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DEPARTMENT OF NATURAL RESOURCES
Gordon E. Harmston, Executive Director

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MINERALS AND MINERAL LOCALITIES OF UTAH

by Kenneth C. Bullock

Nature displays her most common mineral, quartz, in this beautiful crystal cluster.
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MINERALS AND MINERAL LOCALITIES OF UTAH

by Kenneth C. Bullock

INTRODUCTION

There has long been widespread interest by mineralogists and geologists in the minerals of the State. This interest is increasing both because of renewed activity in old mining camps and because of Utahns and tourists who seek relaxation and adventure out-of-doors. Evidence of this interest is the organization of many rock and mineral societies.

This current publication of the minerals of the state was preceded by my two earlier compilations: "Minerals and Mineral Localities of Utah", 1960, and "Minerals of Utah", 1967. The present volume is the result of updating to the year 1980, and revisions and enlargements of the earlier editions. Mineral listings of the state have increased to 706 of which 134 are duplicate names. A few hydrocarbons and a few rock terms such as obsidian have been included, but coal, petroleum, and natural gas are not listed. Minor occurrences of many minerals have been omitted, and only a few rock-forming mineral occurrences are included. The main helium and carbon dioxide occurrences are listed.

In Chapter I mining districts are listed alphabetically both for each county and for the State.

Chapter II is devoted to county listings of mining districts, mines, and mineral localities, with the minerals found at each mine or locality. Most mining districts and mineral localities in the county lists are large enough to warrant further subdivision into mines and specific mineral localities. Minerals which are characteristic of the entire locality are listed as occurring in the locality as a whole, along with those for which the specific area (mine, for instance) is not known. Other minerals, however, that occur in a particular part of a larger district or locality, are listed only under the area specified.

Chapter III consists of an alphabetical listing of 706 minerals found in Utah including a brief description of each mineral, followed by a listing of the occurrences of each mineral in the State.

Following the Bibliography is an Appendix, including six subdivisions with alphabetical listing of minerals under the following headings: (a) minerals of the state; (b) minerals by each county; (c) crystal system; (d) chemical class; (e) selected metallic minerals of the state; (f) selected metallic minerals of each county.

CHAPTER I

MINING DISTRICTS OF COUNTIES AND THE STATE OF UTAH

The districts listed below are used in an informal sense. Areas and districts as they appear in other publications may be interchanged.

COUNTY LISTINGS

BEAVER COUNTY

Antelope District (Mineral Range).
Beaver Lake District (Beaver Lake Mountains).
Bradshaw District (Mineral Range).
Fortuna District (Tushar Mountains).
Gordon District (Tushar Mountains).
Granite and North Granite Districts (Mineral Range).
Indian Peak District (Needle Range).
Lincoln District (Mineral Range).
McGarry District (Mineral Range).
Newton District (Tushar Mountains).
Pine Grove District (Wah Wah Mountains).
Pruess (Newhouse) District (San Francisco Mountains).
Rocky District (Rocky Range).
San Francisco (Frisco) District (San Francisco Mountains).
Star and North Star Districts (Star Range).
Sterling District (Red Buttes).
Sulphur District (Wah Wah Mountains).
Washington District (Needle Range).

1 Professor of Geology, Brigham Young University, Provo, Utah
**BOX ELDER COUNTY**

Ashbrook District (Grouse Creek Mountains).
Box Elder District (Wasatch Mountains).
Crater Island District (Crater Island).
Lucin District (Pilot Range).
Newfoundland District (Newfoundland Mountains).
Park Valley District (Raft River Mountains).
Promontory District (Promontory Mountains).
Rosebud District (Grouse Creek Mountains).
Sierra Madre District (Wasatch Mountains).
Willard District (Wasatch Mountains).

**CACHE COUNTY**

Paradise District (Bear River Range).
Richmond District (Bear River Range).

**CARBON COUNTY**

Tidewell and Rideout District (West Tavaputs Plateau).

**DAGGETT COUNTY**

No Organized Mining Districts.

**DAVIS COUNTY**

Farmington District (Wasatch Mountains).

**DUCHESNE COUNTY**

Castle Peak District (Uinta Basin)

**EMERY COUNTY**

Cedar Mountain District (Cedar Mountain).
Emery (Lost Springs) District (Red Plateau).
Green River District (S. W. Green River).
San Rafael District (San Rafael Swell).

**GARFIELD COUNTY**

Colorado River District (Colorado River).
Coyote Creek (Antimony) District (Escalante Mountains).
Little Rockies District (Henry Mountains).
North Wash District (Henry Mountains).
Trachyte District (Henry Mountains).

**GRAND COUNTY**

La Sal District (North Mountain, La Sal Mountains).
Little Grand District (S.E. Green River).
Miners Basin District (North Mountain, La Sal Mountains).
Polar Mesa District (Polar Mesa).
Richardson District (Waring Creek).
Thompsons District (S. E. Thompso).
Wilson Mesa (Wheeler Desert) District (Wilson Mesa).
Yellow Cat District (W. part of Thompsons District).

**IRON COUNTY**

Escalante District (Mt. Escalante).
Gold Springs District (Hamlin Valley).
Iron Springs District (Iron and Granite Mountains, Three Peaks).
Pinto Iron (Silver Belt) District (Pinto).
Stateline District (Hamlin Valley).

**JUAB COUNTY**

Deseret (Desert Mountain) District (Desert Mountain).
Detroit (Drum, Joy) District (Drum Mountains).
Fish Springs District (Fish Springs Mountains).
Juab District (Wasatch Mountains).
Mona District (Long Ridge).
Mt. Nebo (Timmons) District (Wasatch Mountains).
North Tintic District (East Tintic and Boulter Mountains).
Spring Creek District (Deep Creek Mountains).
Tintic District (East Tintic Mountains).
Trout Creek (Johnson Peak) District (Deep Creek Mountains).
West Tintic District (West Tintic Mountains).

**KANE COUNTY**

Colorado River District (Colorado River).

**MILLARD COUNTY**

Detroit (Drum, Joy) District (Drum Mountains).
Gordon District (Pavant Mountains).
Leamington (Oak City) District (Canyon Mountains).
Saw Back District (W. of Sevier Lake).

**MORGAN COUNTY**

Argenta District (Wasatch Mountains).
Hardscrabble (Mill Creek) District (Wasatch Mountains).
Morgan District (Wasatch Mountains).
PIUTE COUNTY
Gold Mountain (Kimberly) District (Deer Creek, Tushar Mountains).
Marysvale District (Marysvale Uranium Area).
Mt. Baldy District (Cottonwood Creek, Tushar Mountains).
Ohio District (Bullion Canyon, Tushar Mountains).

RICH COUNTY
Swan Creek (Garden City) District (Bear River Range).

SALT LAKE COUNTY
Big Cottonwood District (Wasatch Mountains).
Bingham (West Mountain) District (Oquirrh Mountains).
Hot Springs (Adams) District (Wasatch Mountains).
Little Cottonwood (Alta) District (Wasatch Mountains).
Lower Placer District (Oquirrh Mountains).
Smelter District (Oquirrh Mountains).

SAN JUAN COUNTY
Big Indian District (Big Indian Wash-Lisbon Valley Area).
Cottonwood Canyon District (N. of Bluff).
Monticello (Blue Mountain) District (Abajo Mountains).
Monument Valley (Monumental) District (Monument Valley).
Paradox Valley District (Paradox Valley).
Red Canyon District (Red Canyon).
White Canyon District (White Canyon).

SANPETE COUNTY
No Organized Mining Districts.

SEVIER COUNTY
Henry District (Antelope Range).
Salina Creek District (Salina Creek).

SUMMIT COUNTY
Marble (Silver Creek) District (Wasatch Mountains).
Park City (Uinta) District (Wasatch Mountains).

TOOELE COUNTY
Bingham (West Mountain) District (Oquirrh Mountains).
Blue Bell District (Sheeprock Mountains).
Columbia District (N.E. Sheeprock Mountains).
Dugway District (Dugway Range).
East Erickson District (W. Sheeprock Mountains).
Erickson (Black Crook) District (Simpson Mountains).
Free Coinage District (Stansbury Mountains).
Gold Hill (Clifton) District (Deep Creek Mountains).
Granite Mountain District (Granite Mountains).
Grantsville (Third Term) District (Stansbury Mountains).
Greeley District (Toquima Hill).
Lakeside District (Lakeside Mountains).
Mercur (Camp Floyd) District (Oquirrh Mountains).
North Tintic (Boulter, Caledonia, Oasis) District (Boulter Mountains).
Ophir District (S. W. Oquirrh Mountains).
Osceola District (Thorpe Hills).
Rush Valley (Stockton) District (W. Oquirrh Mountains).
Silver Island (Silver Islet) District (Silver Island Mountains).
Tooele District (W. Oquirrh Mountains).
Willow Springs District (Deep Creek Mountains).

UINTAH COUNTY
Brush Creek District (Uinta Mountains).
Carbonate District (Uinta Mountains).
Green River District (Cub Creek).
Uteland Knoll District (Ouray).

UTAH COUNTY
Alpine District (Wasatch Mountains).
American Fork District (Wasatch Mountains).
East Tintic District (East Tintic Mountains).
Lehi District (Lake Mountain).
North Tintic (Caledonia, Oasis) District (East Tintic Mountains).
Payson District (Wasatch Mountains).
Provo District (Wasatch Mountains).
Santaquin District (Wasatch Mountains).
Silver Lake District (Wasatch Mountains).
Spanish Fork District (Wasatch Mountains).
Utah District (Long Ridge).

WASATCH COUNTY
Blue Ledge District (Bald Mountain).
Elkhorn District (E. Keetley).
Rhodes Plateau (Woodland) District (Uinta Mountains).
Snake Creek (Howland, White Pine) District (Wasatch Mountains).

WAYNE COUNTY
Miners Mountain District (Miners Mountain).

WASHINGTON COUNTY
Bull Valley District (Bull Valley).
Santa Clara District (Santa Clara).
Silver Reef (Harrisburg) District (Leeds).
Tutsagubet District (Beaver Dam Mountains).

WEBER COUNTY
Fremont Island District (Fremont Island).
Sierra Madre District (Wasatch Mountains).
Weber (Junction) District (Wasatch Mountains).

CHAPTER II
MINING DISTRICTS OF UTAH

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87. Payson .......................................... Utah
88. Pine Grove ...................................... Beaver
89. Pinto Iron ....................................... Iron
90. Polar Mesa ...................................... Grand
91. Promontory ..................................... Box Elder
92. Provo ............................................ Utah
93. Pruess ........................................... Beaver
94. Red Canyon ..................................... San Juan
95. Richardson ..................................... Grand
96. Richmond ...................................... Cache
97. Rhodes Plateau ................................ Wasatch
98. Rocky ............................................ Beaver
99. Rosebud ........................................ Box Elder
100. Rush Valley ................................... Tooele
101. Salina Creek .................................. Sevier
102. San Francisco .................................. Beaver
103. San Rafael ..................................... Emery
104. Santa Clara .................................... Washington
105. Sandy ........................................... Utah
106. Saw Back ....................................... Millard
107. Sierra Madre .................................. Box Elder, Weber
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Silver Creek (See Marble)

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110. Silver Reef ..................................... Washington
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     White Pine (See Snake Creek)
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134. Willow Springs ....................................... Tooele
135. Wilson Mesa ........................................... Grand
     Woodland (See Rhodes Plateau)
136. Yellow Cat ........................................... Grand

MINERAL LOCALITIES LISTED BY COUNTY

BEAVER COUNTY

ANTELOPE DISTRICT (Mineral Range) barite, calcite, galena, magnetite, malachite.

BEAVER (near) - hyalite.

BEAVER LAKE DISTRICT (Beaver Lake Mountains) - andalusite, barite, diaspore, plancheite.
Bat Ridge - calcite, garnet, magnetite
Beaver Copper, Copper Mountain Mines - azurite, malachite.
Beaver-Harrison, OK mines - azurite, bornite, chalcocite, chalcoprite, chrysocolla, copper, covellite, cuprite, jasper, limonite, malachite, molybdenite, powellite, pyrite.

Black Rock mine - specular hematite.
Galena mine - galena.
Iron Mountain Pass deposits - hematite.
Skylark mine - azurite, calcite, chalcoprite, chrysocolla, copper, cuprite, diopside, garnet, hematite, malachite, magnetite, muscovite, pyrite.
West Spring - brucite, clinohumite, ludwigite, szabelite.

BLUE MOUNTAINS.
Black Jack (Skougard) claims - pyrolusite, rhodochrosite.
Suse Q (Iron Lily) claims - calcite pyrolusite, rhodochrosite.
T. 29 S., R. 12 W. - hematite, magnetite.
BLUE VALLEY - black agate with blue bands.

BRADSHAW DISTRICT (Mineral Range) - amethyst, clinozoisite, tourmaline, tremolite, wollastonite.

Cave mine - anglesite, aragonite, argentite, aurichalcite, cerussite, chalcopyrite, cuprite, galena, gold, limonite, magnetite, malachite, pyrite, sphalerite, sulfur.

Hecla mine - argentite, chalcopyrite, galena, gold, pyrite.

Jolly Boy mine - gold, limonite.

Nip and Tuck mine - argentite, chalcopyrite, galena, gold, pyrite.

2 R's group - epidote, fluorite, garnet, idocrase, malachite, scheelite, serpentine.

ENGLISH SPRING (Wah Wah Mountains) - hematite, limonite.

FORTUNA DISTRICT (Tushar Mountains).

Rocky Hollow - gold, limonite, pyrite.

FRISCO DISTRICT (See SAN FRANCISCO DISTRICT)

GORDON DISTRICT.

Sulphurdale - epsomite, marcasite, pyrite, sulfur.

GRANITE and NORTH GRANITE DISTRICTS (Mineral Range).

Beaver View mine - argentite, cerussite, chrysocolla, galena, gold, smithsonite, sphalerite.

Big Pass (Pass Canyon) group - argentojarosite, aurichalcite, barite, calcite, cerussite, epidote, fluorite, galena, garnet, gold, idocrase, jarosite, limonite, malachite, molybdenite, pyrite, scheelite, tremolite, wollastonite.

Bismuth (Major) mine - amphibole, bismuthinite, fluorite, idocrase, molybdenite, pyrite, scheelite.

Burnt Hollow group - epidote, galena, hematite, limonite, magnetite, scheelite.

Contact group - barite, bornite, chalcopyrite, epidote, fluorite, garnet, gold, hematite, molybdenite, scheelite.

Garnet group - almandite, epidote, fluorite, gold, malachite, scheelite.

King-of-the-Hills group - hematite, malachite, scheelite.

Major Fault group - scheelite.

Miller mine - apatite, beryl, helvite, thulite, topaz.

Molly group - epidote, garnet, pyrite, scheelite.

Oak group - epidote, garnet, idocrase, scheelite.

Oak Basin group - epidote, garnet, idocrase, scheelite.

Rattler group - calcite, epidote, garnet, idocrase, scheelite.

Scheelite group - beryl, epidote, garnet, scheelite.

Sunrise property - thorium, rare earths.

Ward group - epidote, garnet, idocrase, scheelite.

INDIAN PEAK DISTRICT (Needle Range) - argentite, cerussite, fluorite, galena.

Big Pinto Spring - alunite.

Blue Bell, Cougar Spar, Dagout, JB, Nooday, Lost Sheep, Utah mines - calcite, fluorite, quartz. Steelville, Spor properties - pyrolusite.

LINCOLN DISTRICT (Mineral Range).

Creole mine - amethyst, anglesite, azurite, bornite, calcite, cerussite, chalcopyrite, chrysocolla, clinozoisite, copper pitch, epidote, fluorite, galena, garnet, hematite, idocrase, limonite, magnetite, malachite, opal, pyrite, quartz, tourmaline, tremolite, scheelite, wollastonite.

Rattler Iron claim - limonite, magnetite.

Lincoln (Rawlins) mine - anglesite, argentite, chalcopyrite, chrysocolla, galena, hematite, limonite, magnetite, malachite, pyrite, smithsonite, sphalerite.

MCGARRY DISTRICT (Mineral Range) - barite, calcite, galena, magnetite, malachite.

MILFORD (near) - opal.

MOONEY SPRINGS - topaz.

NEWHOUSE DISTRICT (See PRUESS DISTRICT)

NEWTON DISTRICT (Tushar Mountains).

Black Rock (Shotwell) deposit - pyrolusite.

Indian Creek - autunite, fluorite, galena, gold, pyrite, tobernite.

Louise claims - huebnerite, quartz.

North Creek (head) - wolframite.

Rob Roy mine - gold, pyrite, quartz.

Sheep Rock mine - alunite, amethyst, argentite, calcite, cerargyrite, fluorite, limonite, pyrite, sericite, tellurium mineralization.

Sniffer and Mystery claims - autunite, fluorite, metamorphite, torbernite, uranophane.

NORTH STAR DISTRICT (See GRANITE DISTRICT).

NORTH STAR DISTRICT (See STAR DISTRICT).

PINE GROVE DISTRICT (Wah Wah Mountains) - alunite, anglesite, cerussite, galena, molybdenite, pyrite, pyrolusite.

Blawn Peak - alunite.

Central Wah Wah Iron deposits - limonite.
Daisy mine - autunite, fluorite, uraninite.  
Emma prospect - hematite, limonite.  
Iron Queen (Mooney, Wilson, Last Chance) prospects - autunite, fluorite, hematite, limonite.  
King Iron prospect - hematite, limonite.  
Iron Queen (Mooney, Wilson, Last Chance) prospects - autunite, fluorite, hematite, limonite.  
King Iron prospect - hematite, limonite.  
Pine Grove Associates mine - chalcopyrite, fluorite, galena, garnet, huebnerite, magnetite, molybdenite, sphalerite, topaz.  
Producer mine - autunite, fluorite, uraninite.  
Staats (Monarch) mine - autunite, calcite, fluorite, magnetite, metatorbernite, quartz, uraninite, uranophane.

PRUESS (NEWHOUSE) DISTRICT (San Francisco Mountains).  
Blackbird group, Cactus mine - anhydrite, azurite, barite, chalcopyrite, cosalite, goethite, limonite, magnetite, malachite, molybdenite, pyrite, quartz, sanidine, selexite, serpentine, siderite, stilbite, tetrahedrite, tourmaline, wollastonite.  
Cactus Gulch - chalcopyrite, garnet, limonite, quartz, rutile, tourmaline.  
Copper Gulch - garnet, tourmaline.  
Gold Reef mine - barite, cerussite, galena, gold, pyrite.  
Indian Queen mine - galena.

ROCK CORRAL (E. of) - albite, orthoclase, prase, smoky quartz.  

ROCKY DISTRICT (Rocky Range).  
Adelita mine - magnetite, wulfenite.  
Bawana mine - azurite, bornite, chalcopyrite, diopside, garnet, kinoite, magnetite, malachite, stringhamite, tenorite, thamasite.  
Copper Ranch mine - azurite, garnet, magnetite, malachite, muscovite, scheelite.  
Little Rocky prospect - huntite.  
Maria mine - azurite, bornite, chalcopyrite, magnetite, malachite.  
Old Hickory mine - apatite, bornite, chalcopyrite, diopside, garnet, magnetite, magnesite, pyrite, scheelite, thamasite.  
Silver Shield Mining and Milling Company mine - magnetite.

SAN FRANCISCO (FRISCO) DISTRICT (San Francisco Mountains) - apatite, augite, biotite, chlorite, chrysocolla, goethite, hornblende, ilmenite, magnesite, manganite, pyrosluite, quartz, rare earths, rhodochrosite, rutile, thorium mineralization, titanite, zircon.  
Beaver Carbonate mine - chalcopyrite, galena, pyrite, sphalerite.  
Cupric mine - chalcopyrite, diopside, fluorite, galena, garnet, pyrite, scheelite, sphalerite, wustite, wulfenite.  
Frisco Contact mine - epsomite.  
Golden Reef mine - gold, selenium mineralization.  
Horn Silver mine - alunite, anglesite, argentite, azurite, barite, beaverite, bindheimite, brochantite, calamine, calcite, cerargyrite, cerussite, chalcocite, chalcedony, chalcopyrite, chrysocolla, cosalite, covellite, dufrenoyosite, galena, galarsite, gypsum, jamesonite, jarosite, kaolinite, linarite, malachite, melaconite, opal, plumbojarosite, proustite, pyargyrite, pyrite, scorodite, smithsonite, stibnite, sulfur, wollastonite, wulfenite, wurtzite, zircon.  
Imperial mine - chalcopyrite, copper, cuprite, galena, hematite, magnetite, malachite.  
King David mine - galena, pyrite.  
Michigan group - chalcopyrite, galena, gold, pyrite.  
Peacock Copper group - galena, sphalerite.  
Washington mine - chalcopyrite, galena, pyrite, sphalerite.  

SOUTHERN SAN FRANCISCO MOUNTAINS  
Brimstone Mound - opal, sulfur.  
White Mountain - autunite, carnottite.  

STAR and NORTH STAR DISTRICTS (Star Range) - aurichalcite, bismuthite, cerargyrite, molybdenite, scorodite, rhodochrosite, saponite.  
Atlas mine - libethenite.  
Brown Thrush, Cabin, Fluorine Ledge, Lucky Boy nos. 1-2, Manassa, Monte Cristo, Quartzite, North Virginia Extension, Virginia nos. 1-5 claims - fluorite, quartz.  

Cedar-Talisman, Hoosier Boy Mines - anglesite, azurite, calamine, cerussite, galena, malachite, smithsonite, troostite, willemite.  
Commonwealth, Kemple, Progressive, St. Mary’s mines - azurite, bismuthinite, bismutite, calcite, cerussite, chalcopyrite, garnet, limonite, malachite, pyrite.  
Copper King mine - azurite, garnet, magnetite, malachite, scheelite.  
Dotson mine - azurite, cerussite, galena, malachite.  
Emerson mine - aurichalcite, cerussite, hemimorphite.  
Estelle mine - anglesite, cerussite.  
Estelle, Mowitza, Vicksburg mines - anglesite, cerussite, galena.  
Gold Crown mine - anglesite, cerussite, malachite, smithsonite.  
Harrington-Hickory, Rebel, White Rock mines - anglesite, azurite, cerussite, chalcopyrite, corkite, galena, limonite, malachite, pyrite, silver, sphalerite, tetrahe-
drite, vanadinite, wulfenite.  
**Hub mine** - anglesite, cerussite, chalcopyrite, chlorite, fluorite, galena, magnetite, muscovite, plumbojarosite, pyrite, serpentine, sphalerite.  
**Lady Bryan mine** - chalcopyrite, epidote, fluorite, hedenbergite, magnetite, muscovite, pyrite, pyroxene, tremolite.  
**Little May Lilly Mine** - scheelite.  
**Mammoth mine** - cerussite, limonite.  
**Maud S. mine** - cerussite, chalcopyrite, smithsonite.  
**Moscow mine** - amphibole, anglesite, cerussite, chalcopyrite, fluorite, galena, greenockite, hedenbergite, jarosite, plumbojarosite, pyrite, rhodochrosite, sericite, smithsonite, sphalerite.  
**Red Warrior mine** - anglesite, arsenopyrite, azurite, cerussite, chalcopyrite, galena, jarosite, limonite, malachite, plumbojarosite, pyrite, smithsonite, sphalerite.  
**Sundown mine** - cerussite, hemimorphite, malachite, manganese.  
**Vicksburg mine** - cerussite, pyrite.  
**Wild Bill mine** - anglesite, azurite, cerussite, chalcopyrite, chrysocolla, corkite, diopside, fluorite, galena, garnet, jarosite, magnetite, malachite, pyrite, specularite, sphalerite.  
**Woodhouse mine** - cerussite, pyrite.  

**STERLING DISTRICT** (Red Buttes) - no minerals reported.  
**SULPHUR DISTRICT** (Wah Wah Mountains) - sulfur.  
**TUSHAR MOUNTAINS**  
**Sulfurdale area** - clinoptilolite in tuff.  
**Three Creek Reservoir area** - clinoptilolite in tuff.  
**WAH WAH VALLEY** - sulfur.  
**WAH WAH MOUNTAINS**  
**Blawn Peak** - alunite.  
**NG subareas A, B, C, and D deposits** - alunite.  
**SX deposit** - alunite.  
**Violet claims** - hematite, quartz, red beryl, topaz.  
**WASHINGTON DISTRICT** (Needle Range)  
**Blue Bell, Cougar Spar, Doughout (Dagout), J. B., Lost Sheep, Noonday, Utah mines** - fluorite.  
**Orizaba Consolidated mine, Lucero claim** - yellow andradite.  

**WHITE MOUNTAIN** - alunite.  
**Grampian Hill** - magnesite, tremolite.  

**BOX ELDER COUNTY**  
**ASHBROOK DISTRICT** (Grouse Creek Mountains) - diaspore.  
**Bovine mine** - scheelite.  
**Vipont mine** - anglesite, argentite, argyrodite, arsenopyrite, azurite, cerargyrite, cerussite, chalcocite, chalcopyrite, copper, covellite, cuprite, galena, gold, hematite, limonite, malachite, orpiment, pearceite, pyrrhotite, pyrite, quartz, realgar, rhodochrosite, sericite, silver, sphalerite, tennantite.  
**BIRD ISLAND** - guano.  
**BOX ELDER DISTRICT** (Wasatch Mountains) - calcite, cerussite, galena.  
**CRATER ISLAND DISTRICT** (Crater Island).  
**Copper Blossom mine** - bornite, calcite, chalcopyrite, chrysocolla.  
**DRY LAKE MINE** (E. Brigham City) - stibnite.  
**GREAT SALT LAKE** (shores) - aragonite, bloedite, glauberite, halite, mirabilite, thenardite.  
**GROUSE CREEK RANGE** - epidote, stolzite.  
**Birch, Southern Conley, Western Grouse Creeks** - kyanite.  
**Lone Pine, Magnitude, Rocky Pass mines** - scheelite.  
**GUNNISON ISLAND** - guano.  
**LUCIN DISTRICT** (Pilot Range).  
**Copper Mountain mine** - alunite, anglesite, azurite, barite, cerussite, chrysocolla, copper, cuprite, galena, goethite, gold, halloysite, kaolinite, limonite, malachite, melacnmite.  
**Cunepah (Montello) tunnel** - cerussite, galena, limonite, smithsonite.  
**Empire mine** - bismutite, variscite, wulfenite.  
**Jeff-Doran mine** - azurite, limonite, malachite.  
**Judson mine** - cerussite.  
**Parkdale mine** - chrysocolla.  
**Tecoma Hill mines** - alunite, anglesite, cerussite, chalcopyrite, galena, goethite, gold, halloysite, hemimorphite, hematite, kaolinite, limonite, plumbojarosite, pyrite, sericite, silver, smithsonite, sphalerite, wulfenite.  
**Tri-State Minerals claim** - barite.  
**NEWFOUNDLAND DISTRICT** (Newfoundland Mountains) - anglesite, bismuthinite, cerussite, galena.
Copper Ridge - azurite, bornite, chalcopyrite, chrysocolla, limonite, malachite, pyrite.
Desert Peak, Pack Rat Canyon - scheelite.

NORTH SHORE OF GREAT SALT LAKE asphalt, pyrite in shale and slate.

PARK VALLEY DISTRICT (Raft River Mountains). Century, Susannah mines - arsenopyrite, chalcopyrite, galena, gold, monazite, pyrite, sphalerite.

PROMONTORY DISTRICT (Promontory Mountains).
Big Pine mining properties - cerussite.
Lakesview, Lead Hill, North Side, Volunteer mines - bornite, calamine, cerussite, chalcopyrite, gold, gypsum, limonite, malachite, pyrite, smithsonite.
Promontory Point - obsidian, variscite.
Sunshine mining properties - cerussite.

ROSEBUD DISTRICT (Grouse Creek Mountains) - barite, cerussite, chlorite, epidote, garnet, muscovite, quartz.
A & W, Magnitude mines - galena, scheelite, vanadinite, wulfenite.
Mogul mine - galena, gold.
Red Buttes - chalcopyrite, gold, pyrite.

ROZEL POINT - asphalt.

SALINE STATION (near) - smithsonite.

SIERRA MADRE DISTRICT (Wasatch Mountains) - See Weber County.

SNOWVILLE (near) - variscite.

UTAHLITE HILL (5 mi. N. W. Lucin) - lucinite, metavariscite, variscite, wardite.

WILLARD DISTRICT (Wasatch Mountains) - bindheimite, cyrtolite, stibnite.
Consolidated group, Louise Consolidated mine, Silver Queen claim - galena.
Gold Standard mine - hematite, limonite.
Mormon Girl claim - azurite, magnetite, malachite, muscovite.
Ogden Boilmakers claim - azurite, bindheimite, galena, malachite, tetrahedrite.
Overland claim - azurite, chalcopyrite, gold, malachite, pyrite, tetrahedrite.
Twin Pine claim - magnetite.
Wasatch Gold and Iron mine - hematite, magnetite.

CACHE COUNTY
HYRUM AREA (Blacksmith Fork).
Lucky Star claim - galena, malachite; silver.

Moon claim - gold, hematite, smithsonite.
Pig Hole Hollow - pyrolusite.
Tip Top claim - cerussite, galena, silver, smithsonite.

LA PLATA AREA (Davenport Creek).
La Plata, Sunrise claims - galena.
Sundown claim - malachite.
Yellow Jacket claim - cerussite, silver.

LOGAN AREA (Logan Canyon) - chalcotrichite, galena.

PARADISE DISTRICT (East Fork Little Bear River) - anglesite, azurite, cerussite, galena, malachite.

SMITHFIELD AREA - cerussite, kaolinite, smithsonite.

CARBON COUNTY
COAL (COLD) CREEK (20 mi. N. Price) - carnotite.

FARNHAM DOME - carbon dioxide.

GORDON CREEK - carbon dioxide.

PRICE (S.W.) - calcite.

SUNNYSIDE (5 mi. N.) - asphalt.

TIDEWELL and RIDEOUT DISTRICT (West Tavaputs Plateau).
Winter Quarters mine - copalite.

WHITMORE CANYON - ozocerite.

DAGGETT COUNTY

BIRCH CREEK DEPOSIT - limonite.

DAGGETT CHIEF PROPERTY - pyrolusite.

RED CREEK (Browns Park).
Yellow Canary uranium deposit - azurite, bornite, brochantite, carnottite, chalcocite, chalcopyrite, gold, hematite, hyalite, malachite, tyuyamunite, volborthite.
RED CREEK COMPLEX (Uinta Mountains) - almandite, anthophyllite, apatite, beryl, hematite, hornblende, hyanite, muscovite, staurolite.

SPRING CREEK DEPOSIT - limonite, pyrolusite.

UINTA MOUNTAINS (N.E. flank) - glauconite in Cambrian Ladore Fm. collophane, carbonate apatite, fluorapatite, francolite, phosphorite in Permian Meade Peak phosphate shale.

DAVIS COUNTY

ANTELOPE ISLAND (Great Salt Lake) - almandite, azurite, biotite, chalcopyrite, chlorite, chrysocolla, epidote, grossularite, hornblende, hyanite, limonite, magnetite, malachite, microcline, oligoclase, quartz, sulfur, vermiculite, zoisite.

BEAR CANYON - tremolite.

FARMINGTON DISTRICT (Wasatch Mountains). 
Morning Star group - azurite, chalcopyrite, cuprite, gold, malachite, pyrite. 
Parrish Canyon - anglesite, azurite, bornite, chalcocite, chalcopyrite, gold, limonite, malachite, pyrite, specularite.

GREAT SALT LAKE (shores) - aragonite, bloedite, glauberite, halite, mirabilite, thenardite.

LUCKY BOY AND UTAHPIOCHE MINES - scheelite.

WANDERING JEW MINE - azurite, galena, malachite.

DUCHESENE COUNTY

ANTELOPE CANYON - wurtzilite.

AVINTAGUIN CANYON - wurtzilite.

CASTLE PEAK DISTRICT (Uinta Basin) - gilsonite.

DUCHESENE (S.W.) - albertite.

DUCHESENE IRON PROSPECT - hematite, red ocher.

GREEN RIVER FORMATION - acmite, analcide, anhydrite, bassanite, bubankite, colophane, crocidolite, dawsonite, etelrite, fluorapatite, hectorite, illite, leucospenite, loughlinite, magnesioarvedsonite, magnesioirbeckite, nepheline, norstrandite, northupite, pyrite, reedmengerite, riebeckite, searlesite, shortite, smectite, thermonatrite, trona.

INDIAN CANYON - sepiolite, wurtzilite.

LAKE FORK - anhydrite, gypsum.

MOON LAKE IRON DEPOSIT - hematite, red ochre.

MYTON (S.) - gilsonite.

RAT HOLE CANYON - wurtzilite.

RED CREEK - wurtzilite.

RED LEDGE and HILLTOP IRON CLAIMS - hematite, red ochre.

ROCK CREEK - gypsum, malachite.

TABBY CREEK - tabbyite.

UINTA MOUNTAINS (S. flank) - carbonate apatite, collophane, fluorapatite, francolite, phosphorite in the Permian Meade Peak phosphate shale.

EMERY COUNTY

BARIUM INCORPORATED MINE - barite.

BLACK DRAGON CANYON - sulfur.

BOW KNOT AREA. 
Sevastopol, Riggs claims - schroekingerite.

CASTLE GATE (E.) - agate, azurite, chalcedony, epsomite, jasper, malachite, silicified bone and wood.

CASTLE VALLEY - agate, azurite, chalcedony, chert, epsomite, jasper, malachite, silicified bone and wood.

CEDAR MOUNTAIN DISTRICT (Cedar Mountain) - agate, anhydrite, carnottite, chalcedony, jasper, gypsum, pyrolusite, psilomelane, silicified bone and wood, sulfur, tyuyumunite, uraninite, wad.

EMERY (near) - brookite, cassiterite, dumortierite, ilmenite, monazite, zircon in Ferron Sandstone Member of Mancos Shale.

EMERY (LOST SPRINGS) DISTRICT (Red Plateau) - galena, gold, malachite, silver.
FULLERS BOTTOM - anhydrite, gypsum.

GREEN RIVER DISTRICT (10-12 mi. S. W. of town of Green River).
Cрабapple claim - schroeckingerite, uraninite.
Denise no. 1 mine - bassettite, coffinite.
Mineral Ten claim - metatorbemite, phosphuranylite, torbernite.
Sodaroll claim - zippeite.
Ventura claims - torbernite, uraninite.
Yellow Queen claims - carnotite, torbernite, uraninite.

GREEN RIVER.
18 mi. W. of town of Green River - carnotite, tyuyamunite.
30 mi. S.W. - agate, chalcedony, fibroferrite, jasper, silicified bone and wood.
50 mi. S. - carnotite, celestite.

HORN SILVER GULCH - anhydride, gypsum.

LAST CHANCE DESERT - agate, chalcedony, jasper.

LOST SPRINGS DISTRICT - (See EMERY DISTRICT).

MEXICAN BEND - sulfur.

MUDDY RIVER - monazite in placers.
Snow deposit - manganite, psilomelane, pyrolusite.

PHILLIPS HUNTINGTON NO. 1 WELL - brookite, cassiterite, dumortierite, as detrital grains in the Ferron Sandstone.

ROCHESTER (near) - pyrolusite.

SAN RAFAEL DISTRICT (San Rafael Swell) - agatized wood, amethyst, chalcedony, galena, gypsum, jasper.
Blue Bird prospect - carnotite, chalcolite.
Camp Bird no. 7 mine - arsenic, carnotite, orpiment, realgar.
Camp Bird no. 12 mine - carnotite.
Camp Bird no. 13 mine - carnotite, uraninite.

Calf Mesa:
Dalton group - autunite.
Dexter group - alunogen, butlerite, chalcanthite, chalcocite, chalcopyrite, copiapite, coqimbite, covellite, fibroferrite, diadochite, goldichite, halotrichite, melanterite, metazeneunite, parabutlerite, pitchblende, pyrite, roemerite, sulfur, tennantite, tetrahedralite, voltaite, zeunerite, zippeite.

Calyx mine - Carnotite, cobaltomenite, coffinite, corvusite, ferroselite, galena, montroseite, pascoite, pitchblende, pyrite, sphalerite, thulcite.
Copper Globe deposit - anglesite, azurite, cerussite, galena, malachite, torbernite.
Delta mine - andersonite, autunite, azurite, bayleyite, becquerelite, beta-uranophane, boltwoodite, bravoite, brochantite, carnotite, covellite, fourmarierite, galena, gunmite, gypsum, hematite, illite, johannite, kaolinite, malachite, meta-autunite, metatorbernite, metatyuyamunite, metazeneunite, phosphuranylite, pyrite, rutherfordite, schoepite, schroeckingerite, torbernite, tyuyamunite, uraninite, uranophane, vanadoniasscheite, volborthite, zeunerite, zippeite.
Dirty Devil mines - coffinite, galena, marcasite, metatorbernite, sphalerite, torbernite.
Flat Top Mesa - carnotite, chrome mica-clay, gypsum, hewettite, metatorbernite, rauvite, torbernite, uvanite.

Green Vein Mesa:
Consolidated mine - becquerelite, johannite, metazeunerite, schoepite, zippeite.
Green Vein no. 5 mine - metazeunerite.
Original Green Vein mine - metazeunerite.

Little Susan mine - marcasite, pyrite, uraninite.
Lone Tree group - autunite, zippeite.
Lucky Strike mine - becquerelite, chalcopyrite, fourmarierite, galena, marcasite, molybdenite, niccolite, pyrite, rabbitite, sphalerite, uraninite, zippeite.
Lucky Strike no. 2 mine - becquerelite, bieberite, cobaltocalcite, fourmarierite, galena, pitchblende, pyrite.
Magor mine - coffinite, uraninite.
Maybe mine - bomite, pyrite, pitchblende.
Marshbank Canyon - uraninite.
Migliaccio mine - carnotite, rauvite, uvanite.

North Mesa nos. 1, 2, and 5 mines - carnotite, corvusite.
Pay Day mine - boltwoodite, marcasite, metazeunerite, uraninite.
Table Mountain - carnotite.

Temple Mountain - ankerite, basaluminite, chrome mica-clay, carnotite, coffinite, dolomite, fermantinite, ferroselite, galena, hewettite, hummerite, illite, metalauninite, metatorbernite, metatyuyamunite, montroseite, pascoite, pitchblende, pyrite, rauvite, rosecollite, tennantite, tetrahedralite, thulcite, torbernite, tyuyamunite, uraninite, uvanite, zippeite.
Fuemrolno.2 mine - abernathyite, arsenic, bassettite, jarosite, meta-aluminate, metazeunerite, orpiment, pitticite, pyrite, realgar, sphalerite, scorodite.
North Temple Mountain, Eagle's Nest prospect - chrome mica-clay.
Rex no. 2 mine - corvusite, hewettite, montroseite, paramontroseite, pitchblende, uraninite.
South Temple Mountain - chrome mica-clay.
Temple Mountain mine - basaluminite, coffinite, corvusite, ferroselite, galena, illite, meta-aluminite, metatyuyamunite, montroseite, pascoite, pyrite, rauvite, tennantite, tetrahedrite, uvanite.
Wild Horse Canyon - autunite, meta-autunite, phosphuranylite.
Wild Horse claims, Dripping Springs - autunite, phosphuranylite.
Temple Rock, and South Temple Wash - autunite, carnotite, corvusite, hewettite, metahewettite, metatorbernite, rauvite, tyuyamunite, uvanite.
Vagabond mine - carnotite, metahewettite, metazeunerite.
Vanura claims - coffinite, uraninite.
West Little Horse Mesa - carnotite.
Wild Horse Canyon - carnotite.

SAN RAFAEL RIVER (2 mi S. of bridge) - agate, anhydrite, carnotite, chalcedony, gypsum, jasper, selenite, sulfur.
Tidwell Ranch - alabaster, carnotite.

SAUCE BASIN - pyrolusite.

SOUTHERN PART OF COUNTY - cryolite, gold.

WOODSIDE (5 mi. S.) - agate, chalcedony, jasper, silicified bone and wood.

WOODSIDE DOME - helium.

GARFIELD COUNTY

ANTIMONY DISTRICT (See COYOTE CREEK DISTRICT).

BOULDER MOUNTAIN.
Pleasant Creek - pyrolusite.

CANNONVILLE - bentonite, wheelerite.

CIRCLE CLIFFS - silicified wood.
Acme mine - autunite, azurite, gypsum, malachite, pyrite, torbernite.
Black Widow mine - autunite, azurite, carnotite, gypsum, torbernite, uraninite, uranophane.
Blue Goose mine - azurite, autunite, gypsum, malachite, torbernite.
Dream Prospect - carnotite.
Horse Canyon prospect - zeunerite.
Horse Head mine - autunite, carnotite, torbernite, uraninite, uranophane.
Lone B mine - carnotite, pyrite.
Rocky Mountain mine - autunite, chalcopyrite, arsenopyrite, chrysocolla, gypsum, pyrite, torbernite.
Steam Boat mine - azurite, autunite, gypsum, torbernite.
Stud Horse mine - autunite, chalcopyrite, pyrite, uraninite, zeunerite.

COLORADO RIVER DISTRICT (Colorado River) - placer gold, magnetite.

COYOTE - ptilolite, amygdaloidal fillings in basalt.

COYOTE CREEK (ANTIMONY) DISTRICT (Escalante Mountains).
Hampton mine - alunogen, epsomite, gypsum, orpiment, realgar, senarmontite, triburite, stibiconite, valentinite.
Dirty Devil River south to Lake Canyon - placer gold.

ESCALANTE (near) - agate, ilmenite, monazite, silicified bone and wood, zircon.

HENRIEVILLE - bentonite.

HENRY MOUNTAINS - bornite, betauranotile, jet, johannite, uranophane, vanoxite, zippeite.
Bromide, Oro mines - azurite, chalcopyrite, epidote, gold, ilmenite, laumontite, magnetite, pyrite, specularite.
Crescent Creek - bentonite, carnotite, metahewettite, pascoite, placer gold, tyuyamunite.
Cuprum claim - azurite, gold, magnetite, malachite.
Starlight claims - tyuyamunite.
Southwestern Flanks - ilmenite, monazite, zircon.

HITE - gold, platinum in placers.

HUTCH PASTURE - pyrolusite, wad.

KAIPAROWITS PLATEAU - monazite, in Straight Cliffs Sandstone six miles south of Escalante.

LITTLE ROCKIES DISTRICT (Henry Mountains).
Del Monte group - carnotite, vanoxite.
Ekker mine, Shooting Canyon - carnotite, vanoxite.

MAMMOTH CREEK (S. Hatch) - onyx (green travertine).

NORTH WASH DISTRICT (Henry Mountains).
Minerals and Mineral Localities of Utah, Kenneth C. Bullock

S.Y. Guthrie group - carnotite, vanoxite.
V.C.A. deposits - carnotite.

OAK CREEK PROSPECT (17 mi. N.F. Boulder) - pitchblende, torbernite.
PANGUITCH (N.W.) - pyrolusite.
SPOTTED DOG CLAIM - torbernite.

TABLE CLIFF PLATEAU.
*Fullmer prospect* - pyrolusite.

TRACHYTE DISTRICT (Henry Mountains).
*Blitz nos. 1-7, June Bell nos. 1-4, Minnie Pearl nos. 1-2, Straight Creek, Trachyte nos. 1-2, V.C.A. claims* - carnotite, vanoxite.
*Trachyte Creek* - carnotite, tyuyamunite.

TROPIC - bentonite.

TUSHAR RANGE.
*Hawkins claims* - pyrolusite.

WATER POCKET CANYON - anhydrite, gypsum.

GRAND COUNTY

AGATE SWITCH - agate, amethyst, chalcedony, red jasper casts of fossils, satin spar, travertine.

BALK MESA - placer gold, pyrolusite.

BEAVER MESA.
*Corvusite nos. 1-3 mines* - carnotite, coffinite, rauvite.

BLUE SPAR PROPERTY (near Colorado-Utah border) - fluorite.

CANE CREEK - anhydrite, carnallite, gypsum, halite, polyhalite, sylvite.

CISCO (near) - agate, agatized clams, chalcedony, calcite (onyx marble), silicified bone and wood, opalized wood.

7 mi. S. - agate.
*Texas Gulf Potash mine* - anhydrite, braitschite, carnallite, gypsum, halite, polyhalite, sylvite.
*Trader Smith's claims* - schroekingerite.

COLORADO RIVER AREA - chromite, gold in placers.
*Dolores River south to Amasa Back* - placer gold.

COURTHOUSE WASH - barite, calcite, limonite, pyrolusite.

CRESCENT JUNCTION - carnallite, sylvite.

FISHER VALLEY - anhydrite, gypsum.

GREEN RIVER - chromite in placers.

GREEN RIVER CROSSING (D. and R.G. Railroad) - aluminite.

GYPSUM HILLS - anhydrite, gypsum.

HARLEY DOME - carbon dioxide, helium.

HOOSIER MINE (near Brendel) - azurite, bornite, malachite, pyrite.

LA SAL DISTRICT (E. slopes of North Mountain, La Sal Mountains).
*Bornite mine* - azurite, bornite, malachite, pyrite.
*Jack claim* - carnotite, corvusite, hewettite, ilsemannite.
*McCoy mine* - azurite, bornite, chalcopyrite, malachite.

LA SAL MOUNTAINS (North Mountain) - actionolite, aegirite, augite, biotite, hedenbergite, oligoclase.

LITTLE GRAND DISTRICT (S. E. Green River).
*Black Bird claim* - pyrolusite.
*Colorado Fuel and Iron Company mine* - barite, calcite, pyrolusite.
*Desert Rock (Mongol) claim* - pyrolusite.
*Dry Lake Wash* - pyrolusite.
*Duma Point* - pyrolusite.
*Needles* - barite, calcite, manganite, pyrolusite, rhodochrosite.
*Salt Wash group* - celestite, chert, manganite, pyrolusite.
*Tenmile Wash* - barite, calcite, psilomelane, pyrolusite.
*White Wash deposits* - pyrolusite.

LITTLE VALLEY - limonite, pyrolusite.

MCCARTHY WELL - anhydrite.

MILL CREEK (N. Moab) - carnotite.

MINERS BASIN DISTRICT (W. slopes of North Mountain, La Sal Mountains).
*Dewey mine* - actinolite, calcite, chalcedony, chrysocolla, chalcopyrite, fluorite, hedenbergite, hematite, malachite, limonite, quartz.
Dillon mine - gold, pyrite.
High Ore mine - azurite, calcite, chalcopyrite, chrysocolla, chalcedony, fluorite, goethite, hematite, limonite, malachite, quartz.
McCormick mine - calcite, malachite, siderite.
M.I.F. mine - actinolite, gold, hedenbergite, pyrite.
Moab no. 1 mine - azurite, chalcopyrite, malachite, pyrite.
Placer Creek - gold.
Skylark mine - chalcopyrite, chrysocolla, limonite, pyrite.
Tornado deposit - gold, pyrite.
West Slope mine - carnotite.

MOAB (5 mi. N.) - agate, chalcedony, silicified bone and wood.

MOAB VALLEY - anhydrite, calciovolborthite, carnotite, gypsum.

MORRISON FORMATION - volkonskoite.

MULESHOE WASH - pyrolusite.

ONION CREEK (La Sal Mountains) - anhydrite, chevkinite in volcanic ash, gypsum.

PACK CREEK (La Sal Mountains) - autunite, carnotite, cuprodesclozite, metahemewittite, tyuyamunite.

PARADOX BASIN - anhydrite, carnallite, gypsum, halite, polyhalite, sylvite.

POISON SPRING CANYON - meta-autunite.

POLAR MESA DISTRICT (Polar Mesa) - fervanite, gypsum, hewettite.
Elva M., Imp. Polar nos. 2-3, Rim Rock no. 2 claims - carnotite.

PR SPRINGS - asphalt.

RICHARDSON DISTRICT (Waring Creek) - azurite, calciovolborthite, carnotite, galena, saponite, tyuyamunite, volborthite.

RYAN CREEK SCHEELITE PROSPECT - barite, fluorite, galena, scheelite, sphalerite.

SALT VALLEY AREA - anhydrite, azurite, carnallite, gold, gypsum, halite, limonite, malachite, polyhalite, psilomelane, pyrolusite, sylvite.

SEGER STATION - carnotite.

SEVEN MILE ANTICLINE - anhydrite, carnallite, gypsum, halite, polyhalite, sylvite.

SEVEN MILE CANYON.
Shinarump nos. 1-3 claims - becquerelite, boltwoodite, bornite, carnotite, chalcocite, chalcopyrite, lithiophorite, pitchblende, pyrite, schroeckingerite, uranite, zippeite.

SQUAW PEAK - pyrolusite.

THOMPSONS AREA - agate, anhydrite, dinosaur bone, carnottite, gypsum, jasper, metahemewittite, metarossite, rossite, rossite, selenite, tyuyamunite, vanoxite.

THOMPSONS DISTRICT (S.E. Thompsons).
Black Ape mine - liebigite, pascoite.
Cactus Rat mines - barnesite, carnotite, hewettite, metahemewittite, phosphuranylite, rauvite, rossite, rossite, steigerite, tyuyamunite, vanoxite.
Cobalt no. 2 mine - phosphuranylite.
Flat Top no. 1 claim - carnotite.
Juniper mine - corvusite, montroseite, melanovanadite, paramontroseite, uraninite.

McCoy group - schroeckingerite.
Parco no. 23 mine - andersonite, corvusite, grantsite, metatyuyamunite, metarossite, montroseite, rossite, rossite, schroeckingerite, selenium, tyuyamunite, uraninite, uraninite, vanoxite, zippeite.
Red Vanadium group - carnotite.
Skinny no. 1 mine - andersonite.
Thom claim - autunite, meta-autunite.

WHEELER DESERT DISTRICT (See WILSON MESA DISTRICT).

WHITE HOUSE - pyrolusite.

WILSON MESA (WHEELER DESERT) DISTRICT (Wilson Mesa) - bentonite, gold, pyrolusite, sherwoodite.

YELLOW CAT DISTRICT (W. part of Thompsons District).
Eli Malichs Lucky Day claim - pitchblende.
L.A. Sutherland Stock claim - pitchblende.
Uvanco (Yellow Jacket) mine - carnotite.
Yellow Cat group - metahemewittite, schroeckingerite, tyuyamunite.

IRON COUNTY

ANTELOPE RANGE
Black Jack (Gregory), Lucky Joe, Taylor claims - pyrol-
usite.
*Newcastle area* - chalcedony geodes.

**CEDAR BREAKS** - agate.

**CEDAR CANYON** - anhydrite, carnitite, gypsum, selenite.

**CEDAR MOUNTAIN.**
*Black Hawk, Joe Louis claims* - pyrolusite.

**CIMA (MARIETTA, STRATTON) MINE** - cinnabar, opal, sulfur.

**ESCALANTE DISTRICT (Mt. Escalante).**
*Clove prospect* - pyrolusite.

**ESCALANTE mine** - adularia, annabergite, barite, cerussite, chlorargyrite, desclioizite, fluorite, galena, hematite, hemimorphite, limonite, malachite, mimetite, montmorillonite, mottramite, pyrolusite, pyromorphite, wilmite, wulfenite.

**GOLD SPRINGS DISTRICT (Hamlin Valley).**
*Aetna, Independence, Jennie, Jumbo, Little Buck, Snowflake mines* - adularia, argentite, gold, limonite, pyrite.

**Homestake mine** - adularia, cerargyrite, fluorite, garnet, gold, mercury, quartz, selenium and tellurium mineralization.

**IRON SPRINGS DISTRICT (Iron mountain, Granite Mountain, Three Peaks).**
*Granite Mountain (Ore bodies: Armstrong, Constitution, Desert Mound, Eclipse, Georgia, Iron Springs Arch, King, Little Allie, Little Jim, Little Mormon, Lindsay Hill, Lindsay South, Milner Pit, Pioche Pit, Section 2, State Section 2, Section 3, Section 4, Section 9, Short Line, Short Line Extension, Thompson, Twitchell Vermillion Pit, Walker)* - actinolite, albite, amethyst, azurite, apatite, barite, chalcedony, cinnabar, diopside, galena, hematite, lodestone, magnetite, limonite, malachite, mimetite, pyrite, siderite.

**Iron Mountain (Ore bodies: A and B, Black Hawk, Black Magnetic, Blowout Hill, Burke no. 2, Burke no. 3, Calumet, Chesapeake, Comstock, Crystal, Cyclone, Deer, Duhuth, Duncan, Excelsior, Homestake, Last Chance, Line Cap, McCahill, Milner Hill, Mountain Lion, Pinto, Pot Metals, Queen of the West, Rex, Sparta, The Last Chance, Tip Top, Wall Street, Yellow Jacket)* - actino-

**KANARRAVILLE** - anhydrite, autunite, gypsum.

**LUND** - sulfur, N. end of Escalante Valley.

**MODENA** - alunite, 1 mile northwest, pyrolusite, rhodochrosite.

**NEEDLES RANGE**
*PV deposit* - alunite.

**PARAGONAH** - analcite, in andesite flows.

**Iron Peak** - andesine, augite, biotite, chlorite, damourite, magnetite.

**PAROWAN (near)** - niter.

**PINTO IRON (SILVER BELT) DISTRICT (Pinto)** - hematite, magnetite.

**SAND SPRINGS** - gold.

**SILVER BELT DISTRICT (See PINTO IRON DISTRICT).**

**STATELINE DISTRICT (Hamlin Valley)** - argentite, bog ore, cerargyrite, ferrimolybdate, gold, mercury, pyrite, selenium mineralization, sylvanite.

**Creole, Gold Dome, Johnny, Ofer, Phelps, Utah Spur mines** - adularia, cerargyrite, gold, hematite, jarosite, limonite, pyrolusite.

**WAH WAH MOUNTAINS**
*SX deposit* - alunite.

**JUAB COUNTY**

**ABRAHAM HOT SPRINGS** - psilomelane.
DEEP CREEK MOUNTAINS
Apex and Mary mines - beryl, fluorite, scheelite.
Gold Bond mine - azurite, gold, malachite, pyrolusite.
Heavenly Hills prospect - silver.
Hornet, MacMillan, Eastern Trout Creek mines - scheelite.
Johnson Canyon prospects - azurite, galena, malachite, pyrolusite.
Queen of Sheba and Juno mines - beryl, gold.
Red Hill mine - gold.
Singleton Canyon mine - azurite, malachite, tenorite, pyrolusite.
Trout Creek mine - beryl, fluorite, psilomelane, scheelite, sphalerite.
Water Canyon mine - azurite, malachite.

DESERET (DESERT MOUNTAIN) DISTRICT (Desert Mountain). - antlerite, bornite, brochanite, fluorite, hematite, limonite, magnetite, pyrite, tetrahedrite.
Miller mine - cerussite, galena, quartz with liquid inclusions.
Rockwell shaft - barite, chalcopyrite, chrysocolla, malachite.

DESERET MOUNTAIN DISTRICT (See DESERET DISTRICT).

DETROIT (DRUM, JOY) DISTRICT (Drum Mountains) (See also MILLARD COUNTY) - agate, jarosite, jasper.
Black Boy group (Staats and Pratt mines) - psilomelane, pyrolusite, rhodochrosite.
Charm, Copperhead, E.P.H., Ibex mines - azurite, bismutite, cerargyrite, chalcedony, chalcopyrite, cuprite, galena, gold, jasper, hematite, malachite, pyrite, pyrolusite.
Ibex mine - gold in jasperoid.
Iron Blossom mine - goethite, limonite, psilomelane, pyrolusite, wad.
Martha mine - gold in jasperoid.

DRUM DISTRICT (See DETROIT DISTRICT).

DUGWAY RANGE - beryl, bixbyite, chalcedony, fluorite, garnet, topaz.

EAST TINTIC DISTRICT (See under UTAH COUNTY).

EAST TINTIC MOUNTAINS - phosphorite in basal Deseret Limestone.

FISH SPRINGS DISTRICT (Fish Springs Mountains).
Carnation, Emma, Galena, Utah mines - anglesite, cerargyrite, cerussite, chalcopyrite, covellite, fluorite, galena, limonite, magnesite, plumbojarosite, pyrite, sphalerite.
Garrick mine - barite.

GOSHUTE INDIAN RESERVATION - beryl, muscovite, orthoclase, quartz.

HONEYCOMB HILLS - autunite, bertrandite, fluorite, meta-uranocircite, montmorillonite, sklodowskite, soddyte, spodumene, uraninite, uranophane, uranospinite.

IBAPAH MOUNTAINS.
Fifteenmile Canyon - beryl (gem quality aquamarine).

INDIAN CREEK - autunite, fluorite.

JERICO - agate, chalcedony, jasper, labradorite.

JOHNSON PEAK DISTRICT (See TROUT CREEK DISTRICT).

JOY DISTRICT (See DETROIT DISTRICT).

JUAB DISTRICT (Wasatch Mountains) - cerussite, galena.

KEG (MCDOWELL) MOUNTAINS - agate, labradorite, obsidian.

MONA DISTRICT (Long Ridge) - anhydrite, cerussite, galena, gypsum.

MT. NEBO (TIMMONS) DISTRICT (Wasatch Mountains).
Ajax to no. 2 prospect - galena, sphalerite.
Big Nebo mine - argentite, cerussite, galena.
Black Ledge claims - chalcedony, pyrolusite.
Blackett Tunnel - argentite, galena.
Eva (Privateer) mine - argentite, barite, calcite, calamine, cerussite, cuprite, dolomite, galena, smithsonite, sphalerite.
Freddie Lode - argentite, barite, calamine, cerussite, galena, smithsonite, sphalerite.
Highland mine - calcite, galena, sphalerite.
Santanquin Chief mine - cerussite, galena, sphalerite.
Santanquin King mine - cerussite, galena.
Syndicate (Bullock) Tunnel - cerussite, galena.

NORTH TINTIC DISTRICT (Boulter Mountains) (See also under Tooele and Utah Counties).
Tintic Prince mine - galena, jasper, pyrite.

SAN PITCH MOUNTAINS.
Black Jack (Kendall-Duvall) claims - agate, braunite, chalcedony, quartz, psilomelane.
Chicken Creek, Levan, Nephi, Salt Creek - anhydrite, gypsum, halite.
Orme property - calcite, opal, psilomelane, pyrolusite.

SPRING CREEK DISTRICT (W. side Deep Creek Mountains).
Queen of Sheba mine - albite, azurite, beryl, biotite, galena, garnet, limonite, muscovite, orthoclase, pyromorphite, quartz, tourmaline.

THOMAS RANGE - agate, bertrandite, beryl, chalcedony, clinoptilolite, fluorite, garnet, opal, pseudobrookite, quartz, specularite, topaz.
Autunite no. 8 claim - calcite, fluorite, opal, quartz, sanidine, weeksite.
Buena no. 1 claim - fluorite, opal.
Good Will, Yellow Chief groups - betauranophane, fluorite, schroeckingerite, uranophane, weeksite.

SPOR MOUNTAIN - bertrandite, clinoptilolite, fluorite, hectorite, morganite.
Bell Hill mine - carnitite, chalcedony, chalcopyrite, fluorite, hematite, magnetite, montmorillonite, pyrite, quartz.
Blowout mine - carnitite, fluorite, montmorillonite, quartz.
Blue Queen prospect - fluorite.
Claybank, Blue Chalk, Fluro, Hogsback, Northend, Rainbow, Roadside claims, Tarus - bertrandite, calcite, chalcedony, clinoptilolite, fluorite, gel-bertrandite, montmorillonite.
Dell no. 1 mine - fluorite, quartz.
Dell no. 5 mine - carnitite, fluorite, montmorillonite, quartz.
Eagle Rock prospect - calcite, carnitite, fluorite, mala- chite, montmorillonite.
Evening Star prospect - fluorite, sanidine, quartz.
Floride mine - carnitite, fluorite, hematite, limonite.
Floride no. 5 mine - fluorite, montmorillonite.
Fluorine Queen mine - carnitite, chalcedony, fluorite, montmorillonite, pyrolusite.
Fluorine Queen no. 4 prospect - carnitite, fluorite, montmorillonite.
Green Crystal mine - chalcedony, fluorite.
Harrisite mine - calcite, carnitite, fluorite, montmorillonite.
Hilltop mine - carnitite, fluorite, quartz.
Lost Sheep mine - carnitite, chalcedony, fluorite, quartz.
Lost Soul prospect - fluorite.
Lucky Louie mine - carnitite, chalcedony, fluorite.
Nonella prospect - fluorite, opal, quartz.
Oversight mine - calcite, fluorite, quartz.
Rainbow no. 2 prospect - fluorite.
Thursday mine - calcite, fluorite.

TOPAZ MOUNTAIN - almandite, beryl, bixbyite, calcite, carnelian, carnitite, chalcedony, clinoptilolite, fluorite, garnet, hematite, morganite, hyalite, pyromorphite, quartz, sandine, schroeckingerite, specularite, spessarite, topaz, uranophane, weeksite.

TIMMONS DISTRICT (See MT. NEBO DISTRICT).

TINTIC DISTRICT (East Tintic Mountains) - arsenosiderite, arduinite, atacamite, cotunnite, pyrolusite, tennantite, siderotil, sickerlite, spangolite, zoisite.
Ajax mine - boryckite, chalcopyllite, enargite, mixite, tyrolite.
American Eagle mine - conichalcite, chenevixite, erinite.
Beck Tunnel mine - cerussite, galena, jasper.
Black Dragon mine - galena, limonite, pyrite.
Black Jack Empire mine - gold, limonite, silver, pyrolusite, wad.
Boss Tweed mine - azurite, barite, bismite, bismuth, bismutite, brochantite, calamine, cuprite, malachite, mixite.
Brooklyn mine - crandallite.
Bullion Beck mine - anglesite, aurichalcite, azurite, calamine, cerargyrite, cerussite, gold, galena, marcasite, pearceite, silver, smithsonite, sphalerite.
Carissa mine - aurichalcite, azurite, barite, bismuth, bismutite, brochantite, calcite, chrysocolla, conichalcite, copper, cuprite, enargite, garnet, lettsomite, malachite, mixite, olivenite, pitticite, scorodite, utahite.
Centennial Eureka mine - azurite, barite, cerargyrite, chalcocite, chalcopyrite, conichalcite, copper, cornwallite, cuprite, enargite, erinite, galena, gold, malachite, metazeunerite, silver, zeunerite.
Chief Consolidated mine - cerargyrite, cerussite, enargite, galena, huntite on 1800 level, jasper, proustite, pyrrargyrite, pyrite, silver, smithsonite, sphalerite.
Colorado mine - calamine, cerussite, galena, geocronite, smithsonite, sphalerite.
Dragon mine - chrysocolla, galena, halloysite, limonite.
Eagle and Blue Bell mine - anglesite, bismite, bismuthite, bismoclite, cerargyrite, cerussite, daubreeite, enargite, galena, jarosite, jasper, smithsonite.
Emerald mine - bismuth, calcite, hematite, limonite, psilomelane, wad.
Eureka Hill mine - anglesite, barite, brochantite, carphosiderite, cerussite, enargite, galena, gold, leadhillite, minette, phosgenite, pyromorphite, sphalerite.
Gemini mine - anglesite, aurichalcite, azurite, calamine, cerargyrite, cerussite, galena, heulandite, hydrozincite, jasper, malachite, marasite, pearceite, silver, smithsonite.
Godiva mine - anglesite, cerargyrite, cerussite, galena, minium, smithsonite.  
Gold Chain mine - barite, conichalcite, enargite, malachite, olivenite, pharmacosiderite, tyrolite.  
Grand Central mine - barite, cerargyrite, chalcocite, chalcopyrite, connellite, covellite, enargite, galena, jasper, limonite, silver.  
Homestake and Shoebridge mines - enargite, galena.  
Humbug mine - anglesite, cerussite, galena, stephanite.  
Iron mine - cerargyrite, hematite, limonite.  
Iron Blossom mine - adamite, aragonite, aurichalite, azurite, barite, calcite, covellite, enargite, galena, jasper, malachite, pyrite, sphalerite.  
Lower Mammoth mine - enargite, galena, pyrite, smithsonite, sphalerite, tetrahedrite.  
New Bullion mine - smithsonite.  
Mammoth mine - argentite, arsenobismite, barite, bindheimite, bismuthian bismuthinite, berickite, bronchonite, cerargyrite, cerussite, chalcophyllite, clinoclase, enargite, erinite, famatinite, galena, gold, gypsum, lettsomite, olivenite, pharmacosiderite, pyromorphite, silver, tyrolite.  
May Day mine - aurichalcite, calamine, galena, gold, hydrozincite, smithsonite.  
Mintintic mine - ruzynite.  
Opohonga mine - barite, enargite, olivenite.  
Packard Peak - halloysite.  
Scotia mine - bindheimite, jamesonite.  
Sioux mine - azurite, dolomite, enargite, galena, malachite, quartz.  
Sunbeam mine - anglesite, cerussite, limonite, malachite, pyrite.  
Swansea mine - anglesite, arsenopyrite, barite, cerussite, enargite, galena, meliconite, melanterite, pyrite, silver, sphalerite, tenorite.  
Uncle Sam mine - aurichalcite, smithsonite.  
Victoria mine - ankerite, bismutite, calamine, enargite, galena, gold, jasper, manganite.  
White Cloud mine - pyrolusite, wad.  
Yankee mine - aurichalcite, smithsonite.  

TROUT CREEK (JOHNSON PEAK) DISTRICT (E. side Deep Creek Mountains) - fluorite, gold, pyrrhotite, sphalerite.  
Apex mine - beryl, quartz, scheelite.  
Bacon mine - andalusite, scheelite.  
TROUT CREEK mine - scheelite.  

WEST TINTIC DISTRICT (West Tintic Mountains) - arsenopyrite, bismuthinite, enstatite, galena, idocrase, magnetite, molybdenite, pyrite, scheelite, sphene, t alc, tremolite, wollastonite.  
88 mine - anglesite, barite, cerussite, chrysocolla, fluorite, galena.  
Iron King mine - andradite, clinozoisite, epidote, grossularite, magnetite, pyrite, scheelite, specularite.  
Lockheed Iron property - chalcopyrite, epidote, hematite, magnetite, malachite, pyrite.  
1903 mine - barite, calamine, cerussite, chalcopyrite, chrysocolla, fluorite, galena, limonite, malachite, pyrite, sphalerite.  
Pyramid mine - barite, galena, limonite, malachite.  
Scottia (Old Scotia) mine - anglesite, arsenopyrite, azurite, barite, bindheimite, cerussite, chalcopyrite, chrysocolla, conichalcite, galena, gold, hematite, jamesonite, limonite, linarite, malachite, olivenite, pharmacosiderite, pyrite, scorodite, sphalerite.  
Tintic Western (Desert Tungsten) mine - actinolite, andradite, azurite, barite, calcite, chalcopyrite, chlorite, chrysocolla, clinozoisite, epidote, grossularite, limonite, magnetite, malachite, pyrite, quartz, scheelite, specularite, stibnite.  
War Eagle claims - anglesite, aurichalcite, barite, bindheimite, calcite, cerussite, chalcedony, chalcopyrite, chrysocolla, galena, gold, hematite, limonite, malachite, pyrite, specularite, wad.  

KANE COUNTY  
ALUM HILLS - aluminite.  
BULLOCH CLAIMS - autunite, carnotite, torbernite, tyuyamunite.  
CANNONVILLE - anhydrite, gypsum.  
COLORADO RIVER DISTRICT - placer gold, magnetite.  
GLENDALE - anhydrite, gypsum.  
JOHNSON CREEK - anhydrite, gypsum.  
KAIBAB FAULT - (W. side) - allophane, ammoniojarosite, ammonia alum.  
KAIPAROWITS PLATEAU (S. part) - ilmenite, monazite, zircon.  
Croton Canyon - monazite in Straight Cliffs Sandstone.  
Rees Canyon - monazite in Straight Cliffs Sandstone.  
Sunday Canyon - monazite in Straight Cliffs Sandstone.  
KANAB (near) - silicified wood.  
KANAB CREEK - anhydrite, gypsum.
KIMBALL VALLEY - anhydrite, gypsum.

KITCHEN CORRAL CANYON - barite, calcite, chalcedony, limonite, pyrolusite.

ORDERVILLE - agate, anhydrite, calcite geodes, gypsum, silicified wood.

PARIA (PAHREAH) - aluminate, autunite, anhydrite, carnottite, gypsum, uranospinite.

PARIA (PAHREAH) MINING COMPANY - azurite, cuprite, malachite.

PARIA RIVER - placer gold, in Shinarump clays, fifteen miles north of Utah-Arizona boundary.

VIRGIN RIVER - torbernite.

MILLARD COUNTY

ANTELOPE SPRINGS - limonite, pyrite, altered to limonite.

BLACK ROCK (5 mi. N.) - red and black obsidian; flowering or snowflake obsidian.

CLEAR LAKE RAILROAD STATION - straw yellow labradorite in weathered andesite.

CRICKET MOUNTAINS - dolomite, hematite in ferruginous quartzite member of Prospect Mountain Quartzite.

DETROIT (DRUM, JOY) DISTRICT (LITTLE DRUM MOUNTAINS) (See also Juab County).
Almond, Blue Bell, Major Drum mines - azurite, bismuthite, cuprite, chalcedony, chalcopyrite, malachite, pyrite, pyrolusite, rhodochrosite, wad.
Black Diamond, Guy (Black Jack), Last Chance, Martha, Silica Plug mines - jasper, manganite, pyrolusite, wad.
Charm mine - gold in jasperoid.
Martha mine - gold in jasperoid.

DRUM DISTRICT (See DETROIT DISTRICT).

FILLMORE (near) - anhydrite, gyspite, gypsum, niter.

GORDON DISTRICT (Pavant Mountains).
Black, Philadelphia, Sulphur King mines - gypsum, sulfur.
Cove Creek - gypsum, hematite, marcasite, pyrite, sulfur.
Excelsior, Mariposa, New York, Prince Albert, Queen
Victoria mines - gypsum, hematite, sulfur.
Rain Bow mine - fluorite.
Victor Conqueror mine - marcasite, pyrite, sulfur.

HOUSE RANGE.
Amasa Valley - albite, biotite, diopside, garnet, gold, idocrase, molybdenite, pyrite, scheelite, tourmaline, tremolite, wollastonite.
Granite Canyon - placer gold.
Horseshoe, Mt. Baldy, New Klondike, Pine Peak, Pinkie Peak, South, South Fit, Sidespring mines - diopside, garnet, idocrase, scheelite.
Notch Peak (intrusive and contact) - albite, biotite, diopside, garnet, gold, idocrase, molybdenite, oligoclase, orthoclase, pyrite, scheelite, tremolite, wollastonite.
Painter Springs - garnet, idocrase, microcline, orthoclase, muscovite, pyrite, scheelite.
Rainbow mine - diopside, fluorite, garnet, idocrase, scheelite.

JOY DISTRICT (See DETROIT DISTRICT).

KANOSH (near) - anhydrite, gyspite, gypsum.

LEAMINGTON (OAK CITY) DISTRICT (Canyon Range).
Arbroath mine - anglesite, cerussite, galena.
Fool Creek Canyon - azurite, limonite, malachite.
Leamington Mining Company - anglesite, cerussite, galena.
Wood Canyon - galena, sphalerite.
Yellowstone mine - anglesite, aragonite, cerussite, galena, gold.

OAK CITY DISTRICT (See LEAMINGTON DISTRICT)

SAW BACK DISTRICT (W. of Sevier Lake) - chalcopyrite, galena, garnet, molybdenite.

SEVIER LAKE (S. end) - corundum in angular masses in alluvium.

SOUTH PAVANT RANGE
Cove Fort (N.E.) - fluorspar, sulfur.
Dog Valley - chalcedony, fluorite.

TABERNACLE MOUNTAIN - guano.

TUSHAR MOUNTAINS
Cove Fort area - clinoptilolite in tuff.

TWIN PEAK - andesine, apatite, augite, biotite, mag-
netite, martite.

Black Diamond Iron prospect - hematite, magnetite, martite.

WHITE MOUNTAIN - red and black obsidian, black obsidian.

MORGAN COUNTY

ARGENTA DISTRICT (Wasatch Mountains).
Carbonate Hill, Carbonate Gem mines - anglesite, barite, cerussite, galena, jarosite, limonite, pyrite, smithsonite.

ARTHUR FORK - biotite, monazite, molybdenite, uraninite, xenotime.

HARDSCRABBLE (MILL CREEK) DISTRICT (Wasatch Mountains).
Norway group - hematite, limonite.

MILL CREEK DISTRICT (See Hardscrabble District).

MORGAN DISTRICT (Wasatch Mountains).

ROUND VALLEY.
Copper Mountain mine - azurite, malachite.

STRAWBERRY MINE (near Gateway) - gold, silver.

PIUTE COUNTY

ALUNITE RIDGE - alunite.

ANTELOPE RANGE - limonite, pyrolusite, torbernite.

CIRCLEVILLE MOUNTAIN - stellerite.

DEER TRAIL MOUNTAIN - alunite.

DRY CANYON - pyrolusite.

GOLD MOUNTAIN (KIMBERLY) DISTRICT (Deer Creek, Tushar Mountains) alunite, barite, garnet, gypsum.

Annie Laurie mine - argentite, cerargyrite, fluorite, galena, gold, limonite, pyrite, sphalerite.
Keystone mine - fluorite.
Mill Creek on Signal Peak - placer gold.
Sevier mine - adularia, argentite, amethyst, azurite, cerargyrite, fluorite, gold, limonite, pyrite.

KIMBERLY DISTRICT (See GOLD MOUNTAIN DISTRICT)

MARYSVALE DISTRICT (Marysvale Uranium Area) - adularia, allphane, alunite, albite, biotite, calcite, cobaltominitite, clinohlore, chlorite, cristobalite, dickite, halite, halloysite, manganocalcite, montmorillonite, nontronite, obsidian.
Alum King mine - potash alun.
Al-Kee-Mee prospect - alunite, natroalunite.
Big Chief, Big Star, Manning Creek, Mary's Lamb, Marysvale Peak, North Star, Pittsburg, White Hills, Winkelman mines - alunite.
Blackbird, Blue Miami Moon no. 1 mines - pyrolusite.
Buddy mine - autunite, jordisite, lithiophorite, pitchblende.

Bullion Monarch (Farmer John) mine - autunite, barite, fluorite, ilsemannite, jordisite, johannite, lithiophorite, metatorbernite, schroeckingerite, torbernite, pitchblende, uraninite, uranophane, uranopilite, zippeite.
Copper Butte mine - autunite, torbernite, uranophane.
Copper Cap mine - jordisite.

East Slope no. 2 prospect - alunite, autunite, hematite, metatorbernite, schroeckingerite, uranophane.

Freedom Lease, V.C.A. mine - autunite, pitchblende.
Freedom no. 1 mine - autunite, fluorite, ilsemannite, jordisite, jordisite, lithiophorite, pitchblende, torbernite, schroeckingerite, umohoite.
Freedom no. 2 mine - autunite, betauranotitel, fluellite, fluorite, gearysritite, ilsemannite, jordisite, jordisite, lithiophorite, meta-autunite, metatorbernite, phosphuranylite sabugalite, schroeckingerite, sklodowskite, torbernite, umohoite, uraninite, uranophane, zeurnite, zippeite.

J & L. alunite mine - alunite, hyalite, opal, phosphuranylite.
LaVita prospect - fluorite, goethite, hematitite, metatorbernite, meta-autunite, molybdenite, pyrite, rauvite, tyuyamunite.

Papsy's Hope prospect - meta-autunite, uranophane.
Prospector no. 1 mine - autunite, fluellite, fluorite, ilsemannite, jordisite, johannite, lithiophorite, pitchblende, torbernite, schroeckingerite, uraninit, uranophane, uranopilite, zippeite.
Prospector no. 3. mine - autunite, lithiophorite, pitchblende, torbernite, schroeckingerite.

Quicksilver mine - amethyst argentite, cinnabar, ilsemannite, metacinnabar, mordenite, onofrite, quartz, selenite, tiemannite.
Silica Hills - alunite, celadonite, chabazite, goethite, jarosite, opal, natrolite, thomsonite.

White Horse deposit - alunite, kaolinite.

Yellow Jacket mine - alunite, jarosite.
MOUNT BALDY DISTRICT (Cottonwood Creek, Tushar Mountains).

_Aetna (Edna) mine_ - alunite.
_Bradburn, Close In, Mineral Products, L and N, Sunshine mines_ - alunite,
_Christmas mine_ - alunite.
_Clyde mine_ - chalcopyrite, malachite, pyrite, sphalerite, tetrahedrite, wurtzite.
_Crystal mine_ - alunite, galena.

_Deer Trail mine_ - anatase, anglesite, cerussite, fluorite, galena, gold, jarosite, limonite, leuchtenbergite, malachite, manganocalcite, octahedrite, plumbogranite, pyrite, pyrolusite, quartz, specularite, sphalerite, zircon.
_Green Eyed Monster mine_ - limonite, pyrite.
_Lucky Boy mine_ - barite, cinnabar, onofrite, tellurium mineralization, tiemannite.
_Pluto mine_ - argentite, cerargyrite, cerussite, galena, gold, tellurium mineralization, wulfenite.

MOUNT BELKNAP - pyrolusite.

OHIO DISTRICT (Bullion Canyon, Tushar Mountains).
_Bully Boy and Webster mines_ - azurite, barite, cerussite, chalcopyrite, fluorite, galena, gold, hydrozincite, limonite, pyrite, pyrolusite, quartz, specularite, sphalerite.
_Cascade mine_ - azurite, cerussite, chalcopyrite, galena, gold, malachite, pyrite, tetrahedrite, sphalerite.
_Copper Belt, Iris, Shamrock mines_ - azurite, cerussite, chalcopyrite, galena, gold, malachite, pyrite, tetrahedrite, tellurium mineralization, titanium.
_Dalton mine_ - azurite, cerussite, gold, malachite, pyrite, rhodochrosite, tetrahedrite.
_Gilbert claims_ - pyrolusite.
_Great Western mine_ - chalcopyrite, fluorite, galena, pyrite, sphalerite, tetrahedrite.
_Pine Gulch Creek_ - placer gold.
_Shamrock mine_ - chalcopyrite, fluorite, galena, sphalerite, tetrahedrite.
_Tunnel Extension No. 2 mine_ - bismuthinite, cassiterite, chalcoctite, chalcopyrite, covellite, cuproblumosite, emplectite, gold, tetрадимный, tetrahedrite.
_Wege mine_ - adularia, azurite, gold, malachite.

SEVIER CANYON - alunite, anhydrite, gypsum, limonite.

TUSIAR RANGE.
_Dillon mine_ - rhodochrosite.

RICH COUNTY

BEAR RIVER RANGE.

Lakeview claims - calcite, jasper, pyrolusite, rhodochrosite.

CRAWFORD MOUNTAINS - phosphorite, tuuyamunite.

GARDEN CITY DISTRICT (See SWAN CREEK DISTRICT).

LAKETOWN CANYON - phosphorite.

SWAN CREEK (GARDEN CITY) DISTRICT (Bear River Range).
_Victoria prospect_ - azurite, barite, cerussite, galena, tennantite, wulfenite.

WOODRUFF CREEK - phosphorite.

SALT LAKE COUNTY

ADAMS DISTRICT (See HOT SPRINGS DISTRICT).

ALTA DISTRICT (See LITTLE COTTONWOOD DISTRICT).

ALTA STOCK - allanite, bornite, brucite, calcite, chalcopyrite, diopside, forsterite, garnet, hypersthen, ludwigite, magnetite, pyrite, tremolite in contact zone.

ALUM POINT - apjohnite, bushmanite, pickeringite.

BIG COTTONWOOD CANYON (near mouth) - large orthoclase crystals.

BIG COTTONWOOD DISTRICT (Wasatch Mountains) - actinolite, andradite, anglesite, asbestos, barite, dufrenoyite, orthoclase.
_Alta Tunnel and Transportation Company mine_ - cerussite, galena, malachite, smithsonite.
_American Metals mine_ - galena, pyrite, quartz, sphalerite.
_Big Cottonwood mine_ - bornite, brucite, chalcopyrite, ephesite, forsterite, galena, hydromagnesite, magnesio-ludwigite, magnetite, malachite, periclase, pyrite, susseite, xanthophyllite.
_Carbonate mine_ - argentite, aurichalcite, cerussite, galena, limonite, malachite, pyrolusite, smithsonite.
_Cardiff mine_ - cerussite, covellite, enargite, galena, limonite, malachite, plumbogranite, pyrite, pyrolusite, rhodochrosite, smithsonite, sphalerite, tetrahedrite.
_Columbus Rexall mine_ - bornite, chalcopyrite, enargite, galena, pyrite, siderite, tetrahedrite.
_Confidence mine_ - anorthite.
_Copper King mine_ - cuprite, molybdenite.
_Eclipse mine_ - azurite, anglesite, cerussite, galena,
goethite, malachite.

Great Western mines - lugwigite, (see Big Cottonwood and Mountain Lake mines).

Howell-Baby McKee mine - chalcopyrite, galena, pyrite, sphalerite.

Kennebec mine - cerussite, galena.

Kentucky - Utah mine - chalcopyrite, magnetite, pyrite.

Lulu mine - chalcopyrite, galena, siderite.

Maxfield mine - alaskite, anorthite, dyscarsite, galena, pyrite, sepiolite, sphalerite, tetrahedrite, wollastonite.

Mountain Lake mine - bornite, brucite, chalcocite, chalcopyrite, diopside, epidote, ephesite, forsterite, garnet, hydromagnesite, magnesioludwigite, magnetite, malachite, muscovite, periclad, scheelite, sussexite, szaibelyite, xanthophyllite.

Mountain View mine - ludwigite.

New State mine - gold.

Prince of Wales and Antelope mines - azurite, cerussite, galena, malachite, smithsonite, sphalerite, wad.

Reed and Benson mines - cerussite, chalcopyrite, galena, goethite, hemimorphite, sphalerite, tetrahedrite.

Silver Mountain mine - cerussite, galena, pyrite, smithsonite, sphalerite.

Steamboat mine - chalcocite, forsterite.

Tar Baby mine - galena.

Tungsten Tunnel mine - huebnerite, powellite, scheelite.

Woodlawn mine - cerussite, chalcopyrite, galena, magnetite, malachite, pyrite, pyrolusite, sphalerite, wulfenite.

Bingham (West Mountain) District (Oquirrh Mountains) - actinolite, bismuth, bismutite, bournonite, calcite, garnet, linarite, magnetite, massicot, mercury, pyrolusite, pyrhotite, rutile, seligmannite, siderotil, tennantite.

Bear Gulch - placer gold.

Bingham Canyon - placer gold.

Bingham Copper (Kenecott, Utah Copper) Pit - allophe, apophyllite, bornite, chalcocite, chalcopyrite, chalcopyrite, digenite, enargite, foshagite, gold, gyrolite, kaolinite, illite, malachite, molybdenite, nontronite, okinite, palladium, platinum, pyrite, quartz, sericite, selenium mineralization, stilbite, tellurium mineralization, thauasite, thomsonite, tobermorite, turquoise, vivianite, wavelite.

Boston Consolidated, Burning Moscow, Last Chance, Nest mines - cerussite, chalcocite, chalcopyrite, galena, gold, pyrite, sphalerite.

Broad Gauge mine - cerussite, chalcocite, gold, hematite, pyrite.

Brooklyn, Yosemite mines - cerussite, chalcopyrite, galena, gold, pyrite, sphalerite.

Burtfield mine - azurite, cerussite, chalcopyrite, galena, gold, malachite, pyrite, rhodochrosite, sphalerite.

Burtfield Canyon - orpiment, realgar.

Caledonia, Montezuma, Red Wing mines - cerussite, galena, gold, pyrite.

Carr Fork - placer gold.

Carr Fork mine - bornite, chalcopyrite, galena, garnet, hematite, magnetite, molybdenite, pyrite, pyrrhotite, sphalerite.

Colorado mine - chalcopyrite, galena, pyrite.

Commercial mine - azurite, chalcocite, malachite, pyrite.

Commercial mine - azurite, chalcocite, malachite, pyrite.

Conger, Fortune mine - chalcocite, chalcopyrite, galena, pyrite.

Copper Center Tunnel - bornite, chalcopyrite, pyrite.

Dalton, Lark group - azurite, cerussite, chalcopyrite, galena, gold, pyrite, silver, sphalerite.

Eagle Bird lode - arsenopyrite, barite, galena, rhodochrosite, sphalerite.

Eighty Nine mine - tetrahedrite.

Frisco mine - chalcopyrite, galena, pyrite, sphalerite.

Galena, Old Jordan mines - anglesite, azurite, bornite, cerussite, chalcocite, chalcopyrite, cuprite, enargite, galena, gold, goslarite, limonite, malachite, opal, pisnate, pyrite, quartz, sphalerite, tenorite, tetrahedrite, silver.

Highland Boy, Yampa mines - azurite, bornite, calaverite, chalcocite, chalcopyrite, copper, covellite, cuprite, enargite, galena, leverrierite, limonite, malachite, marasite, pyrite, racewinite, siderite, specularite, sphalerite.

Jersey Blue mine - cerussite, galena.

Lucky Boy mine - barite, luckite, melanterite, mallardite, rhodochrosite.

Midland mine - azurite, cerussite, galena, malachite, marcasite.

Minnie mine - chalcocite, pyrite.

Neptune mine - galena, pyrite, silver, sphalerite.

Northern Chief lode - covellite.

Old Telegraph mine - azurite, cerussite, chalcocite, chalcopyrite, galena, gold, malachite.

Parnell mine - gold.

Petro mine - cerussite, galena.

Phoenix mine - chalcocite, galena, pyrite.

Queen lode - argentite, galena.

Queen mine - argentite, barite, chalcopyrite, galena, rhodochrosite, sphalerite.

Silver Shield mine - chalcopyrite, galena, freibergite, tetrahedrite.

Tieveraukee mine - azurite, binnite, galena, malachite,
pyargyrite, pyrite, silver, sphalerite.

*U.S. and Lark mine* - azurite, cerussite, chalcopyrite, galena, gold, malachite, montmorillonite, pyrite, quartz, silver, sphalerite, talc.

*Winonauck, Dixon mines* - azurite, cerussite, chalcocite, chalcopyrite, cubanite, dufrenoysite, galena, gold, goslarite, pyrite, pyargyrite, rhodochrosite, sphalerite, tetrahedrite.

*York mine* - azurite, chalcopyrite, galena, malachite.

**CAMP WILLIAMS**

*Evans lime quarry* - calcite, pyrolusite.

**CLAYTON PEAK STOCK** - ankerite, bornite, brucite, calcite, chalcopyrite, diopside, forsterite, garnet, idocrase, magnesite, magnetite, monticellite, periclase, phlogopite, pyrite in contact zone.

**DRY CANYON** - phosphorite.

**GREAT SALT LAKE (shores)** - aragonite, bloedite, glauberite, gypsum, halite, mirabilite, thenardite.

**HOT SPRINGS (ADAMS) DISTRICT** (Wasatch Mountains) - cerussite, galena.

**LAKE BONNEVILLE SHORELINE** - thinolite as cement of gravels.

**LITTLE COTTONWOOD (ALTA) DISTRICT** (Wasatch Mountains) - allanite, chabazite, ferrimolybdate, heulandite, mesolite, orthoclase, prehnite, periclase, sepiolite, stilbite, zoisite.

*Albion mine* - argentite, barite, bouronite, cerussite, chalcopyrite, galena, pyrite.

*Alta mine* - actinolite, biotite, diopside, forsterite, garnet, tremolite, vesuvianite.

*Alta Consolidated mine* - cerussite, chalcopyrite, limonite, magnetite, pyrite, wulfenite.

*Alta - Gladstone vein no. 5* - molybdenite, pyrite.

*Bay State mine* - stilbite.

*Cabin mine* - cerussite, galena, limonite, plumbojarosite.

*Centennial Alta mine* - beaverite, enargite, tyrolite, wulfenite.

*City Rocks mine* - wulfenite.

*Columbus Consolidated and Wasatch Drainage Tunnel mine* - galena, pyrite, sphalerite, tetrahedrite.

*Columbus-Rexal mine* - bornite, chalcopyrite, enargite, galena, pyrite, siderite, tetrahedrite.

*Emma mine* - argentite, anglesite, azurite, cerussite, calamine, chrysocolla, cervantite, galena, limonite, malachite, massicot, pyrite, pyrolusite, siderite, smithsonite, stephanite, sphalerite, stolzite, tetrahedrite, tungstenite, wulfenite, wolframite.

*Flagstaff mine* - barite, cerussite, galena, limonite, plumbojarosite, wulfenite.

*Grizzly mine* - linarite.

*Little Emma mine* - anglesite, calamine, cerussite, chalcocite, chrysocolla, galena, malachite, pyrite, pyrolusite, sphalerite, stephanite, tungstenite, wulfenite.

*Michigan-Utah (Continental Alta) mine* - anglesite, cerussite, galena, limonite, ludwigite, magnetite, pyrolusite, rhodochrosite, wulfenite.

*Native Copper mine* - chalcopyrite, copper.


*Patsey Marley mine* - epidote.

*Peruvian Consolidated mine* - galena, pyrite, tetrahedrite.

*South Hecla mine* - (includes Dwyer and Sells Tunnels) - aikinite, busmite bismuth, bismuthinite, bornite, chalcopyrite, enargite, galena, garnet, ludwigite, magnetite, plumbojarosite, pyrite, scheelite, smithsonite, sphalerite, tetrahedrite, wollastonite.

*Superior mine* - chalcopyrite, galena, pyrite, sphalerite, tetrahedrite.

*Third Chance mine* - molybdenite.

*West Toledo mine* - cerussite.

**LITTLE COTTONWOOD STOCK** (Wasatch Mountains) - apatite, allanite, biotite, hornblende, magnetite, microcline, molybdenite, orthoclase, plagioclase, pyrite, quartz, sphene, sericite, scheelite, zircon.

**LOWER PLACER DISTRICT** (Oquirrh Mountains) - gold.

**SMELTER DISTRICT** (Oquirrh Mountains) - limonite, malachite.

**WEST MOUNTAIN DISTRICT** (See BINGHAM DISTRICT).

**SAN JUAN COUNTY**

**ABAJO MOUNTAINS** - placer gold on south flank.

**ABE DAY'S VANADIUM CLAIM** - carnotite.

**BIG INDIAN DISTRICT** (Big Indian Wash-Lisbon Valley Area).

*Big Buck mine* - becquerelite, coffinite, doloresite, montroseite, uraninite, vanadium hydromica.

*Big Indian Copper mine* - azurite, chalcocite, chalcopyrite, covellite, cuprite, malachite, pyrite.

*Cal uranium mine* - coffinite, carnotite, doloresite, montroseite, paramontroseite, uraninite, vanadium hy-
dromica.

Homestake mine - coffinite, doloresite, montroseite, paramontroseite, uraninite, vanadium hydromica.

La Sal mine - coffinite, doloresite, montroseite, uraninite, vanadium hydromica.

Mi Vida (Utex) mine - bayleyite, carnotite, cerussite, chalocite, clausathlite, coffinite, doloresite, fluorite, galena, greenochite, liebigite, montroseite, paramontroseite, pascoite, pitchblende, sphalerite, tyuyamunite, uraninite, vanadium hydromica, vanoxite.

Radon mine - carnotite, celestite, coffinite, doloresite, montroseite, tyuyamunite, uraninite, vanadium hydromica, whewellite.

Rattlesnake mine - carnotite, coffinite, doloresite, montroseite, uraninite, vanadium hydromica.

BLUFF - placer gold in sands of San Juan River.

BLUE JAY MINE - boltwoodite.

BLUE MOUNTAIN DISTRICT (See MONTICELLO DISTRICT).

BROWNS HOLE AREA - carnotite.

BULL CANYON - carnotite.

“C” GROUP CLAIMS - rutherfordine.

CANE SPRINGS PASS.

Bridger Jack Flat - carnotite.

CANE WASH.

Atomic King no. 2 mine - andersonite.

CHESS RIDGE - carnotite.

CHINLE WASH - pyrope.

COLORADO RIVER - chromite, gold in placers.

San Juan River Junction to Lees Ferry - placer gold.

COMB RIDGE (near) - pyrope in volcanic vents.

COTTONWOOD CANYON DISTRICT.


DRY VALLEY - carnotite.

EAST CANYON - carnotite, tyuyamunite.

ELK RIDGE - andersonite, bieberite, chalcanthite, chalcocite, donkeyite, tyuyamunite, uranothallite.

Avalanche no. 13 (Ransome) mine - coffinite, erythrite, uraninite.

Coral claim - bayleyite, carnotite, swartzite.

Horseshoe no. 1 mine - coffinite, uraninite.

King Edward mine - chalcopyrite, coffinite, erythrite, ilsemannite, pyrite, siderite, uraninite.

King James - Virgene mine - ilsemannite, tennantite, uraninite, zippeite.

Notch nos. 1 and 4 mines - cuprosklodowskite, ilsemannite, jarosite, marcasite, meta-autunite, uraninite.

Notch nos. 5 and 6 mines - chalcopyrite, corvusite, galena, malachite, metzeunerite, schroeckingerite, volbrothite.

Oakie mine - azurite, chalcopyrite, coffinite, malachite, uraninite.

Payday mine - bornite, chalcopyrite, galena, uraninite.

Sandy no. 2 mine uraninite.

Sandy no. 3 mine - allophane, alunite, chalcopyrite, metazeunerite, uraninite, uranophane.

Western Payday mine - coffinite, uraninite.

Woodenshoe no. 3 mine - azurite, malachite, uraninite.

GOLDEN QUEEN MINE - gold.

GYPSUM CREEK - anhydrite, gypsum.

INDIAN CREEK - carnotite.

JULIA CLAIMS - boltwoodite.

LA SAL MOUNTAINS - amethyst, azurite, bornite, carnotite, chalocite, chrysocolla, covellite, limonite, malachite, manganite, molybdenite, torbernite.

Middle Mountain, Brumley Ridge - aegirite, apatite, augite, magnetite, noselite, orthoclase, sodalite, sphene.

Point Lookout Placer - gold.

LA SAL QUADRANGLE.

Angle mine - carnotite, roscoelite, tyuyamunite.

Black Hat mine - coffinite, corvusite, melanovanadate, montroseite, pitchblende, pyrite, roscoelite.

Brushy Basin no. 1 mine - carnotite, tyuyamunite.

Brushy Basin no. 3 mine - carnotite, schroeckingerite, tyuyamunite.

Confusion mine - carnotite, roscoelite, tyuyamunite.

Elray mine - carnotite, tyuyamunite.

Evening Star mine - carnotite, corvusite, hewettite, simplotite, tyuyamunite.
Minerals and Mineral Localities of Utah, Kenneth C. Bullock

Firefly-Pigmy mine - carnotite, clausenthalite, coffinite, corvusite, galena, montroseite, pyrite, roscelite, tennantite, tyuyamunite, uraninite.

Grey Dawn mine - (see PARADOX VALLEY DISTRICT).

Hesperus mine - carnotite, corvusite, roscelite, schroekingerite, tyuyamunite.

Jackpot mine - azurite, carnotite, malachite, tyuyamunite.

Little Dawn mine - carnotite, metatyuyamunite, roscelite.

Little Peter mine - carnotite, corvusite, montroseite, pascoite, roscelite, tyuyamunite.

Lucky no. 1 mine - carnotite, roscelite, tyuyamunite.

Marjorie Ann mine - carnotite, roscelite, tyuyamunite.

Maud mine - carnotite, roscelite, tyuyamunite.

Morning Star mine - carnotite, roscelite, tyuyamunite.

New Yellow Spot mine - carnotite, roscelite, tyuyamunite.

Sumner mine - carnotite, metatyuyamunite, roscelite.

Too High mine - carnotite, metatyuyamunite, roscelite.

Uranium Girl mine - carnotite, roscelite, tyuyamunite.

Valley View mine - carnotite, corvusite, metatyuyamunite, montroseite, roscelite.

Vanadium Queen mine - (See PARADOX VALLEY DISTRICT).

Vista Grande mine - carnotite, roscelite, tyuyamunite.

Wedge mine - carnotite, metatyuyamunite, roscelite.

Yellow Bird mine - carnotite, corvusite, montroseite, pitchblende, roscelite, tyuyamunite.

Yip Yip mine - carnotite, roscelite, tyuyamunite.

LISBON VALLEY - tyuyamunite.

Climax nos. 1-2 claims - azurite, carnotite, cuprite, malachite.

Lisbon Coppermine - azurite, cuprite, malachite.

MOAB VALLEY - anhydrite, carnallite, gypsum, halite, polyhalite, sylvite.

MONTEZUMA CANYON - carnotite.

Bradford no. 5 mine - carnotite.

Cottonwood mine - carnotite.

Dixie no. 1 mine - carnotite, roscelite.

Last Chance no. 1 mine - carnotite.

Lucky Boy mine - carnotite, roscelite.

Rim Rock mine - carnotite.

Rock mine - carnotite, roscelite.

Slum mine - carnotite.

Strawberry mine - carnotite, roscelite.

Titus no. 3 mine - carnotite.

Verdure mine - carnotite, roscelite.

West Cliff House no. 8 mine - carnotite, pascoite, roscelite.

MONTICELLO (BLUE MOUNTAIN) DISTRICT (Abajo Mountains) - anhydrite, carnotite, gypsum.

Alma mine - pyrite.

Blue Bird, Danish Girl, Gold Queen mines - chalcopyrite, galena, gold, pyrite, sphalerite.

Brushy Basin, Spring Creek - metarossite.

Copper Queen mine - azurite, bornite, chalcocite, chalcopyrite, chrysocolla, covellite, malachite, pyrite.

Dream mine - chalcopyrite, galena, gold, limonite, pyrite, sphalerite.

Duckett mine - calcite, gold, limonite, pyrite.

Harts Draw, Lakes claim, Robertson Pasture, Shay Mountain, Shay Road, Sunshine mining claim properties - metatyuyamunite.

Log Cabin claim - gold.

Tuffy Copper mine - azurite, chalcocite, malachite, pyrolusite.

MONUMENT VALLEY (MONUMENTAL DISTRICT) (Monument Valley).

Holiday Mesa - uraninite.

Mitten no. 1 mine - corvusite, navajoite, tyuyamunite, uraninite.

Oljeta mine - autunite, azurite, malachite, tyuyamunite, uraninite, uranophane.

Skyline mine - autunite, azurite, malachite, metatorbernite, torbernite, tyuyamunite, uraninite, uranophane.

Whirlwind mine - azurite, chalcocite, calciovolborthite, malachite, tyuyamunite, uranophane.

MONUMENTAL DISTRICT (See MONUMENT VALLEY DISTRICT).

MORRISON FORMATION - volkonskoite.

MOSES ROCK - chlorite, corundum, grossularite garnet, kornerupine, pyrope garnet, rutile, spinel in dike rock.

MULE EAR - pyrope in alluvium.

NAVAJO RESERVATION - carnotite, pyrope.

PARADOX BASIN - anhydrite, gypsum.

PARADOX VALLEY DISTRICT (Paradox Valley) - carnallite, kieserite, sylvite.

Grey Dawn mine - azurite, beta-uranophane, betauranott, carnotite, chalcocite, chalcopyrite, coffinite, corvusite, covellite, eucairite, galena, gummite, hewet-
tite, malachite, melanovanadate, metaheuwettite, metatorbernite, metatyuyamunite, montroseite, novacekite, phosphuranylite, pitchblende, pyrite, roscoelite, sale­eite, sphalerite, torbernite, uraninite, uranophane, uranospathite.

Vanadium Queen mine - carnotite, coffinite, corvsute, heuwettite, melanovanadate, montroseite, nolanite, paramontroseite, pitchblende, pyrite, roscoelite, selenium, simpultite, tuyumunite, uraninite.

PETE NO. 6 CLAIM - boltwoodite.

PINTADO CANYON - pintadoite.

RED CANYON DISTRICT (Red Canyon) carnotite, chalcocite, covellite, malachite.

Frey no. 4 mine - becquerelite, cuprosklodowskite, johannite, jordisite, islemannite, schoepite, uraninite.

Jerry group - boltwoodite.

Markey no. 3 mine - alunite, chalcanthite, chalcopyrite, metatorbernite, metazuenerite, pyrite, torbernite, uraninite.

Posey mine - becquerelite, brochanite, cuprosklodowskite, johannite, phosphuranylite, pitchblende, schoepite, uraninite, uranophane, uranopilite, zippeite.

SAN JUAN RIVER - anhydrite, chalcopyrite, copper, gold, gypsum, malachite.

Montezuma Canyon west to Colorado River - placer gold.

SPANISH VALLEY ANTICLINE - carnotite.

WHITE CANYON DISTRICT (White Canyon).

Bell mine - azurite, malachite, uranophane.

Blue Lizard mine - bornite, chalcopyrite, covellite, pyrite, uraninite.

Four Aces mine - azurite, carnotite, malachite.

Fry no. 4 mine - azurite, chalcanthite, chalcopyrite, jarosite, malachite, pickeringite, pyrite, uraninite.

Gonaway-North Point claims - phosphuranylite.

Happy Jack mine - allophane, antlerite, azurite, barite, becquerelite, bieberite, bornite, boltwoodite, brochantite, carnotite, chalcanthite, chaledony, chalcopyrite, chalcopyrite, covellite, erythrite, galena, gersdorffite, goethite, greenochite, gypsum, hematite, hydromica, islemannite, jarosite, johannite, magnetite, malachite, marcasite, metatorbernite, metazuenerite, microcline, phosphuranylite, pitchblende, psilomelane, pyrite, quartz, sabugalite, schoepite, sepiolite, siderotil, smithite, sphalerite, sulfur, torbernite, tourmaline, uraninite, uranopilite, uranophane, zippeite.

Hideout mine (Deer Flats) - azurite, bayleyite, becquerelite, bornite, brochantite, carnotite, chalcocite, chalcopyrite, covellite, johannite, malachite, phosphuranylite, pitchblende, schoepite, schroeckingerite, torbernite, uraninite, uranophane, uranopilite.

Jomac mine - azurite, chalcanthite, chalcocite, chalcopyrite, coconinoite, hematite, jarosite, malachite, metazeunerite, pyrite.

Notch mine - uraninite.

Posey mine - antlerite, azurite, becquerelite, brochantite, chalcocite, cuprosklodowskite, malachite, meta-autunite, metatorbernite, phosphuranylite.

White Canyon no. 1 mine - bornite, carnotite, chalcopyrite, copper, covellite, marcasite, metatorbernite, pyrite, uraninite, uranophane, vogtlite.

White Fawn, Yellow Circle claims - carnotite.

W.N. mine (Deer Flats) - alunite, boothite, bornite, chalcanthite, chalcocite, chalcopyrite, covellite, metatorbernite, metazeunerite, pyrite, torbernite, uraninite, zippeite.

SANPETE COUNTY

DRY CANYON (N. of) - galena, marcasite, pyrite, sphalerite, strontianite.

EPHRAIM (near) - limonite pseudomorphs after pyrite.

FAIRVIEW (near) - beidellite.

GUNNISON (S.E.) - anhydrite, gypsum, halite.

MANTI (near) - epsomite.

MAYFIELD (S.W.) - anhydrite, gypsum.

MT. PLEASANT (8 mi. N.W.) - jasper, pyrolusite.

R.A.J. PROSPECT - autunite, torbernite.

TWELVE MILE CANYON - anhydrite, gypsum, halite.

SEVIER COUNTY

AURORA - bentonite, fuller's earth.

FISH LAKE - opal.

GLENWOOD (N.E.) - anhydrite, chaledony geodes, gypsum, halite, selenite.

HENRY DISTRICT (Antelope Range).

Georgia, Jumbo, Yellow Hornet properties - pyrolusite.
Iron Peaks property - hematite, limonite, magnetite, pyrolusite, thorium mineralization.

Krotke Iron (Iron Cap) mine - hematite, limonite, pyrolusite, thorium mineralization.

LaVeta Prospect - fluorite, meta-autunite, metatorbernite, rauvite, tyuyamunite.

Noonday claims - pyrolusite.

Iron Cap mine - hematite, limonite, pyrolusite, thorium mineralization.

LaVeta Prospect - fluorite, meta-autunite, metatorbernite, rauvite, tyuyamunite.

Noonday claims - pyrolusite.

Trinity prospect (Monzonite Hill) - apatite, albite, antigorite, andradite, calcite, chalcanthite, chalcopyrite, chaledony, diopside, epidote, grossularite, gypsum, galena, hematite, ilelite, kaolinite, microcline, muscovite, montmorillonite, magnetite, orthoclase, phlogopite, pyrolusite, penninite, prochlorite, quartz, rutile, serpentine, scapolite, specularite, tremolite, wollastonite.

MONROE CANYON - brockite, jarosite, monazite, thorite in vein.

PINE CANYON (S. of Koosharem) - corundum, variety sapphire, hercynite.

REDMOND - bentonite, halite.

ROCK CANDY MOUNTAIN - alunite, ilelite, jarosite, limonite, montmorillonite, pyrite, selenite.

SALINA CREEK DISTRICT (Salina Creek) - Ball mine - azurite, chalcocite, chalcopyrite, galena, malachite, sphalerite.

Lead Hill mine - azurite, celestite, cerussite, chalcocite, galena, malachite, pyrite, sphalerite.

SEVIER CANYON - azurite, copalite, malachite.

SEVIER PLATEAU - Black Beauty claims (Forshea Mountain) - pyrolusite, wad.

SIGURD - anhydrite, gypsum, halite, selenite.

SUMMIT COUNTY - psilomelane, pyrolusite.

BONANZA FLAT - grossularite.

COALVILLE (near) - manganite, psilomelane, pyrolusite, sulfur.

FRANSON CANYON - phosphorite.

MARBLE (SILVER CREEK) DISTRICT - galena, pyrite.
Wabash property - chalcopyrite, gypsum, pyrite.

SILVER CREEK DISTRICT (See MARBLE DISTRICT)

UINTA DISTRICT (See PARK CITY DISTRICT).

TOOELE COUNTY

AMATRICE HILL - chalcedony, crandallite, jasper, millisite, variscite, wardite.

BINGHAM (WEST MOUNTAIN) DISTRICT (Oquirrh Mountains). (See also under Salt Lake County).
* Carr Fork mine* - bornite, chalcopryrite, galena, garnet, hematite, magnetite, molybdenite, pyrite, pyrhotite, sphalerite.
* May Flower mine* - boulangerite, galena, pyrite, sphalerite.

BLACK CROOK DISTRICT (See ERICKSON DISTRICT).

BLUE BELL DISTRICT (Sheeprock Mountains).
* Benyon Canyon mine* - galena, pyrite, quartz, sphalerite.
* Black Hawk mine* - cerussite, galena, silver.
* Bogan mine* - bismuthinite, galena, hematite, limonite, pyrolusite.
* Hidden Splendor mine* - galena.
* Little Valley mine* - pyrite.
* Morgan mine* - barite, cerussite, galena, pyrite, pyrolusite.
* The Iron mine* - halloysite, hematite, jasper, limonite.

BOULTER DISTRICT (See NORTH TINTIC DISTRICT).

CALEDONIA DISTRICT (See NORTH TINTIC DISTRICT).

CAMP FLOYD DISTRICT (See MERCUR DISTRICT).

CEDAR MOUNTAINS - calcite (onyx marble).

CLIFTON DISTRICT (See GOLD HILL DISTRICT).

COLUMBIA DISTRICT (N.E. Sheeprock Mountains).
* Benmore, Sharp mines* - cerussite, fluorite, galena, limonite, pyrite, pyrolusite, quartz, sphalerite, silver, wad.
* Iron Hope prospect* - quartz, specularite.
* Iron King mine* - specular hematite.
* Sultana mine* - galena, gold, limonite, pyrite, quartz, silver.

DEEP CREEK MOUNTAINS - agate, andalusite, cerusite, chaledony, galena.
* Bonanza mine* - arsenopyrite, scorodite.
* Complex prospect* - azurite, malachite, scheelite.
* Congar Hill mine* - cinnabar, metacinnabar, pyrite, sphalerite, stibiconite, senarmontite, valentinite, stibnite.
* Cyclone and Leap Year mine* - aikenite, arsenopyrite, galena, chalcopyrite, chalcantite, sphalerite.
* Devils Pit, Oro del Rey, and Eagles Nest mines* - azurite, chalcocite, chalcopyrite, galena, gold, specularite, sphalerite, malacite, plumbojarosite.
* Dewey mine* - azurite, jarosite, malachite, pyrolusite, tetrahedrite.
* Fortuna prospect* - conichalcite, malachite, pyrolusite.
* Iron Blossom prospect* - hematite, limonite.
* Laura prospect* - azurite, chalcopyrite, malachite.
* Midas mine* - arsenopyrite, chalcopyrite, galena, pyrite, pyrite, spadaite, vesuvianite.
* Midland mine* - arsenopyrite, galena, gold, jarosite, plumbojarosite.
* Monoco mine* - azurite, chalcopyrite, chrysocolla, galena, malachite, plumbojarosite.
* North Pass mines* - galena, jarosite, malachite, siderite, tetrahedrite.
* Overland and Gold Star prospects* - azurite, galena, malachite, sphalerite.
* Probert mine* - barite, cinnabar, conichalcite, malachite, scheelite, stibnite.
* Prosperity prospect* - azurite, malachite, tenorite.
* Silver Queen prospect* - azurite, galena, jarosite, malachite, pyrite.
* Willow Springs prospects* - galena, tetrahedrite.

DEEP CREEK VALLEY - natron.

DUGWAY DISTRICT (Dugway Range) agate, amethyst, apatite, beryl, bixbyte, chaledony, garnet, rosasite, topaz.
* Belcher claim* - azurite, chrysocolla, malachite, melaconite, tenorite.
* Bertha claim* - cerussite, chalcantite, chalcocite, chalcopyrite, chlorite, covellite, galena, gypsum, hematite, hydromica, hemimorphite, limonite, pyrite, smithsonite, sphalerite, tennantite, tetrahedrite.
* Black Dragon claim* - chrysocolla, cuprite, hematite, limonite, malachite.
* Black Maria claim* - azurite, chrysocolla, fluorite, malachite.
* Boston claim* - cerussite, siderite, wulfenite.
* Bryan claim* - anglesite, calcite, cerussite, chlorite, chrysocolla, fluorite, galena, hematite, hemimorphite,
hydrozincite, limonite, smithsonite, sphalerite.  

**Buckhorn mine** - barite, cerargyrite, cerussite, copper, cuprite, fluorite, galena, magnetite, prosophite, silver, sphalerite, sulfnite.  

**Bullion Canyon** (head) - aragonite, barite, galena, hemimorphite, pyrite, siderite, wulfenite.  

**Confidence property** - azurite, barite, calcite, cerussite, chrysocolla, fluorite, hematite, jarosite, limonite, malachite.  

**Eureka claim** - fluorite.  

**Four Metals mines** - barite, cerargyrite, cerussite, chalcanthite, chlorite, copper, cuprite, fluorite, galena, gold, gypsum, hematite, hydrozincite, jarosite, limonite, pyrite, silver, smithsonite, sphalerite, wulfenite.  

**Francis property** - barite, cerussite, galena, smithsonite, sphalerite.  

**Golconda property** - fluorite.  

**Great Eastern, Nautilus, Pride of the West claims** - barite, covellite, fluorite, siderite.  

**Juno claim** - barite, smithsonite.  

**Kelly's Hole** - azurite, barite, calcite, cerussite, chalcanthite, chlorite, copper, cuprite, fluorite, galena, gold, gypsum, hematite, jarosite, limonite, malachite, melaconite, pyrite, spahalerite, tenorite.  

**Lauris claim** - barite, cerussite, fluorite, galena, hematite, limonite.  

**Metal States (Cannon) mine** - azurite, chalcanthite, chrysocolla, fluorite, pyrite, tenorite.  

**Morrell shaft** - hydrozincite.  

**New Park claim** - chalcopyrite.  

**Rainbow claim** - fluorite.  

**Rattler property** - fluorite, quartz.  

**Raymond-Bald Eagle property** - azurite, cerussite, galena, hematite, hemimorphite, limonite, malachite, smithsonite.  

**Surplus Claim** - chalcopyrite, gypsum, melaconite, pyrite, tenorite.  

**Yellow Jacket property** - cerussite, limonite.  

**DUTCH MOUNTAIN** - augite, azurite, cerussite, fluorite, galena, malachite.  

**EAST ERICKSON DISTRICT** (S. W. Sheerock Mountains).  

**Copper Jack mine** - chalcopyrite, chrysocolla, fluorite, limonite, malachite, pyrolusite, pyrite, turquoise.  

**Dutch Peak** (**Park-Utah** mine) - galena, pyrite.  

**Ekker Canyon prospect** - biotite, quartz, wolframite.  

**Flying Dutchman mine** - chalcopyrite, fluorite, pyrite, uraninite.  

**Green's Ridge** - chlorite, limonite, magnetite, pyrite, scheelite.  

**Hard-to-beat-canyon** - beryl, chalcopyrite, fluorite, pyrite, topaz, samarskite, uraninite.  

**Indianapolis mine** - galena, gold, pyrite, quartz, sphalerite, specularite.  

**Jessel Bezzel mine** - azurite, chrysocolla, malachite, turquoise.  

**Sheeprock Canyon** - beryl, chalcopyrite, fluorite, pyrite, scheelite, samarskite, uraninite.  

**Silver King mine** - biotite, chalcopyrite, fluorite, pyrite, pyrolusite, quartz, samarskite, specularite, uraninite.  

**Silver Shield** (**Flying Dutchman** mine) - chalcopyrite, chrysocolla, fluorite, limonite, malachite, pyrite, pyrolusite, turquoise.  

**South Pine Canyon** - biotite, huebnerite, magnetite, monazite.  

**Tintic-Delaware** (**Free Coinage** mine) - galena, hematite, pyrite, specularite, sphalerite.  

**ERICKSON (BLACK CROOK) DISTRICT** (Simpson Mountains).  

**Black Jack, Black Rock, Blain, Deer Trail** (**Black Cap**), **Indian Boy, May Farmer mines** - cerussite, fluorite, galena, pyrite, pyrolusite, spahalerite.  

**Good Hope mine** - cerussite, fluorite, galena.  

**Happy Jack mine** - cerussite.  

**Highland Lassie no. 1 mine** - chalcopyrite, chrysocolla, limonite, malachite.  

**Huber-Rydalch mine** - manganese, pyrolusite, psilomelane, wad.  

**Indian Chief mine** - cerussite, galena.  

**Last Hope no. 3 mine** - chalcopyrite, galena.  

**OK mine** - cerargyrite, tetrahedrite.  

**Queen Mary claims** - pyrolusite, wad.  

**Silver Reef mine** - cerargyrite, chalcopyrite, limonite, pyrite, tetrahedrite.  

**Utonia claim** - galena, pyrite, rhodonite, rhodochrosite, sphalerite.  

**FAIRFIELD QUADRANGLE** - tridymite in volcanic rocks.  

**FREE COINAGE DISTRICT** (Stansbury Mountains) - cerussite, galena, gold, pyrite.  

**GOLD HILL** (**CLIFTON** DISTRICT) (Deep Creek Mountains) - agate, allanite, axinite, dolomite, erubescite, enstatite, ferrimolybdite, indium mineralization, huebnerite, scandium mineralization, rutile.  

**Alvardo mine** - bornite, calcite, chalcanthite, chaldony, chalcocite, chalcopyrite, diopside, galena, garnet, gold, graphite, jarosite, limonite, magnetite, malachite, oligoclase, opal, pyrite, siderite, siderotil, spadaite, vesuvianite, wollastonite, zoisite.
B. Estell mine - scheelite.
Bonanza mine - arsenopyrite, cerussite, galena, scorodite, sphalerite.
Bonnemort claim - calcite, chalcocite, chalcopyrite, diopside, wollastonite, zoisite.
Boston mine - arsenopyrite, cerussite, limonite, plumbojarosite, scorodite.
Cane Springs mine - andalusite, bornite, chalcocite, chalcopyrite, covellite, diopside, garnet, molybdenite, pyrite, sepiolite, spadaite, vesuvianite, wollastonite, zoisite.
Calaveras mine - amphibole, azurite, chalcedony, chalcopyrite, chrysocolla, garnet, humite, malachite, pyrite, specularite, tourmaline.
Cash Boy mine - anglesite, arsenopyrite, cerussite, galena, pyrite, sphalerite, wulfenite.
Centennial and Enterprise mines - amphibole, apatite, chalcolite, chalcopyrite, diopside, jefferisite, magnetite, malachite, scheelite, tourmaline.
Christmas Mining Company mine - barite, galena, tetrahedrite.
Climax mine - arsenopyrite, galena, pyrite, sphalerite.
Copper Bloom mine - apatite, azurite, bismuth, bismuthinite, bismutite, beidellite, chalcedony, chalcocite, chalcopyrite, copper pitch, covellite, cuprotungstite, gold, jarosite, malachite, pyrite, scheelite, tetrahedrite, tourmaline.
Copper Hill mine - azurite, malachite.
Copperopolis mine - azurite, bornite, chalcocite, chalcopyrite, diopside, garnet, malachite, scheelite.
Copper Queen-Midland Mining Company mine - arsenopyrite, azurite, chalcopyrite, galena, parosite, malachite, plumbожarosite, pyrite, siderite, sphalerite.
Cyclone mine - aikinite, arsenopyrite, chalcanthite, chalcopyrite, galena, jarosite, plumbожarosite, pyrite, wulfenite.
Doctor mine - apatite, bismuth, bornite, chalcopyrite, epidote, garnet, magnetite, malachite, pyrite, scapolite, scheelite, tourmaline.
E.H.B. mine - scheelite.
Enterprise mine - scheelite.
Evans claim - tetrahedrite.
Fraction Lode mine - epidote, garnet, quartz, scheelite.
Frankie mine - bornite, chalcopyrite, chrysocolla, clinzoisite, conichalcite, copper pitch, diopside, epidote, garnet, humite, malachite, pyrite, scheelite, titanicite, tourmaline, wollastonite.
Garrison Monster mine - barite, calamine, cerussite, galena, malachite, plumbожarosite, smithsonite.
Gold Belt claim - galena.
Gold Bond mine - biotite, chrysocolla, copper pitch, danburite, diopside, epidote, fluorite, hematite, malachite, quartz, scapolite, specularite, sphalerite, tourmaline.
Gold Hill (U.S.) mine - adamite, aikinite, anglesite, arsenopyrite, aurinite, azurite, beudantite, carminite, cerussite, chalcocite, chalcopyrite, chenevixite, chlorite, chrysocolla, cinclase, conichalcite, cornwallite, cuproadamite, ferrisyplesite, galena, gysum, jamesonite, jarosite, malachite, mimetite, nontronite, olivenite, opal, pyrite, pyrrhotite, scorodite, siderite, sphalerite, stibnite, tennantite, tyrolite, wollastonite.
Gold Hill (Western Utah) mine - adamite, arsenosiderite, beudanite, conichalcite, natrojarosite, phaurosiderite.
Gold Hill Standard mine - anglesite, arsenopyrite, galena, plumbожarosite, scorodite, wulfenite.
Kena claim - cuprotungstite, wulfenite.
Lucy I. mine - bismuth, bismuthinite, bismutite, calaverite, chalcopyrite, copper pitch, epidote, garnet, gold, malachite, scheelite, tremolite.
Ida Lull mine - azurite, bornite, chalcopyrite, covellite, diopside, garnet, malachite, scheelite.
Mascot mine - arsenopyrite, cerussite, scheelite, scorodite.
Midas mine - bornite, gold, siderite, vesuvianite.
Midland prospect - siderite.
Minnehaha mine - arsenopyrite, azurite, chrysocolla, malachite.
Monaco mine - anglesite, azurite, cerussite, copper pitch, chrysocolla, galena, malachite, opal, plumbожarosite.
Monte Del Rey mine - arsenopyrite, cerussite, scorodite.
Napoleon mine - chrysocolla, malachite.
New Baltimore mine - anglesite, arsenopyrite, azurite, cerussite, desolizite, galena, malachite, mimetite, plumbожarosite, pyrite.
Ozark mine - arsenopyrite, azurite, malachite, scorodite.
Pole Star Copper Company mine - azurite, chalcedony, conichalcite, cuprite, cuprotungstite, ferberite, malachite, olivenite, pyrite, scheelite, tetrahedrite, tourmaline, wolframite.
Rea mine - azurite, calcite, malachite, tetrahedrite.
Reaper mine - actionolite, albite, amphibole, anatase, anorthoclase, barite, biotite, chalcopyrite, covellite, epidote, gold, galena, hematite, hornblendie, ilmenite, kaolinite, leucoxene, molybdenite, serpentine, tetrahedrite, tourmaline, zircon.
Red Jacket mine - anglesite, cerussite, galena, mimetite, plumbожarosite, pyrite, wulfenite.
Rodenhouse Wash - adularia, bertrandite, quartz.
Rube mine - anglesite, boulangerite, calcite, chalcopyrite, cerussite, chlorite, galena, gold, jarosite, molybdenite, plumbожarosite, pyromorphite, scheelite, scapolite, spadaite, talc, zoisite.
Minerals and Mineral Localities of Utah, Kenneth C. Bullock

Shay claim - plumbojarosite, wulfenite.  
Silver and Gold Mining Company mine - arsenopyrite, cerussite, galena, limonite, pyrite, scorodite, sphalerite.  
Silver King mine - anglesite, azurite, cerussite, chalocite, chrysocolla, malachite, plumbojarosite, wollastonite.  
Spotted Fawn mine - anglesite, cerussite, galena.  
Star Dust mine - quartz, scheelite.  
Success mine - arsenopyrite, galena, jarosite, plumbojarosite, pyrite, pyrite, quartz, sphalerite, tennantite.  
Unadine mine - arsenopyrite, azurite, chrysocolla, limonite, magnetite, malachite, nontronite, opal, scorodite, spinel, tetrahedrite.  
U. S. mine - arsenopyrite, aikinite, cerussite, chalcopyrite, cobaltite, jamesonite, malachite, pyrite, pyrrhotite, sphalerite, scorodite, stibnite.  
Victory no. 1 mine - apatite, azurite, chalcocite, chalcopyrite, chrysocolla, malachite, pyrite, quartz, tetrahedrite, tourmaline.  
Wilson Consolidated mine - bismuth, bismite, bismuthinite, bismutite, orthoclase, scheelite, stolzite.  
Yellow Hammer mine - actinolite, albite, apatite, azurite, chalcopyrite, copperpitch, gold, malachite, molybdenite, muscovite, orthoclase, powellite, scheelite, tourmaline.

GRANITE MOUNTAIN DISTRICT (Granite Mountain) - albite, apatite, beryl, garnet, kaolinite, microcline, muscovite, orthoclase, plagioclase, samarskite, tourmaline, zircon.  
Blue Bell mine - azurite, beryl, chalcopyrite, fluorite, galena, garnet, malchite, samarskite, tourmaline.  
Cannon Tank Canyon mine - azurite, chalcopyrite, fluorite, galena, malachite.  
Desert, El Dorado, Mountain Queen mines - azurite, chalcopyrite, fluorite, galena, gold, hematite, limonite, malachite, pyrite, quartz.

GRANTSVILLE (THIRD TERM) DISTRICT (Stansbury Mountains) - cerussite, chalcopyrite, galena, malachite, pyrite.  
Timpie Valley, Ruby Crystal mine - cinnabar, metacinnabar.

GREAT SALT LAKE (shores) - aragonite, bloedite, blauberite, gypsum, halite, mirabilite, thenardite.

GREAT SALT FLATS - halite, sylvite.

GREELEY DISTRICT (Topliff Hill) - cerussite, malachite, pyrite.

IBAPA IH MOUNTAINS - barite, beryl (aquamarine variety), cinnabar.

JOHNSON PASS - calcite (onyx), galena.

KNOLLS - gypsum.

LAKESIDE DISTRICT (Lakeside Mountains) - anglesite, cerargyrite, cerussite, galena.

MERCUR (CAMP FLOYD) DISTRICT (Oquirrh Mountains) - aragonite, barite, lorandite, pharmacosiderite, psilomelane, quartz, rutile, scorodite, suivanite, talc, tourmaline.  
Brickyard mine - melanterite, orpiment, realgar, sulfur.  
Consolidated Mercur, Daisy (Normal), La Cigale mines - gold, jasper.  
Geyser - Marion mine - arsenopyrite, calcite, cerargyrite, gold, jasper.  
Golden Gate mine - arsenopyrite, calcite, cinnabar, gold, orpiment, realgar, stibnite, tellurium mineralization variscite.  
Hillside mine - cinnabar, orpiment, sulfur.  
Mercur mine - calcite, cinnabar, orpiment, realgar, seleinite, variscite, zircon.  
Mineral Hill mine - azurite, cerussite, chalcopyrite, galena, limonite, malachite, pyrite.  
Sacramento mine - cinnabar, gold, jasper, orpiment, realgar, sulfur.  
Sparrowhawk mine - cinnabar, jarosite, stibnite, variscite.  
Sunshine mine - cinnabar, orpiment, sulfur.

NORTH TINTIC (BOULTER, CALEDONA, OASIS) DISTRICT (Boulter Mountains) (See also under Juab and Utah Counties).  
New Bullion mine - anglesite, cerussite, galena, hemimorphite, pyrite, smithsonite, sphalerite.  
Scranton mines - anglesite, aurichalcite, cerussite, galena, hemimorphite, hydrozincite, pyrite, pyromorphite, quartz, smithsonite, sphalerite.

OASIS DISTRICT (See NORTH TINTIC DISTRICT).

OPHIR DISTRICT (Oquirrh Mountains).  
DRY CANYON AREA - apatite, barite, brochantite, calcite, chalocotrichite, chrysocolla, gold, quartz.  
Brooklyn mine - azurite, cerussite, malachite, silver, smithsonite.  
Deseret mine - paligorskite.  
Kearsarge mine - aurichalcite, azurite, covellite, chalcopyrite, galena, hessite, jarosite, limonite, malachite, plumbojarosite, smithsonite.  
Mono mine - azurite, cerargyrite, cerussite, chalcopyrite, copper, galena, jarosite, limonite, malachite, pyrite, sil-
ver, sphalerite, stephanite.

Queen of the Hills mine - azurite, cerussite, galena, limonite, malachite, tetrahedrite.

Surprise mine - argentite, chalcopyrite, galena, gold.

FOOTHILL AREA

Lakes of Killarney mine - cerargyrite, jasper, malachite.

LION HILL AREA - pyrolusite, sercite, stibiconite, utahite.

Buffalo mine - argentojarosite, aurichalcite, barite, cerussite, cerargyrite, chalcopyrite, fluorite, galena, gold, jarosite, jasper, limonite, malachite, pyrite, plumbojarosite, wad.

Chloride Point - argentojarosite, aurichalcite, barite, cerussite, cerargyrite, jasper, jarosite, limonite, malachite, plumbojarosite, pyrite, smithsonite, stibiconite, stibnite.

Douglas, Lion, Zella mines - barite, calcite, cerussite, cerargyrite, jasper, jarosite, plumbojarosite.

East Side, Empire, Iron, Monarch, Northern Light, Woodruff mines - cerussite, cerargyrite, gold, jarosite, plumbojarosite, wad.

Three Metals mine - cerussite, cerargyrite.

OPHIR HILL AREA - barite, tetrahedrite.

Admiral Dewey prospect - cerussite, galena, gypsum, jarosite, limonite.

Chicago mine - azurite, cerussite, limonite, malachite.

Cliff mine - aurichalcite, azurite, andradite, cerussite, chalcopyrite, diopside, epidote, galena, garnet, jarosite, limonite, malachite, plumbojarosite, pyrite, pyroslusite, smithsonite, sphalerite, talc, tremolite.

Hidden Treasure mine - actinolite, andradite, apatite, aurichalcite, azurite, beaverite, calamine, cerargyrite, cerussite, cuprite, diopside, epidote, galena, hedenbergite, hydrozincite, limonite, malachite, plumbojarosite, pyrite, smithsonite, sphalerite, topaz, wad, wollastonite.

Jim Fisk mine - argentite, cerargyrite, cerussite, pyrargyrite, silver.

Ophir Hill Consolidated, Ophir Coalition (Montana) mines - andradite, albite, argentite, apatite, anhydrite, bismuth, calcite, calcanthite, chalcocite, chalcopyrite, chlorite, clinozoisite, dolomite, diopside, epidote, fluorite, galena, grossularite, melanterite, phlogopite, psilomelane, pyrite, pyrolusite, pyrrhotite, quartz, sanidine, scheelite, sercite, siderite, sphalerite, tennantite, titanite, tremolite, wad, wolframite, wurtzite, zircon.

Sacramento mine - argentite, aurichalcite, azurite, calamine, cerargyrite, cerussite, chalcopyrite, cuprite, galena, hydrozincite, limonite, malachite, plumbojarosite, pyrite, smithsonite, sphalerite, wad, wollastonite.

OQUIRRH MOUNTAINS

Manning Canyon Shale - chlorite, gibbsite, kaolinite, illite, pyrophyllite, rectorite.

Tickville Gulch - hypersthene.

S. part - olivine.

OSCEOLA DISTRICT (Thorpe Hills) - cerussite, galena, pyrite.

OVERLAND CANYON - bismuthinite.

PINE CANYON - vesuvianite.

RUSH VALLEY (STOCKTON) DISTRICT (Oquirrh Mountains) - iddingsite, natrolite, phillipsite.

Argent mine - cerussite, galena, jarosite, limonite, plumbojarosite, pyrite.

Ben Harrison mine - arsenopyrite, cerussite, chalcopyrite, galena, gypsum, jarosite, limonite, malachite, plumbojarosite, pyrite, sphalerite.

Calumet mine - cerussite, chalcopyrite, galena, jarosite, limonite, malachite, pyrite, sphalerite, sulfur, zoisite.

Galena King mine - cerussite, chalcopyrite, galena, jarosite, limonite, malachite, plumbojarosite, pyrite, sphalerite.

Homerine mine - anglesite, apophyllite, aragonite, arsenopyrite, aurichalcite, beudanite, cerussite, chalcopyrite, clinozoisite, diopside, epidote, fluorite, galena, gold, jarosite, limonite, malachite, mimetite, nontronite, plumbojarosite, pyrite, pyromorphite, sepiolite, serpentine, smithsonite, sphalerite, tetrahedrite, wad, wollastonite.

Mescatine mine - cerargyrite, cerussite, galena, jarosite, limonite, plumbojarosite, sphalerite, pyrite.

Muernbrook mine - anglesite, cerussite, chalcopyrite, galena, gypsum, jarosite, limonite, malachite, melanterite, plumbojarosite, pyrite, sphalerite.

Salvation-Hercules mine - cerargyrite, cerussite, chalcopyrite, galena, jarosite, limonite, malachite, plumbojarosite, pyrite.

Settlement Canyon - analcite, actinolite, grossularite, pyrophilite, thompsonite.

Soldier Creek - epidesmeme, grossularite, hematite, wollastonite.

Southport mine - cerussite, malachite.

Tip Top mine - chalcopyrite, galena, pyrite, sphalerite.

SALDURO - bischofite, carnallite, halite, kainite, kieserite, polyhalite, sylvite.

SHEEP RIDGE (east of) - nepheline in basalts and sills.
SILVER ISLAND (SILVER ISLET) DISTRICT (Silver Island Mountains).
Carrie Mack property - azurite, barite, hindheimite, cerussite, galena, jamesonite, malachite, pyrite.

SILVER ISLET DISTRICT (See SILVER ISLAND DISTRICT).

STANSBURY MOUNTAINS
Amatrice Hill - chalcedony, crandallite, jasper, millisite, variscite, wardite.
Grantsville (near) - calcite (onyx).
Mack Canyon - labradorite, olivine.
Manning Canyon Shale - chlorite, gibbsite, kaolinite, illite, pyrophyllite, rectorite.
Muskrat Canyon - labradorite, olivine.
North Willow Canyon - augite, biotite, labradorite.
Salt Mountain - labradorite, olivine.

STOCKTON DISTRICT (See RUSH VALLEY DISTRICT).

TOOELE DISTRICT (Oquirrh Mountains) - cerussite, galena, malachite, pyrite.

WENDOVER - bischofite, carnallite, halite, kainite, kieserite, polyhalite, sylvite.

WEST MOUNTAIN DISTRICT (See BINGHAM DISTRICT).

WILD CAT MOUNTAINS
Silver Queen (Wild Cat) mine - barite, chalcopyrite, fluorite, gold, pyrite, silver, prosopite.

WILLOW SPRINGS DISTRICT (Deep Creek Mountains) - azurite, cerussite, galena, chalcopyrite, malachite.

UINTAH COUNTY
ARGSYLE CREEK - argulite.
ASHLEY CREEK - carnotite.
Woodside Iron prospect - hematite.
ASPHALT RIDGE - asphalt.
ASPHALT WASH - gilsonite.
BASSETT MINE - galena.
BLACK DRAGON MINE - gilsonite.

BONANZA MINE - gilsonite, petroleum in gilsonite vein.
BROWNS PARK AREA - azurite, bornite, chalcocite, hematite, malachite, pyrite.
Red Creek - tyuyamunite.
BRUSH CREEK - collophane, carbonate apatite, fluorapatite, francolite, phosphorite, rare earths.
BRUSH CREEK DISTRICT (Uinta Mountains).
Little Alta mine - azurite, cerargyrite, malachite, smithsonite.

BULLIONVILLE - azurite, malachite.
CARBONATE DISTRICT (Uinta Mountains).
Dyer mine - azurite, bornite, chalcocite, hematite, malachite, pyrite.
Jessie Ewing mine, Red Creek, Willow Creek - azurite, malachite.
Pope Iron mine - hematite.

EVACUATION CREEK - asphalt.
FORT DUCHESNE - gilsonite.
FRANDSON CANYON - collophane, carbonate apatite, fluorapatite, francolite, phosphorite, rare earths.

GREEN RIVER DISTRICT.
Cub Creek - placer chromite, gold.
Flaming Gorge Reservoir in Horseshoe Bend - placer gold.
GREEN RIVER FORMATION - abelsonite, analcite, ankerite, barytocalcite, burbankite, calcite, dawsonite, dolomite, elpidite, garrelsite, illite, leucosphenite, nahcolite, neighborhood, norstrandite, searlesite, shortite, smectite, pyrite, wurtzite.

HELLS HOLE CANYON - analcite, apophyllite.
JENSON - monazite in placer sands.
Bonnie Bell claims - autunite.

LITTLE BRUSH CREEK - collophane, carbonate apatite fluorapatite, francolite, phosphorite, rare earths.
LITTLE SPLIT MOUNTAIN - azurite, chalcocite, gold, malachite.

PR SPRINGS - asphalt.
RAINBOW MINE - gilsonite.

ROCK CREEK - collophane, carbonate apatite, fluoroapatite, francolite, phosphorite, rare earths.

SILVER KING MINE - cerussite.

SNOW CLAIMS - autunite, torbernite.

SPLIT MOUNTAIN - glauconite, in curtis Formation.

STEINAKER DRAW - gypsum.

UTELAND KNOLL DISTRICT (Ouray) - azurite, chalcocite, gypsum, halotrichite, ilsemannite, malachite, molybdenite, pyrite.

VERNAL (N.) - analcite in Chinle Formation; glauconite in Curtis Formation.

WHITE RIVER CANYON - analcite, apophyllite.

WHITEROCKS CANYON - asphalt, gypsum.

UTAH COUNTY

ALPINE (2 mi. W.) - jasper.

ALPINE DISTRICT (Wasatch Mountains) - orthoclase, quartz.

AMERICAN FORK DISTRICT (Wasatch Mountains) - molybdenite, monticellite, smithsonite, tetradymite.

APPEX STANDARD mine - anglesite, argentite, azurite, cerargyrite, cerussite, enargite. galena, gold, hessite, malachite, pyargyrite, pyrite, pyralspite, silver, sphalerite, tetrahedrite.

BEVERLY HILLS

BEVERLY HILLS

BLACK JACk (Winberg), White Cloud claims - pyrolusite.

BURGIN mine - anglesite, antlerite, argentite, argentojarosite, aurichalcite, barite, birmesite, brochantite, cerussite, chalcophanite, cryptomelane, dickite galena, goethite, gold, hetaerolite, hollandite, hydromica, jaipaite, jasper, jarosite, kaolinite, lanarkite, limonite, marasite, massicot, melanterite, mimetite, minium, nesbite, yankee mine - barite, chalcopyrite, gold, galena, jame sonite, pyrite, sphalerite, tetrahedrite.

CALEDONIA DISTRICT (See NORTH TINTIC DISTRICT)

CLAY CANYON (Oquirrh Mountains) - bedellite, crandallite, dehnrite, deltaite, dennisonite, davidsonite, englishite, gordonite, goyazite, kolbeckite, lehite, lewistonite, millisite, montgomeryite, overite, pseudowavellite, sterrettite, variscite, wardite.

COLTON

Higgins, James Peak (Brown Bear), Kyune Canyon, Midnight, Miller, Pleasant Valley, Thomas Ranch, Town mines - albrite, ingramite, nigrite, ozocerite.

EAST TINTIC DISTRICT (East Tintic Mountains) - altaite, albite,allophane, alumian, alunite, anatase, arsenopyrite, bayldonite, beaverite, beidellite, bivalent, bindheimite, bismuthinite, boehmite, bornite, calcite, celadonite, chalcantite, chenevixite, cimolite, claudetite, chalcocite, chinochlore, collophane, conichalcite, copiapite, copper, coquimbite, credernite, cuprite, cuprogoslarite, delesserite, diaspore, dolomite, endellite, epsomite, famantinite, faratshite, ferrogoslarite, freibergite, gold, goyazite, gunningite, halloysite, hydromica, heulandite, hisingerite, jamesonite, jenkinsite, kieserite, klaprothite, leucoxene, leucite, leucophanite, linearite, lindeite, martite, miargyrite, montmorillonite, mordenite, nontronite, okenite, olivenite, pargasite, penninite, pisinite, potash alum, rhomboclase, siparite, sylvanite, taprite, tobramite, tungstate, untaninite, vanadinite, volkite, xanthate, zoisite, zunicite.

Dutchman (Wild Dutchman) mine - barite, cerussite, chalcopyrite, galena, limonite, pyrite, sphalerite, tetrahedrite.

Dutchman property - argentite, cerussite, galena.

EAST TINTIC DISTRICT - altaite, albite, alunite, alunian, anatase, arsenopyrite, bayldonite, beaverite, beidellite, bivalite, bindheimite, bismuthinite, boehmite, bornite, calcite, celadonite, chalcantite, chenevixite, cimolite, claudetite, chalcocite, chinochlore, collophane, conichalcite, copiapite, copper, coquimbite, credernite, cuprite, cuprogoslarite, delesserite, diaspore, dolomite, endellite, epsomite, famantinite, faratshite, ferrogoslarite, freibergite, gold, goyazite, gunningite, halloysite, hydromica, heulandite, hisingerite, jamesonite, jenkinsite, kieserite, klaprothite, leucoxene, leucite, leucophanite, linearite, lindeite, martite, miargyrite, montmorillonite, mordenite, nontronite, okenite, olivenite, pargasite, penninite, pisinite, potash alum, rhomboclase, siparite, sylvanite, taprite, tobramite, tungstate, untaninite, vanadinite, volkite, xanthate, zoisite, zunicite.

EAST TINTIC DISTRICT (East Tintic Mountains) - altaite, albite, alunite, alunian, anatase, arsenopyrite, bayldonite, beaverite, beidellite, bivalite, bindheimite, bismuthinite, boehmite, bornite, calcite, celadonite, chalcantite, chenevixite, cimolite, claudetite, chalcocite, chinochlore, collophane, conichalcite, copiapite, copper, coquimbite, credernite, cuprite, cuprogoslarite, delesserite, diaspore, dolomite, endellite, epsomite, famantinite, faratshite, ferrogoslarite, freibergite, gold, goyazite, gunningite, halloysite, hydromica, heulandite, hisingerite, jamesonite, jenkinsite, kieserite, klaprothite, leucoxene, leucite, leucophanite, linearite, lindeite, martite, miargyrite, montmorillonite, mordenite, nontronite, okenite, olivenite, pargasite, penninite, pisinite, potash alum, rhomboclase, siparite, sylvanite, taprite, tobramite, tungstate, untaninite, vanadinite, volkite, xanthate, zoisite, zunicite.

Lake Solitude - spinel.

Mary Ellen, Live Yankees mines - chalcopyrite, galena, jamesonite, pyrite.

MILLER mine - argentite, azurite, cerussite, galena, limonite, malachite, plumbogossarosite, wad, wulfenite.

PACIFIC mine - barite, galena, pyrite, sphalerite, tetrahedrite.

Pittsburgh mine - cerussite, galena, limonite, plumbogossarosite, sericite.

Silver Dipper mine - galena, pyrite, sphalerite, tetrahedrite.

Water Fall vein - galena, pyrite, sphalerite, tetrahedrite.
polybasite, pyrite, pyrolusite, quartz, quenselite, rhodochrosite, siderite (manganoan), smithsonite, sphalerite, silver, szomolnokite, tetrahedrite.

**Eureka Bullion mine** - anglesite, azurite, cerussite, chalcopyrite, enargite, galena, gold, malachite, pyrite, sphalerite, tetrahedrite.

**Eureka Lily mine** - acanthite, anglesite, argentite, barite, bismuthinite, bornite, calaverite, cerargyrite, cerussite, chalcocite, chalcopyrite, enargite, galena, gold, hemimorphite, hessite, jamesonite, malachite, petzite, plumbojarosite, polybasite, proustite, pyrite, silver, smithsonite, sphalerite, tetrahedrite.

**Eureka Standard mine** - anglesite, argentite, azurite, barite, bornite, calavarite, cerussite, chalcocite, chalcopyrite, covellite, enargite, galena, gold, hessite, kaolinite, malachite, marcasite, petzite, proustite, pyrite, sphalerite, sylvanite (krennerite), tetrahedrite.

**Iron King mine** - argentite, barite, enargite, galena, gold, hematite, hessite, limonite, pyrite, pyrolusite, tetrahedrite.

**Larsen Clay pits** - allophane, alunite, endellite, gibbsite, halloysite, kaolinite, pyrite.

**North Lily mine** - anglesite, argentite, azurite, barite, bornite, calavarite, cerussite, chalcocite, chalcopyrite, covellite, enargite, galena, gold, hessite, kaolinite, malachite, marcasite, petzite, proustite, pyrite, sphalerite, sylvanite (krennerite), tetrahedrite.

**Tin tic Standard mine** - anglesite, argentite, azurite, barite, bornite, calavarite, cerussite, chalcocite, chalcopyrite, covellite, enargite, galena, gold, hessite, kaolinite, malachite, marcasite, petzite, proustite, pyrite, sphalerite, sylvanite (krennerite), tetrahedrite, wurtzite.

**Tintic Standard mine** - argentite, argentotojarosite, anglesite, azurite, barite, bismuthinite, cerargyrite, cerussite, chalcophanite, chalcopyrite, coronadite, enargite, galena, gold, halotrichite, hematite, hessite, jarosite, kornelite, krennerite, limonite, luzonite, montmorillonite, petzite, pseudomorphs after pyrite, pyrite, sphalerite, tennantite, tetrahedrite, wurtzite.

**Trixie mine** - anglesite, argentotojarosite, argentite, azurite, bornite, cerussite, chalcocite, chalcopyrite, covellite, enargite, galena, gold, hematite, hemimorphite, hydrophane, jarosite, malachite, plumbojarosite, polybasite, proustite, pyrite, scorodite, smithsonite, sphalerite, stromeyerite, tennantite, tetrahedrite, wurtzite.

**Zuma mine** - barite, enargite, galena, pyrite, sphalerite.

FOX HILLS (S. end Lake Mountain) - endellite, halloysite, kaolinite, montmorillonite, olivine in basalts.

GILLULY (8 mi. N. W.) - asphalt.

JORDAN NARROWS, OREM, SARATOGA, SOLDIERS PASS QUADRANGES - kaolinite, pyrophyllite in the Manning Canyon Shale.

LAKE BONNEVILLE SHORELINE - thinolite as a cement in gravels.

LAKE MOUNTAINS

*Manning Canyon Shale* - chlorite, gibbsite, kaolinite, illite, pyrophyllite, rectorite.

LEHI DISTRICT (Lake Mountain).

*Manning Canyon Shale* - chlorite, gibbsite, kaolinite, illite, pyrophyllite; rectorite.

PELICAN POINT AREA.

*Canyon, Foothill and Hilltop, Pelican and Utah Valley veins* - aragonite, calcite.

*Hutchings claim* - limonite pseudomorphs after pyrite.

*Philippine, Potter claims* - calcite, (onyx).

PFEIFFER CANYON AREA - calcite (onyx).

*Blue Rock claim* - pyrolusite.

WEST SLOPE AREA.

*Wildcat mine* - cryptomelane, wad.

LITTLE COTTONWOOD STOCK - apatite, allanite, biotite, hornblende, magnetite, microcline, plagioclase, quartz, sphele, zircon.

NORTH TINTIC (CALEDONIA, OASIS) DISTRICT (East Tintic Mountains) (See also under Juab and Tooele Counties).

*Blowhole Hill property* - cerussite, galena.

*Fields group (Fremont Canyon)* - jasper, pyrolusite.

*Lehi-Tintic, Tintic Empire, Tintic Paymaster mines* - anglesite, cerussite, galena, jasper, pyrite.

*North Tintic claims* - pyrolusite.

*Owen mine, Tip Top tunnel* - psilomelane, pyrolusite, wad.

*Selma mine* - anglesite, cerussite, limonite, hematite, pyrite.

OASIS DISTRICT (See NORTH TINTIC DISTRICT).

PAYSON DISTRICT (Wasatch Mountains).

*Nelson mine* - galena, gold, limonite, pyrite.

*Snydicate mine* - barite, cerussite, galena, limonite, smithsonite, sphalerite.

PROVO DISTRICT (Wasatch Mountains).

*Monarch (Buckley) mine* - argentite, calcite, cerussite,
dolomite, galena, hematite, limonite, pyrite.

SANTAQUIN DISTRICT (Wasatch Mountains).
Black Balsam vein - calcite, chalcopyrite, fluorite, malachite, pyrite.
Blue Eagle prospect - calcite, cerussite, vanadinite.
Copper Bullion prospect - chalcopyrite, malachite, specularite, pyrite.
Sally Ann prospect - chalcopyrite, cuprite, malachite.
Santaquin Central tunnel - chalcopyrite, pyrite, specularite.
Union Chief mine - barite, calcite, cerussite, serpentine, galena, hematite, limonite, sulfur.

SILVER LAKE DISTRICT (Wasatch Mountains).
Deer Creek - brucite, cordierite, garnet, gold, graphite, hematite, magnetite, molybdenite, olivine, prehnite, periclase, psilomelane, quartz, scheelite, siderite, sphene, wollastonite.
Mayday Extension claim - scheelite.
Milkmaid mine - actinolite, anglesite, andradite, argentite, barite, bornite, cerussite, chalcopyrite, epidote, galena, gold, grossularite, pyrite, scheelite, tetrahedrite, zircon.
Ontario mine - actinolite, anglesite, argentite, barite, cerussite, chalcopyrite, galena, gold, pyrite, sphalerite, tetrahedrite.
Silver Creek - andradite, brucite, cordierite, epidote, grossularite, graphite, hematite, magnetite, olivine, periclase, quartz, siderite, zircon.

SPANISH FORK CANYON.
Diamond Fork - sulfur.
Little Diamond Fork - phosphorite.

SPANISH FORK DISTRICT (Wasatch Mountains).
Dream (Relief) mine - no production of metals.

THISTLE JUNCTION - geodes containing asphalt.

THORPE HILLS - azurite, malachite, sulvanite, volbor-thite.
Manning Canyon Shale - chlorite, gibbsite, kaolinite, illite, pyrophyllite, rectorite.

UTAH DISTRICT (Long Ridge).
Alpha, Emerald, Lucky Boy, Queen of the West, Spalding, Trotter mines - gypsum, hematite, jasper, limonite, pyrolusite, psilomelane, wad.

WASATCH MOUNTAINS
Manning Canyon Shale - chlorite, gibbsite, kaolinite, illite, pyrophyllite, rectorite.

WELLS CANYON (S. Oquirrh Mountains) - calcite, eardleyite, quartz, smithsonite.

WASATCH COUNTY

BLUE LEDGE DISTRICT (Bald Mountain).
Glencoe, McHenry, Valeo mines - cerussite, galena, gold, pyromorphite, sphalerite.
Mayflower mine - bornite, chalcopyrite, galena, gold, pyrite, rhodochrosite, sphalerite, siderite, silver.
Ontario tunnel - magnesioferrite.

BONANZA FLAT - calcite, garnet, muscovite.

CLAYTON PEAK - chabazite, spinel, vesuvianite.

ELKHORN DISTRICT (Wasatch Mountains).
Crawford property - cerussite, galena, gold, tetrahedrite.
Nelson, Queen properties - cerussite, galena, gold, tetrahedrite.

HOWLAND DISTRICT (See SNAKE CREEK DISTRICT).

KEETLEY AREA - alunite, dickite, halloysite, kaolinite, montmorillonite.

MIDWAY (N.) - phosphorite.

RHODES PLATEAU (WOODLAND) DISTRICT (Uinta Mountains).
East Star no. 1, Gray Hawk properties - pyrolusite.
Ferry Iron deposit - hematite, magnetite, red ochre, specularite.

SNAKE CREEK (HOWLAND, WHITE PINE) DISTRICT (Wasatch Mountains)
grossularite, penninite, phlogopite, muscovite.
Revelator mine - cerussite, galena, pyromorphite, sphalerite.
West Quincy mine - cerussite, galena, gold, sphalerite.

SOLDIER SUMMIT.
Culmer Brothers, Soldier Summit, U. S. mines - albertite, ingramite, nigrite, ozocerite.

STRAWBERRY AREA - barite, along Charleston Thrust Fault.

UINTA MOUNTAINS (S. W. flank) - carbonate apatite, collophane, fluorapatite, francolite, phosphorite.

WHITE PINE DISTRICT (See SNAKE CREEK DISTRICT).
WOODLAND DISTRICT (See RHODES PLATEAU DISTRICT).

WASHINGTON COUNTY

BEAVER DAM MOUNTAINS - realgar, scheelite.

BEAVER DAM WASH - agate, silicified wood.

BULL VALLEY DISTRICT (Bull Valley) - calcite, gold.
Bucky claim - hematite.
Big Mountain claims - hematite, magnetite.
Cove Mountain - hematite.
Emma claims - hematite, magnetite.
Enterprise claims - hematite.
Iron Rod claims - hematite.
Pilot claims - hematite, magnetite, orpiment, realgar, stibnite.
Redtop claims - magnetite.
Soft Iron claims - hematite, red ocher.

CASTLE CLIFF (near) - agate, silicified wood.

CENTRAL (near) - chalcedony in basalt flows.

DRY CANYON - aurichalcite.

ENTERPRISE (near) - birnessite.

GUNLOCK (W.) - stibnite in silicified limestone.

HARRISBURG DISTRICT (See SILVER REEF DISTRICT).

HURRICANE CLIFFS - autunite.

MINERAL MOUNTAIN.
Beauty Knoll claims - alunite, halloysite, kaolinite.
Emma mine - antigorite, azurite, brucite, chloride, chrysocolla, forsterite, magnetite, malachite, magnetite, periclase, spinel.
Gregerson mine - brucite, chrysocolla, malachite, magnetite, serpentine.
Picadilly mine - limonite, magnetite, pyrite.

SANTA CLARA DISTRICT (Santa Clara) - autunite, carnottite, silicified wood.
Black Beauty no. 1 claim - celestite, gypsum, pyrolusite.

SILVER REEF (HARRISBURG) DISTRICT (Leeds) - aguilarite, bornite, calcite, chalcopyrite, cuprite, gypsum, jasper, kaolinite, montmorillonite, muscovite, pyrite, quartz, selenium mineralization, tenorite.
B. Reef mine - volborthite.
Barbee and Walker mine - chalcocite, silver.
Buckeye mine - autunite, carnottite, malachite.
Butte Reef mine - carnottite.
California mine - argentite, cerargyrite.
Cobb mine - chalcocite, embolite.
Doyle shaft - carnottite.
Duffin, Toquerville mines - autunite, chalcocite.
East Reef mine - autunite, carnottite, malachite.
Emily Jane mine - chalcocite, malachite.
Last Chance mine - chalcocite.
Leeds mine - argentite, azurite, cerargyrite.
Maud claim - malachite.
Newton mine - azurite.
Requa mine - argentite, azurite, cerargyrite, malachite.
Savage mine - argentite, cerargyrite.
Thompsons mine - chalcocite, silver.
Tecumseh Hill - cerargyrite, chalcocite, volborthite.
Wells pit - volborthite.

ST. GEORGE (S.) - gypsum.

TOQUERVILLE - gypsum.
Wallace claims - pyrolusite.

TUTSAGUBET DISTRICT (Beaver Dam Mountains).
Apex (Dixie) mine - adamite, aurichalcite, azurite, cerussite, copper, cuprite, hydrozincite, jarosite, limonite, malachite, plumbagorasite, rosasite, smithsonite.
Paymaster mine - cerussite, jarosite, malachite, plumbagorasite.

VIRGIN ANTICLINE (N. end) - autunite.

VIRGIN RIVER - gypsum, halite.

WAYNE COUNTY

CAINEVILLE.
Basal Entrada Formation - huge selenite crystals.
T. 27 S., R. 9 E. - anatase, monazite, staurolite, rutile, tourmaline, zircon in Ferron Sandstone.

CAPITOL REEF MONUMENT - carnottite, sideronatrite, torbernite.

CAPITOL WASH - azurite, asphalt, malachite, uranocher.

CAPITOL WASH TO SHEETS GULCH - azurite, malachite, metatorbernite.
CHIMNEY ROCK to TANTLUS FLAT - alunite, brochantite, chalcanthite, metatorbernite.

COLEMAN CANYON to OAK CREEK - carnotite, jarosite, metarossite, metatorbernite, schoeckingerite.

FREMONT RIVER.
South Wash - huge selenite crystals.

FRUITA (S.E. in Grand Wash). 
Oyler mine - alunite, becquerelite, carnitite, chalcanthite, chalcoprite, gypsum, johannite, lepidocrocite, metatorbernite, pitchblende, pyrite, schoepite, sklodowskite, torbernite, zippeite.

SPRING GULCH - pyrolusite.

FRUITA TO HANKSVILLE - agate, chert, silicified wood.

GRAND WASH TO CAPITOL WASH - alunite, asphalt, jarosite, malachite, metatorbernite, zippeite.

HANKSVILLE (N.) - carnitite.

HENRY MOUNTAINS.
Mt. Ellen (N. end) - carnitite.
Coaly basin (N. W. Flank Mt. Ellen) - jet.

LAST CHANCE GULCH - anhydrite, gypsum.

MINERS MOUNTAIN DISTRICT (Miners Mountain) - chalcoprite, galena, pyrite.
Old Faithful, Wonder Copper no. 1 mines - azurite, limonite, malachite.

MUDDY RIVER - anhydrite, carnitite, gypsum.

NOTOM BENCH - carnitite.

POISEN SPRINGS - carnitite.

RABBIT VALLEY.
Old Dixon prospect - carnitite, jarosite, limonite, silicified wood.

TORREY (near) - agate, jasper, metazeunerite, silicified bone and wood.
T. R. Lode no. 1 mine - azurite, limonite, malachite.

UPHEAVAL DOME - carnitite.

WATERPOCKET FOLD - carnitite.

WEBER COUNTY

COLD WATER CANYON - azurite, barite, fluorite, gold, malachite.

FREMONT ISLAND DISTRICT (Fremont Island) - chalcopyrite, galena, gold, pyrite, silver.

HUNTSVILLE (10 mi. E.) - pyrolusite.

JUNCTION DISTRICT (See WEBER DISTRICT).

OGDEN - fluorite, above “W” on mountain.

OGDEN CANYON - garnet, hornblende, limonite, phosphorite, uraninite.

SIERRA MADRE DISTRICT (Wasatch Mountains) - epidote, garnet, hematite, molybdenite, quartz. Eldorado property - anglesite, bornite, calcite, cerussite, fluorite, galena, malachite.
King Solomon vein - chalcoprite, gold, malachite, pyrite.
Napoleon-Maghera group - biotite, chalcoprite, hornblende, pyrite.

STRONGS CANYON - garnet.

WEBER (JUNCTION) DISTRICT (Wasatch Mountains) - hematite, magnetite.
New Azurite claim - azurite, galena, malachite.
Norman mine - fluorite.
Payday claims - psilomelane, pyrolusite.
Standard Mining Company mine - galena, malachite.

CHAPTER III

MINERALS OF UTAH

ABELSONITE
Nickel porphyrin, C\textsubscript{31}H\textsubscript{36}N\textsubscript{4}Ni. Triclinic. Aggregates of platy crystals, H. less than 3, G, 1.33-1.48. Semi-metallic to adamantine luster. Pink purple to dark reddish brown. Occurs in Mahogany zone of the Green River Formation.
Uintah County Green River Formation.

ABERNATHYITE
Hydrous potassium uranium arsenate, KUO\textsubscript{2}AsO\textsubscript{4}\textsuperscript{-} 3H\textsub{2}O. Tetragonal.

*Emery County* San Rafael district: Temple Mountain, Fuemrol no. 2 mine.

**ACANTHITE**

*Utah County* East Tintic district: Eureka Lily mine.

**ACMITE**

*Duchesne County* Carter Oil Company wells; Green River Formation; Sinclair Mortenson well.

**ACTINOLITE**
Calcium-magnesium-iron amphibole, Ca₂(Mg, Fe)₅Si₈O₂₂(OH)₂. Monoclinic. Crystals short or long bladed, columnar or fibrous, granular massive. H. 5-6. G. 3-3.2. Cleavage prismatic at angle of 56 degrees. Color bright green and grayish green. Commonly found in crystalline schists.

*Beaver County* Granite district: Bismuth mine; Star district: Moscow mine.

*Grand County* LaSal Mountains (North Mountain); Miners Basin district: Dewey, M.I.F. mines.


*Juab County* West Tintic district: Tintic Western mine.

*Salt Lake County* Big Cottonwood district; Bingham district; Little Cottonwood district: Alta mine.

*Tooele County* Gold Hill district: Reaper, Yellow Hammer mines; Ophir district: Ophir Hill area-Hidden Treasure mine; Rush Valley district: Settlement Canyon.

*Utah County* Silver Lake district: Milkmaid, Ontario mines.

**ADAMITE**

*Juab County* Tintic district: Iron Blossom mine.

*Tooele County* Gold Hill district: Gold Hill (Western Utah) mine.

*Washington County* Tutsagubet district: Apex (Dixie) mine.

**ADULARIA** (See ORTHOCLASE)

**AEGERITE** (See WURTZILITE)

**AEGRINE** (See AEGRITE)

**AEGIRINE**

*Grand County* La Sal Mountains: North Mountain.

*San Juan County* La Sal Mountains: Middle Mountain, Brumley Ridge.

**AEONITE** (See WURTZILITE)

**AGATE**
(See CRYPTOCRYSTALLINE QUARTZ)

**AGUILLARITE**

*Washington County* Silver Reef district.

**AIKINITE**

*Salt Lake County* Little Cottonwood district: South Hecla mine.

*Tooele County* Gold Hill district: Gold Hill (U.S.), U.S. mines. Deep Creek Mountains: Cyclone, Leap Year mines.
ALABASTER (See GYPSUM)

ALASKAITE


ALBERTITE


ALBITHE


ALISONITE (See GALENA)

ALLANITE

Complex silicate, (Ca,Fe)2R,Al,Fe3Si5O12(OH)2. R = rare earths. Monoclinic. Commonly massive and in imbedded grains. H. 5.5-6. G. 3.5-4.2. Luster submetallic to pitchy. Color brown to pitch-black. Often coated with yellow-brown alteration product. Salt Lake County Alta stock; Little Cottonwood district; Little Cottonwood stock. Tooele County Gold Hill district. Utah County Little Cottonwood stock.

ALLEVARDITE (See RECTORITE)

ALLOPHANE


ALMANDINE (See SPINEL)

ALMANDITE (See GARNET)

ALTAITE


ALUMIAN


ALUMINITE

ALUNITE


\textit{Beaver County} Indian Peak Range: Big Pinto Spring; Pine Grove district: Southern Wah Wah Mountains; Blawn Peak, NG Subareas A, B, C, and D deposits, SX deposit. Newton district: Sheep Rock mine; San Francisco district: Horn Silver mine; White Mountain.

\textit{Box Elder County} Lucin district: Copper Mountain, Tecoma Hill mines.

\textit{Iron County} Modena, 1 mile northwest; Needles Range: PV deposit; Southern Wah Wah Mountains: SX deposit.

\textit{Millard County} Church Hills: Stevens prospect.

\textit{Piute County} Deer Trail Mountain-Alunite Ridge; Gold Mountain district; Marysvale district: Al-Kee-Mee, Aluminum Bar, Aluminum Queen, Big Chief, Big Star, Close In, East Slope no. 2, J. and L. Alunite, Manning Creek, Mary’s Lamb, Marysvale Peak, North Star, Pittsburg, Potash Butte, Silica Hills, White Hills, White Horse, Yellow Jacket mines; Mount Baldy district: Aetna, Alunite Ridge, Bradburn, Christmas mines, Close In, Crystal, L. and N., Mineral Products, Sunshine mines; Sevier Canyon.

\textit{San Juan County} Red Canyon district: Markey no. 3 mine; White Canyon district: W. N. mine.

\textit{Sevier County} Rock Candy Mountain.

\textit{Utah County} East Tintic district, Larsen clay pits.

\textit{Wasatch County} Keetley area.

\textit{Washington County} Mineral Mountain: Beauty Knoll claims.

\textit{Wayne County} Chimney Rock to Tantlus Flat; Fruita: Oyler mine; Grand Wash to Capitol Wash.

ALUNOGEN

Hydrous aluminum sulfate, Al\(\text{\textsubscript{2}(SO\text{\textsubscript{4}})\text{\textsubscript{3}}\cdot16H\text{\textsubscript{2}}O. Triclinic. Usually in delicate fibrous masses, crusts, or in powder form. H. 1.5-2. G. 1.65-1.8. Cleavage perfect. Luster vitreous to silky. Colorless, white, yellowish, or reddish by impurities.

\textit{Emery County} San Rafael district: Dexter group.

\textit{Garfield County} Coyote Creek district: Hampton mine.

AMATRICE (See VARISCITE)

EMETHYST (See QUARTZ)

AMONIAALUM

Hydrous ammonium aluminum sulfate, (NH\textsubscript{4})Al(SO\textsubscript{4})\textsubscript{2}·12H\textsubscript{2}O. Isometric. Occurs as fibrous or columnar masses, or as efflorescences. H. 1.5. G. 1.6. Fracture conchoidal. Luster vitreous, fibrous masses silky. Colorless to white. Taste sweetish and astringent.

\textit{Kane County} Kaibab fault, west side.

AMMONIOJAROSITE

Basic sulfate of ammonium and ferric iron, (NH\textsubscript{4})\Fe\textsubscript{2}(SO\textsubscript{4})\textsubscript{3}·(OH)\textsubscript{6}. Hexagonal. Occurs as small lumps and irregular flattened nodules, composed of microscopic tabular grains. G. 3.1. Color light yellow. Luster dull, waxy to earthy.

\textit{Kane County} Kaibab fault, west side.

AMPHIBOLE (See also ACTINOLITE, HORNBLENDE, TREMOLITE)

Series of complex silicates of magnesium, iron, calcium, and aluminum or various combinations of these elements. Amphibole is a common rockforming mineral in both igneous and metamorphic rocks.

\textit{Tooele County} Gold Hill district: Calaveras, Centennial and Enterprise, Reaper mines.

ANALCIME (See ANALCITE)

ANALCITE

Hydrous sodium aluminum silicate, NaAlSi\textsubscript{2}O\textsubscript{6}·H\textsubscript{2}O. Isometric. Usually forms trapezohedrons, also massive granular, compact. H. 5-5.5. G. 2.2. Cleavage cubic. Fracture subconchoidal. Brittle. Luster vitreous. Colorless, white: occasionally gray, greenish, yellowish, or reddish. A zeolite.

\textit{Duchesne County} Carter Oil Company wells; Green River Formation; Sinclair Mortenson well.

\textit{Iron County} in andesite flows near Paragonah.

\textit{Tooele County} Rush Valley district: Settlement Canyon.

\textit{Uintah County} Chirle Formation near Vernal; Green River Formation south of Ouray. Hells Hole Canyon; White River Canyon.

ANATASE

Titanium dioxide, TiO\textsubscript{2}. Tetragonal. Commonly pyramidal crystals, also tabular. H. 5.5-6. G. 3.9. Cleavage perfect. Fracture subconchoidal. Brittle. Luster adamantine. Color various shades of brown, passing into indigo-blue and black; also greenish, blue-green, lilac, gray, and
rarely colorless. Streak colorless to pale yellow. Transparent.

**Piute County** Mount Baldy district: Deer Trail mine.  
**Tooele County** Gold Hill district: Reaper mine.  
**Utah County** East tintic district.  
**Wayne County** Caineville.

**ANDALUSITE**  

**Beaver County** Beaver Lake district.  
**Juab County** Trout Creek district: Bacon mine.  
**Tooele County** Deep Creek Mountains; Gold Hill district: Cane Springs mine.

**ANDESONITE**  
Hydrous carbonate of sodium, calcium, uranium, $\text{Na}_2\text{Ca(UO}_2\text{)}(\text{CO}_3)_3 \cdot 6\text{H}_2\text{O}$. Hexagonal. Occurs in clusters of minute pseudo-cubic crystals. G. 2.8. Color bright green. Fluoresces bright green. Soluble in water.  
**Grand County** Thompsons district: Parco no. 23, Skinny no. 1 mines.  
**Emery County** San Rafael district: Delta mine.  
**San Juan County** Cane Wash: Atomic King no. 2 mine; Elk Ridge.

**ANDESINE**  
**Iron County** Paragonah: Iron Peak.  
**Millard County** Twin Peaks.

**ANDRADITE** (See GARNET)

**ANGLESITE**  

**Beaver County** Bradshaw district: Cave mine; Pine Grove district; San Francisco district: Horn Silver mine; Lincoln district: Creole, Lincoln mines; Star district: Cedar-Talisman, Estelle, Gold Crown, Hoosier Boy, Harrington-Hickory, Hub, Moscow, Rebel, Red Warrior, White Rock, Wild Bill mines.  
**Box Elder County** Ashbrook district: Vipont mine; Lucin district: Copper Mountain, Tecoma Hill mines; Newfoundland district.  
**Cache County** Paradise district.  
**Davis County** Farmington district: Parrish Canyon.  
**Emery County** San Rafael district: Copper Globe mine.  
**Juab County** Fish Springs district: Carnation, Emma, Galena, Utah mines; Tintic district: Bullion Beck, Eagle, Blue Bell, Eureka Hill, Gemini, Godiva, Humbug, Sunbeam, Swansea mines; West Tintic district: 88, Scotia, War Eagle mines.  
**Millard County** Leamington district: Arbroath, Leamington Mining Company, Yellowstone mines.  
**Morgan County** Argenta district: Carbonate Hill, Carbonate Gem mines.  
**Piute County** Mount Baldy district: Deer Trail mine.  
**Salt Lake County** Big Cottonwood district, Eclipse mine, Bingham district: Galena, Old Jordan mines; Little Cottonwood district: Emma, Little Emma, Michigan-Utah mines.  
**Summit County** Park City district: Comstock, Daly, Little Bell, Nail Driver, Ontario, Scottish Chief, Silver King, Woodside mines.  
**Tooele County** Dugway district: Bryan claim; Gold hill district: Cash Boy, Gold Hill (U. S.), Gold Hill Standard, Monoco, New Baltimore, Red Jacket, Rube, Silver King, Spotted Fawn mines; North Tintic district: New Bullion, Sacramento mines; Rush Valley district: Honerine, Muerbrooke mines; Lakeside district.  
**Utah County** East Tintic district: Apex Standard, Burgin, Eureka Bullion, Eureka Lily, Eureka Standard, North Lily, Tintic Standard, Trixie mines; North Tintic district: Lehi Tintic, Tintic Empire, Tintic Paymaster, Selma mines; Silver Lake district: Milkmaid, Ontario mines.  
**Weber County** Sierra Madre district: Eldorado property.

**ANHYDRITE**  
Calcium sulfate, $\text{CaSO}_4$. Orthorhombic. Crystals not common, usually massive, granular. H. 3-3.5. G. 2.9. Cleavage good. Fracture uneven. Brittle. Luster vitreous to pearly. Color white, gray, bluish, reddish. Transparent to translucent. Occurs in association with gypsum. In southeastern Utah it is found in the Paradox Member of the Hermosa Formation; in east-central Utah it occurs in the Carmel and Summerville Formation; in
central Utah in the Arapien Shale; in southwestern Utah it occurs in the Kaibab, Moenkopi, Carmel, and Curtis Formations; in northeastern Utah it occurs in the Thaynes, Green River, and Carmel Formations.

**Beaver County** Prewitt district: Blackbird, Cactus mines.  
**Duchesne County** Green River Formation; Lake Fork.  
**Emery County** Cedar Mountains; Fullers Bottom; Horn Silver Gulch; San Rafael River.  
**Garfield County** Water Pocket Canyon.  
**Grand County** Cane Creek; Fisher Valley; Gypsum Hills; McCarthy well; Moab Valley; Onion Creek; Paradox basin; Salt Valley; Seven Mine Anticline; Texas Gulf Potash mine, Thompsons area.  
**Juab County** Cedar Canyon; Kanarraville.  
**Sanpete County** Gunnison; Mayfield; Twelve Mile Canyon.  
**Sevier County** Glenwood; Sigurd.  
**Tooele County** Ophir district: Ophir Hill area-Ophir Hill Consolidated, Ophir Coalition mines.  
**Wayne County** Last Chance Gulch; Muddy River.  

**ANKERITE**


**Emery County** San Rafael district: Temple Mountain.  
**Juab County** Tintic district: Victoria mine.  
**Salt Lake County** Little Cottonwood district: Clayton Peak stock contact zone.  
**Uintah County** Green River Formation.  

**ANNABERGITE**

A hydrated arsenate of cobalt, nickel, Ni$_2$(AsO$_4$)$_2$·8H$_2$O. Monoclinic. Crystals rare, prismatic to acicular and flattened. Usually occurs as fine crystalline coatings or earthy. H. 1.5-2.5. G. 3. Cleavage good. Flexible. Sceptile. Luster weakly adamantine, pearly; also dull, earthy. Color pink, rose, white, gray, apple green.  

**Iron County** Escalante district: Escalante mine.  

**ANORTHITE**


**Millard County** House Range: Notch Peak stock.  
**Salt Lake County** Big Cottonwood district: Confidence, Maxfield mines.  

**ANORTHOCLASSE**


**Tooele County** Gold Hill district: Reaper mine.  

**ANTHOPHYLLITE**


**Daggett County** Red Creek Complex.  

**ANTHRAXOLITE** (See GILSONITE)  

**ANTIGORITE**


**Sevier County** Henry district: Trinity prospect.  
**Washington County** Mineral Mountain: Emma mine.  

**ANTLERITE**


**Juab County** Deseret Mountain district.  
**San Juan County** White Canyon district: Happy Jack, Posey mines.  
**Utah County** East Tintic district: Burgin mine.
APATITE


Beaver County Granite district: Miller mine; Rocky district: Old Hickory mine; San Francisco district.
Iron County Iron Springs district: Granite Mountain, Iron Mountain, Three Peaks.
Millard County Twin Peaks.
Salt Lake County Little Cottonwood stock.
San Juan County La Sal Mountains: Middle Mountain, Brumley Ridge.
Sevier County Henry district: Trinity prospect.
Tooele County Dugway district; Gold Hill district: Centennial and Enterprise, Copper Bloom, Doctor, Victory no. 1, Yellow Hammer mines; Granite Mountain district; Ophir district: Dry Canyon area; Ophir Hill area - Hidden Treasure, Ophir Hill Consolidated, Ophir Coalition mines.
Utah County Little Cottonwood stock.

APJOHNNITE

A hydrated sulfate of aluminum and manganese, MnAl$_2$(SO$_4$)$_4$·22H$_2$O. Monoclinic. Occurs as masses and crusts, composed of fibrous or acicular crystals. H. 1.5. G. 1.8. Luster silky. Colorless to white, also tinted rose, pale green, yellow.

Salt Lake County Alum Point.

APPHYLLITE

Hydrous calcium potassium fluorosilicate, KCa$_4$Si$_8$O$_20$(F,OH)·8H$_2$O. Tetragonal. Usually occurs as crystals. H. 4.5 -5. G.2.4. Cleavage perfect. Luster pearly, vitreous. Colorless, white, gray, may be shades of green, yellow, rose. Transparent to translucent.

Salt Lake County Bingham district: Bingham Copper pit.
Tooele County Rush Valley district: Honerine mine.
Uintah County Hells Hole Canyon: White River Canyon.

AQUAMARINE (See BERYL)

ARAGONITE


Beaver County Bradshaw district.
Box Elder County Great Salt Lake.
Davis County Great Salt Lake.
Juab County Tintic district: Iron Blossom mine.
Millard County Leamington district: Yellowstone mine.
Salt Lake County Great Salt Lake.
Tooele County Great Salt Lake; Mercur district; Rush Valley district: Honerine mine.
Utah County Lehi district: Pelican Point area - Canyon, Foothill and Hilltop, Pelican and Utah Valley veins.

ARDUNITE


Juab County Tintic district.

ARGENTITE


Beaver County Bradshaw district: Cave, Hecla, Nip and Tuck mines; San Francisco district: Horn Silver mine; Granite district: Beaver View mine; Indian Peak district; Lincoln district: Lincoln mine; Newton district: Sheep Rock mine.

Box Elder County Ashbrook district: Vipont mine.
Juab County Mt. Nebo district: Big Nebo, Blackett tunnel, Eva, Freddie Lode mines; Tintic district: Mammoth mine.
Piute County Gold Mountain district: Annie Laurie, Sevier mines; Marysville district: Quicksilver mine; Mt. Baldy district: Pluto mine.
Salt Lake County Big Cottonwood district: Carbonate mine; Bingham district; Little Cottonwood district: Albion, Emma mines.
Summit County Park City district: Daly West mine.
Tooele County Ophir district: Dry Canyon area - Surprise mine; Ophir Hill area - Jim Fisk, Ophir Hill Consolidated, Ophir Coalition, Sacramento mines.
Utah County Alpine district: Alpine-Galena property; American Fork district: Miller mine; East Tintic district: Apex Standard, Burgin mine; Eureka Lily, Eureka Standard, Iron King, North Lily, Tintic Standard, Trixie mines; Provo district: Monarch mine; Silver Lake district: Milkmaid, Ontario mines.
Washington County Silver Reef district: California,
ARGENTOJAROSITE

Basic sulfate of silver and iron, AgFe$_3$-(SO$_4$)$_2$(OH)$_6$.

*Beaver County* Granite district: Big Pass group.
*Tooele County* Ophir district: Lion Hill area - Buffalo mine, Chloride Point.
*Utah County* East Tintic district: Burgin, Eureka Lily, Tintic Standard, Trixie mines.

ARGULITE

An asphalt. Occurs as an asphalt-saturated sandstone.
*Uintah County* Argyle Creek.

ARCYRODITE


*Box Elder County* Ashbrook district: Vipont mine.

ARSENIC


*Emery County* San Rafael district: Camp Bird No. 7, Fuemrol no. 2 mines.

ARSENIOSIDERITE


*Juab County* Tintic district.
*Tooele County* Gold Hill district: Gold Hill (Western Utah) mine.

ARSENOBISMITE


*Juab County* Tintic district: Mammoth mine.

ARSENOPYRITE


*Box Elder County* Ashbrook district: Vipont mine; Park Valley district: Century, Susannah mines.
*Garfield County* Circle Cliffs: Rocky Mountain mine.
*Juab County* Tintic district: Swansea mine; West Tintic district: Scotia mine.
*Salt Lake County* Bingham district: Eagle Bird lode, Tooele County Deep Creek Mountains, Bonanza, Cyclone, Leap Year, Midas, Midland, Monte del Rey mines.Gold Hill district: Bonanza, Boston, Cash Boy, Climax, Copper Queen-Midland Mining Company, Cyclone, Gold Hill (U. S.), Gold Hill Standard, Mascot, Minnehaha, Monte Del Rey, New Baltimore, Ozark, Silver and Gold Mining Company, Success, Unadine, and U. S. mines; Mercur district: Geyser-Marion, Golden State mines; Rush Valley district: Geyser-Marion, Golden State mines; Rush Valley district: Geyser-Marion, Golden State mines.

ASBESTOS (See SERPENTINE)

ASPHALT (See ASPHALTUM)

ASPHALTUM


*Box Elder County* north shore of Great Salt Lake; Rozel Point.
*Carbon County* Sunnyside.
*Uintah County* Asphalt Ridge; Evacuation Creek; PR Springs; Whiterocks Canyon.
*Utah County* Colton; Gilluly; Thistle Junction.
*Wasatch County* Soldier Summit.
*Wayne County* Capitol Wash; Grand Wash to Capitol Wash.

ATACAMITE

Basic chloride of copper, Cu$_2$(OH)$_3$Cl. Orthorhombic.

**Juab County** Tintic district.

**AUGITE**


**Beaver County** San Francisco district; Star district: Lady Bryan mine.

**Grand County** La Sal Mountains: North Mountain.

**Iron County** Paragonah; Iron Mountain.

**Millard County** Twin Peaks.

**San Juan County** La Sal Mountains district: Middle Mountain, Brumley Ridge.

**Tooele County** Dutch Mountain; Stansbury Mountains: North Willow Canyon.

**AURICHALCITE**


**Beaver County** Bradshaw district: Cave mine; Granite district: Big Pass group; Star district: Emerson mine.

**Juab County** Tintic district: Bullion Beck, Carissa Gemini, Iron Blossom, May Day, Uncle Sam, Yankee mines; West Tintic district: War Eagle claims.

**Salt Lake County** Big Cottonwood district: Carbonate mine.

**Tooele County** Ophir district: Dry Canyon area - Kearsarge mine; Lion Hill area - Buffalo mine, Chloride Point; Ophir Hill area - Cliff, Hidden Treasure, Sacramento mines; Rush Valley district: Honeine mine; North Tintic district: Scranton mine.

**Washington County** Dry Canyon; Tutsagubet district: Apex (Dixie) mine.

**AUSTINITE**


**Beaver County** Southern San Francisco Mountains:

White Mountain, one mile east. Pine Grove district: Daisy, Producer, Staats (Monarch) mines.

**Emery County** San Rafael district: Delta Mine, Wild Horse Canyon.

**Garfield County** Circle Cliffs: Acme, Black Widow, Blue Goose, Horse Head, Rocky Mountain, Steam Boat, Stud Horse mines.

**Grand County** Pack Creek; Seven Mile Canyon; Thompsons district: Thom claim, Parco no. 23 mine.

**Iron County** Kanarraville.

**Juab County** Honeycomb Hills; Indian Creek.

**Kane County** Bulloch claims; Paria, 9 miles south.

**Piute County** Marysville district: Buddy, Bullion Monarch, Copper Butte, East Slope no. 2, Freedom lease, Freedom nos. 1 and 2, Prospector nos. 1 and 3 mines.

**San Juan County** Monument Valley district: Ojleta, Skyline mines.

**Sanpete County** R.A.J. prospect.

**Uintah County** Jenson: Bonnie Bell claims; Snow claims.

**Washington County** Hurricane Cliffs; Santa Clara Silver Reef district: Buckeye, Duffin and Toquerville, East Reef mines; Virgin anticline.

**AXINITE**

Hydrous aluminum borosilicate with varying amounts of calcium, manganese, and ferrous iron, (Ca, Mn, Fe, Mg)-₃Al₂BSi₄O₁₅(OH). Triclinic. Frequently in crystals and crystalline aggregates; also massive, lamellar to granular. H. 6.5-7. G. 3.3. Luster vitreous. Color clove-brown, violet, gray, yellow, green. Transparent to translucent.

**Tooele County** Gold Hill district.
AZURITE


Beaver County Beaver Lake district: Copper Mountain, Beaver-Harrison, OK, Skylark mines; Lincoln district: Creole mine; Pross district: Blackbird, Cactus mines; Rocky district: Bawana, Copper Ranch mine; Maria mines; San Francisco district: Horn Silver mine; Star district: Cedar-Talisman, Hoosier Boy, Commonwealth, Kemple, Progressive, St. Mary's, Copper King, Dotson, Harrington-Hickory, Rebel, White Rock, Red Warrior, Wild Bill mines.

Box Elder County Ashbrook district: Vipont mine; Lucin district: Copper Mountain, Jeff-Doran mines; Newfoundland district: Copper Ridge; Willard district: Mormon Girl, Ogden Boilmakers, Overland claims.

Cache County Castle Dale; Castle Valley; San Rafael district: Delta mine, Dexter group, Copper Globe deposit.

Dagget County Red Creek: Yellow Canyon uranium deposit.

Davis County Antelope Island; Farmington district: Morning Star group, Parrish Canyon; Wandering Jew mine.

Emery County Castle Dale; Castle Valley; San Rafael district: Delta mine, Dexter group, Copper Globe deposit.


Grand County Hoosier mines; La Sal district: Bornite, McCoy mines; Miners Basin district: Moab no. 1, High Ore mines; Richardson district; Salt Valley.

Iron County Iron Springs district- Granite Mountain, Iron Mountain.

Juab County Deep Creek Mountains: Gold Bond, Johnson Canyon, Singleton Canyon, Water Canyon mines; Detroit district: Charm, Copperhead, E. P. H., Ibex mines; Tintic district: Boss Tweed, Bullion Beck, Carissa, Centennial Eureka, Gemini, Iron Blossom, Sioux mines; Spring Creek district: Queen of Sheba mine; West Tintic district: Scotia, Tintic Western mines.

Kane County Paria Mining Company mine.

Millard County Church Hills: Stevens prospect; Detroit district: Almond, Blue Bell, Major Drum mines; Leamington district: Fool Creek Canyon.

Morgan County Morgan district: Chicago-Utah, Iron King, Morgan Consolidated, Morgan Crescent, Red Eagle mines; Round Valley: Copper Mountain mine.

Pitue County Gold Mountain district: Sevier mine; Ohio district: Bully Boy and Webster, Cascade, Copper Belt, Dalton, Iris, Shamrock, Wedge mines.

Rich County Swan Creek district: Victoria prospect.


San Juan County Big Indian district: Big Indian Copper mine; Elk Ridge: Oakie, Woodenshoe No. 3 mines; La Sal Mountains: La Sal Quadrangle: Jackpot mine; Lisbon Valley: Climax nos. 1-2, Lisbon Copper mines; Monticello district: Copper Queen, Tuffy Copper mines; Monument Valley district: Oljeta, Skyline, Whirlwind mines; Paradox Valley district: Grey Dawn mine; White Canyon district: Bell, Four Aces, Fry No. 4, Happy Jack, Hideout, Jomac, Posey mines.

Sevier County Salina Creek district: Ball, Lead Hill mines; Sevier Canyon.

Summit County Park City district: Daly, Daly-Judge, Daly West, Jupiter, New York, Silver King, Silver King Consolidated, Woodside mines.

Tooele County Deep Creek Mountains: Complex, Dewey, Devils Pit, Eagles Nest, Gold Star, Laura, Monocoo, Oro del Rey, Overland, Prosperity, Silver Queen mines; Dugway district: Belcher, Black Maria, Confidence, Kelly's Hole, Metal States, Raymond-Bald Eagle mines; East Erickson district: Jesse Bezel mine; Gold Hill district: Calvera, Copper Bloom, Copper Hill, Copperopolis, Copper Queen-Midland Mining Company, Gold Hill (U. S.), Ida Lull, Minnehaha, Mono, New Baltimore, Ozark, Pole Star Copper Company, Rea, Silver King, Unadine, Victory no. 1, Yellow Hammer mines; Granite Mountain district: Blue Bell, Cannon Tank Canyon, Desert, Dutch Mountain, El Dorado, Mountain Queen mines; Mercur district: Mineral Hill mine; Ophir district: Dry Canyon area - Brooklyn, Kearsarge, Mono, Queen of the Hills mines; Ophir Hill area - Chicago, Cliff, Hidden Treasure, Sacramento mines; Silver Island district: Carrie Mack property; Willow Springs district.

Utah County Browns Park area: Brush Creek district: Little Alta mine; Bullionville; Carbonate district: Dyer, Jessie Ewing mines, Red, Willow Creeks; Little Split Mountain; Uteland Knoll district (Ouray).

Utah County American Fork district: Miller mine; East Tintic district: Apex Standard, Eureka Bullion, Eureka Lily, Eureka Standard, Tintic Standard, Trixie mines; Thorpe Hills.

Washington County Mineral Mountain: Emma mine; Silver Reef district: Leeds, Newton, Requa mines; Tattlesbuget district: Apex (Dixie) mine.

Wayne County Capitol Wash; Capitol Wash to Sheets.
Gulch; Miners Mountain district: Old Faithful, Wonder Copper no. 1 mines; Torrey: T. R. Lode no. 1 mine.  
Weber County Cold Water Canyon; Weber district: New Azurite claim.

**BALYDONITE**

Basic hydrous copper lead arsenate, (Pb, Cu)$_3$As$_2$O$_8$·(Pb,Cu)·(OH)$_2$·H$_2$O. Probably monoclinic. In mamillary concretions, fibrous, drusy. H. 4.5. G. 4.4. Color green, yellow green. Luster resinous.  
*Summit County* Park City district: Daly-Judge mine.  
*Utah County* East Tintic district.

**BARITE**

*Beaver County* Antelope district; Beaver Lake district; Granite district: Big Pass, Contact mines; McGarry district; Pruess district: Blackbird, Cactus, Gold Reef mines; San Francisco district: Horn Silver mine.  
*Box Elder County* Lucin district: Copper Mountain, Tri-State Minerals mines; Rosebud district.  
*Emery County* Barium Incorporated mine.  
*Grand County* Courthouse Wash; Little Grand district: Colorado Fuel and Iron Company mine; Needles; Tennille Wash; Ryan Creek Scheelite prospect.  
*Juab County* Deseret district: Rockwell shaft; Fish Springs district: Garrick mine; Mount Nebo district: Eva, Freddie mines; Tintic district: Boss Tweed, Carissa, Centennial Eureka, Eureka Hill, Gold Chain, Grand Central, Iron Blossom, Mammoth, Ophohonga, Swansea mines; West Tintic district: 88, 1903, Pyramid, Scotia, War Eagle mines.  
*Kane County* Kitchen Corral Canyon.  
*Morgan County* Argenta district: Carbonate Hill, Carbonate Gem mines.  
*Pleasant County* Gold Mountain district; Marysville district: Bullion Monarch mine; Mount Baldy district: Lucky Boy mine; Ohio district: Bully Boy and Webster mines.  
*Rich County* Swan Creek district: Victoria prospect.  
*Salt Lake County* Big Cottonwood district; Bingham district: Eagle Bird Lode, Lucky Boy, Queen mines; Little Cottonwood district: Albion, Flagstaff mines.  
*San Juan County* White Canyon district: Happy Jack mine.  
*Summit County* Park City district.

**Tooele County** Bluebell district: Morgan mine; Deep Creek Mountains: Probert mine; Dugway district: Buckhorn, Confidence, Four Metals, Francis, Great Eastern, Juno, Kellys Hole, Lauris, Nautilus, Pride of the West mines; Gold Hill district: Christmas Mining Company, Garrison Monster, Reaper mines; Ibapah Mountains; Mercur district; Ophir district: Dry canyon area; Lion Hill area: Buffalo, Chloride Point, Douglas, Lion, Zella mines; Ophir Hill area; Silver Island district: Carrie Mack Property; Wild Cat Mountain: Silver Queen mine.  
*Utah County* American Fork district: Bog, Dutchman, Pacific, Yankee mines; East Tintic district: Burgin, Eureka Lily, Eureka Standard, Iron King, Zuma mines; Tintic Standard mines; Payson district: Syndicate mine; Santanquin district: Union Chief mine; Silver Lake district: Milkmaid, Ontario mines.  
*Wasatch County* Strawberry area, along thrust fault.  
*Weber County* Cold Water Canyon.

**BARNESITE**

*Grand County* Thompsons district: Cactus Rat mine.

**BARYTOCALCITE**

*Uintah County* Sun Oil Company South Ouray well.

**BASALUMINITE**

*Emery County* Temple Mountain: Fuemrol No. 2 mine.

**BASSANITE**

Occurs with anhydrite in Green River Formation.
*Duchesne County* Green River Formation.

**BASSETITE**

Hydrated iron uranium phosphate, \( \text{Fe} (\text{UO}_2)_2 (\text{PO}_4)_{2 \cdot 8\text{H}_2\text{O}} \). Monoclinal. Occurs as plates of flattened crystals. Cleavage perfect. H. 2.5 G. 3.4. Luster vitreous. Color olive green, also yellow, brown. Transparent. Not fluorescent. *Emery County* Green River district: Denise no. 1 mine; San Rafael district: Fuenrol no. 2 mine.

**BAYLEYITE**

Hydrated magnesium uranium carbonate, \( \text{Mg}_2 (\text{UO}_2)(\text{CO}_3)_{3 \cdot 18\text{H}_2\text{O}} \). Monoclinal. Occurs as minute, short prismatic crystals, also in acicular and divergent groups. H. 2-2.5. G. 2. Color sulfur yellow. Luster vitreous. *Emery County* San Rafael district: Delta mine. *San Juan County* Big Indian district: Mi Vida mine; Elk Ridge; Coral claim; White Canyon district: Hideout mine.

**BEAVERITE**


**BEQUERELITE**

Hydrated calcium uraninate, \( \text{CaU}_6\text{O}_{19 \cdot 11\text{H}_2\text{O}} \). Orthorhombic. Crystals tabular and elongated, striated; also massive. H. 2.5 G. 5.2. Cleavage good. Luster adamantine. Color amber to brownish yellow. Streak yellow. Transparent. *Emery County* San Rafael district: Delta mine, Green Vein Mesa, Consolidated, Lucky Strike, Lucky Strike no. 2 mines. *Grand County* Seven Mile Canyon. *San Juan County* Big Indian district: Big Buck mine; Red Canyon district: Frey no. 4, Posey mines; White Canyon district: Happy Jack, Hideout, Posey mines.

**BEIDELLITE**

Hydrous aluminum silicate, \( (\text{Na}, \text{Ca}/2)_{0.33}\text{Al}_3 (\text{Al},\text{Si})_4 \text{O}_{10}(\text{OH})_2 \cdot n\text{H}_2\text{O} \). Monoclinal. A member of the smectite group. Occurs in thin crystal plates. H. 1.5 G. 2.6. Cleavage one direction. Luster vitreous to waxy. Color white, red, gray. *Tooele County* Gold Hill district: Copper Bloom mine. *Utah County* Clay Canyon; East Tintic district. *Sanpete County* near Fairview.

**BENTONITE (See MONTMORILLONITE)**

**BERTRANDITE**


**BERYL**

Beryllium aluminum silicate, \( \text{Be}_3\text{Al}_2\text{Si}_6\text{O}_{18} \). Hexagonal. Crystals usually long prismatic, often vertically striated. Also coarse columnar or granular to compact. Also. H. 7-8. G. 2.7. Cleavage poor. Fracture conchoidal to uneven. Brittle. Luster vitreous. Color emerald green, pale green to blue, yellow, white. Transparent to translucent. Aquamarine variety found in Ibapah Mountains; bixbite, raspberry red color, found on Topaz Mountain; morganite, pink to rose red, variety found on west side of Spor Mountain. *Beaver County* Granite district: Miller, Scheelite group mines. *Daggett County* Red Creek Complex. *Juab County* Deep Creek Mountains: Apex, Jumbo, Mary, Queen of Sheba, Trout Creek mines. Goshute Indian Reservation: Ibapah Mountains: Fifteenmile Canyon; Thomas Range: Spor, Topaz Mountains; Trout Creek district: Apex mine; Spring creek district: Queen of Sheba mine; Dugway Range. *Tooele County* Dugway district: East Erickson district: Hard - to - Beat, Sheeprock Canyons; Granite Mountain district; Blue Bell mine, Ibapah Mountains.

**BETA-URANOPHANE**

(See BETA-URANOTILE)
BETA-URANOTILE


BEUDANTITE

Basic sulfate-arsenate of lead and ferric iron, \( \text{PbFe}_3(\text{AsO}_4)_2(\text{SO}_4)(\text{OH})_6 \). Hexagonal. H. 3.5-4.5. G. 4.2 Color black, dark green, brown. Streak grayish yellow, greenish. Luster vitreous to resinous. Transparent to translucent. Tooele County Gold Hill district: Gold Hill (U.S.), Gold Hill (Western Utah) mines; Rush Valley district: Honerine mine.

BICKERITE (See AUSTINITE)

BIEBERITE


BILINITE

Hydrous iron sulfate, \( \text{Fe}_2(\text{SO}_4)_4 \cdot 22\text{H}_2\text{O} \). Monoclinic. Radial fibrous aggregates. H. 2. G. 1.88. Color white to yellowish. Utah County East Tintic district.

BILLINGSLEYITE

Silver sulfosalts, \( \text{Ag}_7(\text{AsSb})_3\text{S}_6 \). Orthorhombic. Occurs as fine grained aggregates. H. 2.5. G. 5.9. Color lead gray. Metallic luster. Slightly sectile. Utah County East Tintic district: North Lily mine.

BINDHEIMITE

A pyroantimonate of lead, \( \text{Pb}_2\text{Sb}_2\text{O}_6 \cdot (\text{O},\text{OH}) \). Isometric. Occurs as cryptocrystalline masses, dense to earthy, or as incrustations. H. 4.4-5. G. 4.6-5.6. Fracture earthy to conchoidal. Luster resinous, dull or earthy. Color yellow, brown, reddish brown, gray white, greenish. Streak white to yellow. Opaque to translucent. Beaver County San Francisco district: Horn Silver mine. Box Elder County Willard district: Ogden Boilmakers claim. Juab County Tintic district: Scotia mine; West Tintic district: War Eagle claims. Utah County East Tintic district.

BINNITE (See TENNANTITE)

BIOTITE


BIRNESSITE

A hydrous manganese oxide, perhaps \( \text{(Na, Ca)}\text{Mn}_7\text{O}_{14} \cdot 3\text{H}_2\text{O} \). Hexagonal. Earthy, some grains show
Utah County East Tintic district: Burgin mine.
Washington County Enterprise.

BISCHOFITE

Hydrous magnesium chloride, MgCl₂·6H₂O. Monoclinic. Crystalline granular, foliated; sometimes fibrous. Fracture conchoidal to uneven. H. 1-2. G. 1.6. Colorless to white. Luster vitreous to dull.
Tooele County Salduro; Wendover.

BISMITE

Juab County Tintic district: Boss Tweed, Eagle, Blue Bell mines.
Salt Lake County Little Cottonwood district: South Hecla mine.
Tooele County Gold Hill district: Wilson Consolidated mine.
Utah County East Tintic district: Eureka Lily mine.

BISMOCLITE

Juab County Tintic district: Eagle, Blue Bell mines.

BISMUTH

Juab County Tintic district: Boss Tweed, Emerald mines.
Salt Lake County Bingham district; Little Cottonwood district: South Hecla mine.
Tooele County Gold Hill district: Copper Bloom, Doctor, Lucy L., Wilson Consolidated mines; Ophir district: Ophir Hill area - Ophir Hill Consolidated, Ophir Coalition mines.

BISMUTHIAN BINDHEIMITE

Bismuth antimonate of lead, Pb₂(Sb,Bi)₂O₆ (O,OH). Isometric. Occurs as cryptocrystalline masses, earthy to dense, or as incrustations. H. 4-4.5. G. 4.6-5.6. Luster resinous, dull, or earthy. Color clear to pale yellow to deep yellow-brown.
Juab County Tintic district: Mammoth mine.

BISMUTHINITE

Beaver County Bismuth mine; Star district: Commonwealth, Kemple, Progressive, St. Mary’s mines.
Box Elder County Newfoundland district.
Juab County Tintic district: Mammoth mine; West Tintic district.
Piute County Ohio district: Tunnel Extension No. 2 mine.
Salt Lake County Little Cottonwood district: South Hecla mine.
Tooele County Blue Bell district: Bogan mine; Gold Hill district: Copper Bloom, Lucy L., Wilson Consolidated mines; Overland Canyon.
Utah County East Tintic district: Eureka Lily, North Lily, Tintic Standard mines.

BISMUTITE

Beaver County Star district: Commonwealth, Kemple, Progressive, St. Mary’s mines.
Box Elder County Lucin district: Empire mine.
Juab County Detroit district: Charm, Copperhead, E. P. H., Ibex mines; Tintic district: Boss Tweed, Carissa, Eagle and Blue Bell, Victoria mines.
Millard County Detroit district: Almond, Blue Bell, Major Drum mines.
Salt Lake County Bingham district.
Tooele County Gold Hill district: Copper Bloom, Lucy L., Wilson Consolidated mines.

BIXBITE (See BERYL)
BIXBYITE

BLOEDITE

BOEHMITE

BOG ORE (See GOETHITE)

BOLTWOODITE
Hydrous potassium uranium silicate, K_2(UO_2)_2·2(SiO_3)·5H_2O. Orthorhombic; may be monoclinic. Occurs as radiating acicular to fibrous aggregates. H. 3.5. G. 3.6. Cleavage good. Luster pearly to silky. Color yellow. Fluoresces dull green. Encrusts primary uraninite. Emery County San Rafael district: Delta, Pay Day mines. Grand County Seven Mile Canyon. San Juan County Blue Jay mine; Julia claims; Pete no. 6 claim; Red Canyon district: Jerry group; White Canyon district: Happy Jack mine.

BOOTHITE

BORICKITE

BORNITE
Copper iron sulfide, Cu_5FeS_4. Isometric. Usually massive, granular or compact. H. 3. G. 5. Cleavage poor. Fracture conchoidal, uneven. Luster metallic. Color copper-red to bronze, with iridescent tarnish. Streak grayish black. Opaque. Beaver County Beaver Lake district; Granite district: Contact group; Lincoln district: Creole mine; Rocky district: Bawana, Maria, Old Hickory mines. Box Elder County Crater Island district: Copper Blossom mine; Newfoundland district: Copper Ridge; Promontory district: Lakeview mining properties. Daggett County Red Creek: Yellow Canary uranium deposits. Davis County Farmington district: Parrish Canyon. Emery County San Rafael district: Maybe mine. Garfield County Henry Mountains. Grand County Hoosier mine; La Sal district: Bornite, McCoy mines; Seven Mile Canyon: Shinarump nos. 1-3 claims.

Juab County Deseret Mountain district. Salt Lake County Big Cottonwood district: Big Cottonwood, Columbus-Rexall, Mountain Lake mines; Bingham district: Bingham Copper pit, Carr Fork, Copper Center tunnel, Galena, Old Jordan, Highland Boy, Yampa mines; Little Cottonwood district: Alta Stock contact zone, South Hecla mine. San Juan County Elk Ridge, Payday mine; La Sal Mountains; Monticello district: Copper Queen mine; White Canyon district: Blue Lizard, Happy Jack, Hideout, White Canyon No. 1, W. N. mines. Summit County Park City district: Daly, Ontario mines. Tooele County Gold Hill district: Alvarado, Cane Springs, Copperopolis, Doctor, Frankie, Ida Lull, Midas mines. Uintah County Browns Park area: Carbonate district: Dyer mine. Utah County East Tintic district; Eureka Lily, Eureka Standard, Trixie mines; Silver Lake district: Milkmaid mine. Wasatch County Blue Ledge district: Mayflower mine. Washington County Silver Reef district. Weber County Sierra Madre district: Eldorado property.
BOULANGERITE


*Summit County* Park City district: Park City Consolidated mine.

*Tooele County* Bingham district: May Flower mine; Gold Hill district: Rube mine.

BOURNONITE


*Salt Lake County* Bingham district; Little Cottonwood district: Albion mine.

*Summit County* Park City district: Daly Judge, Daly West, Silver King, Woodside mines.

BRAITSCHITE


*Grand County* Cane Creek: Texas Gulf Potash mine.

BRAUNITE


*Juab County* San Pitch Mountains: Black Jack (Kendall-Duvall) claims.

BRAVOITE


*Emery County* San Rafael district: Delta mine.

BRICKERITE (See AUSTINITE)

BROCHANTITE


*Beaver County* San Franciscos district: Horn Silver mine.

*Daggett County* Red Creek: Yellow Canary uranium deposit.

*Emery County* San Rafael district: Delta mine.

*Juab County* Deseret district. Tintic district: Boss Tweed, Carissa, Eureka Hill, Mammoth mines.

*San Juan County* Red Canyon district: Posey mine: White Canyon district: Happy Jack mine, Hideout, Posey mines.

*Summit County* Park City district: Silver King, Woodside mines.

*Tooele County* Ophir district: Dry Canyon area.

*Utah County* East Tintic district: Burgin mine.

*Wayne County* Chimney Rock to Tantlus Flat.

BROCKITE


*Sevier County* Monroe Canyon in a vein.

BRONZITE (See ENSTATITE)

BROOKITE


*Emery County* Emery: Phillips Huntington no. 1 well.

BRUCITE


*Beaver County* Beaver Lake district.

*Salt Lake County* Big Cottonwood district: Big Cottonwood, Mountain Lake mines; Little Cottonwood district: Alta and Clayton Peak stocks along contact.

**Grand County** Moab Valley; Richardson district.

**San Juan County** Monument Valley district: Whirlwind mine.

**Utah County** Silver Lake district: Deer, Silver Creeks.

**Washington County** Mineral Mountain: Emma, Gregerson mines.

**BURBANKITE**

Rare earth carbonate, \( \text{(Na, Ca, Sr, Ba, Ce)}_6(\text{CO}_3)_5 \). Hexagonal. Color grayish yellow. H. 3.5. G. 3.5. Cleavage good. Effervesces in cold HC.

**Duchesne County** Green River Formation.

**Uintah County** Green River Formation.

**Calamine** (See HEMIMORPHITE)

**CALAVERITE**


**Salt Lake County** Bingham district: Highland Boy, Yampa mines.

**Summit County** Park City district: Park City Consolidated mine.

**Tooele County** Gold Hill district: Lucy L. mine.

**Utah County** East Tintic district: Eureka Lily, Eureka Standard mines.

**CALCITE**

Calcium carbonate, \( \text{CaCO}_3 \). Hexagonal. Rhombohedral and scalenohedral crystals common. Also fibrous, granular, earthy, chalky, stalactitic. H. 3. G. 2.7. Cleavage perfect rhombohedron. Luster vitreous. Color usually white, colorless, may be various shades when impure. Shows double refraction.

**Beaver County** Antelope district; Beaver Lake district: Rat Ridge, Skylark mines; Blue Mountains: Susie Q claims; Granite district: Big Pass, Rattler groups; Indian Peak district: Blue Bell, Cougar Spar, Dugout, JB, Noonaday, Lost Sheep, Utah mines; Lincoln district: creole mine; McCarry district; Newton district: Sheep Rock mine; Pine Grove district: Monarch mine; San Francisco district: Horn Silver mine; Star district: Commonwealth, Kemple, Progressive, St. Mary's mines.

**Box Elder County** Box Elder district; Crater Island district: Copper Blossom mine.

**Carbon County** near Price.

**Garfield County** Mammoth Creek.

**Grand County** Agare Switch; Cisco; Courthouse Wash; Miners Basin district: Dewey, High Ore, McCormick mines; Little Grand district: Colorado Fuel and Iron Company mines, Needles, Tennmile Wash.

**Juab County** Mt. Nebo district: Eva, Highland mines; Thomas Range: Autunite no. 8, Claybank, Blue Chalk, Hogsback, Northend, Rainbow, Roadside, Eagle Rock, Harristoe, Oversight, Thursday mines; Topaz Mountain: Tintic district: Carissa, Emerald, Iron Blossom mines; San Pitch Mountains: Orme property; West Tintic district: Tintic Western, War Eagle claims.

**Kane County** Kitchen Corral Canyon; Orderville.

**Piute County** Marysville district.

**Rich County** Bear River Range: Lakeview claims.

**Salt Lake County** Bingham district; Camp Williams: Evans lime quarry.

**San Juan County** Monticello district: Duckett mine.

**Sevier County** Henry district: Trinity prospect.

**Summit County** Park City district.

**Tooele County** Cedar Mountains: Dugway district: Boston, Confidence mines, Kellys Hole; Gold Hill district; Alvarado, Bonnemort, Rea, Rube mines; Johnson Pass; Mercus district: Geyser Marion, Golden Gate, Mercru mines; Ophir district: Dry Canyon area; Lion Hill area - Lion, Douglas, Zella mines; Ophir Hill area - Ophir Coalition mine; Stansbury Mountains, Grantsville.

**Utah County** Sun Oil Company South Ouray well.

**Utah County** East Tintic district; Lehi district: Pelican Point area - Canyon, Foothill and Hilltop, Pelican and Utah Valley veins, Philippine, Potter claims; Pfeiffer Canyon area; Provo district: Monarch mine; Santanquin district: Black Balsam, Blue Eagle, Union Chief mines;
Wells Canyon.
Wasatch County Bonanza Flat.
Washington County Bull Valley district; Silver Reef district.
Weber County Sierra Madre district: Eldorado property.

CALEDONITE

Salt Lake County Little Cottonwood district: Oxford, Geneva mines.

CARBONATE APATITE


CARBON DIOXIDE

CARMINITE
Tooele County Gold Hill district: Gold Hill (U. S.) mine.

CARNALLITE
Grand County Cane Creek: Texas Gulf Potash mine; Crescent Junction; Paradox basin; Salt Valley; Seven Mile Anticline.
San Juan County Moab Valley, Paradox Valley district. Tooele County Salduro; Wendover.

CARNELIAN
(See CRYPTOCRYSTALLINE QUARTZ)

CARNOTITE
Hydrous potassium uranium vanadate, K₂(UO₂)₂ (V₂O₄)₂·3H₂O. Orthorhombic or monoclinic? Rarely found in crystals. Usually occurs as powder or loosely coherent aggregates, also disseminated. G. 5. Cleavage perfect basal. Luster dull or earthy. Color bright yellow to greenish-yellow.

Beaver County Southern San Francisco Mountains: White Mountain, one mile east.
Carbon County Coal Creek.

 Daggett County Red Creek: Yellow Canary uranium deposit.

Emery County Cedar Mountain district; Green River district: Yellow Queen mine; San Rafael district: Blue Bird, Calyx, Camp Bird Nos 7, 12, and 13, Delta, Flat Top Mesa, Migliaccio, North Mesa Nos. 1, 2 and 5, Temple Rock, South Temple Wash, Vagabond, West Little Horse Mesa, Wild Horse Canyon mines.

Grand County Beaver Mesa: Covusite nos. 1-3 mines; La Sal district: Jack claim; Miners Basin district: West Slope mine; Mill Creek; Moab Valley; Pack Creek; Polar Mesa district: Elva M. and Adjoining, Elva M. and Imp, Polar nos. 2-3, Rim Rock and Rim Rock no. 2 claims; Richardson district; Seger Station; Seven Mile Canyon: Shinarump nos. 1-3 claims: Thompsons area; Thompsons district: Cactus Rat, Flat Top no. 1, Red Vanadium groups; Yellow Cat district: Uvanco mine.
Iron County Cedar Canyon.

Juab County Thomas Range: Bell Hill, Blowout, Dell no. 5, Eagle Rock, Floride, Fluorine Queen, Fluorine Queen no. 4, Harrisite, Hilltop, Lost Sheep, Lucky Louie mines; Topaz Mountain.
Kane County Bulloch group; south of Paria.
San Juan County: Abe Day’s vanadium claim; Big Indian district: Cal Uranium, Mi Vida, Radon, Rattlesnake mines; Browns Hole area; Bull Canyon; Cane Springs Pass: Bridger Jack Flat; Chess Ridge; Cottonwood Canyon district: Basin, Big Hole, Birthday Shale, Blue Bird, East Bank, Found no. 2, Hangover nos. 1-2, Ridge nos. 1 - 2, Ridge nos. 1 - 2 mines; Dry Valley; East Canyon; Elk Ridge: Coral claim; Indian Creek; Little Peter, Lucky No. 1, Marjorie Ann, Maud, Morning Montezuma Canyon: Bradford No.5, Vanadium Queen mines; Red Yip Valley View, Vista Grande, Wedge, Yellow Bird, Yip Yip mines; Lisbon Valley: Climax nos. 1 - 2 claims; Montezuma Canyon: Bradford No. 5, Cottonwood, Dixie No. 1, Last Chance No. 1, Lucky Boy, Rim Rock, Rock, Slum, Strawberry, Titus No. 3, Verdure, West Cliff House No. 8 mines; Monticello district; Navajo Reservation; Paradox Valley district: Grey Dawn, Vanadium Queen mines; Red Canyon district; Spanish Valley Anticline; White Canyon district: Four Aces, Happy Jack, Hideout, White Canyon no. 1, White Fawn, Yellow Circle mines.

Uintah County: Ashley Creek.
Washington County: Santa Clara district; Silver Reef district: Buckeye, Butte Reef, Doyle Shaft, East Reef mines.
Wayne County: Capitol Reef Monument; Coleman Canyon to Oak Creek; Fruita: Oyler mine; Hanksville; Henry Mountains: Mt. Ellen; Muddy River; Noton Bench; Poison Springs; Rabbit Valley: Old Dixon prospect; Upheaval Dome; Waterpocket Fold.

CARPHOSIDERITE

Hydrous basic sulfate of ferric iron, (H₂O)Fe₃(SO₄)₂(OH)₄H₂O. Hexagonal. Earthy or scaly crusts and aggregates, reniform. H. 4 - 4.5. G. 2. 4 - 2.9. Cleavage doubtful. Luster resinous to dull. color golden yellow, dark straw-yellow. A gossan constituent.

Juab County: Tintic district: Carissa, Eureka Hill mines.
Tooele County: Ophir district: Lion Hill area.

CASSITERITE


Emery County: Emery; Phillips Huntington no. 1 well.
Pluie County: Ohio district: Tunnel Extension No. 2 mine.

CELADONITE


Plate County: Marysville district: Silica Hills.
Utah County: East Tintic district.

CELESTITE


Emery County: 50 miles S. of town of Green River.
Grand County: Little Grand district: Salt Wash group.
San Juan County: Big Indian district: Radon mine.
Sevier County: Salina Creek district: Lead Hill mine.
Washington County: Santa Clara district: Black Beauty no. 1 claim.

CERARGYRITE


Beaver County: Newton district: Sheep Rock mine; San Francisco district: Horn Silver mine; Star district.
Box Elder County: Ashbrook district; Vipont mine.
Iron County: Escalante district: Escalante mine; Gold Springs district: Homestake mine; Stateline district: Creole, Gold Dome, Johnny, Oif, Phelps, Utah Spur mines.
Juab County: Detroit district: Charm, Copperhead, E. P. H., Ibex mines; Fish Springs district: Carnation, Emma, Galena, Utah mines; Tintic district: Bullion Beck, Centennial Eureka, Chief Consolidated, Eagle and Blue Bell, Gemini, Godiva, Grand Central, Iron, Mammoth mines.
Pluie County: Gold Mountain district: Annie Laurie, Sevier mines; Mt. Baily district: Pluto mine.
Salt Lake County: Bingham district: Dixon, Winnamuck mines.
Summit County: Park City district: Daly, Ontario, Scottish Chief mines.
Tooele County: Dugway district: Buckhorn, Four...
Metals mines; Erickson district: OK, Silver Reef mines; Lakeside district: Mercur district: Geyser-Marion mine; Ophir district: Dry Canyon area - Mono mine; Foothill area - Lakes of Killarney mine; Lion Hill area - Buffalo, Chloride Point, East Side, Douglas, Empire, Iron, Lion, Monarch, Northern Light, Three Meadows, Woodruff, Zella mines; Ophir Hill area - Hidden Treasure, Jim Fish, Sacramento mines; Rush Valley district: Mescatine, Salvation-Hercules mines.

Upham County Brush Creek district: Little Alta mine.  Utah County Sانتaquin district: Union Chief mine.  Washington County Silver Reef district: California, Lees, Requa, Savage, Tecumseh Hill mines.

CERUSSITE


Beaver County Bradshaw district: Cave mine; Granite district: Beaver View, Big Pass mines; Indian Peak district: Lincoln district: Creole mine; Pine Grove district; Pruess district: Gold Reef mine; San Francisco district: Horn Silver mine; Star district: Cedar-Talisman, Emerson, Gold Crown, Hoosier Boy, Commonwealth, Kemple, Maud S., Progressive, St. Mary’s, Dotson, Estelle, Mowizita, Vicksburg, Harrington-Hickory, Rebel, Sundown, White Rock, Hub, Mammoth, Moscow, Red Warrior, Wild Bill mines, Woodhouse mines.

Box Elder County Ashbrook district: Vipont mine; Box Elder district: Lucin district: Cunepah Tunnel, Copper Mountain, Judson, Tecoma Hill mines; Newfoundland district: Promontory district: Big Pine, Lakeview, Sunshine Mining Properties; Rosebud district.  Cache County Hyrum area - Tip Top claim; La Plata area - Yellow Jacket claim; Paradise district; Smithfield area.

Emery County San Rafael district: Copper Globe deposit.  Iron County Escalante district: Escalante mine.

Juab County Deseret district: Miller mine; Fish Springs district: Utah mines; Juab district; Mona district: Mt. Nebo district: Big Nebo, Eva, Freddie, Santaukin Chief, Santaukin King, Syndicate Tunnel mines; Ticint district: Beck Tunnel, Bullion Beck, Chief, Chief Consolidated, Colorado, Eagle and Blue Bell, Eureka Hill, Gemini, Godiva, Humbug, Iron Blossom, Mammoth, Sunbeam, Swansea mines; West Ticint district: 88, 1903, Scotia, War Eagle mines.

Millard County Church Hills: Stevens prospect.  Leamington district: Arbroath, Leamington Mining Company, Yellowstone mines.

Morgan County Argenta district: Carbonate Hill, Carbonate Gem mines.

Pike County Mt. Baldy district: Deer Trail, Pluto mines; Ohio district: Bully Boy and Webster, Cascade, Copper Belt, Dalton, Iris, Shamrock mines.

Rich County Swan Creek district: Victoria prospect.  Salt Lake County Big Cottonwood district: Alta Tunnel and Transportation Company, Carbonate, Cardiff Kennebec, Eclipse, Reed and Benson, Silver Mountain mines, Prince of Wales, Woodlawn mines; Bingham district: Boston Consolidated, Burning Moscow, Broad Gauge, Brooklyn, Butterfield, Caledonia, Dalton and Lark, Galena, Jersey Blue, Last Chance, Midland, Montezuma, Nast, Old Jordan, Old Telegraph, Petro, Red Wing, U. S. and Lark, Yosemite mines; Hot Springs district: Little Cottonwood district: Albion, Alta Consolidated, Cabin, Dwyer, Emma, Flagstaff, Little Emma, Michigan-Utah, West Toledo mines.

San Juan County Big Indian district: Mi Vida mine.  Sevier County Salina Creek district: Lead Hill mine.  Summit County Park City district: Comstock, Creole, Daly, Jupiter, Little Bell, Nail Driver, New York, Ontario, Scottish Chief, Silver King, Woodside mines.

Tooele County Blue Bell district: Black Hawk, Morgan mines; Columbia district: Benmore, Sharp mines; Deep Creek Mountains; Dutch Mountain; Dugway district: Bertha, Boston, Bryan, Buckhorn, Confidence, Four Metals, Francis, Kellys Hole, Lauris, Raymond - Bald Eagle, Yellow Jacket mines; Erickson district: Black Jack, Black Rock, Blain, Deer Trail, Good Hope, Happy Jack, Indian Boy, Indian Chief, May Farmer mines; Free Coinage district; Gold Hill district: Bonanza, Boston, Cash Boy, Garrison Monster, Gold Hill (U. S.), Mascot, Mono, Monte Del Rey, New Baltimore, Red Jacket, Rube, Silver and Gold Mining Company, Silver King, Spotted Fawn, U. S. mines; Grantsville district: Gleeley district; Lakeside district; Mercur district: Mineral Hill mine; North Ticint district: New Bullion, Scranton mines; Ophir district: Dry Canyon area - Brooklyn, Mono, Queen of the Hills mines; Lion Hill area - Buffalo, Chloride Point, Douglas, Lion, Zella, East Side, Empire, Iron, Monarch, Northern Light, Three Metals, Woodruff mines; Ophir Hill area - Admiral Dewey, Chicago, Cliff, Hidden treasure, Jim Fisk, Sacramento mines; Osceola district; Rush Valley district: Argent, Ben Harrison, Calumet, Galena, Honerine, Mescatine, Muerbrook, Salvation - Hercules, Southport mines; Silver Island district: Carrie Mack property; Tooele district; Willow Springs district.

Uintah County Silver King mine.

Utah County Alpine district: Alpine - Galena property;
American Fork district: Dutchman, Miller, Pittsburgh mines; East Tintic district: Apex Standard, Burgin, Eureka Bullion, Eureka Lily, Eureka Standard, North Lily, Tintic Standard, Trixie mines; North Tintic district: Blowhole Hill, Lehi-Tintic, Tintic Empire, Tintic Paymaster, Selma mines; Payson district: Syndicate mine; Provo district: Monarch mine; Sautanquist district: Blue Eagle, Union Chief mines; Silver Lake district: Milkmaid, Ontario mines.

\textit{Wasatch County} Blue Ledge district: Glencoe, McHenry, Valeo mines; Elkhorn district: Crawford, Nelson and Queen mines; Snake Creek district: Revelator, West Quincy mines.

\textit{Washington County} Tutsagubet district: Apex, Paymaster mines.

\textit{Weber County} Sierra Madre district: Eldorado property.

\textbf{CERVANTITE}


\textit{Salt Lake County} Little Cottonwood district: Emma, Little Emma mines.

\textbf{CHABAZITE}

Hydrous calcium aluminum silicate, \(\text{CaAl}_2\text{Si}_4\text{O}_{12} \cdot 5\text{H}_2\text{O}\). Hexagonal. Usually in crystals. Cleavage poor. H. 4.5. G. 2.1. Luster vitreous. Color white, yellow, pink, red. Transparent to translucent. Brittle.

\textit{Piute County} Marysville district: Silica Hills.

\textit{Salt Lake County} Little Cottonwood district.

\textit{Summit County} Park City district.

\textit{Wasatch County} Clayton Peak.

\textbf{CHALCANTHITE}


\textit{Beaver County} San Francisco district: Horn Silver mine.

\textit{Emery County} San Rafael district: Calf Mesa, Dexter group.

\textit{Salt Lake County} Bingham district: Bingham Copper pit, Broad Gauge, Galena, Old Jordan, Highland Boy, Yampa mines.

\textit{San Juan County} Elk Ridge; Red Canyon district: Markey no. 3 mine; White Canyon district: Fry No. 4 mine, Happy Jack, Jomac, W. N. mines.

\textit{Sevier County} Henry district: Trinity prospect.

\textit{Summit County} Park City district.

\textit{Tooele County} Deep Creek Mountains: Cyclone, Leap Year mines; Dugway district: Bertha, Four Metals, Juno, Metal States mines; Gold Hill district: Alvarado, Cyclone mines; Ophir district: Ophir Hill area - Ophir Hill Consolidated, Ophir Coalition mines.

\textit{Utah County} East Tintic district.

\textit{Wayne County} Chimney Rock to Tantlus Flat; Fruita: Oyler mine.

\textbf{CHALCEDONY}

\textit{(See CRYPTOCRYSTALLINE QUARTZ)}

\textbf{CHALCOCITE}


\textit{Beaver County} Beaver Lake district: Beaver-Harrison, OK mines; San Francisco district: Horn Silver mine.

\textit{Box Elder County} Ashbrook district: Vipont mine.

\textit{ Daggett County} Red Creek: Yellow Canary uranium deposit.

\textit{Davis County} Farmington district: Parrish Canyon.

\textit{Emery County} San Rafael district: Blue Bird, Dexter Group mines.

\textit{Grand County} Seven Mile Canyon.

\textit{Juab County} Tintic district: Centennial Eureka, Grand Central mines.

\textit{Millard County} Church Hills: Stevens prospect.

\textit{Piute County} Ohio district: Tunnel Extension No. 2 mine.

\textit{Salt Lake County} Big Cottonwood district: Mountain Lake, Steamboat Tunnel mines; Bingham district: Boston Consolidated, Burning Moscow, Columbia, Commercial, Conger, Dixon, Fortune, Galena, Highland Boy, Last Chance, Minnie, Nast, Old Jordan, Old Telegraph, Phoenix, Winnamuch, Yampa mines.

\textit{San Juan County} Big Indian district: Big Indian Copper, Mi Vida mines; Elk Ridge; La Sal Mountains; Monticello district: Copper Queen, Tuffy Copper mines; Monument Valley district: Whirlwind mine; Paradox Valley district: Grey Dawn mine; Red Canyon district; White Canyon district: Happy Jack, Hideout, Jomac, Posey, W. N. mines.

\textit{Sevier County} Salina district: Ball, Lead Hill mines.

\textit{Summit County} Park City district: Daly, Mayflower,
Ontario mines.

Tooele County Deep Creek Mountains: Devils Pit, Eagles Nest, Oro del Rey mines. Dugway district: Bertha mine; Gold Hill district: Alvarado, Bonnemont, Cane Springs, Centennial and Enterprise, Copper Bloom, Copperopolis, Gold Hill (U. S.), Silver King, Victory no. 1 mines; Ophir district: Ophir Hill area - Ophir Hill Consolidated, Ophir Coalition mines.

Uintah County Browns Park area; Carbonate district: Dyer mine: little Split Mountain; Uteland Knoll district: Ouray.

Utah County East Tintic district: Eureka Lily, Eureka Standard, Trixie mines.

Washington County Silver Reef district: Barbee and Walker, Cobb, Duffin and Toquerville, Emily Jane, Last Chance, Thompson, Tecumseh Hill mines.

CHALCOPHANITE


Utah County East Tintic district: Burgin mine.

CHALCOPHYLLITE

Hydrous basic sulfate-arsenate of copper and aluminum, Cu₁₈Al₃(AsO₄)₃ (SO₄)₂ (OH)₂·3H₂O. Hexagonal. Tabular six-sided crystals. Also foliated masses, and rosette aggregates. H. 2. G. 2. 6. Cleavage basal. Luster vitreous, pearly. Color emerald green or grass green. Streak paler than the color. Transparent to translucent.

Juab County Tintic district: Ajax, Mammoth mines.

CHALCOPYRITE


Beaver County Beaver Lake district: Beaver-Harrison, OK, Skylark mines; Bradshaw district: Cave, Hecla, Nip and Tuck mines; Granite district: Contact group; Lincoln district: Creole, Lincoln mines; Pruess district: Blackbird, Cactus mines, Cactus Gulch; Rocky district: Bavana, Maria, Old Hickory mines; San Francisco district: Beaver Carbonate, Cupric, Horn Silver, Imperial, Michigan, Washington mines; Star district: Commonwealth, Harrington Hickory, Hub, Kemple, Lady Bryan, Maud S., Moscow, Progressive, Rebel, Red Warrior, St. Mary's, Vicksburg, White Rock, Wild Bill mines.

Box Elder County Ashbrook district: Vipont mine; Crater Island district: Copper Blossom mine; Lucin district: Tecoma Hill mines; Newfoundland district: Copper Ridge; Park Valley district: Century, Susannah mines; Promontory district: Lakeview properties; Rosebud district: Red Buttes; Willard district: Overland claim.

Daggett County Red Creek: Yellow Canary uranium deposit.

Davis County Antelope Island; Farmington district: Morning Star group; Parrish Canyon.

Emery County San Rafael district: Dexter group, Lucky Strike mine.

Garfield County Circle Cliffs: Rocky Mountain, Stud Horse mines; Henry Mountains: Bromide, Oro mines.

Grand County La Sal district: McCoy mine; Miners Basin district: Dewey, High Ore, Moab no. 1, Skylark mines; Seven Mile Canyon, Shinarump nos. 1-3 claims.

Juab County Deseret district: Rockwell shaft; Detroit district: Charm, Copperhead, E. P. H., Ibex mines; Fish Springs district: Carnation, Emma, Galena, Utah mines; Thomas Range: Bell Hill mine; Tintic district: Centennial Eureka, Grand Central mines; West Tintic district: Lockheed Iron, 1903, Scotia, Tintic Western, War Eagle mines.

Millard County Detroit district: Almond, Blue Bell, Major Drum mines; Saw Back district.

Morgan County Morgan district: Morgan Crescent mine.

Piute County Mt. Baldy district: Clyde mine; Ohio district: Bully Boy and Webster, Cascade, Copper Belt, Iris, Shamrock mines, Tunnel Extension No. 2, Shamrock mines.

Salt Lake County Big Cottonwood district: Columbus Rexall, Big Cottonwood, Howell-Baby McKee, Reed and Benson, Woodlawn mines, Kentucky-Utah, Lulu, Mountain Lake mines; Bingham district: Bingham Copper Pit, Boston Consolidated, Brooklyn, Burning Moss, Butterfield, Colorado, Commercial, Conger, Copper Center Tunnel, Dalton and Lark, Dixon, Fortune, Frisco, Galena, Highland Boy, Last Chance, Nast, Old Jordan, Old Telegraph, Queen, Silver Shield, U. S. and Lark, Winnamuck, York, Yosemite mines; Little Cottonwood district: Albion, Alta Consolidated, Columbus-Rexall, Dwyer, Native Copper, Oxford and Geneva, South Hecla, Superior mines.

San Juan County Big Indian district: Big Indian Copper mine; Elk Ridge: King Edward, Notch nos. 5 and 6, Oakie, Payday, Sandy no. 3 mines; Monticello district: Blue Bird, Danish Girl, Dream, Gold Queen, Copper Queen mines; Paradox Valley district: Grey Dawn mine; Red Canyon district: Jerry group; San Juan River; White Canyon district: Blue Lizard, Fry no. 4, Happy Jack, Hideout, Jomac, White Canyon no. 1, W. N.
mines.

Sevier County Henry district: Trinity prospect. Salina Creek district: Ball mine.

Summit County Park City district: Daly, J.A.C. Tunnel, Kearns-Keith, Mayflower mine, Ontario, Scottish Chief, Silver King, Wahash, Woodside mines.

Tooele County Deep Creek Mountains: Cyclone, Devils Pit, Eagles Nest, Laura, Leap Year, Midas, Monte de Rey, Morocco, Oro del Rey mines; Dugway district: Bertha, Kelly's Hole, New Park, Surplus mines; East Erickson district: Copper Jack, Flying Dutchman, Hard-to-Beat, Sheeprock Canyons, Silver King, Silver Shield mines; Erickson district: Highland Lassie no. 1, Last Hope no. 3, Silver Reef mines; Gold Hill district: Alvarado, Bonnemort, Cane Springs, Calaveras, Centennial and Enterprise, Copper Bloom, Copperoplis, Copper Queen-Midland Mining Company, Cyclone, Doctor, Frankie, Gold Hill (U. S.), Lucy L., Ida Lull, Reaper, Rube, U. S., Victory no. 1, Yellow Hammer mines; Granite Mountain district: Blue Bell, Cannon Tank Canyon, Desert, El Dorado, Mountain Queen mines; Grantsville district: Mercure district: Mineral Hill mine; Ophir district: Dry Canyon area - Kearseage, Mono, Surprise mines; Lion Hill area - Buffalo mine; Ophir Hill area - Cliff, Ophir Hill Consolidated, Ophir Coalition, Sacramento mines; Rush Valley district: Ben Harrison, Calument, Galena King, Honerine, Muerbrook, Salvation-Hercules, Tip Top mines; Wild Cat Mountains: Silver Queen mine; Yellow Springs district.

Utah County American Fork district: Dutchman, Mary Ellen, and Live Yankee, Yankee mines; East Tintic district: Eureka Lily, Tintic Standard mines; Santanquin district: Black Balsam, Copper Bullion, Sally Ann, Santanquin Central mines; Silver Lake district: Milkmaid, Ontario mines.

Wasatch County Blue Ledge district: Mayflower mine.

Washington County Silver Reef district.

Wayne County Fruita: Oyler mine; Miners Mountain district.

Weber County Fremont Island district; Sierra Madre district: Eldorado, King Solomon, Napoleon-Maghara mines.

CHALCOTRICHITE (See CUPRITE)

CHENEVIXITE

Basic hydrous arsenate of copper and ferric iron, probably \( \text{Cu}_2 \text{Fe}_2(\text{AsO}_4)_2 \) \( (\text{OH})_4 \cdot \text{H}_2\text{O} \). Orthorhombic. Compact earthy to opaline H. 3. S. G. 3.9. Fracture earthy. Brittle. Color dark green to greenish yellow. Streak greenish yellow.

Juab County Tintic district: American Eagle, Mammoth mines.

Tooele County Gold Hill district: Gold Hill (U. S.) mine.

Utah County East Tintic district.

CHERT

(See CRYPTOCRSTALLINE QUARTZ)

CHEVKINITE


Grand County onion Creek.

CHLORARGYRITE (See CERARGYRITE)

CHLORITE

Hydrous magnesium aluminum silicate, \( \text{Mg}_3(\text{Si}_4\text{O}_{10}) \) \( (\text{OH})_2 \cdot \text{Mg}_3(\text{OH})_6 \) essentially. Monoclinic. In pseudo-hexagonal tabular crystals. Usually foliated massive or aggregates of minute scales. Cleavage perfect. Folia flexible but not elastic. H. 2-2.5. G. 2.6-2.9. Luster vitreous to pearly. Color green of various shades.

Beaver County San Francisco district: Star district: Harrington - Hickory, Rebel, White Rock mines.

Box Elder County Rosebud district.

Davis County Antelope Island.

Iron County Paragonah: Iron Peak.

Juab County West Tintic district: Tintic Western mine.

Piute County Marysville district.

Salt Lake County Bingham district: Bingham Copper Pit.

San Juan County Moses Rock dike.

Summit County Park City district.

Tooele County Dugway district: Bertha, Boston, Four Metals mines; East Erickson district: Ekker Canyon prospect; Gold Hill district: Gold Hill (U. S.), Rube mines; Ophir district: Ophir Hill area - Ophir Hill Consolidated, Ophir Coalition mines; Oquirrh Mountains: Manning Canyon Shale; Stansbury Mountains: Manning Canyon Shale.

Utah County Beverly Hills: Manning Canyon Shale; Lake Mountain: Manning Canyon Shale; Lehi district: Manning Canyon Shale; Thorpe Hills: Manning Canyon Shale; Wasatch Mountains: Manning Canyon Shale. Washington County Mineral Mountain: Emma mine.

CHLOROPAL (See NONTRONITE)

CHLOR-UTAHLITE (See VARISCITE)

CHROME MICA-CLAY
A green chrome mica-clay. Contains approximately 0.4 to 0.6 percent Cr₂O₃, and consists of mixed 2M₁ and 1M mica polymorphs. Occurs in thin veinlets, layers, and streaks in sandstone. Micaceous habit. Color green, or gray-green.

*Enter County* San Rafael district: Flat Top Mesa, Temple Mountain, North Temple Mountain, Eagle Nest prospect, South Temple Mountain.

**CHROMITE**


*Grand County* Colorado River area, Green River.

*San Juan County* Colorado River placers.

*Uintah County* Green River district: Cub Creek.

**CHRYSOCOLLA**


*Beaver County* Beaver Lake district: Beaver-Harrison, OK, Skylark mines; Granite district: Beaver View mine; Lincoln district: Creole, Lincoln mines; San Francisco district: Horn Silver mine; Star district: Wild Bill mine.

*Box Elder County* Crater Island district: Copper Blossom mine; Lucin district: Copper Mountain, Parkdale mines; Newfoundland district: Copper Ridge.

*Davis County* Antelope Island.

*Garfield County* Circle Cliffs: Rocky Mountain mine.

*Grand County* Miners Basin district: Dewey, High Ore, Skylark mines.

*Juab County* Deseret district: Rockwell shaft; Tintic district: Carissa, Dragon mines; West Tintic district: 88, 1903, Scotia, Tintic Western, War Eagle mines.

*Millard County* Church Hills: Stevens prospect.

*Morgan County* Morgan district: Morgan Crescent mine.

*Salt Lake County* Little Cottonwood district: Emma, Little Emma mines.

*San Juan County* La Sal Mountains; Monticello district: Copper Queen mine.

*Summit County* Park City district: Daly, Daly-Judge, Little Bell, Scottish Chief, Silver King, Woodside mines.

*Tooele County* Deep Creek Mountains: Morocco mine. Dugway district: Belcher, Black Dragon, Black Maria, Bryan, Confidence, Kellys Hole, Metal States mines; East Erickson district: Copper Jack, Jessel Bezzel, Silver Shield mines; Erickson district: Highland Lassie no. 1 mine; Gold Hill district: Calaveras, Frankie, Gold Hill (U. S.), Gold Bond, Minnehaha, Mono, Napoleon, Silver King, Unadine, Victory no. 1 mines; Ophir district: Dry Canyon area.

*Washington County* Mineral Mountain: Emma, Greger-son mines.

**CHRYSOLOLITE** (See OLIVINE)

**CIMOLITE**


*Utah County* East Tintic district.

**CINNABAR**


*Iron County* Cima mine; Iron Springs district: Granite Mountain, Iron Mountain.

*Piute County* Marysville district; Quicksilver mine; Mt. Baldy district: Lucky Boy mine.

*Tooele County* Deep Creek Mountains: Congar Hill mine; Gold Hill district; Grantsville district: Timpale Valley, Ruby Crystal mine; Mercur district: Golden Gate, Hillside, Mercur, Sacramento, Sparrowhawk, Sunshine mines.

**CLAUDETITE**


*Utah County* East Tintic district.

**CLAUSTHALITE**


*San Juan County* Big Indian district: Mi Vida mine. La Sal Quadrangle: Firefly-Pigmay mine.
CLINOCHLORE

*Piute County* Marysvale district.
*Utah County* East Tintic district.

CLINOCASITE (See CLINOCLASE)

CLINOCLASE

*Juab County* Tintic district: Mammoth mine.
*Tooele County* Gold Hill district: Gold Hill (U. S.) mine.

CLINOHUMITE

*Beaver County* Beaver Lake district: West Spring.

CLINOPTILOLITE

*Beaver County* Tushar Mountains: Sulfurdale, Three Creek Reservoir areas.
*Juab County* Thomas Range: Topaz Mountain, Spor Mountain.
*Millard County* Tusher Mountains: Cove Fort area.

CLINOZOISITE

Hydrous calcium aluminum silicate, Ca₂Al₃Si₃O₁₂OH Monoclinic. Crystals are prismatic, columnar, also massive granular. H. 6-6.5. G. 3.3. Luster vitreous. Color grayish white, green, pink. Transparent to translucent.
*Beaver County* Bradshaw district; Lincoln district: Creole mine.
*Juab County* West Tintic district: Iron King, Tintic Western mines.
*Tooele County* Gold Hill district: Frankie mine; Ophir district: Ophir Hill area - Ophir Hill Consolidated, Ophir Coalition mines; Rush Valley district: Honerine mine.

COBALT BLOOM (See ERYTHRITE)

COBALTITE

*Juab County* Gold Hill district: Gold Hill (U. S.) mine.

COBALTOCALCITE

*Emery County* San Rafael district: Lucky Strike no. 2 mine.

COBALTOSENITE

*Emery County* San Rafael district: Calyx mine.

COCONINOITE

*Emery County* San Rafael district: Calyx mine.

COFINITE

*San Juan County* White Canyon district: Jomac mine.

COFINTITE

*Emery County* Green River district: Denise no. 1 mine; San Rafael district: Calyx, Dirty Devil, Magor, Temple Mountain, Vanura mines.
Juab County Beaver Mesa: Corvisite nos. 1-3 mines.  
San Juan County Big Indian district: Big Buck, Cal Uranium, Homestake, La Sal, Mi Vida, Radon, Rattlesnake mines; Elk Ridge: Avalanche No. 13, Horse-shoe No. 1, King Edward, Oakie, Western Payday mines; La Sal Quadrangle: Black Hat, Firefly-Pignay mines. Paradox Valley district: Grey Dawn, Vanadium Queen mines.

**COLLOPHANE**

Hydrous calcium carbonate phosphate, \( \text{Ca}_{10}(\text{PO}_4)_6(\text{CO}_3)_2 \cdot \text{H}_2\text{O} \). Massive. Cryptocrystalline apatite, or organic origin. Opaline or horn-like; with dense, layered or colloform structure, H. 3-4. G. 2. 7. Luster weakly vitreous to dull. Grayish white, yellow, or brown. Associated with fish scales in the Green River Formation found in the Phosphoria Formation.

Daggett County Uinta Mountains.

Duchesne County Green River Formation; Uinta Mountains.

Uintah County Brush Creek; Frandson Canyon; Little Brush Creek; Rock Creek.

Utah County East Tintic district.

**CONICHALCITE**


Juab County Tintic district: American Eagle, Carissa, Centennial Eureka, Gold Chain mines; West Tintic district: Scotia mine.

Millard County Church Hills: Stevens prospect.

Tooele County Deep Creek Mountains: Fortuna, Probert mines; Gold Hill district: Frankie, Gold Hill (Western Utah), Pole Star Copper Company mines.

Utah County East Tintic district.

**CONNELLITE**

Hydrous basic chloride sulfate of copper, \( \text{Cu}_{19}(\text{SO}_4)_6\cdot\text{Cl}_4(\text{OH})_{32}\cdot3\text{H}_2\text{O} \). Hexagonal. Acicular crystals, in radiated groups and as felted aggregates, H. 3. G. 3. 3. Luster vitreous. Color azurite blue. Streak pale greenish blue. Translucent.

Juab County Tintic district: Grand Central mine.

**COPALITE**

A hydrocarbon. Color pale yellow, gray, brown. G. 1.03. Associated with coal.

Carbon County Tidewell and Rideout district: Winter Quarters mine.

Sevier County Salina Canyon.

**COPIAPITE**

Hydrous basic iron magnesium sulfate, \( (\text{Fe}, \text{Mg})\text{Fe}_4(\text{SO}_4)_6(\text{OH})_2\cdot20\text{H}_2\text{O} \). Triclinic. Small, brilliant plates, stacked one upon another in large numbers forming wormy or rod-like structures. Cleavage perfect. H. 2. 5 - 3. G. 2. 1. Color yellow to bronzy brown. Luster pearly. Transparent to translucent.

Emery County San Rafael district: Dexter group.

Utah County East Tintic district.

**COPPER**


Beaver County Beaver Lake district: Skylark mine; San Francisco district: Imperial mine.

Box Elder County Ashbrook district: Vipont mine; Lucin district: Copper Mountain mine.

Juab County Tintic district: Carissa, Centennial Eureka mines.

Morgan County Morgan district: Morgan Crescent mine.

Salt Lake County Bingham district: Commercial, Highland Boy, Yampa mines; Little Cottonwood district: Native Copper mine.

San Juan County San Juan River; White Canyon district: White Canyon no. 1 mine.

Tooele County Dugway district: Buckhorn, Four Metals mines; Ophir district: Dry Canyon Area - Mono mine.

Utah County East Tintic district.

Washington County Tutsagubet district: Apex (Dixie) mine.

**COPPER PITCH (See TENORITE)**

**COQUIMBITE**

Hydrous iron aluminum sulfate, \( \text{Fe}_2\text{Al}(\text{SO}_4)_3\cdot9\text{H}_2\text{O} \). Hexagonal. Short hexagonal prisms, up to one-half inch long. H. 2. 5. G. 2. 1. Color pale violet to purple; small crystals colorless. Cleavage poor. Luster vitreous. Transparent. Taste astringent.

Emery County San Rafael district: Dexter group.

Utah County East Tintic district.
CORDIERITE

Magnesium iron aluminum silicate, \((\text{Mg,Fe})_2\text{Al}_4\text{Si}_5\text{O}_{18}\). Orthorhombic. Crystals usually short prismatic pseudo-hexagonal twins. Also as imbedded grains and massive. Cleavage poor. H. 7 - 7.5. G. 2. 6. Luster vitreous. Color different shades of blue. Transparent to translucent.

Utah County Silver Lake district: Deer, Silver Creeks.

CORKITE

Basic sulfate-phosphate of lead and ferric iron, \(\text{PbFe}_3^2\cdot (\text{PO}_4) \cdot (\text{SO}_4) \cdot \text{(OH)}_6\). Hexagonal. H. 3.5. G. 4.3. Cleavage perfect. Color dark green, yellowish green to pale yellow. Luster vitreous to resinous. Occurs in gossans with limonite.

Beaver County Star district: Harrington-Hickory, Rebel, White Rock, Wild Bill mines.

CORNWALLITE

Hydrous basic arsenate of copper, \(\text{Cu}_5(\text{AsO}_4)\cdot \text{(OH)}_4 \cdot \text{H}_2\text{O}\). Monoclinic. Occurs as small botryoidal crusts with a radial fibrous structure. Somewhat resembles malachite. Fracture conchoidal. Slightly brittle, H. 4. 5. G. 4. 1. Color green to emerald green.

Juab County Tintic district: Centennial Eureka mine.

Tooele County Gold Hill district: Gold Hill (U. S.) mine.

CORONADITE

Manganese lead oxide, \(\text{MnPbMn}_6\text{O}_{14}\cdot \text{H}_2\text{O}\). Tetragonal. Massive, in botryoidal crusts with fibrous structure. H. 4½-5. G. 5.44. Luster dull. Color dark gray to black. Streak brownish black.

Utah County East Tintic district: Trixie mine.

CORUNDUM


Millard County South end of Sevier Lake.

Sevier County Pine Canyon, Black Hawk claims.

San Juan County Moses Rock dike.

CORVUSITE

Hydrous oxide of vanadium, \(\text{V}_2\text{O}_4 \cdot 6\text{V}_2\text{O}_3 \cdot \text{nH}_2\text{O}\). Massive. H. 2.5-3. G. 2.8. Fracture conchoidal. Color and streak blue - black to brown. Opaque.

Emery County San Juan district: North Mesa Nos. 1, 2, and 5 mines. San Rafael district: Calyx, Rex no. 2, Temple Mountain mines, Temple Rock, South Temple Wash.

Grand County La Sal district: Jack claim; Thompsons district: Parco no. 23, Juniper mines.

San Juan County Elk Ridge: Notch Nos. 5 and 6 mines; La Sal Quadrangle: Black Hat, Evening Star, Firefly-Pigmay, Hesperus, Little Peter, Valley View, Yellow Bird mines; Monument Valley district: Mitten no. 1 mine; Paradox Valley district: Grey Dawn, Vadadium Queen mines.

COSALITE


Beaver County Pruess district: Black Bird, Cactus mines; San Francisco district: Horn Silver mine.

COTUNNITE

Lead chloride, \(\text{PbCl}_2\). Orthorhombic. Crystals often flattened and elongated. Also massive, granular. H. 2. 5. G. 5. 8. Cleavage good. Fracture subconchoidal. Slightly sectile. Luster adamantine, silky, pearly. Colorless to white, also yellowish or greenish.

Juab County Tintic district.

COVELLITE


Beaver County Beaver Lake district: Beaver-Harrison, OK mines; San Francisco district: Horn Silver mine. Box Elder County Ashbrook district: Vipont mine.

Emery County San Rafael district: Delta, Dexter Group mines.

Juab County Fish Springs district: Carnation, Emma, Galena, Utah mines; Tintic district: Grand Central, Iron Blossom mines.

Millard County Church Hills: Stevens prospect.
**Piute County** Ohio district: Tunnel Extension No. 2 mine.

**Salt Lake County** Big Cottonwood district: Cardiff mine; Bingham district: Highland Boy, Northern Chief, Yampa mines.

**San Juan County** Big Indian district: Big Indian Copper mine; La Sal Mountains; Monticello district: Copper Queen mine; Paradox Valley district: Grey Dawn mine; Red Canyon district; White Canyon district: Happy Jack mine, White Canyon district: Blue Lizard, Hideout, White Canyon No. 1, W. N. mines.

**Summit County** Park City district: Park City Consolidated mine.

**Tooele County** Dugway district: Bertha, Pride of the West mines; Gold Hill district: Cane Springs, Copper Bloom, Ida Lull, Reaper mines; Ophir district: Dry Canyon area - Kearnsarge mine.

**Crandallite**

Hydrous basic phosphate of calcium and aluminum, CaAl₃(PO₄)₂(OH)₅·H₂O. Hexagonal. Rarely as minute trigonal prisms. Usually compact or fibrous masses. H. 5. G. 2.8. Cleavage good. Luster vitreous. Color yellow to yellowish white, white, gray.

**Juab County** Tintic district: Brooklyn mine.

**Utah County** Amatrice Hill.

**Cryptocrystalline Quartz**

Silicon dioxide, SiO₂. Cryptocrystalline. Often mammilary, massive. Fibrous and granular varieties. H. 6.7. G. 2.6. Luster dull, waxy, vitreous. Transparent to translucent, some opaque. Color white, gray, blue, brown, yellow, green, red, black. The main varieties found in Utah are: Chalcedony, the common variety has a waxy luster, color gray, blue, brown or white. Agate, or variegated chalcedony, is more colorful and is found in many gravels, veins, and replacements. Distinctive agate patterns are the mosslike patterns in moss agate; distinct angular bands are characteristic of fortification agate; feathery-shaped impurities are typical of plume agate. Jasper, a granular opaque variety of cryptocrystalline quartz is red, and less commonly yellow, blue or green. Petrified wood is a term loosely applied to wood replaced by silica; the term silicified wood is preferred. Most silicified wood in Utah occurs in the Triassic Petrified Forest and Shinarump Members of the Chinle Formation. Dinosaur bone is commonly silicified. Most bone occurs in the Jurassic Brushy Basin Member of the Morrison Formation. Chert, a granular variety, is common in Upper Paleozoic strata, where it occurs as bands, lenses, concretions, and irregular-shaped masses. The Mississippian Deseret, Humbug, Gardner, Madison, and Pine Canyon strata contain abundant light-gray to brown and black chert. The Pennsylvanian Oquirrh Formation contains creamy, and gray to black chert. The Permian Park City Group has abundant purplish black, gray to black, and reddish brown chert. Beaver County Blue Valley (black agate with blue bands); Beaver Lake district, San Francisco district, and Rock Corral area (chert, chalcedony).

**Emery County** Castle Dale, Castle Valley, Cedar Mountain, Green River, Last Chance Desert, San Rafael River, San Rafael district, and Woodside areas (agate, chalcedony, chert, jasper, silicified bone and wood).

Garfield County Moss Agate Hills near Panguitch (moss agate); Circle Cliffs, and Escalante areas (agate, silicified bone and wood).

Grand County Agate Switch, and Cisco areas (agate, chalcedony, jasper); Moab, and Thompsons areas (agate, chalcedony, jasper, silicified bone and wood); Little Grand district (chert); Miners Basin district (chalcedony). Iron County Cedar Breaks area (red and moss agate); Antelope Range, and Newcastle areas (chalcedony geodes); Iron Springs district (chalcedony). Juab County Detroit district, Keg Mountains, San Pitch Mountains, and Thomas Range areas (agate); Jerico (moss agate, plume agate, jasper); Thirteen miles south of Levan (fortification agate); Detroit district, Dugway Range, Mt. Nebo district, Thomas Range, Tintic district,
Topaz Mountain, San Pitch Mountains, and West Tintic district areas (chalcedony, jasper).

Kane County Kanab (silicified wood); Kitchen Corral Canyon (chalcedony); Orderville (agate, silicified wood).

Millard County Detroit district (chalcedony, jasper).

Rich County Bear River Range (jasper).

San Juan County White Canyon district (chalcedony).

Sevier County Glenwood, Henry district areas (chalcedony).

Tooele County Amatrice Hill, Deep Creek Mountains, and Gold Hill district areas (agate, chalcedony); Dugway Mountains (agate geodes); Blue Bell district, Mercur district, and Ophir district areas (jasper).

Utah County Two miles west of Alpine (jasper); East Tintic district, North Tintic district, and Utah district areas (jasper); Wasatch Mountains (chert).

Washington County Beaver Dam Wash, and Castle Cliffs areas (agate, silicified wood), central (chalcedony in basalts); Silver Reef district (jasper, silicified wood).

Wayne County Fruita, Hanks ville and Torrey areas (agate, jasper, silicified bone and wood).

CRYPTOMELANE


Utah County East Tintic district: Burgin mine. Lehi district: West Slope area - Wildcat mine.

CUBANITE


Salt Lake County Bingham district: Dixon, Winnamuck mines.

Utah County East Tintic district: North Lily mine.

CUPRITE


Beaver County Beaver Lake district: Skylark mine; Bradshaw district: Cave mine; San Francisco district: Imperial mine.

Box Elder County Ashbrook district: Vipont mine; Lucin district: Copper Mountain mine.

Cache County Logan area.

Davis County Farmington district: Morning Star group.

Juab County Detroit district: Charm, Copperhead, E. P. H., Ibex mines; Mt. Nebo district: Eva mine; Tintic district: Boss Tweed, Carissa, Centennial Eureka mines.

Kane County Paria Mining Company mine.

Millard County Detroit district: Almond, Blue Bell, Major Drum mines.

Morgan County Morgan district: Morgan Crescent mine.

Salt Lake County Big Cottonwood district: Copper King mine; Bingham district: Galena, Old Jordan, Highland Boy, Yampa mines.

San Juan County Big Indian district: Big Indian Copper mine; Lisbon Valley: Climax nos. 1-2, Lisbon Copper mines.

Summit County Park City district: Daly-Jude mine.

Tooele County Dugway district: Black Dragon, Buckhorn, Four Metals mines, Kellys Hole; Gold Hill district: Pole Star Copper Company mine; Ophir district: Ophir Hill area - Hidden Treasure, Sacramento mines.

Utah County East Tintic district; Santaquin district: Sally Ann prospect.

Washington County Silver Reef district: Tutsagubet district: Apex (Dixie) mine.

CUPROADAMITE (See ADAMITE)

CUPROBISMUTITE

Copper bismuth sulfide, Cu6Bi8S15. Monoclinic. Similar to but not dimorphous with emplectite. G. 6.35. Occurs as small bladed intergrowths.

Pitte County Ohio district: Tunnel Extension No. 2 mine.

CUPRODESCLOIZITE (See DESCLOIZITE)

CUPROGOSLARITE


Utah County East Tintic district.

CUPROPLUMBITE (See BALYDONITE)

CUPROSCHHEELITE (See CUPROTUNGSTITE)

CUPROSKLODOWSKITE
Hydrous basic copper uranium silicate, Cu(UO$_2$)$_2$·(SiO$_3$)$_2$(OH)$_2$·5H$_2$O. Orthorhombic. Minute prismatic or acicular crystals. Usually grouped in radial clusters, also as thin films and botryoidal crusts. Cleavage good. H. 3 - 4. G. 3.5. Color yellowish green, grass green. Luster silky, pearly to dull. San Juan County Elk Ridge: North Nos. 1 and 4 mines; White Canyon district: Frey no. 4, Posey mines.

**CUPROTUNGSITE**


**CYANOTRICHITE**


**CYRTOLITE (See ZIRCON)**

**DAHLLITE (See CARBONATE APATITE)**

**DAMOURITE**


**DANBURITE**


**DAUBREITE**


**DAVISONITE**

Hydrous basic phosphate of calcium and aluminum, perhaps Ca$_3$Al(PO$_4$)$_2$(OH)$_3$·H$_2$O. Possibly hexagonal. Occurs as botryoidal or spherulitic crusts. Cleavage perfect basal. H. 4.5. G. 2.85. Color white. Utah County Clay Canyon.

**DAWSONITE**


**DEHRNITE**

Basic calcium sodium potassium phosphate, (Ca,Na,K)$_5$(PO$_4$,CO$_3$)$_3$(OH). Hexagonal. Occurs as botryoidal or spherulitic crusts composed of fibrous to bladed crystals; also as minute hexagonal prisms. H. 5. G. 3. Cleavage perfect basal. Colorless to pale green, greenish white, grayish. Luster Weakly vitreous. Utah County Clay Canyon.

**DELESSITE**


**DETAITE**

Hydrous basic phosphate of calcium and aluminum, Ca(Al$_2$Ca)(PO$_4$)$_2$(OH)$_4$·2H$_2$O. Orthorhombic. As minute crystals; also as cherty or chalky crusts of matted fibers. Cleavage good. H. 5. G. 2.9. Color gray to lavender, pale blue; also canary yellow. Utah County Clay Canyon.

**DENNISONITE (See DAVISONITE)**

**DESCLOIZITE**

Grand County Pack Creek.
Iron County Escalante district: Escalante mine.
Tooele County Gold Hill district: New Baltimore mine.

DIAODOCHITE


Emery County San Rafael district: Dexter group.

DIASPHERE


Beaver County Beaver Lake district.
Box Elder County Ashbrook district.

DICHROITE (See CORDIERITE)

DICKITE


Utah County East Tintic district.

DIGENITE


Salt Lake County Bingham district: Bingham Copper Pit.

DIOPSIDE

Calcium magnesium silicate, CaMgSi$_2$O$_6$. Monoclinic. In prismatic crystals; also granular massive, columnar and lamellar. H. 5-6. G. 3.2. Cleavage prismatic imperfect. Luster vitreous. Color white to light green. Characteristically found as a contact metamorphic mineral in limestone.

Beaver County Beaver Lake district: Skylark mine; Rocky district: Bawana mine, Old Hickory mine; San Francisco district: Beaver Carbonate mine; Star district: Lady Bryan, Wild Bill mines.

Iron County Iron Springs district: Granite Mountain, Iron Mountain.

Millard County House Range: Amasa Valley, Horse-shoe, Mt. Baldy, New Klondike, Notch Peak, Pine Peak, Pinke Peak, Rainbow, South, South Pit, Sidesprings mines.

Salt Lake County Little Cottonwood district: Alta and Clayton Peak stocks along contact.

Sevier County Henry district: Trinity prospect.

Tooele County Gold Hill district: Alvarado, Bonnemort, Cane Springs, Centennial and Enterprise, Copperopolis, Frankie, Gold Bond, Ida Lull mines; Ophir district: Ophir Hill area Cliff, Hidden Treasure, Ophir Hill Consolidated, Ophir Coalition mines; Rush Valley district: Honeine mine.

DOLOMITE

Calcium magnesium carbonate, CaMg(CO$_3$)$_2$. Hexagonal. Habit rhombohedral, the crystal faces commonly curved. Also massive, coarse to fine granular. H. 3.5. G. 2.8. Cleavage rhombohedral perfect. Brittle. Luster vitreous to pearly. Colorless, White, yellowish brown, pink, rose.

Emery County San Rafael district: Temple Mountain.
Juab County Mt. Nebo district: Eva mine; Tintic district: Sioux mine.

Millard County Cricket Mountains.

Summit County Park City district: Park City Consolidated mine.

Tooele County Gold Hill district: Ophir district: Ophir Hill area.

Uintah County Sun Oil Company South Ouray well
Utah County East Tintic district: Provo district: Monarch mine.

DOLORESITE


San Juan County Big Indian district: Big Buck, Cal Uranium, Homestake, La Sal, Mi Vida, Radon, Rattlesnake mines.

DONKEYITE

**DUFRENOYSITE**


**DUMORTIERITE**


**DYSCRASITE**


**EARDLEYITE**

Status uncertain, composition indefinite, possibly a nickelian smithsonite. Color green to pale green. Associated with calcite, smithsonite, and quartz in small veins and replacements. Utah County Wells Canyon.

**EITELITE**

Sodium magnesium carbonate, Na$_2$Mg(CO$_3$)$_2$. Hexagonal. Occurs as tiny crystals a few millimeters in diameter. Good basal cleavage. Authigenic mineral. Found in cores and cuttings from the Green River Formation. Duchesne County Green River Formation; Sinclair Mortenson well.

**ELATERITE** (See WURTZILITE)

**ELPIDITE**

Orthorhombic. Thin prismatic crystals; or fine fibrous fan-shaped aggregates. H. 5. G. 2.5-2.6. Hydrous sodium zirconium silicate, Na$_2$ZrSi$_6$O$_{15}$·3H$_2$O. An authigenic mineral, found in the Green River Formation. Uintah County Sun Oil Company South Ouray well.

**EMBOLITE**


**EMPLECTITE**


**ENARGITE**


**ENDELLITE**
Hydrous aluminum silicate, $\text{Al}_2\text{Si}_2\text{O}_5(\text{OH})_4 \cdot 4\text{H}_2\text{O}$. Monoclinic. Usually in claylike masses, either compact or friable. Perfect cleavage. H. 2. G. 2. 6. Color usually white. Hydrothermal alteration product.

Utah County East Tintic district: Larson clay pits, North Lily mine; Fox Hills.

ENGLISHITE

Hydrous basic phosphate of potassium, calcium, and aluminum of uncertain formula, perhaps $\text{K}_2\text{Ca}_4\text{Al}_8(\text{PO}_4)_8(\text{OH})_{10} \cdot 9\text{H}_2\text{O}$. Probably monoclinic. Occurs as layers and aggregates of subparallel plates. Cleavage perfect, micaceous. Flexible. H. 3. G. 2. 6. Colorless and transparent. Luster vitreous, pearly.

Utah County Clay Canyon.

ENSTATITE


Juab County West Tintic district.

Tooele County Gold Hill district.

EPHESEITE


Salt Lake County Big Cottonwood district: Big Cottonwood, Mountain Lake mines.

EPIDESMINE

Hydrous calcium sodium aluminum silicate, $(\text{CaNa}_3\text{K})_3\text{Al}_5(\text{Al}, \text{Si})_\text{Si}_14\text{O}_{40} \cdot 15\text{H}_2\text{O}$. Orthorhombic. Occurs in minute crystals. G. 2. 2. Cleavage good. Colorless to yellow. Found in lava flows.

Tooele County Rush Valley district: Soldier Creek.

EPIDOTE


Beaver County Bradshaw district: 2 R’s group; Granite district: Big Pass, Burnt Hollow, Contact, Garnet, Molly, Oak, Oak Basin, Rattler, Scheelite, Ward groups; Lincoln district: Star district: Lady Bryan mine.

Box Elder County Grouse Creek Range; Rosebud district.

Davis County Antelope Island.

Garfield County Henry Mountains: Bromide, Oro mines.

Juab County West Tintic district: Iron King, Lockheed Iron, Tintic Western mines.

Salt Lake County Big Cottonwood district: Mountain Lake mine; Little Cottonwood district: Patsey Marley mine.

Sevier County Henry district: Trinity prospect.

Summit County Park City district.

Tooele County Gold Hill district: Doctor, Fraction Frankie, Gold Bond, Lucy L., Reaper mines; Ophir district: Ophir Hill area - Cliff, Hidden Treasure, Ophir Hill Consolidated, Ophir Coalition mines; Rush Valley district: Honerine mine.

Utah County Silver Lake district: Milkmaid mine, Silver Creek.

Weber County Sierra Madre district.

EPSOMITE


Beaver County Gordon district: Sulphurdale; San Francisco district: Frisco Contact mine.

Emery County Castle Dale; Castle Valley.

Garfield County Coyote Creek district: Hampton mine.

Sanpete County Manti.

Utah County East Tintic district.

ERINITE


Juab County Tintic district: American Eagle, Centennial Eureka, Mammoth mines.

ERUBESCITE (See BORNITE)

ERYTHRONE

Hydrous cobalt arsenate, $\text{Co}_3(\text{AsO}_4)_2 \cdot 8\text{H}_2\text{O}$. Monoclinic. Prismatic crystals; often as radial or stellate groups.
San Juan County Elk Ridge: Avalanche No. 13, King Edward mines; White Canyon district: Happy Jack mine.

ESSONITE (See GARNET)

ETTRINGITE

Hydrous calcium aluminum sulfate, \( \text{Ca}_6\text{Al}_2(\text{SO}_4)_3\cdot(\text{OH})_{12}\cdot26\text{H}_2\text{O} \). Hexagonal. Small prismatic crystals. H. 2-2½. G. 1.77. Colorless. Transparent, becoming white on dehydration. Beaver County Rocky district: Old Hickory mine.

EUCARITE


FAMATINITE


FARATSIHITE


FERBERITE


FERNANDINITE

Hydrous calcium vanadyl vanadate, \( \text{CaO} \cdot V_2\text{O}_4 \cdot 5\text{V}_2\text{O}_5 \cdot 14\text{H}_2\text{O} \). Massive, cryptocrystalline to fibrous; rarely in rectangular plates. Color dull green. Emery County San Rafael district: Temple Mountain.

FERRIMOLYBDITE

Hydrous ferric molybdate, probably \( \text{Fe}_2(\text{MoO}_4)_3 \cdot 8\text{H}_2\text{O} \). Probably orthorhombic. Massive, and as fibrous crusts or tufted and radial fibrous aggregates. Also as earthy powder or coating. Very soft. G. 3. Luster silky to earthy. Color canary yellow to greenish yellow. Streak pale yellow. Iron County State Line district. Salt Lake County Little Cottonwood district. Tooele County Gold Hill district.

FERRISYMPLESITE

Hydrous iron arsenate, \( \text{Fe}_3(\text{AsO}_4)_2(\text{OH})_3 \cdot 5\text{H}_2\text{O} \). Small irregular masses. Luster resinous. Color amber-brown. H. 2½. G. 3. Tooele County Gold Hill district: Gold Hill (U. S.) mine.

FERROGOSLARITE

Hydrous zinc iron sulfate, \( (\text{Zn},\text{Fe})\text{SO}_4 \cdot 7\text{H}_2\text{O} \). Orthorhombic. Usually in crusts or stalagmitic, with fibrous structure. Massive, fibrous, or granular. H. 2½. G. 1.98. Color green to brown. Utah County East Tintic district.

FERROLUDWIGITE (See LUDWIGITE)

FERROPALLIDITE

(See SZOMOLNOKITE)

FERROSELITE


FERVANITE

Hydrous ferric vanadate, \( \text{Fe}_4\text{V}_4\text{O}_{16} \cdot 5\text{H}_2\text{O} \). Probably

**Grand County** Polar Mesa district.

**FIBROFERRITE**


**Emery County** Green River: 30 miles southwest; San Rafael district: Dexter group.

**FLUORAPATITE**


**Daggett County** Uinta Mountains.

**Duchesne County** Green River Formation; Uinta Mountains.

**Juab County** Deep Creek Mountains: Apex, Mary, Trout Creek mines; Deseret district, Dugway Range; Fish Springs district: Carnation, Emma, Galena, Utah mines; Honeycomb Hills; Indian Creek; Thomas Range: Autunite no. 8, Buena no. 1, Good Will, Yellow Chief mines; Spor Mountain: Bell Hill, Blowout, Claybank, Blue Chalk, Hogsback, Northend, Rainbow, Roadside, Dell no. 1, Dell no. 5, Evening Star, Florida, Florida no. 5, Fluorine Queen, Fluorine Queen no. 4, Green Crystal, Harrisite, Hilltop, Lost Sheep, Lost Soul, Lucky Louie, Monella, Oversight, Rainbow no. 2, Thursday mines; Topaz Mountain; Trout Creek: West Tintic district: 88, 1903 mines.

**Millard County** Gordon district: Rain Bow mine; South Pavnant Range: Cove Fort, Dog Valley.

**Piute County** Gold Mountain district: Annie Laurie, Keystone, Sevier mines; Marysvale district: Buddy, Bulion, Monarch, Fluorite, Freedom no. 1-2, LaVita, Prospector no. 1 mines; Mt. Baldy district: Deer Trail mine; Ohio district: Bully Boy, Great Western, Shamrock and Webster mines.

**San Juan County** Big Indian district: Mi Vida mine.

**Sevier County** Henry district: La Veta prospect.

**Summit County** Park City district: Silver King, Woodsside mines.

**Tooele County** Columbia district: Benmore, Sharp mines; Dutch Mountain: Dugway district: Black Maria, Bryan, Buckhorn, Confidence, Eureka, Four Metals, Golconda, Pride of the West, Kellys Hole, Lauris, Rainbow, Rattler mines; East Erickson district: Copper Jack, Flying Dutchman, Hard-to-Beat Canyon, Sheeprock, Silver King, Silver Shield mines; Erickson district: Black Jack, Black Rock, Blain, Deer Trail, Indian Boy, May Farmer, Good Hope mines; Gold Hill district: Gold Bond mine; Granite Mountain district: Blue Bell, Cannon Tank Canyon, Desert, El Dorado, Mountain Queen mines; Ophir district: Lion Hill area - Buffalo mine; Ophir Hill area - Ophir Coalition mine; Rush Valley district: Honerine mine; Wild Cat Mountains: Silver Queen mine.

**Utah County** Santsaquon district: Black Balsam vein. **Weber County** Cold Water Canyon; Sierra Madre district: Eldorado property; Weber district: Norman mine.

**FORSTERITE** (See OLVINE)
Magnesium variety of olivine, Mg$_2$SiO$_4$. Orthorhombic. In small equidimensional or tabular crystals. Usually in imbedded grains or in granular masses. H. 6 - 7. G. 3. 2. Fracture conchoidal. Luster vitreous. Color olive to grayish green and brown, also white and yellow.

Salt Lake County Big Cottonwood district: Big Cottonwood, Mountain Lake, Steamboat Tunnel mines; Little Cottonwood district: Alta mine, Alta and Clayton Peak stocks contact zone.

FOSHAGITE


Salt Lake County Bingham district: Bingham Copper Pit.

FOURMARIERITE


Emery County San Rafael district: Delta, Lucky Strike, Lucky Strike no. 2 mines.

FRANCOLITE (See FLUORAPATITE)

FREIBERGITE


Utah County East Tintic district.

GALENA


Beaver County Antelope district; Beaver Lake district: Galena mine; Brashaw district: Cave, Heela, Nip and Tuck mines; Granite district: Beaver View, Big Pass, Burnt Hollow mines; Indian Peak district; Lincoln district: Creole, Lincoln mines; McCarrey district; Newton district; Indian Creek; Pine Grove district: Pine Grove Associates mine; Pruess district: Gold Reef, Indian Queen mines; San Francisco district: Beaver Carbonate, Cupric, Horn Silver, Imperial, King David, Michigan, Peacock Copper, Washington mines; Star district: Dotson, Hoosier Boy, Hub, Moscow, Red Warrior, Vicksburg, White Rock, Wild Bill mines.

Box Elder County Ashbrook district: Vipont mine; Box Elder district; Lucin district: Cenepah Tunnel, Copper Mountain, Tectoma Hill mines; Newfoundland district; Park Valley district: Century, Susannah mines; Rosebud district: A & W, Magnitude, Mogul mines; Willard district: Consolidated group, Louise Consolidated mine, Ogden Boilermakers, Silver Queen mines.

Cache County Hyrum area: Lucky Star, Tip Top claims; La Plata area: La Plata, Sunrise claims; Logan area: Paradise district: Richmond district.

Davis County Wandering Jew mine.

Emery County Emery district; San Rafael district: Calyx, Delta, Dirty Devil, Lucky Strike, Temple Mountain mines, Dexter group, Lucky Strike no. 2 mines.

Grand County Richardson district; Ryan Creek Scheelite prospect.


Juab County Deep Creek Mountains: Johnson Canyon prospects; Deseret district: Miller mine; Detroit district: Utah mine; Juab district; Monan district; Mt. Nebo district: Ajaxx no. 2, Big Nebo, Blackett Tunnel, Eva, Freddie, Highland, Sangaquin Chief, Sangaquin King, Snydicate mines; North Tintic district: Tintic Prince mine; Tintic district: Black Dragon, Beck Tunnel, Bullion Beck, Centennial Eureka, Chief Consolidated, Colorado, Dragon, Eagle and Blue Bell, Eureka Hill, Gemini, Godiva, Grand Central, Humbug, Iron Blossom, Lower Mammoth, Mammoth, May Day, Sioux, Swansea, Victoria mines; Spring Creek district: Queen of Sheba mine; West Tintic district: 88, 1903, Pyramid, Scotia, War Eagle mines.

Millard County Leamington district: Arbroath, Leamington Mining Company. Wood Canyon, Yellowstone mines; Saw Back district.

Morgan County Argenta district: Carbonate Hill, Carbonate Gem mines.

Platte County Gold Mountain district: Annie Laurie mine; Mt. Baldy district: Crystal, Deer Trail, Pluto mines; Ohio district: Bully Boy and Webster, Cascade, Copper Belt, Great Western, Iris, Shamrock mines.

Rich County Swan Creek district: Victoria prospect. Salt Lake County Big Cottonwood district: Alta Tunnel and Transportation Company, American Metals, Big Cottonwood, Carbonate, Cardiff, Columbus-Rexall, Howell-Baby McKee, Kennebec, Lulu, Maxfield, Prince of Wales, Reed and Benson, Silver Mountain, Tar Baby, Woodlawn mines; Bingham district: Boston Consolidated, Brooklyn, Burning Moscow, Butterfield, Caledonia, Colorado, Conger, Dalton and Lark, Dixon, Eagle
Bird, Fortune, Frisco, Galena, Highland Boy, Jersey Blue, Midland, Montezuma, Neptune, Old Jordan, Old Telegraph, Petro, Phoenix, Queen, Queen Lode, Red Wing, Silver Shield, Tiewaukee, U. S. and Lark, Winnamuck, Yampa, York, Yosemite mines; Hot Springs district; Little Cottonwood district: Albion, Cabin, Columbus Consolidated and Wasatch Drainage Tunnel, Columbus-Rexal, Dwyer, Emma, Flagstaff, Little Emma, Michigan - Utah, Peruvian Consolidated, South Hecla, Superior mines.

San Juan County: Big Indian district: Mi Vida mine; Elk Ridge: Notch Nos. 5 and 6, Payday mines; La Sal Quadrangle: Firefly-Pigmay mine; Monticello district: Blue Bird, Copper Queen, Danish Girl, Gold Queen mines; Paradox Valley district: Grey Dawn mine; White Canyon district: Happy Jack mine.

Sanpete County: Dry Canyon

Sevier County: Henry district: Trinity prospect; Salina Creek district: Ball, Lead Hill mines.

Summit County: Marble district; Park City district: American Flag, California, Comstock, Creole, Daly, Daly West, Jupiter, Kearns - Keith, Little Bell, Mayflower Nail Driver, New York, Ontario, Scottish Chief, Silver King, Silver King Consolidated, Woodside mines.

Tooele County: Bingham district: May Flower mine; Blue Bell district: Bennion Canyon, Black Hawk, Bogan, Hidden Splendor, Morgan mines; Columbia district: Sharp, Benmore, Sultana mines; Deep Creek Mountains: Cyclone, Devils Pit, Eagles Nest, Gold Star, Leap Year, Midland, Mono, Monte del Rey, North Pass, Oro del Rey, Overland, Silver Queen, Willow Springs mines, Dutch Mountain; Dugway district: Bertha, Bryan, Buckhorn, Bullion Canyon, Four Metals, Francis, Kellys Hole, Lauris, Raymond - Bald Eagle mines; East Erickson district: Dutch Peak, Indianapolis, Tintic-Delaware mines; Erickson district: Black Joe, Black Rock, Blain, Deer Trail, Indian Boy, May Farmer, Good Hope, Indian Chief, Last Hope no. 3, Utonia mines; Free Coinage district; Gold Hill district: Alvarado, Bonanza, Cash Boy, Christmas Mining Company Climax, Copper Queen-Midland Mining Company, Cyclone, Garrison Monster, Gold Belt, Gold Hill (U. S.), Gold Hill Standard, Monoco, New Baltimore, Reaper, Red Jacket, Rube, Silver and Gold Mining Company, Spotted Fawn, Success, Unadine mines; Granite Mountain district: Blue Bell, Cannon Tank Canyon, Desert, El Dorado, Mountain Queen mines; Grantsville district; Johnson Pass; Lakeside district; Mercury district: Mineral Hill mine; North Tintic district: New Bullion, Scranton mines; Ophir district: Dry Canyon area - Kearsarge, Mono, Queen of the Hills, Surprise mines; Lion Hill area - Buffalo mine; Ophir Hill area - Admiral Dewey, Cliff, Hidden Treasure, Ophir Hill Consolidated, Ophir Coalition, Sacramento mines; Osceola district; Rush Valley district: Argent, Ben Harrison, Calumet, Galena King, Honerine, Mescaline, Muerbrook, Salvation - Hercules, Tip Top mines; Silver Island district: Carrie Mack property; Tooele district; Willow Springs district.

Utah County: Bassett mine.

Utah County: Alpine district: Alpine-Galena, Lucky Chance mines; American Fork district: Bay State, Bog, Dutchman, Mary Ellen, Live Yankee, Miller, Pacific, Pittsburgh, Silver Dipper, Water Fall, Yankee mines; East Tintic district: Apex Standard, Burgin, Eureka Bullion, Eureka Lily, Eureka Standard, Iron King, North Lily, Tintic Standard, Tintie mines; North Tintic district: Blowhole Hill, Lehi Tintic, Tintic Empire, Tintic Paymaster mines; Payson district: Nelson, Syndicate mines; Provo district: Monarch mine; Santanquin district: Union Chief mine; Silver Lake district: Milkmaid, Ontario mines.

Wasatch County: Blue Ledge district: Glencoe, Mayflower, McHenry, Valeo mines; Elkhorn district: Crawford, Nelson and Queen mines; Snake Creek district: Revelator, West Quincy mines.

Wayne County: Miners Mountain district.

Weber County: Fremont Island district; Sierra Madre district: Eldorado property; Weber district: New Azurite, Standard Mining Company mines.

GARNET GROUP

The group includes a number of important subspecies which conform to the general formula $A_3B_2(SiO_4)_3$. (A = calcium, magnesium, ferrous iron, or divalent manganese; B = aluminum, ferric iron, titanium, or chromium). Isometric. Common forms are dodecahedrons and trapezohedrons. Also in ground grains, massive granular, coarse or fine. H. 6. 5-7.5. G. 3.5-4.3. Luster vitreous to resinous. Color varying with composition; mostly red, brown, yellow, white, green, black. Transparent to translucent. Grossularite is the most common garnet in Utah and occurs in contact metamorphic zones in crystalline limestones.

Beaver County: Beaver Lake district: Bat Ridge, Skylark mine; Madshard district: 2 R's group; Granite district: Big Pass, Contact, Molly, Oak, Oak Basin, Rattler, Scheelite, Ward groups; Lincoln district: Creole mine; Pine Grove district: Pine Grove Associates mine; Pruss district: Cactus Gulch, Copper Gulch; Rocky district: Bawana, Copper Ranch, Old Hickory mines; San Francisco district: Cupric mine; Star district: Commonwealth, Copper King, Kemple, Progressive, St. Mary's, Wild Bill mines; Washington district; Orizaba Consolidated mine, Lucero claim.

Box Elder County: Dove Creek; Rosebud district.
**Minerals and Mineral Localities of Utah,** Kenneth C. Bullock

**Davis County** Antelope Island.

**Iron County** Gold Springs district: Homestake mine.

**Juab County** Dugway Range; Thomas Range: Topaz Mountain; Tintic district: Carissa mine; Spring Creek district: Queen of Sheba mine; West Tintic district: Iron King, Tintic Western mines.

**Millard County** House Range: Amasa Valley, Horseshoe, Mt. Baldy, New Klondike, Pine Peak, Pinke Peak, Rainbow, South, South Pit, Sidesprings mines, Notch Peak, Painter Springs; Saw Back district.

**Piute County** Gold Mountain district.

**Salt Lake County** Big Cottonwood district: Mountain Lake mine; Bingham district; Little Cottonwood district: Alta, South Hecla mines, Alta and Clayton Peak stocks contact zone.

**San Juan County** Chinle Wash; Comb Ridge; Moses Rock; Mule Ear; Navjo Reservation.

**Sevier County** Henry district: Trinity prospect.

**Summit County** Bonanza Flat; Park City district: Jupiter mine.

**Tooele County** Deep Creek Mountains: Midas mine; Dugway district; Gold Hill district: Alvarado, Calaveras, Cane Springs, Copperopolis, Doctor, Fraction Lode, Frankie, Lucy L., Ida Lull mines; Granite Mountain district: Blue Bell mine; Ophir district: Ophir Hill area - Chicago, Hidden Treasure, Ophir Hill Consolidated, Ophir Coalition mines; Rush Valley district: Settlement Canyon, Soldier Creek.

**Utah County** Silver Lake district: Deer Creek, Milkmaid mine, Silver Creek.

**Wasatch County** Bonanza Flat; Snake Creek district.

**Weber County** Ogden Canyon; Sierra Madre district; Strongs Canyon.

**GARRELSITE**

Hydrous barium sodium boron silicate, $\text{Ba}_3\text{Na}_2\text{Si}_2\text{O}_7\cdot 13\text{OH}$. Monoclinic. Crystals have steep dipyramidal shape, faces striated. Colorless, but darkened by inclusions. Occurs as sparse crystals in the Green River Formation.

**Uintah County** Sun Oil Company South Ouray well.

**GEARKSUTITE**

Hydrous calcium aluminum fluoride, $\text{CaAl(OH)}_2\cdot \text{F}_2\cdot \text{H}_2\text{O}$. Probably monoclinic. Massive or nodular, earthy. Consists of very minute needles. H. 2. G. 2.7. Colorless to white. Luster dull.

**Piute County** Marysvale district: Freedom no. 2 mine.

**Utah County** East Tintic district.

**GEOCRONITE**


**Juab County** Tintic district: Colorado mine.

**Summit County** Park City district: Silver King mine.

**GEL-BERTRANDITE**

(See BERTRANDITE)

**GERSDORFFITE**


**San Juan County** White Canyon district: Happy Jack mine.

**GIBBSITE**


**Millard County** Church Hills: Stevens prospect.

**Tooele County** Oquirrh Mountains: Manning Canyon Shale; Stansbury Mountains: Manning Canyon Shale; Utah County Beverly Hills: Manning Canyon Shale; East Tintic district; Lake Mountain: Manning Canyon Shale; Lehi district: Manning Canyon Shale; Thorpe Hills: Manning Canyon Shale; Wasatch Mountains: Manning Canyon Shale.

**GLAUBERITE**


**Box Elder County** Shores of Great Salt Lake.
Davis County Shores of Great Salt Lake.
Salt Lake County Shores of Great Salt Lake.
Tooele County Shores of Great Salt Lake.

GLAUCONITE

Essentially a hydrous silicate of iron and potassium. 
\[(K,Na)\,(Al,Fe,Mg)_2\,(Al,Si)_4\,O_{10}(OH)_2\]. Monoclinic. H. 2. 
G. 2.4-2.9. Considerable variation in composition. 
Probably occurs in both colloidal and crystalline forms. 
Usually amorphous. Resembles chlorite. Color dull 
green. Found in ocean sediments near the continental 
shores. Found in the Cambrian Ladore Formation, and 
Jurassic Curtis Formation.

Daggett County Uinta Mountains.
Uintah County Eastern Uinta Mountains; Split Mountain; North of Vernal.

GOETHITE

Hydrogen iron oxide, \(HFeO_2\). Orthorhombic. Rarely in 
distinct crystals, often flattened. In acicular crystals. 
Also massive, reniform, stalactitic in radiating fibrous 
aggregates. Cleavage good. H. 5-5.5. G. 4.4. Luster 
adamanite to dull. Brittle. Color yellowish brown to 
dark brown. Streak yellowish brown. Occurs with 
limonite forming gossans in Utah.

Beaver County San Francisco district: Pruess district: 
Blackbird, Cactus mines.

Box Elder County Lucin district: Copper Mountain, 
Tecoma Hill mines.

Grand County Miners Basin district: High Ore mine.
Iron County State Line district.

Juab County Detroit district: Iron Blossom mine.

Piute County Marysville district: La Vita prospect, 
Silica Hills.

Salt Lake County Big Cottonwood district: Eclipse, 
Reed and Benson mines.

San Juan County White Canyon district: Happy Jack 
mine.

Utah County East Tintic district: Burgin mine.

GOLD

Native gold, Au. Isometric. Crystals rare. Commonly 
reticulated, dendritic, filiform, spongy. Also massive 
or as flattened grains or scales. H. 2.5-3. G. 19.3. Frac­
ture hackly. Very malleable and ductile. Color and 
streak gold-yellow when pure. Luster metallic. Opaque.

Beaver County Bradshaw district: Cave, Hecla, Jolly, 
Nip and Tuck mines; Fortuna district: Rocky Hollow; 
San Francisco district: Golden Reef, Michigan group 
mines; Granite district: Beaver View, Big Pass, Contact, 
Garnet group mines; Newton district: Indian Creek, 
Rob Roy mine; Pruess district: Gold Reef mine.

Box Elder County Ashbrook district: Vipont mine; 
Dove Creek; Lucin district: Copper Mountain, Tecoma 
Hill mines; Park Valley district: Century, Susannah 
mines; Promontory district: Lakeview mine; Rosebud 
district: Mogul mine, Red Buttes; Willard district: 
Overland claim.

Cache County Hyrum area: Moon claim.

Daggett County Red Creek: Yellow Canary uranium 
deposit.

Davis County Farmington district: Morning Star mine, 
Parish Canyon.

Emery County Emery district: southern part of County.

Garfield County Colorado River district: Dirty Devil 
River south to Lake Canyon; Henry Mountains: Bro­
mide, Crescent Creek, south flank of Mount Ellen, 
Cuprum, Oro mines.

Grand County Bald Mesa; Colorado River area: Dolores 
River south to Amasa Back; Miners Basin district: 
Dillon, M. I. F. mines, Placer Creek, Tornado deposit; 
Salt Valley; Wilson Mesa.

Iron County Gold Springs district: Aetna, Homestake, 
Independence, Jennie, Jumbo, Little Buck, Snowflake 
mires; Sand Springs; State Line district: Creole, Gold 
Dome, Johnny, Ofur, Phelps, Utah Spur mines.

Juab County Deep Creek Mountains: Gold Bond, 
Jumbo, Queen of Sheba mines; Detroit district: Charm, 
Copperhead, E. P. H., Ibex, Martha mines: Tintic 
district: Black Jack, Bullion Beck, Centennial, Empire, 
Eureka, Eureka Hill, Mammoth, May Day, Victoria 
mires; Trout Creek district; West Tintic district: Scotia, 
War Eagle mines.

Kane County Colorado River district; Paria River, 
Shinarump clay 15 miles north of state boundry.

Millard County House Range: Amasa Valley, Granite 
Canyon, Notch Peak; Leamington district: Yellowstone 
mire.

Morgan County Morgan district: Chicago-Utah, Iron 
King, Morgan Consolidated, Morgan Crescent, Red 
Eagle mines; Strawberry mine.

Piute County Deer Creek; Gold Mountain district: 
Annie Laurie, Mill Creek on Signal Peak, Sevier mines. 
Mt. Baldy district: Deer Trail, Pluto mines; Ohio district: 
Bully Boy and Webster, Cascade, Dalton, Pine Gulch 
Creek, Tunnel Extension No. 2, Wedge mines.

Salt Lake County Big Cottonwood district: New State 
mire; Bingham district: Bingham Copper Pit, Broad 
Gauge, Boston Consolidated, Burning Moscow, But­ter­ 
field, Caledonia, Commercial, Dalton and Lark, Dixon, 
Galena, Last Chance, Montezuma, Nast, Old Jordan, Old 
Telegraph, Parnell, Red Wing, U. S. and Lark, Winna­ 
muck, Yosemite mines; Bingham district: Bear Gulch, 
Bingham Canyon, Carr Fork; Little Cottonwood district:
Dwyer claims; Lower Placer district.

San Juan County Abajo Mountains: south flank; Bluff; Colorado River: San Juan River junction south to Lees Ferry; Golden Queen mine; La Sal Mountains; Monticello district: Blue Bird, Copper Queen, Danish Girl, Duckett, Gold Queen, Log Cabin mines; Point Lookout Placer; San Juan River: Moneuza Canyon west to Colorado River.

Summit County Park City district: Daly-Judge, Mayflower, New York, Silver King, Woodside mines.

Tooele County Columbia district: Sultana mine; Deep Creek Mountains: Devils Pit, Eagles Nest, Midland, Oro del Rey, Red Hill mines; Dugway district: Four Metals mine; East Erickson district: Indianapolis mine; Free Coinage district; Gold Hill district: Alvarado, Cane Springs, Copper Bloom, Lucy Midas, Reaper, Rube, Yellow Hammer mines; Granite Mountain district: Desert, El Dorado, Mountain Queen mines; Mercur district: Consolidate Mercur, Daisy, La Cigale, Golden Gate, Sacramento mines; Ophir district: Dry Canyon area - Surprise mine; Lion Hill area Buffalo, East Side, Empire, Iron, Monarch, Northern Light, Woodruff mines; Rush Valley district: Honerine mine; Wild Springs, Cane Creek, district; Sierra Madre district: King Solomon vein.

Utah County American Fork district: Yankee mine; East Tintic district: Apex Standard, Burgess, Eureka Bullion, Eureka Lily, Eureka Standard, Iron King, North Lily, Tintic Standard, Trixie mines; Payson district: Nelson mine; Silver Lake district: Deer Creek, Milkmaid, Ontario mines.

Wasatch County Blue Ledge district: Glencoe, McHenry, Mayflower, Valeo mines; Elkhorn district: Crawford, Nelson and Queen properties; Snake Creek district; West Quincy mine.

Washington County Bull Valley district.

Weber County Cold Water Canyon: Fremont Island district; Sierra Madre district: King Solomon vein.

GOLDICHITE


Emery County San Rafael district: Dexter group.

GORDONITE

Hydrous basic magnesium aluminum phosphate, MgAl₂(PO₄)₂(OH)₂·8H₂O. Triclinic. Usually in bundles which radiate outward in sheaf-like aggregates. H. 3.5. G. 2.2. Cleavage good. Fracture conchoideal. Brittle. Luster vitreous to pearly. Colorless to smoky white.

Utah County Clay Canyon.

GOSLARITE


Beaver County San Francisco district: Horn Silver mine.

Salt Lake County Bingham district: Dixon, Galena, Old Jordan, Winnamuck mines.

Summit County Park City district.

Utah County East Tintic district.

GOYAZITE


Utah County Clay Canyon.

GRANTSITE

Hydrous sodium calcium vanadate, Na₄Ca₂V₁₀O₂₂·8H₂O. Monoclinic. Occurs as aggregates of microscopic fibers or blades; botryoidal. H. soft. G. 2.9. Color dark olive green to greenish black. Luster silky.

Grand County Thompsons district: Parco no. 23 mine.

GRAPHITE


Tooele County Gold Hill district: Alvarado mine.

Utah County Silver Lake district: Deer, Silver Creeks.

GREENOCKITE


Beaver County Star district: Moscow mine.

San Juan County Big Indian district: Mi Vida mine;
White Canyon district: Happy Jack mine.  
Utah County East Tintic district: North Lily mine.

GROSSULARITE (See GARNET)

GUANO

Essentially a tricalcium phosphate. Found in areas frequented by birds, comprised chiefly of their excrement.  
Box Elder County Bird Island: Gunson Island.  
Millard County Tabernacle Mountain.

GUMMITE

No single formula attributed to these materials, essentially oxides of uranium, usually with Pb, Th, rare earths, and large amounts of water. Massive, dense. Also as crusts. H. 2.5-5. G. 3.9-6.4. Fracture conchoidal, uneven. Brittle. Luster greasy to vitreous, often resembles gum. Color yellow, orange, brown, black.  
Emery County San Rafael district: Delta mine.  
San Juan County Paradox Valley district: Grey Dawn mine.

GUNNINGITE

Utah County East Tintic district.

GYPSITE

Earthy mixture of gypsum with clay and sand. Found on playas.  
Millard County West of Fillmore, dunes twenty feet high.  
Tooele County Large dunes near Knolls.

GYPSUM

Hydrous calcium sulfate, CaSO₄·2H₂O. Monoclinic. Single crystals commonly simple in habit. Also granular massive, foliated, and rock forming. H. 2. G. 2.3. Cleavage perfect one direction, two imperfect. Flexible, not elastic. Luster vitreous to pearly. Colorless, white, gray, yellowish or brownish. Gypsum occurs as extensive beds of sedimentary origin, associated with anhydrite. In southeastern Utah found in the Paradox Member of the Hermosa Formation; in east-central Utah it occurs in the Carmel, Entrada, and Summerville Formations; in central Utah in the Arapieh Shale; in southwestern Utah in the Kaibab, Moenkopi, Carmel, and Curtis Formations; in northeastern Utah in the Thaynes and Carmel Formations. Huge selenite crystals have been found in caves in Wayne County, and other parts of the State.  
Beaver County Prues district: Blackbird, Cactus mines; San Francisco district: Horn Silver mine.  
Box Elder County Promontory district: Lakeview Mining properties.  
Duchesne County Lake Fork; Rock Creek.  
Emery County Cedar Mountain district: Fullers Bottom; Horn Silver Gulch; San Rafael district: Delta mine, Flat Top Mesa; San Rafael River: Tidwell Ranch.  
Garfield County Circle Cliffs: Acme, Black Widow, Blue Goose, Rocky Mountain, Steam Boat mines; Coyote Creek district: Hampton mine, Water Pocket Canyon.  
Grand County Agate Switch; Cane Creek: Texas Gulf Potash mine; Fisher Valley; Gypsum Hills; Moab Valley; Onion Creek; Polar Mesa district; Paradox Basin; Salt Valley; Seven Mile anticline; Thompsons area.  
Iron County Cedar Canyon; Kanarriaville.  
Juab County Mona district: San Pitch Mountains; Chicken Creek, Levan, Nephi, Salt Creek; Tintic district: Mammoth mine.  
Kane County Cannonville; Glendale; Johnson Creek; Kanab Creek; Kanab Creek; Kimball Valley; Orderville; Paria.  
Millard County Fillmore; Gordon district: Cove Creek, Black, Excelsoir, Maripose, New York, Philadelphia, Prince Albert, Sulphur King, Queen Victoria mines; Kanosh.  
Pinte County Gold Mountain district; Marysville district: Quick silver mine; Sevier County.  
Salt Lake County Shores of Great Salt Lake.  
San Juan County Gypsum Creek; Moab Valley; Monticello district; Paradox Basin; San Juan River; White Canyon district: Hapy Jack mine.  
Sanpete County Gunnison; Mayfield; Twelve Mile Canyon.  
Sevier County Glenwood; Henry district: Trinity prospect; Rock Candy Mountain; Sigurd.  
Summit County Park City district: Wabash property.  
Tooele County Dugway district: Bertha, Four Metals, Kellys Hole, Metal States, Surplus mines; Gold Hill district: Gold Hill (U. S.) mine; shores of Great Salt Lake; Knolls; Mercur district: Mercur mine; Ophir district: Ophir Hill area - Admiral Dewey prospect; Rush Valley district: Mescatine mine.  
Uintah County Steinaker Draw; Uteland Knoll district: Ouray; Whiterocks Canyon.  
Utah County Utah district: Alpha, Emerald, Lucky Boy, Queen of the West, Spalding, Trotter mines.  
Washington County Santa Clara district: Black Beauty
no. 1 claim; Silver Reef district; St. George; Toquerville; Virgin River.

Wayne County Caineville; Fremont River: South Wash; Fruita: Oyler mine; Last Chance Gulch; Muddy River.

GYRO

Hydrous basic calcium silicate, \( \text{Ca}_2\text{Si}_3\text{O}_7(\text{OH})_2 \cdot \text{H}_2\text{O} \). Hexagonal. A zeolite. Occurs in white concretions, lamellar, radiating structures. Basal cleavage. H. 3-4. G. 2.4.

Salt Lake County Bingham district: Bingham Copper Pit.

HALITE


Box Elder County Lucin district: Copper Mountain, Tecoma Hill mines.

Juab County San Pitch Mountains: Chicken Creek, Levan, Nephi, Salt Creek.

Piute County Marysvale district.

Salt Lake County Great Salt Lake.

San Juan County Moab Valley.

Sanpete County Gunnison; Twelve Mile Canyon.

Sevier County Glenwood; Redmond; Sigurd.

Tooele County Great Salt Lake; Great Salt Lake Flats; Salduro; Wendover.

Washington County Virgin River.

HALLOYSITE

Hydrous aluminum silicate, \( \text{Al}_2\text{Si}_2\text{O}_5(\text{OH})_4 \cdot 2\text{H}_2\text{O} \). Monoclinic. H. 1-2. G. 2.1. Fracture conchoidal. Luster pearly, waxy, dull. Color white, grayish, greenish, yellowish, bluish, reddish.

Box Elder County Lucin district: Copper Mountain, Tecoma Hill mines.

Juab County Tintic district: Dragon mine, Packard Peak.

Millard County Church Hills: Stevens prospect.

Piute County Marysvale district.

Summit County Park City district: Park-Bingham Tunnel.

Tooele County Blue Bell district: The Iron mine.

Utah County East Tintic district: Larsen clay pits; Fox Hills.

Wasatch County Keetley area.

Washington County Mineral Mountain: Beauty Knoll claims.

HALOTRICHITE

Hydrous sulfate of divalent iron, \( \text{FeAl}_2(\text{SO}_4)_4 \cdot 22\text{H}_2\text{O} \). Monoclinic. Occurs in silky fibrous forms, tufted. Also acicular. H. 1.5. G. 1.9. Cleavage poor. Fracture conchoidal. Brittle. Luster vitreous. Colorless to white, yellowish or greenish. Taste astringent.

Emery County San Rafael district: Dexter group.

Uintah County Uteland Knoll district: Ouray.

Utah County East Tintic district: Tintic Standard mine.

HECTORITE

Hydrous magnesium lithium silicate, \( \text{Na}_0.33\text{Mg}_2\text{Li}_3\cdot \text{Si}_4\text{O}_{10}(\text{OH})_2 \). Monoclinic. A member of the smectite group. Massive, very fine grain; claylike. H. 1-2. G. 2-3. Color white. Luster dull.

Duchesne County Green River Formation.

Juab County Thomas Range: Spar Mountain.

Uintah County Green River Formation.

HEDENBERGITE


Bear River County Star district: Lady Bryan, Moscow mines.

Grand County La Sal Mountains: North Mountain; Miners Basin district: Dewey, M. I. F. mines.

Tooele County Ophir district: Ophir Hill area — Hidden Treasure mine.

HELIUM

Helium, He. Inert, colorless, odorless gas. Helium is next to hydrogen in lightness. Density 0.178. Associated with natural gas.

Emery County Woodside Dome.

Grand County Harley Dome.

HELVITE


Beaver County Granite district: Miller mine.
HEMATITE


**Beaver County** Beaver Lake district: Black Rock mine, Iron Mountain Pass, Skylark mines; Blue Mountains; English Springs; Granite district: Burnt Hollow, Contact, King of the Hills groups; Lincoln district: Creole, Lincoln mines; Pine Grove district: Emma, Iron Duke (Iron Glory or Ruby Iron), Iron Queen (Mooney, Wilson, Last Chance), King Iron prospects; San Francisco district: Imperial mine; Star district: Wild Bill mine; Wah Wah Mountains: Violet Claims.

**Box Elder County** Ashbrook district: Vipont mine; Lucin district: Copper Mountain, Tecoma Hill mines; Willard district: Gold Standard, Wasatch Iron and Gold mines.

**Cache County** Hyrum area: Moon claim; Paradise district: Mineral Point.

**Daggett County** Red Creek: Yellow Canary uranium deposit; Red Creek Complex.

**Davis County** Antelope Island: Farmington district: Parrish Canyon.

**Duchesne County** Duchesne Iron prospect; Moon Lake Iron deposit; Red Ledge: Hilltop Iron claims.

**Emery County** San Rafael district: Delta mine.

**Garfield County** Henry Mountains: Bromide, Oro mines.

**Grand County** Miners Basin district: Dewey, High Ore mines.

**Iron County** Escalante district: Escalante mine; Iron Springs district: Granite Mountain, Iron Mountain, Three Peaks (See under MINERAL LOCALITIES, Iron County); Pinto Iron district; Stateline district: Creole, Gold Dome, Johnny, Ofer, Phelps, Utah Spur mines.

**Juab County** Deseret district; Detroit district: Charm, Copperhead, E. P. H., Ibex mines; Thomas Range: Bell Hill mine, Florida mine; Topaz Mountain; Tintic district: Emerald, Iron mines; West Tintic district: Lockheed Iron, Scotia, War Eagle, Iron King, Tintic Western mines.

**Millard County** Cricket Mountains: ferruginous member of Prospect Mountain Quartzite; Gordon district: Excelsior, Mariposa, New York, Prince Albert, Queen Victoria mines, Cove Creek; Twin Peaks (maritave variety).

**Morgan County** Hardscrabble district: Norway group.

**Piute County** Marysville district: East Slope no. 2, La Vita prospects; Mt. Baldy district: Deer Trail mine.

**Salt Lake County** Bingham district: Broad Gauge, Highland Boy, Yampa mines.

**San Juan County** White Canyon district: Happy Jack, Jomac mines.

**Sevier County** Henry district: Iron Peaks, Krotke Iron, Trinity mines.

**Summit County** Park City district: Mayflower mine. Jupiter mine.

**Tooele County** Columbia district: Iron King mine; Deep Creek Mountains: Devils Pit, Eagles Nest, Iron Blowout, Oro del Rey mines; Blue Bell district: Bogan, The Iron mines; Columbia district: Iron Hope prospect; Dugway district: Bertha, Black Dragon, Bryan, Confidence, Four Metals, Kellys Hole, Lauris, Eagle mines; East Erickson district: Indianapolis, Silver King, Tintic-Delaware mines; Gold Hill district: Calaveras, Gold Bond, Reaper mines; Granite Mountain district: Desert, El Dorado, Mountain Queen mines; Rush Valley district: Soldier Creek mine.

**Utah County** Ashley Creek: Woodside Iron prospect; Browns Park area; Carbonate district: Dyer, Pope Iron mines.

**Utah County** East Tintic district: Apex Standard, Eureka Lily, Iron King, North Lily, Tintic Standard mines; North Tintic district: Selma mine; Provo district: Monarch mine; SANTAQUIN district: Copper Bullion, Santaquin Central Tunnel, Union Chief mines; Silver Lake district: Deer, Silver Creeks; Utah district: Alpha, Emerald, Lucky Boy, Queen of the West, Spalding, Trotter mines.

**Wasatch County** Rhodes Plateau district: Ferry Iron deposit.


**Weber County** Sierra Madre district; Weber district.

HEMIMORPHITE


**Beaver County** San Francisco district: Horn Silver mine; Star district: Emerson, Sundown mines, Cedar-Talisman, Hoosier Boy mines.

**Box Elder County** Lucin district; Tecoma Hill mine; Promontory district: Lakeview Mining properties.

**Iron County** Escalante district: Escalante mine.

**Juab County** Mt. Nebo district: Eva, Freddie mines; Tintic district: Boss Tweed, Bullion Beck, Colorado, Gemini, May Day, Victoria mines; West Tintic district: Lockheed Iron mine.
Salt Lake County
Big Cottonwood district: Reed and Benson mines; Little Cottonwood district: Emma, Little Emma mines.

Summit County
Park City district: Quincy mine.

Tooele County
Dugway district: Bertha, Bryan claims, Bullion Canyon; Gold Hill district: Garrison Monster mine; North Tintic district: Raymond-Bald Eagle, New Bullion, Scranton mines; Ophir district: Ophir Hill area Hidden Treasure, Sacramento mines.

Utah County
East Tintic district: Eureka Lily, North Lily, Trixie mines.

HERCYNITE
Essentially an oxide of iron and aluminum, FeAl₂O₄.
Isometric. Occurs as massive, coarse granular to compact, irregular or rounded embedded grains. H. 7.5-8. G. 4.4. Dark grayish green to dark green. Found in isolated boulders with corundum.

Sevier County
Pine Canyon: Black Hawk claims.

HESSITE

Tooele County
Ophir district: Dry Canyon area - Kearns mine.

Utah County

HETAEROLITE

Utah County
East Tintic district: Burgin mine.

HEULANDITE

Beaver County
Granite district: Bismuth mine; San Francisco district; Star district: Moscow mine.

Davis County
Antelope Island.

Salt Lake County
Little Cottonwood stock.

Tooele County
Gold Hill district: Reaper mine. Utah County Little Cottonwood stock.

Weber County
Ogden Canyon; Sierra Madre district: Napoleon-Maghera group.

HUEBNERITE
Manganese tungstate, MnWO₄. Monoclinic. Commonly long prismatic crystals. Striated or furrowed. Cleav-
HYDROZINCITE
Juab County Tintic district: Gemini, May Day mines.
Plate County Ohio district: Bully Boy and Webster mines.

HYPERSTHENE
Beaver County Star district: Lady Bryan mine.
Salt Lake County Alta stock.
Tooele County Oquirrh Mountains: Tickville Gulch.

ICELAND SPAR (See CALCITE)

IDDINGSITE
Hydrous magnesium iron silicate, probably $\text{H}_8\text{Mg}_9\text{Fe}_2\text{Si}_3\text{O}_{14}$. Orthorhombic. Lamellar crystals or foliated. H. 3. G. 2.7. Cleavage good. Luster bronze. Color chestnut brown to yellowish green. Alteration product.
Tooele County Rush Valley district.

IDOGRASE
Hydrous calcium aluminum silicate, $\text{Ca}_{10}(\text{Mg,Fe})_2\text{Al}_4(\text{Si}_2\text{O}_7)_2(\text{Si}_2\text{O}_7)(\text{OH})_2$. Tetragonal. Crystals Prismatic, often striated. H. 6.5. G. 3.4. Luster vitreous to resinous. Color green, brown, yellow, blue, red. Usually found in crystalline limestone resulting from contact metamorphism.
Beaver County Bradshaw district: 2 R's group; Granite district: Big-Pass, Bismuth, Oak, Oak Basin, Rattler, Ward groups; Lincoln district: Creole mine.
Juab County West Tintic district.
Millard County House Range: Amasa Valley, Horsehoe, Mt. Baldy, New Klondike, Pine Peak, Pinke Peak, Rainbow, South, South Pit, Sidesprings mines, Notch...
Minerals and Mineral Localities of Utah, Kenneth C. Bullock

Peak, Painter Springs.

Salt Lake County Little Cottonwood district: Alta mine, Clayton Peak Stock contact zone.

Tooele County Deep Creek Mountains: Midas mine; Gold Hill district: Alvarado, Cane Springs, Midas mines; Pine Canyon.

Wasatch County Clayton Peak.

ILLITE

Hydrous potassium aluminum silicate, $K_2(Si_6Al_2)Al_4O_{20}(OH)_4$. Monoclinic. Massive, extremely fine grained. Often admixed with other clay minerals. H. 1-2. G. 2.6-2.9. Usually white, also pale colors.

Duchesne County Green River Formation.

Emery County San Rafael district: Delta, Temple Mountain mines.

Salt Lake County Bingham district: Bingham Copper Pit.

San Juan County White Canyon district: Happy Jack mine.

Sevier County Henry district: Trinity prospect; Rock Candy Mountain.

Tooele County Dugway district: Bertha claim; Oquirrh Mountains: Manning Canyon Shale; Stansbury Mountains: Manning Canyon Shale.

Uintah County Green River Formation.

Utah County Beverly Hills: Manning Canyon Shale: East Tintic district: Burgin mine; Lake Mountain: Manning Canyon Shale; Lehi district: Manning Canyon Shale; Thorpe Hills: Manning Canyon Shale; Wasatch Mountains: Manning Canyon Shale.

ILMENITE


Beaver County San Francisco district.

Emery County Emery.

Garfield County Escalante; Henry Mountains: Bromide, Oro mines, southwestern flanks of Henry Mountains.

Kane County Southern part of Kaiparowits Plateau.

Tooele County Gold Hill district: Reaper mine.

ILSEMANNITE

Molybdenum oxide, $Mo_3O_8\cdot nH_2O$? Found only as earthy masses, stains, or as a disseminated pigment.

Color black, blue black, blue.

Grand County La Sal district: Jack claim.

Piute County Marysvale district: Bullion Monarch, Freedom nos. 1-2, Prospector no. 1, Quick silver mines.

San Juan County Elk Ridge: King Edward, King James-Virgene, Notch Nos. 1 and 4 Mines; Red Canyon district: Frey no. 4 mine; White Canyon district: Happy Jack mine.

Uintah County Uteland Knoll district.

INDIUM

Rare metal, indefinite mineral association. Found in contact metamorphic ore deposits and in replacement veins. Associated with scandium.

Tooele County Gold Hill district.

INGRAMITE

An asphaltic pyrobitumen. Occurs in the basal Green River Formation.

Utah County Colton: Higgins, James Peak (Brown Bear), Kyune Canyon, Midnight, Miller, Pleasant Valley, Thomas Ranch, Town mines.

Wasatch County Soldier Summit: Culmer Brothers, Soldier Summit, U. S. mines.

IOLITE (See CORDIERITE)

JALPAITE

Silver copper sulfide, $Ag_3CuS_2$. Isometric. Small clusters of round grains, or inclusions in galena and tetrahedrite. Secondary growths in cerussite.

Utah County East Tintic district: Burgin mine.

JAMESONITE


Beaver County San Francisco district: Horn Silver mine.

Juab County Tintic district; West Tintic district: Scotia mine.

Summit County Park City district: California mine.

Tooele County Gold hill district: Gold Hill (U. S.), U. S. mines; Silver Island district: Carrie Mack property.

Utah County American Fork district: Mary Ellen and Live Yankee, Yankee mines; East Tintic district: Eureka Lily mine.
JAROSITE


Beaver County Granite district: Big Pass group; San Francisco district: Horn Silver mine; Star district: Moscow, Red Warrior, Wild Bill mines.

Emery County San Rafael district: Fuenrol no. 2 mine.

Iron County Stateline district: Creole, Gold Dome, Johnny, Ofer, Phelps, Utah Spur mines.

Juab County Detroit district; Tintic district: Eagle and Blue Bell mines.

Millard County Church Hills: Stevens prospect.

Morgan County Argenta district: Carbonate Hill, Carbonate Gem mines.

Piute County Marysvale district: Copper Cap, Freedom no. 1, Silica Hills, Yellow Jacket mines; Mt. Baldy district: Deer Trail mine.

San Juan County Elk Ridge: Notch Nos. 1 and 2 mine; White Canyon district: Fry No. 4, Happy Jack, Jomac mines.

Sevier County Monroe Canyon; Rock Candy Mountain.

Tooele County Deep Creek Mountains: Dewey, Midland, North Pass, Silver Queen mines; Dugway district: Confidence, Four Metals mines, Kellys Hole; Gold Hill district: Alvarado, Copper Bloom, Copper Queen Midland Mining Company. Cyclone, Gold Hill (U. S.), Rube, Success, U. S. mines; Mercur district: Sparrowhawk mine; Ophir district: Dry Canyon area - Kearsarge mine; Lion Hill area Buffalo mine; Chloride Point, Douglas, Empire, Iron, Lion, Monarch, Northern Light, Woodruff, Zella mines; Ophir Hill area - Admiral Dewey, Cliff mines; Rush Valley district: Argent, Ben Harrison, Calument, Galena King, Honerine, Mescatine, Muerbrook, Salvation-Hercules mines.

Utah County East Tintic district: Burgin, Tintic Standard, Trixie mines.

Washington County Tutsagubet district: Apex (Dixie), Paymaster mines.

Wayne County Colemen Canyon to Oak Creek; Grand Wash to Capitol Wash; Rabbit Valley, Old Dixon prospect.

JASPER (See CRYPTOCRYSTALLINE QUARTZ)

JASPEROID (See CRYPTOCRYSTALLINE QUARTZ)

JEFFERISITE

Hydrous magnesium iron aluminum silicate, 10(Mg,Fe)0.4(AlFe)₂O₃·10SiO₂·7H₂O. Hydrated mica belonging to the vericulites. Occurs in broad plates and small scales. H. 1.5. G. 2.3. Cleavage basal perfect. Pearly luster. Color dark yellowish brown. Alteration product. Tooele County Gold Hill district: Centennial and Enterprise mines.

JENKINSITE

Hydrous magnesium iron manganese silicate, (Mg,Fe,Mn)₄Si₃O₁₀·3H₂O. Associated with minerals in altered wall rocks. Utah County East Tintic district.

JET


Utah County East Tintic district.

JOHANNITE


Garfield County Henry Mountains.

Piute County Marysvale district: Bullion Monarch, Prospector no. 1 mines.

San Juan County Red Canyon district: Frey no. 4, Posey mines; White Canyon district: Happy Jack, Hideout mines.

Utah County Fruit: Oyler mine.

JORDISITE


San Juan County Red Canyon district: Frey no. 4 mine.

KAINITE

Hydrous magnesium iron aluminum silicate, 10(Mg,Fe)0.4(AlFe)₂O₃·10SiO₂·7H₂O. Hydrated mica belonging to the vericulites. Occurs in broad plates and small scales. H. 1.5. G. 2.3. Cleavage basal perfect. Pearly luster. Color dark yellowish brown. Alteration product. Tooele County Gold Hill district: Centennial and Enterprise mines.
Hydrous sulfate and chloride of potassium and magnesium, \( \text{K}_2\text{Mg(SO}_4\text{)}\text{Cl·3H}_2\text{O} \). Monoclinic. Granular massive and interbedded with other salts. Cleavage perfect. Fracture even. Brittle. H. 2.5-3. G. 2.2. Luster vitreous. Colorless to white. An evaporite resulting from artificial ponding. *Tooele County* Salduro; *Wendover*.

**KAOLINITE**


**KASOLITE**

Hydrous lead uranium silicate, \( \text{Pb(UO}_2\text{)}\text{Si}_2\text{O}_5\text{·H}_2\text{O} \). Monoclinic. Crystals small, stout prismatic habit, divergent groups, crusts, and granular masses. Cleavage perfect. Brittle. H. 4.5. G. 5.9. Color ochre yellow to brownish yellow. Luster dull to earthy. *Piute County* Marysvale district

**KERMESITE**


**KIESERITE**

Hydrous magnesium sulfate, \( \text{MgSO}_4\text{·H}_2\text{O} \). Monoclinic. Mostly massive, coarse to fine granular, and intergrown with other salts. H. 3.5. G. 2.6. Colorless, white or yellowish. Luster vitreous. Cleavage good. *Grand County* Paradox basin. *San Juan County* Paradox Valley district. *Tooele County* Salduro; *Wendover*. *Utah County* East Tintic district.

**KIMOLITE (See Cimolite)**

**KINOITE**


**KLAPROTHITE**


**KOLBECKITE**

Hydrous scandium phosphate, \( \text{Sc}_4\text{PO}_4\cdot2\text{H}_2\text{O} \). Orthorhombic. Occurs in altered variscite nodules. Crystals short prismatic, minute. H. 5. G. 2.44. Colorless, yellowish, bright blue to blue-gray. Transparent. Luster vitreous to pearly. *Utah County* Clay Canyon.

**KORNELITE**

Hydrous ferric sulfate, \( \text{Fe}_2(\text{SO}_4)_3\cdot7\text{H}_2\text{O} \). Monoclinic. Lath-like and acicular crystals. Also tufted aggregates, crusts, globular masses. G. 2.8. Cleavage good. Luster silky. Color pale rosepink to violet. *Utah County* East Tintic district: Tintic Standard mine.

**KORNERUPINE**

Hydrous magnesium aluminum boron silicate, \( \text{Mg}_3\text{Al}_5(\text{Si},\text{Al},\text{B})_5\text{O}_{21}\cdot(\text{OH}) \). Orthorhombic. In fibrous to columnar aggregates. H. 6.5. G. 3.27. Colorless to white,
brown.

San Juan County Moses Rock dike.

KRENNERITE

Utah County East Tintic district: North Lily, Tintic Standard mines.

KYANITE

Box Elder County Grouse Creek Range: Birch, Southern Conley, Western Grouse Creeks.
Daggett County Red Creek Complex.

LABRADORITE

Juab County East of Jericho; Keg Mountains.
Morgan County Clear Lake Railroad Station.
Tooele County Stansbury Mountains: Mack, Muskrat, North Canyons, Salt Mountain.

LANARKITE

Utah County East Tintic district: Burgin mine.

LAUMONTITE

Hydrous calcium sodium aluminum silicate, CaAl₂Si₄O₁₂·4H₂O. Monoclinic. A zeolite. Common crystal form is a prism. Also columnar, radiating and divergent. H. 3.5-4. G. 2.3. Cleavage good. Luster vitreous to pearly. Color white to yellow or gray.
Garfield County Henry Mountains: Bromide, Oro mines.

LEADHILLITE

Juab County Tintic district: Eureka Hill mine.

LEHIITE

Hydrous basic phosphate of sodium, potassium, calcium and aluminum of uncertain formula, perhaps (Na,K)₂Ca₅Al₈(PO₄)₁₀(OH)₁₂·6H₂O. Found as crusts and layers comprised of subparallel aggregates of fibers. H. 5.5. G. 2.9. Color white to gray.
Utah County Clay Canyon.

LEPIDOCROCITE

Wayne County Fruita: Oyler mine.

LETTSOMITE (See CYANOTRICHITE)

LEUCHTENBERGITE

Duchesne County Mt. Baldy district: Deer Trail mine.
Utah County East Tintic district.

LEUCOSPHERITE

Duchesne County Carter Oil Company wells; Sinclair Mortenson well.
Uintah County Sun Oil Company South Ouray well.

LEUCOXENE (See ANATASE)

LEVERRIERITE

basal. Colorless to brown.

**Salt Lake County** Bingham district: Highland Boy, Yampa mines.
**Utah County** Clay Canyon.

**LEWISTONITE**

Basic calcium potassium sodium phosphate, \((Cu,K,Na)\_2\cdot(PO\_4)\_3\cdot(OH)\). Hexagonal. Occurs as stout hexagonal prisms, or in sheet-like aggregates. H. 5. G. 3. Cleavage perfect. Colorless to pale green, white. Similar to apatite. **Utah County** Clay Canyon.

**LIBETHENITE**

Hydrous copper phosphate, \(Cu\_2(PO\_4)\cdot(OH)\). Orthorhombic. Short prismatic crystals, also equant. H. 4. G. 3.97. Translucent. Light to dark olive green, also dark green.

**Beaver County** Star district: Atlas mine.

**LIEBIGITE**

Hydrous calcium uranium carbonate, \(Ca\_2(U(CO\_3)\_4\cdot10H\_2O)\). Orthorhombic. Crystals equant or short prismatic. Most commonly as scaly or granular aggregates, crusts. H. 2.5-3. G. 2.4. Cleavage good. Luster vitreous to pearly. Color pale green to yellowish green. Fluoresces.

**Grand County** Thompsons district: Black Ape mine.
**San Juan County** Big Indian district: Mi Vida mine; Elk Ridge.

**LIMONITE**

Hydrous basic iron oxide, FeO(OH)\_nH\_2O. Amorphous. Occurs in mammillary to stalactitic masses, concretionary, nodular, earthy. H. 5-5.5. G. 3.6-4. Luster vitreous, dull to earthy. Color dark brown to black. Streak yellowish brown. May show play of iridescence. Occurs as gossan capping.

**Beaver County** Beaver Lake district; Bradshaw district: Cave, Hecla mines; Fortuna district: Rocky Hollow; Granite district: Big Pass, Burnt Hollow groups; Lincoln district: Creole, Lincoln, Rattler Iron claims; Newton district: Sheep Rock mine; Pine Grove district: Central Wah Wah Iron deposit, Emma, Iron Duke (Iron Glory or Ruby), Iron Queen, Mooney, Wilson or Last Chance, King Iron prospects; Pruss district; Blackbird, Cactus mines, Cactus Gulch; Star district: Commonwealth, Harrington-Hickory, Kemple, Mammoth, Progressive, Rebel, Red Warrior, St. Mary's, White Rock mines.
**Box Elder County** Ashbrook district: Vipont mine; Lucin district: Copper Mountain, Cunepah Tunnel, Jeff-Doran, Tecoma Hill mines; Newfoundland district: Copper Ridge; Promontory district: Lakeview Mining properties; Willard district: Gold Standard mine.
**Daggett County** Birch Creek deposit; Spring Creek deposit.
**Davis County** Antelope Island; Farmington district: Parrish Canyon.
**Grand County** Courthouse Wash; Miners Basin district: Dewey, High Ore, Skylark mines; Little Valley; Salt Valley.
**Iron County** Escalante district: Escalante mine; Gold Springs district: Aetna, Independence, Jennie, Jumbo, Little Buck, Snowflake mines; Iron Springs district; Granite Mountain, Iron Mountain; Stateline district: Creole, Gold Dome, Johnny, Ofer, Phelps, Utah Spur mines.
**Juab County** Deseret district; Detroit district: Iron Blossom mine. Fish Springs district: Carnation, Emma, Galena, Utah mines; Thomas Range: Floride mine; Spring Creek district: Queen of Sheba mine; Tintic district: Black Dragon, Black Jack, Dragon, Empire, Emerlad, Grand Central, Iron, Sunbeam mines; West Tintic district: Pyramid, Scotia, Tintic Western, War Eagle mines.
**Kane County** Kitchen Corral Canyon.
**Millard County** Antelope Springs; Leamington district: Fool Creek Canyon.
**Morgan County** Argenta district: Carbonate Hill, Carbonate Gem mines; Hardscrabble district: Norway group.
**Piute County** Antelope Range; Gold Mountain district: Annie Laurie, Sevier mines; Mt. Baldy district: Deer Trail, Green Eyed Monster mines; Ohio district: Bully Boy and Webster mines; Sevier Canyon.
**Salt Lake County** Big Cottonwood district: Carbonate, Cardiff mines; Bingham district: Galena, Old Jordan, Highland Boy, Yampa mines; Little Cottonwood district: Alta Consolidated, Cabin, Emma, Flagstaff, Michigan-Utah mines; Smelter district.
**San Juan County** La Sal Mountains; Monticello district: Copper Queen, Duckett mines.
**Sanpete County** Ephraim. **Sevier County** Henry district: Iron Peaks property; Rock Candy Mountain. **Summit County** Park City district: Silver King, Woods-side mines.
**Tooele County** Blue Bell district: Bogan, The Iron mines; Columbia Mining district: Benmore, Sharp, Sultana mines; Deep Creek Mountains: Iron Blowout mine; Dugway district: Bertha, Black Dragon, Bryan, Confidence, Eagle, Four Metals, Kelly's Hole, Lauris, Metal States, Yellow Jacket mines; East Erickson dis-
trict: Copper Jack, Green’s Ridge, Silver Shield mines; Erickson district: Highland Lassie no. 1, Silver Reef mines; Gold Hill district: Alvarado, Boxton, Silver and Gold Mining Company, Unadine mines; Granite Mountain district: Desert, El Dorado, Mountain Queen mines; Mercur district: Mineral Hill mine; Ophir district: Dry Canyon area - Kearsarge, Mono, Queen of the Hills mines; Lion Hill area - Buffalo mine; Ophir Hill area - Admiral Dewey, Chicago, Cliff, Hidden Treasure, Sacramento mines; Rush Valley district: Argent, Ben Harrison, Calunet, Galena King, Honerine, Mescatine, Muurbrook, Salvation - Hercules mines.

Utah County American Fork district: Dutchman, Miller, Pittsburgh mines; East Tintic district: Burgin, Iron King, Tintic Standard mines; Lehi district: Hutchings claim; North Tintic district: Selma mine; Payson district: Nelson, Syndicate mines; Provo district: Monarch mine; Salt Lake City district: Alpha, Emerald, Lucky Boy, Queen of the West, Spalding, Trotter mines.

Washington County Mineral Mountain: Picadilly mine.

Wayne County Miners Mountain district: Old Faithful, Wonder Copper no. 1 mines; Rabbit Valley: Old Dixon prospect; Torrey: T. R. Lode no. 1 mine.

Weber County Ogden Canyon.

LINARITE


Beaver County San Francisco district: Horn Silver mine.

Juab County West Tintic district: Scotia mine.

Salt Lake County Bingham district; Little Cottonwood district: Grizzly mine.

Summit County Park City district: Silver King, Woodside mines.

Utah County East Tintic district.

LITHIOPHORITE


Grand County Seven Mile Canyon: Shinarump nos. 1-3 claims.

Platte County Marysville district: Buddy, Bullion Monarch, Freedom nos. 1, Prospector nos. 1 and 3 mines.

LODESTONE (See MAGNETITE)

LORANDITE


Tooele County Mercur district.

LOUGHLINITE

Hydrous sodium magnesium silicate, Na₂Mg₃Si₆O₁₆·8H₂O. Fibrous structure. Color pearly-white, Luster silky. G. 2.2. Very similar to sepiolite in appearance.

Authigenic mineral in the Green River Formation.

Duchesne County Green River Formation.

LUCINITE (See VARISCITE)

LUCKITE (See MELANTERITE)

LUDWIGITE


Beaver County Beaver Lake district: West Spring.

Salt Lake County Big Cottonwood district: Big Cottonwood, Great Western, Mountain Lake, Mountain View mines; Little Cottonwood district: Alta Stock contact zone, Michigan Utah, Heela mines.

LUZONITE


Utah County East Tintic district: North Lily, Tintic Standard mines.

MAGNESIOARFVEDSONITE

A magnesium amphibole. Occurs as microscopic blue intergrowths on hornblende; and as asbestiform blue aggregates in brown dolomite marlstone. Matted fibrous habit. Color blue, blue gray.

Duchesne County Avintaquin Canyon: Green River Formation.
MAGNESIOFERRITE


Summit County Park City district; Ontario Tunnel.
Wasatch County Blue Ledge district: Ontario Tunnel.

MAGNESIOLUDWIGITE (See LUDWIGITE)

MAGNESIORIEBECKITE


Duchesne County Carter Oil Company wells; Green River Formation; Sinclair Mortenson well.

MAGNESITE


Beaver County Rocky district: Old Hickory, Silver Shield Mining Company mines; San Francisco district; White Mountain: Grampian Hill.
Juab County Fish Springs district: Carnation, Emma, Galena, Utah mines.
Salt Lake County Little Cottonwood district: Clayton Peak stock contact zone.

MAGNETITE


Beaver County Antelope district; Beaver Lake district: Bat Ridge, Skylark mines; Blue Mountains; Bradshaw district: Cave mine; English Springs; Granite district: Burnt Hollow group; Lincoln district: Creole, Lincoln, Rattler Iron claims; McGarry district; Pine Grove district: Pine Grove Associates mine. Pruess district: Blackbird, Cactus mines; Rocky district: Adelia, Bawana, Copper Ranch, Maria, Old Hickory mines; San Francisco district: Imperial mine; Star district: Commonwealth, Hub, Kemple, Lady Bryan, Progressive, St. Mary’s, Wild Bill mines.

Box Elder County Willard district: Twin Pine claim, Wasatch Iron and Gold mine.

Davis County Antelope Island.

Garfield County Colorado River district; Henry Mountains: Bromide, Cuprum, Oro mines.

Iron County Iron Springs district: Granite Mountain, Iron Mountain, Three Peaks (See mine listing under Iron County; Paragonah: Iron Peak; Pinto Iron district.

Juab County Deseret district; Thomas Range: Bell Hill mine; West Tintic district: Iron King mine, Lockheed Iron property, Tintic Western mine.

Kane County Colorado River district.

Millard County Twin Peaks: Black Diamond Iron prospect.

Salt Lake County Big Cottonwood district: Big Cottonwood, Kentucky-Utah, Mountain Lake, Woodlawn mines; Bingham district: Little Cottonwood district: Alta Consolidated, Alta Stock contact zone, Michigan-Utah, South Hecla mines; Little Cottonwood stock.
San Juan County La Sal Mountains: Middle Mountain, Brunley Ridge; White Canyon district: Happy Jack mine.

Sevier County Henry district: Iron Peaks property, Trinity prospect.

Summit County Park City district.

Tooele County Dugway district: Buckhorn claim; East Erickson district: Ekker Canyon, Silver Shield mines; Gold Hill district: Alvarado, Centennial and Enterprise, Doctor, Unadine mines.
Utah County Little Cottonwood stock; Silver Lake district: Deer, Silver Creeks.
Wasatch County Rhodes Plateau district: Ferry Iron deposit.
Washington County Bull Valley district: Big Mountain, Emma, Pilot, Redtop claims; Mineral Mountain: Emma, Gregerson, Picadilly mines.
Weber County Weber district.

MALACHITE


Beaver County Antelope district; Beaver Lake district: Beaver Harrison, Copper Mountain, OK, Skylark mines; Bradshaw district: Cave, 2 R’s mines; Granite district: Big Pass, Garnet, King-of-the-Hills groups; Lincoln district: Creole, Lincoln mines; McGarry district; Pruess district: Cactus mine; Rocky district: Adelia, Bawana, Maria mine; San Francisco district: Horn Silver, Imperial mines; Star district: Cedar-Talisman, Commonwealth, Copper King, Dotson, Gold Crown, Harrington-Hickory, Hoosier Boy, Kemple, Progressive, Rebel, Red Warrior,
St. Mary’s, Sundown, White Rock, Wild Bill mines.

**Box Elder County** Ashbrook district: Vipont mine; Lucin district: Copper Mountain, Jeff Doran mines; Newfoundland district: Copper Ridge; Promontory district: Lakeview mine; Willard district: Mormon Girl, Ogden Boilmakers, Overland claims.

**Cache County** Hyrum district: Lucky Star Claim; La Plata area: Sundown claim; Paradise district; Richmond district.

**Daggett County** Red Creek, Yellow Canary Uranium deposit.

**Davis County** Antelope Island; Farmington district: Morning Star group, Parrish Canyon; Wandering Jew mine.

**Duchesne County** Rock Creek.

**Emery County** Castle Dale; Castle Valley; Emery district; San Rafael district: Copper Globe, Delta mines.

**Garfield County** Circle Cliffs: Acme, Blue Goose mines; Henry Mountains: Cuprum claim.

**Grand County** Hoosier mine; La Sal district: Bronite, Mc Coy mines. Miner’s Basin district: Dewey, High Ore, McCormick, Moab no. 1 mines; Salt Valley.


**Kane County** Paria Mining Company.

**Millard County** Church Hills: Stevens prospect; Detroit district: Almond, Blue Bell, Major Drum mines; Leamington district: Fool Creek Canyon.

**Morgan County** Morgan district: Chicago-Utah, Iron King, Morgan Consolidated, Morgan Crescent, Red Eagle mines; Round Valley: Copper Mountain mine.

**Piute County** Mt. Baldy district: Clyde, Deer Trail mines; Ohio district: Cascade, Copper Belt, Dalton, Iris, Shamrock, Wedge mines.

**Salt Lake County** Big Cottonwood district: Alta Tunnel and Transportation Company, Antelope, Big Cottonwood, Carbonate, Cardiff, Eclipse, Mountain Lake, Price of Wales, Woodlawn mines; Bingham district: Bingham Copper Pit, Butterfield, Columbia, Commercial, Galena, Highland Boy, Midland, Old Jordan, Old Telegraph, U. S. and Lark, Yampa mines; Little Cottonwood district: Emma, Little Emma mines; Smelter district.

**San Juan County** Big Indian district: Big Indian Copper mine; Elk Ridge: Notch Nos. 5 and 6, Oakie, Wooden-shoe No. 3 mines; La Sal Mountains; La Sal Quadrangle: Jackpot mine, Lisbon Valley, Climax nos. 1-2, Lisbon Copper mines; Monticello district: Copper Queen, Tuffy Copper mines; Monument Valley district: Ol jata, Skyline, Whirlwind mines; Paradox Valley district: Grey Dawn mine; Red Canyon district; San Juan River; White Canyon district; Bell, Four Aces, Fry No. 4, Happy Jack, Hideout, Jomac, Posey mines.

**Sevier County** Salina Creek district: Ball, Lead Hill mines, Sevier Canyon.

**Summit County** Park City district: Comstock, Daly, Daly-Judge, Daly West, Jupiter, Nail Driver, Ontario, Scottish Chief, Silver King, Silver King Consolidated, Woodside mines.

**Tooele County** Deep Creek Mountains: Complex, Devils Pit, Dewey, Eagles Nest, Fortuna, Gold Star, Laura, Monocoo, North Pass, Oro del Rey, Overland, Probert, Prosperity, Silver Queen mines; Dutch Mountain; Dugway district: Belcher, Black Maria, Black Dragon, Confidence, Juno, Metal States, Raymond-Bald Eagle mines; East Erickson district: Copper Jack, Jessel Bezzel, Silver Shield mines; Erickson district: Highland Lassie no. 1 mine; Gold Hill district: Alvarado, Calaveras, Centennial, Copperopolis, Enterprise, Copper Bloom, Copper Hill, Copper Queen-Midland Mining Company, Doctor, Frankie, Garrison Monster, Gold Bond, Gold Hill (U. S.), Ida Lull, Lucy L., Minnehaha, Mono, Napoleon, New Baltimore, Ozark, Pole Star Copper Company, Rea, Silver King, Unadine, Victory no. 1, Yellow Hammer mines; Granite Mountain district: Blue Bell, Cannon Tank Canyon, Desert, El Dorado, Mountain Queen mines; Grantsville district; Greeley district; Mercur district: Mineral Hill mine; Ophir district: Dry Canyon area - Brooklyn, Kearsearge, Mono, Queen of the Hills mines; Foot hill area - Lakes of Killarney mine; Lion Hill area - Buffalo mine, Chloride Point; Ophir Hill area - Chicago, Cliff, Hidden Treasure, Sacramento mines; Rush Valley district: Ben Harrison, Calumet, Galena, Honerine, Muerbrook, Salvation Hercules, Southport mines; Silver Island district: Carrie Mack property; Tooele district; Willow Springs district.

**Uintah County** Brown Park area; Brush Creek district: Little Alta mine; Bullionville: Carbonate district: Dyer, Jessie Ewing mines, Red, Willow Creeks; Little Split Mountain; UteLand Knoll district: Ouyar.

**Utah County** American Fork district: Miller mine; East Tintic district: Apex Standard mine, Eureka Bullion, Eureka Lily, Eureka Standard, Tintic Standard, Trixie mines; Santaquin district: Black Balsam, Copper Bullion, Sally Ann mines; Thorpe Hills.

**Washington County** Mineral Mountain: Emmal, Greger-son mines; Silver Reef district: Buckeye, East Reef, Emily Jane, Maud, Requa mines; Tutsa-unet district:
Apex (Dixie), Paymaster mines.
Wayne County Capitol Wash; Capitol Wash to Sheets Gulch; Grand Wash to Capitol Wash; Miners Mountain district: Old Faithful, Wonder Copper no. 1 mines; Torrey: T. R. Lode no. 1 mine.
Weber County Cold Water Canyon; Sierra Madre district: Eldorado, King Solomon mines; Weber district: New Azurite, Standard Mining Company mines.

MALLARDITE


Salt Lake County Bingham district: Lucky Boy mine.

MANGANITE


Beaver County San Francisco district; Star district: Sundown mine.
Emery County Muddy River.
Grand County Little Grand district: Needles, Salt Wash group.
Juab County Tintic district: Victoria mine.
Millard County Detroit district: Black Diamond, Guy, Last Chance, Martha, Silica Plug mines.
San Juan County La Sal Mountains.
Summit County Coalville.
Tooele County Erickson district: Huber-Rydalch mine.

MANGANOCALCITE

Piute County Marysvale district; Mt. Baldy district: Deer Trail mine.

MANGANODOLOMITE (See DOLOMITE)

MARCASITE


Beaver County Gordon district: Sulphurdale.
Emery County San Rafael district: Dirty Devil, Little Susan, Lucky Strike, Pay Day mines.
Juab County Tintic district: Bullion Beck, Gemini mines.
Millard County Gordon district: Cove Creek, Victor Conqueror mine.
Morgan County Morgan district: Chicago-Utah, Iron King, Morgan Consolidated, Red Eagle mines.
Salt Lake County Bingham district: Highland Boy, Midland, Yampa mines.
San Juan County Elk Ridge: North 1 and 4 mines; White Canyon district: Happy Jack mine.
Sanpete County Dry Canyon.
Utah County East Tintic district: Burgin, Eureka Standard, Tintic Standard mines.

MARTITE (See HEMATITE)

MASSICOT

Salt Lake County Bingham district; Little Cottonwood district: Emma mine.
Summit County Park City district.
Utah County East Tintic district: Burgin mine.

MATILDITE

Utah County East Tintic district.

MEERSCHAUM (See SEPIOLITE)

MELACONITE (See TENORITE)

MELANOVANADITE

Grand County Thompsons district: Juniper mine.
San Juan County La Sal Quadrangle: Black Hat mine;
Paradox Valley district: Grey Dawn, Vanadium Queen mines.

MELANTERITE


Emery County San Rafael district: Dexter group.
Juab County Tintic district: Swansea mines.
Salt Lake County Bingham district: Lucky Boy mine.
Tooele County Mercur district: Brickyard mine; Ophir district: Ophir Hill area-Ophir Hill Consolidated, Ophir Coalition mines; Rush Valley district: Muerbrook mine.
Utah County East Tintic district: Burgin mine.

MERCURY


Iron County Gold Springs district: Homestake mine; State Line district.
Salt Lake County Bingham district.

MESOLITE

Hydrous sodium calcium aluminum silicate, Na₂Ca₂Al₆Si₉O₃₀·8H₂O. Monoclinic. Occurs in acicular and capillary crystals; delicate divergent tufts. Cleavage good. H. 5. G. 2. 3. Color white or colorless.

Salt Lake County Little Cottonwood district.

META-AZULITE


Emery County San Rafael district: Temple Mountain, Fuemrol No. 2 mine.

MERA-VANADITE


Emery County San Rafael district: Delta mine, Wild Horse Canyon.

Grand County Poison Spring Canyon; Thompsons district: Thom claim.
Juab County Marysville district: Freedom no. 2, La Vita, Papsy's Hope mines.
San Juan County Elk Ridge: Notch Nos. 1 and 4 mines; White Canyon district: Posey mine.
Sevier County Henry district: La Veta prospect.

METACINNABAR


Juab County Marysville district: Quicksilver mine.
Tooele County Grantsville district: Quicksilver mine.

METAHEWETTITE


Emery County San Rafael district: Temple Rock, South Temple Wash, Vagabond mine.
Garfield County Henry Mountains: Crescent Creek.
Grand County Pack Creek; Thompsons area; Thompsons district: Cactus Rat mines; Yellow Cat district: Yellow Cat group.
San Juan County Paradox Valley district: Grey Dawn mine.

MÉTASTIBNITE


Summit County Park City district: Silver King, Woodside mines.
METASTRENGITE


Iron County Iron Spring district: Iron Mountain, Blowout Hill.

METATORBERNITE

Hydrous copper uranium phosphate, Cu(UO₂)₂(PO₄)₂·8H₂O. Tetragonal. In tabular crystals, often in rosettes or sheaf-life aggregates. H. 2. 5. G. 3. 6. Cleavage basal perfect. Brittle. Luster vitreous to pearly. Color pale green to dark green.

Beaver County Pine Grove district: Staats (Monarch) mine.

Emery County Green River district: Mineral Ten claim; San Rafael district: Delta, Dirty Devil mines, Flat Top Mesa, Temple Mountain, South Temple Wash.

Piute County Marysville district: Bullion Monarch, East Slope no. 2, Freedom no. 2, La Vita mines.

San Juan County Monument Valley district: Skyline mine; Paradox Valley district: Grey Dawn mine; Red Canyon district: Markey no. 3 mine; White Canyon district: Happy Jack, Posey, White Canyon No. 1 mines, W. N. mines.

Sevier County Henry district: La Veta prospect.

Wayne County Capitol Wash to Sheets Gulch; Chimney Rock to Tantlus Flat; Coleman Canyon to Oak Creek; Fruita: Oyler mine; Grand Wash to Capitol Wash.

METATYUYAMUNITE


Emery County San Rafael district: Delta mine.

Grand County Thompsons district: Parco no. 23 mine.

San Juan County La Sal Quadrangle: Little Dawn, Sumner, Too High, Valley View, Wedge mines; Monticello district: Harts Draw, Lakes claim, Robertson Pasture, Shay Mountain, Shay Road, Sunshine Mining claim; Paradox Valley district: Grey Dawn mine.

META-URANOCIRCITE


Juab County Honeycomb Hills.

METAVARISCITE


Box Elder County Utahlite Hill.

META-ZEUNERITE


Emery County San Rafael district: Consolidated, Delta, Dexter group, Fuenrol no. 2, Green Vein Mesa, Green Vein no. 5, Original Green Vein mines, Pay Day, Vagabond mines.

Juab County Tintic district: Centennial Eureka mine.

San Juan County Elk Ridge: Notch Nos. 5 and 6, Sandy No. 3 mines; Red Canyon district: Markey no.3 mine; White Canyon district: Happy Jack, Jomac, W. N. mines.

Wayne County Torrey.

MIARGYRITE


Utah County East Tintic district.

MICROCLINE


Davis County Antelope Island; Wasatch Mountains, Farmington Complex.

Millard County House Range: Notch Peak intrusive, Painter Springs.

Salt Lake County Little Cottonwood stock.

San Juan County White Canyon district: Happy Jack
mine.

**Sevier County** Henry district: Trinity prospect.
**Tooele County** Granite Mountain district.
**Utah County** Little Cottonwood stock.

**MILLISITE**

Hydrous basic phosphate of sodium, calcium, and aluminum, \((\text{N,K})\text{CaAl}_6\text{(PO}_4\text{)}_4\text{(OH)}_9\cdot3\text{H}_2\text{O}\). Probably tetragonal. Occurs as chalcedonic crusts or spherules with fibrous structure. H. 5.5. G. 2.8. Cleavage good. Color white to light gray.

**Tooele County** Amatrice Hill.
**Utah County** Clay Canyon.

**MIMETITE**


**Iron County** Escalante district: Escalante mine; **Iron Springs district**: Granite Mountain, Iron Mountain.
**Juab County** Tintic district: Eureka Hill mine.
**Millard County** Church Hills: Stevens prospect.
**Summit County** Park City district.
**Tooele County** Gold Hill district: Gold Hill (U.S.), New Baltimore, Red Jacket mines; **Rush Valley district**: Honerine mine.
**Utah County** East Tintic district: Burgin mine.

**MINIUM**

Lead oxide, \(\text{Pb}_3\text{O}_4\). Tetragonal. Found only massive, earthy, or pulverulent; in microscopic crystalline scales. H. 2.5. G. 9.1. Color scarletred or brownish red. Luster greasy or dull, Streak orange-yellow.

**Juab County** Tintic district: Gemini, Godiva mines.
**Utah County** East Tintic district: Burgin mine.

**MIRABILITE**

Hydrous sodium sulfate, \(\text{Na}_2\text{SO}_4\cdot10\text{H}_2\text{O}\). Monoclinic. Crystals short prismatic, resemble borax. Also massive as crusts, granular, stalactitic. H. 1-2. G. 1.5. Cleavage good. Fracture conchoidal. Luster vitreous. Colorless to white.

**Box Elder County** Shores of Great Salt Lake.
**Davis County** Shores of Great Salt Lake.
**Salt Lake County** Shores of Great Salt Lake.

**MIXITE**

Hydrous basic copper bismuth arsenate, \(\text{Cu}_2\text{Bi}_2\text{(AsO}_4\text{)}_6\text{(OH)}_8\cdot6\text{H}_2\text{O}\). Hexagonal. In hair-like crystals, tufted groups, or incrusting. Also compact, in reniform masses. H. 3-4. G. 3.8. Luster dull. Color emerald-green to bluish green, pale green or white. Streak lighter than color.

**Juab County** Tintic district: Ajax, Boss Tweed, Carissa mines.

**MOLYBDENITE**


**Beaver County** Beaver Lake district; **Granite district**: Big Pass, Bismuth, Contact groups; **Pine Grove district**: Pine Grove Associates mine; **Pruess district**: Blackbird, Cactus Mines; **Star district**.
**Emery County** San Rafael district: Lucky Strike mine.
**Juab County** West Tintic district.
**Millard County** House Range: Amasa Valley, Notch Peak intrusive.
**Morgan County** Arthur Fork.
**Piute County** Marysvale district: La Vita prospect.
**Salt Lake County** Big Cottonwood district: Alta-Gladstone Vein no. 5, Third Chance mines; **Bingham district**: Bingham Copper pit, Carr Fork mine; Little Cottonwood stock.
**San Juan County** La Sal Mountains.
**Tooele County** Gold Hill district: Cane Springs, Rube, Reaper, Yellow Hammer mines.
**Uintah County** Uinteland Knoll district: Ouray.
**Utah County** American Fork district; **Silver Lake district**: Deer Creek.
**Weber County** Sierra Madre district.

**MOLYBDITE** (See FERRIMOLYBDITE)

**MONAZITE**

Phosphate of the cerium metals, \((\text{Ce},\text{La},\text{Y},\text{Th})(\text{PO}_4\text{})\). Monoclinic. Crystals flattened, elongated, sometimes prismatic. H. 5-5.5. G. 4.6-5.4. Cleavage good. Fracture uneven. Brittle. Luster variable, resinous, waxy, vitreous. Color yellowish or reddish brown to brown, also shades of yellow, greenish, and nearly white.

**Box Elder County** Park Valley district.
**Emery County** Muddy River tributaries, seven fossil placers in Ferron Sandstone.
**Garfield County** Escalante; Henry Mountains on southwest flanks; Kaiparowits Plateau, fossil placer six miles south of Escalante in Straight Cliffs Sandstone.  

**Kane County** Kaiparowits Plateau; Rees Canyon, Croton Canyon, and Sunday Canyon, fossil placers in Straight Cliffs Sandstone.  

**Morgan County** Arthur Fork.  

**Sevier County** Monroe Canyon.  

**Tooele County** East Erickson district: South Pine Canyon.  

**Uintah County** Jenson.  

**Wayne County** Caineille.  

**MONHEIMITE** (See SMITHSONITE)  

**MONIMOLITE**  


**Tooele County** Gold Hill district: U. S. Mine.  

**MONTGOMERYITE**  


**Utah County** Clay Canyon.  

**MONTICELLITE**  

Calcium magnesium silicate, CaMgSiO₄. Orthorhombic. Occurs in small prismatic crystals or grains. H. 5. G. 3. 2. Colorless to gray.  

**Salt Lake County** Little Cottonwood district: Clayton Peak stock contact zone.  

**Utah County** American Fork district.  

**MONTMORILLONITE**  

Hydrous calcium sodium potassium aluminum silicate, (Ca,Na₂K₂)Al₂Si₁₀O₃·₄·2·H₂O. Monoclinic. Found in minute crystals. Also in hemispherical or reniform concretions with fibrous structure. H. 3 - 4. G. 2. 2. Cleavage good. Color white, yellowish, pinkish. A zeolite.  

**Piute County** Marysville district: Quicksilver mine.  

**Utah County** East Tintic district.  

**MORGANITE** (See BERYL)  

**MUSCOVITE**  

Essentially KAl₂(AlSi₃O₁₀)(OH)₂. Monoclinic. Crys­

tals tabular, may resemble orthorhombic or hexa­
gonal symmetry. Foliated, in scales, crypto-crystalline, compact massive. H. 2 - 2.5. G. 2. 7 - 3.1. Cleavage perfect basal. Folia flexible and elastic. Luster vitreous, silky, pearly. Transparent and colorless in thin sheets. Thicker sheets may be yellow, brown, green, or red.  

**Beaver County** Beaver Lake district: Skylark mine;
Star district: Hub, Lady Bryan, Moscow mines; Newton district: Sheep Rock mine; Rocky district: Copper Ranch mine.

Box Elder County
Ashbrook district: Vipont mine; Lucin district: Tecomia Hill mines; Rosebud district; Willard district: Mormon Girl claim.

Daggett County
Red Creek Complex.

Juab County
Goshute Indian Reservation; House Range: Painter Springs; Spring Creek district: Queen of Sheba mine.

Piute County
Marysvale district: Al Kee-Mee prospect.

Salt Lake County
Big Cottonwood district: Mountain Lake mine; Bingham district: Bingham Copper pit; Little Cottonwood stock.

Sevier County
Henry district; Trinity prospect.

Summit County
Park City district: Daly-Judge, Silver King, Silver King Consolidated, Woodside mines.

Tooele County
Gold Hill district: Yellow Hammer mine; Granite Mountain district; Ophir district: Lion Hill area - Ophir Hill area - Ophir Hill Consolidated, Ophir Coalition mines.

Utah County
American Fork district: Pittsburgh mine; East Tintic district.

Wasatch County
Bonanza Flat; Snake Creek district.

Washington County
Silver Reef district.

MOTTRAMITE


Iron County
Escalante district: Escalante mine.

NAHCOLITE


Duchesne County
Carter Oil Company wells; Green River Formation; Sinclair Mortenson well.

Uintah County
Sun Oil Company South Ouray well.

NATROALUNITE


Piute County
Marysvale district: Al Kee-Mee prospect.

NATROJAROSITE


Tooele County
Gold Hill district: Gold Hill (Western Utah) mine.

NATROLITE

Hydrous sodium aluminum silicate, Na₂Al₃Si₃O₁₂·2H₂O. Orthorhombic. Prismatic crystals, usually in radiating crystal groups. Also fibrous, massive, granular, compact. H. 5 - 5. G. 2. 3. Cleavage perfect. Luster vitreous. Colorless to white, tints of yellow, red. Transparent to translucent.

Piute County
Marysvale district: Silica Hills.

Tooele County
Rush Valley district.

NATRON


Tooele County
Deep Creek Valley.

NAVAJOITE


San Juan County
Monument Valley district: Mitten no. 1 mine.

NEIGHBORITE


Uintah County
Sun Oil Company South Ouray well.

NEPHELINE

**NICCOLITE**


**NIGRITE (See ASPHALTUM)**

**NITER**


**NOLANITE**


**NONTRONITE**

Hydrous iron aluminum silicate, \( \text{Na}_2\text{Fe}_3\text{Si}_3\text{O}_{10}(\text{OH})_2\cdot\text{nH}_2\text{O} \). A member of the smectite group. Monoclinic. A clay mineral. Compact, massive; has opal-like appearance. Earthy. H. 1-1.5. G. 2.5. Fragile. Color yellow, greenish-yellow. *Piute County* Marysvale district. *Salt Lake County* Bingham district: Bingham Copper Pit. *Tooele County* Gold Hill district: Gold Hill (U. S.), Unadine mines; Rush Valley district: Honerine mine. *Utah County* East Tintic district.

**NORSTRANDITE**

Aluminum trihydroxide, \( \text{Al(OH)}_3 \). Monoclinic. Occurs as thick tabular crystals; also as aggregates. H. 3. G. 2.4. Colorless to coral pink, to reddish brown. *Duchesne County* Green River Formation. *Uintah County* Green River Formation.

**NORTHUPITE**

Sodium magnesium chloride-carbonate, \( \text{Na}_3\text{MgCl}_2\cdot(\text{CO}_3)_2 \). Isometric. Found as tiny octahedral crystals. Fracture conchoidal. Brittle. H. 3.5 - 4. G. 2.4. Luster vitreous. Colorless; also pale yellow, gray, or brown. Transparent. Found in the Green River Formation. *Duchesne County* Green River Formation.

**NOSELITE**

Sodium aluminum sulfate silicate, \( \text{Na}_4\text{Al}_3\text{Si}_3\text{O}_{12}\cdot\text{SO}_4 \). Isometric. Crystals are rare; commonly massive, in imbedded grains. H. 5. G. 2.3. Color gray, blue, brown. Luster vitreous. Transparent to translucent. *San Juan County* La Sal Mountains: Middle Mountain, Brumley Ridge.

**NOVACEKITE**

Hydrous magnesium uraninate arsenate, \( \text{Mg(UO}_2\text{)}_2\cdot(\text{AsO}_4)_2\cdot12\text{H}_2\text{O} \). Tetragonal. Crystals rectangular plates. Occurs as crusts of interlocking aggregates. H. 2.5. G. 3.7. Color pale yellow, yellow. *San Juan County* Paradox Valley district: Grey Dawn mine.

**NSUTITE**


**OBSIDIAN**


**OCTAHEDRITE (See ANATASE)**

**OKENITE**
Basic hydrous calcium silicate, \( \text{H}_2\text{CaSi}_2\text{O}_6 \cdot \text{H}_2\text{O} \). Triclinic. A zeolite. Occurs in minute blade-shaped crystals. Commonly fibrous; also compact. Cleavage perfect. H. 4-5, G. 2-3. Color white, with a shade of yellow or blue.

Salt Lake County Bingham district: Bingham Copper Pit.
Utah County East Tintic district.

OLIGOCLASE

Sodium, calcium aluminum silicate, \( \text{NaAlSi}_3\text{O}_8 \cdot \text{CaAl}_2\text{-Si}_2\text{O}_8 \). Triclinic. A plagioclase feldspar. Commonly massive, compact. H. 6, G. 2-6. Cleavage good two directions. Twinning common. Luster vitreous to pearly. Colorless to white. Translucent.

Davis County Antelope Island.

Grand County La Sal Mountains, North Mountain.
Millard County House Range, Notch Peak intrusive.
Tooele County Gold Hill district: Alvarado mine.

OLIVENITE


Davis County Antelope Island.

Juab County Tintic district: Carissa, Gold Chain, Mammoth, Ophohonga mines; West Tintic district: Scotia mine.
Summit County Park City district; Silver King, Woodside mines.
Tooele County Gold Hill district: Gold Hill (U. S.), Pole Star Copper Company mines.
Utah County East Tintic district.

OLIVINE


Beaver County San Francisco district.
Tooele County Southern Oquirrh Mountains; Stansbury Mountains: Mack, Muskrat, North Willow Canyons, Salt Mountain.
Utah County American Fork district: Deer, Silver Creeks; Fox Hills.

ONYOFRITE

Plate County Marysville district: Quicksilver mine. Mt. Baldy district: Lucky Boy mine.

ONYX (See CALCITE)

OPAL

Hydrous silica, \( \text{SiO}_2 \cdot \text{nH}_2\text{O} \). Amorphous. Massive; often botryoidal, stalactitic, or earthy. H. 5-6, G. 1.9-2.2. Conchoidal fracture. Luster vitreous to resinous. Colorless, white, pale shades of yellow, red, brown, green, gray, blue. Often has a milky or opalescent appearance, and may display a fine play of colors.

Beaver County Beaver; Lincoln district: Creole mine; Milford; San Francisco district: Horn Silver mine; Southern San Francisco Mountains: Brimestone Mound.
Daggett County Red Creek: Yellow Canary uranium deposit.

Grand County Near Cisco.
Iron County Cima mine.
Juab County San Pitch Mountains: Orme property; Thomas Range: Autunite no. 8, Buena no. 1 claims, Nonella prospect, Topaz Mountain.
Plate County Marysville district: J. and L. Alunite mine, Silica Hills.
Salt Lake County Bingham district; Galena, Old Jordan mines.
Sevier County Fish Lake.
Tooele County Gold Hill district: Alvarado, Gold Hill (U. S.), Mono, Unadine mines.

ORPIMENT


Box Elder County Ashbrook district: Vipont mine.
Emery County San Rafael district: Camp Bird No. 7, Fuenrol no. 2 mine.
Garfield County Coyote Creek district: Hampton mine.
Salt Lake County Bingham district: Butterfield Canyon.
Tooele County Mercru district: Brickyard, Golden Gate, Hillside, Mercru, Sacramento, Sunshine mines.
Washington County Bull Valley district: Pilot claims.
ORTHITE (See ALLANITE)

ORTHoclase


Beaver County Pruss district: Blackbird group, Cactus mine; Rock Corral.
Juab County Goshute Indian Reservation; Spring Creek district: Queen of Sheba mine; Thomas Range: Autunite no. 8, Evening Star prospects, Topaz Mountain.
Millard County House Range: Notch Peak intrusive, Painter Springs.
Flute County Gold Mountain district: Sevier mine; Marysvale district; Ohio district: Wedge mine.
Salt Lake County Big Cottonwood Canyon; Big Cottonwood district; Little Cottonwood district; Little Cottonwood stock.
San Juan County La Sal Mountains: Middle Mountain, Brumley Ridge.
Sevier County Henry district: Trinity prospect.
Tooele County Gold Hill district: Rodenhouse Wash, Wilson Consolidated, Yellow Hammer mines; Granite Mountain district; Ophir district: Ophir Hill area — Ophir Hill Consolidated, Ophir Coalition mines.
Utah County Alpine district; Little Cottonwood stock.

OSARIZAWAITE


Millard County Church Hills: Stevens prospect.

OVERITE


Utah County Clay Canyon.

OZOCERITE

Mineral wax. Wax-like in appearance and consistency. Colorless to white when pure; often pale green, yellowish, brownish yellow, brown. Occurs in veins and fillings in brecciated zones.

Carbon County Whitmore Canyon.
Utah County Colton: Higgins, James Peak (Brown Bear), Kyune Canyon, Midnight, Miller, Pleasant Valley, Thomas Ranch, Town mines.
Wasatch County Soldier Summit: Culmer Brothers, Soldier Summit, U. S. mines.

PALIGORSKITE

Hydrous magnesium aluminum silicate, (Mg,Al)₂₋Si₄O₁₀(OH)₄·4H₂O. Monoclinic. H. soft. G. 2.2. Commonly known as mountain leather from its leather-like appearance.

Tooele County Ophir district: Dry Canyon area: Deseret mine.

PALLADIUM


Salt Lake County Bingham district: Bingham Copper Pit.

PARABUTLERITE


Emery County San Rafael district: Calf Mesa, Dexter group.

PARAMONTROSEITE

Vanadium oxide, VO₂. Orthorhombic. G. 4.0. In part or wholly pseudomorphic after montroseite. Metastable, and alteration product.

Emery County San Rafael district: Rex no. 2 mine.
Grand County Thompsons district: Juniper mine.
San Juan County Big Indian district: Cal Uranium, Homestake, Mi Vida mines; Paradox Valley district: Vanadium Queen mine.

PARGASITE

Utah County East Tintic district.

PASCOITE


Emery County San Rafael district: Calyx mine; Temple Mountain.
Garfield County Crescent Creek.
Grand County Thompsons district: Black Ape mine.
San Juan County Big Indian district: Mi Vida mine.
La Sal Quadrangle: Little Peter mine; Montezuma Canyon: West Cliff House No. 8 mine.

PEARCEITE


Box Elder County Ashbrook district: Vipont mine.
Juab County Tintic district: Bullion Beck, Gemini mines.
Utah County East Tintic district: North Lily mine. Tintic Standard mine.

PENNINE (See PENNINITE)

PENNINITE

Variety of chlorite, (Mg,Fe,AI)₆(Si,Al)₄O₁₀(OH)₈·

Piute County Marysvale district.
Sevier County Henry district: Trinity prospect.
Utah County East Tintic district.
Wasatch County Snake Creek district.

PERICLASE


Salt Lake County Big Cottonwood district: Big Cottonwood, Mountain Lake mines; Little Cottonwood district: Clayton Peak Stock contact zone.
Utah County Silver Lake district: Deer, Silver Creeks.
Washington County Mineral Mountain: Emma mine.

PETRIFIED WOOD

(See CRYSTOCRYSTALLINE QUARTZ)

PETZITE


Utah County East Tintic district: Eureka Lily, Eureka Standard, North Lily, Tintic Standard mines.

PHARMACOSIDERITE


Juab County Tintic district: Gold Chain, Mammoth mines; West Tintic district: Scotia mine.
Tooele County Gold Hill district: Gold Hill (Western Utah) mine; Mercur district.

PHILLIPSITE


Tooele County Rush Valley district.

PHLOGOPITE


Salt Lake County Little Cottonwood district: Clayton Peak Stock contact zone.
Sevier County Henry district: Trinity prospect.
Tooele County Ophir district: Ophir Hill area- Ophir Hill Consolidated, Ophir Coalition mines.
Wasatch County Snake Creek district.

PHOSGENITE


PHOSPHORITE

Phosphate rock, of variable composition. Essentially a carbonate fluorapatite in calcareous rocks, and an aluminum phosphate in clay shales. Mississippian phosphate shales are located in Ogden Canyon, Laketown Canyon, and in the East Tintic Mountains. The Permian Phosphoria Formation occurs in northern and northeastern Utah. *Daggett County* Uinta Mountains. *Duchesne County* Uinta Mountains. *Juab County* East Tintic Mountains in basal Deseret Limestone. *Rich County* Crawford Mountains; Laketown Canyon; Woodruff Creek. *Salt Lake County* Dry Canyon. *Summit County* Franson Canyon; Park City district. *Uintah County* Brush Creek; Frandson Canyon; Little Brush Creek; Rock Creek. *Utah County* Spanish Fork Canyon; Little Diamond Fork. *Wasatch County* Midway; Uinta Mountains. *Weber County* Ogden Canyon.

PHOSPHURANYLITE

Hydrous basic calcium uranium phosphate, \( \text{Ca}((\text{UO}_2)_4\text{PO}_{4})_3\text{OH} \cdot 7\text{H}_2\text{O} \). Orthorhombic. Found as thin coatings or aggregates that appear dense, earthy, or minutely scaly. Cleavage perfect. H. 2. 5. G. 4. 1. Color deep golden yellow to rich yellow. Not fluorescent. *Emery County* San Rafael district: Fuenrol no. 2 mine. *Juab County* Tintic district: Carissa mine.

PITCHBLENDE (See URANINITE)

Massive or colloform uraninite.

PITTICITE

Hydrous iron arsenate sulfate, \( \text{Fe}_2(\text{AsO}_4)(\text{SO}_4)(\text{OH})\cdot \text{nH}_2\text{O} \). Massive, reniform or stalactitic, and as coatings. H. 2-3. G. 2. 4. Brittle. Fracture earthy to conchoidal. Luster dull to vitreous. Color yellowish, brownish, reddish. *Emery County* San Rafael district: Fuenrol no. 2 mine. *Juab County* Tintic district: Carissa mine.

PLAGIOCLASE (See ALBITE, OLIGOCLASE, ANDESINE, LABRADORITE, ANORTHITE)

Hydrous copper silicate, \( \text{Cu}_8(\text{Si}_4\text{O}_{11})_2\text{OH} \cdot \text{H}_2\text{O} \). Orthorhombic. Fibrous, often mammillary. H. 5. 5. G. 3. 3. Color blue. *Beaver County* Beaver Lake district on east side of Beaver Lake Mountains.
PLATINUM


Garfield County Hite in placers.
Salt Lake County Bingham district: Bingham Copper Pit.

PLEONASTE (See HERCYNITE)

PLUMBOJAROSITE


Beaver County San Francisco district: Horn Silver mine; Star district: Hub, Moscow, Red Warrior mines.
Box Elder County Lucin district: Tecoma Hill mines.
Juab County Fish Springs district: Carnation, Emma, Galena, Utah mines.
Piute County Mt. Baldy district: Deer Trail mine.
Salt Lake County Big Cottonwood district: Cardiff mine; Little Cottonwood district: Cabin, Flagstaff, South Hecla mines.
Tooele County Deep Creek Mountains: Devils Pit, Eagles Nest, Midland, Monocoon, Oro del Rey mines; Gold Hill district: Boston, Copper Queen-Midland Mining Company, Cyclone, Garrison Monster, Gold Hill Standard, Monocoon, New Baltimore, Red Jacket, Rube, Shay, Silver King, Success mines; Ophir district: Dry Canyon area - Kearseage mine; Lion Hill area - Buffalo mine, Chloride Point, Douglas, Lion, Zella, Empire, East Side, Iron Monarch, Northern Light, Woodruff mines; Ophir Hill area - Cliff, Hidden Treasure, Sacramento mines; Rush Valley district: Argent, Ben Harrison, Galena King, Homerine, Mescatine, Muerbrook, Salvation - Hercules mines.
Utah County American Fork district: Miller, Pittsburgh mines; East Tintic district: Eureka Lily, North Lily, Tintic Standard, Trixie mines.
Washington County Tutsagubet district: Apex, Paymaster mines.

POLYBASITE


Utah County East Tintic district: Burgin, Eureka Lily, Tintic Standard, Trixie mines.

POLYHALITE

Hydrous potash calcium magnesium sulfate, K$_2$Ca$_2$Mg(SO$_4$)$_4$·2H$_2$O. Triclinic. Crystals are small and rare; usually massive. Cleavage perfect. H. 3.5. G. 2.8. Luster vitreous to resinous. Colorless to white, gray, salmon pink. Transparent.

Grand County Cane Creek: Texas Gulf Potash mine, Paradox Basin; Salt Valley; Seven Mile anticline.
San Juan County Moab Valley.
Tooele County Salduro; Wendover.

POTASS ALUM


Piute County Marysville district: Alum King mine.
Utah County East Tintic district.

POTASH CLAY (See HYDROMICA)

POWELLITE


Beaver County Beaver Lake district: Beaver-Harrison, OK mines.
Salt Lake County Big Cottonwood district: Tungsten Tunnel mine.
Tooele County Gold Hill district: Yellow Hammer mine.

PRASE (See CRYPTOCRYSTALLINE QUARTZ)

PREHNITE


Salt Lake County Little Cottonwood district.
Utah County Silver Lake district: Deer, Silver Creeks.
PROCHLORITE


*Sevier County* Henry district: Trinity prospect.

PROSOPITE


*Tooele County* Dugway district: Buckhorn claim; Wild Cat Mountains: Silver Queen mine. 

PROUSTITE


*Emery County* Cedar Mountain district; Muddy River. 

*Garfield County* Coyote. 

*Piute County* Marysvale district. 

PYRARGYRITE


*Beaver County* San Francisco district: Horn Silver mine. 

*Box Elder County* Ashbrook district: Vipont mine. 

*Juab County* Tintic district: Chief Consolidated mine. 

*Tooele County* Ophir district: Ophir Hill area - Jim Fisk mine. 

*Utah County* East Tintic district: Eureka Lily, Eureka Standard, Trixie mines. 

PYRITE


*Salt Lake County* Bingham district: Tiewaukee, Winnamuck, Dixon mines. 

*Summit County* Park City district: Park City Consolidated mine. 

*Tooele County* Ophir district: Ophir Hill area - Jim Fisk mine. 

*Utah County* East Tintic district: Apex Standard mine. 

*Utah County* East Tintic district: Apex Standard mine.
Beaver County: Beaver Lake district: Beaver-Harrison, OK, Skylark mines; Bradshaw district: Cave, Hecla, Nip and Tuck mines; Fortuna district: Rocky Hollow; Gordon district: Sulphurdale; Granite district: Big Pass, Bismuth, Molly mines; Lincoln district: Creole, Lincoln mines; Newton district: Indian Creek, Rob Roy, Sheep Rock mines; Pine Grove district; Pruss district: Blackbird, Cactus, Gold Reef mines; Rocky district: Old Hickory mine; San Francisco district: Beaver Carbonate, Cupric, Horn Silver, King David, Michigan, Washington mines; Star district: Commonwealth, Harrington-Hickory, Hub, Kemple, Lady Bryan, Moscow, Progressive, Red Warrior, St. Mary's, White Rock, Wild Bill Woodhouse mines.

Box Elder County: Ashbrook district: Vipont mine; Lucin district: Tecoma Hill mines; Newfoundland district: Copper Ridge mine; North shore of Great Salt Lake; Park Valley district; Promontory district: Lakeview Mining properties; Rosebud district: Red Buttes; Willard district: Overland claim.

Davis County: Farmington district: Morning Star group, Parrish Canyon.

Duchesne County: Green River Formation.

Emery County: San Rafael district: Calyx, Dexter Group, Little Susan, Lucky Strike, Lucky Strike no. 2, Maybe, Temple Mountain mines.


Grand County: Hoosier mine; La Sal district: Bornite mine; Miner’s Basin district: Dillon, M. I. F., Moab no. 1, Skylark, Tornado mines; Seven Mile Canyon: Shinarump nos. 1-3 claims.


Juab County: Deseret district; Detroit district: Charm, Copperhead, E. P. H., Ixem mines; Fish Springs district: Carnation, Emma, Galena, Utah mines; North Tintic district: Tintic Prince mine; Spor Mountain: Bell Hill mine; Tintic district: Black Dragon, Chief Consolidated, Iron Blossom, Lower Mammoth, Sunbeam, Swansea mines; West Tintic district: Iron King, Lockheed, 1903, Scotia, Tintic Western, War Eagle mines.


Morgan County: Argenta district: Carbonate Hill, Carbonate Gem mines; Morgan district: Chicago-Utah, Iron King, Morgan Consolidated, Red Eagle mines.

Piute County: Gold Mountain district: Annie Laurie, Sevier mines; Marysvale district: La Vita prospect; Mt. Baldy district: Clyde, Deer Trail, Green Eyed Monster mines; Ohio district: Bully Boy and Webster, Cascade, Copper Belt, Dalton, Great Western, Iris, Shamrock mines.

Salt Lake County: Big Cottonwood district: American Metals, Big Cottonwood, Cardiff, Columbus-Rexall, Howell-Baby McKee, Kentucky-Utah, Maxfield, Silver Mountain, Woodlawn mines; Bingham district: Bingham Copper Pit, Boston Consolidated, Burning Moscow, Broad Gauge, Brooklyn, Butterfield, Caledonia, Carr Fork, Columbia, Commercial, Conger, Colorado, Dalton and Lark, Dixon, Frisco, Fortune, Galena, Highland Boy, Last Chance, Minnie, Montezuma, Nast, Neptune, Old Jordan, Phoenix, Red Wing, Tiewaukee, U. S. and Lark, Winnamuck, Yampa, Yosemite mines; Little Cottonwood district: Albion, Alta-Galdstone Vein no. 5, Alta Consolidated, Columbus Consolidated and Wasatch Drainage Tunnel, Columbus Rexal, Dwyer, Emma, Little Emma, Peruvian Consolidated, South Hecla, Superior mines; Little Cottonwood stock.

San Juan County: Big Indian district: Big Indian Copper mine; Elk Ridge: King Edward mine; La Sal Quadrangle: Black Hat, Firefly-Pigmay mines; Monticello district: Alam, Blue Bird, Copper Queen, Danish Girl, Dream, Duckett, Gold Queen mines; Paradox Valley district: Grey Dawn, Vanadium Queen mines; Red Canyon district: Markey no. 3 mine; White Canyon district: Blue Lizard, Fry No. 4, Happy Jack, Jomac, White Canyon No. 1, W. N. mines.

Sanpete County: Dry Canyon.

Sevier County: Rock Candy Mountain; Salina Creek district: Lead Hill mine.

Summit County: Marble district; Park City district: California, Comstock, Daly, Daly-Judge, Daly West, J. A. C. Tunnel, Kearns-Keith, Mayflower, New York, Ontario, Silver King, Wabash, Woodside mines.

Tooele County: Bingham district: May Flower mine; Blue Bell district: Bennion Canyon, Little Valley, Morgan mines; Columbia district: Benmore, Sharp, Sultana mines; Deep Creek Mountains: Congar Hill, Mida, Silver Queen mines; Dugway district: Bertha, Bullion Canyon, Four Metals, Kelly’s Hole, Metal States, Surplus mines; East Erickson district: Copper Jack, Dutch Peak, Flying Dutchman, Greens Ridge, Hard-to-Beat Canyon, Indianapolis, Sheeprock, Silver King, Silver Shield, Tintic-Delaware mines; Erickson district: Black Jack, Black Rock, Blain, Deer Trail, Indian Boy, May Farmer, Silver Reef, Utonia mines; Free Coinage district: Gold Hill district: Alvarado, Cape Springs, Calaveras, Cash Boy, Climax, Copper Bloom, Copper Queen-Midland Mining Company, Cyclone, Doctor, Doctor, Doctor, Doctor,
Frankie, Gold Hill (U. S.), New Baltimore, Pole Star Copper Company, Red Jacket, Silver and Gold Mining Company, Success, U. S., Victory no. 1 mines; Granite Mountain district: Desert, El Dorado, Mountain Queen mines; Greeley district; Grantsville district; Mercure district: Mineral Hill mines; North Tintic district: New Bullion, Scranton mines; Ophir district: Dry Canyon area - Mono mine; Lion Hill area - Buffalo mine, Chloride Point; Ophir Hill area - Cliff mine, Hidden Treasure, Ophir Hill Consolidated, Ophir Coalition, Sacramento mines; Oseola district: Rush Valley district, Arpent, Ben Harrison, Calument, Galena King, Honerine, Mescatine, Muerbrook, Salvation - Hercules, property; Tooele district; Wild Cat Mountains: Queen mine.

Uintah County Brown Park area; Carbonate district: Dyer mine; Sun Oil Company South Ouray well; Uteland Knoll district: Ouray.

Utah County Alpine district: Lucky Chance mine; American Fork district: Bog, Dutchman, Mary Ellen and Live Yankee, Pacific, Silver Dipper, Water Fall, Yankee mines; East Tintic district: Apex, Burgin, Eureka Bullion, Eureka Lily, Eureka Standard, Iron King, Larsen Clay pits, Tintic Standard, Trixie, Zuma mines; North Tintic district: Lehi-Tintic, Tintic Empire, Tintic Paymaster, Selma mines; Payson district: Nelson mine; Provo district: Monarch mines; Santagquin district: Black Balsam, Copper Bullion, Santequin Central mines; Silver Lake district: Milkmaid, Ontario mines.

Wasatch County Blue Ledge district: Mayflower mine.

Washington County Silver Reef district.

Wayne County Fruitia: Oyler mine; Miners Mountain district.

Weber County Fremont Island district; Sierra Madre district: King Solomon, Napoleon-Maghera mines.

PYROLOUSITE


Beaver County Blue Mountains: Black Jack, Susie Q. Claims; Indian Peak district; Steelville, Spor properties; Newton district; Black Rock deposit; Pine Grove district; San Francisco district.

Cache County Hyrum area: Pig Hole Hollow.

Daggett County Daggett Chief property; Spring Creek deposit.

Emery County Cedar Mountains; Muddy River; Rochester: Sauker Basin.

Garfield County Boulder Mountain; Pleasant Creek; Hutch Pasture; Panguitch; Table Cliff Plateau; Tushar Range: Hawkins claims.

Grand County Bald Mesa; Courthouse Wash; Little Grand district: Black Bird, Colorado Fuel and Iron Company, Desert Rock (Mongol), Dry Lake Wash, Duma Point, Needles, Salt Wash group, Tenmile Wash, White Wash mines; Muleshoe Wash; Salt Valley; Squaw Peak; Wilson Mesa district; White House.

Iron County Antelope Range: Black Jack, Lucky Joe, Taylor claims; Cedar Mountains: Black Hawk, Joe Louis claims; Escalante district: Clove, Escalante mines; Stateline district: Creole, Gold Dome, Johnny, Ofer, Phelps, Utah Spur mines; Modena property. Juab County Deep Creek Mountains: Gold Bond, Johnson Canyon, Singleton Canyon mines; Detroit district: Iron Blossom mine, Detroit district: Black Boy group, Charm, Copperhead, E. P. H., Ibex mines; Mt. Nebo district: Black Ledge claims; Thomas district: Fluorine Queen mine; Tintic district: Black Jack Empire, White Cloud; San Pitch Mountains: Black Jack, Orme properties.

Kane County Kitchen Corral Canyon.

Millard County Detroit district: Almond, Black Diamond, Blue Bell, Guy, Last Chance, Major Drum, Martha, Silica Plug mines.

Platte County Antelope Range; Dry Canyon; Marysvale district: Blackbird, Blue Miami Moon no. 1 mines; Mt. Baldy district: Deer Trial mine; Mt. Belknap, Ohio district: Bully Boy and Webster mines, Gilbert claims.

Rich County Bear River Range: Lakeview claims.

Salt Lake County Big Cottonwood district: Carbonate, Cardiff, Woodlawn mines; Bingham district; Camp Williams: Evans Lime Quarry; Little Cottonwood district: Emma, Little Emma, Michigan - Utah mines.

Sanpete County Mt. Pleasant.

Sevier County Henry district: Iron Peaks, Georgia, Jumbo, Yellow Hornet, Krothe Iron, Nooday, Trinity mines; Sevier Plateau.

Summit County Beaver Canyon; Coalville; Park City district: Daly, Ontario, Silver King, Woodside mines. Tooele County: Deep Creek Mountains: Dewey, Fortuna mines, Bluebell district: Bogan, Morgan mines; Columbia district: Benmore, Sharp mines; East Erickson district: Copper Jack, Silver King, Silver Shield mines; Erickson district: Blackjack, Blackrock, Blain, Deer Trail, Indian Boy, May Farmer, Huber - Rydalch, Queen Mary mines; Ophir district: Lion Hill area; Ophir Hill area - Cliff, Ophir Hill Consolidated, Ophir Coalition mines.
**PYROMORPHITE**

Lead chlorophosphate, Pb₅(PO₄)₃Cl. Hexagonal. Crystals prismatic, equant, rarely tabular. Often rounded barrel-shaped forms. Also globular, reniform forms. H. 3.5 - 4. G. 6.5 - 7.1. Luster resinous to adamantine. Also massive, coarse to fine grained crystalline to cryptocrystalline. H. 7. G. 2.7. Fracture conchoidal. Luster vitreous. Usually colorless, milky, rose, smoky. Beaver County Bradshaw district; Indian Peak district: Blue Bell, Cougar Spar, Dugout, JB, Nooday, Lost Sheep, Utah mines; Lincoln district: Creole mine; Newton district: Louise, Rob Roy, Sheep Rock mines; Pine Grove district: Monarch; Pruess district: Blackbird, Cactus mines, Cactus Gulch; Rock Corral; San Francisco district; Star district: Thrush, Cabin, Fluorine Ledge, Lucky Boy nos. 1-2, Manassa, Monte Cristo, Quartzite, North Virginia Extension, Virginia nos. 1-5 mines; Wahl Wahl mountains: Violet claims. Box Elder County Ashbrooke district: Vipont mine; Rosebud district. Davis County Antelope Island. Emery County San Rafael district. Grand County Agate Switch; Miners Basin district: Dewey, High Ore mines. Iron County Gold Springs district; Iron Springs district: Granite Mountain, Iron Mountain. Juab County Deseret district: Miller mine; Goshute Indian Reservation; Thomas Range: Autunite no. 8, Bel Hill, Blowout, Dell no. 1, Dell no. 5, Evening Star, Hilltop, Lost Sheep, Nonella, Oversight mines; Topaz Mountain; Tintic district: Sioux mine; San Pitch mine; San Pitch Mountains: Black Jack claims: Spring Creek district; Trout Creek district: Apex mine; West Tintic district: 1903, Tintic Western mines. Piute County Gold Mountain district: Sevier mine; Marysville district: Quicksilver mine; Mt. Baldy district: Deer Trail mine; Ohio district: Bully Boy and Webster mines. Salt Lake County Bingham district: Bingham Copper.
Pit, Galena, Old Jordan, U. S. and Lark mines; Little Cottonwood stock.

San Juan County La Sal Mountains; White Canyon district: Happy Jack mine.

Sevier County Henry district: Trinity prospect.

Summit County Park City district: Daly-Judge, Daly West, Jupiter, Kearns-Keith, Silver King, Silver King Consolidated, Woodside mines.

Tooele County Blue Bell district: Bennion Canyon mine; Columbia district: Benmore, Sharp, Iron Hope, Sultana mines; Dugway district: Ratterl mine; East Erickson district: Ekker Canyon, Indianapolis, Silver King mines; Gold Hill district: Gold Bond, Rodenhouse Wash, star Dust, Success, U. S. mines; Granite district: Desert, El Dorado, Mountain Queen mines; Mercur district; Ophir district: Dry Canyon area; Ophir Hill Consolidated, Ophir Coalition mines; North Tintic district: Scranton mine.

Utah County Alpine district; American Fork district: Bog mine; Little Cottonwood stock; East Tintic district: Burgin mine; Silver Lake district: Deer, Silver Creeks, Wells Canyon.

Washington County Silver Reef district.

Weber County Sierra Madre district.

QUENSELITE


Utah County East Tintic district: Burgin mine.

RABBITTITE


Emery County San Rafael district: Lucky Strike, Lucky Strike no. 2 mines.

RACEWINITE


Salt Lake County Bingham district: Highland Boy, Yampa mines.

RAUVITE


Emery County San Rafael district: Flat Top Mesa, Migliaccio mine, Temple Mountain, South Temple Mountain, South Temple Wash.

Grand County Beaver Mesa: Corvusite nos. 1-3 mines; Thompsons district: Cactus Rat mines.

Piute County Marysville district: La Vita prospect.

Sevier County Henry district: La Veta prospect.

REALGAR


Box Elder County Ashbrook district: Vipont mine.

Emery County San Rafael district: Camp Bird No. 7, Fuenrol no. 2 mines.

Garfield County Coyote Creek district: Hampton mine.

Salt Lake County Bingham district: Butterfield Canyon.

Tooele County Mercur district: Brickyard, Golden Gate, Mercur, Sacramento mines.

Washington County Beaver Dam Mountains; Bull Valley district: Pilot claims.

RECTORITE

Interstratified pyrophyllite and vermiculite.

Tooele County Oquirrh Mountains: Manning Canyon Shale: Stansbury Mountains: Manning Canyon Shale. Utah County Beverly Hills: Manning Canyon Shale; Lake Mountain: Manning Canyon Shale, Lehi district: Manning Canyon Shale; Thorpe Hills: Manning Canyon Shale; Wasatch Mountains: Manning Canyon Shale.

RED OCHER (See HEMATITE)

REEDMERGERITE


Duchesne County Carter Oil Company wells; Green River Formation; Sinclair Mortenson well.

RHODOCHROSITE


**RHODONITE**


**RHOMBOCLASE**

Hydrous iron sulfate, $\text{HFe(SO}_4)_2 \cdot 4\text{H}_2\text{O}$. Orthorhombic. Thin tabular plates. Also stalactites with radiating structure. Fracture conchoidal to fibrous. H. 2. G. 2. 3. Luster submetallic to greasy. Colorless to white, gray, pale yellow, green or blue. Summit County: Park City district: Daly, Ontario mines. Tooele County: Erickson district: Utonia claim.

**RIEBECKITE**


**RIPIDOLITE**


**ROCKBRIDGEITE**


**ROEMERITE**

Hydrous ferrous and ferric sulfate, $\text{FeFe}_2(\text{SO}_4)_2 \cdot 14\text{H}_2\text{O}$. Triclinic. Occurs as crystalline masses and very crude, equant crystals. Cleavage perfect. H. 3 - 3. 5. G. 2. 2. Color dark brown. Luster oily to vitreous. Transparent. Taste saline, astringent. Emery County: San Rafael district: Calf Mesa, Dexter group. Utah County: East Tintic district.

**ROSASITE**


**ROSCOELITE**

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View, Vista Grande, Wedge, Yellow Bird, Yip Yip mines; Montezuma Canyon: Dixie No. 1, Lucky Boy, Rock, Strawberry, Verdure, West Cliff House No. 8 mines; Paradox Valley district: Grey Dawn, Vanadium Queen mines.

ROSE QUARTZ (See QUARTZ)

ROSSITE


Grand County Thompsons area; Thompsons district: Cactus Rat, Parco no. 23 mines.

RUBY SILVER

(See PROUSTITE and PYRARGYRITE)

RUTHERFORDINE


Emery County San Rafael district: Delta mine. San Juan County “C” Group claims.

RUTILE


Beaver County Pruess district: Blackbird, Cactus mines. Salt Lake County Bingham district. San Juan County Moses Rock dike. Sevier County Henry district: Trinity prospect. Tooele County Gold Hill district; Mercur district. Utah County East Tintic district. Wayne County Caineville.

SABUGALITE


Piute County Marysville district: Freedom no. 2 mine. San Juan County White Canyon district: Happy Jack mine.

SAGENITE (See RUTILE)

SALEEITE

Magnesium uraninate phosphate, Mg(UO₂)₂(PO₄)₂·8-10H₂O. Tetragonal. Crystals rectangular plates. H. 2½. G. 3.27. Color pale yellow, yellowish green. Translucent to transparent. Fluoresces brilliant yellow green.

San Juan County Paradox Valley district: Grey Dawn mine.

SAMARSKITE


Tooele County East Erickson district: Hard-to-Beat, Sheeprock Canyons, Silver King mine; Granite Mountain district: Blue Bell mine.

SANIDINE (See ORTHoclase)

SAPONITE

Hydrous magnesium aluminum iron silicate, (Mg,Al-Fe)₃(Al,si)₄O₁₂(OH)₂. Monoclinic. Member of the smectite group. Usually amorphous and impure. Commonly massive. In nodules or cavities. H. soft. G. 2. 2. Luster greasy. Color white, yellowish, grayish green, bluish, reddish.

Beaver County Star district. Grand County Richardson district. Utah County East Tintic district.

SAPPHIRE (See CORUNDUM)

SATIN SPAR (See GYPSUM)

SCANDIUM

Rare metal, Sc, indefinite mineral association. Occurs in contact metamorphic deposits and in replacement veins.

Tooele County Gold Hill district.
SCAPOLITE

Varied composition from (Na,Ca)₂Al₂(Al, Si)₃Si₆O₂₄(C₁, CO₃)₂SO₄ to (Ca, Na)₄Al₃(Al, Si)₃Si₆O₂₄(Cl, CO₃)₂SO₄. Tetragonal. Crystals usually prismatic. Usually coarse crystals, or with faint fibrous appearance. H. 5 - 6. G. 2 - 7. Luster vitreous. Color white, gray, pale green, bluish, reddish.

Sevier County: Henry district: Trinity prospect.

Tooele County: Gold Hill district: Doctor, Gold Bond, Rube mines.

SCHHEELITE


Beaver County: Bradshaw district: 2 R's group; Granite district: Big Pass, Bismuth, Burnt Hollow, Contact, Garnet, King-of-the-Hills, Major fault, Molly, Oak, Oak Basin, Rattler, Scheelite, Ward mines; Lincoln district: Creole mine; Rocky district: Copper Ranch, Old Hickory mines; San Francisco district: Cupric mine; Star district: Copper King, Little May Lilly mines.

Box Elder County: Ashbrook district: Bovine mine; Grouse Creek Range: Rocky Pass mine; Newfoundland district: Desert Peak, Park Rat Canyon; Rosebud district: A and W, Magnitude mines.

Davis County: Lucky Boy and Pioche mines.

Grand County: Ryan Creek Scheelite property.

Juab County: Deep Creek Mountains: Apex, Eastern Trout Creek, Hornet, MacMillan, Mary mines; Trout Creek district: Apex, Bacon, Trout Creek mines; West Tintic district: Iron King, Tintic western mines.


Salt Lake County: Big Cottonwood district: Mountain Lake, Tungsten Tunnel mines; Little Cottonwood district: South Hecla mine; Little Cottonwood stock.

Tooele County: Deep Creek Mountains: Complex, Probert mine; East Erickson district: Ekker Canyon prospect, Sheeprock Canyon; Gold Hill district: B. Estelle, Centennial and Enterprise, Copper Bloom, Copperopolis, Doctor, E. H. B., Enterprise, Fraction Lode, Frankie, Ida Lull, Lucy L., Mascot, Pole Star Copper Company, Star Dust, Wilson Consolidated, Yellow Hammer mines; Ophir district: Ophir Hill area -

Ophir Hill Consolidated, Ophir Coalition mines.

Utah County: Silver Lake district: Deer Creek, Mayday Extension, Milkmaid mines.

Washington County: Beaver Dam Mountains.

SCHOEPITE


Emery County: San Rafael district: Delta mine, Green Vein Mesa, Consolidated mine.

San Juan County: Red Canyon district: Frey no. 4, Posey mines; White Canyon district: Happy Jack, Hideout mines.

Wayne County: Fruita: Oyler mine.

SCHROECKINGERITE


Emery County: San Rafael district: Delta mine; Bow Knot area; Green River district: Crabapple claim.

Grand County: Cisco: Trader Smith's claims; Seven Mile Canyon; Thompsons district: McCoy, Parco no. 23 mines; Yellow Cat district: Yellow Cat group.

Juab County: Thomas Range: Good Will, Yellow Chief groups; Topaz Mountain.

Pike County: Marysvale district: Bullion Monarch, East Slope no. 2, Freedom nos. 1 - 2, Prospector nos. 1 and 3 mines.

San Juan County: Elk Ridge: Notch Nos. 5 and 6 mines; La Sal Quadrangle: Brushly Basin No. 3, Hesperus mines; White Canyon district: Hideout mine.

Wayne County: Coleman Canyon to Oak Creek.

SCORODITE


Beaver County: San Francisco district: Horn Silver mine;
Star district.

*Emery County* San Rafael district: Temple Mountain, Fuemrol no. 2 mine.

*Juab County* Tintic district: Carissa mine; West Tintic district: Scotia mine.

*Tooele County* Deep Creek Mountains: Bonanza mine. Gold Hill district: Bonanza, Boston, Gold Hill (U. S.), Gold Hill Standard, Mascot, Monte Del Rey, Ozark, Silver and Gold Mining Company, Unadine, U. S. mines; Mercur district.

*Utah County* East Tintic district: Trixie mine.

**SEARLESITE**


*Duchesne County* Carter Oil Company wells; Green River Formation; Sinclair Mortenson well.

*Uintah County* Sun Oil Company South Ouray well.

**SELENITE** (See GYPSUM)

**SELENIUM**


*Grand County* Thompsons district: Parco no. 23 mine.

*San Juan County* Paradox Valley district: Vanadium Queen mine.

**SELIGMANNITE**


*Salt Lake County* Bingham district.

**SEPARLITE**


*Beaver County* Mineral Range.

*Duchesne County* Indian Canyon.

*Salt Lake County* Big Cottonwood district: Maxfield mine; Little Cottonwood district.

*San Juan County* White Canyon district: Happy Jack mine.

*Tooele County* Gold Hill district: Cane Spring mine. Rush Valley district: Honerine mine.

**SERICITE** (See MUSCOVITE)

**SERPENTINE**


*Beaver County* Bradshaw district: 2 R’s group; Pruss district: Blackbird, Cactus mines; Star district: Hub mine.

*Salt Lake County* Big Cottonwood district.

*Sevier County* Henry district: Trinity prospect.

*Summit County* Park City district: Daly, Ontario mines.

*Tooele County* Gold Hill district: Reaper mine; Rush Valley district: Honerine mine.

*Washington County* Mineral Mountain: Gregerson mine.

**SERPOPHITE**

Hydrous magnesium silicate, H$_4$Mg$_3$Si$_3$O$_7$·2H$_2$O. Associated with minerals in contact metamorphic aureoles.

*Utah County* East Tintic district.

**SHERWOODITE**


*Grand County* Wilson Mesa district.
SHORTITE


SICKLERITE


SIDERITE


SIDERONATRITE


SIDEROTIL


SILICIFIED BONE and WOOD
(See CRYPTOCRYSTALLINE QUARTZ)

SILVER

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Walker, Thompsons mines.
_Weber County_ Fremont Island district.

**SIMPLOTITE**


_Weber County_ Fremont Island district. 
_Simpson County_ Paradox Valley district: Vanadium Queen mine.

**SKLODOWSKITE**


_Juab County_ Honeycomb Hills.
_Piute County_ Marysville district: Freedom no. 2 mine.
_Thatcher County_ Futon district.

**SMALTITE**


_Juab County_ White Canyon district: Happy Jack mine.

**SMECTITE**

Group name for bentonite and fullers earth clay minerals, including beidellite, hectorite, montmorillonite, nontronite, and saponite.

_Duchesne County_ Green River Formation: South Fork Avintaquin Creek, Left Fork Indian Creek, Willow Creek.
_Juab County_ Thomas Range: Spor Mountain.
_Utah County_ Green River Formation, South of Ouray.

**SMITHSONITE**


_Beaver County_ Granite district: Beaver View mine; Lincoln district: Lincoln mine; Star district: Cedar - Talisman, Gold Crown, Hoosier Boy, Maud S., Moscow, Red Warrior, Vicksburg mines; San Francisco district: Horn Silver mine.
_Bus Elder County_ Lucin district: Cunepah Tunnel, Tecoma Hill mine; Promontory district: Lakeview Mining properties; Saline Station.
_Cache County_ Hyrum area: Moon, Tip Top claims; Smithfield area.
_Morgan County_ Argenta district: Carbonate Hill, Carbonate Gem mines.
_Salt Lake County_ Big Cottonwood district: Alta Tunnel and Transportation Company, Antelope, Carbonate, Cardiff, Prince of Wales, Silver Mountain mines; Little Cottonwood district: Dwyer, Emma, South Hecla mines.
_Toele County_ Dugway district: Bertha, Bryan, Four Metals, Francis, Juno, Raymond-Bald Eagle mines; Gold Hill district: Garrison Monster mine; North Tintic district: New Bullion, Scramont mines; Ophir district: Dry Canyon area-Brooklyn, Kearsarge mines; Lion Hill area - Chloride Point; Ophir Hill area - Cliff, Hidden Treasure, Sacramento mines; Rush Valley district: Honeine mine.
_Utah County_ Brush Creek district: Little Alta mine.
_Utah County_ American Fork district: East Tintic district: Burgin, Eureka Lily, North Lily, Trixie mines; Payson district: Syndicate mine; Wells Canyon.
_Washington County_ Tutsagubet district: Apex (Dixie) mine.

**SMOKY QUARTZ (See QUARTZ)**

**SODALITE**

Sodium aluminum silicate with chlorine, Na$_4$Al$_5$Si$_3$:O$_{12}$Cl. Isometric. Crystals rare, commonly massive, in imbedded grains. Cleavage good. H. 5. 5-6. G. 2. 2. Luster vitreous. Color usually blue, also white, gray, green. Transparent to translucent.

_San Juan County_ La Sal Mountains: Middle Mountain, Brumley Ridge.

**SODDYITE**

Hydrous uranium silicate, (UO$_2$)$_5$(SiO$_4$)$_3$(OH)$_2$·5H$_2$O. Orthorhombic. Occurs as distinct crystals, also massive, earthy. Cleavage perfect. H. 3. 5. G. 4. 7. Color dull yellow to canary yellow; amber, greenish yellow. Streak pale yellow. Luster vitreous.

_Juab County_ Honeycomb Hills.
SODIUM ANALOGUE OF HEWETTITE
(See BARNESITE)

SOUMANSITE (See WARDITE)

SPADAITE

Hydrous magnesium silicate, perhaps MgSiO₃·H₂O. Amorphous. Has a massive habit. H. 2. 5. Color reddish. Tooele County Deep Creek Mountains: Midas mine; Gold Hill district: Alvarado, Cane Springs, Rube mines.

SPANGOLITE


SPECULARITE (See HEMATITE)

SPESSARITE (See GARNET)

SPHAEROCOBALTITE
(See COBALTLOCALCITE)

SPHALERITE


Beaver County Bradshaw district: Cave mine; Granite district: Beaver View mine; Lincoln district: Lincoln mine; San Francisco district: Beaver Carbonate, Cupric, Peacock Copper, Washington mines; Star district: Harrington-Hickory, Hub, Moscow, Red Warrior, Vicksburg, White Rock, Wild Bill mines. Box Elder County Ashbrook district: Vipont mine; Lucin district: Tecoma Hill mine; Park Valley district: Century, Susannah mines. Emery County San Rafael district: Calyx, Dirty Devil, Fuenrol No. 2, Lucky Strike mines. Grand County Ryan Creek Scheelite prospect. Juab County Deep Creek Mountains, Trout Creek mine. Fish Springs district: Carnation, Emma, Galena mines; Mt. Nebo district: Ajaxto no. 2, Eva, Freddie Lode, Highland, Santaquin Chief mines; Tintic district: Bullion Beck, Chief Consolidated, Colorado, Eureka Hill, Iron Blossom, Lower Mammoth, Swansea mines; Trout Creek district; West Tintic district: Lockheed Iron, Scotia mines. Millard County Leamington district: Wood Canyon. Piute County Gold Mountain district: Annie Laurie mine; Mt. Baldy district: Clyde, Deer Trail mines; Ohio district: Bully Boy and Webster, Cascade, Great Western, Shamrock mines. Salt Lake County Big Cottonwood district: American Metals, Antelope, Cardift, Howell-Baby McKee, Maxfield, Prince of Wales, Reed and Benson, Silver Mountain, Woodlawn mines; Bingham district: Boston Consolidated, Brooklyn, Burning Moscow, Butterfield, Carr Fork, Dalton and Lark, Dixon, Eagle Bird Lode, Frisco, Galena, Highland Boy, Last Chance, Nast, Neptune, Old Jordan, Queen, Tiewaukee, U. S. and Lark, Winnamuck, Yampa, Yosemite mines; Little Cottonwood district: Columbus Consolidated and Wasatch Drainage Tunnel, Swyer, Emma, Little Emma, South Hecla, Superior mines. San Juan County Big Indian district: Mi Vida mine; Monticello district: Blue Bird, Danish Girl, Dream, Gold Queen mines; Paradox Valley district: Grey Dawn mine; White Canyon district: Happy Jack mine. Sanpete County Dry Canyon. Sevier County Salina Creek district: Ball, Lead Hill mines. Summit County Park City district: California, Comstock, Daly, Daly Judge, Daly West, Kearns - Keith, Mayflower, Ontario, Silver King, Woodside mines. Tooele County Bingham district: May Flower mine; Blue Bell district: Bennion Canyon mine; Columbia district: Sharp, Benmore mines; Deep Creek Mountains: Congar Hill, Cyclone, Devils Pit, Eagles Nest, Gold Star, Leap Year, Oro del Rey, Overland mines; Dugway district: Bertha, Bryan, Buckhorn, Eureka, Francis, Kellys Hole, Surplus mines; East Erickson district: Indianapolis, Tintic Delaware mines; Erickson district: Black Jack, Black Rock, Blain, Deer Trail, Indian Boy, May Farmer, Utonia mines; Gold Hill district: Bonanza, Cash Boy, Climax, Copper Queen-Midland Mining Company, Gold Bond, Gold Hill (U. S.), Rube, Silver and Gold Mining Company, Success, U. S. mines; North Tintic district: New Bullion, Scantone mines; Ophir district: Dry Canyon area - Mono mine; Ophir Hill area - Cliff, Hidden Treasure, Ophir Hill Consolidated, Ophir Coalition, Sacramento mines; Rush Valley district: Ben Harrison, Calunet, Galena King, Honerine, Mescatine, Muerbrook, Tip Top mines. Utah County American Fork district: Bay State, Bog, Dutchman, Pacific, Silver Dipper, Water Fall, Yankee...
mines; East Tintic district: Burgin, Apex Standard, Eureka Bullion, Eureka Lily, Eureka Standard, North Lily, Tintic Standard, Trixie, Zuma mines; Payson district: Syndicate mine; Silver Lake district: Ontario mine.

Wasatch County Blue Ledge district: Glencoe, Mayflower, McHenry, Valeo mines; Snake Creek district: Revelator, West Quincy mines.

SPHENE


Beaver County San Francisco district.

Juab County West Tintic district.

Salt Lake County Little Cottonwood stock.

San Juan County La Sal Mountains: Middle Mountain, Brumley Ridge.

Tooele County Gold Hill district: Frankie mine; Ophir district: Ophir Hill area - Ophir Hill Consolidated, Ophir Coalition mines.

Utah County Little Cottonwood stock: Silver Lake district: Deer Creek.

SPINEL


Beaver County Granite district: Garnet group.

Daggett County Red Creek Complex.

San Juan County Moses Rock dike.

Summit County Park City district.

Tooele County Gold Hill district: Unadine mine.

Utah County American Fork district: Lake Solitude.

Wasatch County Clayton Peak.

Washington County Mineral Mountain: Emma mine.

SPODUMENE


Juab County Honeycomb Hills.

STAUROLITE


Daggett County Red Creek Complex.

Wayne County Caineville.

STEIGERITE


Piute County Circleville Mountain.

STELLERITE


Piute County Circleville Mountain.

STEPHANITE


Juab County Tintic district: Humbug mine.

Salt Lake County Little Cottonwood stock: Emma, Little Emma mines.

Tooele County Ophir district: Dry Canyon area - Mono mine.

STERRETTITE (see KOLBECKITE)

STIBICONITE


Garfield County Coyote Creek district: Hampton mine.

Tooele County Deep Creek Mountains: Congar Hill mine. Ophir district: Lion Hill area.
STIBNITE


Box Elder County Willard district: Dry Lake mine. Garfield County Coyote Creek district: Hampton mine. Juab County West Tintic district: Tintic Western mine. Salt Lake County Little Cottonwood district: Bay State mine.

Summit County Park City district: Silver King mine. Tooele County Deep Creek Mountains: Congar Hill mines; Gold Hill district: Gold Hill (U. S.) mine; Mercur district: Golden Gate, Sparrowhawk mines; Ophir district: Chloride Point. Washington County Bull Valley district: Pilot claims; Gunlock.

STILBITE

Hydrous sodium calcium aluminum silicate, \( \text{NaCa}_2\text{Al}_2\text{Si}_3\text{O}_{16}\cdot16\text{H}_2\text{O} \). Monoclinic. Crystals are usually in the form of cruciform penetration twins. Also sheaf-like aggregates, radiated, globular and columnar. H. 3. 5. G. 2. 1. Cleavage good. Fracture uneven. Brittle. Luster vitreous to pearly. Color white; occasional yellow, brown, reddish.

Beaver County Pruess district: Blackbird, Cactus mines. Salt Lake County Bingham district: Bingham Copper Pit; Little Cottonwood district.

STOLZITE


Box Elder County Grouse Creek Range. Salt Lake County Little Cottonwood district: Emma mine. Tooele County Gold Hill district: Wilson Consolidated mine.

STRINGHAMITE

Hydrous Copper calcium silicate, \( \text{CuCaSiO}_4 \cdot 2\text{H}_2\text{O} \). Monoclinic. Crystalline to botryoidal as a fracture filling. Transparent to translucent. Light to dark blue. Beaver County Rocky district: Bawana mine.

STROMEYERITE


STRONTIANITE


Sanpete County Dry Canyon.

SULFUR


Beaver County Bradshaw district: Cave mine; Gordon district: Sulphurdale; San Francisco district: Horn Silver mine; Southern San Francisco Mountains: Brimestone Mound; Sulphur district; Wah Wah Valley. Davis County Antelope Island. Emery County Black Dragon Canyon; Cedar Mountain district: Mexican Bend; San Rafael River; San Rafael district: Calf Mesa, Dexter group. Iron County Cima mine; Lund. Millard County Gordon district: Cove Creek, Black, Excelsior, Mariposa, New York, Philadelphia, Prince Albert, Queen Victoria, Sulphur King, Victor Conqueror mines; South Pavant Range: Cove Fort. San Juan County White Canyon: Happy Jack mine. Tooele County Mercur district: Brickyard, Hillside, Sacramento, Sunshine mines; Rush Valley district: Calumet mine. Utah County Spanish Fork Canyon: Diamond Fork; Santaquin district: Union Chief mine.

SULVANITE

Copper vanadium sulfide, \( \text{Cu}_2\text{VS}_4 \). Isometric. Crystals cubic; usually massive. H. 3-.5. G. 4. Cleavage basal

Tooele County Mercur district.
Utah County Thorpe Hills: Cedar Fort member of Oquirrh Formation.

**SUSSEXITE**

Hydrous manganese magnesium borate, \((\text{Mn,Mg})(\text{BO}_2)\cdot(\text{OH})\). Orthorhombic. Occurs as veinlets or masses with fibrous structure. H. 3-3½. G. 3.3. Color white, buff, straw yellow. Luster silky to earthy. Salt Lake County Big Cottonwood district: Big Cottonwood, Mountain Lake mines.

**SWARTZITE**

Hydrous carbonate of calcium, magnesium, and uranium, \(\text{CaMg(UO}_2\cdot\text{CO}_3\cdot12\text{H}_2\text{O}\). Monoclinic. Occurs as clusters of tiny prismatic crystals. G. 2.3. Color green. Fluoresces bright green. San Juan County Elk Ridge: Coral claim.

**SYLVANITE**


**SYLVAITE**

Potassium chloride, \(\text{KCl}\). Isometric. Crystals usually cubic. Also massive, coarsely granular to compact, crusts. H. 2. G. 1.9. Cleavage perfect cubic. Not as brittle as halite. Luster vitreous. Colorless or white; grayish, bluish, yellowish, reddish. Taste sharp, bitter. Grand County Cane Creek: Texas Gulf Potash mine; Crescent Junction; Paradox Basin; Salt Valley; Seven Mile Canyon. San Juan County Moab Valley; Paradox Valley. Tooele County Great Salt Lake Flats; Salduro; Wendover.

**SZAIBELYITE**

Hydrous manganese magnesium borate, \((\text{Mg,Mn})\text{BO}_3\cdot\text{H}\). Orthorhombic. Occurs as veinlets or masses with fibrous structure; embedded nodules, sometimes dense or chalky. H. 3-3.5. G. 2.6. Fibers not flexible. Luster silky to dull or earthy. Color white to buff or straw yellow. Beaver County Beaver Lake district: West Spring. Salt Lake County Big Cottonwood district: Mountain Lake mine.

**SZOMOLNOKITE**

Hydrous ferrous sulfate, \(\text{FeSO}_4\cdot\text{H}_2\text{O}\). Monoclinic. Prismatic crystals. Also globular to stalactitic. H. 2½. G. 3.05. Luster vitreous. Color yellow, reddish brown. Utah County East Tintic district: Burgin, Tintic Standard mines.

**TABBYITE**

An asphaltum. Occurs as minor veins and impregnations. Duchesne County Tabby Creek.

**TALC**


**TENNANTITE**

Copper iron arsenic sulfide, \((\text{Cu,Fe})_6\text{As}_4\text{S}_6\cdot13\). Isometric. Crystals tetrahedral. Also massive, coarse or fine, granular to compact. H. 3-4.5. G. 4.6-5.1. Fracture subconchoidal to uneven. Rather brittle. Luster metallic. Streak black to brown to cherry-red. Opaque. Box Elder County Ashbrook district: Vipont mine. Emery County San Rafael district: Dexter Group, Temple Mountain mines. Juab County Tintic district. Rich County Swan Creek district: Victoria prospect. Salt Lake County Bingham district: Tiewaukee mine. San Juan County Elk Ridge: King James-Virgene mine; La Sal Quadrangle: Firefly-Pigmay mine. Tooele County Dugway district: Bertha claim; Gold Hill district: Gold Hill (U. S.), Success mines; Ophir district: Ophir Hill area - Ophir Hill Consolidated, Ophir
Coalition mines.
_{Utah County_} East Tintic district: North Lily mine.

TENORITE

_{Beaver County_} Lincoln district: Creole mine; Rocky district: Bawana mine; San Francisco district: Horn Silver mine.
_{Box Elder County_} Lucin district: Copper Mountain mine.
_{Juab County_} Tintic district: Swansea mine.
_{Morgan County_} Morgan district: Morgan Crescent mine.
_{Salt Lake County_} Bingham district: Galena, Old Jordan mines.
_{Tooele County_} Dugway district: Belcher, Kellys Hole, Metal States, Surplus mines; Gold Hill district: Copper Bloom, Frankie, Gold Bond, Lucy L., Monoaco, Yellow Hammer mines.
_{Washington County_} Silver Reef district.

TETRADYMITE

_{Piute County_} Ohio district: Tunnel Extension No. 2 mine.
_{Utah County_} American Fork district; East Tintic district.

TETRAHEDRITE

Essentially copper, iron, zinc, and silver antimony sulfide, (Cu₄Fe,Zn,Ag)₁₂Sb₄S₁₃. Isometric. Habit tetrahexahedral, frequently in crystals. Also massive, coarse or fine granular to compact. H. 3. 4. 5. G. 4. 9. Fracture subconchoidal to uneven. Rather brittle. Luster metallic. Color iron-black. Streak black to brown to cherry-red. Opaque.
_{Beaver County_} Pruess district: Blackbird group, Cactus mine; Star district: Harrington - Hickory, Rebel, White Rock mines.
_{Box Elder County_} Willard district: Ogden Boilmakers, Overland claims.
_{Emery County_} San Rafael district: Dexter Group, Temple Mountain mines.
_{Juab County_} Deseret district; Tintic district: Lower Mammoth mine.
_{Piute County_} Mt. Baldy district: Clyde mine; Ohio district: Bully Boy, Cascade, Copper Belt, Dalton, Great Western, Iris, Shamrock, Tunnel Extension No. 2 mines, Webster mines.
_{Salt Lake County_} Big Cottonwood district: Cardiff, Columbia-Rexall, Maxfield, Reed and Benson mines, Bingham district: Dixon, Eighty Nine, Old Jordan, Silver Shield, Winnamuck mines; Little Cottonwood district: Columbus Consolidated and Wasatch Drainage Tunnel, Columbus - Rexal, Emma, Peruvin Consolidated, South Hecla, Superior mines.
_{Summit County_} Park City district: American Flag, Daly, Daly-Judge, Daly West, Mayflower, Ontario, Silver King, Silver King Consolidated, Woodside mines.
_{Tooele County_} Deep Creek Mountains: Dewey, North Pass, Willow Springs mines; Dugway district: Bertha claim; Erickson district: OK, Silver Reef mines; Gold Hill district: Christmas Mining Company, Copper Bloom, Evans, Pole Star Copper, Rea, Reaper, Unadine, Victory No. 1. mines; Ophir district: Dry Canyon area - Queen of the Hills mine; Ophir Hill area; Rush Valley district: Honesine mine.
_{Utah County_} American Fork district: Bog, Pacific, Silver Dipper, Water Fall, Hankey mines; East Tintic district: Apex Standard, Burgin, Eureka Bullion, Eureka Lily, Eureka Standard, Iron King, North Lily, Tintic Standard, Trixie mines; Silver Lake district: Milkmaid, Ontario mines.
_{Wasatch County_} Elkhorn district: Crawford, Nelson, Queen properties.

THAUMASITE

_{Beaver County_} Rocky district: Bawana, Old Hickory mines.
_{Salt Lake County_} Bingham district: Bingham Copper Pit.
_{Summit County_} Park City district.

THENARDITE

Minerals and Mineral Localities of Utah, Kenneth C. Bullock

grayish, yellowish, reddish. Transparent to translucent.  
*Box Elder County* Shores of Great Salt Lake.  
*Davis County* Shores of Great Salt Lake.  
*Tooele County* Shores of Great Salt Lake.

**THERMONATRITE**

*Davis County* Green River Formation.

**THINOLITE**

A calcite pseudomorph. Found as tufa along shores of ancient Lake Bonneville, especially the Provo shoreline, forms cement to gravels.  
*Salt Lake County* Lake Bonneville shorelines.  
*Utah County* Lake Bonneville shorelines.

**THOMPSONITE**

*Piute County* Marysville district: Silica Hills,  
*Salt Lake County* Bingham district: Bingham Copper Pit.  
*Tooele County* Rush Valley district: Settlement Canyon.  
*Utah County* East Tintic district.

**THORITE**

*Sevier County* Monroe Canyon.

**THUCHOLITE**

*Emery County* San Rafael district: Calyx mine, Temple Mountain.
Hill area - Hidden Treasure mine.

TORBERNITE
Hydrous copper uranium phosphate, \( \text{Cu(UO}_2\text{)}_3(\text{PO}_4\text{)}_2\cdot8\text{-}12\text{H}_2\text{O} \). Tetragonal. Crystals thin to thick tabular, usually square in outline. Also foliated, micaceous, and scaly aggregates. H. 2.5. G. 3. Cleavage perfect basal. Laminae rather brittle. Luster vitreous, pearly. Color emerald green. Streak paler than the color. Beaver County Newton district: Indian Creek, Sniffer and Mystery claims.

Emery County Green River district: Venura, Yellow Queen claims; San Rafael district; Copper Globe district: Flat Top Mesa, Temple Mountain.

Garfield County Circle Cliffs: Acme, Black Widow, Blue Goose, Horse Head, Rocky Mountain, Steam Boat mines; Oak Creek prospect; Spotted Dog claim.

Kane County Bulloch claims; Virgin River.

Piute County Antelope Range; Marysvale district: Bullion Monarch, Copper Butte, Freedom Nos. 1-2, Prospector Nos. 1 and 3 mines.

San Juan County La Sal Mountains; Monument Valley district: Skyline mine; Paradox Valley district: Grey Dawn mine; Red Canyon district: Markey no. 3, Posey mines; White Canyon district: Happy Jack, Hideout, W. N. mines.

Sanpete County R. A. J. prospect.


TREMOLITE
Basic calcium magnesium silicate, \( \text{Ca}_2\text{Mg}_5(\text{Si}_8\text{O}_{22})\cdot(\text{OH})_2 \). Monoclinic. Crystals prismatic. Often bladed, in radiating columnar aggregates. Also coarse to fine granular, compact. H. 5-6. G. 3-3.3. Cleavage prismatic. Luster vitreous. Color white to light green.

TROILITE (See PYRRHOTITE)

TROOSTITE (See WILLEMITE)

TRONDITE
Hydrous sodium acid carbonate, \( \text{Na}_3\text{H( CO}_3\text{)}_2\cdot2\text{H}_2\text{O} \). Monoclinic. Authigenic mineral from cuttings in Green River Formation. Cleavage perfect. Fracture uneven. H. 2. 5-3. G. 2. Luster vitreous. Colorless, gray, yellowish. Taste alkaline.

Duchesne County Green River Formation.

TROOSTITE (See WILLEMITE)

TSCHEFFKINITE (See CHEVKINITE)

TSCHERMIGIT (See AMMONIA ALUM)
TUNGSTENITE

Salt Lake County Little Cottonwood district: Emma, Little Emma mines.

TURQUOIS

Salt Lake County Bingham district: Bingham Copper Pit.
Tooele County East Erickson district: Copper Jack, Jessel Bezzel, Silver Shield mines.

TYROLITE

Juab County Tintic district: Ajax, Gold Chain, Mammoth mines.
Salt Lake County Little Cottonwood district: Centennial Alta mine.
Tooele County Gold Hill district: Gold Hill (U. S.) mine.

TYUYAMUNITE

Hydrous basic vanadate of uranium and calcium, Ca₅(BO₂)₂(VO₄)₂·8·10H₂O. Orthorhombic. Occurs as scales and flattened laths; as radial aggregates. Commonly massive, compact to cryptocrystalline; also pulverulent. H. 2. G. 3.6. Cleavage basal perfect. Luster adamantine, waxy. Color canary-yellow, greenish yellow.

Daggett County Red Creek: Yellow Canary Uranium deposit.
Emery County Cedar Mountain district; Green River district; San Rafael district: Delta mines, Temple Mountain, South Temple Wash.
Garfield County Henry Mountains: Crescent Creek, Starlight claims; Trachyte district: Trachyte Creek.
Grand County Pack Creek; Richardson district; Thompsons area; Thompsons district: Cactus Rat, Parco no. 23 mines; Yellow Cat district: Yellow Cat group.
Kane County Bullock claims.
Piute County Marysvale district: La Vita prospect.
Rich County Crawford Mountains.
San Juan County Big Indian district: Mi Vida, Radon mines; East Canyon; Elk Ridge; La Sal Quadrangle: Angle, Brushy Basin Nos. 1 and 3, Confusion, Evening Star, Firefly-Pigmay, Hesperus' Jackpot, Little Peter, Lucky No. 1, Marjorie Ann, Maud, Morning Star, New Yellow Spot, Uranium Girl, Vista Grande, Yellow Bird, Yip Yip mines; Lisbon Valley; Monument Valley district: Mitten no. 1, Oljeta, Skyline, Whirlwind mines; Paradox Valley district: Vanadium Queen mine.
Uintah County Browns Park: Red Creek.

UINTAITE (See GILSONITE)

UINTAHITE (See GILSONITE)

UMOHOITE

Piute County Marysvale district: Freedom nos. 1-2 mines.

URANINITE

Beaver County Pine Grove district: Daisy, Producer, Staats (Monarch) mines.
Emery County Cedar Mountain district; Green River district: Crabapple, Venura, Yellow Queen claims; San Rafael district: Calf Mesa, Dexter group, Calyx, Delta, Little Susan, Lucky Strike, Lucky Strike no. 2, Magor, Marshbank Canyon, Maybe, Pay Day, Temple Mountain, Rex no. 2 mines.
Garfield County Circle Cliffs: Black Widow, Horse Head Stud Horse mines; Oak Creek prospect.
Grand County Seven Mile Canyon; Thompsons district: Juniper mine; Yellow Cat district: Eli Malich's Lucky Day, L. A. Sutherland Sock claims.
Juab County Honeycomb Hills.
Morgan County Arthur Fork.
Piute County Marysvale district: Buddy, Bullion Monarch, Freedom Lease, Freedom nos. 1-2, Prospector nos. 1 and 3 mines; Mt. Baldy district: Deer Trail mine.
San Juan County Big Indian district: Big Buck, Cal Uranium, Homestake, La Sal, Mi Vida, Radon, Rattlesnake mines; Elk Ridge: Avalanche No. 13, Horse shoe No. 1, King Edward, King James-Virgene, Oakie, Payday, Sandy Nos. 2 and 3, Western Payday, Wooden shoe No. 3 mines; La Sal Quadrangle: Black Hat, Firefly-Pigmay, Little Peter, Yellow Bird mines; Monument Valley: Holiday Mesa, Mitten no. 1, Skyline mines; Paradox Valley district: Grey Dawn, Vanadium Queen mines; Red Canyon district: Frey no. 4, Markey no. 3, Posey mines; White Canyon district: Black Lizard, Fry No. 4, Happy Jack, Hideout, Notch, White Canyon no. 1 W. N. mines.
Tooele County East Erickson district: Flying Dutchman, Hard-to-Beat, Sheeprock Canyons, Silver King mines.
Wayne County Fruita: Oyler mine.
Weber County Ogden Canyon.

URANITE (See AUTUNITE and TORBERNITE)
Emery County San Rafael district.

URANOCHER (See URANOPILITE)

URANOCIRCITE (See META-URANOCIRCITE)

URANOPHANE

Hydrous basic calcium uranium silicate, Ca(UO$_2$)$_2$·SiO$_2$·6H$_2$O. Monoclinic. Crystals are minute needles, with poorly developed faces. Occurs in radiating aggregates, massive, fibrous. Cleavage perfect. H. 2.5. G. 3.8. Brittle. Luster vitreous to pearly, dull to waxy. Color lemon yellow, pale straw yellow, honey brown, greenish yellow, orange yellow. Weakly fluorescent.

Beaver County Newton district: Sniffer and Mystery claims; Pine Grove district: Staats (Monarch) mine.

Emery County San Rafael district: Delta mine.

Garfield County Circle Cliffs: Black Widow, Horse Head mines; Henry Mountains.

Juab County Honeycomb Hills; Thomas Range: Good Will, Yellow Chief mines, Topaz Mountain.

Piute County Marysvale district: Bullion Monarch, Copper Butte, East Slope no. 2, Papsy’s Hope, Prospector no. 1 mines.

San Juan County Elk Ridge: Sandy No. 3 mine; Monument Valley district: Oljeta, Skyline, Whirlwind mines; Paradox Valley district: Grey Dawn mine; Red Canyon district: Posey mine; White Canyon district: Bell, Happy Jack, Hideout, White Canyon no. 1 mines.

URANOPILITE


Piute County Marysvale district: Bullion Monarch, Prospector no. 1 mines.

San Juan County White Canyon district: Happy Jack mine.

Wayne County Capitol Wash.

URANOSPATHITE

Hydrous copper uraninite, arsenate-phosphate, Cu(UO$_2$)$_2$[(As,PO$_4$)$_4$]·12H$_2$O. Probably tetragonal. Occurs as fan shaped groups of flat plates. G. 2.5. Color yellow to pale green, bluish green.

San Juan County Paradox Valley district: Grey Dawn mine.

URANOSPINITE


Juab County Honeycomb Hills.

Kane County Paria.

URANOTHALLITE (See LIEBIGITE)

UTAHITE (See CARPHOSIDERITE)

UTAHLITE (See VARISCITE)

UTAH ONYX (See CALCITE)

UVANITE

Hydrous uranium vanadate, U$_2$V$_6$O$_{24}$·15H$_2$O. Orthorhombic. Occurs as minute crystalline masses and coatings. Cleavage good. Color brownish yellow.

Emery County San Rafael district: Flat Top Mesa, Temple Mountain, Wild Mountain mine, Temple Rock, South Temple Wash.

UVAROVITE (See GARNET)
VALENTINITE


VANADINITE


VANADIUM HYDROMICA (See ROSCOELITE)

VANDENDREISSCHEITE

Hydrous lead uranium oxide, Pb₇O₂₂·12H₂O. Orthorhombic. Occurs as dense microcrystalline aggregates. Color yellow-orange, brownish orange, orange-red. Cleavage good. Emery County San Rafael district: Delta mine.

VANOXITE

Hydrous vanadium oxide, V₄V₂O₁₃·8H₂O (?). Occurs in microscopic crystals, bladed. Massive, occurs as a cement in sandstone. Color black. Opaque. Garfield County Henry Mountains; Little Rockies district: Del Monte group, Ekker mine; North Wash district: S. Y. Guthrie group; Trachyte district: Blitz nos. 1-2, June Bell nos. 1-4, Minnie Pearl nos. 1-2, Straight Creek, Trachyte nos. 1-2, V. C. A. claims. Grand County Thompsons area; Thompsons district: Cactus Rat, Parco no. 23 mines. San Juan County Big Indian district: Mi Vida mine.

VARISCITE


VERMICULITE

This term includes a number of micaceous minerals, all hydrated silicates, in part related to chlorites. Alteration products chiefly of micas. Laminae are soft, pliable. Luster pearly, bronze-like. Color white, yellow, brown. Davis County Antelope Island. Tooele County Oquirrh Mountains: Manning Canyon Shale; Stansbury Mountains: Manning Canyon Shale. Utah County Beverly Hills: Manning Canyon Shale; Lake Mountain: Manning Canyon Shale; Lehi district: Manning Canyon Shale; Thorpe Hills: Manning Canyon Shale; Wasatch Mountains: Manning Canyon Shale.

VESUVIANITE (See IDOCRAZE)

VITROITE (See BERTRANDITE)

VIVIANITE


VOGLITE

Hydrous calcium copper uranium carbonate, probably Ca₂Cu(UO₂)(CO₃)₄·6H₂O. Triclinic or monoclinic. Occurs as coatings and aggregates of tiny scales. Cleavage perfect. Luster pearly. Color emerald green, bright grass green. San Juan County White Canyon district: White Canyon no. 1 mine.

VOLBROTHITE
Hydrous copper vanadate, $\text{Cu}_3(\text{VO}_4)_2\cdot 3\text{H}_2\text{O}$. Monoclinic. Occurs as scaly, spongy, or fibrous crusts; also as rosette-like aggregates. H. 3. S. G. 3. 5. Cleavage perfect. Luster vitreous to pearly. Color dark olive-green, yellowish green.

Daggett County Red Creek, Yellow Canary Uranium deposit.

Grand County Richardson district.
San Juan County Elk Ridge: Notch No. 5 and 6 mines.
Utah County Thorpe Hills.
Washington County Silver Reef district: B Reef, Tecumseh Hill, Wells mines.

VOLCHONSKOITE


Grand County Morrison Formation.
San Juan County Morrison Formation.

VOLTAITE

Hydrous potassium iron sulfate, $\text{K}_2\text{Fe}_2\text{Fe}_4(\text{SO}_4)_{12}\cdot 18\text{H}_2\text{O}$. Isometric. Crystals cubic, octahedral. H. 2. 7. No cleavage. Fracture conchoidal. Luster resinous. Color greenish black to black. Opaque.

Emery County San Rafael district: Calf Mesa, Dexter group.
Utah County East Tintic district.

WAD

Manganese ore composed of a mixture of hydrous manganese oxides. Occurs in earthy or compact masses; also reniform, concretionary, or incrusting. H. 1-6. G. 2. 8-4. 4. Luster dull. Color black, bluish, brownish black. Streak black, bluish black, reddish brown.

Emery County Cedar Mountain district.
Garfield County Hutch Pasture.
Juab County Detroit district: Iron Blossom mine; East Tintic district: Black Jack Empire, White Cloud mines; West Tintic district: War Eagle claim.
Millard County Detroit district: Almond, Black, Diamond, Blue Bell, Guy, Last Chance, Martha, Major Drum, Silica Plug mines.
Salt Lake County Big Cottonwood district: Antelope, Prince of Wales mines.
Sevier County Sevier Plateau: Black Beauty claims.
Tooele County Columbia district: Benmore, Sharp mines; Erickson district: Hyber - Rydalch, Queen Mary mines; Ophir district: Lion Hill area - Buffalo, East Side, Empire, Iron, Monarch, Northern Light, Woodruff mines; Ophir Hill area - Hidden Treasure, Ophir Hill Consolidated, Ophir Coalition, Sacramento mines; Rush Valley district: Honerine mines.
Utah County American Fork district: Miller mine; East Tintic district: Tintic Standard mine; Lehi district: Wildcat mine; North Tintic district: Oxen mine, Tip Top Tunnel; Utah district: Alpha, Emerald, Lucky Boy, Queen of the West, Spalding, Trotter mines.

WARDITE

Hydrous sodium aluminum phosphate, $\text{NaAl}_3(\text{PO}_4)_2\cdot (\text{OH})_4\cdot 2\text{H}_2\text{O}$. Tetragonal. Crystals are pyramidal. Also granular aggregates and crystals, radially fibrous, concentrically banded spherulites. H. 5. G. 2. 8. Cleavage perfect. Luster vitreous. Color blue-green to pale green, colorless.

Box Elder County Utahlute Hill.
Tooele County Amatrice Hill.
Utah County Clay Canyon.

WAVELLEITE

Hydrous basic aluminum phosphate, $\text{Al}_3(\text{OH})_3(\text{PO}_4)_2\cdot 5\text{H}_2\text{O}$. Orthorhombic. Crystals rare. Usually occurs as hemispherical or globular aggregates with radial structure. Also as crusts or stalactitic. H. 3. 5-4. G. 2. 3. Cleavage perfect. Fracture uneven. Brittle. Luster vitreous. Color greenish white, green, yellow, brownish, blue, white, colorless.

Salt Lake County Bingham district: Bingham Copper Pit.

WEEKSITE

Hydrous potassium uranium silicate, $\text{K}_2(\text{UO}_2)_2(\text{Si}_2\cdot \text{O}_5)_3\cdot 4\text{H}_2\text{O}$. Orthorhombic. Occurs chiefly as radiating fibrous clusters. H. 1-2. G. 4. 1. Luster waxy. Color yellow.

Juab County Thomas Range: Autunite no. 8, Good Will, Yellow Chief mines, Topaz Mountain.

WERNERITE (See SCAPOLITE)

WHEELERITE

A yellowish resin, resembling amber.
Garfield County Cannonville.

WHEWELLITE

Hydrous calcium oxalate, $\text{CaC}_2\text{O}_4\cdot \text{H}_2\text{O}$. Monoclinic. Occurs only as crystals, equant, or prismatic. Cleavage good. H. 2. 5. G. 2. 2. Fracture conchoidal. Brittle.

San Juan County Big Indian district: Radon mine.

WILLEMITE


Beaver County Star district: Cedar-Talisman, Hoosier Boy mines.

Iron County Escalante district: Escalante mine.

WIRE SILVER (See SILVER)

WOLFRAMITE (See also FERBERITE and HUEBERNITE)


Beaver County Newton district: North Creek.

Tooele County East Erickson district: Ekker Canyon prospect; Gold Hill district: Kena, Pole Star Copper Company mines; Ophir district: Ophir Hill Consolidated, Ophir Coalition mines.

WOLLASTONITE


Beaver County Bradshaw district; Granite district: Big Pass group; Lincoln district: Pruess district: Blackbird, Cactus mines; San Francisco district: Cupric, Imperial mines.

Juab County West Tintic district.

Millard County House Range: Amasa Valley, Notch Peak intrusive.

Salt Lake County Big Cottonwood district: Maxfield mine; Little Cottonwood district: South Hecla mine.

Tooele County Gold Hill district: Alvarado, Bonnemort, Cane Springs, Frankie, Gold Hill (U. S.), Silver King mines; Ophir district: Ophir Hill area - Hidden Treasure, Sacramento mines; Rush Valley district: Honerine mine, Soldier Creek.

Utah County Silver Lake district: Deer Creek.

WULFENITE


Beaver County Rocky district: Adelia mine; San Francisco district: Horn Silver mine; Star district: Harrington-Hickey, Rebel, White Rock mines.

Box Elder County Lucin district: Empire, Tecoma Hill mines; Rosebud district: A and W Magnitude mines.

Iron County Escalante district: Escalante mine.

Pike County Mt. Baldy district: Pluto mine; Ohio district: Bully Boy and Webster mines.

Rich County Swan Creek district: Victoria prospect.

Salt Lake County Big Cottonwood district: Woodlawn mine; Little Cottonwood district: Alta Consolidated, Centennial Alta, City Rocks, Emma, Flagstaff, Little Emma, Michigan - Utah mines.

Tooele County Dugway district: Boston, Buckhorn, Four Metals mines; Gold Hill district: Cash Boy, Cyclone, Gold Hill (U. S.), Red Jacket, Standard, Shay mines.

Utah County American Fork district: Miller mine.

WURTZILITE


Duchesne County Antelope Canyon; Avintaguin Canyon; Indian Canyon; Rat Hole Canyon; Red Creek.

WURTZITE


Beaver County San Francisco district: Horn Silver mine.

Pike County Mt. Baldy district: Clyde mine.

Tooele County Ophir district: Ophir Hill area - Ophir Hill Consolidated, Ophir Coalition mines.

Uintah County Sun Oil Company South Ouray well.

Utah County East Tintic district: North Lily mine.

XANTOPHYLLITE

Brittle, mica, perhaps, H$_8$(Mg,Ca)$_{14}$Al$_{16}$Si$_8$O$_{52}$. Mono-

XENOTIME


ZEUNERITE


ZINKENITE


ZIPPEITE

Hydrous basic uranium sulfate, (UO₂)₂(SO₄)(OH)₂⁻·4H₂O. Orthorhombic. Occurs as fragile crusts and reniform spheroidal aggregates. Also pulverulent to earthy. H. 2. G. 3. 2. Cleavage perfect. Luster dull to earthy. Color orange yellow, orange red, reddish brown. Fluoresces lemon yellow to green. Emery County Green River district: Sodaroll claim; San Rafael district: Calf Mesa, Consolidated, Delta, Dexter group, Green Vein Mesa, Lone Tree, Lucky Strike, Lucky Strike no. 2 mines, Temple Mountain. Garfield County Henry Mountains. Grand County Seven Mile Canyon; Thompsons district: Parco no. 23 mine. Piute County Marysvale district: Bullion Monarch, Freedom no. 2, Prospector no. 1 mines. San Juan County Elk Ridge: King James-Virgene mine; Red Canyon district: Posey mine; White Canyon district: Happy Jack, Hideout, W. N. mines. Wayne County Fruitia: Oyler mine; Grand Wash to Capitol Wash.

ZIRCON


ZOISITE


ZUNYITE

Hydrous aluminum silicate, Al₁₃Si₅O₂₀(OH,F)₁₈Cl.

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APPENDIX
Minerals of Utah

The list below contains 706 names which appeared in Chapter III. Of these, 134 are duplicate mineral names, rock terms, or hydrocarbon names, and were not programmed in the computer analyses reported in the remaining five lists. If a mineral has two names, the one that has priority or more common usage was used in the computer analysis, and the second rank name is indicated as follows: Adularia (See Orthoclase).

<table>
<thead>
<tr>
<th>Abelsonite</th>
<th>Altaite</th>
<th>Antigorite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abernathyite</td>
<td>Alumian</td>
<td>Antlerite</td>
</tr>
<tr>
<td>Acanthite</td>
<td>Aluminate</td>
<td>Apatite</td>
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<td>Alunite</td>
<td>Apgohnite</td>
</tr>
<tr>
<td>Actinolite</td>
<td>Alunogen</td>
<td>Apophyllite</td>
</tr>
<tr>
<td>Adamite</td>
<td>Amatricite (See Variscite)</td>
<td>Aquamarine (See Beryl)</td>
</tr>
<tr>
<td>Adularia (See Orthoclase)</td>
<td>Amethyst (See Quartz)</td>
<td>Aragonite</td>
</tr>
<tr>
<td>Aegerite (See Wurtzilite)</td>
<td>Ammonia Alun</td>
<td>Ardunite</td>
</tr>
<tr>
<td>Aegirine (See Aegirite)</td>
<td>Ammoniojarosite</td>
<td>Argentite</td>
</tr>
<tr>
<td>Aegirite</td>
<td>Amphibole</td>
<td>Argentojarosite</td>
</tr>
<tr>
<td>Aeonite (See Wurtzilite)</td>
<td>Analcime (See Analcite)</td>
<td>Argulite (hydrocarbon)</td>
</tr>
<tr>
<td>Agate (See Cryp. Quartz)</td>
<td>Analcite</td>
<td>Argyrodite</td>
</tr>
<tr>
<td>Aguilarite</td>
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<td>Arsenic</td>
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<tr>
<td>Aikinite</td>
<td>Andalusite</td>
<td>Arseniosiderite</td>
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<td>Alabaster (See Gypsum)</td>
<td>Andersontie</td>
<td>Arsenobismite</td>
</tr>
<tr>
<td>Alaskaita</td>
<td>Andesine</td>
<td>Arseno-yrte</td>
</tr>
<tr>
<td>Albertite (hydrocarbon)</td>
<td>Andradite (See Garnet)</td>
<td>Asbestos (See Serpentine)</td>
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<td>Albite</td>
<td>Anglesite</td>
<td>Asphalt (See Asphaltum)</td>
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<td>Anhydrite</td>
<td>Asphaltum (hydrocarbon)</td>
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<td>Ankerite</td>
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<td>Allevardite (See Rectorite)</td>
<td>Annabergite</td>
<td>Augite</td>
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<td>Allophane</td>
<td>Anorthite</td>
<td>Aurichalcite</td>
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<td>Almandine (See Spinel)</td>
<td>Anorthoclase</td>
<td>Austinite</td>
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<tr>
<td>Almandite (See Garnet)</td>
<td>Anthophyllite</td>
<td>Autunite</td>
</tr>
</tbody>
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Axinite
Azurite
Balydonite
Barite
Barnesite
Barytocalcite
Basaluminite
Bassanite
Bassetite
Bayleyite
Beaverite
Becquerelite
Biedellite
Bentonite (See Montmorillonite)
Bertrandite
Beryl
Beta-uranophane (See Beta-uranotile)
Beta-uranotile
Beudanite
Bickerite (See Austinite)
Bieberite
Bilinite
Billingsleyite
Bindheimite
Binnite (See Tennantite)
Biotite
Berinesite
Bischofite
Bismite
Bismoclite
Bismuth
Bismuthian bindheimite
Bismuthinite
Bismutite
Bixbite (See Beryl)
Bixbyite
Bloedite
Boehmite
Bog Ore (See Geothite)
Boltwoodite
Boothite
Borickite
Borntie
Boulangerite
Bournonite
Braitschite
Braunite
Bravoite
Brickerite (See Austinite)
Brochantite
Brockite
Bronzite (See Enstatite)
Brookite
Brucite
Burbankite
Bushmanite (See Pickeringite)
Butlerite
Calamine (See Hemimorphite)
Calaverite
Calciovolbolite
Calcite
Caledonite
Carbonate Apatite
Carbon Dioxide (gas)
Carminite
Carnallite
Carnelian (See Cryp. Quartz)
Carnotite
Carphosiderite
Cassiterite
Celadonite
Celestite
Cerargyrite
Cerusite
Cervantite
Chabazite
Chalcanthite
Chalcedony (See Cryp. Quartz)
Chalcocite
Chalcopyrite
Chalcophanite
Chalcophyllite
Chalcopyrite
Chalcotrichite (See Cuprite)
Chenevixite
Chert (See Cryp. Quartz)
Chevkinite
Chlorite
Chloroparal (See Nontronite)
Chlor-Utahlite (See Variscite)
Chrome mica-clay
Chromite
Chrysocolla
Chrysolite (See Olivine)
Cimolite
Cinnabar
Claudetite
Clausthalite
Clinochlore
Clinoclase
Clinoclase (See Clinoclasite)
Clinohumite
Clinoptilolite
Clinozoisite
Cobalt Bloom (See Erythrite)
Cobaltite
Cobaltocalcite
Cobaltomenite
Coconinoite
Coffinite
Collophane
Connichalcite
Connellite
Copalite (hydrocarbon)
Copiapite
Copper
Copper Pitch (See Tenorite)
Coquimbite
Cordierite
Corkite
Coronadite
Cornwallite
Corundum
Corvasite
Cosalite
Cotunnite
Covelite
Crandallite
Crednerite
Cristobalite
Crocidolite (See Riebeckite)
Cryolite
Cryocrystalline Quartz
Cryptomelane
Cubanite
Cuprite
Cuproadamate (See Adamite)
Cuprobsmuthite
Cuprosdesloizite (See Desloizite)
Cuprogoslarite
Cuproplumbite (See Balydonite)
Cuprosocheelite (See Cuprotungstite)
Curroskloedowskite
Cuprotungstite
Cyanotrichite
Cyrtolite (See Zircon)
Dahllite (See Carbonate apatite)
Damourite
Danburite
Daubreeite
Davisonite
Dawsonite
Dehrnite
Delessite
Deltaita
Dennisonite (See Davisonite)
Deslozite
Diadochite
Diaspore
Dichroite (See Cordierite)
Dickite
Digenite
Diposide
Dolomite
Doloresite
Donkeyite
Dufrenousite
Dumortierite
Dyscorisite
Eardleyite
Eitelite
Elaterite (See Wurtzilite)
Elpidite
Embolite
Emplecticite
Enargite
Endellite
Englishite
Enstatite
Ephecite
Epidesmine
Epidote
Epsomite
Erinite
Erubescite (See Bornite)
Erthrite
Esmonite (See Garnet)
Ettringite
Eucarite
Famatinite
Faratshiite
Ferroberite
Fernandinite
Ferrimolybdite
Ferrisymplesite
Ferrogoslarite
Ferroludwigite (See Ludwigite)
Ferropallidite (See Szomolnokite)
Ferroelite
Fervanite
Fibroferrite
Fluellite
Fluorapatite
Fluorite
Forsterite
Foshagite
Formarierite
Francolite (See Fluorapatite)
Freibergite
Galena
Garnet
Garrelsite
Gearksutite
Gel-bertrandite (See Bertrandite)
Geocronite
Gersdorffite
Gibbsite
Gilsonite (hydrocarbon)
Glauberite
Glaucorite
Goethite
Gold
Goldichite
Gordonite
Goslomite
Goyazite
Grantsite
Graphite
Greenockite
Grossularite (See Garnet)
Guano (rock)
Gummithe
Gunningite
Gypsum (rock)
Gypsum
Gryolite
Halite
Halloysite
Halotrichite
Hectorite
Hedenbergite
Helium (gas)
Helvite
Hematite
Hemimorphite
Hercynite
Hessite
Hetaerolite
Heudalite
Hewettite
Higginsite (See Conichalcite)
Hisingerite
Hollandite
Hornblende
Huebnerite
Humite
Hummerite
Huntite
Hyalite (See Opal)
Hydromagnesite
Hydromica (See Illite)
Hydrozincite
Hypersthene
Iceland Spar (See Calcite)
Iddingsite
Idocrase
Illite (See Hydromica)
Ilmenite
Isemaninite
Indium
Ingramite (hydrocarbon)
Iolite (See Cordierite)
Jalpaite
Jamesonite
Jarosite
Jasper (See Cryp. Quartz)
Jasperoid (See Cryp. Quartz)
Jefferisite
Jenkinsite
Jet (hydrocarbon)
Johannite
Jordsite
Kainite
Kaufinite
Kasolite
Kermesite
Kieserite
Kimolite (See Cimolite)
Kinoite
Klaprothite
Kolbeckite
Kornelite
Kornerupine
Krennerite
Kyanite
Labradorite
Lanarkite
Laumontite
Leadhillite
Lehite
Lepidocrocite
Lettsomite (See Cyanotrichite)
Leuchtenbergite
Leucosphenite
Leucocxene (See Anatase)
Leverrierite
Lewistonite
Libethenite
Liebigite
Limonite
Linartite
Lithiophorite
Lodestone (See Magnetite)
Lorandrite
Loughlinite
Lucinite (See Variscite)
Luckite (See Melanterite)
Ludwigite
Luzonite
Magnesiarfvedsonite  Nahcolite
Magnesioferrite  Natroalanite
Magnesioludwigite  Natrojarosite
Magnesioriebeckite  Natrolite
Magnesite  Natron
Magnetite  Navajolite
Malachite  Neighborite
Mallardite  Nepheline
Manganite  Niccolite
Manganocalcite  Nigrite (hydrocarbon)
Manganodolomite  Niter
Magnesiodolomite (See Dolomite)  Nolanite
Marcasite  Nontronite
Martite (See Hematite)  Norstranpite
Massicot  Northupite
Matildite  Noselite
Meerschaum (See Sepiolite)  Novacekite
Melanomite (See Tenorite)  Nsutite
Melanovanadite  Obsidian (rock)
Melanovane (See Tenorite)  Octahedrite (See Anatase)
Melanterite  Okenite
Mercury  Oligoclase
Mesolite  Olivenite
Meta-aluminate  Olivine
Meta-autunite  Onofrite
Metacinnabar  Onyx (See Calcite)
Metahewettite  Opal
Metarosite  Orpiment
Metastibnite  Orthite (See Allanite)
Metastrengite  Orthoclase
Metatorbernite  Osarizawaite
Metatyuyamunite  Overite
Meta-urano circite  Ozocerite (hydrocarbon)
Metavarriscite  Paligorskite
Metazone  Palladium
Metamérite  Parabrutelite
Mineralite  Paramontroseite
Mézilite  Pargasite
Minium  Pascoite
Mézilite  Pearceite
Mixite  Pennine (See Penninite)
Molybdite (See Ferrimolybdite)  Penninite
Monazite  Periclase
Monheimite (See Smithsonite)  Petrified Wood (See Cryp. Quartz)
Monimolite  Petzite
Montgomeryite  Pharmacosiderite
Monticellite  Phillipite
Montmorillonite  Phlogopite
Montroseite  Phosgenite
Mordenite  Phosphorite
Morganite (See Beryl)  Phosphuranylite
Mottramite  Pickeringite
Muscovite  Pintadoite
Pisanite
Pitchblende (See Uraninite)
Pittite
Plagioclase
Plancheite
Platinum
Pleonaste (See Hercynite)
Plumbojarosite
Polybasite
Polyhalite
Potash Alum
Potash Clay (See Hydromica)
Powellite
Prase (See Cryp. Quartz)
Prehnite
Prochlorite
Prosepite
Proustite
Pseudobrookite
Pseudowavellite (See Crandallite)
Psilomeland
Ptolite
Pyrgyrite
Pyrite
Pyrolusite
Pyromorphite
Pyrope (See Garnet)
Pyrophylite
Pyroxene
Pyrrolhote
Quartz
Queneselite
Rabbitite
Racewinite
Ravite
Realgar
Rectorite
Red Ocher (See Hematite)
Reedmengerite
Rohdocroosite
Rhodolite
Rhodonite
Rhomboclase
Riebeckite
Ripidolite
Rockbridgeite
Roemerite
Rosasite
Roscoelite
Rose Quartz (See Quartz)
Rossaite
Ruby Silver (See Proustite and Pyrgyrite)
Ruthfordine
Rutile
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Sabugalite
Sagenite (See Rutile)
Saleeite
Samarskite
Sanidine (See Orthoclase)
Saponite
Sapphire (See Corundum)
Satin Spar (See Gypsum)
Scandium
Scapolite
Scheelite
Schoeckingerite
Scorodite
Searlesite
Selenite (See Gypsum)
Selenium
Seligmannite
Senarmontite
Sepiolite
Sericite (See Muscovite)
Serpentine
Serpophite
Sherwoodite
Shortite
Sicklerite
Siderite
Sideronatrite
Siderotil
Silicified Bone and Wood (See Cryp. Quartz)
Silver
Simplotite
Sklodowskite
Smaltite
Smectite
Smoky Quartz (See Quartz)
Sodalite
Soddyite
Sodium Analogue of Hewettite (See Barnesite)
Soumansite (See Wardite)
Spadaite
Spangolite
Specularite (See Hematite)
Spessarite (See Garnet)
Sphaerocobaltite (See Cobaltocalcite)
Sphalerite
Sphene
Spinel
Spodumene
Staurolite
Steigerite
Stellerite
Stephanite
Sterrettite (See Kolbeckite)
Stibiconite
Stibnite
Stilbite
Stolzite
Stringhamite
Stromeyerite
Strontianite
Sulfur
Sulvanite
Sussexite
Swartzite
Sylvanite
Sylavite
Szaibelyite
Szomolonokite
Tabbyite (hydrocarbon)
Talc
Tennantite
Tenorite
Tetradyndite
Tetrahedrite
Thaumasite
Thenardite
Thomsonite
Thomsonite
Thinolite
Thompsonite
Thorite
Thucolite (hydrocarbon)
Thulite (See Zoisite)
Tiemannite
Tinticite
Titanite (See Sphene)
Titanoclinohumite
Tobermorite
Topaz
Torbernite
Tourmaline
Travertine (rock)
Tremolite
Tridymite
Trollite (See Pyrrhotite)
Trona
Troostite (See Willemite)
Tscheffkinite (See Chevkinite)
Tschermakite (See Ammonia alum)
Tungstenite
Turquois
Tropical
Tuyuyumite
Uintaite (See Gilsonite)
Uintahite (See Gilsonite)
Umohoite
Uraninite
Uranite (See Autunite and Torbernite)
Uranocher (See Uranopilite)
Uranocircite (See Meta-uranocircite)
Uranophane
Uranopilite
Uranospahtite
Uranospinite
Uranothallite (See Liebigite)
Utahite (See Carphosiderite)
Utahite (See Variscite)
Utah Onyx (rock)
Uranite
Uvarovite (See Garnet)
Valentinite
Vanadinite
Vanadium Hydromica (See Roscoelite)
Vandendriescheite
Vanoxide
Variscite
Vermiculite
Vesuvianite (See Idocrase)
Vitroite (See Bertrandite)
Vivianite
Voglite
Volborthite
Volchonkoite
Voltaite
Wad
Wardite
Wavellite
Weeksite
Wernerite (See Scapolite)
Wheelerite (hydrocarbon)
Whewellite
Willemite
Wire Silver (See Silver)
Wolframite
Wollastonite
Wufenite
Wurtzillite (hydrocarbon)
Wurtzite
Xanthophyllite
Xenotime
Zeunerite
Zinkenite
Zippeite
Zircon
Zoisite
Zunyite
Utah Minerals Listed by County

The mineral compilation of the State emphasizes the numerous varieties of minerals found in mines and mining districts. Listings of rock-forming minerals are only given where they may be of local significance; but it should be recalled that most of the common rock-forming minerals would be formed in each county. Counties which have many mines have extensive mineral listings, whereas those with little or no metallic production have limited minerals reported. Tooele County, for instance, with 188 minerals recognized, has the largest mineral listing; whereas Carbon County has only 2. The total number of minerals described in each county is indicated by the number given within parentheses following the county name.

**BEAVER COUNTY** (123)

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**BOX ELDER COUNTY** (67)

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**CARBON COUNTY** (2)

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**DAGGETT COUNTY** (26)

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| Cyprite | Malachite | }

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| Paramontroseite | Schoepite | Zircon |}

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### Minerals and Mineral Localities of Utah, Kenneth C. Bullock

- **Molybdenite**
- **Nitrate**
- **Oligoclase**
- **Orthoclase**
- **Osarizawaite**

#### RICH COUNTY (12)

- Azurite
- Crypto. Quartz
- Rhodochrosite
- Barite
- Galena
- Tennantite
- Calcite
- Phosphorite
- Tyuyamunite
- Cerussite
- Pyrolusite
- Wulfenite

#### MORGAN COUNTY (24)

- Anglesite
- Cuprite
- Molybdenite
- Monazite
- Actinolite
- Dufrenoysite
- Aikinite
- Dysansites
- Alaskaita
- Enargite
- Alstonite
- Ephesite
- Allanite
- Epidote
- allophanite
- Ferrimolybdate
- Allophane
- Forsterite
- Alahite
- Hemimorphite
- Barite
- Garnet
- Hematite
- Galena
- Heulandite
- Bismite
- Hydromagnesite
- Bismuth
- Hornblende
- Bismuthinite
- Idocrase
- Opal
- Pyrrhotite
- orthoclase
- Palladium
- Periclase
- Phosphorite
- Pickeringite
- Pisante
- Platinum
- Prehnite
- Pyrite
- Pyrolusite
- Pyrrhotite
- Quartz
- Racewinite
- Realgar
- Rhodochrosite
- Rutile

#### SALT LAKE COUNTY (142)

- Anglesite
- Cuprite
- Molybdenite
- Monazite
- Actinolite
- Dufrenoysite
- Aikinite
- Dysansites
- Alaskaita
- Enargite
- Alstonite
- Ephesite
- Allanite
- Epidote
- allophanite
- Ferrimolybdate
- Allophane
- Forsterite
- Alahite
- Hemimorphite
- Barite
- Garnet
- Hematite
- Galena
- Heulandite
- Bismite
- Hydromagnesite
- Bismuth
- Hornblende
- Bismuthinite
- Idocrase
- Opal
- Pyrrhotite
- Quartz
- Racewinite
- Realgar
- Rhodochrosite
- Rutile

#### PIUTE COUNTY (93)

- Albite
- Allophane
- Alunite
- Alunite
- Anatase
- Anglesite
- Anhydrite
- Argentite
- Autunite
- Azurite
- Barite
- Beta-uranotile
- Biotite
- Calcite
- Celadonite
- Cerargyrite
- Cerussite
- Chabazite
- Chalcopyrite
- Chlorite
- Cinnabar
- Clinoclore
- Cobaltmonite
- Cristobalite
- Cuproblismutite
- Dickite
- Emplectite
- Fluellite
- Fluorite
- Galena
- Garnet

#### PIUTE COUNTY (93)

- Albite
- Allophane
- Alunite
- Anatase
- Anglesite
- Anhydrite
- Argentite
- Autunite
- Azurite
- Barite
- Beta-uranotile
- Biotite
- Calcite
- Celadonite
- Cerargyrite
- Cerussite
- Chabazite
- Chalcopyrite
- Chlorite
- Cinnabar
- Clinoclore
- Cobaltmonite
- Cristobalite
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- Dickite
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- Fluorite
- Galena
- Garnet

#### PIUTE COUNTY (93)

- Albite
- Allophane
- Alunite
- Anatase
- Anglesite
- Anhydrite
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- Autunite
- Azurite
- Barite
- Beta-uranotile
- Biotite
- Calcite
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- Cinnabar
- Clinoclore
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- Fluorite
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#### PIUTE COUNTY (93)

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- Chlorite
- Cinnabar
- Clinoclore
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<td><strong>Plumbojarosite</strong> Variscite</td>
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<td><strong>Wad</strong> Wollastonite</td>
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<td></td>
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<tr>
<td><strong>Wolframite</strong> Wurtzite</td>
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<tr>
<td><strong>Zircon</strong> Zoisite</td>
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**UINTAH COUNTY (46)**

- Abelsonite
- Alumian
- Analcite
- Apophyllite
- Auunite
- Azurite
- Barytocalcite
- Biotite
- Burbankite
- Calcite
- Carbonate apatite
- Carnotite
- Cerargyrite
- Cerussite
- Chalcocite
- Chromite

**UTAH COUNTY (164)**

- Acanthite
- Actinolite
- Albite
- Allanite
- Allophan
- Altaite
- Alumite
- Anataze
- Anglesite
- Antlerite
- Apatite
- Aragonite
- Argente
- Argentojarosite
- Azurite
- Barite
- Beidellite
- Bilinite
- Billingsleyite
- Biotite
- Bismuthian bindheimite
- Bismuthinite
- Boehmite
- Bornite
- Brochantite
- Brucite
- Calcite
- Cerargyrite
- Cerussite

- Chalcocite
- Chalcopyrite
- Cimolite
- Claudette
- Clinechlore
- Cordierite
- Coronadite
- Crandallite
- Crednerite
- Crypto. Quartz
- Cryptomelane
- Cubanite
- Cuprite
- Cuprofargoslarite
- Davisonite
- Dehniite
- Delessite
- Deltaite
- Dickite
- Dolomite
- Eardleyite
- Enargite
- Endellite
- Englishite
- Epidote
- Faratsibite
- Ferrogoslarite
- Fluorite
Freibergite  Limonite  Pyrolusite
Galena  Luzonite  Pyrophyllite
Garnet  Magnetite  Quartz
Gearsuite  Malachite  Quenselite
Goyazite  Marcasite  Rectorite
Gigasite  Massicot  Rhodochrosite
Gold  Matildite  Rhomboclase
Gordonite  Melanterite  Rutilite
Graphite  Miargyrite  Rutile
Greenockite  Microcline  Scheelite
Gunningite  Millisite  Siderite
Gypsum  Mimetite  Siderotil
Halloysite  Minium  Silver
Halogravitie  Molybdenite  Smithsoniane
Hematite  Monominite  Sphalerite
Hessite  Montgomeryite  Sphere
Hetaerolite  Monticellite  Spinel
Hisingerite  Montmorillonite  Spertettite
Hollandite  Muscovite  Stromeyerite
Hornblende  Nontronite  Sulphur
Hydromica  Nsultite  Sylvanite
Jalpaite  Olivine  Szomolnokite
Jamesonite  Orthoclase  Tetradymite
Jaroite  Overite  Tetrahedrite
Jenkinsite  Pargasite  Thinolite
Kaolinite  Pearcite  Wad
Kermesite  Periclase  Wardite
Klaprothite  Petzite  Wollastonite
Kolbeckite  Phosphorite  Wulfenite
Kornelite  Plumbobarsite  Wurtzite
Krennerite  Polybasite  Zircon
Lanarkite  Potash Alum  Zoisite
Lehite  Psilomelane  Pyrite
Leuchtenbergite  Prehnite  Pyrite
Leverierite  Psilomelanite  Pyrite
Lewistonite  Pyrite  Pyrolusite

WASATCH COUNTY (33)

Alunite  Hematite  Siderite
Barite  Idocrase  Silver
Bornite  Kaolinite  Sphalerite
Calcite  Magnesoferrite  Spinel
Carbonate apatite  Magnetite  Tetrahedrite
Cerussite  Montmorillonite  Siderite
Chabazite  Muscovite  Silver
Chalcopyrite  Pinninite  Sphalerite
Dickite  Phlogopite  Spinel
Fluorapatite  Phosphorite  Tetrahedrite
Galena  Pyrite  Tetraxherite
Garnet  Pyrolusite  Uruninite
Gold  Pyromorphite  Uruninite
Halloysite  Rhodochrosite  Wand

WASHINGTON COUNTY (47)

Adamite  Chrysocolla  Montmorillonite
Aguilarite  Copper  Muscovite
Alunite  Crypto. Quartz  Orpiment
Argentite  Cuprite  Plumbojarosite
Aurichalcite  Emolite  Pyrite
Autunite  Gold  Pyrolusite
Azurite  Gypsum  Quartz
Birnessite  Halite  Realgar
Bornite  Halloysite  Rosasite
Calcite  Hematite  Scheelite
Carnotite  Hydrozincite  Silver
Celestite  Jarosite  Smithsonite
Cerargyrite  Kaolinite  Stibnite
Cerusite  Limonite  Tenorite
Chalcopyrite  Magnette  Volborthite

WAYNE COUNTY (33)

Alunite  Jarosite  Rutile
Anatase  Johannite  Schöepite
Anhydrite  Lepidocrocite  Schroekingerite
Azurite  Limonite  Sideronatrite
Brochantite  Malachite  Sklodowskite
Carnotite  Metachalcite  Staurolite
Chalcocite  Metarossite  Torbernite
Chalcopyrite  Metatherenite  Uraninite
Crypto. Quartz  Monazite  Uranopilite
Galena  Pyrite  Zippeite
Gypsum  Pyrolusite  Zircon

WEBER COUNTY (26)

Anglesite  Magnetite  Barite  Malachite
Azurite  Molybdenite  Biotite  Molybdenite
Borite  Phosphorite  Bornite  Phosphorite
Calcite  Pilsomelanite  Cerussite  Pyrite
Chabazite  Pyrolusite  Chalcopyrite  Pyrite
Chalcopyrite  Chloropyrite  Epidote  Silver
Dickite  Fluorite  Galena  Uraninite
Fluorapatite  Garnet  Gold  Uraninite
Galena  Gold  Hematite  Uraninite
Garnet  Hematite  Honblende
Gold  Honblende  Limonite
Halloysite  Limonite  Magnetite
Utah Minerals Listed by Crystal Systems

The minerals of the State fall into 8 categories: the 6 crystal systems, amorphous minerals, and minerals with an undetermined status. An alphabetical listing of the crystal systems follows with the minerals that fall into each system. The total number of minerals found in each system is indicated by the number in parentheses. It is apparent that the six crystal systems vary greatly in the number of minerals which represent them.

### AMORPHOUS (7)

<table>
<thead>
<tr>
<th>Allophane</th>
<th>Crandallite</th>
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<tbody>
<tr>
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<td>Dehrnite</td>
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<tr>
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<td>Dolomite</td>
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<td>Eitelite</td>
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<tr>
<td>Opal</td>
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### HEXAGONAL (77)

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<td>Ilemnite</td>
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<td>Jarosite</td>
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<tr>
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<tr>
<td>Chabazite</td>
<td>Natrojarosite</td>
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<td>Cinnabar</td>
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### ISOMETRIC (58)

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<td>Beidellite</td>
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### TOURMALINE (28)

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### ORTHORHOMBIC (192)

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Uranopilite  
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Voglite  
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Volchonskoite  
Whewellite  
Wolfaramite  
Xanthophyllite  
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Ferroselite  
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Fluellite  
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Goethite  
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Huminite  
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Utah Minerals Listed by Chemical Class

The minerals of the State have been assigned to 21 chemical classes. Less than 40 percent of Utah’s minerals fall into a single chemical class, such as a simple sulfide or oxide. Many fall into 2 chemical classes, such as azurite, which is listed as a carbonate, and also as a hydroxyl-hydrous mineral. Several lie in 3 chemical classes and a few in 4 classes. One of the surprising results in this tabulation is the abundance of hydroxyl-hydrous minerals. A total of 277 minerals, or 55 percent of the minerals of Utah, contain water. An alphabetical listing of the chemical classes follows with the minerals that fall into each class. The total minerals found in each class is indicated by the number in parentheses.

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Beidellite  
Bertrandite  
Beta-Uranotile  
Beudantite  
Bieberite  
Bilinite  
Bindheimite  
Biotite  
Birnessite  
Bischofite  
Bismuthian bindheimite  
Bloedite  
Boehmite  
Boltwoodite  
Boothite  
Borickite  
Brachantite  
Braitschite  
Brookite  
Brucite  
Butlerite  
Calciovolborthite  
Calcedonite  
Carbonate apatite  
Carminite  
Carnallite  
Carnotite  
Carphosiderite  
Chabazite  
Chalcophanite  
Chalcophyllite  
Chenevixite  
Chlorite  
Chrome mica-clay  
Chrysocolla  
Cimolite  
Clinochlore  
Clinoclase  
Clinohumite  
Clinoptilolite  
Clinezoisite  
Coconinoite  
Coffinite  
Collophane  
Conichalcite  
Connellite  
Copiapite  
Coquimbite  
Corkite  
Cornwallite  
Corvusite  
Crandallite  
Cuproskodowskite  
Cuprotungstite  
Cyanotrichite  
Damourite  
Davisonite  
Dawsonite  
Dehrnitz  
Delessite  
Deltaite  
Descloizite  
Diadochite  
Diaspore  
Dickite  
Doloresite  
Elpidite  
Endellite  
Englishite  
Ephestite  
Epidesmine  
Epidote  
Epsomite  
Erinite  
Erythrite  
Ettringite  
Faratsihite  
Fernandinite  
Ferrimolybdate  
Ferrisyneplesite  
Ferrugoslarite  
Ferrvanite  
Fibroferrite  
Fluellite  
Foshagite  
Fournarierite  
Garrelsite  
Gearksutite  
Gibbsite  
Glaucopinite  
Goethite  
Goldichite  
Gordonite  
Goslarite  
Goyazite  
Grantsite  
Gummite  
Gunningite  
Gypsum  
Gyrolite  
Halloysite  
Halotrichite  
Hectorite  
Hemimorphite  
Heulandite  
Hewettite  
Hisingerite  
Hornblende  
Humite  
Hydromagnesite  
Hydromica  
Hydrozincite  
Iddingsite  
Idocrase  
Ilesemannite  
Jarosite  
Jeffersite  
Jenkinsite  
Johannite  
Kainite  
Kaolinite  
Kasolite  
Kieserite  
Kinoite  
Kornelite  
Kornerupine  
Kolbeckite  
Laumontite  
Leadhillite  
Lehite  
Lepidocrocite  
Leuchtenbergite  
Leverrierite  
Lewistonite  
Libethenite  
Liebigite  
Limonite  
Linarte  
Loughlinite  
Magnesioriebeckite  
Malachite  
Mallardite  
Manganite  
Melanterite  
Mesolite  
Meta-aluminite  
Meta-autunite  
Metahewettite  
Matarosite  
Metastrengite  
Metatorbernite  
Metatyuyamunite  
Meta-Uranocircite  
Metavariscite  
Metazeunerite  
Millsite  
Mirabilite  
Mixite  
Montgomeryite  
Montmorillonite  
Montroseite  
Mordenite  
Mottramite  
Muscovite  
Natroalunite  
Natrojarosite  
Natrolite  
Navajoite  
Nontronite  
Norstrandite  
Novacekite  
Okenite  
Olivine  
Opal  
Osarizawaite  
Overite  
Paligorskite  
Parabuterite  
Paragasite  
Pascoite  
Pharmacosiderite  
Phillipsite  
Phlogopite  
Phosphyranylite  
Picketingite  
Pinninite  
Pintadoite  
Pisanite  
Pittoe  
Planchonite  
Plumbojarosite  
Polyhalite  
Potos Alum  
Prehnite  
Prochlorite  
Prosopite  
Psilomelane  
Ptilolite  
Pyrophyllite  
Quenselite  
Rabgittite  
Racewinite  
Rauvite  
Rectorite  
Rhambolase  
Ripidolite  
Rockbridge  
Roemerite  
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<td>Whewellite</td>
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<td>Vandendriesscheite</td>
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**PHOSPHATES (49)**

- Apatite
- Autunite
- Bassetite
- Borickite
- Brockite
- Carbonate apatite
- Coconoinite
- Collophane
- Corkite
- Crandallite
- Davisonite
- Dehrnite
- Deltaite
- Diodochite
- Englishite
- Fluorapatite
- Gordonite
- Goyazite
- Kolbeckite
- Lehite
- Lewistonite
- Libethenite
- Meta-Autunite
- Metastrengite
- Metatorbernite
- Meta-Uranocircite
- Metavariscite
- Millisite
- Mimetite
- Monazite
- Montgomeryite
- Overite
- Phosphorite
- Phosphorynlyl
- Pyromorphite
- Rockbridgeite
- Sabugalite
- Saleeite
- Sickerite
- Sterrettite
- Tinticite
- Torbernite
- Turquos
Minerals and Mineral Localities of Utah, Kenneth C. Bullock 159

Uranophosphite
Variscite
Vivianite
Wardite
Wavellite
Xenotime

SELENATES-SELENITES (4)
Clausthalite
Cobaltomeneite
Onofrite
Tiemannite

SELENIDES (2)
Eucarite
Ferroeselite

SILICATES (157)
Acmite
Actinolite
Aegirite
Albite
Allanite
Allophane
Analcite
Andalusite
Andesine
Anorthite
Anorthoclase
Anthophyllite
Antigorite
Apophyllite
Arduinite
Augite
Axinite
Beidellite
Bertrandite
Beryl
Beta-uranotile
Biotite
Boltwoodite
Celadonite
Chabazite
Chevkinite
Chlorite
Chrome mica-clay
Chrysocolla
Cimolite
Clinochlore
Clinohumite

Clinoptylolite
Clinozoisite
Coffinite
Cordierite
Cristobalite
Crypto. Quartz
Cuprosklodowskite
Damourite
Danburite
Delessite
Dickite
Diopside
Dumortierite
Epidote
Endellite
Enstatite
Ephesite
Epidesmine
Epidotite
Faratsihite
Ferrogeslarite
Forsterite
Foshagite
Garnet
Garrelsite
Glaucophane
Gyrolite
Halloysite
Hectorite
Hedenbergite
Helvite
Hemimorphite
Heulandite
Hisingerite
Hornblende
Humite
Hydromica
Hypersthene
Iddingsite
Idocrase
Jefferisite
Jenkensite
Kaolinite
Kasolite
Kinoite
Kornerupine
Kyanite
Labradorite
Laumontite
Leuchtenbergite
Leucosphenite
Leverrierite
Loughlinite
Magnesioarfvedsonite
Magnesioriebeckite
Mesolite
Microcline
Monticellite
Montmorillonite
Mordenite
Muscovite
Natrolite
Nepheline
Nontronite
Noselite
Okenite
Oligoclase
Olivine
Opal
Orthoclase
Palgorskite
Pargasite
Pinninite
Phillipsite
Phlogopite
Plancheite
Prehnite
Prochlorite
Ptolomite
Pyrophyllite
Quartz
Racewinite
Rectorite
Reidmargerite
Rhodonite
Riebeckite
Ripidolite
Roscoelite
Saponite
Scapolite
Searlesite
Serpentinite
Serpophite
Sklodowskite
Smectite
Sodalite
Soddyite
Spadite
Sphene
Spodumene
Staurolite
Stellerite
Stilbite
Stringhamite
Talc
Thaumasite
Thomsonite
Thorite
Titanclinohumite
Torbermorite
Topaz
Tourmaline
Tremolite
Tridymite
Uranophane
Vermiculite
Volchonskoite
Weeksite
Willemite
Wollastonite
Xantophyllite
Zircon
Zoisite
Zunyite

SULFATES (81)
Alum
Aluminate
Alunite
Alunogen
Ammonia Alum
Ammoniojarosite
Anglesite
Anhydrite
Antlerite
Apjohnite
Argentojarosite
Barite
Basiluminate
Bassanite
Beaverite
Beudantite
Bieberite
Bilinite
Bloedite
Boothite
Brochantite
Butlerite
Calcedonite
Carphosiderite
Celestite
Chalcanthite
Chalcophyllite
Coconinoite
Connellite
Copiapite
Coquimbite
Corkite
Cuprogoslarite
Cyanotrichite
Diadochite
Epsomite
Ettringite
Fibroferrite
Glauberite
Goldichite
Goslarite
Gunningite
Gypsum
Halotrichite
Jarosite
Johannite
Kainite
Mieserite
Kornelite
Lanarkite
Leadhillite
Linarite
Mallardite
Meta-aluminate
Mellanite
Mirabilite
Natroalunite
Natrojarosite
Noselite
Osarizawaite
Parabutlerite
Pickingite
Pisanite
Pitticite
Plumbojarosite
Polyhalite
Potash Alum
Rhomboclase
Rosemerite
Scapolite
Schroekingerite
Sideronatrite
Siderotil
Spangolite
Szomolnokite
Thaumasite
Thenardite
Uranopilite
Voltaite
Zippeite

SULFIDES (45)

Acanthite

SULFOSALTS (20)

Billingsleyite
Boulangerite
Bournonite
Enargite
Famatinite
Freibergite

TUNGSTATES (7)

Cuprotungsite
Ferberite
Heuberite
Powellite
Scheelite
Stolzite
Wolframite

URANINATES (40)

Abernathyite
Andersonite
Autunite
Bassette
Bayleyite
Beta-uranotile
Boltwoodite
Carnotite
Cuprosklodowskite
Fournmarierite
Johannite
Kasolite
Liebigite
Meta-autunite
Metatorbernite
Metatyuyamunite
Mottmatite
Nolanite
Pascoite
Pintadoite
Rauvite
Roscoelite
Rossite
Sherwoodite
Simploite
Steigerite
Tyuyamunite
Uvaneite
Vanadinite
Volborthite

VANADATES (27)

Barnesite
Calciovoolborthite
Carnotite
Desclozite
Fernandinite
Fervanie
Grantsite
Hewettite
Hummerite
Melanovanadite
Metahewettite
Metarossite
Metatyuyamunite
Metamattamate

The document contains a list of minerals and their names, organized into categories such as Sulfides, Sulfosalts, Tungstates, Uraninates, and Vanadates. Each category includes a variety of minerals with names like Corkite, Cuprogoslarite, Cyanotrichite, and others.
Utah Minerals Listed Under Selected Metallic Elements

Thirty metallic elements were selected by the author for consideration in this compilation. Most of these elements have formed ore deposits of actual or potential economic value in Utah; few metallic elements such as chromium, cobalt, nickel, and tin occur in minerals that may have only mineralogical significance. An alphabetical listing of the thirty selected metallic elements is given below. After each element is a list of Utah minerals containing it. The numbers in parentheses indicate the number of minerals in each list.

<table>
<thead>
<tr>
<th>Element</th>
<th>Minerals</th>
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</thead>
<tbody>
<tr>
<td>ANTIMONY MINERALS (23)</td>
<td>Chalcophyllite, Chenevixite, Claudetite, Clinoclase, Cobaltite, Conichalcite, Cornwallite, Donkeyite, Dufrenoysite, Enargite, Erinite, Erythrite, Ferrisymphlesite, Geocronite, Gersdorffite, Lorandite, Luzonite, Metazeunerite, Mimetite, Mixite, Niccolite, Novacekite, Olivenite, Orpiment, Pearceite, Pharmacosiderite, Pitticite, Proustite, Realgar, Scorodite, Seligmannite, Smaltite, Tennantite, Tyrolite, Uranospathite, Uranospinite, Zeunerite</td>
</tr>
<tr>
<td>COBALT MINERALS (9)</td>
<td>Annabergite, Bieberite, Cobaltite, Cobaltocalcite, Cobaltomine, Cryptomelane, Erythrite, Gersdorffite, Smaltite</td>
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<td>Aikinite, Alaskaitse, Arsenobismite, Bismite, Bismoclite, Bismuth, Bismuthian bindheimite, Bismuthinite, Bismutite, Cosalite, Cuprobismutite, Daubreite, Emplectite, Klaprothite, Matildite, Mixite, Tetradyomite, Cadmium Minerals (1), Connellite, Copper, Greenockite, CERIUM MINERALS (5), Allanite, Burbankite, Chevkinite, Monazite, Samarskite, CHROMIUM MINERALS (2), Chrome mica-clay, Chromite</td>
</tr>
<tr>
<td>ARSENIC MINERALS (49)</td>
<td>Abernathyite, Adamite, Annabergite, Arsenic, Arsenosiderite, Arsenobismite, Arsenopyrite, Austinite, Balydonite, Beudantite, Billingsleyite, Carminite</td>
</tr>
<tr>
<td>BARIUM MINERALS (9)</td>
<td>Barite</td>
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</table>
### Enargite
### Erinite
### Ecucrite
### Famatinite
### Freebergite
### Jalpaite
### Johannite
### Kinoite
### Libethenite
### Linairate
### Luzonite
### Malachite
### Metaborbernite
### Metazeunerite
### Mixite
### Mottramite
### Olivenite
### Osarizawaite
### Pisanite
### Plancheite
### Polybasite
### Rosasite
### Seligmannite
### Spangolite
### Stringhamite
### Stromeyerite
### Sulvanite
### Tennantite
### Tenorite
### Tetrahedrite
### Torbernite
### Turquois
### Tyrolite
### Uranospashite
### Vogite
### Volborthite
### Zeunerite

**GOLD MINERALS (5)**
- Calaverite
- Gold
- Krennerite
- Petzite
- Sylvanite

**IRON MINERALS (106)**
- Acmite
- Actinolite
- Aegirite
- Allanite
- Ammoniojarosite
- Ankerite
- Anthophyllite
- Argentojarosite
- Arseniosiderite
- Arsenopyrite
- Augite
- Axinite
- Bassetite
- Beaveringite
- Beidellite
- Beudantite
- Bilitite
- Biotite
- Bixbyite
- Borrickite
- Bornite
- Butlerite
- Carminite
- Carphosiderite
- Chalcopyhanite
- Chalcopyrite
- Chenexvite
- Chromite
- Cobaltite
- Copiapite
- Coquimbite
- Corkite
- Cubanite
- Delesite
- Diadochite
- Dumortierite
- Epidote
- Ferberite
- Ferrimolybdite
- Ferrisymphene
- Fervanite
- Fibroferrite
- Freibergite
- Garnet
- Gersdorffite
- Glaucocite
- Goethite
- Goldichite
- Gunningite
- Halotrichite
- Hedenbergite
- Hematite
- Hercynite
- Hisingerite
- Hornblende
- Hypersthene
- Iddingsite
- Idocrase
- Ilmenite
- Jamesonite
- Jarosite
- Jefferisite
- Jenkinsite
- Kornelite
- Lepidocrocite
- Limonite
- Ludwigite
- Magnesioferrite
- Magnesioriebeckite
- Magnetite
- Marcasite
- Melanterite
- Metastrangite
- Montroseite
- Natrijarosite
- Nolanite
- Nontronite
- Olivine
- Parabutlerite
- Pargasite
- Pharmacosiderite
- Plininite
- Pisanite
- Pitticite
- Plumbojarosite
- Pseudobrookite
- Pyrite
- Pyrrhotite
- Rhomboclase
- Riebeckite
- Ripidolite
- Rockbridgeite
- Roemerite
- Scorodite
- Sicklerite
- Siderite
- Sideronatriite
- Siderotil
- Staurosite
- Szomolnokite
- Tennantite
- Tinticite
- Tourmaline
- Vivianite
- Voltaite
- Wolframite

**LEAD MINERALS (47)**
- Aikinite
- Alaskanite

**LITHIUM MINERALS (3)**
- Lithiophorite
- Sicklerite
- Spodumene

**MANGANESE MINERALS (30)**
Minerals and Mineral Localities of Utah, Kenneth C. Bullock

TELLURIUM MINERALS (7)
- Altaite
- Calaverite
- Hessite
- Krennerite
- Petzite
- Sylvanite
- Tetradyomite

PLATINUM MINERALS (1)
- Platinum

SCANDIUM MINERALS (1)
- Kolbeckite

SELENIUM MINERALS (2)
- Eucarite
- Ferrosilite

SILVER MINERALS (26)
- Acanthite
- Aguilarite
- Alaskanite
- Argentite
- Argentojarosite
- Argyrodite
- Billingsleyite
- Cerargyrite
- Dysarsite
- Emolbit
- Eucarite
- Freibergite
- Hesite
- Japalite
- Matildite
- Miargyrite
- Pearceite
- Petzite
- Polybasite
- Proustite
- Pyargyrite
- Silver
- Stephanite
- Stromeyerite
- Sylvanite
- Tetrahedrite

TIN MINERALS (2)
- Cassiterite
- Samarskite

TITANIUM MINERALS (10)
- Anatase
- Brookite
- Chevkinite
- Ilmenite
- Leucosphenite
- Pseudobrookite
- Rutile
- Samarskite
- Sphene
- Titanoclinohumite

TUNGSTEN MINERALS (8)
- Cuprotungstite
- Ferberite
- Huebnerite
- Powellite
- Scheelite
- Stolzite
- Tungstenite
- Wolframite

MERCURY MINERALS (5)
- Cinnabar
- Mercury
- Metacinnabar
- Onofrite
- Tiemannite

MOLYBDENUM MINERALS (7)
- Ferrimolybdite
- Ilsemannite
- Jordisite
- Molybdenite
- Powellite
- Umohoiite
- Wulfenite

MOLYBDENUM MINERALS (7)
- Ferrimolybdite
- Ilsemannite
- Jordisite
- Molybdenite
- Powellite
- Umohoiite
- Wulfenite

NICKEL MINERALS (6)
- Annabergite
- Eardleyite

VANADIUM MINERALS (35)
- Barnesite
- Calciovolborthite
- Carnotite
- Coconinoite
- Corusite
- Descoizite
- Doloresite
- Doloresite
- Fernandinite
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Celestite

TIN (1)
Cassiterite

TITANIUM (2)
Brookite
Ilmenite

URANIUM (25)
Abernathyrite
Autunite
Bayleyite
Becquerelite
Boltwoodite
Carnotite
Coffinite
Fourmarierite
Gummite
Metatorbernite
Metazeunerite
Phosphuranylite
Rauvite
Rutherfordite
Schoepite
Schroeckingerite
Torbernite
Tyuyamunite
Uraninite
Uranite
Vandendriesscheite
Zeunerite
Zippeite

VANADIUM (11)
Carnotite
Corrusite
Fernandinite
Hewettite
Hummerite
Metaheuwettite
Paramontroseite
Rauvite
Roscoelite
Tyuyamunite
Uvanite

ZINC (1)
Sphalerite

ZIRCONIUM (1)
Zircon

TITANIUM (1)
Ilmenite

URANIUM (9)
Autunite
Beta-uranotile
Carnotite
Johannite
Torbernite
Tyuyamunite
Uraninite
Uranophane
Zippeite

VANADIUM (6)
Carnotite
Metahewettite
Montroseite
Pascoite
Tyuyamunite
Vanoxite

ZIRCONIUM (1)
Zircon

GRAND COUNTY

BARIUM (2)
Barite
Psilomelane

CERIUM (1)
Monazite

CHROMIUM (1)
Chromite

COPPER (9)
Azurite
Bornite
Calciovolborthite
Chalcocite
Chalcopyrite
Chrysocolla
Descoelite
Malachite
Volborthite

IRON (14)
Actinolite
Aegirite
Augite
Biotite

ZINC (1)
Sphalerite

GRAND COUNTY

MOLYBDENUM (1)
Ilesmannite

PHOSPHORUS (3)
Autunite
Meta-autunite
Phosphuranylite

STRONTIUM (1)
Celestite

TITANIUM (1)
Chromite
Fervanite
Goethite
Hedenbergite
Hematite
Limonite
Montroseite
Pyrite

LEAD (2)
Descoelite
Galena

LITHIUM (1)
Lithiophorite

MANGANESE (5)
Lithiophorite
Manganite
Psilomelane
Pyrolusite
Rhodochrosite

IRON (8)

MANGANESE (2)
Pyrolusite
Wad

PHOSPHORUS (3)
Autunite
Monazite
Torbernite

PHOSPHORUS (3)
Boltwoodite
Carnotite
Coffinite
Liebigite
Meta-autunite
Metatyuyamunite
Phosphuranylite

Plutonic rocks

TUNGSTEN (1)
Scheelite

URANIUM (15)
Andersonite
Autunite
Becquerelite
Boltwoodite
Carnotite
Coffinite
Liebigite
Meta-autunite
Metatyuyamunite
Phosphuranylite

Plutonic rocks

Uraninite
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ZINC (1)
Sphalerite
Magnesioferrite
Magnetite
Pyrite

SUMMIT COUNTY
LEAD (12)
Anglesite
Barytynite
Boulangerite
Bournonite
Cerussite
Galena
Jamesonite
Linarite
Massicot
Mimetite
Pyromorphite
Zinkenite

ARSENIC (3)
Balydonite
Mimetite
Olivenite
MANGANESE (5)
Manganite
Mimetite
Olivenite
BARIUM (2)
Barite
Psilomelane

COPPER (15)
Aurichalcite
Azurite
Beaverite
Bournite
Bismuthinite
Bismuthite
Bismuthinite
Bismuthite

GOLD (2)
Calaverite
Gold

IRON (48)
Actinolite
Allanite
Argentojarosite
Arseniosiderite
Arsenopyrite
Augite
Axinite
Beaverite
Borite
Borite
Biotite
Bournite
Carminite
Carphosiderite
Chalcopryite
Chenevixite
Chenevixite
Cobaltite
Cuprite
Ferraparonite
Ferrisuphatrite
Ferrimolybdate
Ferrisuphatrite

TOOELE COUNTY
ANTIMONY (8)
Boulangerite
Jamesonite
Monimolite
Pyrargyrite

CERIUM (3)
Allanite
Monazite
Samarakite

COPPER (27)
Aikinite
Garnet
Hedenbergite
Hematite
Hornblende
Hypersthene
Iddingsite
Idocrase
Ilmenite
Jamesonite
Jarosite
Jeffersite
Limonite
Magnetite
Melanterite
Natrojarosite
Nontronite
Olivine
Pharmacosiderite
Plumbojarosite
Pyrite
Pyrrhotite
Scorodite
Siderite
Siderotil
Tennantite
Tourmaline
Wolframite

**LEAD (16)**
Aikinite
Anglesite
Beaverite
Beudantite
Boulangerite
Carminite
Cerusite
Descloizite
Galena
Jamesonite
Mimetite
Monimolite
Plumbojarosite
Pyromorphite
Stolzite
Wulfenite

**MANGANESE (10)**
Allanite
Axinite
Huebnerite
Manganite
Psilomelane
Pyrolusite

**RHODOCROSITE**
Rhodonite
Wad
Wolframite

**MERCURY (2)**
Cinnabar
Metacinnabar

**MOLYBDENUM (4)**
Ferrimolybdate
Molybdenite
Powellite
Wulfenite

**PHOSPHORUS (6)**
Apatite
Mimetite
Monazite
Pyromorphite
Turquoise
Variscite

**SILVER (9)**
Argentite
Argentojarosite
Cerargyrite
Hessite
Proustit
Pyargyritle
Silver
Stephanite
Tetrahedrite

**TELLURIUM (2)**
Calaverite
Hessite

**TIN (1)**
Samarskite

**TITANIUM (5)**
Anatase
Ilmenite
Rutile
Samaraske
Sphene

**TUNGSTEN (7)**
Cuprotungstate
Ferberite
Huebnerite
Powellite

**Scheelite**
Stolzite
Wulfenite

**IRON (6)**
Bornite
Chromite
Glaucophane
Halotrichite
Hematite
Pyrite

**LEAD (2)**
Cerussite
Galena

**MOLYBDENUM (2)**
Ilsemannite
Molybdenite

**PHOSPHORUS (7)**
Autunite
Carbonate apatite
Carnotite
Fluorapatite
Monazite
Phosphorite
Torbernite

**SILVER (1)**
Cerargyrite

**STRONTIUM (1)**
Burbankite

**TITANIUM (1)**
Leucosphenite

**URANIUM (4)**
Autunite
Carnotite
Torbernite
Tyuyamunite

**COPPER (5)**
Azurite
Bornite
Chalocite
Malachite
Torbernte

**GOLD (1)**
Gold

**ZIRCONIUM (1)**
Elpidite
UTAH COUNTY

ANTIMONY (7)
Billingsleyite
Bismuthian bindheimite
Jamesonite
Kermesite
Miarystite
Polybasite
Tetrahedrite

ARSENIC (6)
Billingsleyite
Clausedrite
Enargite
Luzonite
Mimetite
Pearceite

BARYLUM (1)
Allanite

BISMUTH (5)
Bismuthian bindheimite
Bismuthinite
Klaprothite
Matildite
Tetradymite

CADMIUM (1)
Greenockite

CERIUM (1)
Allanite

COBALT (1)
Cryptomelane

COPPER (19)
Azurite
Bornite
Brochantite
Chalcocite
Chalcopyrite
Crednerite
Cubanite
Cuprite

LEAD (15)
Altarite
Anglesite
Bismuthian bindheimite
Cerussite
Coronadite
Galena
Jamesonite
Lanarkite
Massicot
Mimetite
Minium
Plumbojarosite
Quinselte
Vanadinite
Wulfenite

MANGANESE (14)
Allanite
Chalcophanite
Coronadite
Crednerite
Cryptomelane
Hetaerolite
Hollanite
Jenkinsite
Nsutite
Pslomelane
Rhodochrosite
Wad

MOLYBDENUM (2)
Molybdnite
Wulfenite

NICKEL (1)
Eardleyite

PHOSPHORUS (20)
Apatite
Crandallite
Davisonite
Dehrnite
Deltaite
Englishite
Gordonite
Goyazite
Kolbeckite
Lehiite
Lewistonite
Millisite

SCANDIUM (1)
Kolbeckite

SILVER (16)
Argentite
Argentojarosite
Billingsleyite
Cerargyrite
Freibergite
Hessite
Jalpaite
Matildite
Miarystite
Pearceite
Petzite
Polybasite
Silver
Stromeyerite
Sylvanite
Tetrahedrite

TELLURIUM (6)
Altarite
Hessite
Krennerite
Petzite
Sylvanite
Tetrahedrite

TITANUM (3)
Anatase
Rutile
Sphene

TUNGSTEN (1)
Scheelite

VANADIUM (1)
Vanadinite

ZINC (12)
Chalcophanite
Cryptomelane
Cuprogoslarite
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THE UTAH GEOLOGICAL AND MINERAL SURVEY is a Division of the Utah Department of Natural Resources and operates under the guidance of a 7-member Board appointed by the Governor from industry and the public-at-large. The Survey is instructed by law to collect and distribute reliable information concerning the mineral resources, topography, and geology of the state, to investigate areas of geologic and topographic hazards that could affect the citizens of Utah, and to support the development of natural resources within the state. The *Utah Code Annotated, 1953 Replacement Volume 5, Chapter 36, 53-36-1 through 12*, describes the Survey and its functions.

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