

Chaparral Energy CO₂/EOR Open House

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June 21, 2013

Chaparral Energy hosted a luncheon and bus tour of their holdings in the Burbank Field in western Osage County on June 20, 2013 for the Osage Minerals Council and several very lucky Shareholders and guests. Chaparral is developing the old Burbank Field using CO₂/EOR (Enhanced Oil Recovery) methods. Those attending from the Minerals Council were Andrew Yates, Sonny Abbott, Myron Red Eagle, Galen Crum, Cynthia Boone and Melvin Core. Other invited guests were Ann Abbott, Larry Stephens, several vendors for Chaparral, at least one member of the news media, and myself. Larry Stephens is a field technician for the Osage Nation Energy and Natural Resources Department and a degree'd geologist with extensive experience in the Osage.

To provide a little history on the Burbank Field, and relying on Google as a source of information, we find that on May 8, 1920, the Marland Oil Company completed the Burbank discovery well on the Bertha Hickman farm near the town of Burbank, Oklahoma. The initial discovery produced 150 barrels of oil per day from the Burbank sand at a depth of 2,949 to 3,001 feet, and later that year the Roxana Petroleum Company brought in another well at 3,450 barrels per day in the same general area. At first the wells were thought to be from separate fields, but as drilling proceeded they were all found to be connected. The field eventually grew to thirty-three square miles (21,120 acres), located principally in Osage County, but with a small extension into Kay County. The field had its highest production from 1920 through 1926 with twenty million to thirty-one million barrels annually and a peak production day of 121,700 barrels on July 21, 1923. In 1926, the Burbank Field produced more than 103 million barrels of oil. Today, we Osages feel like we are doing quite well to produce around 5 million barrels per year (a little over 14,000 barrels per day) from the entire 1.5 million acres of the Minerals Estate.

Although it was an important area, the Burbank Field never experienced the runaway booms of other fields. Burbank was dominated by major companies, including Marland, Roxana, Carter Oil Company, Gypsy Oil Company, Waite Phillips, Phillips Petroleum Company, Skelly Oil Company, and Comar Oil Company, who banded together and agreed to drill on ten-acre spacing for oil conservation purposes.

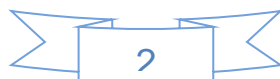
The day with Chaparral began with a luncheon at the Pawhuska Elks Lodge. The featured speaker was Mark Fischer, Founder and CEO of Chaparral Energy. Mr. Fischer began his presentation by explaining how Frank Phillips was a key player in the development of the Burbank Field. He told us that even though several hundred million barrels of oil were taken from this small oil field up through the late 1930's and then several hundred million more barrels were taken through the 1950's using a secondary recovery method known as water flooding, they believe that between 60% and 70% of the OOIP (original oil in place) is still in the ground. He is spending \$84 million to start trying to get another 25% of it. They anticipate that they will spend a total of \$800 million throughout the life of the field.

He went on to explain that, by injecting CO₂ (carbon dioxide) under pressures above 1300 PSI, they could re-pressurize the Burbank Sand formation, causing much of the remaining oil to start moving away from each injection well and into at least 4 producing wells, each about 1,000 feet away from the injection point. The oil will absorb some of the CO₂, causing it to swell a little and become thinner, making it flow easier through the sand stone formation. They anticipate that this re-pressurization will cause the oil to flow to the surface from the recovery wells, therefore no pump jacks will be needed.

After lunch, about 15 of us loaded up on a tour bus and took a ride to what is known as the Chaparral North Burbank Unit. The manager for the North Burbank Unit served as our tour guide. It was absolutely amazing to see how simple this project really is from a technical standpoint, and then learn how expensive it is to get it done.

First, a source of CO₂ had to be secured. The Coffeyville Refining's fertilizer plant, about 70 miles to the east, was the nearest available source. Coffeyville Fertilizer had been venting CO₂ for years. It was a by-product from their operation, and totally useless to them. A deal was made whereby they would recover and sell this former by-product to Chaparral. Chaparral built a 23,500 HP compressor station at Coffeyville, and then built a 68.3 mile 8 inch pipeline to the North Burbank Unit. This, in itself, was a huge expense.

Meanwhile, there was much work to be done in the field before injection could begin. Virtually every well, whether plugged and abandoned, shut in, or producing had to be evaluated. There are hundreds of them out there. Most were re-entered, overhauled, and/or re-plugged and made ready to withstand the new down-hole pressures that are coming. This has taken 3 years, and is still going on.



There are 4 producing wells for each injection well, each no more than 1,000 feet from the point of injection, and laid out in a specific pattern. If necessary, more recovery wells will be added later.

There is not one working pump jack to be seen in the area. This was the most startling visible change we saw. Many had been removed and the rest had been partially dismantled to get them out of the way. Chaparral says that they anticipate that there will be enough pressure in the formation to push the oil to the surface and on to the tank batteries through the flow lines. By reconditioning each well, Chaparral will now be able to control the pressures and the flow of fluid. We will probably never see another gusher blowing oil everywhere in the Burbank field.

All of the old tank batteries were gone and huge new tanks and separators have been installed and construction is ongoing. The new tank batteries are neatly laid out and are perfect examples of modern day oilfield technology. All fluid levels, pressures, flow rates, temperatures, and other things relevant to the operation of the entire field are continually monitored using SCADA (Supervisory Control and Data Acquisition) systems powered by solar panels, which transmit information to computers housed in a new office complex located within a few hundred yards of the heart of the operation.

Some CO₂ will, at some point, begin to return to the surface along with the oil. This will be collected at the point of separation and returned to the injection system. Chaparral says they will recover at least 98% of the produced CO₂. Capturing the emissions at Coffeyville and this CO₂ recovery done in the field, plus the fact that the only thing that uses power is the main compressor stations at each end of the pipeline and a few electrically driven pumps to handle the fluids on the surface, makes this a very ecologically “green” operation. Even most of the oil is shipped through existing pipelines instead of being hauled in trucks. This should make the Federal EPA very happy, and maybe it will help keep them out of the Osage.

Now comes the good part. Both Mr. Fischer and the production manager, told us that even though they started injection on June 1, 2013, it will take several months to start seeing the effects, but, by the end of 2013, they expect to see a 3,500 barrel per day increase in production. Within the next ensuing 6 month period, they expect to see an additional 1,500 BPD being produced. Later, at the peak of production, they tell us that a total of 6,000 additional BPD is expected. It is a huge investment, but it should pay off handsomely, both for Chaparral and for the Osages. And it should last for many years. Congratulations Chaparral, and we Thank You.

Ray McClain, Osage Shareholder