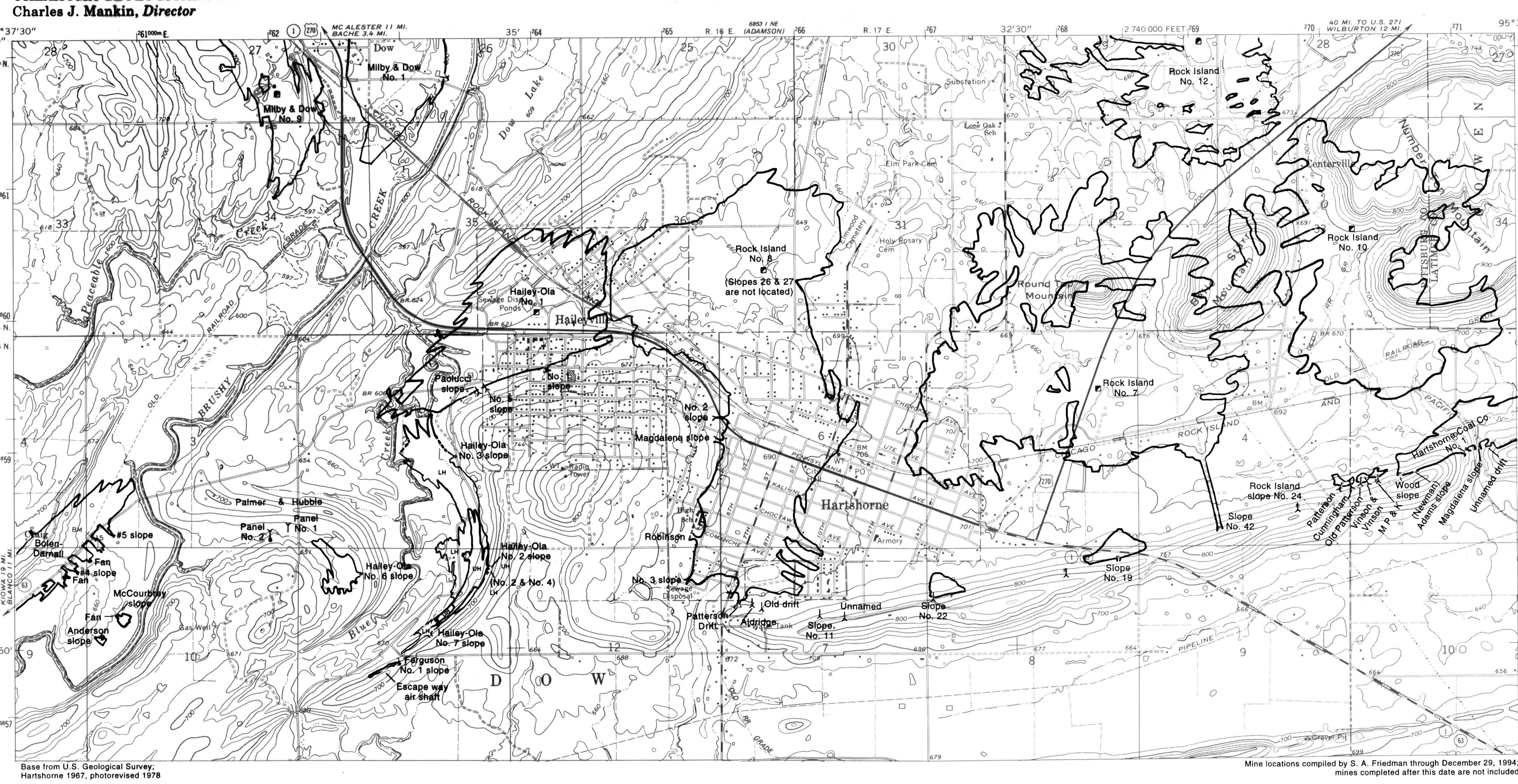
OKLAHOMA GEOLOGICAL SURVEY
Charles J. Mankin, Director



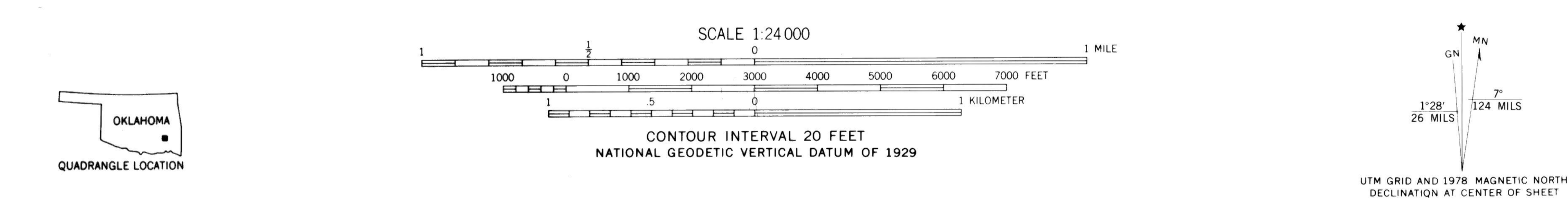
EXPLANATION

Boundary of mined area, dashed where inferred

Drift or slope mine entrance

Mine shaft

Hailey-Ola No. 1 — Mine name & number



DISCUSSION

Topographic base map

Areas of and entries to abandoned, underground coal mines have been plotted on the U.S. Geological Survey topographic map of the Hartshorne 7.5′ Quadrangle, because the user can see section, township, and range boundaries, and ground features such as streams (creeks), valleys, hills, county roads, highways, houses, barns, and farm ponds, in relation to the location of the mines. This topographic map was photo revised in 1978 and serves as the base map.

Mine boundaries, terms, and methods

At first glance, the reader may think that the entire area within the mine boundaries represents underground voids. But this is not a fact. An examination of the areas within the mine boundaries will reveal small odd-shaped or rectangular-shaped areas; these depict most of the solid coal pillars and barriers large enough to be shown on the base map. Most pillars and barriers are not shown. Most of the mines shown on the map were mined by room-and-pillar method. A room, say 60 ft long by 40 ft wide, is where coal was removed by pick or machine mining. A pillar is the solid coal bed, forming the ribs or faces of the sides of the rooms; pillars may be smaller than, or similar in size, to the rooms. Rooms are connected to each other so that miners, equipment, and mined coal could move or be moved freely in the mine, up to the land surface. Once a segment of a mine had been mined by this method, fresh air and travel routes commonly were altered by the addition of burlap curtains, brick, wood, or concrete walls thus sealing off groups of rooms. In many areas the "roof" strata have fallen into rooms. Mining techniques were affected or controlled by geology, e.g., the type of rock overlying the coal bed was called roof rock by the miners, and that underlying the coal bed, the floor. If the roof rock were non-cohesive, the miners dug smaller rooms, leaving large pillars that helped to support the roof rock and thus leaving more coal in the ground. Geologists refer to coal reserves remaining in pillars, barriers, or larger areas in underground mines as "lost-in-mining." In areas where these mines are within 60 ft of the land surface, some of these unmined pillars, barriers, and larger areas were mined later by surface methods. In the McAlester mining region commonly only 40% of the coal was removed by mining at any of the underground mines (Trumbull, 1957). Thus 60% of the solid coal bed still is present in most cases within the peripheral boundaries of the coal mines shown on this quadrangle map. The remaining "lost-in-mining" coal is present in the form of standard pillars and barriers, and also in some places that are much larger than these pillars and barriers. These large areas of coal within the abandoned mines also are shown on the quadrangle map. Most pillars and barriers are too small and too numerous to show on the quadrangle map.

Map scale, mine symbols, and overlapping mine boundaries

Photographic techniques were used to reduce the fragile, old blueprint mine maps, which are on file at the Oklahoma Department of Mines (ODOM), from their large scale of one inch equals 100 ft to the present topographic quadrangle map scale of one inch equals 2,000 ft. The peripheral boundary lines of the mines represent the maximum extent of the mined areas. The square shaft symbols indicate vertical shafts; the Y-shaped symbols represent drift (slope) entries. All named slope mines in the quadrangle area were driven into the outcrop of the coal beds and are thus drift mines. Later, as these mines were made deeper, shafts (or additional slopes) were dug from the surface into them for purposes of safety, emergencies, and to facilitate movement of men, supplies, and coal production. Furthermore state mine inspectors often ordered mine operators to construct additional shafts or slopes in mines that were still active to increase fresh air flow and for access of emergency equipment and men, or for an escape way for the miners. Thus, you will see multiple drift-entry symbols (some without names) for most of the mines shown on this map.

In sections 2 and 11, T. 4 N., R. 16 E., the Hailey-Ola No. 2 slope mine produced Upper Hartshorne coal from a slope that is directly over a totally separate slope (also called No. 2) that produced the Lower Hartshorne coal. This is why the mine boundaries are complex and appear to overlap in this location. Also, you can see one drift entry almost on top of another. A few drift entries are shown as separate from any boundaries of underground mines, because evidence is lacking to show the areal extent of mining.

Possible land subsidence

The thickness of the Lower Hartshorne coal (see Oklahoma Geological Survey SP–74–2, 1974) is 3 to 5 ft, averaging 4 ft in the area where it has been mined in the Hartshorne Quadrangle map. If the roof shale collapsed into a mine room or haulage passageway that was about 100 ft below the land surface, one might expect (1) no land to settle or cave in, (2) a small subsidence of the land (perhaps a few inches), or (3) a maximum of 1 or 2 ft of land-surface subsidence. The deeper the mine, the less likely the possibility of the overlying land surface to subside, because of a roof fall in the mine rooms or passageways. Recall that an area of approximately 40% of the coal bed has been removed by mining. Roof support timbers and steel roof supports also were installed in many areas of these mines. Nevertheless, in the professional opinion of the writer, for reasons concerning maximum public safety, certified geologists, or registered architects or mining engineers should be consulted before any structures are built above abandoned underground mines, especially in places where the mines are less than 200 ft deep.

Sources of data

Table 1 lists depths to the coal mined at the bottom of mine shafts and along mine slopes or drifts. The source of this depth data is varied, but all of it has been modified by the present writer. Some data are taken from geological publications, referenced in the Footnotes, some from blueprint mine maps, some from annual reports of the Oklahoma State mine inspectors; and many have been mathematically calculated by the writer using dip measurements. A few depths are extrapolated from data from proprietary boreholes located adjacent to a few of the mines. Depths of many small mines could not be determined, are unknown, and are recorded on the table as n.a. (not available).

Selected Bibliography

Friedman, S. A., 1974, Investigation of the coal reserves in the Ozarks Section of Oklahoma and their potential uses: Oklahoma Geological Survey Special Publication 74–2, 117 p., 24 figs., 77 tables [Fifth printing, 1981].

Hendricks, T. A., 1937, Geology and fuel resources of the southern part of the Oklahoma coal field; part 1, the McAlester district, Pittsburg, Atoka, and Latimer counties: United States Geological Survey Bulletin 874–A, plate 7.

Keenan, C. M., 1963, Historical documentation of major coal-mine disasters in the United States not classified as explosions of gas or dust: 1846–1962: United States Bureau of Mines Bulletin 616, p. 42.

Oklahoma Department of Mines, Annual reports of the Chief Mine Inspector 1909–1912, 1929–1993.

Trumbull, J. V. A., 1957, Coal resources of Oklahoma: United States Geological Survey Bulletin 1042–J, p. 367.

Disclaimer

The writer has not shown every single "dog hole" digging into a coal outcrop, although he has depicted to the best of his ability and knowledge the boundary of every large, abandoned underground coal mine, shown on blueprint maps that were available from the Oklahoma Department of Mines. Furthermore, the accuracy of blueprint-mine maps depends in part on the accuracy of the surveyor or engineer, who had access to the mines, and who depicted the extent and location of the coal mines before they were closed, abandoned, or sealed. Although the writer cannot swear to their total accuracy today, he assumed that these maps are accurate enough and worth plotting on the Hartshorne 7.5′ topographic Quadrangle Map to provide the public with valuable information on the depth and distribution of abandoned underground coal mines.

TABLE OF ABANDONED UNDERGROUND COAL MINES

Coal Company[a]	Mine Name or Number[b]	Location[d] Section	T.	R.	County	Name of Coal[e]	Depth to Top of Coal[f] (ft)	Thickness of Coal[g] (ft)	Years of Operation[h]	Reported Production[h] (tons)	Reported No. of Miners Killed[h]
Rock Island Improvement	12[c]	28,29,32,33	5N	17E	Pittsburg	Lower Hartshorne	400	3.8	Before 1929–1931	410,071	2
Rock Island Improvement	10	33 4	5N 4N	17E	Pittsburg	Lower Hartshorne	583	3.7	Before 1929–1933	326,575	n.a.
Rock Island Improvement	10	34 3	5N 4N	17E	Latimer	Lower Hartshorne	583	3.6	Before 1929–1933	Included with line above	n.a.
Rock Island Improvement	7	31,32 4,5,6	5N 4N	17E	Pittsburg	Lower Hartshorne	375	4.0	Before 1907–1931	515,316	3
Rock Island Coal & Mining	No. 42 Slope	4	4N	17E	Pittsburg	Lower Hartshorne	0–452	4.6	n.a.[i]	n.a.	n.a.
Rock Island Improvement	8	31 36	5N 5N	17E 16E	Pittsburg	Lower Hartshorne	254	4.0	Before 1907–1911	169,428	11
Rock Island	8 Slopes 26 & 27	31 36	5N 5N	17E 16E	Pittsburg	Lower Hartshorne	0–150	4.0	1910–1911	Included with line above	n.a.
Rock Island	No. 2 Slope	6 1	4N 4N	17E 16E	Pittsburg	Lower Hartshorne	0–200	4.4	Before 1907	n.a.	n.a.
Rock Island	Unnamed Slope	7	4N	17E	Pittsburg	Lower Hartshorne	0–100	4.4	Before 1907	n.a.	n.a.
Magdalena	Magdalena Slope	6 1	4N 4N	17E 16E	Pittsburg	Lower Hartshorne	0–200	4.4	Before 1907	n.a.	n.a.
Robinson	Robinson Slope	1	4N	16E	Pittsburg	Lower Hartshorne	0–200	4.4	Before 1907	n.a.	n.a.
Rock Island	No. 3 Slope	12	4N	16E	Pittsburg	Lower Hartshorne	0–200	4.4	Before 1907	n.a.	n.a.
Milby and Dow Coal & Mining	No. 1 Shaft No. 1 Slope[c]	26,27 34,35	5N	16E	Pittsburg	McAlester	n.a. 0–219	~3.0	Before 1907	n.a.	n.a.
Milby and Dow Coal & Mining	No. 9[c]	27,34	5N	16E	Pittsburg	McAlester	388	3.0	1912–1931	51,667 (in 1930)	1
Hailey-Ola	No. 1	35,36	5N	16E	Pittsburg	Lower Hartshorne	~400	~3.0	Before 1907–1930	177,420	31
Hailey-Ola	No. 1 Slope	1,2	4N	16E	Pittsburg	Lower Hartshorne	0–272	~3.0	Before 1907–n.a.	n.a.	n.a.
Hailey-Ola	No. 5 Slope	1,2	4N	16E	Pittsburg	Lower Hartshorne	0–519	~3.0	Before 1907–n.a.	n.a.	n.a.
Hailey-Ola	Paolucci Slope	2	4N	16E	Pittsburg	Lower Hartshorne	0–325	n.a.	n.a.	n.a.	n.a.
Hartshorne	No. 1 Slope[c]	3	4N	17E	Latimer	Lower Hartshorne	0–370	3.7	Before 1922–1939	31,915	1
Unnamed	Unnamed Drift	3	4N	17E	Latimer	Lower Hartshorne	0–121	3.5	Before 1922	n.a.	n.a.
Magdalena	Magdalena Slope	3	4N	17E	Latimer	Lower Hartshorne	0–296	3.0	Before 1922–1938	n.a.	n.a.
Adams	Adams Slope	3	4N	17E	Latimer	Lower Hartshorne	0–53	3.0	1957–1967	1,097	n.a.
(Newman)	Newman Slope	3	4N	17E	Latimer	Lower Hartshorne	0–136	3.0	Before 1937 –1937	n.a.	n.a.
Wood	Wood Slope	3	4N	17E	Latimer	Lower Hartshorne	0–212	3.2	Before 1939	n.a.	n.a.
MP&K	No. 1	3	4N	17E	Latimer	Lower Hartshorne	0–106	3.5	1949–1950	n.a.	n.a.
Vinson and Vinson	No. 1 Slope	3	4N	17E	Latimer	Lower Hartshorne	0–102	3.2	1950–1952	n.a.	n.a.
Pattison	Pattison Slope	3	4N	17E	Latimer	Lower Hartshorne	0–100	3.2	Before 1950	n.a.	n.a.
Cunningham	No. 1	3	4N	17E	Latimer	Lower Hartshorne	0–93	3.8	1954	n.a.	n.a.
Pattison	Old Slope	4	4N	17E	Pittsburgh	Lower Hartshorne	0–201	3.8	1959	n.a.	n.a.
Rock Island	Slope No. 24	4	4N	17E	Pittsburg	Lower Hartshorne	0–50	3.8	Before 1930	n.a.	n.a.
Rock Island	Slope No. 19	4,5,8	4N	17E	Pittsburg	Lower Hartshorne	0–150	4.1	Before 1930	n.a.	n.a.
Rock Island	Slope No. 11	7	4N	17E	Pittsburg	Lower Hartshorne	0–100	4.4	Before 1911	n.a.	n.a.
Rock Island	Slope No. 22	8	4N	17E	Pittsburg	Lower Hartshorne	0–150	4.5	Before 1930	n.a.	n.a.
Hailey-Ola	No. 3 Slope	2	4N	16E	Pittsburg	Lower Hartshorne	0–287	4.0	Before 1907–1919	73,625	2
Hailey-Ola	No. 2 Slope	2,11	4N	16E	Pittsburg	Lower Hartshorne	0–600	4.0	1911–1919	27,335	2
Hailey-Ola	No. 2 Slope	2,11	4N	16E	Pittsburg	Upper Hartshorne	0–303	3.0–3.5	1919–1921	n.a.	n.a.
Hailey-Ola	No. 4 Slope	11	4N	16E	Pittsburg	Lower Hartshorne	0–n.a.	4.0	1907–1912	63,574	0
Hailey-Ola	No. 7 Slope	11	4N	16E	Pittsburg	Lower Hartshorne	0–413	3.8–5.6	Before 1919 –1919	n.a.	n.a.
Ferguson	No. 1 Slope	11	4N	16E	Pittsburg	Upper Hartshorne	0–138	~4.0	1912	n.a.	n.a.
Hailey-Ola	No. 6 Slope	2,11	4N	16E	Pittsburg	McAlester	0–360	3.2	1912–1920	n.a.	n.a.
Palmer and Hubble	Panel No. 1 Slope	3	4N	16E	Pittsburg	McAlester	0–76	3.2	1930	n.a.	n.a.
Palmer and Hubble	Panel No. 2 Slope	3	4N	16E	Pittsburg	McAlester	0–153	3.2	1930	n.a.	n.a.
Bolen-Darnall	No. 5 Slope	3,4,10	4N	16E	Pittsburg	McAlester	0–287	~3.0	1910–1911	n.a.	2
Bolen-Darnall	No. 4 Slope[c]	4,9,10	4N	16E	Pittsburg	McAlester	0–478	~3.0	1910–1916	71,121	n.a.
Bolen-Darnall	Stevenson Slope	9	4N	16E	Pittsburg	McAlester	0–115	~3.0	1911–n.a.	n.a.	n.a.
Anderson	Slope No. 1	10	4N	16E	Pittsburg	McAlester	0–28	~3.0	1913	n.a.	n.a.
McCourbrey	Slope No. 1	10	4N	16E	Pittsburg	McAlester	0–37	~3.0	1913	n.a.	n.a.

Footnotes

[a]Former name and concurrent name of company are indented.

[b]Mine name or number is from Oklahoma Department of Mines (and predecessors) Annual Reports (1909–1912; 1930–1931), U.S. Geological Survey (USGS) Bulletin 874–A, plate 7 (1937), and blueprint mine maps on file at the Oklahoma Department of Mines (ODOM).

[c]Part of mine is located in an adjacent 7.5-minute quadrangle map area.

[e]Name of coal bed as used in Oklahoma Geological Survey Special Publication 74–2 (1974). Coal bed names are those assigned for each mine by the engineer who made the blueprint map for the mining company, by USGS Bulletin 874–A, plate 7, or by the present author if there was a conflict or if no name was shown on the cited references.

[d]Mine location is from same sources as noted in footnote b (above) and the Hartshorne Oklahoma 7.5-minute topographic quadrangle map of the USGS, 1967, photo-revised 1978.

[f]Depth to the top of coal in slope mines is shown in feet from the surface to the maximum depth in the mine; e.g., 0–300. A single depth is listed if the mined coal was brought to the surface through a shaft. The term shaft is reserved for a vertical shaft. Although some depths are taken from the blueprint mine maps or from USGS Bulletin 874–A, plate 7, most were determined for slope mines by the present author applying trigonometric functions, following determination of the dip of the coal bed. All slope mines were driven into the coal bed at the outcrop face and are thus drift mines. Most are called slopes on the blueprint maps and on plate 7.

[g]Thickness of coal beds was determined from field observations and measurements, from blueprint mine maps, from USGS Bulletin 874–A, plate 7, or from proprietary records of coal-test boreholes.

[h]Years operated, reported production, and number of miners killed represent incomplete records from references cited in footnotes a–f. Data from reports of the ODOM for 1913–1929 were not available for use on this map. These data also were not available for any period that mines were active before Oklahoma became a state in 1907.

[i]Not available.

Note: Information regarding the location of Hailey-Ola No. 4 Slope is conflicting, because: (1) USGS Bulletin 874 plate 7 (published in 1937) shows it in section 2, T. 4 N., R. 16 E., but (2) the first report of the ODOM Chief Mine Inspector of Oklahoma (1912, p. 56) indicates that the No. 4 Slope in the Lower Hartshorne coal is ½ mile south of the No. 3 Slope, which means the No. 4 Slope is in section 11. The No. 2 Slope began in 1911 (ODOM) in the Lower Hartshorne coal; it would have been in the same place as the No. 4 Slope in section 2 or 11. A lease map at the ODOM shows a No. 4 Slope in the same location (in section 11) that the No. 2 Slope occupies on a map of the No. 2 mine. We may never know the correct location of this No. 4 Slope until the map of this mine shows up. It is not present in the files of the ODOM or the OGS. Examination of these reports and maps suggest to the writer that the Hailey-Ola No. 4 Slope is in section 11, T. 4 N., R. 16 E.

MAP SHOWING THE DISTRIBUTION OF UNDERGROUND MINES IN THE HARTSHORNE AND McALESTER COALS IN THE HARTSHORNE 7.5′ QUADRANGLE, PITTSBURG AND LATIMER COUNTIES, OKLAHOMA

By

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1996