which is the most persistent vein in the basin, contains an ore shoot 2½ to 9 feet thick, and over 200 feet in stope lengths. Parts of the ore shoot contain 40 percent lead and 52 ounces per ton in silver. Hunting (1956, p. 207) reports the average metal content of the ore as follows: 4.7 percent lead, 4.8 percent zinc, 0.35 percent copper, 1.78 percent arsenic, 0.062 ounce per ton in gold, and 9.8 ounces per ton in silver.

Principal Silver Deposits of Stehekin District (Horseshoe Basin Area)

Doubtful

Location: SE1/4 NW1/4 sec. 31, T. 35 N., R. 14 E.
Development: 30- and 100-foot adits.
Geology: 16- to 24-inch quartz vein in gneiss. Vein contains a 4-inch band of sulfides, which assays 87.5 to 100 ozs. silver per ton and 54 to 62 percent lead.
Production: None.

Franklin

Location: NE1/4 SW1/4 sec. 31, T. 35 N., R. 14 E.
Development: Unknown.
Geology: 4-foot-thick quartz vein, select samples of which assayed 89 to 100 ozs. silver per ton and 42 to 54 percent lead.
Ore minerals: Galena and pyrite.
Production: None.

Homestake and Star

Location: SW1/4 NW1/4 sec. 33, T. 35 N., R. 14 E.
Development: 30-foot open cut.
Geology: 4-foot-wide ore body, select samples of which assayed 112 to 400 ozs. silver per ton and 1 oz. gold.
Ore minerals: Unknown.
Production: None.

Horseshoe Basin

Location: N1/4 sec. 29 and NE1/4 sec. 32, T. 35 N., R. 14 E.
Development: 1,000-foot crosscut adit with 1,000 feet of drifts.
Geology: Persistent shear zone in granodiorite can be followed for 1,060 feet along strike. Ore shoot 3 feet wide and 330 feet long averages 9.8 ozs. silver, 0.662 oz. gold, 4.7 percent lead, 4.8 percent zinc, 0.35 percent copper, and 1.78 percent arsenic.
Ore minerals: Galena, sphalerite, chalcopyrite, arsenopyrite, and pyrite.
Production: None.

Isoletta

Location: SW1/4 NW1/4 sec. 5, T. 34 N., R. 14 E.
Development: 215-foot adit.
Geology: Unknown. Select samples assayed 300 to 700 ozs. silver per ton.
Ore minerals: Unknown. Probably argentiferous galena.
Production: 1 ton in the early 1900's.
Quien Sabe

Location: SE4 NW1/4 sec. 31, T. 35 N.,
R. 14 E.
Development: 250-foot drift.
Geology: Quartz vein, select samples of
which assayed 103 to 204 ozs. silver
and 0.1 oz. gold.
Ore minerals: Galena, chalcopyrite, arsenopyrite, and pyrite.

Production: None.

KITTITAS COUNTY

Silver has been reported at many metal occurrences in Kittitas County, but the county has never
had a major silver-producing mine. From 1884 to

FIGURE 25.—Silver deposits of Kittitas County.
1970, mines of the county produced around 25,000 ounces of silver, almost all of which came from the refining of placer gold that was mined in the Swauk district. Lode gold mines in the Swauk district also produced silver, but the production was minor. In the Cle Elum and Gold Creek districts, silver was a byproduct of gold, copper, and lead mining operations; however, the combined metal production from mines of these districts was less than $10,000. Currently no lode mines are operating in the county, and only small-scale placer mining is taking place in the Swauk district.

Although many mines in the Cle Elum and Gold Creek districts report the presence of silver, only at a few properties does the silver content of the veins exceed 10 ounces per ton. Most silver deposits appear to be small and consist of sparsely metallized shear zones and quartz veins in andesite and granitic rocks. The andesite is part of the Keechelus Andesite (Oligocene and Eocene), whereas the granitic rocks are part of the Mount Stuart batholith (Cretaceous). Common ore minerals of metallized shear zones and quartz veins are pyrite, pyrrhotite, arsenopyrite, chalcopyrite, galena, and sphalerite. Free gold, pyrargyrite, and tetrahedrite are rarely present.

**CLE ELUM DISTRICT**

**Principal Silver Deposits**

**American Eagle**

- **Location:** SE 1/4 SE 1/4 sec. 22, T. 24 N., R. 14 E.
- **Development:** Unknown.
- **Geology:** 6-foot vein with 1½ feet of ore that assays up to 1.5 ozs. gold and 15 ozs. silver per ton.
- **Ore minerals:** Unknown.
- **Production:** None.
- **Reference:** Bethune, 1892, p. 133.

**Aurora**

- **Location:** Secs. 26 and 27, T. 24 N., R. 14 E.
- **Development:** 2 shafts, each over 200 feet deep.
- **Geology:** 4-foot-thick quartz vein. Select samples of vein assayed 1 oz. gold,
14 ozs. silver, 6 percent copper, and 28 percent arsenic.

Ore minerals: Free gold and arsenopyrite.
Production: Minor.

GOLD CREEK DISTRICT

Principal Silver Deposits of Gold Creek District

Esther and Louisa

Location: NE¼NE¼ sec. 27, T. 23 N., R. 12 E.
Development: 2 adits.
Geology: Quartz vein in andesite. Vein

Production: None.

Cle Elum

Location: Near SW. cor. sec. 24, T. 23 N., R. 14 E.
Development: 700-foot inclined shaft.
Geology: 4-foot vein, select samples of which assay up to 55 ozs. silver and 0.2 oz. gold.
Ore minerals: Pyrite.

Production: None.
sparsely metallized but high-grade ore assayed 240 ozs. silver and 0.5 oz. gold per ton.

**Ore minerals:** Pyrargyrite, galena, sphalerite, and pyrite.

**Production:** Minor production in 1896.

**Reference:** Huntting, 1956, p. 298.

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**Silver King and Silver Queen**

**Location:** Near center sec. 36, T. 23 N., R. 11 E.

**Development:** Caved adit and inclined shaft.

**Geology:** Quartz vein in andesite assays up to 22.4 ozs. silver, 0.07 oz. gold, and 0.063 percent copper.

**Ore minerals:** Unknown.

**Production:** None.


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**Giant**

**Location:** SE¼ sec. 22, T. 23 N., R. 12 E.

**Development:** 500-foot adit with short drifts and a 100-foot adit with a winze.

**Geology:** ½- to 6-foot-wide metallized shear zones in granitic rocks. Ore minerals make up less than 5 percent of the shear zones, and assays show up to 14.96 ozs. silver, 0.14 oz. gold, 0.08 percent copper, and 0.16 percent lead. Select dump samples assayed 12.40 ozs. silver, 2.40 oz. gold, 0.3 percent copper, and 2.1 percent lead.

**Ore minerals:** Galena, chalcopyrite, and pyrite.

**Production:** Unknown.

**Reference:** Gualtieri and others, 1973, p. 64-66.

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**Transit**

**Location:** NW¼NW¼ sec. 26, T. 23 N., R. 12 E.

**Development:** 100-foot adit and a 60-foot drift with a winze.

**Geology:** Narrow metallized shear zones in andesite. Sample from the shear zone assayed 10.70 ozs. silver, 0.08 oz. gold, and 0.56 percent copper.

**Ore minerals:** Pyrite.

**Production:** None.

PART III

SILVER OCCURRENCES
of
WESTERN WASHINGTON
CASCADE MOUNTAINS

INTRODUCTION

No major silver districts are present in western Washington; from 1890 through 1969, western counties produced only 2,255,585 ounces of silver valued at around $1,888,745. From 1903 through 1956, Snohomish County produced 31,099 ounces. The combined production of Whatcom County produced 57,837 ounces, and King County produced 34,503 ounces. The combined production of Skagit, Pierce, Lewis, and Skamania Counties is only around 3,000 ounces. Silver from Snohomish County was produced as a byproduct of the gold and copper mining operations in the Monte Cristo and Index districts; silver from Whatcom County was mainly a byproduct of gold mining operations in the Mount Baker district; in King County silver was a byproduct of gold mining operations in the Miller River district.

Currently (1975), no metal mines are operating in western Washington. However, in recent years exploration has been undertaken on several large low-grade copper deposits. If placed into production, appreciable amounts of silver would be produced as a byproduct of copper mining operations.

PHYSIOGRAPHY

The principal silver deposits of western Washington are in the parts of Whatcom, Skagit, Snohomish, and King Counties that fall within the north half of the Cascade Mountains physiographic province. This is an area of extremely rugged terrain resulting from alpine glaciation. Throughout much of the area, serrated rocky ridges and rocky pinacles of the alpine type of topography dominate the landscape. Much of the terrain has elevations in excess of 6,000 feet, which is the general timberline. Above timberline, many small lakes occupy glacial cirques, and long rocky ridges glacial tarns are common. Above 7,000 feet elevation, snowfields and glaciers may be found throughout the year. Mount Baker (10,778 feet) and Glacier Peak (10,436 feet), which are Pleistocene volcanoes, are the highest mountains in the Northern Cascades. Numerous streams occur throughout the region and many of them occupy deep, glaciated valleys. Major rivers include the Snoqualmie, Snohomish, Skykomish, Stillaguamish, Skagit, and Nooksack. Up to 120 inches of rain per year on the western slopes of the Northern Cascades produce thick stands of Douglas fir, western hemlock, and western red cedar. Undergrowth is dense, and consists of alder, willow, maple, salmonberry, blackberry, ferns, and devil’s club. Above timberline the forests give way to typical alpine vegetation, consisting of groves of mountain hemlock and alpine fir surrounded by meadows of heather, huckleberry, and blueberry.

GENERAL GEOLOGY AND MINERALIZATION

The Northern Cascade Mountains are composed of a core of granitic rocks and metamorphosed sedimentary and volcanic rocks, which are flanked by younger sedimentary and volcanic rocks (fig. 6).
The older metamorphosed sedimentary and volcanic rocks consist mainly of pre-Jurassic gneiss, schist, quartzite, phyllite, marble, and greenstone. The post-Jurassic sedimentary rocks consist chiefly of shale, arkose, graywacke, and conglomerate. Post-Jurassic volcanic rocks are mainly andesite, basalt, and rhyolite flows with associated pyroclastic rocks. The volcanic cones of Mount Baker and Glacier Peak are composed of andesite flows and pyroclastic rocks of Pleistocene age; however, ash eruptions from Mount Baker occurred as recently as 1843, and currently (1975) a vent near the top of the mountain is emitting steam and gases. The last major eruption from Glacier Peak was 12,000 years ago.

The granitic rocks, which make up part of the core of the Cascade Mountains, were intruded into the older rocks of the Cascades during Cretaceous and early Tertiary times. Most Cretaceous granitic rocks are from 100 to 120 million years old, whereas the granitic Tertiary intrusive rocks are as young as 14 to 20 million years. The largest granitic masses, which are of batholithic size, are composed mainly of quartz diorite and granodiorite. The smaller granitic masses consist of stocks and plugs of Tertiary age, which vary in composition from granite to quartz diorite. The borders of most granitic intrusive rocks are gradational into the enclosing rocks; however, the borders of some granitic masses contain intrusive breccias.

The rocks of the Cascade Mountains have been tightly folded along north-northwesterly-trending axes. This folding developed early, as is shown by foliation and folding in the older metamorphic rocks, which make up part of the core of the Cascades. The Tertiary rocks of the region have also been folded and faulted, though not to the extent of the older rocks. The northern part of the Cascade Mountains has been uplifted more than the southern part so that the overall structure of the Cascades resembles a south-plunging anticline. The uparching of the Cascades occurred over a time period of about 6 million years that began in Pliocene time and continued into Pleistocene. Because of the greater uplifting, and subsequent erosion in the north Cascades, many mineral deposits have been exposed. In the south Cascades, where uplifting and erosion has not been as great, great thicknesses of Tertiary volcanic rocks predominate.

Most silver deposits of the Northern Cascades of western Washington are fissure veins or mineralized joints and shear zones that occur in or close to bodies of granitic rocks (see fig. 5). Common host rocks for the deposits include schist, argillite, quartzite, phyllite, granodiorite, diorite, granite, andesite, and porphyry. The veins range from a fraction of an inch to as much as 15 feet in thickness, with the average thickness being around 3 feet. Pinching and swelling of veins is widespread. Common gangue minerals of silver-bearing veins include quartz and calcite that are accompanied by gouge and wallrock fragments. Common ore minerals include pyrite, pyrrhotite, arsenopyrite, chalcopyrite, galena, and sphalerite. Among the less common minerals are tetrahedrite, chalcocite, bornite, molybdenite, stibnite, argentite, pyrargyrite, native silver, and free gold. The bulk of the silver is contained in argentiferous galena and argentian tetrahedrite. Only rarely are silver sulfides and native silver visible in the silver ores. However, ruby silver was reported to be a major mineral at the "45" mine in Snohomish County. Although select samples from some silver deposits contained as much as 600 ounces per ton in silver, the average silver content of the silver veins is only around 6 ounces per ton. Several mines have shipped small amounts of ore that contained 20 to 40 ounces per ton in silver. At the "45" mine the average silver content of ore shipped was 93 ounces per ton, while 300,000 tons of ore mined at Monte Cristo averaged 6 ounces per ton in silver. In western Washington the ground-water level almost coincides with
the surface. In most deposits oxidation of the primary sulfides rarely extends deeper than 10 feet, and secondary enrichment of the silver deposits does not exist.

An exception to the vein-type silver deposit is the silver-bearing breccia at the Great Excelsior mine in Whatcom County. At this property a rather large body of pyritized and silicified breccia in andesite, argillite, and slate contains 3.4 ounces per ton in silver and 0.09 ounce in gold.

SNOHOMISH COUNTY

Snohomish County leads in the production of silver for western Washington counties; however, almost all the metal was a byproduct of gold and copper mining operations. From 1890 until 1907, gold mines in the county produced the bulk of the silver. After 1907, most silver came from copper-mining operations.

The production of silver in Snohomish County came to an end in 1969, when the Kromona copper mine in the Sultan district ceased operations. Peak years for the production of silver in Snohomish County are shown in Table 23.

Although silver-bearing veins occur in all mining districts of Snohomish County, no district is classed as a silver district, because the value of gold or copper produced in the past has exceeded that of silver. Only one mine in the county can be classed as a silver mine, this being the "45" mine in the Sultan Basin district. From 1896 to 1901, the mine produced 3,185 tons of ore that averaged 93 ounces per ton in silver and 0.74 ounce in gold. The gross value of the ore was around $100,000.

The richest silver-bearing veins in the county are found in the Sultan Basin, Silver Creek, Silverton, and Darrington districts; however, the deposits appear to be small. The silver occurs mainly in argentiferous galena that for the most part is sparsely disseminated in quartz veins and shear zones. In deposits that have been mined, galena, as well as other ore minerals, occurred in lenses and stringers that were erratically distributed in quartz veins and shear zones. Common sulfides, other than galena, include pyrite, pyrrhotite, chalcopyrite, sphalerite, and arsenopyrite. The less common ore minerals of the veins are bornite, tetrahedrite, scheelite, pyrrygryte, native silver, and molybdenite. Common host rocks for the silver deposits are argillite, slate, and phyllite of possible Triassic-Jurassic age, as well as granodiorite and quartz diorite of mid-Tertiary age. Although select samples from some deposits contain up to 200 ounces per ton in silver, the average silver content of most deposits is less than 5 ounces per ton. The average silver content of ore from the Monte Cristo district was 6 ounces per ton; the gold content of the ore was 0.6 ounce per ton. At the Sunset mine, where the ore averaged around 2.45 percent copper, the average

<table>
<thead>
<tr>
<th>Table 23.—Peak production years for silver in Snohomish County</th>
<th>Total production (ounces)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years</td>
<td>Mines</td>
</tr>
<tr>
<td>1890-1907</td>
<td>Monte Cristo Sunset &quot;45&quot;</td>
</tr>
<tr>
<td>1916-1920</td>
<td>Sunset</td>
</tr>
<tr>
<td>1923-1930</td>
<td>Sunset</td>
</tr>
<tr>
<td>1939-1943</td>
<td>Iowa Florence Rae Sunset Kromona</td>
</tr>
</tbody>
</table>

1/ Production prior to 1903 cannot be substantiated. The figures shown are believed to be realistic and are based upon the most reliable data available.
silver content was only 0.59 ounce per ton, and the gold content was 0.0057 ounce.

**Major Mines**

"45" (Magus) Mine

This property, which is at the headwaters of Williamson Creek in the Sultan district, is the only major silver mine in western Washington. As early as 1896, ore containing up to 135 ounces per ton in silver was shipped to the Everett smelter, and by 1901, the mine produced 3,185 tons of ore valued at $99,255. Ore was shipped that contained 48.4 to 171.4 ounces per ton in silver, and averaged 93 ounces. Based on partial smelter returns the "45" mine produced around 300,000 ounces of silver, and 2,356 ounces of gold. In the early 1900's, a 12,000-foot-long, single-rope aerial tramway extended from the mine to Silverton.

The main mine workings comprise a lower No. 3 adit (2,400 feet long), an intermediate No. 2 adit (650 feet long), and an upper No. 1 adit (300 feet long). Stoops extend from the upper adit to 120 feet beneath the No. 2 adit, for a vertical distance of 320 feet. As far as is known, the entire production from the mine came from these stoops.

The "45" vein is a quartz calcite fissure vein that occurs in a northwest-trending, steeply dipping shear zone in argillite, quartzite, and schist. The
vein is from 6 inches to 6 feet in width, and appears to be at least 3,000 feet long. It carries pyrite, arsenopyrite, pyrrhotite, scheelite, chalcopyrite, galena, and tetrahedrite. According to early reports ruby silver (pyrargyrite or proustite) was present in the upper workings of the mine, where high-grade ore shoots varying from a few inches to 5 feet in thickness were mined. Assays of veins on the Magus and Hard to Beat claims show 6 to 18 percent arsenic, 4 percent zinc, 4.6 to 6.5 percent lead, 8 to 10.4 ounces of silver, and 0.28 to 0.6 ounce of gold. The bulk of the high-grade silver ore in the mine appears to have been removed; however, ore containing 8 to 10 ounces per ton in silver is still present. The possibility also exists that underdeveloped veins that parallel the "45" vein may contain high-grade ore shoots.

SULTAN DISTRICT

Principal Silver Deposits

Calumet

Location: Near center of N½ sec. 27, T. 29 N., R. 10 E.

Development: 250-foot adit.

Geology: ½- to 2-foot thick quartz vein in metamorphic rocks. Vein assays trace to 1.03 oz. gold, 0.56 to 5.33 ozs. silver, 0.48 to 6.5 percent copper, and 0.10 to 4.85 percent zinc.

Ore minerals: Galena, chalcopyrite, sphalerite, pyrite, and pyrrhotite.

Production: None.

Mines and Prospects

1. "45"
2. Calumet
3. Silver Horseshoe

FIGURE 29.—Index map of the Sultan district.
"45" (Magus)

Location: 5\(\frac{1}{2}\) sec. 29, T. 30 N., R. 10 E.
Development: Over 4,000 feet of underground workings, and several large stopes. 300–, 700–, and 2,400-foot adits have developed the deposit over a vertical distance of 350 feet.

Geology: Metallized shear zones in schist, argillite, and quartzite. Main shear zone averages 24 inches in width, and appears to be at least 3,000 feet long. High grade ore contained up to 171 ounces per ton in silver. Average ore contained 93 ounces per ton in silver, and 0.74 ounce of gold.

Ore minerals: Galena, pyrargyrite, sphalerite, chalcopyrite, scheelite, tetrahedrite, arsenopyrite, pyrite, and pyrrhotite.

Production: 1896 to 1902, 3,185 tons of ore shipped to smelters contained 300,000 ounces of silver and 2,356 ounces of gold.

References: Carithers and Guard, 1945, p. 39–46; Gage, 1941, p. 166–167; Landes and others, 1902, p. 66–67; Patty, 1921, p. 296–297.

Silver Horseshoe

Location: SW\(\frac{1}{4}\) sec. 33, T. 30 N., R. 10 E.
Development: Several open cuts.

Geology: 2-foot-wide metallized shear zone in quartz diorite. Parts of the shear zone contain 0.04 to 0.42 oz. gold, 4.8 to 160.8 ozs. silver, and 3.6 to 11.3 percent lead.

Ore minerals: Sparse galena, sphalerite, chalcopyrite, scheelite, molybdenite, pyrite, pyrrhotite, and arsenopyrite.

Production: None.


SILVER CREEK DISTRICT

Principal Silver Deposits

Billy Lee

Location: NW\(\frac{1}{4}\)SE\(\frac{1}{4}\) sec. 7, T. 28 N., R. 11 E.
Development: 25- and 112-foot adits.

Geology: 18-foot-thick vein with 2-foot-thick band of sulfides. Said to assay high in silver, gold, and lead.

Ore minerals: Galena and pyrite.

Production: None.


Blue Bird

Location: Center S\(\frac{1}{2}\) sec. 7, T. 28 N., R. 11 E.
Development: Crosscut adit.

Geology: 27-foot-thick vein with 2-foot-thick band of sulfides that assays up to 50 ozs. silver per ton and 48 percent lead.

Ore minerals: Galena and pyrite.

Production: None.

Reference: Huntting, 1956, p. 156.

Corona

Location: Sec. 10, T. 28 N., R. 11 E.
Development: 65-foot adit.
FIGURE 30.—Index map of the Silver Creek district.

Geology: 6-foot-thick vein with a 3-foot-thick band of ore that assays up to 70 ozs. silver and 1 oz. gold.

Ore minerals: Unknown.
Production: None.

Crown Point

Location: Sec. 8, T. 28 N., R. 11 E.
Development: 30-foot adit.
Geology: Several veins ranging from 4 to 20 feet in thickness. Assays of 107 ozs. silver and 40 percent lead reported.

Ore minerals: Galena and pyrite.
Production: None.

Base map: U.S.F.S.

Location: Sec. 18, T. 28 N., R. 11 E.
Development: Unknown.
Geology: 2-foot-thick vein carrying up to 30 ozs. silver per ton.
Ore minerals: Galena.
Production: None.
Golconda

Location: SE\(\frac{1}{4}\) sec. 8, T. 28 N., R. 11 E.
Development: 40-foot adit.
Geology: 4- to 20-foot-wide metallized shear zone with 2-foot band of ore that assays 42 percent lead and high in silver and gold.
Ore minerals: Galena and pyrite.
Production: None.

Mineral Center

Location: W\(\frac{3}{4}\) sec. 26, T. 29 N., R. 11 E.
Development: Total of 3,500 feet of underground workings in 3 adits.
Geology: Metallized shear zones up to 40-foot wide in metasediments. Samples from one shear zone assayed 7.38 ozs. silver and 0.10 oz. gold.
Ore minerals: Abundant pyrite and minor chalcopyrite.
Production: None.

Jasper

Location: NE\(\frac{1}{4}\)NW\(\frac{3}{4}\) sec. 36, T. 29 N., R. 11 E.
Development: 27-foot adit.
Geology: 7-foot vein with a 1-foot band of ore. Select dump sample assayed 138 ozs. silver and 44 percent lead.
Ore minerals: Galena.
Production: None.

Morning Star

Location: SW\(\frac{1}{4}\) sec. 33, T. 29 N., R. 11 E.
Development: Several short adits.
Geology: Several metallized shear zones with one ore shoot 6 feet wide that assays up to 41 ozs. silver and 40 percent lead.
Ore minerals: Galena, pyrite, and chalcopyrite.
Production: None.

Jasperon

Location: SE\(\frac{1}{4}\)SW\(\frac{1}{4}\) sec. 31, T. 29 N., R. 11 E.
Development: 3,000 feet of workings in several adits.
Geology: Narrow metallized fracture zones in granodiorite. Ore shoots are 3 to 8 inches wide and sporadic. Eight samples assayed trace to 19.20 ozs. silver, 0.02 to 0.44 oz. gold, trace to 4.5 percent copper and 0.8 to 15.1 percent lead.
Ore minerals: Galena, sphalerite, stibnite, vanadinite, cinnabar, chalcopyrite, arsenopyrite, and pyrite.
Production: None.

Trade Dollar

Location: SE\(\frac{1}{4}\) sec. 36, T. 29 N., R. 10 E.
Development: 50-foot drift.
Geology: 4-foot vein, select samples of which assay 63 percent lead and 37 ozs. silver.
Ore minerals: Galena and pyrite.
Production: None.
**Vandalia**

Location: SW¼ sec. 7, T. 28 N., R. 11 E.

Development: 220-foot adit and a 75-foot shaft with 2 levels.

Geology: 20-foot-wide shear zone with ½ to 3 feet of ore. Select samples assayed up to 300 ozs. silver, 2 ozs. gold, and 40 percent lead.

Ore minerals: Galena and pyrite.

Production: None.


**Darrington District**

**Principal Silver Deposits**

**Courtney**

Location: SW¼ sec. 27, T. 32 N., R. 9 E.

Development: 10-foot adit.

Geology: 3-foot vein containing up to 15 ozs. silver, 4 percent lead, and 0.5 oz. gold.

Ore minerals: Unknown.

**Mines and Prospects**

1. Courtney
2. Feldt
3. Forest Hope
4. Gray Mare
5. Green Crown
6. Hannah
7. Highland
8. Hunter
9. Larson

FIGURE 31. — Index map of the Darrington district.
Production: None.
Reference: Huntting, 1956, p. 82.

Feldt

Location: SE$_1^4$NE$_1^4$ sec. 30, T. 32 N., R. 9 E.
Development: 2 open cuts.
Geology: Metallized breccia along fault zone in altered volcanic rocks. Ore minerals occur in a 7-inch zone in the breccia.
Ore minerals: Stibnite, berthierite, chalcopyrite, galena, sphalerite, tetrachlorite, cobaltite, pyrite, and arsenopyrite.
Production: None.

Green Crown

Location: SE$_1^4$ sec. 31, T. 32 N., R. 9 E.
Development: Unknown.
Geology: 100-foot-wide shear zone containing metallized quartz veins up to 10 inches thick. Parts of some veins assay up to 32 ozs. silver, 5 ozs. gold, and 26 to 42 percent copper.
Ore mineral: Chalcopyrite.
Production: None.
Reference: Huntting, 1956, p. 84.

Hannah

Location: NE$_1^4$ sec. 32, T. 32 N., R. 9 E.
Development: Unknown.
Geology: 3-foot-thick vein in granodiorite. Select samples of vein assay up to 41 ozs. silver, 1 oz. gold, and 30 percent copper.
Ore minerals: Unknown.
Production: None.

Highland

Location: Sec. 3, T. 31 N., R. 9 E.
Development: Unknown.
Geology: 18 inches of ore that assays 15 to 40 ozs. silver and 18 percent copper.
Ore minerals: Unknown.
Production: None

**Hunter**

Location: NW¼ sec. 34, T. 32 N., R. 9 E.
Development: 50-foot adit.
Geology: 3-foot vein with a 9-inch band of ore that assays 8 to 40 ozs. silver, 1 oz. gold, 10 percent copper, and 4 percent lead.
Ore minerals: Galena, chalcopyrite, and pyrite.
Production: None.

**Larson**

Location: Secs. 19 and 30, T. 32 N., R. 9 E.
Development: 100-foot adit.

**Big Four**

Location: NW¼ sec. 33, T. 30 N., R. 10 E.
Development: 100-foot adit.

**SILVERTON DISTRICT**

Principal Silver Deposits

**Mines and Prospects**
1. Big Four
2. Glengarry
3. New Seattle
4. St. Louis and Jackson
5. White Swan

FIGURE 32.—Index map of the Silverton district.
Geology: 30-inch metallized zone at contact between granite and syenite. Assays of up to 20 ozs. silver per ton reported.

Ore minerals: Galena and arsenopyrite.
Production: None.

**Glengarry**

Location: Sec. 18, T. 30 N., R. 10 E.
Development: Unknown.
Geology: 45 inches of "ore," with assays of up to 150 ozs. per ton in silver.

Ore mineral: Tetrahedrite.
Production: None.

**New Seattle**

Location: NW_1/4 sec. 2, T. 20 N. R. 9 E.
Development: Short adit.
Geology: 5-foot vein, parts of which assay 350 ozs. per ton in silver.

Ore mineral: Tetrahedrite.
Production: None.

**St. Louis and Jackson**

Location: Near center sec. 1, T. 30 N., R. 9 E.
Development: 600-foot drift with a 200-foot crosscut. Also a 150-foot adit.
Geology: 1- to 6-foot-thick quartz vein in granodiorite. Parts of vein assay up to 30 percent copper, 1 oz. gold, 25 ozs. silver, and 1.2 percent tungsten.

Ore minerals: Chalcopyrite, scheelite, tetrahedrite, and pyrite.

Production: Minor in the early 1900's.

**White Swan**

Location: Sec. 3, T. 30 N., R. 9 E.
Development: 50-foot adit.
Geology: Unknown, but vein reported to carry up to 200 ozs. per ton in silver.

Ore minerals: Unknown.
Production: None.

**MONTE CRISTO DISTRICT**

**Principal Silver Deposit**

**Monte Cristo (Mystery, Pride)**

Location: Sec. 22, T. 29 N., R. 11 E.
Development: 3 main adits contain around 12,000 feet of underground workings. Also several short adits.
Geology: Shear zones in schist and tonalite contain lenses of sulfide ore from 100 to 300 feet in diameter, and 1 to 15 feet thick. Gangue consists of quartz, calcite, and sheared wall rock. Ore averaged 5 ounces per ton in silver, and 0.40 ounce of gold. Near-surface ores contained up to 12 ounces of silver, 0.95 ounce gold, 4 percent copper, and 5 percent lead.

Ore minerals: Arsenopyrite, pyrite, chalcopyrite, galena, sphalerite, jamesonite, and realgar.
Production: 1890-1908, 300,000 tons of ore containing around 1,500,000 ounces of silver, and 120,000 ounces of gold.

WHATCOM COUNTY

From 1900 to 1957, Whatcom County produced around 80,000 ounces of silver, most of which came from lode gold mines in the Mount Baker and Slate Creek mining districts. The county's major silver producers were the Great Excelsior, which produced around 65,000 ounces of silver from 1902 to 1915, and the Azurite gold mine, which produced 2,111 ounces of silver from 1936 to 1938. The remaining silver was chiefly a byproduct of gold mining operations at the Lone Jack, Red Mountain, New Light, and Mammoth mines. Only the Illinois mine in the Slate Creek district is classed as a silver mine because silver is the most valuable metal at this property. At other silver-bearing deposits in the county the value of gold, copper, lead, or zinc exceeds the value of silver.

With the exception of the Great Excelsior, silver-bearing deposits in the Mount Baker and Slate Creek districts are the quartz fissure type most of which are sparsely metallized. In general, galena-bearing veins carry the most silver, and up to several hundred ounces per ton in silver has been obtained from select samples. However, the average silver content of most veins is only around 5 to 10 ounces per ton. In a few veins galena, sphalerite, and chalcopyrite occur in small isolated ore shoots that contain up to several hundred tons of ore. At the Great Excelsior, silver occurs in pyritic and silicified breccia. The breccia averages around 3 ounces per ton in silver and 0.09 ounces per ton in gold. Although silver is present in the gold veins of the county, the average silver content of the veins is only from 0.02 to 0.15 ounce per ton. A high of 2.75 ounces per ton in silver was reported in high-

FIGURE 33.—Silver deposits of Whatcom and Skagit Counties.
grade gold ore from the Mammoth mine in the Slate Creek district.

MOUNT BAKER DISTRICT

Principal Silver Deposit

Great Excelsior

Location: SW_4 NW_4 sec. 6, T. 39 N., R. 8 E.

Development: 280-, 350-, and 450-foot adit with almost 1,000 feet of drifts, crosscuts, winzes, and raises. One stope 180 feet long, 60 feet wide, and up to 80 feet high.

Geology: Pyritized and silicified breccia in andesite, argillite, and slate. Breccia averages 0.09 oz. per ton in gold and 3.4 ozs. per ton in silver.

Ore minerals: Mainly pyrite with sparse chalcopyrite, galena, sphalerite, and arsenopyrite; minor very fine-grained tetrahedrite.

Production: 1903-1905, 1917; total production around $69,000 in gold and silver.

References: Moen, 1969, p. 86-87, Landes and others, 1902, p. 43-44.

SKAGIT COUNTY

The production of silver in Skagit County has been insignificant; from 1900 to 1955, several small-scale mining operations in the Cascade and Thunder Creek districts of eastern Skagit County (fig. 33) produced 2,613 ounces of silver. The bulk of the silver produced in the late 1890’s and early 1900’s came from the Boston and Willis and Everett mines, near the headwaters of Thunder Creek. Silver produced in 1953 and 1955 came from the Johnsburg mine near the headwaters of the Cascade River.

Although assays of up to several hundred ounces per ton in silver have been obtained from several metal deposits in Skagit County, the average silver content of the deposits is less than 10 ounces per ton. The silver occurs in shear zones in granodiorite, quartz diorite, and schist. The metallized parts of the shear zones average less than 1 foot in thickness and contain disseminated sulfides or lenses of massive sulfides in a gangue of quartz and calcite. Some lenses of massive argentiferous galena are 4 to 30 inches thick; however, the lenses are seldom greater than 50 feet in stope or pitch length. Common sulfides of the veins include pyrite, arsenopyrite, sphalerite, and chalcopyrite. The less common ore
minerals are cerussite, anglesite, and native gold. The silver-bearing minerals are argentiferous galena and fine-grained argentite.

The small size of the ore shoots, and their erratic distribution in the veins, appear to be main factors that discouraged mining operations in the past. Because most deposits fall within the boundaries of the North Cascades National Park, which was established in October 1968, it is unlikely that the deposits will ever be mined.

CASCADe AND THUNDER CREEK DISTRICTS

Principal Silver Deposits

**Boston**

Location: Sec. 24, T. 35 N., R. 13 E.

Development: 35- and 60-foot adits.

Geology: 6- to 9-foot-thick quartz vein in diorite. 8-inch band, which assayed
8.4 ozs. silver, 0.16 oz. gold, 0.2 percent copper, 22.1 percent lead, and 13 percent zinc.

**Ore minerals:** Galena, sphalerite, calcanthite, chalcopyrite, pyrite, and arsenopyrite.

**Production:** 2 tons in the 1890's.

**Reference:** Huntting, 1956, p. 231.

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**Cascade**

**Location:** NW ¹⁄₄ sec. 7, T. 34 N., R. 13 E.

**Development:** 100-foot adit.

**Geology:** 5-foot vein with a 10-inch band of sulfides that assays 48 to 51 ozs. silver and 32 to 37 percent lead.

**Ore minerals:** Galena and pyrite.

**Production:** None.

**Reference:** Huntting, 1956, p. 231.

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**Epoch**

**Location:** Near center E ¹⁄₂ sec. 10, T. 34 N., R. 13 E.

**Development:** Adit.

**Geology:** 3-foot vein of solid galena reported. Vein assays 39 to 102 ozs. silver and 38 to 45 percent lead.

**Ore minerals:** Galena.

**Production:** None.

**Reference:** Huntting, 1956, p. 231.

---

**Midas**

**Location:** W ¹⁄₂ sec. 25 and E ¹⁄₂ sec. 26, T. 35 N., R. 13 E.

**Development:** 2 adits with over 1,500 feet of drifts and crosscuts.

**Geology:** Narrow sulfide-bearing quartz veins in sheared diorite gneiss. Sulfides occur in lenses 7 to 24 inches in thickness and assay up to 20 ozs. silver, 0.14 oz. gold, 2.2 percent lead, and 1.96 percent zinc.

**Ore minerals:** Chalcopyrite, galena, spha-
Silver Tip

Location: Secs. 16 and 17, T. 35 N., R. 14 E.
Development: 40-foot shaft, several short adits, and open cuts.
Geology: 3- to 4-foot thick vein containing 1 to 2 feet of ore that assays 19.9 ozs. silver, 20.5 percent lead, and 6.6 percent zinc.
Ore minerals: Galena, sphalerite, and pyrite.
Production: None.

Thunder Creek (Dorothy)

Location: W½ Sec. 15, T. 35 N., R. 14 E.
Development: 425- and 760-foot adits.
Geology: 6-inch to 6-foot-thick metallized shear zone in altered diorite. Samples from shear zone assayed 4.25 to 7 ozs. silver, 5 to 10 percent lead, 4 to 4.7 percent zinc, and 0.34 percent copper.
Ore minerals: Galena, chalcopyrite, sphalerite, and pyrite.
Production: None.

KING COUNTY

Silver produced in King County from 1903 to 1960 totaled 31,102 ounces valued at 25,120. Most silver came from the Apex and Cleopatra mines in the Miller River district of northeastern King County. Silver was produced in the county as early as 1897, but production figures are not available for years prior
to 1904. The most productive silver mine was the Cleopatra, which produced around $250,000 in silver and gold. The bulk of the production came from near-surface silver ore that contained up to 250 ounces per ton in silver. Although the Apex is classed as a gold mine, the average silver content of ore mined was 9.15 ounces per ton. Total production of gold and silver from the Apex was around $300,000. Small shipments of copper, lead, zinc, antimony, gold, and silver ores were made from other mines in the county, but production from these mines was minor.

Mines and prospects that contain significant amounts of silver occur chiefly in the Miller River district. The ore minerals occur mainly in steeply dipping, northwest–to west-trending shear zones in granodiorite of the Snoqualmie batholith (middle Tertiary). Some shear zones contain metallized quartz-calcite veins, whereas other shear zones consist mainly of sheared and altered country rock with scattered grains of ore minerals. The common sulfides of the quartz-calcite veins and shear zones are pyrite, arsenopyrite, galena, sphalerite, and chalcopyrite; some deposits
contain as much as 5 percent arsenic. The less common ore minerals are stibnite, molybdenite, tetrabori-
drite, jamesonite, stephanite, and stannite. Deposits
that have high silver contents are also high in lead or
gold.

Several deposits contain up to 100 ounces per
ton in silver, but the ore shoots are generally less
than 2 feet in thickness and are small. The ore min-
erals occur as narrow streaks in the veins and shear
zones, or as scattered lenses and pods. In the Apex
and Cleopatra mines, several ore shoots averaged 20
ounces per ton in silver and were as much as 200 feet
long and up to 2½ feet thick.

MILLER RIVER DISTRICT

Principal Silver Deposits

Apex

Location: SW¼ sec. 34, T. 26 N., R. 10 E.
Development: 1,675-, 475-, 150-, and
100-foot adits over a vertical distance
of 460 feet. Extensively stoped be-
tween the 1,675- and 475- foot adits.
Geology: Quartz vein 2 to 6 feet thick in
granodiorite. High-grade ore occurs

Mines and Prospects

1. Apex
2. Cleopatra
3. Bear Basin
4. Coney Basin
5. Damon and Pythias
6. Seattle-Cascade

FIGURE 36.—Index map of the Miller River district.
as narrow streaks in the vein, and 
as assay up to 3.15 ounces per ton in  
gold and 63 ounces per ton in silver.  
Some ore contained 21 to 26 percent  
arsenic, 10 to 20 ounces in silver,  
1 1/2 to 2 1/2 ounces in gold, and 4 1/2 to 6  
percent lead. Average silver content  
of 91 samples of vein in adits is 6.295  
ounces per ton; average gold content  
of samples is 1.125 ounces per ton.  
Silver is contained in argentiferous  
galena.

Ore minerals: Chalcopyrite, galena, sphalerite, arsenopyrite, and pyrite.

Production: $80,000 prior to 1901; 1905-1943, $220,000.

References: Livingston, 1971, p. 145-147;  
Patty, 1921, p. 301-305.

Bear Basin

Location: NE 34 sec. 23, T. 25 N., R. 10 E.
Development: 8 adits containing a total of  
2,165 feet of drifts and crosscuts.

Geology: Metallized shear zones up to 4 feet  
width in granodiorite. Select samples of  
shear zones showed 10 to 90 ozs.  
per ton of silver. A 10-inch channel  
sample assayed 0.06 oz. gold, 6.0  
ozs. silver, and 1.71 percent copper.  
A 17-inch channel sample assayed  
0.06 oz. gold, 16.90 ozs. silver, and  
13 percent zinc.

Ore minerals: Minor pyrite, arsenopyrite,  
freibergite, jamesonite, stibnite,  
staninite, andorite, sphalerite, galena,  
and molybdenite.

Production: None.

Cleopatra

Location: NW 34 SE 34 sec. 24, T. 25 N.,  
R. 10 E.
Development: 1,260- and 160-foot adits  
connected by raise.

Geology: 5-foot thick metallized shear zone  
in granodiorite. Ore minerals are  
spotty. One ore shoot 2 1/2 feet thick  
and 100 feet long averaged 20 ounces  
per ton in silver. Average silver content  
of 93 samples from vein in adits is 13.35  
ounces per ton.

Ore minerals: Argentiferous galena, chalcopyrite, 
tetrahedrite, sphalerite, jamesonite, pyrite, and arsenopyrite.

Production: $250,000 from 1897 through  
1941.
References: Livingston, 1971, p. 139-140;  
Purdy, 1951, p. 79-83.

Coney Basin

Location: NE 34 sec. 13, T. 25 N., R. 10 E.  
and SE 34 sec. 19, T. 25 N., R. 11 E.
Development: 2 adits with around 3,000 feet  
of drifts and crosscuts. Upper adit  
2,000 feet long.

Geology: Metallized quartz veins in gran-  
odiorite, and a 4-foot wide metallized  
silicified zone also in granodiorite.  
Average of 22 samples showed 11.97  
ozs. silver, and 0.38 oz. gold; ore  
mined in 1941 assayed 0.86 oz. gold,  
19.71 ozs. silver, 0.82 percent copper,  
6.0 percent lead, 6 percent zinc,  
1.52 percent arsenic, and 0.26 percent  
antimony.

Ore minerals: Galena, chalcopyrite, spal-
erite, tetrahedrite, and pyrite.
Production: 40 tons in 1895, and minor production between 1934 and 1941.

**Damon and Pythias**

**Location:** Center sec. 33, T. 26 N., R. 10 E.

**Development:** Several adits. Main adit is a 1,425-foot crosscut with 1,350 feet of drifts on two veins.

**Geology:** Two quartz veins up to 3 feet thick in granodiorite. Ore averages 0.245 oz. gold, 2.2 ozs. silver, and 7.86 percent arsenic. Ore shipped prior to 1940 averaged 0.87 oz. gold, 9 ozs. silver, and 4 percent lead.

**Ore minerals:** Chalcopyrite, galena, pyrite, and arsenopyrite.

Production: 23 tons prior to 1940.

**Seattle-Cascade**

**Location:** Center N½ sec. 17, T. 25 N., R. 11 E.

**Development:** 400-foot adit, and an 800-foot adit with a 250-foot raise.

**Geology:** 1½-foot wide metallized shear zone in granodiorite. Shear zone contains sulfide bands up to 8 inches thick, which assay up to 30 ozs. silver per ton.

**Ore minerals:** Galena, sphalerite, chalcopyrite, pyrite, and arsenopyrite.

Production: Minor production prior to 1900, and in 1940.
APPENDIX A

PRINCIPAL SILVER DEPOSITS OF EASTERN WASHINGTON

BY COUNTY AND DISTRICT

CHELAN COUNTY
See Figure 22\(^1\)

Meadow Creek District

1. Iowa prospect
2. Orphan Boy prospect
3. Hunter prospect
4. Little Jap prospect
5. Sunday Morning mine

Stehekin District (Horseshoe Basin area)

6. Isoletta prospect
7. Doubtful prospect
8. Franklin prospect
9. Quean Sabe prospect
10. Homestake and Star prospect
11. Horseshoe Basin prospect

FERRY COUNTY
See Figure 13

Keller District

1. Gwin mine
2. Dan Patch prospect
3. Algonkian prospect

4. Longstreet mine
5. Silver Leaf mine
6. Shoo Fly mine
7. Silver Crown No. 2 mine
8. Ivanhoe prospect
9. Butterfly prospect
10. King Solomon prospect
11. Plymouth Rock prospect
12. Advance prospect
13. Keystone prospect
14. Royal Ann prospect
15. Good Ore prospect
16. Stray Dog mine
17. Oom Paul prospect
18. Montana mine
19. Romulus prospect
20. New York prospect
21. Meteor mine
22. Reserve prospect
23. Chief Barnaby prospect
24. Big Lake prospect
25. U.S. prospect
26. McJunkin prospect
27. Congress prospect
28. Burlington and Delaware prospect
29. Shamrock mine
30. Anderson prospect
31. Summit prospect
32. Addison mine

\(^1\) Numbers on mines and prospects correspond to numbers on figures in text.
33. Golden Chord mine
34. Jumper prospect
35. Rover Bonanza prospect
36. Meadow Creek prospect
37. Great Northern prospect

Curlew District
38. Anchor prospect
39. Panama prospect

KITTITAS COUNTY
See Figure 25

Cle Elum District
1. American Eagle prospect
2. Boss prospect
3. Aurora mine
4. Camp Creek mine
5. Cle Elum prospect

Gold Creek District
6. Silver King and Silver Queen prospect
7. Esther and Louisa mine
8. Transit prospect
9. Giant prospect

OKANOGAN COUNTY
See Figure 16

Loomis District
1. Mountain Sheep mine
2. Ruby mine
3. Number One prospect
4. Summit prospect
5. Eagle prospect
6. Kaaba-Texas mine

Conconully District
16. Leuena mine
17. Mohawk prospect
18. Mammoth mine
19. Monitor mine
20. John Arthur prospect
21. Tough Nut mine
22. Lone Star mine
23. Key mine
24. Esther prospect
25. Salmon River prospect
26. Homestake mine
27. Lady of the Lake prospect
28. Leonora prospect
29. Nevada mine
30. Plant-Callahan mine
31. First Thought mine
32. Last Chance mine
33. Sonny Boy mine
34. Fourth of July mine
35. Keystone prospect
36. Arlington mine
37. Woo Loo Moo Loo prospect
38. Chloride prospect
39. Wind Fall prospect
40. Buck Mountain mine
41. Sherman mine
42. Silver Bell prospect
43. Silver Bluff mine  
44. Black Huzzar prospect  
45. Eureka prospect  
46. Gold Eagle prospect  
47. Gold Cup prospect  
48. Lulu prospect  
49. Evening Star prospect  
50. Minnehaha prospect  
51. Okanogan Belle prospect  
52. Hard scrimmage prospect  
53. Central mine  
54. Carl Fredrick prospect  
55. Wheeler mine  
56. Peacock mine  
57. Shelby prospect  

Sheridan District  
58. Sheridan mine  
59. Zalla M. mine  
60. American Flag mine  
61. Silver Bell mine  

Park City District  
62. Eureka prospect  
63. Summit mine  
64. Mountain Boy mine  
65. Ramore prospect  
66. Hanaford prospect  

Nespelem District  
67. Great Divide prospect  
68. Anna prospect  
69. Evening prospect  
70. Andy O'Neil mine  
71. Anchor prospect  
72. Apache mine  

73. Lilman mine  
74. Little Chief mine  
75. Panama mine  

PEND OREILLE COUNTY  
See Figure 7  

Metaline District  
1. Hanley mine  
2. Oriole mine  
3. Poorman mine  
4. LaSota prospect  
5. Rocky Creek mine  

Newport District  
6. Skippy and Queen Bess prospect  
7. Eagle (Ries) mine  

STEVENS COUNTY  
See Figure 8  

Orient District  
1. Comstock prospect  
2. Iron Mask prospect  
3. Montana and Washington prospect  
4. Easter Sunday mine  
5. McKinley prospect  

Northport District  
6. Bullion mine  
7. Great Republic prospect  
8. Coyote mine  
9. Sunset prospect  
10. Sterret mine  
11. Silver Crown mine  
12. Melrose mine
13. Jackson mine  
14. Red Top mine  
15. Hazel mine  
16. Roosevelt mine  
17. United Treasure mine  
18. Keough mine  
19. Myeerah mine  
20. Frisco Standard mine  
21. Morning prospect  
22. Burrus mine  
23. Galena Farm prospect  

**Summit District**  
40. Daisy Tempest mine  
41. Silver Summit mine  

**Chewelah District**  
42. Krug (Hanford) mine  
43. Jay Dee mine  
44. High Grade mine  
45. United Copper mine  
46. Copper King mine  
47. Amazon mine  
48. Chinto mine  
49. Eagle (Blue Star) mine  
50. Jay Gould mine  
51. U.S. Copper Gold mine  
52. Mullen prospect  
53. Nevada mine  
54. Edna mine  
55. Double Eagle mine  
56. Wells Fargo mine  

**Bossburg District**  
24. Al Ki prospect  
25. Silver Trail mine  
26. Young America mine  
27. Bonanza mine  
28. Gold Bar prospect  
29. Chloride Queen mine  
30. Avondale-Dome prospect  

**Kettle Falls District**  
31. Gold Ledge mine  
32. Vanasse prospect  
33. Gold Reef mine  
34. Ark mine  
35. Aguila mine  

**Deer Trail District**  
57. Orchid mine  
58. Cleveland mine  
59. Deer Trail mine  
60. Brooks mine  
61. Saturday Night-Sunday Morning mine  
62. Queen-Seal mine  
63. Alchan Bee mine  
64. Silver Star prospect  
65. Orazada mine  
66. Indian Trail mine  

**Calville District**  
36. Longshot mine  
37. Middleport mine  
38. Old Dominion mine  
39. Ore Cache mine
PRINCIPAL SILVER DEPOSITS OF WESTERN WASHINGTON
BY COUNTY AND DISTRICT

KING COUNTY
See Figure 35

Miller River District
1. Apex mine
2. Cleopatra mine
3. Bear Basin prospect
4. Coney Basin mine
5. Damon and Pythias mine
6. Seattle Cascade mine

SKAGIT COUNTY
See Figure 33

Cascade-Thunder Creek District
1. Johnsburg mine
2. Boston mine
3. Cascade prospect
4. Epoch prospect
5. Lakeside prospect
6. Midas prospect
7. Thunder Creek prospect
8. Thunder Mountain prospect
9. Willis and Everett mine
10. Silver Tip prospect

SNOHOMISH COUNTY
See Figure 28

Darrington District
1. Larson prospect

1/ Numbers on mines and prospects correspond to numbers on figures in text.

2. Feldt prospect
3. Gray Mare prospect
4. Courtney prospect
5. Forest Hope prospect
6. Hunter prospect
7. Highland prospect
8. Hannah prospect
9. Green Crown prospect

Silvertown District
10. New Seattle prospect
11. White Swan prospect
12. St. Louis and Jackson mine
13. Glengarry prospect
14. Big Four prospect
15. "45" (Magus) mine
16. Silver Horseshoe prospect
17. Calumet prospect

Sultan District

Silver Creek District
18. Jasper prospect
19. Jasperson prospect
20. Trade Dollar prospect
21. Mineral Center prospect
22. Morning Star prospect
23. Corona prospect
24. Crown Point prospect
25. Golconda prospect
26. Editor prospect
27. Billy Lee prospect
28. Blue Bird prospect
29. Vandalia prospect

Monte Cristo District

30. Monte Cristo (Mystery, Pride) prospect

WHATCOM COUNTY
See Figure 33

Mount Baker District
1. Great Excelsior mine

Slate Creek District
2. Illinois prospect
### APPENDIX B

#### PROPERTY INDEX

<table>
<thead>
<tr>
<th>Property</th>
<th>County</th>
<th>District</th>
<th>Index map page</th>
<th>Property description page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addison</td>
<td>Ferry</td>
<td>Keller</td>
<td>99</td>
<td>100</td>
</tr>
<tr>
<td>Advance</td>
<td>Ferry</td>
<td>Coda</td>
<td>93</td>
<td>94</td>
</tr>
<tr>
<td>Aichan Bee</td>
<td>Stevens</td>
<td>Deer Trail</td>
<td>70</td>
<td>72</td>
</tr>
<tr>
<td>Algontian</td>
<td>Ferry</td>
<td>Coda</td>
<td>93</td>
<td>94</td>
</tr>
<tr>
<td>Al Ki</td>
<td>Stevens</td>
<td>Bossburg</td>
<td>75</td>
<td>76</td>
</tr>
<tr>
<td>Amazon</td>
<td>Stevens</td>
<td>Chewelah</td>
<td>63</td>
<td>66</td>
</tr>
<tr>
<td>American Eagle</td>
<td>Kittitas</td>
<td>Cle Elum</td>
<td>141</td>
<td>141</td>
</tr>
<tr>
<td>American Flag</td>
<td>Okanogan</td>
<td>Sheridan</td>
<td>125</td>
<td>126</td>
</tr>
<tr>
<td>Anna</td>
<td>Okanogan</td>
<td>Nespelem</td>
<td>128</td>
<td>130</td>
</tr>
<tr>
<td>Anchor</td>
<td>Okanogan</td>
<td>Nespelem</td>
<td>128</td>
<td>130</td>
</tr>
<tr>
<td>Anchor</td>
<td>Ferry</td>
<td>Curlew</td>
<td>92</td>
<td>103</td>
</tr>
<tr>
<td>Anderson</td>
<td>Ferry</td>
<td>Keller</td>
<td>99</td>
<td>97</td>
</tr>
<tr>
<td>Andy O'Neil</td>
<td>Okanogan</td>
<td>Nespelem</td>
<td>128</td>
<td>130</td>
</tr>
<tr>
<td>Apache</td>
<td>Okanogan</td>
<td>Nespelem</td>
<td>128</td>
<td>130</td>
</tr>
<tr>
<td>Apex</td>
<td>King</td>
<td>Miller River</td>
<td>165</td>
<td>165</td>
</tr>
<tr>
<td>Aguila (Eagle-Newport)</td>
<td>Stevens</td>
<td>Kettle Falls</td>
<td>62</td>
<td>89</td>
</tr>
<tr>
<td>Ark (Silver Queen)</td>
<td>Stevens</td>
<td>Kettle Falls</td>
<td>62</td>
<td>89</td>
</tr>
<tr>
<td>Arlington</td>
<td>Okanogan</td>
<td>Conconully</td>
<td>106</td>
<td>110</td>
</tr>
<tr>
<td>Aurora</td>
<td>Kittitas</td>
<td>Cle Elum</td>
<td>141</td>
<td>141</td>
</tr>
<tr>
<td>Avondale-Dome</td>
<td>Stevens</td>
<td>Bossburg</td>
<td>75</td>
<td>76</td>
</tr>
<tr>
<td>Bear Basin</td>
<td>King</td>
<td>Miller River</td>
<td>163</td>
<td>166</td>
</tr>
<tr>
<td>Bellevue</td>
<td>Okanogan</td>
<td>Loomis</td>
<td>120</td>
<td>121</td>
</tr>
<tr>
<td>Big Four</td>
<td>Snohomish</td>
<td>Silverton</td>
<td>157</td>
<td>157</td>
</tr>
<tr>
<td>Big Lake</td>
<td>Ferry</td>
<td>Coda</td>
<td>92</td>
<td>94</td>
</tr>
<tr>
<td>Billy Lee</td>
<td>Snohomish</td>
<td>Silver Creek</td>
<td>153</td>
<td>152</td>
</tr>
<tr>
<td>Black Huzzar</td>
<td>Okanogan</td>
<td>Conconully</td>
<td>105</td>
<td>110</td>
</tr>
<tr>
<td>Blue Bird</td>
<td>Snohomish</td>
<td>Silver Creek</td>
<td>153</td>
<td>152</td>
</tr>
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## APPENDIX C

### SILVER PRODUCTION IN WASHINGTON

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</table>

1/ Individual years were not published by U.S. Bureau of Mines so individual company confidential information would not be disclosed.
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