OMB Control No. 1024-0018
expiration date 03/31/2022

United States Department of the Interior
National Park Service DRAFT

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions.

1. Name of Property DRAFT

Historic name: _Midway-Sunset Jack Plant_____
Other names/site number: _Engineers Oil Company_____
Name of related multiple property listing: __N/A_____
(Enter "N/A" if property is not part of a multiple property listing

2. Location

Street & number: _25296 SR 33, approximately 1 mile south of Derby Acres_____
City or town: _Fellows___ State: _California___ County: _Kern_____
Not For Publication: [ ] Vicinity: [X]

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this ___ nomination __ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property ___ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

___national ___statewide ___local

Applicable National Register Criteria:

___A ___B ___C ___D

Signature of certifying official/Title: **Date**

State or Federal agency/bureau or Tribal Government

In my opinion, the property __ meets __ does not meet the National Register criteria.

Signature of commenting official: **Date**

Title: **State or Federal agency/bureau or Tribal Government**

4. National Park Service Certification

I hereby certify that this property is:

___ entered in the National Register

___ determined eligible for the National Register

___ determined not eligible for the National Register

___ removed from the National Register

___ other (explain:) _____

Signature of the Keeper Date of Action

5. Classification

Ownership of Property

(Check as many boxes as apply.)

Private:	[X]
Public – Local	[ ]
Public – State	[ ]
Public – Federal	[ ]

Category of Property

(Check only **one** box.)

Building(s)	[ ]
District	[ ]
Site	[ ]
Structure	[X]
Object	[ ]

Number of Resources within Property
(Do not include previously listed resources in the count)

Contributing	Noncontributing	
2		buildings
		sites
1		structures
		objects
3	0	Total

Number of contributing resources previously listed in the National Register 0

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6. Function or Use
Historic Functions
(Enter categories from instructions.)
INDUSTRY/PROCESSING/EXTRACTION:
extractive facility

Current Functions
(Enter categories from instructions.)
VACANT/NOT IN USE

7. Description

Architectural Classification
(Enter categories from instructions.)
OTHER/NO STYLE

Materials: (enter categories from instructions.)
Principal exterior materials of the property: Walls: wood framing covered by corrugated galvanized steel sheets
Roof: wood truss framing covered by corrugated galvanized steel sheets

Narrative Description
(Describe the historic and current physical appearance and condition of the property. Describe contributing and noncontributing resources if applicable. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, type, style, method of construction, setting, size, and significant features. Indicate whether the property has historic integrity.)

Summary Paragraph

The Midway-Sunset Jack Plant is located in western Kern County on its original site within the Midway-Sunset Oil Field, the largest known oil field in California. The property upon which the jack plant is located has been under continuous production by Engineers Oil Company since the first well was drilled in 1911. The setting of the jack plant is a 60-acre property that is gently sloping to the east and is sparsely vegetated and largely vacant. The jack plant pumping unit is housed within a wood framed irregularly shaped building of 1,559 square feet covered on its walls and roof with sheets of corrugated galvanized steel. The building is functional and has been essential to the survival of the jack plant machinery and was in use for many decades. The pumping unit is composed of steel parts and is supported by a framework of large timbers mounted on concrete piers. Two eccentric wheels are mounted on a shaft which is belt driven by an electric motor through additional gears and wheels. Steel cables called jack lines are attached with hooks to the eccentric wheels. When operated, these lines went through openings in the walls toward eight wells and balancing weights on the surrounding property. The jack plant was

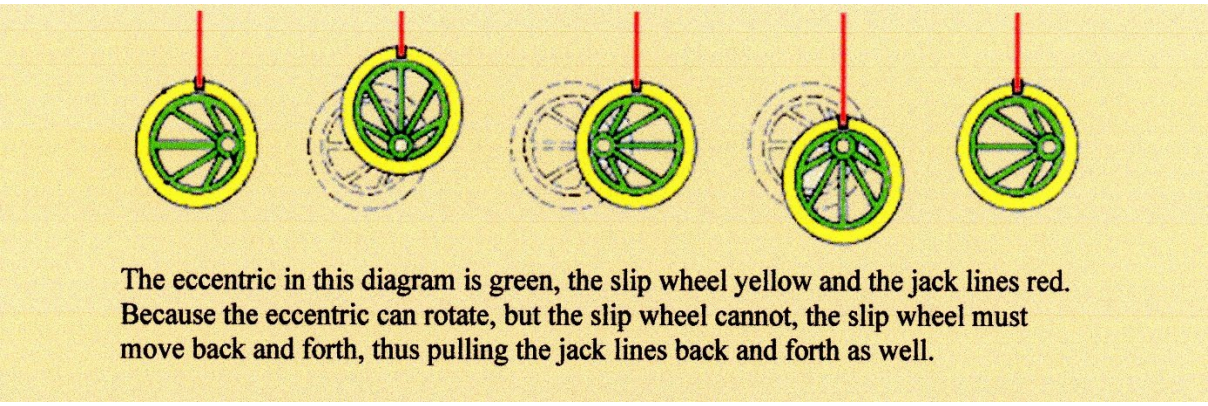
in use until 1990 and retains all aspects of integrity. It is in fair condition. Within the boundary are remnants of the jack lines and counterbalances, a Tool House, a contributing building in poor condition. Nothing remains of a burned-down house that was used by employees and their families. Because the jack plant is located on a property where oil production is still occurring, there are various tanks, production lines, produced water ponds, pump jacks at existing wells, and electric lines. These do not contribute to the eligibility of the jack plant and are outside the boundary of the nominated property. Dirt roads crisscross the property. On other properties in the vicinity there is a water processing plant and hundreds of active pump jacks and related equipment utilized in oil production.

Narrative Description

Jack Plant **One Contributing Structure and One Contributing Building**

The Midway-Sunset Jack Plant is a surviving example of technology in use during the early years of California oil production to pump multiple wells from a central power point. It was referred to as a "jack-line" system in use in Pennsylvania oil fields starting in 1884 and first employed in California fields in the 1890s. This technology owes its existence to the imagination and engineering knowledge of George Allen of Franklin, Pennsylvania.

The diagram below is from "Old Stuff from the Oil Fields"[1], a publication of the San Joaquin Geological Society. From left to right, it shows how the eccentric moves around the off-center shaft. The shaded image represents the starting position of the rotation for a full circle.



The Midway-Sunset Jack Plant is estimated to have been constructed and into use in 1913, by which time 3 wells were being produced with significant production, according to company records. A 1919 map of the site (Figure 1) shows eight wells being operated by the jack line system. The map labels the structure within which the pumping unit is situated as the "Engine House", but it has long been called the Jack Plant.

[1] San Joaquin Geological Society (SJGS), "Old Stuff from the Oil Fields" accessed online at www.sjvgeology.org, reprinted courtesy of SJGS

The Midway-Sunset Jack Plant pumping unit is a version of the Allen Patent Pumping Unit in the Figure 2 illustration. The Allen unit is shown in drawings as being held up by a metal framework, whereas the Midway-Sunset unit is mounted on 12 x 12 x 9' long timbers angled at 33 degrees that are supported on four concrete piers that have dimensions of 5' by 3'-11" by 1'-10" tall. (Photo 20) These timbers and other structural members support a platform that both allows employee access by way of a stair and also supports a drip pan to catch grease and oil.

Photographs of other contemporary jack plant pumping units show variations in the types of supporting structures for the shafts and gears, as well as the number of eccentrics, the gears which cause the jack lines to move back and forth. For example, Figure 3 is a photograph of Red Bank Jack Plant in the Kern River Field near Bakersfield. While similar to the Midway-Sunset Jack Plant, the support timbers reach a peak to hold the eccentrics, but there is no employee platform or drip pan. The Midway-Sunset Jack Plant retains the functional essence of the Allen design, so the support system and number of eccentrics are variations which were adapted to the local site, available materials and number of wells.

The Midway-Sunset unit consists of two 4'-9" diameter eccentric wheels that are driven by a 6"diameter vertical shaft. The shaft is rotated by a 5'-5" diameter horizontal ring gear which is driven in turn by a pinion gear. That gear is turned by a 15-inch-wide belt (Photo 16) on a 5'-2" diameter drive wheel. (Photo 15) The belt is 45 feet long. The belt and drive wheel assemblies lie above a concrete structure which is 41 inches wide with a curb on each side that forms a raceway for the belt. Guards made of 2 ½" steel pipe are at the sides to prevent accidental contact with the belt when in operation.

The power to drive the belt was originally a gas engine but when gas was not available from nearby wells, an electric motor was used, starting in about 1985 (Photo 12). The motor drove a series of v-belts which rotated a 4'-7" diameter drive wheel along with a horizontal shaft which drove the belt. (Photo 14) The tension on the drive belt and v-belts can be adjusted by moving the wheels back or forth as needed upon steel girders that act as a sled.

As noted, the essential design feature of the pumping unit that makes it function are the eccentric wheels. On the outside diameter of 4'-9" diameter wheel is a slip wheel that moves back and forth because of the offset rotation of the eccentric. Attached to these wheels by hooks are steel cables, the jack lines that run through open holes in the walls. Those jack lines outside the building were hung by a cable on wood, and later steel pipe, rod swings as seen in early photographs of the property (Figure 4).

Photos 6 and 8 show the remnants of the steel pipe rod swings. The earlier wood version of the rod swings have disappeared from the property.

When such a system is in operation it must be balanced among all of the wells. If the system was not in balance, the vertical shaft would be pulled from side to side. This wobbling motion would in time cause bearings and other parts to wear prematurely. In addition, the extra motion from the wobbling vertical shaft would cause the attached cables to move back and forth

excessively, leading to uneven pumping action at the wells. The weight of the rods, pumps and fluid being produced in each well can be calculated and the system can be balanced by the other wells and through counter-balances with weights placed at strategic locations. When a well was down for maintenance, an additional counter balance could be hooked into the system to provide balance.

The eccentrics rotate slowly, meaning the wells were stroked from about 7 to 12 strokes a minute. Gearing at the motor could be changed to modify the strokes per minute. A lubrication system kept the bevel gear and the slip wheels well-greased.

For protection from the elements, including very hot weather in summer and freezing winter weather, the jack plant machinery is housed within a 1,559 square foot wood framed building. (Photo 6) The floor is a concrete slab poured in place. The posts that frame the walls rest on wood rails directly upon the earth. Because the wood foundation rails are not on the concrete slab but next to the slab, it is very likely that the surrounding wood building was built after the slab was poured and after the pumping unit machinery was installed. Because the pumping unit is so heavy it would have been much easier to install before the enclosure was built.

Walls are wood framed and are covered on the outside by corrugated galvanized sheet metal. The roof has a light weight wood truss framing covered with corrugated galvanized steel sheets. The interior of the walls are open and without covering, so that structural elements are visible. The interior west and east walls are about 9’- 8” high. They are framed with 4x6 posts that are 5’-0” to 6’-0” on center.

The roof structure is composed of wood trusses made up of 2x4s and 1x4s that are 6’ feet on center through the building. The gable ends of the building reach a height of 17’-6” feet. The roof has an approximately 7 in 12 pitch.

Exterior features of the building include a 2’-8” entrance door on the south side and 6’-0” sliding doors on the west and north sides. At the northwest corner there is an 8’-0” wide by 4’-2” deep storage area.

In the walls are 13 openings for the jack-lines to go through towards the wells and counterbalances. Photo 9 shows a number of these openings. The openings are about 20” high and they vary in width from 26” to 49”. Unlike other wood-framed and corrugated metal clad buildings, this is a structure almost without windows. There is a single window with glass on the west side of the structure which provides light to the area where the motor is located. Cable openings thus provide most of the light during the day. The openings are essential to the functioning of the jack line system and provide visual clues on how the plant operated.

This jack plant operated until 1990 by which time over 1.5 million barrels of oil had been pumped from the property using the machinery according to company records. However, the bearing at the bottom of the vertical shaft had become worn, causing the shaft to wobble. The wobble of the eccentric gears made the pumping of the wells uneven and out of balance. A

replacement bearing did not solve the problem so the jack plant was placed out of service and individual pump jacks with electric motors were installed at each well.

The jack plant was left in place after it was no longer in use. This has led to some deterioration of the structure as some galvanized metal sheets were blown away. These have been replaced from sheets found on the property. Exterior wood surrounds at jack line openings were degraded by the summer heat and were rebuilt with wood found on the property. Because the property is in an area of very little rain and no snow, it has been better preserved than would otherwise be the case. Also, there is no evidence of termites so most of the wood foundation and wood structural members appear to be largely intact.

In terms of significance, the jack plant building and the pumping unit are both essential to understanding how this historic property functioned. The outward appearance of the building is unremarkable compared to other corrugated metal buildings found in oil fields. However, the unusual openings in the exterior walls allow jacklines to exit on their path to individual wells and help to illustrate how the jack plant operated. In addition, the building has been essential to the survival of the machinery it houses. Because of the significance of the jack plant unit, and the unique features and importance of the corrugated steel building that houses the pumping unit, for the purposes of this nomination, the jack plant machine is counted as one structure, and the building housing the machinery is regarded as one building.

In its current state this central pumping unit was last driven by an electric motor. Today, the remaining wells are individually operated by electric motors. When there were eight wells being pumped by the central power of the jack plant, this was a great savings in electrical energy and cost, making it valuable machinery.

Tool House **One Contributing Building**

Just north and slightly west of the Jack Plant is the Tool House. (Photos 10 and 11) This building was used for repair of oilfield equipment and for welding, using other tools and storing spare parts such as valves and pipes. Company vehicles were repaired in the building. The structure has deteriorated significantly and only remnants of its earlier functions remain in the work benches, homemade anvil, and storage shelves. Much of the galvanized corrugated metal sheeting which cladded the roof has disappeared and the wood framing is becoming compromised.

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

[X] A. Property is associated with events that have made a significant contribution to the broad patterns of our history.

[ ] B. Property is associated with the lives of persons significant in our past.

[X] C. Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

[ ] D. Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark "x" in all the boxes that apply.)

[ ] A. Owned by a religious institution or used for religious purposes

[ ] B. Removed from its original location

[ ] C. A birthplace or grave

[ ] D. A cemetery

[ ] E. A reconstructed building, object, or structure

[ ] F. A commemorative property

[X] G. Less than 50 years old or achieving significance within the past 50 years

Areas of Significance
(Enter categories from instructions.)
ENGINEERING

Period of Significance
1913-1990

Significant Dates
1913
1925
1990

Significant Person
(Complete only if Criterion B is marked above.)
N/A

Cultural Affiliation
N/A

Architect/Builder
Unknown

Statement of Significance Summary Paragraph (Provide a summary paragraph that includes level of significance, applicable criteria, justification for the period of significance, and any applicable criteria considerations.)

The Midway-Sunset Jack Plant is eligible for listing on the National Register of Historic Places at the local level of significance under Criteria A and C. The jack plant is significant under Criterion A in the area of Industry for its association with the development and production of the Midway-Sunset Oil Field in western Kern County, California. The jack plant is also significant under Criterion C in the area of Engineering because it represents an early oil field pumping method, and as a rare remaining example of central power oil pumping technology on its original site and housed in its original building.

This period of significance for the Midway-Sunset Jack Plant is from 1913 when it is estimated that it was installed at the Engineers Oil Company property, to 1990, when pump jacks with electric motors were installed at each well, and the subject jack plant was placed out of service. The Midway-Sunset Jack Plant must meet National Register Criteria Consideration G: properties that have achieved significance within the past fifty years, for the period 1973-1990. The resource does meet Criteria Consideration G since until 1990 it continued to operate and serve the same function for which it was constructed in 1913. In addition, the majority of the period of significance for this resource, sixty-three years, occurs prior to the fifty-year threshold.

Narrative Statement of Significance (Provide at least **one** paragraph for each area of significance.)

Significance Under Criterion A

The Midway-Sunset Jack Plant is locally significant under Criterion A, in the area of Industry for its association with the development and production of the Midway-Sunset Oil Field in western Kern County, California.

Exploration and Development of the Midway-Sunset Oil Field

Histories of the exploration and exploitation of petroleum often describe how indigenous peoples used deposits of oil or asphaltum. Also frequently cited is E. L. Drake's well in 1859 Titusville, Pennsylvania as the beginning of the oil industry in the United States. However, for the present purpose, it is more important to note that development of the Midway-Sunset Oil Field started much later and only after explorations of a number other oil fields in California were well underway. Operators in those other fields used techniques that found ready use in Midway-Sunset. For example, in the Kern River Field, located seven miles north of the center of Bakersfield, measurable quantities of oil were discovered in 1899. As stated by one author, four years after the discovery, that field's production had climbed to approximately 17 million barrels a year, enabling California in 1903 to become the nation's top oil-producing state, with an output of 24,382,000 barrels for the year.[2] Relevant to the current discussion, the "Allen patented pumping unit made it possible to pump many shallow wells from one central power source at

[2] Rintoul, William, *Drilling Through Time:75 Years With California's Division of Oil and Gas*, California Department of Conservation, Division of Oil and Gas, Sacramento, 1990, p. 12

Kern River."[3] The pumping unit was economical because there was a single motor and the small steel-framed pump jacks at each well were much simpler and therefore less costly.

The Midway-Sunset Oil Field is the largest field in California, but it was not until 1942 that the California Division of Oil and Gas recognized that name as area of oil production 20 miles long and four to six miles wide in western Kern County.[4] The puzzle was one of geology: discovery of the 22 seemingly separate fields occurred over many years. There is a technical definition for the field, but for the current purposes it suffices to say it stretches from the Midway part of the field at the northwest to the Sunset part of the field to the southeast. Maps (Figures 5-7) show the field and the location of the Midway-Sunset Jack Plant at several scales.

As early as 1858 asphalt deposits were discovered by a survey party at a location which would later be known as the Sunset Oil Field. In 1887 Solomon Jewett & H. A. Blodget along with a veteran driller named William "Billy" E. Youle organized the Sunset Oil Company and erected the first oil derrick in Kern County at the Sunset field near the future town of Maricopa and drilled several wells. By 1894 Jewett and Blodget had drilled 16 wells ranging in depth from 80 feet to 1320 feet. It was reported that "the specific gravity of this oil varies from 12 degree Baume[5] to a heavy liquid asphaltum that requires to be heated by steam, which is forced to the bottom of the well, before the heavy oil can be pumped".[6]

The construction of the railroad to the area took many years after the Southern Pacific Railroad arrived in Bakersfield in 1876. In 1891, construction began on a Southern Pacific railroad line to Asphalto (McKittrick) and in 1892 the first train load of asphaltum was shipped from McKittrick. In 1901 the Sunset Western Railroad built 30.3 miles to Sunset, with the first rail laid in April. A branch south 2.5 miles to Maricopa opens Mar. 1904, and a branch north 17.1 miles north to Shale and Fellows opens Jan. 1, 1909.[7] To put this in perspective, before the railroad, Jewett and Blodget asphaltum was hauled to Bakersfield with teams of 16 to 24 mules which took six days.[8] The construction of the railroad reduced the time and cost of transport and also provided transportation for employees and goods to and from the oil fields.

[3] Rintoul, William, *Spudding In: Recollections of Pioneer Days In the California Oil Fields*, California Historical Society, San Francisco, 1976, p. 35
[4] Del Mar, David B., "A Brief Early History of the Midway-Sunset Oil Field", in *Geology of the Midway-Sunset Oil Field and Adjacent Temblor Range, San Joaquin Basin, California*, A Guidebook for a Field Trip by the American Association of Petroleum Geologists, May 17-19, 1996, p. 42
[5] French chemist Antoine Baume developed the system of measuring the specific gravity of liquids, including oil. For oil, water is given the gravity of 10 and oil with higher gravities are given numbers greater than ten. As the numbers increase the liquid has less mass and thus is less dense. Such oil will therefore separate from water in a quiet environment. The gravity of the oil is important because a higher gravity oil has more energy than a one with lower gravity and is thus worth more. Today, oil is cited as having a certain "gravity" without noting either "Baume" or "specific".
[6] ibid., p. 40
[7] San Joaquin Geological Society, "Old Stuff from Oil Fields", accessed online
[8] Del Mar, David B., op. cit., p. 40.

Jewett and Blodget in association with the railroad, "organized a company, Standard Asphalt, and built a twenty-one-kettle refinery near the railhead. Three hundred tons of crude asphalt produced about 100 tons of refined asphalt, which was priced at an average of $25 per ton."[9]

According to William Rintoul, the turning point in the development of the Midway-Sunset Oil field occurred in 1909 when Chanslor-Canfield Midway Oil Company's Midway No. 2-6 (Figure 8) at Fellows in the Midway field blew over the top of the derrick in November…at the rate of 2,000 barrels a day. This was "the first real gusher in either the Midway or Sunset districts, which had produced oil since before the turn of the century but had seen nothing like the Midway gusher before." [10]

During the next year more than 25 wells that produced more than 1,000 Barrels per day were completed.[11] In March, 1910 the Lakeview Gusher had an initial production of about 18,000 barrels per day and in a few days, this well was out of control. It flowed for another 18 months and produced an estimated 8,000,000 barrels although much of the oil was lost.[12]

The effects of the Chanslor-Canfield gusher and others that followed were significant. This is one description:

> Oil booms had a great effect on town life in the San Joaquin Valley, transforming sleepy farming communities like Bakersfield into roaring centers of excitement and stimulating the growth of towns, such as Coalinga, in the midst of developing oil fields or, like Taft, at the end of railroad spur lines. Some of the valleys' production pioneers, of course, came in ahead of the railroads, paved roads, frame houses, and adequate supplies of drinking water. [13]

Additional wells were drilled and some of them were significant. The following describes the rush to lease properties for drill sites:

> More and more operators responded to reports of rich sands, and by year's end 140 new derricks marched across the skyline, helping to bring the field's annual production to 2 million barrels of oil, an increase of fivefold over the previous year.
>
> Even before the final numbers were in, growing excitement over the Midway discoveries, together with efforts by Congress to withdraw oil-bearing public lands from further entry, precipitated a land rush. Toward nightfall on the last day of 1909, caravans of automobiles rolled out of Bakersfield and other San Joaquin communities and by

[9] Rintoul, William, *Spudding In: Recollections of Pioneer Days in the California Oil Fields*, California Historical Society, p.7
[10] Rintoul, William, *Drilling Through Time:75 Years With California's Division of Oil and Gas*, p. 14.
[11] Pack, R. W., *The Sunset-Midway Oil Field California, Part I. Geology and Oil Resources*, Department of the Interior, U. S. Geological Survey, Washington, Government Printing Office, 1920, p. 65
[12] Ibid.
[13] Rintoul, William, *Spudding In: Recollections of Pioneer Days in the California Oil Fields*, California Historical Society, p.63

> daybreak "the dessert hills were sprinkled with tents, armed guards and stakes from which fluttered the little, white location notices. They filled the hastily constructed hotels in the booming oil towns of Taft, Fellows and Maricopa and swarmed through the valley in a fevered search for black gold.[14]

Through the next decade hundreds of wells were drilled in the field. Annual production increased considerably. In 1909, production in the Midway-Sunset field was 3.8 million barrels. In 1910 production increased to 17.6 million barrels. Production peaked in 1914 at 47.1 million barrels and then trailed off over the next four years to under 40 million barrels annually.[15]

More interesting is that in 1910 the average well produced 220 barrels per day, but production per well fell continuously over the next eight years to about 45 barrels per well per day.[16] Jack plant technology for individual producers would have been important in remaining competitive in the oil market. As production on a lease fell, a jack plant would have been more efficient to operate especially if an operator's wells were only producing a few barrels a day.

The Advantage of Jack Plants

The following is a contemporary observation about the value of a jack plant:

In 1922 the Engineers Oil Company field operator wrote a letter to the home office in Los Angeles. (Figure 9) The company's well No. 8 which was pumped by a separate gas engine was inoperative because of the freezing weather, but the other eight wells were being pumped by the jack plant:

> "We have not been able to pump No. 8 for several days as our water lines are frozen, will get the line to No. 8 repaired and protected as soon as possible.
>
> Have been able to keep the power running [in the jack plant] so have not lost any production except at No. 8; Many of the Co's [oil companies in the area] who have gas engines at each well are having considerable trouble as well as losing production." [17]

A number of authors have cited the effect and importance of jack plant technology:

- Kenny A. Franks and Paul F. Lambert: "Use of the Allen Pumping Unit allowed power to be conveyed for more than half mile in all directions from the central power plants. This in turn allowed a number of wells to be pumped economically at the same time and thereby made marginal wells profitable." [18]

[14] Kirk, Anthony, *A Flier in Oil, Adolph B. Spreckels and the Rise of the California Petroleum Industry,* California Historical Society, San Francisco, 2000, p. 59
[15] Pack, R. W., op. cit. p. 67.
[16] Ibid., chart after p. 66
[17] Engineers Oil Company records, January 22, 1922.
[18] Franks, Kenny A. and Lambert, Paul F., *Early California Oil, A Photographic History, 1865-1940,* Texas A&M University Press, College Station, TX, 1985, p. 7-8

- William Rintoul: "By 1905, the Allen patented pumping unit, soon nicknamed the "jack-line" system, saw wide use. '*If you had a jack-line plant and steaming plant, which is a dehydration plant, and the person adjacent to you had a well on a lot, this well could be purchased,*' said Kenneth Manley, whose grandfather and father were pioneer Los Angeles oil operators. '*You merely ran a cable from your jack-line system over to the existing well and piped the oil into your tank and you were in business*.' It made more economic sense for the neighbor to sell his single well on a single lot than go to the expense of installing his own jack-line and dehydration equipment. " [19]

- A similar observation was made in a National Register application regarding oil properties in Oklahoma: "Central power houses represent an attempt to power the pumping operations of several wells with a single device. As such, they manifest early efforts at unitization. They were, of course, part of the overall process of oil extraction. They also derive significance as an antiquated technology."[20] Unitization means the combining of the operations of different holders of petroleum resources in a tract to encourage efficiency.

- Anthony Kirk: "Dean Sheldon, a petroleum engineer engaged to evaluate the property [the Monarch lease in Kern County] in early 1948, observed that more than half the wells were producing only 1 to 3 barrels a day. Uneconomical to operate under ordinary circumstances, these "stripper" wells were marginally profitable only because of their shallow depth, the use of jack lines (shackle wires connecting multiple oil pumps to a single, central gasoline engine), and the common leasehold ownership of the land."[21]

- San Joaquin Geological Society: "The appearance in California in the early 1890s of the "jack-line" system of producing wells provided a huge stimulus to the industry by allowing operators to pump from multiple wells using only a single steam or gas engine. The cost savings were enormous compared to the expense of outfitting each well with its own engine."[22]

Technology Advances

Although the Midway-Sunset Jack Plant remained in use until 1990, a new type of pump jack (Figure 10) was invented by Walter Trout and first used for oil production in 1925. Unlike jack line systems with their central power plants, these new pumping units were powered individually, at each well head. As stated in "All pumped Up – Oilfield Technology*"*:

[19] Rintoul, William, *Spudding In: Recollections of Pioneer Days in the California Oil Fields*, California Historical Society, San Francisco, 1976, pp. 34-37
[20]Energy-Related Properties in NE Oklahoma, 1997, Section F Page 14.
[21] Kirk, Anthony, *A Flier in Oil, Adolph B. Spreckels and the Rise of the California Petroleum Industry,* California Historical Society, San Francisco, 2000, p. 78
[22] San Joaquin Geological Society "Old Stuff from Oil Fields", accessed online on June 28, 2022

As efficient as central power units were, time and technology changed the oilfield again. A new icon of U.S. petroleum production appeared and was soon known by many names: Donkey, Grasshopper, Horse-head, Thirsty Bird, and Pump Jack, among others. "This well was perfectly balanced, but even with this result, it was such a funny looking, odd thing that it was subject to ridicule and criticism, and it took a long time, nearly a year, before we could convince many the idea was a good one," [Walter] Trout explained.[23]

As stated in Texas Escapes Online Magazine, "The design patented by Trout in 1926 led to decades of dominance by Lufkin in the manufacture of the unique pumping unit, now the standard throughout the world." [24]

From that point forward, this pump jack technology began taking over oil field pumping. Although some central power plants remained in operation for many years, new technology eventually replaced them. The year 1925 is therefore a good year to note the declining significance of jack plants. After nearly 100 years of continued improvement, pump jacks on individual wells are now in universal use around the world.

A Brief History of Engineers Oil Company[25]
Engineers Oil Company was incorporated on March 28, 1911. There is evidence at the County Recorder that the stock changed ownership at times, but individual names were typically not given. In 1935 one of the owners borrowed money from Frank Smith, who took company stock into escrow as security. Subsequently that owner decided not to repay so Frank Smith became a half owner of the corporation. The other remaining owner was film director, Frank Capra.

Smith and Capra ran the company until 1943 when Capra sold his interest to Frank Smith. The corporation was turned into a partnership between Frank Smith and his sons, Norton and Lyle.

Frank Smith and his wife, Nina, had come to California in 1908 and settled in Los Angeles. Frank got a job selling newspaper subscriptions to the Los Angeles Herald newspaper and in that capacity, he came to Bakersfield. They moved to Bakersfield in 1909 and the 1910 census lists him as still working for the newspaper. City directories show Smith took jobs in tobacco stores and then a position in the office of the Kern County Clerk. In 1916 when then County Clerk died, the Board of Supervisors appointed Frank Smith to the position. He subsequently was reelected to the office until his retirement in 1938.

This background is important in that Frank Smith was not in the oil business when he became an owner of Engineers Oil Company. In 1936 Frank Smith's son, Lyle, graduated from college with degrees in Geology and Engineering. He went to work for Shell Oil Company as a Petroleum Engineer. From that point forward, until the year 2000 he oversaw the onsite operations of the company. Frank Smith's other son, Norton, received a degree from the

[23] Wells, B. A. and Wells, K.L., "All pumped Up – Oilfield Technology", American Oil & Gas Association, 2022, p. 3
[24] Bowman, Bob, Texas Escapes Online Magazine, January 18-24, 2004 column, East Texas Historical Association.
[25] Engineers Oil Company and family records

Colorado School of Mines. During World War II he was in the U. S. Army. Upon his return from the war, he took over the financial part of the company operation. The brothers ran the operation together.

The Engineers Oil Company wells have been for many decades low volume stripper wells. Thus, the jack plant was an important reason that the company was able to continue operating. In addition, it was an efficiently run operation in which revenue covered expenses despite the volatility of oil prices. In 2001 a new generation of family took over the company and have continued to operate it.

Significance Under Criterion C

The Midway-Sunset Jack Plant is locally significant under Criterion C, engineering, as a resource that is a surviving example of the practical application of oil field technology from the early years of California oil production. This equipment was in use at the Engineers Oil Company site in the Midway-Sunset Oil Field starting about 1913 until 1990.

The machinery had its origins in a design called the Allen Patent Pumping Unit which was introduced in the Pennsylvania oil fields by George Allen in 1884.[26] This design is an example of engineering in the evolution of oil field machinery used to pump multiple oil wells from a central power source thereby activating pump jacks at the wells with a single engine or motor.

In 1884 Allen invented what became known as the Allen Patent Pumping Unit, as a result of a fire which consumed the "pumping rigs" [pump jacks] at his wells. As stated in a 1900 biography, "Men Who Made Oil History", paying for rebuilding his operation would have been uneconomical because he had several oil wells with low production.

> This fact set Mr. Allen to thinking of the possibility of devising ways and means to provide a pumping power for wells which would be at once cheap and effective. His inventive genius finally evolved the first disc pumping power built, costing something like $100 and which proved to be a greater success than his most sanguine hopes had anticipated. The success of the power led to some improvements, and finally Mr. Allen took out letters of patent upon which the appliances for pumping wells, among them being the noted eccentric power, which has now come into general use in every country or place where oil is produced, including foreign countries. The power had the effect of materially cheapening the charge for lifting the oil after completion of the well, for, by it, a number of wells could be connected up with rods and operated at a nominal cost.[27]

With respect to the use of the invention, a 1900 newspaper article stated:

> Mr. Allen, in the manufacture of his pumping rigs, licenses certain men to build the eccentric rigs who pay him a royalty on the same. In this way he has men making the

[26] San Joaquin Geological Society, ibid

[27] _____, The Derrick's Hand-Book of Petroleum, Volume II, Derrick Publishing Company, Oil City. PA, 1900, "*Men Who Have Made oil History, Hon. George Allen"*, p. 523

> rigs all over the United States and Canada, in South America, Java, Russia and all over the world.[28]

Perhaps as a result of this licensing arrangement, photos and diagrams show variations in the number of eccentrics, different ways of attaching cables to the eccentrics, alternative support structures, and distinctions in the way in which power is transmitted to the machinery.

Figure 2 depicts the important aspects of this invention and an 1897 newspaper advertisement. In the figure at the top and middle of the machinery are wheels called eccentrics. (Photo 21) Each wheel is composed of a center disc that is rotated by a vertical shaft (Photo 19) which is offset from the center, thus the name "eccentric". Around the eccentric is a slip wheel that only moves back and forth because of the offset rotation of the eccentric. This is the essential design feature of the apparatus that makes it function. This motion is transmitted by cables to wells which through a pump jack changes that horizontal motion into a vertical motion. The vertical movement activates a pump at the bottom of each well, thus lifting oil into the production line.

As an advance in oil field technology, jack plants were significant because at the time they were less costly and more efficient than a single well with a pumping unit, allowed low production volume "stripper"[29] wells to be produced, promoted the unitization of adjacent properties, and if properly housed, allowed continued production in weather that could be a challenge for operators with individual wells.

The Midway-Sunset Jack Plant is a rare remaining example of its type of oil production machinery at is original location and housed in its original building. Many other pumping units were not housed and did not survive. As one contemporary example, the Red Bank Jack Plant (Figure 3) in the Kern River Field [30] near Bakersfield, California was installed in 1912. According to an exhibit sign at the Kern County Museum, the jack plant was donated and moved to the Museum in 1964. In 2001 a building was donated and installed at the Museum to protect the jack plant. The Midway-Sunset Jack Plant survived at its original location to become a significant example of its type because it was housed from the start.

[28] _____, *An Important Decision, Hon. George Allen Wins His Case Before the Court of Appeals – The Decision of Great Importance,* The News-Herald, Franklin Pennsylvania, 18 May 1900, p. 1
[29] A stripper well is one that that is nearing the end of its economically useful life, usually due to low volume
[30] Rintoul, William, *Spudding In*, p. 35

9. Major Bibliographical References

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_____, *An Important Decision, Hon. George Allen Wins His Case Before the Court of Appeals – The Decision of Great Importance,* The News-Herald, Franklin Pennsylvania, 18 May 1900, p 1.

_____, *The Allen Oil-Well Pumping Rig*, Advertisement, The Oil City Derrick, Oil City, Pennsylvania, 27 October 1887, p. 4

_____, The Derrick's Hand-Book of Petroleum, Volume II, Derrick Publishing Company, Oil City. PA, 1900, "*Men Who Have Made oil History, Hon. George Allen"*, p. 523

_____, Energy-Related Properties in NE Oklahoma, Application to the National Register of Historic Places, 1997

_____, Letter from the Engineers Oil Company field operator to their office in Los Angeles, Engineers Oil Company Records, January 22, 1922

_____, San Joaquin Geological Society "Old Stuff from Oil Fields", accessed online on June 28, 2022

A special thanks to Clark Colby of the Coolspring Power Museum in Coolspring, Pennsylvania who researched George Allen and located contemporary newspaper articles.

Previous documentation on file (NPS):

____ preliminary determination of individual listing (36 CFR 67) has been requested
____ previously listed in the National Register
____previously determined eligible by the National Register
____designated a National Historic Landmark
____ recorded by Historic American Buildings Survey #_____
____recorded by Historic American Engineering Record # _____
____ recorded by Historic American Landscape Survey # _____

Primary location of additional data:

____ State Historic Preservation Office
____ Other State agency
____ Federal agency
____ Local government
____ University
____ Other
Name of repository: _____

Historic Resources Survey Number (if assigned): _____

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10. Geographical Data

Acreage of Property __1.55 acres_____

Latitude/Longitude Coordinates
Datum if other than WGS84:_____
(enter coordinates to 6 decimal places)
1. Latitude: 35.232892 Longitude: -119.575823

Verbal Boundary Description (Describe the boundaries of the property.)

The Midway-Sunset Jack Plant includes the jack plant building and the surrounding 1.55 acre property with east-west boundaries of 300 feet and north-south boundaries of 225 feet.

Boundary Justification (Explain why the boundaries were selected.)

The jack plant is sited (Figure 11) at its original location on the 60-acre property that has been owned and under production by Engineers Oil Company since 1911. Only the jack plant machinery and building enclosing it retain the elements of integrity under the criteria of the National Register of Historic Places. However, there are vestiges of the historic operation of the jack plant on the property. In order to better visualize the operation of the jack plant, land surrounding the jack plant has been included in the boundary. When in operation, radiating from the jack plant were jack lines with supports and counter balance locations. Remnants of some jack lines remain and help to illustrate how the plant operated. These are included in the boundary along with the Tool House, which is in a deteriorated condition, and the former site of a now burned down house that was used by employees and their families.

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11. Form Prepared By

name/title: __Mark A. Smith, Partner_____
organization: _Engineers Oil Company_____
street & number: __P.O. Box 1972_____
city or town:_Wilsonville_____ state: _Oregon____ zip code: __97070_____
e-mail: _jackplant1911@gmail.com_____
telephone: _(661) 477-2119_____
date: __November 2022; Revised February 2023_____

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** or equivalent (7.5 or 15 minute series) indicating the property's location.
- **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.
- **Additional items:** (Check with the SHPO, TPO, or FPO for any additional items.)

Photographs
Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels (minimum), 3000x2000 preferred, at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map. Each photograph must be numbered, and that number must correspond to the photograph number on the photo log. For simplicity, the name of the photographer, photo date, etc. may be listed once on the photograph log and doesn't need to be labeled on every photograph.

Photo Log

Name of Property:	Midway-Sunset Jack Plant
City or Vicinity:	Fellows (vicinity)
County:	Kern
State:	California
Photographer:	John Harte
Date Photographed:	September 2022

Description of Photograph(s) and number, include description of view indicating direction of camera:

Exterior Photos (Figure 12)

1 of 21 General view of the site with the Midway-Sunset Jack Plant visible near the center of the photo. The Tool House is to the left of the Jack Plant. In the distance a neighboring property can be seen to the left. The camera is facing north of east.

2 of 21 The Jack Plant, the Tool House and old oilfield equipment and materials. The camera is facing north of east.

3 of 21 View of the south and east sides of the Jack Plant and vicinity, showing remains of oilfield equipment and materials. Neighboring property is visible to the right in the distance. The camera is facing slightly west of north.

4 of 21 Closeup of an old truck and other oilfield equipment and materials. The west side of the Jack Plant is at the left in the photo. The camera is facing southeast.

5 of 21 Remains of a counter balance in the foreground of the photo, looking towards the Jack Plant. To the left in the distance are neighboring oilfields with pump jacks. The camera is facing northwest.

6 of 21 West façade of the Jack Plant with the remnant of a metal jack line swing. The camera is facing east.

7 of 21 North facing Jack Plant facades. The camera is facing slightly east of south.

8 of 21 North Jack Plant facade. Company production tanks are seen to the left in the distance. The camera is facing south.

9 of 21 East and south Jack Plant facades. The camera is facing northwest.

10 of 21 South Jack Plant façade with Tool House to the left. The camera is facing north.

11 of 21 The Tool House. The camera is facing north.

Interior Photos (Figure 13)

12 of 21 Electric motor and v-belts on the drive wheel. The camera is facing south.

13 of 21 Side view of electric motor and v-belts on the drive wheel and guards. The photo also shows the concrete slab floor and the wall and roof framing. The camera is facing south.

14 of 21 General view of the interior of the building and almost the whole operating system, including a top view of electric motor and v-belts on the drive wheel, the long drive belt on the left of the photo, and machinery at the far end of the Jack Plant. The camera is facing south.

15 of 21 Closeup of the drive wheel. The camera is facing northwest.

16 of 21 The drive wheel and the long belt. Also shown is the concrete raceway beneath the belt, and the guards. The camera is facing north.

17 of 21 Drive wheel and drive shaft going to the left and a 12x12 wood timber support on a concrete pier. The camera is facing north.

18 of 21 The 12x12 timber supports above the horizontal ring gear and the vertical drive shaft. The oil pan under the ring gear is visible. The camera is facing south.

19 of 21 Closeup of the ring gear and vertical shaft. The camera is facing east.

20 of 21 Jack Plant machinery showing the ring gear at the bottom and its surrounding oil pan, the vertical shaft, eccentric gears and wood timber framework. The camera is facing east.

21 of 21 The eccentric gears with hooks attached to jack line cables. The camera is facing south.

Figure 1 Site Map Survey from a 1919 Engineers Oil Company Property Appraisal

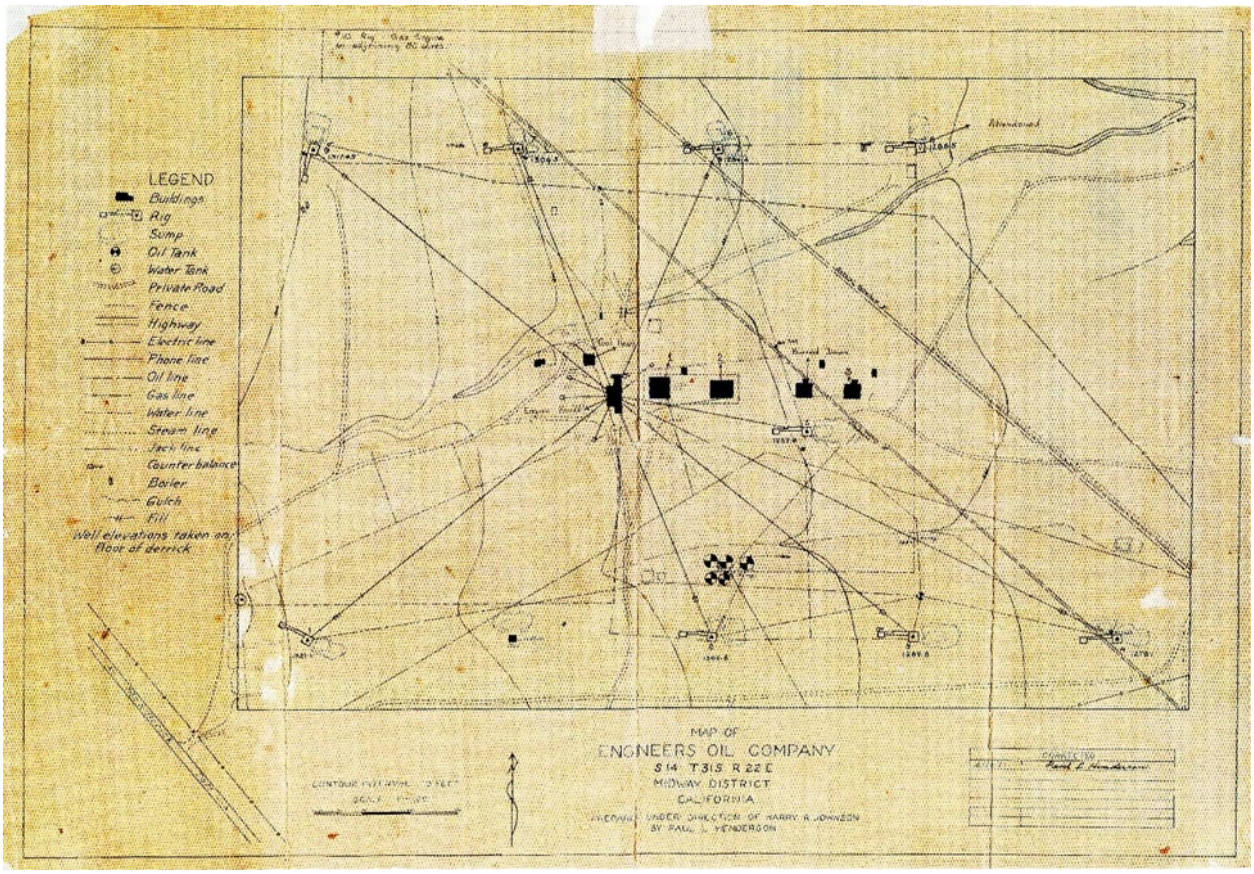
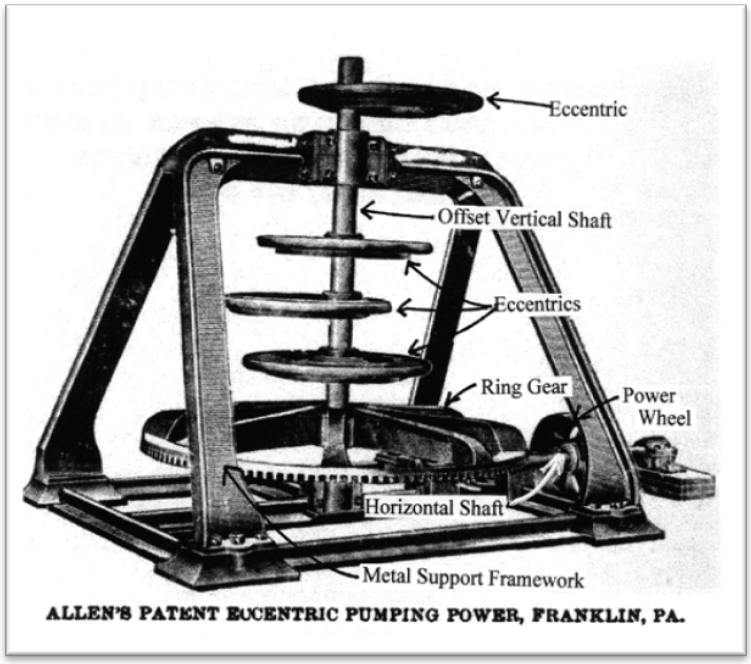


Figure 2 Allen's Patent Pumping Unit and an 1897 Advertisement



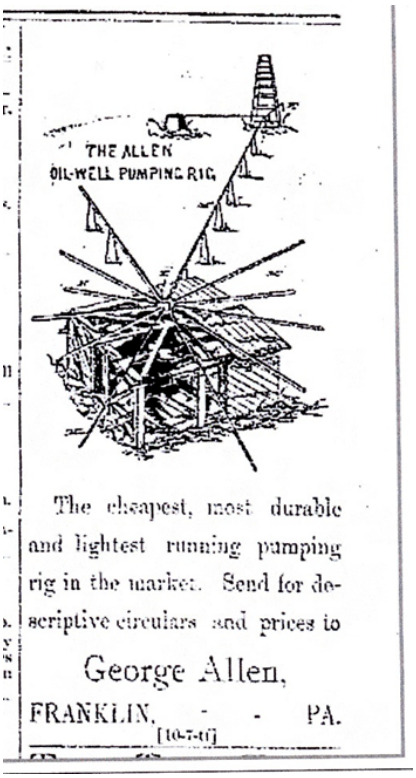


Figure 3 The Red Bank Jack Plant in the Kern River Field, near Bakersfield, California. The jack plant was donated to the Kern County Museum in 1964. In 2001 a building was donated and installed at the Museum to protect the jack plant. Photo circa 1915.

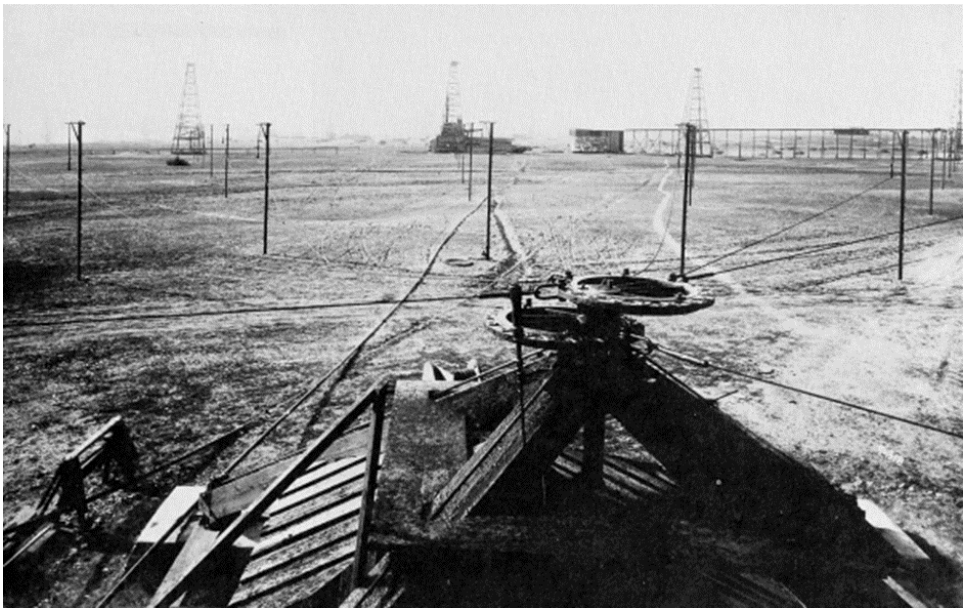


Figure 4 At the Company Site, Photo Showing Jack Lines Supported by Wood and Metal Jack Line Swings, Looking Towards the Jack Plant, 1974

Figure 5 Location Map (USGS)

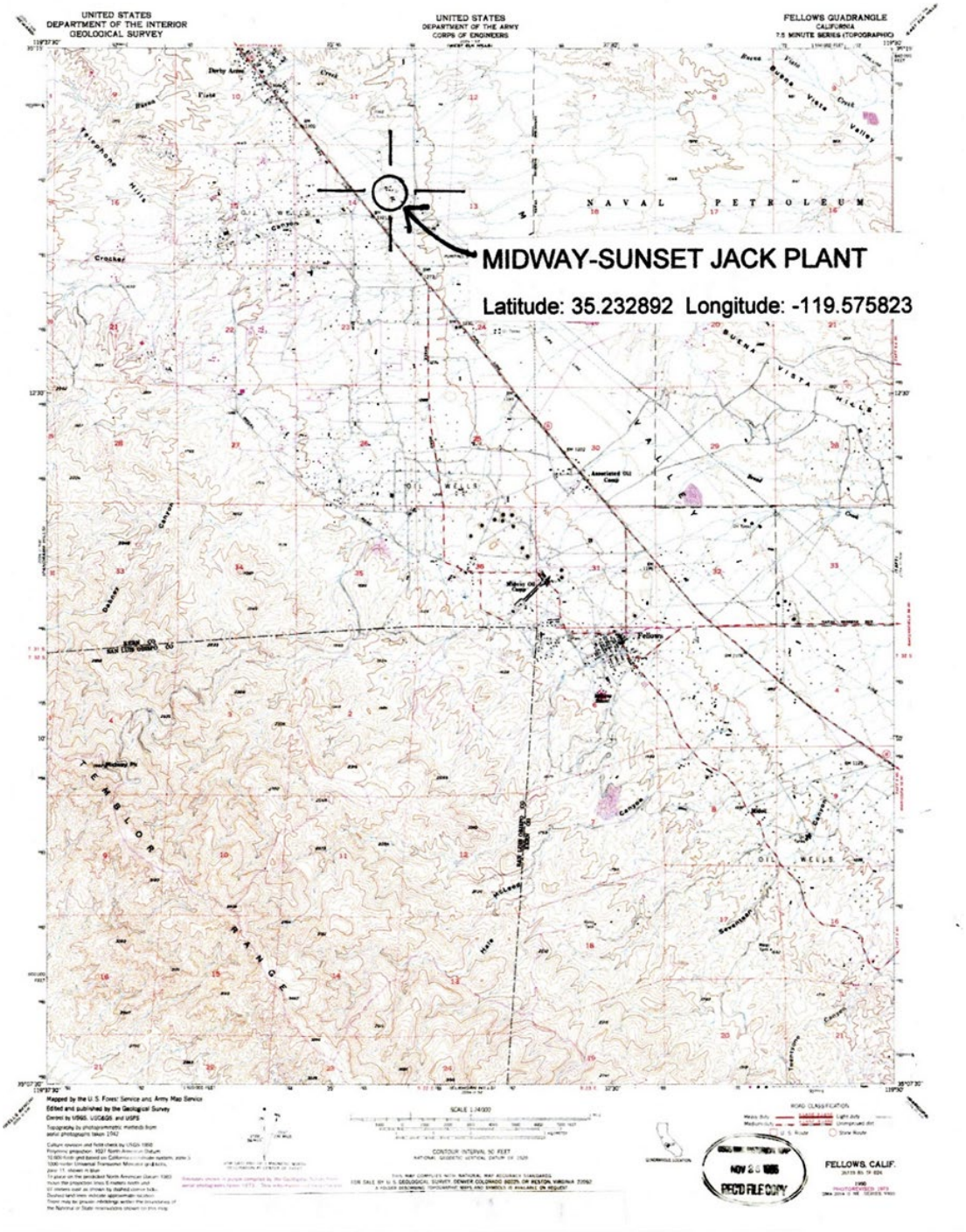


Figure 6 Location on a Map of the Midway-Sunset Oil Field

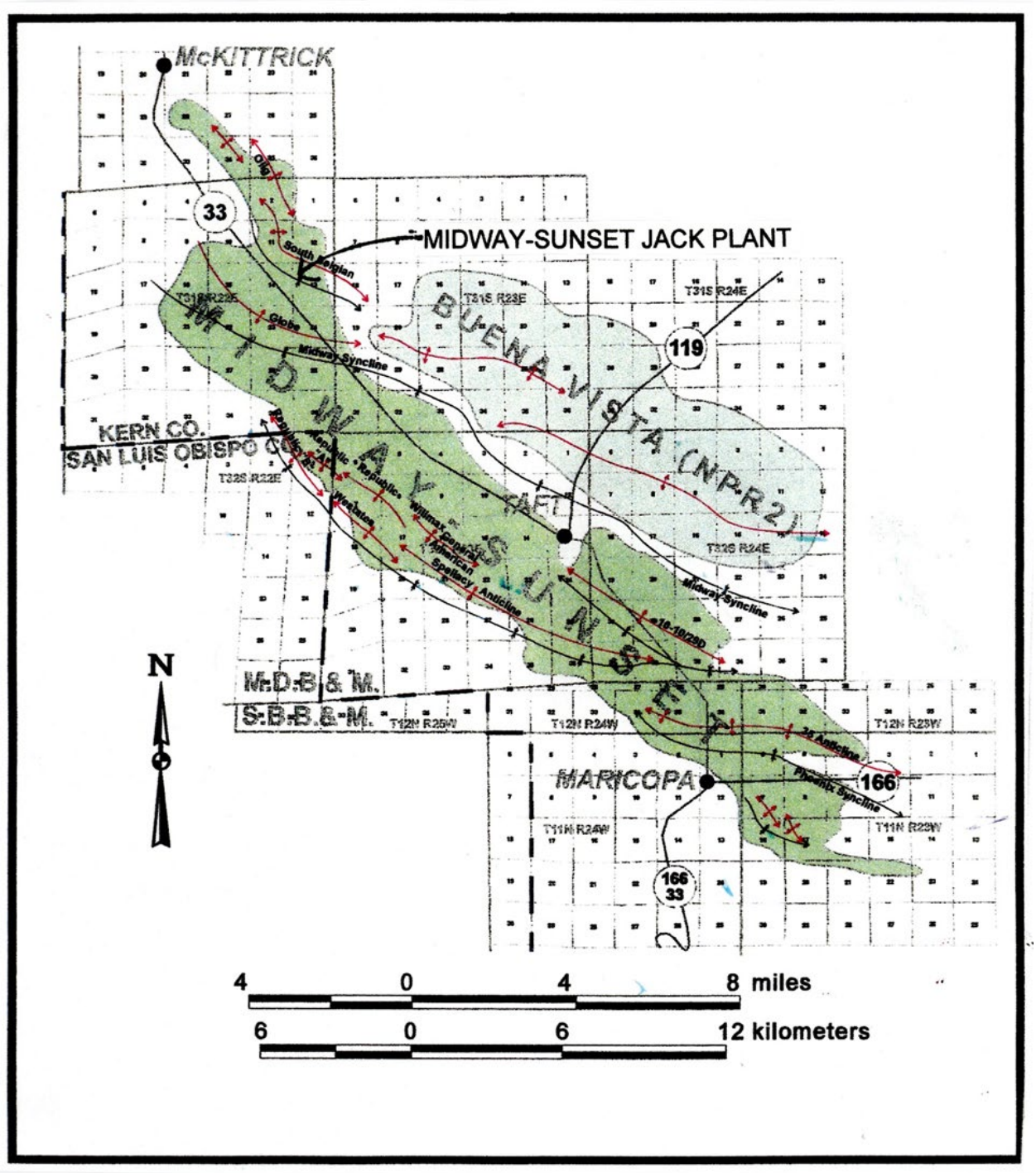


Figure 7 Jack Plant on Aerial Photo of the Site with the Property Line in Red

Figure 8 Chanslor-Canfield Midway Oil Company's Midway No. 2-6 "Gusher", 1909

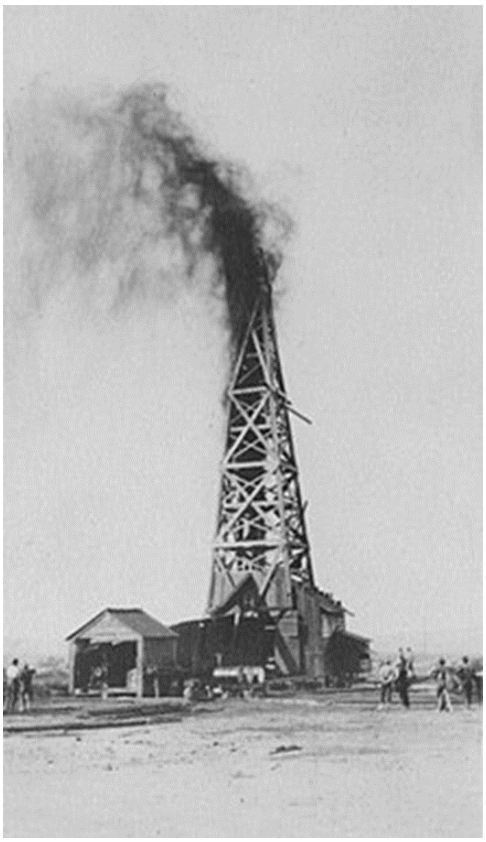
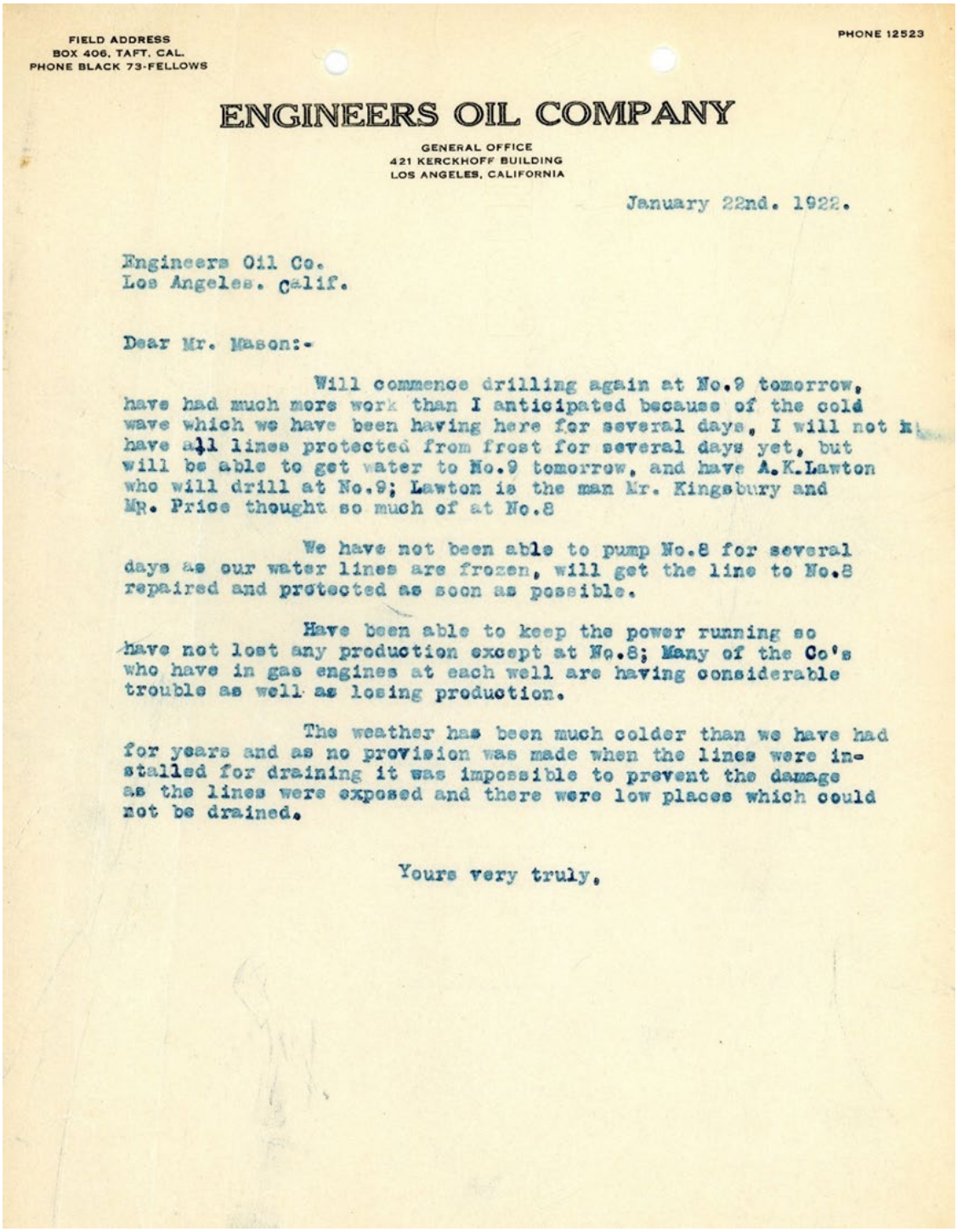


Figure 9 1922 Engineers Oil Company Field Office Letter to the Home Office, relating that the company jack line system has allowed production to proceed without interruption in the cold weather



FIELD ADDRESS
BOX 406, TAFT, CAL.
PHONE BLACK 73-FELLOWS

PHONE 12523

ENGINEERS OIL COMPANY

GENERAL OFFICE
421 KERCKHOFF BUILDING
LOS ANGELES, CALIFORNIA

January 22nd. 1922.

Engineers Oil Co.
Los Angeles. Calif.

Dear Mr. Mason:-

Will commence drilling again at No.9 tomorrow, have had much more work than I anticipated because of the cold wave which we have been having here for several days, I will not have all lines protected from frost for several days yet, but will be able to get water to No.9 tomorrow, and have A.K.Lawton who will drill at No.9; Lawton is the man Mr. Kingsbury and MR. Price thought so much of at No.8

We have not been able to pump No.8 for several days as our water lines are frozen, will get the line to No.8 repaired and protected as soon as possible.

Have been able to keep the power running so have not lost any production except at No.8; Many of the Co's who have in gas engines at each well are having considerable trouble as well as losing production.

The weather has been much colder than we have had for years and as no provision was made when the lines were installed for draining it was impossible to prevent the damage as the lines were exposed and there were low places which could not be drained.

Yours very truly,

Figure 10 The Walter Trout Pump Jack Design, First Installed on a Well in Texas in 1925

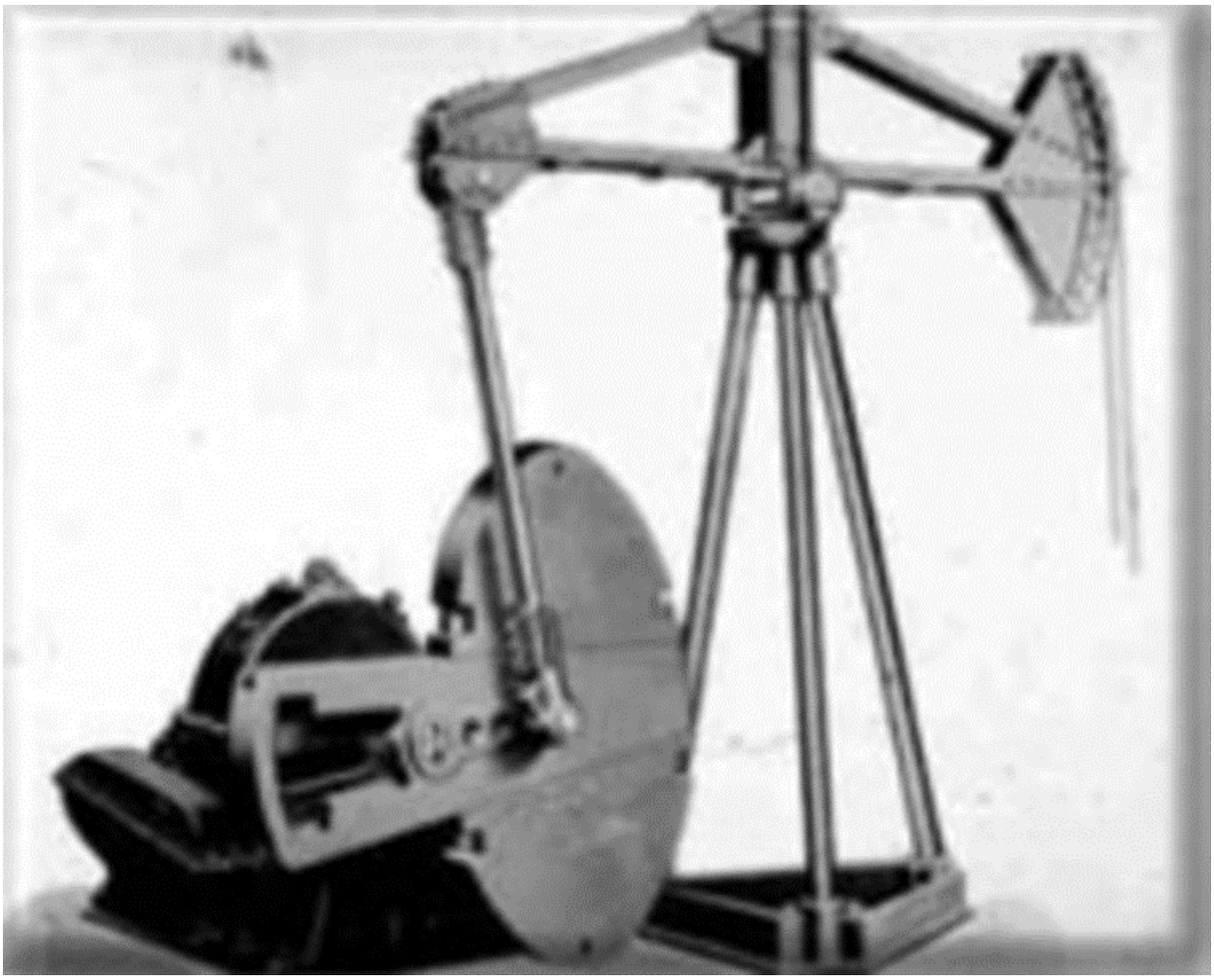


Figure 11 Site Sketch with Boundary

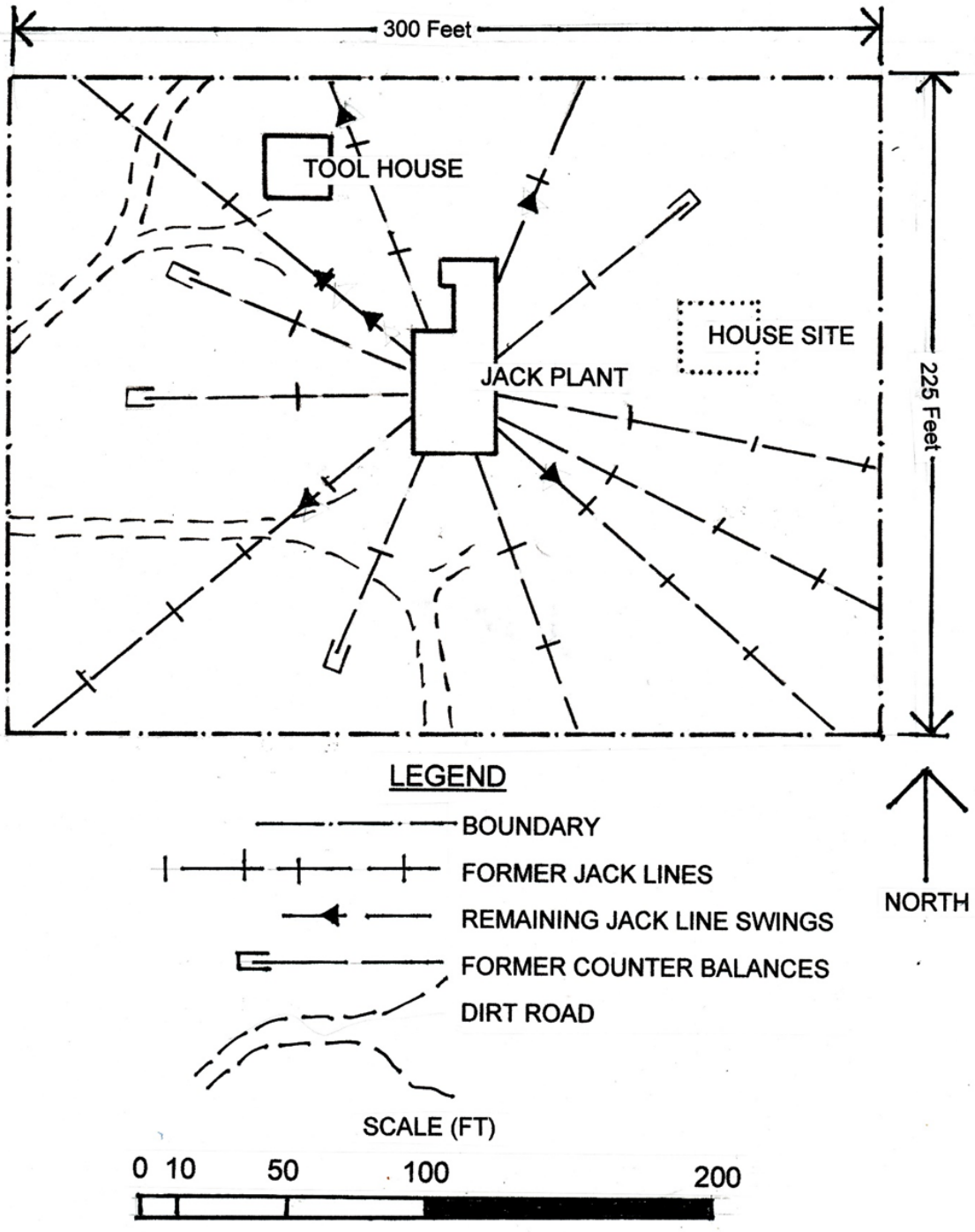


Figure 12 Exterior Photo Key on Site Sketch

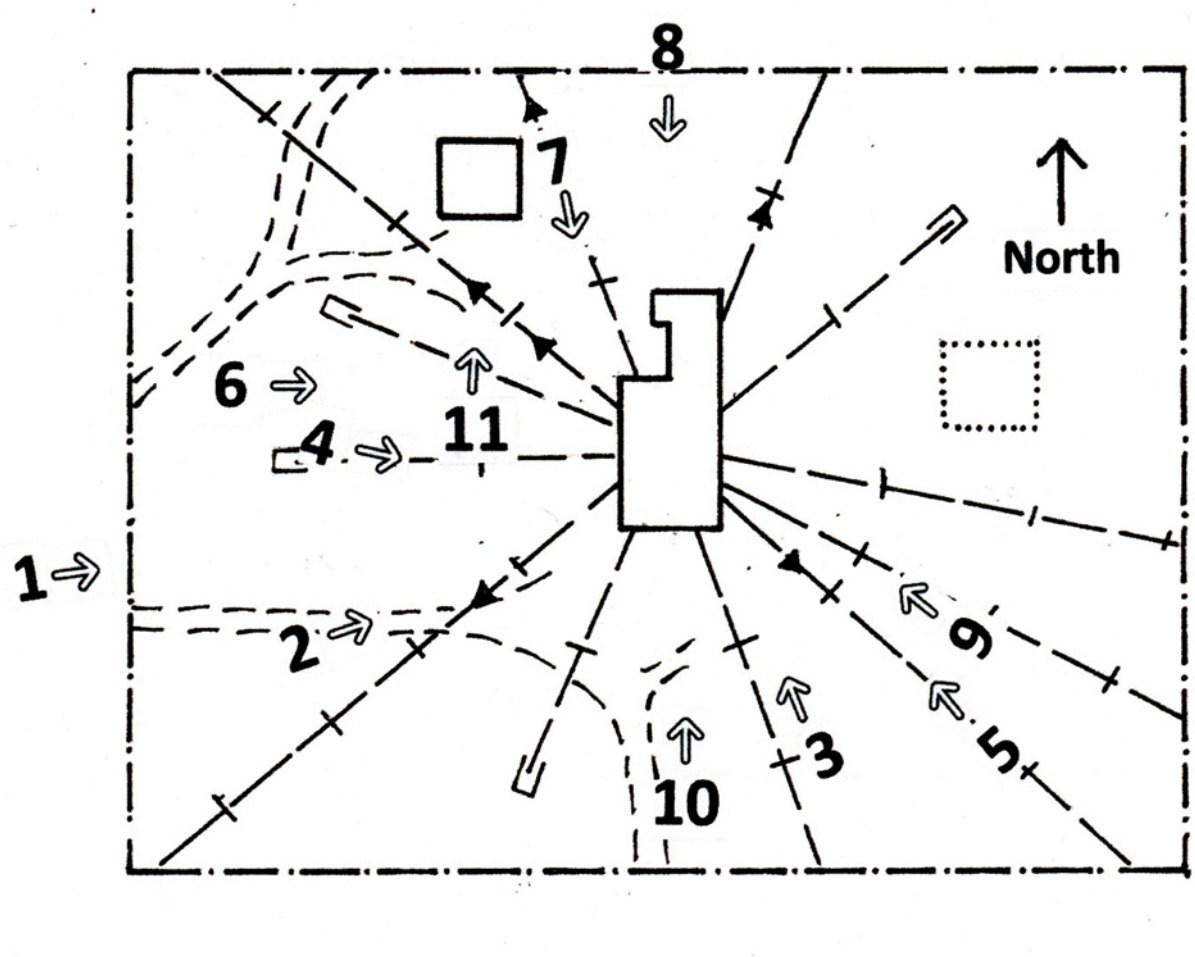


Figure 13 Interior Photo Key on Floorplan Diagram

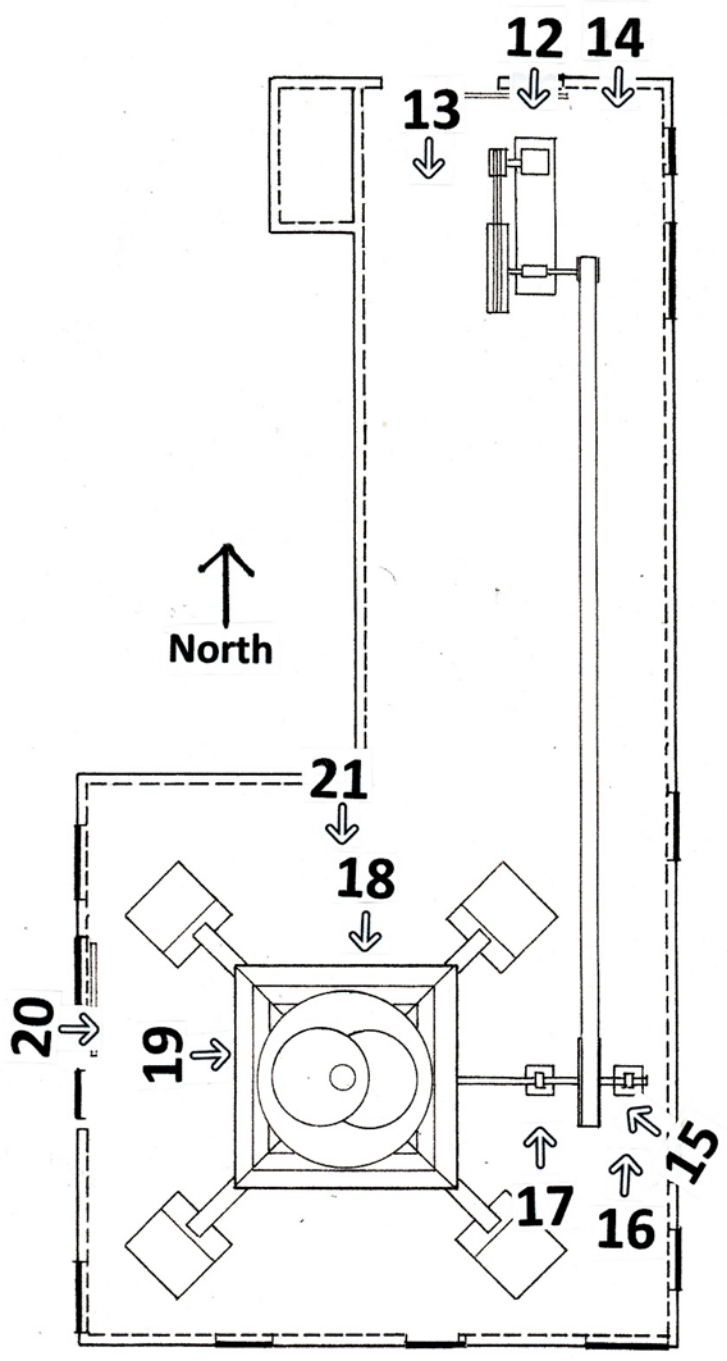


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Photo 7 North facing Jack Plant facades. The camera is facing slightly east of south. A rod swing remnant is seen on the right of the structure.

Photo 8 North Jack Plant facade. Company production tanks are seen to the left in the distance. The camera is facing south.

Photo 9 East and south Jack Plant facades. Clearly visible are the holes which the cables went through heading toward wells or balance. The camera is facing northwest.

Photo 10 South Jack Plant façade with Tool House to the left. The camera is facing north.

Photo 11 The Tool House. The camera is facing north.

Photo 12 Electric motor and v-belts on the drive wheel. The camera is facing south.

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