URANIUM IN WASHINGTON

An Extract from
Bulletin 37, Inventory of Washington Minerals,
Part II, Metallic Minerals

By
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INTRODUCTION

This list of occurrences of uranium in Washington is extracted with only minor changes from the uranium section of Washington Division of Mines and Geology Bulletin 37, Inventory of Washington Minerals, Part II, Metallic Minerals, pages 350 to 357. It is printed separately and distributed without charge for the convenience of those readers who are interested in uranium but would not be sufficiently interested in the minerals of the other metallic elements to wish to purchase the larger bulletin.

The bibliography on page 10 is extracted from the list used in Bulletin 37, Part II. Each reference, here, is assigned a number in bold face type, but these numbers in the bibliography of the present report are not consecutive because only those references pertaining to uranium have been taken from the complete list used in Bulletin 37.

ABBREVIATIONS

av.—average, averaged, averaging
Ave.—Avenue
Co.—Company
cor.—corner
Corp.—Corporation
Cr.—Creek
Dev.—development
dist.—district
Div.—Division
E.—east
Elev.—elevation
cat.—estimated
Fk.—Fork
ft.—foot, feet
in.—inch, inches
Inc.—Incorporated
Lk., lk.—Lake, lake
Loc.—location
max.—maximum
mi.—mile, miles
min.—minimum
Mt.—Mount
Mtn., Mtns.—Mountain, Mountains
N.—north
NE.—northeast
no.—number
NW.—northwest
O—oxygen
Ore min.—ore mineral(s)
p.—page
%
— percent
Prod.—production
Prop.—property
R.—River, Range
Ref.—references
S.—south
SE.—southeast
sec.—section
sq.—square
SW.—southwest
U.—uranium
vol.—volume
W.—west
Wash.—Washington
yr.—year, years
URANIUM

Properties—Uranium is a metal that is hard but ductile and malleable. It is very heavy (2½ times as heavy as steel) and is capable of taking a high polish. The polished metal, however, rather quickly oxidizes to a black surface. In powder form uranium is black and pyrophoric, catching on fire spontaneously upon exposure to air. In its chemical behavior it is most closely related to chromium. The chemical symbol for uranium is "U." Its atomic number is 92, and its atomic weight is 238.07. The specific gravity of the element is 19.05 (1,166 pounds per cubic foot). Its melting point is 1133°C, and its boiling point is 2071°C. Uranium is radioactive, and the isotope U_{235} (present in natural uranium to the extent of about 0.7 percent), is fissionable—properties of utmost importance. Uranium radiates alpha rays, and in its atomic disintegration produces a series of elements including helium, radium, actinium, and lead, which emit alpha, beta, and gamma rays. Pound for pound, fissionable uranium has more than two and a half million times the heat-producing energy of coal.

Uses—By far the most important use of uranium is as a source of nuclear energy, which is utilized in the atomic bombs, and which is being developed for use in power plants for various military and industrial applications. Nonenergy uses of uranium in recent years have been largely in the chemical industries, including use as catalyst and in analytical reagents. Next in importance has been its use in ceramics—in glass for a coloring agent and to regulate the coefficient of thermal expansion of the glass. It has been used in motion picture film manufacture, in electrical equipment, and luminous paint, and it has been alloyed with steel for special uses.

Production—During the years 1945 through 1950 the United States consumption of uranium for nonenergy purposes varied between 1½ and 2½ tons per year. The amount used in the atomic energy program has not been announced. Prior to World War II most of our uranium was imported, but domestic sources now produce large quantities. Data on production and imports and exports are not disclosed. Every producer of uranium ore must be licensed by the U.S. Atomic Energy Commission, and the ore must be sold either directly to the Commission or to a buyer licensed by it.

Prices—Uranium salts prices have not changed greatly in the past few years. Sodium uranate sold at $1.25 per pound in 1936, $1.75 in 1939, and $1.65 from 1942 to 1948. Uranium metal prices have risen considerably, however, being quoted at $7.00 per pound in 1943, $20.00 in 1946, and $50.00 per pound for high-purity metal in 1950. The Atomic Energy Commission’s domestic uranium program provides for: (1) A guaranteed minimum price, effective through March 31, 1962, of $3.50 per pound f.o.b. shipping point, for uranium oxide (U_{2}O_{5}) contained in domestic ores or mechanical concentrates assaying at least 10 percent U_{2}O_{5}. This price does not apply to the carnottite-type and roscoelite-type ores of the Colorado Plateau. (2) Guaranteed minimum prices, effective through March 31, 1962, for the carnottite-type and roscoelite-type ores of the Colorado Plateau area, varying from $1.50 per pound of U_{2}O_{5} in ores containing 0.10 percent U_{2}O_{5} to $3.50 per pound of U_{2}O_{5} in ores containing 0.20 percent or more U_{2}O_{5}. (3) A bonus of $10,000, effective until April 11, 1958, for the discovery of a new deposit and the production therefrom of the first 20 short tons of uranium ore or mechanical concentrate assaying 20 percent or more U_{2}O_{5}. (4) The Commission will pay an additional graduated bonus of up to $35,000, depending upon the quantity and grade of ore, for initial production and delivery of acceptable uranium ore from new and certain existing mining properties. For new properties this bonus payment will be made on each pound of uranium oxide up to and including the first 10,000 pounds.

In May 1956 the Atomic Energy Commission announced a new domestic procurement program which will cover the period from April 1, 1962, through December 31, 1966. This program provides a guaranteed market for uranium concentrates produced by domestic mills from domestic ores. The base price established under this program will be $8.00 per pound of U_{2}O_{5} contained in concentrates meeting specifications.

Ore minerals—More than 100 uranium-bearing minerals are known. In some of these uranium is the principal constituent, but in others it is only a minor part of the mineral. The more important primary minerals are the oxides, pitchblende (50 to 80 percent U_{2}O_{5}) and uraninite (65 to 90 percent U_{2}O_{5}). Some of the more common secondary uranium minerals are the potassium uranium vanadate, carnitite (50 to 55 percent U_{2}O_{5}); the calcium uranium phosphate, autunite (60 percent U_{2}O_{5}); the copper uranium phosphate, torbernite (60 percent U_{2}O_{5}); the calcium uranium vanadate, tyuyumnite, (48 to 55 percent U_{2}O_{5}); and the calcium uranium silicate, uranophane (65 percent U_{2}O_{5}). In general, uranium occurs combined as oxides, phosphates, sulfates, arsenates, carbonates, vanadates, silicates, and hydrocarbons. Uranium minerals that have been found in Washington include uraninite, pitchblende, brannerite, autunite, torbernite, uranophane, monazite, and allanite. The latter two minerals are primarily thorium bearing but sometimes contain uranium. Other uranium minerals reported in Washington are zeunerite, fergusonite, samarskite, euxenite, and cyrtolite.

Geology—Uranium ore deposits occur in a great variety of rocks of igneous, metamorphic, and sedimentary origin. Primary deposits in hydrothermal veins appear to favor felsic intrusive rocks and arenaceous metasediments as host rocks. Within the veins, associated minerals contain, in decreasing order of abundance, iron, copper, cobalt, lead, silver, nickel, and bismuth. Of these, perhaps cobalt, nickel, and bismuth are most indicative. Pegmatites commonly contain uranium minerals but almost never in commercial quantities. The potassium-rich pegmatites, or zones in them, have been indicated as most favorable for the occurrence of uranium minerals. The secondary uranium-mineral occurrences, as low-grade disseminations in the sedimentary rocks—sandstone, shale,
and limestone, are currently producing large tonnages of ore in the United States. A very large part of the domestic production comes from sedimentary-type deposits of this kind, largely from the Colorado Plateau in the "four corners" region of Colorado, Utah, Arizona, and New Mexico.

Although fairly large areas in Washington are underlain by Mesozoic and Tertiary continental sedimentary rocks, and some of these areas are being prospected, no sedimentary-type deposits in which carnitite commonly occurs have yet been found here. All the verified occurrences of uranium in Washington are either in granitic rock or in metamorphic rocks intruded by granite. Uraninite and secondary uranium minerals have been found in pegmatite dikes in this state but not in commercial quantities. The more promising uranium deposits in Washington have been found (1) in and near the contact of granite and rock the granite intrudes, (2) in shear zones cutting these rock types, and (3) as secondary minerals impregnating the fractured, decomposed, and disintegrated granitic and metamorphic rocks adjacent to contacts and shear zones. In other words, primary uranium mineralization may be expected to occur under much the same conditions as does copper, gold, silver, lead, zinc, molybdenum, and other ore mineralization.

Recent developments—Uranium prospecting and exploration in Washington expanded very rapidly during the first few months of 1955, especially in Stevens and Spokane Counties. This activity was the direct result of the discovery of substantial quantities of uranium ore at the Midnite Mines property on the Spokane Indian Reservation in southern Stevens County. Many large and small mining companies and thousands of individuals staked claims on open Federal land or obtained mineral leases on State and private lands north of the Reservation throughout Stevens County. Similar exploration activity in the vicinity of Mount Spokone was triggered by the announcement of the discovery of good-grade autunite mineralization on the Dahl farm near Elk in northern Spokane County. Exploration has been active in the whole northern row of counties westward from the Idaho boundary to the western flanks of the Cascade Mountains and in the Cascades about as far south as Mount Rainier. Locations showing radioactivity are known or have been reported in at least 10 counties in this general region, and this area includes all the authenticated uranium occurrences in Washington; however, because of the tremendous interest in uranium prospecting, there probably is no county in the state in which some prospecting has not been done. To date (February 1957) uranium ore has been shipped in quantities of more than 1 carload each from five properties in Washington, all in Stevens and Spokane Counties. These are the Midnite mine, originally operated by Midnite Mines, Inc. and later by Dawn Mining Co.; the Dahl, Lowley, and Huffman properties operated by Daybreak Uranium, Inc.; and the Lehmecker property operated by North Star Uranium, Inc.

**Occurrences**

Because serious prospecting for uranium in Washington started only very recently and new discoveries of radioactivity are being reported each week, it is impossible to include all the uranium occurrences in the following list. Any such list would be incomplete a short time after compilation.

**CHelan County**

**Holden (Howe Sound) (1)**

**Loc:** Secs. 18 and 19, (31-17E), and secs. 12 and 13, (31-16E), on Railroad Cr. **Ore:** Copper, gold, zinc, silver. **Deposit:** Zone of sulfide disseminations 20 to 75 ft. wide has exposed length of 2,500 ft. and depth of 2,500 ft. in metamorphic rocks. Slight amount of radioactive mineralization in footwall zone in W. end of mine at 1,950- and 2,325-ft. levels. **Ref:** 175. Details other than those dealing with uranium are described more fully in Washington Div. Mines and Geology Bull. 37, Pt. II.

**Howe Sound**

(see Holden)

**Keeler Brothers (2)**

**Loc:** On W. slope of Red Mtn., near headwaters of Chiwawa R., about 1 mi. S. of Lyman Glacier. **Ore:** Molybdenum, copper, gold, silver, tungsten, uranium. **Deposit:** Narrow fissure veins with some hydrothermal alteration of the granodiorite wall rock. A channel sample taken at the most radioactive spot known on the veins assayed 0.1% UO₂. **Ref:** 156. Details other than those dealing with uranium are described more fully in Washington Div. Mines and Geology Bull. 37, Pt. II.

**Peshastin**

**Loc:** 12 mi. from Peshastin. **Owner:** R. F. Brown (1897). **Ore:** Uranium, but the occurrence has not been authenticated. **Ore min:** "Probably a silicate." **Deposit:** 5-ft. ledge. **Ref:** 105, 10/16/97, p. 359.

**Safety Harbor Creek (4)**

**Loc:** Safety Harbor Cr. area. **Access:** Trail. **Prop:** 6 claims. **Owner:** Western States Uranium, Inc. (1955——). **Ore:** Uranium. **Ref:** 158.

**Winesap Canyon (3)**

**Loc:** SW¼NW¼ sec. 5, (28-21E), near head of Winesap Canyon (Oklahoma Gulch). **Access:** 5 mi. by road to railroad. **Prop:** 1 unpatented claim. **Owner:** George Goman, Winesap, Wash. (1942). **Ore:** Uranium. **Ore min:** Uraninite. **Deposit:** Pegmatite made up of feldspar, quartz, and muscovite, with very minor amount of uraninite. **Dev:** Open cut 4 ft. by 6 ft. **Ref:** 67, p. 53. 158.

**Ferry County**

**Box Canyon (5)**

**Loc:** Sec. 28, (37-37E), Nancy Cr. area. **Owner:** V. L. Stevens, Colville, Wash. (1955). **Ore:** Uranium. **Deposit:** Autunite in pegmatitic gneiss. **Ref:** 138.

**Hurrell (8)**

**Loc:** Sec. 21, (36-37E), on SE. flank of Bisbee Mtn., W. of Kettle Falls. **Owner:** John Hurrell, Inchelium, Wash. (1955). **Ore:** Uranium (?). **Deposit:** Radioactivity in pegmatite. **Ref:** 158.
Lucky Leslie (1)

Loc: Near center W\(\frac{1}{2}\)NW\(\frac{1}{2}\) sec. 23, (38-34E), on N. side of Mt. Leona. Elev: 5,950 ft. Access: 1½ mi. by trail to N. Ft. St. Peters Cr. road, by which it is 7½ mi. to railroad at Malo.

Prop: Lucky Leslie No. 2 and several other unpatented claims.

Owner: Wm. Alexander and Chas. Bildeback, Sweet Home, Ore. (1955). Ore: Uranium. Deposit: Uraninite and uranophane in irregular pegmatite lens 25 ft. long and up to 5 ft. thick along a shear zone that is parallel to schistosity in biotite schist and quartzite. Dev: Shallow open cut. Assays: Radiometric tests on samples from open cut show 0.35% to 1.40% U\(_3\)O\(_8\) equivalent. Ref: 158.

Lucky 21 (2)

Loc: Near center NW\(\frac{1}{4}\)NE\(\frac{1}{4}\) sec. 15, (38-34E), E. of Malo, on St. Peters Cr. Elev: 3,750 ft. Access: 7 mi. by road to railroad at Malo. Prop: 10 unpatented claims, including Lucky 21.

Owner: Bert Edwards, Doug Elm, Malo, Wash., and William B. Kleinhans, Republic, Wash. (1955). Ore: Uranium. Deposit: Uraninite and uranophane in narrow pegmatite lenses in quartzite and schist. Dev: Open cuts. Assays: 0.325% U\(_3\)O\(_8\) reported. Note: Since the original 8 claims were staked, 30 or more claims were staked nearby in a few days by various people. Ref: 158.

Nancy Creek (6)

Loc: SW\(\frac{1}{4}\)SW\(\frac{1}{4}\) sec. 29, (37-37E), near Nancy Cr. Elev: 2½ mi. by road to railroad. Prop: 8 claims and 120 acres deeded land. Owner: Patrick Sullivan and Darrell Newland, Colville, Wash., hold lease and have subleased to Day Mines, Inc., Wallace, Idaho (1955—__). Ore: Uranium. Deposit: Uraninite and uranophane in pegmatite lenses in gneiss. Assays: 0.31% to 1.45% U\(_3\)O\(_8\) reported. Note: Since the original discovery in this area dozens of claims were staked within a short time. Ref: 158.

Oregonian (3)

Loc: W\(\frac{1}{4}\)NW\(\frac{1}{2}\)SW\(\frac{1}{4}\) sec. 14 and E\(\frac{1}{4}\)NE\(\frac{1}{4}\)SE\(\frac{1}{4}\) sec. 15, (38-34E), S. of St. Peters Cr. Elev: ¾ mi. by trail to N. Ft. St. Peters Cr. road, by which it is 7½ mi. to railroad at Malo.


Section 36 (7)

Loc: Sec. 36, (37-36E), near head of Nancy Cr. Access: About 8 mi. by road to railroad. Owner: Leases on 320 acres of State land held by R. C. Mulligan, R. J. Pulley, M. F. Fowler, and T. Jones, Okanogan, Wash. (1955). Ore: Uranium. Deposit: Pegmatitic granite in gneiss contains uraninite, autunite, and a little heavy black uranium mineral that probably is uraninite; also halylite, garnet, and apatite. Assays: Samples reported to run as high as 0.51% U\(_3\)O\(_8\). Ref: 158.

Sherman Creek Pass (4)

Loc: Vicinity of Sherman Cr. Pass, Columbia Mtn., and Sherman Pk., 17 mi. E. of Republic. Elev: 4,000 to 7,000 ft. Access: About 16 mi. by road to railroad at Republic. Prop: 29 or more claims. Owner: Sherman Creek Uranium Mines, Inc., Burl Fowler, A. J. Lane, R. R. Embody, Republic, Wash. (1954—__). Ore: Uranium. Ore min: Monazite, autunite. Deposit: Weak radioactivity is sporadically distributed over large area near contact of granite with gneiss and schist, and local areas show considerable radioactivity. At least part of the radioactivity is concentrated in biotite-rich pegmatitic segregations, and here the radioactivity is due to the presence of monazite. Small amount of autunite has been reported along joints in talus blocks. Dev: Open cuts, diamond drill holes. Assays: "Surface samples indicated up to 0.14% U\(_3\)O\(_8\)." Note: Since the original discovery hundreds of claims have been staked in this area. Ref: 158.

Sunset Mines (9)


GRANT COUNTY

Grand Coulee (1)


Peterson


KING COUNTY

Rainy (Western States Copper) (1)

Loc: Sec. 16, (24-10E), Taylor R. dist. Ore: Copper, gold, silver. Ore min: Chalcopyrite, pyrite, pyrrhotite, molybdenite. An insignificant amount of brannerite has been reported. Ref: 157. Details other than those dealing with uranium are described more fully in Washington Div. Mines and Geology Bull. 37, Pt. II.

Snoqualmie


Western States Copper

(see Rainy)

KITTITAS COUNTY

Big Dome (1)

Loc: Sec. 17, (23-15E) and sec. 13, (23-14E), on Fortune Cr. Ore: Copper, tungsten, reportedly uranium. Deposit: Irregular zones of chalcopyrite and pyrite disseminated in granodiorite. Only trace amounts of radioactivity. Ref: 158. Details other than those dealing with uranium are described more fully in Washington Div. Mines and Geology Bull. 37, Pt. II.

LEWIS COUNTY

Eagle Peak (1)

Loc: Near NW. cor. sec. 27, (15-E8), on W. slope of Eagle Peak, Mt. Rainier area. Ore: Copper, gold, silver. Slight radioactivity reported near portal of upper drift. Ref: 157. Details other than those dealing with uranium are described more fully in Washington Div. Mines and Geology Bull. 37, Pt. II.

LINCOLN COUNTY

Egypt

(see Pitney Butte)

Germania Consolidated

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Pitney Butte (Egypt, Spokane Molybdenum) (1)
Loc: NE¼4SE¼ sec. 32, (38-37E), on NE. side of Pitney Butte. Ore: Molybdenite, gold, silver. Deposit: Molybdenite is scattered through a 3- to 4-ft. quartz vein in granite. A fracture contains a black radioactive lens 4 in. or more thick. Ref: 82-A. 133-B, p. 32. Details other than those dealing with uranium are described more fully in Washington Div. Mines and Geology Bull. 37, Pt. II.

Spokane Molybdenum (see Pitney Butte)

OKANOGAN COUNTY

Aeneas (3)

American Strategic Minerals (5)

Bi-Metallic (2)
Loc: NW¼ sec. 26, (39-29E), near Havillah. Ore: Molybdenum, copper, silver, gold, tungsten. Deposit: Molybdenite in zone 1 to 5 ft. wide and 50 ft. long in fractures and intersecting faults in Moly adit. Also ore in 2 other fault zones in Moly adit. Slight radioactivity (up to 4 times background count) in ore zones. Ref: 158. Details other than those dealing with uranium are described more fully in Washington Div. Mines and Geology Bull. 37, Pt. II.

Happy Hill (4)

Lost Lake (1)

Sanpoil (6)

PEND OREILLE COUNTY

Bella May (Metalline Mining and Leasing Co.) (3)
Loc: NE¼4NE¼ sec. 32, (39-43E), Metalline dist. Ore: Zinc, lead. Deposit: Replacement bodies containing sphalerite and galena in Metalline limestone. Unrelated uranium mineralization, of no apparent value, occurs as thin white to yellow coatings along fault surfaces. Ref: 156. Details other than those dealing with uranium are described more fully in Washington Div. Mines and Geology Bull. 37, Pt. II.

Dry Canyon (6)
Loc: In Dry Canyon, which is 2 to 3 mi. E. of Pend Oreille R. Deposit: A 4-ft. dike contains allanite as platy crystals as much as ½ in. long. Ref: 128, p. 58.

Golden Anchor (7A)

Grandview mine (2)
Loc: Secs. 14, 15, 22, and 30, (39-43E), Metalline dist. Ore: Zinc, lead. Deposit: Irregular replacements and disseminations of zinc-lead ore in dolomite. The uranium mineralization is noncommercial and appears to be unrelated to the zinc-lead ore. It occurs in black carbonaceous seams about 1 in. thick, in thin fault gouge zones, and as yellow secondary minerals depositing from descending ground waters. Ref: 156. Details other than those dealing with uranium are described more fully in Washington Div. Mines and Geology Bull. 37, Pt. II.

Highnoon Uranium (8)
(see also Rocky Ridge and West)

Josephine (Pend Oreille Mines & Metals Co.) (1)
Loc: S½ sec. 16, (39-43E), on W. side of Pend Oreille R., Metalline dist. Deposit: Similar to that at Grandview mine. Ref: 156. Details other than those dealing with uranium are described more fully in Washington Div. Mines and Geology Bull. 37, Pt. II.

Kimball Mines (9)

Metalline Mining and Leasing Co. (4)
(see Bella May)

Pend Oreille Mines & Metals Co. (see Josephine)

Ponsness (10)

Rocky Ridge (6A)

Ruby (7)
Sacheen Lake (5)
Loc: Probably sec. 30 (or possibly sec. 29 or 32), (31-44E), on top of hill just E. of Sacheen Lk. Owner: Forrest Corwin, E. 1624 Liberty Ave., Spokane, Wash. (1939). Ore: Uranium (?). Deposit: A sample of pegmatitic granite composed of quartz, orthoclase, and a very little magnetite showed slight radioactivity in one very restricted area of the specimen. Ref: 158.

South Skookum Lake

Stagger Inn (11)

Starlight Uranium (6A)

West (5A)

PIERCE COUNTY

Rushing River (1)

SKAMANIA COUNTY

Rainbow (1)
Loc: Center S½S½ sec. 32, (3-5E), on ridge separating W. Wk. of Washougal R. from Wild Boy Cr. Deposit: Although uranium has been reported here associated with vanadium, lead, copper, gold, and silver, the report probably is in error. Ref: 104, vol. 14, no. 4, p. 40. Details other than those dealing with uranium are described more fully in Washington Div. Mines and Geology Bull. 37, Pt. II.

SNOHOMISH COUNTY

Broken Ridge (5A)
Loc: S½ sec. 18, (28-11E), Silver Creek dist. Ore: Copper, silver, gold, zinc. Deposit: Silicified and mineralized shear zones in metamorphic rocks. Moderate radioactivity in one place on Dewey claim. Ref: 158. Details other than those dealing with uranium are described more fully in Washington Div. Mines and Geology Bull. 37, Pt. II.

Keller (5)

Kromona (4)
Loc: Near center sec. 13, (28-9E), in Sultan Basin. Ore: Copper, gold, silver, tungsten. Deposit: Sulfides in shear zone across the contact of quartz diorite and older metamorphic rocks. Ore in places is slightly radioactive. Ref: 158. Details other than those dealing with uranium are described more fully in Washington Div. Mines and Geology Bull. 37, Pt. II.

Mackinaw (1)
Loc: SE¼SW¼ sec. 19, (29-11E), on W. Fk. Weden Cr. Ore: Copper, nickel, cobalt, gold, silver. Deposit: Sulfides and secondary minerals in shear zone at contact of serpentinite and sedimentary rocks. Small areas of slight radioactivity in the shear zone. Ref: 158. Details other than those dealing with uranium are described more fully in Washington Div. Mines and Geology Bull. 37, Pt. II.

Molly (2)

Sultan (3)

SPOKANE COUNTY

Affiliated Mines (20)

Anacoda Uranium (21)

Carbon (16)

Columbia Enterprises (7)

Curtin (13)

Dahl (Daybreak) (1)
Uranium in Washington

Ore: Uranium. Deposit: Meta-autunite occurs as veinlets and fillings of closely spaced joints in decomposed granite. 5 ore bodies in an area 250 ft. by 900 ft., being worked by open pit. Dev: 7 diamond drill holes (July 1955) show ore to depth of at least 100 ft. 46,300 tons proven ore reserves reported. Assays: Channel samples across 35-ft. width showed 0.35% to 0.80% UO₂. First 10 carloads shipped av. 0.55% UO₂. Prod: Production began Aug. 1955. Total of 5,196 tons through Sept. 1956 av. 0.3346% UO₂. Also 7 carloads from nearby Huffman lease in Sept. 1956. Ref: 158.

Dahl Uranium Mine, Inc. (5)
(see also under Stevens County)

Dawn Uranium & Oil (8)
(see also Curtin, Smith)

Daybreak
(see Dahl and see Bair, Lowley under Stevens County)
Elk Uranium (2)

Fish Lake (14)
Loc: E½SE¼ sec. 32 and W½SW¼ sec. 33, (24-42E), just N. of Fish Lk. Access: Paved highway crosses deposit, and railroad is within a few hundred ft. Prop: Deeded land. Ore: Uranium. Ore min: Secondary minerals. Deposit: Small irregular masses and veinlets of pegmatite near contact of granite with older metamorphic rocks. Although slight radioactivity may be detected in many places over an area of several thousand sq. ft., no concentrations of ore grade are known. Ref: 158.

Graham (15)

Huffman
(see Dahl)
Kit Carson Uranium (3)

Miner (6)

Morning Sun Uranium (4)

North Star Uranium

Painted Desert (12)
(see also under Stevens County)

Schaefer (13)

Section 32 (9)

Section 21 (10)

Smith (17)
Loc: E½SW¼ sec. 13, (28-44E), Mt. Spokane area. Owner: Emma L. and Clarence I. Smith leasing to Target Uranium Co.,
which has made a 50-50 profit-sharing agreement with Dawn Uranium & Oil Co., Spokane, Wash. (1955—-). Ore: Uranium.  
**Deposit:** Commercial ore found in 6 out of 10 wagon-drill holes. 6,690 tons of ore reported to a depth of 60 ft.  
**Prod:** At least 1 truckload in 1956.  
**Ref:** 158.

**Stapleton (12A)**  
**Loc:** E 3/4 sec. 1, (29-44E), Mt. Spokane area.  
**Elev:** 2,800 to 3,100 ft.  
**Prop:** 320 acres of leased land.  
**Owner:** National Uranium Corp., Wallace, Idaho, has 10-yr. lease (1955—-).  
**Ore:** Uranium.  
**Deposit:** Autunite in shear zone in pegmatitic granite.  
**Dev:** Adit, 6 open cuts.  
**Ref:** 158.

**Thompson (19)**  
**Loc:** Sec. 18, (28-45E), on W. slope of Mt. Kit Carson.  
**Prop:** 200-acre lease.  
**Owner:** Leased by Tungsten Uranium Mines, Inc., Spokane, Wash. (1955—-). Have profit-sharing agreement with Rayrock Uranium Co.  
**Ore:** Uranium (?).  
**Deposit:** Radioactive spring.  
**Ref:** 158.

**Tungsten Uranium Mines (11)**  
(see also Germany under Stevens County)  
**Loc:** Sec. 18, (28-45E), 1 mi. W. of Mt. Spokane State Park and 4 mi. S. of Dahl property.  
**Prop:** Mineral leases on 323 acres of deeded land.  
**Owner:** Leased by Tungsten Uranium Mines, Inc., Spokane, Wash., from Arthur Selleck (1955—-).  
**Ore:** Uranium.  
**Deposit:** Autunite reported in granite.  
**Dev:** Bulldozer trenches.  
**Ref:** 158.

**Stevens County**

**A A (1)**  
**Loc:** Sec. 26, (40-36E), Orient dist.  
**Prop:** 1 unpatented claim: A A No. 2.  
**Owner:** Berger Benson, Spokane, Wash. (1955).  
**Ore:** Uranium.  
**Deposit:** Autunite in pegmatitic gneiss.  
**Ref:** 158.

**Arden (4)**  
**Loc:** SE 1/4 SW 1/4 NW 1/4 sec. 14, (34-39E), about 1 mi. SE of Arden.  
**Elev:** 1,875 ft.  
**Owner:** L. E. Haye, Lakeview, Wash. (1955—-).  
**Ore:** Uranium.  
**Deposit:** Autunite sparsely distributed along a NE-trending fractured zone for a length of 5 ft. in Loom Lake granite. Zone of fracturing and clay-mineral alteration is about 2 ft. wide. Considerable fluorescent hylaitle in the vicinity.  
**Ref:** 158.

**Bair (14)**  
**Loc:** E 3/4 sec. 14, (27-37E), near Spokane R., on Spokane Indian Reservation.  
**Owner:** Daybreak Uranium, Inc., Spokane, Wash., has assignment of prospecting lease held by Mr. Bair from Spokane Indian Tribe (1955—-).  
**Ore:** Uranium.  
**Deposit:** Autunite, uraninite.  
**Assays:** Sample from veinlets across a 30-ft. bulldozer cut showed 0.48% UO₂ by chemical analysis.  
**Ref:** 158.

**Big Smoke Uranium (18)**  
**Loc:** Sec. 11, (27-37E), near Spokane R.  
**Prop:** The company holds prospecting permits on more than 10,000 acres of Spokane Indian Reservation land.  
**Owner:** Big Smoke Uranium, Inc., Spokane, Wash. (1955—-).  
**Ore:** Uranium.  
**Deposit:** Urmante, gummite.  
**Assays:** 2 vein in 30-ft. fault zone in arkose near contact with granite. Urnante and gummite in coal in seam 8 ft. wide at depth of 14 ft. A second vein is 12 in. wide and is 30 ft. N. of the first.  
**Dev:** Bulldozer pit 12 ft. deep.  
**Assays:** Chemical assay of soil from 3-ft. depth showed 0.28% UO₂. A 2-ft. vein showed 0.50% UO₂ equivalent, but chemical assay showed 1.30% UO₂.  
**Prod:** One carload shipped in 1956.  
**Ref:** 158.

**Boyd (11)**  
**Loc:** Adjoining Midnite mine on E.  
**Prop:** 458 acres of Spokane Indian Reservation land allotted to Ed Boyd and other members of the Boyd family.  
**Owner:** Leased by Dawn Mining Co., Portland, Oreg. (1956).  
**Ore:** Uranium.  
**Deposit:** Similar to adjacent Midnite deposit.  
**Assays:** 50 ft. of ore in drill hole av. 0.30% UO₂.  
**Ref:** 158.

**Calispell Peak**  
(see Cannon)  
**Cannon (Calispell Peak, Railway Dike) (5)**  
**Loc:** Near W. 1/4 cor. sec. 33, (34-42E), on headwaters of Chewelah Cr.  
**Elev:** 3,750 to 4,340 ft.  
**Access:** About 1/2 mi. by trail from the end of the road up Chewelah Cr.  
**Prop:** 1 claim.  
**Ore:** Uranium, columbium, tantalum, beryllium.  
**Deposit:** Autunite, uraninite, autunite, torbernite, beryl, a few specimens of bismuthite.  
**Dev:** Quartz, feldspar, muscovite.  
**Assays:** Quartzite in roof pendant of schist near intrusive granite. Pegmatite zone is 50 ft. wide and has a length of 1,050 ft. Only a few crystals of uraninite and columbite found.  
**Ref:** 2 open cuts, 8 trenches, 353-ft. adit.  
**Assays:** Uranium and columbite content below commercial grade.  
**Prod:** 6 tons of beryl in 1952.  
**Ref:** 158.

**Crawford**  
(see Indian Chief Uranium)  
**Dahl Uranium Mine, Inc. (12)**  
(see also under Spokane County)  
**Loc:** Sec. 13, (28-37E), near Midnite mine.  
**Owner:** Dahl Uranium Mine, Inc., Spokane, Wash. (1955—-).  
**Ore:** Uranium.  
**Deposit:** Autunite near contact of granite with argillite.  
**Dev:** Several drill holes as much as 75 ft. deep showed weak radioactivity. One hole showed ore from the 128-ft. to 140-ft. depth.  
**Assays:** 0.20% to 0.70% UO₂ equivalent from 128-ft. to 134-ft. depth in one hole.  
**Ref:** 158.

**Germania (6)**  
**Loc:** Near center SW 1/4 sec. 13, (29-37E), Deer Trail dist.  
**Ore:** Tungsten.  
**Deposit:** Wolflam in quartz veins 2 in. to 3 ft. wide in granite. Area of high radioactivity reported on property.  
**Ref:** 158.  
**Dev:** Details other than those dealing with uranium are described more fully in Washington Div. Mines and Geology Bull. 37, Pt. II.

**Germania Consolidated (8A)**  
**Loc:** Secs. 23, 24, and 26, (29-37E), Deer Trail dist.  
**Ore:** Tungsten.  
**Deposit:** Wolframite in 3 narrow quartz veins in granite. Radioactivity reported on 128 acres of deeded land on N. border of company holdings.  
**Ref:** 158.  
**Dev:** Details other than those dealing with uranium are described more fully in Washington Div. Mines and Geology Bull. 37, Pt. II.

**Indian Chief Uranium (Crawford) (7)**  
**Loc:** Sec. 10, (29-37E) and N 1/2 sec. 8, (29-38E), about 7 mi. N. of Midnite mine.  
**Access:** Roads.  
**Prop:** 22 unpatented claims.  
**Owner:** Indian Chief Uranium Co. leasing to Sidney Mining Co. and Mascot Mines Co., Kellogg, Idaho (1955—-).  
**Ore:** Uranium.  
**Deposit:** Autunite reported in sec. 10, (29-37E) in a "tight" vein at a granite-quartzite contact. Exposed along the full length of a 30-ft. bulldozer trench that does not reach either end of the vein.  
**Dev:** 1,800 ft. of bulldozer trenching (May 1955).  
**Ref:** 158.

**Lowley (17)**  
**Loc:** S 1/2 sec. 13, (27-37E), 7 mi. S. of Midnite mine.  
**Prop:** 200 acres.  
**Owner:** Daybreak Uranium, Inc., Spokane, Wash., has assignment of prospecting lease held by William Lowley, Wellpinit, Wash. (1955—-).  
**Ore:** Uranium.  
**Deposit:** Urathanite, uranoplane, autunite, and torbernite.  
**Dev:** Faulted contact between granite and metasediments has uranium mineralization in small fracture seams throughout an area 100 ft. by 300 ft.
Assays: 50 lb. of samples across 70-ft. width reported to run 1.95% U₃O₈. Prod: 5 carloads reported in 1956. Ref: 158.

**Lucky Charm Uranium (10)**


**Midnite (9)**

Loc: Secs. 1 and 12, (28-37E), on flanks of Lookout Mtn., 10 mi. NW. of Wellpinit. Elev: 2,900 to 4,100 ft. Access: 33 mi. by road to railroad at Sprandale or Reardan. Prop: 570-acre lease from Spokane Indian Agency. Owner: Midnite Mines, Inc., Clair Wynecoop, Fres., Wellpinit, Wash. (1955—). Ore: Uranium. Ore min: Autunite, uranophane, gunnite, torbernite, uraninite, liebigite, phosphuranylite. Deposit: Radioactivity traced more than 1 mi. N and S. Uranium mineralization is in shear zones and at and near intrusive contact of Loon Lake granite and Deer Trail argillite in a contact zone which is 100 to 200 ft. wide. Ore bodies, ranging up to several hundred ft. in length and 30 or more ft. in width, are richest at the center and grade outward to assay walls. Autunite and uranophane are the principal ore minerals, but uraninite was found with pyrite at a depth of 150 ft. in one core hole. Mineralization is strongest along joints in argillite but extends down into granite also. Est. 700,000 tons ore reserves reported in 1956. Dev: 13 diamond drill holes drilled by A.E.C. and 28,476 ft. of diamond drill holes drilled by Dawn Mining Co. Numerous bulldozer trenches, 540 ft. of adit workings (1955). Assays: One representative sample ran 0.48% U₃O₈ and others ran as high as 0.86% U₃O₈. Av. of 709 tons shipped was 0.285% U₃O₈. Prod: 100 tons of ore in 1954, 690 tons through Feb. 1955. 94 carloads of ore prior to end of Jan. 1956. Ref: 152–A. 158.

**Northwest Uranium (15)**

Loc: On Spokane Indian Reservation, southern Stevens County, 3 mi. S. of Midnite mine. Owner: Northwest Uranium Mines, Inc., Wallace, Idaho (1965—). Ore: Uranium. Ore min: Autunite. Deposit: Secondary uranium minerals in faults and lignite beds in flat-lying Tertiary claystone, sandstone, and conglomerate beds overlying granite. Dev: Trenches in an area 1,000 ft. by 600 ft. Assays: Sample across 20-ft. stratigraphic thickness of beds shows 0.13% U₃O₈. Selected samples from lignite show as high as 1.15% U₃O₈ and av. 0.634%. A fault-breccia zone 3 ft. wide assays 0.237% U₃O₈. Chemical analysis of three 50-lb. samples showed: (1) bentonitic clay and carbonaceous material—0.427% U₃O₈, (2) arkose—7.16% U₃O₈, (3) conglomerate—0.128% U₃O₈. Radiometric analysis of these same samples showed only about half the above indicated values. Ref: 158.

**O'Toole Mountain (3)**


**Painted Desert (2A)**

(see also under Spokane County)


**Railway Dike (see Cannon)**

**Section 13 (16)**


**Snowshoe (6)**


**Square Deal (13)**


**U & W Uranium (2)**


**YAKIMA COUNTY**

**Bumping Lake (1)**

Loc: In the valley of Deep Cr., near the mouth of Copper Cr., on the road to Copper City, 5 mi. S. of Bumping Lk. dam. Access: 5 mi. by gravel road and 11 mi. by paved road from Chinook Pass highway. 53 mi. by road from railroad at Naches. Prop: 6 unpatented claims, including El Khobar No. 1. Owner: Tom Hendrix, Yakima, Wash. (1954—). Ore: Uranium. Deposit: Strong radioactivity in soil and gravel around a mineral spring which emerges from granite near contact with andesite. Also some autunite along joints in granite. Dev: Open pits. Assays: 0.88% U₃O₈ by wet analysis and 0.36% U₃O₈ by radiometric test on surficial soil. Note: Within a few days of the announcement of this original discovery more than 90 claims were staked by various people in an area about 21⁄2 mi. square in this vicinity. Ref: 158.

**Chinook Pass (2)**

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