## TUNGSTEN STATISTICS

## Compiled by: Arizona Department of Mineral Resources Source: Minerals Yearbook, U. S. Bureau of Mines

Tungsten ore and concentrates shipped from mines in Arizona and the United States, in short tons of 60% WO<sub>3</sub>; Prices and General Imports:

Year	Total U.S.	Arizona Shipments	Avg. Value Per Unit of WO <sub>3</sub> .	Avg Per Pound of Tungsten	General Imports
1941 1942 1943 1944 1945	6567 9383 11945 10283 5534	277 219 62 29 97	\$ 23.41 24.12 25.08 23.35 23.17	\$ 1.48 1.52 1.58 1.47 1.46	10,930 15,851 19,524 19,164 9,078
1946 1947 1948 1949 1950	5193 3094 4,005 2,900* 4,900*	20 13 23	20.17 23.43 26.27 \$25 - \$18 \$18 - \$56	1.27 1.48 1.66	7,157 9,459 10,259 7,731 7,500*

\* Estimated by Engineering & Mining Journal

The tungsten ore mined and milled in the United States, in general, contains 0.5 to 2.5% WO<sub>3</sub> and is beneficiated to a concentrate containing 60% or more WO<sub>3</sub>. The leading tungsten producers and many small operators depend on ore carrying tungsten only as scheelite (calcium tungstate). Huebnerite (man-ganese tungstate), and ferberite (iron tungstate) have contributed smaller quantities of the tungsten in domestic ore mined. Most of the concentrates are converted to ferrotungsten and tungsten metal. Some high-purity concentrates are charged directly to the steel bath.

#### -

# The Story of Tungsten in Arizona during the Last 10 years

- 1941 Shipments of tungsten concentrates in Arizona were 246 short tons averaging 67.44% WO3. The output comprised sheelite, wolframite, huebnerite and ferberite. By far the largest output came from the Boriana Mine near Yucca, Mohave County where wolframite and scheelite concentrates, averaging 70% WO3 were recovered from milling a 1.35% WO3 ore. Other producers were the Tungsten Reef mines in Cochise County, the Gold Crown, Chloriding, and Diff claims, and the Williams Mine in Mohave County, and the Morning Star mine in Pinal County. At the Williams Mine, operations were discontinued because of high operating costs.
- 1942 Shipments of tungsten concentrates in Arizona were 192 tons averaging 68.44% WO3. The Boriana Mine in Mohave County continued to lead in production; where wolframite and scheelite concentrates averaging

68.74% WO3 were recovered from milling a 1.05% ore. Other production came from the Tungsten Reef, Chloriding and Diff claims and Morning Star claim.

1943 Shipments of tungsten concentrates were 65 tons averaging 57.29% WO3. The large decline was due chiefly to suspension of operations in February at the Boriana Mine in Mohave County where 15 tons were produced. Other scattered production came from the Black Gold Mine in Pima County, the Chloriding and Diff claims in Mohave County and Maudina and Morning Star mines in Pinal County.

In addition to the primary tungsten concentrates, small quantities of milling ore were shipped to the Parker and Phoenix depots of Metals Reserve Co.

1944 Shipments of tungsten concentrates were 32 tons averaging 54.31% WO<sub>3</sub>. The Black Gold and Los Guijas mine in Pima county, the Chloriding and Diff claims in Mohave County and the Maudina Mine in Pinal County, and the Quartzsite Mine in Yuma County made up the bulk of production.

In addition to the primary tungsten concentrates, small quantity of secondary concentrates was shipped to the re-treatment plant at Salt Lake City, and small quantities of milling ore were shipped to the Parker and Phoenix depots of Metals Reserve Co.

- 1945 Shipments of primary tungsten concentrates were 140 tons averaging 41.77% WO3. Williams and Ryan, operating a mill at Tucson, accounted for the bulk of the concentrates shipped; the concentrates produced resulted from treating ore purchased from Metals Reserve Co.
- 1946 Shipments of tungsten concentrates were 17 tons averaging 71.24% WO3. The figure includes 8 tons of concentrates averaging 74.16% WO3 recovered at Salt Lake City plant from treating secondary concentrates produced previous to 1946.
- 1947 Shipments of tungsten concentrates were 16 tons averaging 50.31% WO<sub>3</sub>. The output came from widely scattered operations.
- 1948 Shipments of tungsten concentrates were 20 tons averaging 69.4% WO<sub>3</sub>. The output came from widely scattered operations. Domestic scheelite of good known analysis was quoted at \$30.00 - \$28.50 a unit.
- 1949- With a lessened domestic demand, due to large importations, the produc-1950 tion of tungsten in Arizona has practically ceased. Domestic scheelite of good known analysis in carlots delivered was quoted at \$28.50 a unit in 1949, and advanced in 1950 to \$49.00 per unit (20 lbs) for tungsten concentrate.

In 1951 the Gov't instituted a guaranteed price of \$63 per unit, causing Arizona interest in the search for tungsten ore. 2 mills, the Hillside Mine in Yavapai County; and Picacho Mill near Sells, are adding tungsten units.

For an Article on "Tungsten Deposits of Arizona" see: Ariz. Bureau of Mines Geol.Ser. 14, Bull 148, Vol 12, No. 2, 1941, 55pp. By E.D.Wilson.

## TUNGSTEN STATISTICS

Compiled by: Arizona Department of Mineral Resources Source: Minerals Yearbook, U. S. Bureau of Mines

Tungsten ore and concentrates shipped from mines in Arizona and the United States, in short tons of 60% WO<sub>3</sub>; Prices and General Imports:

Year	Total U.S.	Arizona Shipments	Avg. Value Per Unit of WO <sub>3</sub> .	Avg Per Pound of Tungsten	General Imports
1941	6567	277	\$ 23.41	\$ 1.48	10,930
1942	9383	219	24.12	1.52	15.851
1943	11945	62	25.08	1.58	19.524
1944	10283	29	23.35	1.47	19,164
1945	5534	97	23.17	1.46	9,078
1946	5193	20	20.17	1.27	7,157
1947	3094	13	23.43	1.48	9.459
1948	4,005	23	26.27	1.66	10,259
1949	2,900*	-	\$25 - \$18	-	7,731
1950	4,900*	-	\$18 - \$56	-	7,500*

\* Estimated by Engineering & Mining Journal

The tungsten ore mined and milled in the United States, in general, contains 0.5 to 2.5% WO<sub>3</sub> and is beneficiated to a concentrate containing 60% or more WO<sub>3</sub>. The leading tungsten producers and many small operators depend on ore carrying tungsten only as scheelite (calcium tungstate). Huebnerite (manganese tungstate), and ferberite (iron tungstate) have contributed smaller quantities of the tungsten in domestic ore mined. Most of the concentrates are converted to ferrotungsten and tungsten metal. Some high-purity concentrates are charged directly to the steel bath.

#### . . . . .

## The Story of Tungsten in Arizona during the Last 10 years

- 1941 Shipments of tungsten concentrates in Arizona were 246 short tons averaging 67.44% WO3. The output comprised sheelite, wolframite, huebnerite and ferberite. By far the largest output came from the Boriana Mine near Yucca, Mohave County where wolframite and scheelite concentrates, averaging 70% WO3 were recovered from milling a 1.35% WO3 ore. Other producers were the Tungsten Reef mines in Cochise County, the Gold Crown, Chloriding, and Diff claims, and the Williams Mine in Mohave County, and the Morning Star mine in Pinal County. At the Williams Mine, operations were discontinued because of high operating costs.
- 1942 Shipments of tungsten concentrates in Arizona were 192 tons averaging 68.44% WO3. The Boriana Mine in Mohave County continued to lead in production; where wolframite and scheelite concentrates averaging

- 1 -

68.74% WO3 were recovered from milling a 1.05% ore. Other production came from the Tungsten Reef, Chloriding and Diff claims and Morning Star claim.

1943 Shipments of tungsten concentrates were 65 tons averaging 57.29% WO3. The large decline was due chiefly to suspension of operations in February at the Boriana Mine in Mohave County where 15 tons were produced. Other scattered production came from the Black Gold Mine in Pima County, the Chloriding and Diff claims in Mohave County and Maudina and Morning Star mines in Pinal County.

In addition to the primary tungsten concentrates, small quantities of milling ore were shipped to the Parker and Phoenix depots of Metals Reserve Co.

1944 Shipments of tungsten concentrates were 32 tons averaging 54.31% WO3. The Black Gold and Los Guijas mine in Pima county, the Chloriding and Diff claims in Mohave County and the Maudina Mine in Pinal County, and the Quartzsite Mine in Yuma County made up the bulk of production.

In addition to the primary tungsten concentrates, small quantity of secondary concentrates was shipped to the re-treatment plant at Salt Lake City, and small quantities of milling ore were shipped to the Parker and Phoenix depots of Metals Reserve Co.

- 1945 Shipments of primary tungsten concentrates were 140 tons averaging 41.77% WO3. Williams and Ryan, operating a mill at Tucson, accounted for the bulk of the concentrates shipped; the concentrates produced resulted from treating ore purchased from Metals Reserve Co.
- 1946 Shipments of tungsten concentrates were 17 tons averaging 71.24% WO3. The figure includes 8 tons of concentrates averaging 74.16% WO3 recovered at Salt Lake City plant from treating secondary concentrates produced previous to 1946.
- 1947 Shipments of tungsten concentrates were 16 tons averaging 50.31% WO<sub>3</sub>. The output came from widely scattered operations.
- 1948 Shipments of tungsten concentrates were 20 tons averaging 69.4% WO<sub>3</sub>. The output came from widely scattered operations. Domestic scheelite of good known analysis was quoted at \$30.00 - \$28.50 a unit.

1949- With a lessened domestic demand, due to large importations, the produc-1950 tion of tungsten in Arizona has practically ceased. Domestic scheelite of good known analysis in carlots delivered was quoted at \$28.50 a unit in 1949, and advanced in 1950 to \$49.00 per unit (20 lbs) for tungsten concentrate.

In 1951 the Gov't instituted a guaranteed price of \$63 per unit, causing Arizona interest in the search for tungsten ore. 2 mills, the Hillside Mine in Yavapai County; and Picacho Mill near Sells, are adding tungsten units.

For an Article on "Tungsten Deposits of Arizona" see: Ariz. Bureau of Mines Geol.Ser. 14, Bull 148, Vol 12, No. 2, 1941, 55pp. By E.D.Wilson.