers. They require very little effort by the pumper. The pumper will, however, usually make a chart record when testing a well.

This record only requires 12 lines in the record book per tank battery to record a year of production. The pumper can use these figures to determine at a glance how well the lease performed compared to the prior month or year.

### C-4. Important Production Records.

The lease pumper wants to know how current production compares to past periods of performance. Is the well making the same amount of production, falling off, or about the same? The pumper will need to know this each month for each tank battery and for every well. The pumper should tell the company when everything is going well, remaining constant, or declining. With a few simple records the pumper can make good judgments as to where problems may be beginning.

There are two places to keep up with the welfare of the lease—at the well and at the tank battery. Even if there is only one well going into the tank battery, the tank battery production figures are just as important as the well production figures.

**Well Information.** A well test record should be set up that indicates the daily production test for each well. A separate sheet should be used for each well to eliminate confusion when comparing the monthly production figures. This record should only occupy one line for each month, even if it means using the back of the first sheet and the front of the next page. Only one figure is needed for the month. This record can also be set up in column form if preferred. With the passage of time one page of records will extend for six months to two years into the past, depending on system selected, so as the record is read, it will tell the pumper a great deal of information about each well. Some of the information that needs to be posted includes:

**Information Sheet Heading.**

- Lease
- Well number
- Test time (24 hours)

**Line Information.**

- Date of test
- Pump cycles
- Total hours produced
- Total barrels per day (BPD)
- Barrels of oil
- Percentage oil
- Total barrels water
- Percent of water
- Wellhead shakeout
- Cubic feet of gas
- Gas/oil ratio
- Orifice plate size
- Temperature
- Well bleeder pressure or flowing pressures
- Separator pressure
- Other desired information
- Comments

Each pumper will need to adjust this list to the specific needs of the lease. Too much information is better than a short list. To make a good well production analysis, the information must be complete.

**Single-Well Tank Batteries.** When one well goes into one battery, a specific day of the month can be selected and declared a test day. The pumper will also average the daily production from the tank battery and show this as a daily test. In this event, the pumper will also need to project any downtime so that it is known how the average was derived.

**C-5. Monthly Tank Battery Total Production Record.**

At the end of each month, the pumper lists the total production of oil, water, and gas. By dividing these results by the number of days the well produced during the month, a daily average is computed. As a year of records is kept and daily averages compared, the pumper will get a good overview of production. This is the best guide to indicate how the wells are performing.

**Problem analysis from monthly test data.** Some questions that can be answered from the production information include:

- How did the lease do this month?
- Are any wells declining in production?
- Which wells need productivity tests?
- Which wells are having pump problems?
- Do any wells have a tubing problem?
- Is it time to treat and stimulate the reservoir?
- Which wells are developing higher wellhead pressure?
- Are higher casing pressures lowering production?

Depth	3	83	Ft.	1	23	96	Ft.	2	44	09
1/4	4	25	1/4	24	38	1/4	44	51		
1/2	4	67	1/2	24	80	1/2	44	93		
3/4	5	09	3/4	25	22	3/4	45	35		
1	5	51	1	25	64	1	45	76		
1/4	5	93	1/4	26	06	1/4	46	18		
1/2	6	35	1/2	26	47	1/2	46	60		
3/4	6	77	3/4	26	89	3/4	47	02		
2	7	18	2	27	31	2	47	44		
1/4	7	60	1/4	27	73	1/4	47	86		
1/2	8	02	1/2	28	15	1/2	48	28		
3/4	8	44	3/4	28	57	3/4	48	70		
3	8	86	3	28	99	3	49	12		
1/4	9	28	1/4	29	41	1/4	49	54		
1/2	9	70	1/2	29	83	1/2	49	96		
3/4	10	12	3/4	30	25	3/4	50	38		
4	10	54	4	30	67	4	50	80		
1/4	10	96	1/4	31	09	1/4	51	22		
1/2	11	38	1/2	31	51	1/2	51	64		
3/4	11	80	3/4	31	93	3/4	52	06		
5	12	22	5	32	35	5	52	47		
1/4	12	64	1/4	32	77	1/4	52	89		

**Figure 1. A tank chart to convert gauge depths to volume of liquid. This chart is for a cone-bottomed tank and allows for 3.83 barrels in the cone.**

If the pumper does not maintain and seriously compare daily production statistics, the most important information available to judge lease performance is being lost.

**C-6. Records for Daily Use.**

Some records are so valuable that they are referred to almost daily in working on the lease. Regardless of the method used to report the production of the past 24 hours, the lease pumper must understand what is happening on the lease, produce the most possible oil, and keep lifting costs as low as possible while still doing a good job. This is not possible without production references that can be checked quickly as needed. Some of these records are:

**Yesterday’s tank gauges.** The grease book used to record today’s activities will contain

a record of yesterday’s tank gauges, which will show production volume based on tank charts (Figure 1). Every day’s oil and water production is rendered into feet and inches, so as soon as today’s gauge is completed and recorded, the pumper can know how the lease did. Is it over, just right, or short? Corrective action may be needed. If this cannot be determined, the reference system needs to be improved.

**The daily, seven-day, eight-day, or monthly production report.** This is an important record for the production supervisor and company. It details how much oil was produced daily and lists all oil sales. This informs the company of how much income they will receive the following month for this period of time, shows results of well tests, itemizes all major lease problems during the reporting period, and details how much oil was over or short.

The lease pumper should double-check this report before sending it to the company to ensure that all math is accurate and all information easy to read.

**Monthly tank battery production of oil, water, and gas, and daily averages.** The lease records book will contain a monthly total of oil, water, and gas produced, a daily average, gas/oil ratios, and water/oil percentages. This record only consumes one line per month and provides a continuing pulse of how the lease is performing.

This simple record provides answers to questions such as:

- How much oil is being sold?
- How much water is injected or hauled?
- Are injection pressures changing?
- How much gas is being sold?
- How are production averages changing?
- Where are the problems?

**Monthly individual well tests.** Possibly the most valuable record that the lease pumper carries is the monthly well production test record. This is a test where the well has been normalized for several days and a 24-hour test performed. This test is performed one time each month on every well on the lease. It is just as important to carefully perform this test on batteries with one well as on a battery with several wells.

This record is important because it provides the pumper with a measuring tool on how the lease, wells, and pumps are doing. Needed information includes:

- How much tank room will be required to perform this test?
- What orifice plate will be required for the gas reading to stay on the chart?
- Is production falling, constant, or increasing? How much?
- Is the gas/oil/water ratio changing?
- Is the flow line pressure changing?

**Chemical consumption records.** The chemical consumption record for each month is important to maintain because it is an important part of the lifting cost per barrel. Because there is treated oil not yet sold, it is difficult to render into a cost per barrel from the records. It does, however, give the pumper an accurate record of daily consumption. By noting the barrels of oil produced each month, it is relatively accurate. The pumper should know how much chemical is being consumed per 100 barrels of oil treated.

#### **C-7. Benefits of Production Records.**

There are many benefits from maintaining production records. After maintaining these records for a few months, the pumper would never be without them. Some benefits are:

- Knowing how much oil and gas was lost during the month because of lease problems. This figure can also be projected into lost dollars, and the analysis of why it was lost may illustrate the importance of equipment maintenance and pinpoint special problems.
- Indicating wells that are beginning to have downhole problems such as pump wear.
- Assisting in determining when productivity tests should be conducted. They allow monthly analysis of well conditions.
- Indicating increased production from wells that have been worked over and the feasibility of working over other wells.
- Showing loss of production that occurs with time and natural depletion.

Benefits will change according to lease conditions.

#### **C-8. Supply Purchases.**

The lease operator will have written or verbal policies concerning supply purchases. For larger operators where bids can periodically be taken and where case lot purchases are cheaper per item, the pumper should work closely with the lease supervisor when making purchases. Companies usually require advance approval for the purchase of higher quantities of supplies or some types of purchases, such as tool replacement.

#### **C-9. Time Sheets for Work Performed.**

**Company employees.** Time sheets for employees are usually required, even with a small company. This confirms that the pumper receives all pay earned and is a statement to the company confirming that the pumper worked the time submitted.

