The geology of, and known mineral occurrences within, Wilderness Study Areas 4-22/23/24 A and B
Turtle Mountain - Gila Box

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contents:
brief summary of geological features and known mineral occurrences
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map of known mineral occurrences (within, and bordering, WSA 4-22/23/24 A and B)
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references cited

This report is preliminary and has not been edited or reviewed for conformity with Arizona Bureau of Geology and Mineral Technology standards.
1) The Turtle Mountain - Gila Box region is underlain by late Tertiary-Quaternary age sedimentary deposits and volcaniclastic flows. The majority of these flows and related pyroclastic rocks consist of massive andesites and basaltic andesites;

2) There are no known base or precious metal occurrences within the Turtle Mountain - Gila Box WSA's. Two geothermal areas border, or lie just within, the eastern boundary of the appealed area adjacent to the WSA's. The Gillard Hot Springs claims, located along the Gila River, have not reported any mineral production. The Gila Hot Springs claim group to the east reported manganese and barite occurrences. These claims have been abandoned several times since their location in the mid-1900's, and no production has been recorded;

3) A third geothermal area lies near the northeastern border of WSA 4-22/23/24 A. Extent of development and production are unknown;

4) Two large porphyry copper deposits are located to the northeast and southwest of the WSA's, near Morenci and Safford. East of Eagle Creek, ore deposits occur as replacements of sedimentary rocks, as disseminations in monzonite porphyry, and as fault fissure veins associated with a complex system of NE-trending shear zones. Copper and gold prospects were first located in 1870 and were actively mined until the mid-1930's, coincident with the beginning of Morenci open-pit operations.

   To the southwest of the WSA's, in the vicinity of Safford, porphyry copper and associated vein deposits are contained in small granodiorite plutons. Between Safford and Turtle Mountain, disseminated copper occurs within fissure
systems cutting andesite and basaltic andesite flows. Information regarding mining activity and production is largely unavailable for the smaller mines that operated between 1900 and the late 1940's. With the exception of the Kennecott-Safford operations, the majority of these claims and prospects are inactive;

5) Large, irregular deposits of silver occur within Paleozoic sediments in the Clifton-Morenci area. Silver, associated with gold and copper minerals, was mined until the mid-1900's, when the larger deposits were exhausted;

6) Gold lode deposits are located to the east and west of the WSA's, in well-defined fissure vein systems cutting limestone and volcanic rocks. Gold mining produced small amounts of ore between the late 1800's and mid-1900's, when the known deposits were depleted;

7) Gold placer deposits occur in sediments capping terraces of Gila Conglomerate that border the San Francisco and Gila rivers. Free-milling operations exhausted the known concentrations of placer gold by 1905;

8) Manganese oxides are associated with barite and placer gold deposits found in shear zones dissecting Gila Conglomerate and quartz monzonite porphyry in the Morenci area. There are no records of production from the two known manganese deposits within this region;

9) Volcaniclastic sedimentary basin-fill deposits south of the WSA have been surface mined since the mid-1900's for their pumice, cinder, gravel, and perlite content. Production data are unavailable.

For additional discussions of the mineral potential of the Turtle Mountain - Gila Box region, as well as the adjacent Copper Mountain - Morenci and Lone Star - Safford mining districts, see Lindgren (1905), and Robinson and Cook (1966).
MINERAL OCCURRENCES IN THE TURTLE MOUNTAIN-
GILA BOX AREA (4-22/23/24 - A,B)

EXPLANATION

Known mineral occurrences are located by map
number, followed by type of mineral deposit.
See accompanying table of mineral occurrences.

$x^c$ copper; associated silver, zinc, gold lode,
gold placer, lead, and manganese.

$x^a$ silver; associated gold and copper.

$x^u$ gold lode.

$x^a^u$ gold placer.

$x^m$ manganese; pyrolusite and wad.

$x^g$ geothermal areas.

$x^{vol}$ volcanic cinder, pumice, pumicite.

$x^g$ gravel and sand.

$x^?_i$ unknown mineral types.
EXPLANATION

Qa Younger alluvium; unconsolidated, silt, sand, and gravel on active flood plains and in arenal channels.
Qab Broad, low-gradient alluvial fans that are largely inactive and generally dissected by erosional valleys.
Qas Weakly-to-well-indurated conglomerate, tuff breccia, and breccia capping low terraces and ridges.
Qil Older alluvium and colluvium; coarse pediment gravel, sand, and silt of older valley fill.
Qif Gila Conglomerate; small benches and nearly perpendicular bluffs of terrace gravels and boulders, interbedded with layers of semi-indurated sand and sheets of basalts.

- Remnant cinder cones, pyroclastic cone debris and flows.
- Andesite Cinder cones; locally unconsolidated, glassy, and scoriaceous lapilli and and coarse-grained ash with some interbedded thin flows.
- Andesite and basaltic flows of Turtle Mountain-Guthrie Peak, locally includes beds of volcanic Boulder Conglomerate.
- Rhyolite welded ash-flow tuff and coarse-grained porphyritic andesite flows.
- Pyroclastic, air-fall and volcaniclastic sedimentary deposits, includes pebbly lithic-pumice, sandstone, and locally massive and poorly sorted volcanic Boulder Conglomerate beds.
- Intrusive rocks, including granitic plutons and aphanitic to porphyritic plugs and dikes.
- Morenci granite-quartz monzonite-diorite porphyry complex.
- Flows, tufts, breccias, and volcanic conglomerates of andesitic to rhyolitic composition.
- Fine-grained, fossiliferous limestone and shale; Modoc, Morenci, and Longellow formations.
- Coronado Quartzite; quartzite sandstone with basal conglomerate unit.
- Medium- to coarse-grained granitic rocks, commonly porphyritic.  

Sources of information include:

Lindgren, W., Proc. US.
Richer, D.A., and V.A. Lawrence, 1981
Wilson, E.D., and R.T. Moore, 1982
Wynn, M.C., 1981
WILDERNESS UPDATE

A recent development in the Safford District's Wilderness Study has prompted the inclusion of this announcement with the attached letter.

An area contiguous to the Gila Box Wilderness Study Area (WSA), AZ-4-22/23/24(A), will be included in the district wilderness study to determine lands suitable for wilderness status. This area, approximately 6,152 acres, was dropped from further wilderness consideration on November 14, 1980. That decision, however, was appealed. The appeal is now in the hands of the Interior Board of Land Appeals. The final decision of this area will depend on the Board's ruling, expected in the near future.

Since there exists a possibility the decision to drop this area could be changed, this area will be included in our ongoing wilderness study. More efficient use of money, time, and manpower can be obtained by studying this area along with the WSA. If our previous decision is changed, we would not have to add this area to our study at a much later date. If the decision is not changed, this area would simply be dropped from the study.

The map below will show you the location of this area with respect to the Gila Box WSA. If you have any questions on this matter, please contact the Safford District Office at 425 E. 4th St., Safford, Arizona 85546 or call (602) 428-4040.
KNOWN MINERAL OCCURRENCES

TURTLE MOUNTAIN - GILA BOX - APPEALED AREA (4-22/23/24 A,B)

Copper, Manganese, Gold, Silver, Gravel, Cinder, and Geothermal Deposits

The Turtle Mountain - Gila Box region, located in the northern Peloncillo Mountains, is chiefly composed of volcanic and volcaniclastic rocks (late Tertiary - Quaternary; about 30-2 m.y.). The majority of these flows and associated pyroclastics consist of massive andesites and basaltic andesites, referred to as the Turtle Mountain - Guthrie Peak andesite flow (Oligocene-Miocene) and the older Gila River flow (Oligocene). Intercalated with these andesitic units are rhyolitic pyroclastic ash-flows and air-falls, rhyolitic dikes, and dacite flows. Basins flanking the Peloncillo Mountains contain coarse volcaniclastic sedimentary rocks and modern basin-fill deposits associated with the Gila and San Francisco river drainages.

Two large porphyry copper areas lie within 10 km. to the southwest and northeast of the northern Peloncillo Range. In the Gila Mountains to the west, porphyry copper and related copper vein deposits are associated with small granodiorite plutons (late Cretaceous-early Tertiary; 67-52 m.y.) emplaced along ENE-trending shear zones in Tertiary (70 m.y.) andesite flows and breccias. In the Clifton-Morenci area to the east, granodiorite-quartz monzonite-diorite intrusives (56-55 m.y.) and associated copper porphyry deposits underlie Precambrian granite and Paleozoic-Mesozoic sedimentary and igneous rocks (map numbers 2, 4, 5, 9).

Disseminated and Vein deposits of copper also occur within fissure veins in the Turtle Mountain - Guthrie Peak andesite and basaltic andesite complex (map numbers 12-16). Copper deposits are associated with silver, zinc, gold lode, lead-manganese ore, and placer gold.

Large irregular pockets of silver are found as fissure vein replacement deposits in the Clifton - Morenci area (ie: map number 7). Silver, in association with gold and copper minerals, is found in shear zones cutting massive cherty limestone (Ordovician-Carboniferous) and Cambrian quartzites.

Irregular deposits of gold are contained in limonite along well-defined fissure veins in limestone in the Clifton - Morenci area (map numbers 6, 8) and in veins cutting Tertiary andesite volcanics in the Safford - Lone Star area (map number 15).

Placer gold (map numbers 2, 7, 9, 10, 17, 18, 21, 23) has been recovered from Quaternary river gravels resting in Gila Conglomerate in curves of the Gila and San Francisco rivers. Placer gold is derived from small gold-bearing veins in the Clifton - Morenci area, and was actively mined from the early 1880's until the early 1900's when mining claim areas became exhausted. Fine flakes of gold are associated with ferruginous chert pebbles and black sand.

Map numbers 11 and 20 contain manganese deposits and associated barite and placer gold. Manganese minerals, chiefly pyrolusite and wad, are confined to irregular pockets in shear zones within Gila Conglomerate (map number 20) and granite porphyry (map number 11).
The Gila River contains alluvial and volcaniclastic sedimentary basin-fill deposits of economic value. Beds of pumicite, cinders, gravel, and perlite have been actively mined since the mid-1900's (map numbers 22, 25, 27, 30). Geothermal areas (map numbers 3, 19) occur on contacts between basin-fill deposits and volcaniclastic units (Oligocene-Miocene).

Earliest mining activity in the area occurred in the Copper Mountain District (Clifton - Morenci) during the 1870's. Total production within this district from 1873 to 1979 was 680,460,916 short tons (including 11,360,088,031 lbs. copper). Total production within the Lone Star District (Safford) from 1903 to 1966 was 5491 short tons (including 246475 lbs. copper).

MAP NO. 4- 22/23/24 - 1

**Mine** Toppey's Cave

**Location**
- T.04S
- R.27E

**Geology**
Prospect located in andesite and basaltic andesite of the Turtle Mountain - Guthrie Peak region (Miocene-Oligocene). Andesite flow characterized by fine-grained, sparsely porphyritic texture; locally includes beds of volcanic boulder conglomerate.

**Mineral Products** Unknown.

**Development and Production** Underground exploration prospect; extent of development unknown.

**References**
- USBM Files, Toppey's Cave
- USGS Bryce Mountain Quad (1:62500)
- Richter and Lawrence, 1981

MAP NO. 4- 22/23/24 - 2

**Mine** Gold Belt Mines
- (Eagle Gold and Copper Claims, Dover Copper Group)

**Location**
- T.04S
- R.28E

**Geology**
Secondary copper deposits in irregular pockets in well-defined fissure vein striking N45W and paralleling granite porphyry dike (Tertiary) in basaltic lava flow (Tertiary). Surface oxidation forms gossans over central ore body; copper lies in streaks with manganese ore. Maximum width of orebody, 10 ft.

**Mineral Products**
- copper: chrysocolla, malachite, chalcocite
- silver
- gold placer
- lead: sphalerite, galena, cerussite
- manganese: pyrolusite
Development and Production 20 patented claims located in 1904; operated (as of 1957) by Dover Copper Mining Co. Development included 8 shafts, several tunnels, 5-stamp gold mill. All 700 ft. of known orebody was connected by drift workings. Gold placer gravels have been mined in Copperplate Gulch since the early 1880's. Mined 3814 short tons of ore between 1907 and 1947 (includes 820 tons of copper ore).

References
ABGMT CRIB Data, 1981
USGS Clifton Quad (1:62500)
BLM Mining District Sheet 840
Mines Handbook, 1918, p. 473

MAP NO. 4-22/23/24 -3

Mine
Eagle Creek Spring

Location
T.04S Sec. 35
R.28E N½

Lat. 33-02-48N
Long. 109-28-46W
Elev. 4000 ft.

Geology
Hot springs located on contact between andesite and basaltic andesite of Turtle Mountain - Guthrie Peak region (Oligocene-Miocene) and Gila Conglomerate and associated younger basin-fill deposits (Miocene - Pleistocene). Andesite unit locally contains beds of volcanic boulder conglomerate and lenses of pyroclastic scoria; rocks are fine-grained and locally porphyritic. Gila conglomerate contains tuffaceous, gravel to boulder volcanic conglomerate in lower part, and semi-indurated volcanic conglomerate with gravel, sand, silt, and clay deposits of alluvial and lacustrine origin in upper part. Hot-water convection system.

Mineral Products geothermal

Development and Production Surface workings in vicinity of hot springs. 2 springs with surface temperatures averaging 36°C and subsurface temperatures of 115°C. Covers subsurface area of 1.5 sq. km.

References
USBM Files, Eagle Creek Spring
USGS Clifton Quad (1:62500)
Richter and Lawrence, 1981
Remner, et.al, 1975, 1981
Lindgren, 1905, pl. 1

MAP NO. 4-22/23/24 -4

Mine
Coronado Mine
(Horseshoe Shaft, Arizona Copper Co. Group)
Location

T.04S Sec. 6
R.29E E1/4
Lat. 33-06-42N
Long. 109-23-52N
Elev. 5750 ft.

Geology

Secondary copper minerals, chiefly chrysocolla and malachite, form replacement seams along major E-W trending fissure fault between coarse-grained granite on north and quartzite and quartzitic conglomerate on south (late Precambrian-Cambrian). Associated with dark-green diabase dike (Cretaceous-Tertiary). Process of concentration by surface oxidation to 400 ft. depth and secondary enrichment. Reported occurrence of zinc and manganese in fault fissure system.

Mineral Products

Copper: chalococite, chrysocolla, malachite, azurite, libethenite, pyrite, manganese; coronadite, zinc

Development and Production

Developments included 3200-ft-long Coronado Incline and 1-mile long tramway connecting mine and Chase Creek; 9400 ft. long adit; 3 shafts with maximum depth of 1100 ft; one open cut located one mile to west of main shafts and in Horseshoe Gulch; and several winzes and stopes. 3 patented claims located in 1874 and presently owned by Phelps Dodge Corp. Several thousand tons of ore mined prior to 1921 (Arizona Copper Co. Ltd., Coronado Mining Co).

References

ABGMT CRIS Data, 1981
Lindgren, 1905, p.338-344
USBM Files, Coronado Mine
BLM Mining District Sheet 840
USGS Clifton Quad (1:62500)

Dover Copper Group (mines: Keating, Dover, Tucky, Margot, Gold Belt; Bell Group; St. Joe Group; Anita Group; Margot and Tucky Group; Keating Group; Gold Belt Group)

Location

T.04S, R.29E, Sec. 7, NW of NW
Lat. 36-06-20N
T.04S, R.29E, Sec. 6 SW
Long. 109-24-55W
Elev. 5280 ft.

Geology

Irregular copper deposits in NE-trending small fault fissure between granite (Tertiary) on the south and quartz monzonite porphyry (Tertiary; 55.2 ± 1.7 m.y.) on the north. Porphyry cut by NE-trending diabase and granite porphyry dikes. Extensive surface leaching, oxidation, and formation of gossans. Workings also located on late Tertiary replacement veins in Longfellow Limestone (Ordovician) in vicinity. Maximum width of ore bodies, 18 ft.

Mineral Products

Copper - malachite, chrysocolla, pyrite, covellite, chalcocite, azurite, chalcopyrite
silver
gold
lead - manganese ore

**Development and Production** 136 patented claims owned by Dover Copper Mining Co. (as of 1957). Developments included 5 underground mine workings; most productive mine was the Keating Mine, worked by 2 250-ft. shafts, several tunnels, and 3 winzes of 10 to 119 ft. Mined 21,681 short tons of ore between 1913 and 1945.

**References**

ABGMT CRIB Data, 1981
USGS Clifton Quad (1:62500)
Bennett, 1975 (age dates)
ABGMT - USBM File Data
ADMR Dover Copper Group File
Copper Handbook, 1911, p. 616
Lindgren, 1905, p. 344-45
USBM Files, Dover

**MAP NO. 4-22/23/24 - 6**

**Mine**

Buzzard's Shadow Mine

**Location**

T.04S  Sec. 19  Lat 33-04-18N  
R.29E  NW  Long. 109-24-24W

Elev. 4800 ft.

**Geology**

Irregular and tabular deposits of gold in E-NE trending fissure veins, cutting massive cherty Longfellow Limestone (Ordovician) alternating with beds of Morenci Shale (Devonian). Well-defined fissure vein lies between crushed limestone stained by manganese in the hanging wall and Morenci Quartz-Monzonite Porphyry (Tertiary; 55.2± m.y.)

**Mineral Products**

gold lode, silver, copper, manganese

**Development and Production**

12 claims patented by Home Copper Co. in 1901. Developments included several shafts, tunnels, stopes, drifts, and free milling of gold ore on surface. Produced 2589 short tons of ore (224 oz. of gold included) between 1904 and 1915.

**References**

ABGMT CRIB Data, 1981
Lindgren 1905, p. 297
Copper Handbook, 1911, p. 1293-1294
Copper Handbook, 1912-1913, p. 444
Bennett, 1975 (age dates)
USGS Clifton Quad (1:62500)
ABGMT - USBM File Data
New York and Arizona Gold Mines
(Cansler Mine, Buzzard Shadow Group)

Location
T. 04S  Sec. 19  Lat. 33-04-20N
R. 29E  NW  Long. 109-24-34W
Elev. 4680 ft.

Geology
Irregular deposits of base and precious metals in NE-trending fissure veins cutting massive cherty limestones (Ordovician) and underlying quartzites. Alternating sandstone and shale-beds form irregular areas almost entirely surrounded by Morenci Granite Porphyry (Tertiary; 55-56 m.y.) Contact metamorphic replacements and secondary enrichment along margin of intrusives. Major vein deposit is silver; gold occurs free as well as combined in copper and iron sulfides; occurrences of lead and manganese minerals reported. Maximum width of vein deposit 48 inches.

Mineral Products
silver
copper
placer gold
lead
manganese

Development and Production
30 unpatented claims totalling 600 acres; claims located in 1901 by Home Copper Co. Property included four ore bodies, of which the Buzzard Shadow is the easternmost. Developments included 4 tunnels (lengths 1800, 600, 450, and 100 ft.), 5 shafts (maximum depth 260 ft.), small stopes and pits, and free-milling gold ore on surface. Length of workings 5000 ft. Mined 219 short tons of ore between 1921 and 1937.

References
ABGMT CRIB Data, 1981
USGS Clifton Quad (1:62500)
Bennett, 1975 (age dates)
Lindgren, 1905
Copper Handbook, 1911, 1293-94
Copper Handbook, 1912-1913, p. 444
ADMR New York and Arizona Group File
ABGMT Clippings, New York and Arizona Gold and Copper Co.
ABGMT - USBM File Data

Bell and Pinkard Group
(Bell Group, Dover Copper Group Claims)
Location  
T.04S  
R.29E  
Sec. 19  
Lat. 33-04-09N  
N\text{\textdegree}, N\text{\textdegree}/2 of SW  
Long. 109-23-55W  
Elev. 4400 ft.

Geology  
Irregular deposits of gold are contained in limonite along E-NE trending, well-defined veins in Longfellow Limestone (Ordovician). Minor secondary enrichment of copper associated with vein deposits; limestone greatly altered to epidote and magnetite with copper stains and pyrite. Principal intrusions occurred parallel to planes of sedimentation, which dip 10°-30° SW. Quartz monzonite porphyry dikes cut area (Tertiary; 51.3±.9 m.y.).

Mineral Products  
gold lode, silver, copper, lead, zinc

Development and Production  
Surface and underground workings; extent of development and production unknown. Owned by Dover Copper Mining Co. (as of 1957). Production data included with general data for Dover Copper Mining Co.

References  
ADMR Dover Copper Mine File  
BLM Mining District Sheet 840  
Lindgren, 1905, p.292-298  
USGS Clifton Quad (1:62500)  
ABGMT Clippings, Dover Copper Mining Co.  
ABGMT CRIB Data, 1981  
Bennett, 1975 (age dates)

MAP NO. 4-22/23/24-9

Mine  
Lakeman Group

Location  
T.04S  
R.29E  
Sec. 19  
Lat. 33-03-54N  
Cen, S\text{\textdegree}/2  
Long. 109-24-20W  
Elev. 4340 ft.

Geology  
Irregular deposits of copper minerals and gold lode in fissure vein striking N60E and cutting diorite porphyry associated with Morenci porphyry stock (55-56 m.y.). Placer gold and silver carried in sulfides; process of concentration through secondary enrichment. Placer gold in Gold Gulch derived from oxidized, gold-bearing veins associated with intrusive porphyry rather than with regional faulting. Auriferous and argentiferous pyrite finely disseminated in country-rock.

Mineral Products  
copper  
gold lode, gold placer  
silver  
lead: hematite, galena

Development and Production  
8 patented claims totalling about 138 acres, located in late 1800's. Developments included one main shaft 300 ft. deep, 2 short tunnels with lengths of 30 ft and 40 ft, about 470 ft of drifts, an additional shaft, one stope, various shallow cuts and pits, placer gold workings. Produced 1113
short tons of ore between 1904 and 1935 (including 3312 lbs. of copper, 3947 oz. of silver, 32 oz. of gold, 250 lbs. of lead).

References
ABGMT CRIB Data, 1981
USGS Clifton Quad (1:62500)
Bennett, 1975 (age dates)
ABGMT-USBM File Data
BLM Mining District Sheet 841
USBM Files, Lakeman Group
ADMR Lakeman Group File
ABGMT Clippings; Lakeman Group,
Messabi-Morenci Mining Co.
Lindgren, 1905, p. 292-96

MAP NO. 4-22/23/24 - 10

Mine
Gold Gulch Placers

Location
T.04S
Sec. 19,25,30
R.29E, R.28E
Lat. 33-03-40N
Long. 109-24-31W
Elev. 4000 ft.

Geology
Irregular deposits of gold contained in limonite along NE-trending fissure veins in diorite porphyry (Tertiary; 5-56 m.y.) or between porphyry and limestone masses (Ordovician-Mississippian). Concentrated as free gold in sand bars along Pinkard and Gold gulches; forms pockets and occurs as dispersed flakes. Commonly found along porphyry-sediment contact.

Mineral Products
placer gold

Development and Production
Located in 1870 and exhausted by 1905. Free milling operations. See also: Lakeman Group, Bell and Pinkard Group, Corporate and Climax Claims (all mined placers in early 1900's).

References
ABGMT CRIB Data, 1982
USGS Clifton Quad. (1:62500)
Bennett, 1975 (age dates)
Lindgren, 1905, p. 211-12, 292-98
Johnson, M.G., 1972, p. 15-16
Wilson et.al, 1967, p. 185

MAP NO. 4-22/23/24 -11

Mine
Corporate and Climax Claims

Location
T.04S
Sec. 29
R.29E
SW
Lat. 33-03-10N
Long. 109-23-19W
Elev. 4640 ft.
Geology  Manganese minerals confined to irregular bands within prominent NW-trending, vertical quartz fissure veins cutting granite - quartz-monzonite - diorite porphyry (Tertiary; 55-56 m.y.). Gold occurs as placer deposits and in pockets along irregular veins in porphyry, near contact with Pinkard Formation shales (Cretaceous). Manganese minerals are exposed in the vein for about 400-500 ft. along surface.

Mineral Products  manganese: pyrolusite, wad-type oxides
gold placers

Development and Production  Corporate Group consists of 5 contiguous claims; Climax Claim lies adjacent to east. Developments included a 20 ft. cut in the vein on Climax Claim; shaftlike pit and 70 ft. adit on Corporate Claims. Located as gold placer claims in 1932; relocated as manganese claims in 1951.

References  
ABGMT CRIB Data, 1982
USGS Clifton Quad (1:62500)
Bennett, 1975 (age dates)
Farnham, et al., 1961, p. 103
USBM Files, Corporate Group, Climax Claim
Lindgren, 1905, p. 229-30, 296
Johnson, M.G., 1972, p. 15-16
Wilson, et al., 1967, p. 185

MAP NO. 4-22/23/24-12

Mine  Blue Star Claims

Location  T.05S  Sec. 17  Lat. 33-00-00N
R.26E  NE  Long. 109-35-23W
Elev. 4800 ft.

Geology  Located on or near major NW-SE trending normal fault cutting Quaternary-Tertiary sediments to west, and andesite and basaltic andesite flows of Miocene-Oligocene age to north. Volcaniclastic rocks are fine-grained and locally sparsely porphyritic, containing beds of volcanic boulder conglomerate and lenses of pyroclastic scoria. Sedimentary beds contain Gila Conglomerate and younger basin-fill deposits of sand, gravel, silt and clay.

Mineral Products  copper

Development and Production  Exploration prospect; extent of development unknown.

References  
USBM Files, Blue Star Claims
USGS Safford Quad (1:62500)
BLM Mining Claims Lead File 40084, July 1980
USGS Bryce Mtn. Quad (1:62500)
Wynn, 1981
Richter and Lawrence, 1981
MAP NO. 4-22/23/24 - 13

Mine
Mary Claims

Location
T.05S
R.26E
Sec. 13
SW
Lat. 32-59-35N
Long. 109-38-15W
Elev. 5000 ft.

Geology
Secondary copper minerals in narrow, fissure veins at or near contact between Cretaceous-Tertiary andesite flow to south and Tertiary basaltic dome complex to north.

Mineral Products
copper

Development and Production
Exploration prospect; extent of development unknown.

References
USBM Files, Mary Claims
USGS Safford Quad (1:62500)
BLM Mining Claims Lead File 84084, July 1980
Wynn, 1981

MAP NO. 4-22/23/24 - 14

Mine
Bear Springs Claims
(Lula Belle)

Location
T.05S
R.26E
Sec. 24,25
SE
Lat. 32-58-35N
Long. 109-37-30W
Elev. 4800 ft.

Geology
Secondary copper minerals, chiefly chrysocolla, in narrow fissure veins cutting Cretaceous-Tertiary andesite volcanics. Fine-grained massive andesite flows separated by thick flow breccias.

Mineral Products
copper: chrysocolla

Development and Production
Exploration prospect; extent of development unknown.

References
USBM Files, Bear Springs Claims
USGS Safford Quad (1:62500)
BLM Mining Claims Lead File 42662, 35507, July 1980
Wynn, 1981

MAP NO. 4-22/23/24-15

Mine
Ben Hurr
(Lola Dean, Christmas Gift, Walnut Group, Steeple Rock)

Location
T.05S
R.26E
Sec. 36
NE
Lat. 32-57-33N
Long. 109-37-48W
Elev. 4800 ft.
Geology
Secondary copper minerals in narrow fissure veins (N75E, 85°S) cutting Tertiary andesite volcanics. Vein parallels contact between andesite and brecciated felsic dike. Quartz veins in area contain gold and silver. 18 inch vein outcrops for ¼ mile.

Mineral Products
- copper: chrysocolla
- silver
- gold

Development and Production
Surface-underground operations; inactive producer (as of 1980). Developments included one shallow shaft and several trenches. Mined 3 short tones of ore (includes 1700 lbs. of copper ore) between 1951 and 1954; 6 unpatented claims, extending into Sec. 25, 26, and 35 (T.05S, R.26E).

References
USBM Files, Ben Hurr
USGS Safford Quad (1:62500)
ADMR Walnut Group File
ADMR Ben Hurr Mine File
BLM Unpatented Claims Lead File 26703, 1879, July 1980
ABGMT - USBM File Data
USBM Files, Steeple Rock

MAP NO. 4-22/23/24 - 16

Mine
Jet Group (Towne Mines Property - Bug unpatented claims, unpatented claims - Jupiter, Saturn, Venus)

Location
- T.05S
- R.27E
- Sec. 21
- Cen.
- Lat. 32-59-00N
- Long. 109-35-00W
- Elev. 4800 ft.

Geology
Copper deposits of unknown type in massive andesite and basaltic andesite flows associated with the Turtle Mtn. - Guthrie Peak region (Oligocene-Miocene). Deposits probably in fissure veins associated with faults and basaltic andesite dikes of roughly same age. Rocks are fine-grained, olivine-rich, and locally sparsely porphyritic. Unit contains beds of volcanic boulder conglomerate and lenses of pyroclastic scoria, with scoriaceous upper and lower beds. Primary copper minerals in adjacent Lone Star district (to west) consist mainly of pyrite and chalcopyrite; copper minerals generally occur in veins and disseminations within this region.

Mineral Products
- copper

Development and Production
Exploration prospects; extent of development and production unknown. Claims extend into Sec. 15, 17, 18, 19, 20, 21, 22, 23, 26, 27, 29, 30, 33, and 34 (T.05S, R.27E), and Sec. 1, 3, 10, 11, 12, 13, and 29 (T.06S, R.29E).

References
USBM Files, Jet Group
USGS Safford Quad (1:62500)
BLM Mining Claims Lead File - 82532, July 1980
Wilson and Moore, 1958
Richter and Lawrence, 1981
Robinson and Cook, 1966
MAP NO. 4-22/23/24 -17

Mine Claims M.S. 2448
(Claims M.S. 458)

Location T.05S Sec. 12 Lat. 33-01-05N
R.29E NW, SE Long. 109-20-00W

Elev. 3640 ft.

Geology Fine flakes of gold recovered from Morenci Gulch, from other tributary gulches of the San Francisco River, and from elevated gravels resting on Gila Conglomerate above present level of the San Francisco River. Placer gold is derived from oxidized gold-bearing veins associated with intrusive Morenci granite porphyry complex (55-56 my), and are commonly found along or near porphyry-sediment contact. Associated with black sand and abundant pebbles of magnetite, hematite, and limonite.

Mineral Products placer gold

Development and Production Exploration prospects; located in early 1870's mined through underground workings and treated in sluices and rockers at the river. Production data not available; extent of development unknown.

References
USBM Files, Claims M.S. 2448
USGS Clifton Quad (1: 62500)
BLM Mining District Sheet 843
Johnson, M.C., 1972, p. 15-16
Lindgren, 1905; pl. 1, p.101
Bennett, 1975 (age dates)
Wilson, E. D., 1961, p. 65-66

MAP NO. 4-22/23/24 - 18

Mine Smuggler Mine (Oro Fino)

Location T.05S Sec. 14 Lat. 32-59-43N
R.29E SW Long. 110-20-55W

Elev. 3360 ft.

Geology Fine gold contained in old river gravels resting on Gila Conglomerate (Pliocene-Pleistocene) in curves of the San Francisco River. Gravels in placer deposit are 3-12 ft. thick; carry some gold irregularly distributed throughout, but are generally richest at or near Gila Conglomerate bedrock. Associated with black sand and abundant pebbles of magnetite, hematite, and limonite.

Mineral Products placer gold
Development and Production  Underground mining; gravels containing gold are treated in sluices and rockers at the river. Claims located in early 1870's; actively, prospected and developed during 1880's. Sluicing operations conducted in 1933. Production data and extent of development unknown.

References
USBM Files, Smuggler Mine
USGS Guthrie Quad (1:62500)
Richter and Lawrence, 1981
Lindgren, 1905, p. 101
Johnson, M.C., 1972, p. 17-18
Wilson, E.D., 1961, p. 65-67

MAP NO. 4-22/23/24-19

Mine  Gillard Hot Springs
Location  T.05S  Sec. 27  Lat. 32-58-30N  Long. 109-21-00W  Elev. 3500 ft.
Geology  5 springs located on or near contact between Gila Conglomerate and younger basin-fill deposits (Quaternary - late Tertiary), and modern alluvium on active flood plain of the Gila River (Holocene-Recent). Older sediments capping low terraces consist of tuffaceous, gravel to boulder volcanic conglomerate in lower beds, and semi-indurated volcanic conglomerate with gravel, sand, silt, and clay deposits of alluvial and lacustrine origin in upper beds. Subsurface temperature 140°C; surface temperature of 5 springs averages 82°C.

Mineral Products  geothermal
Development and Production  Surface workings; extent of development unknown.

References
USBM Files, Gillard Hot Spring
USGS Guthrie Quad (1:62500)
Richter and Lawrence, 1981
Renner, et.al., 1975, p. 26-27

MAP NO. 4-22/23/24-20

Mine  Gila Hot Springs Group
( Pyrolusite Claims, Pyrolusite No. 1 Claim, Hult Pyrolusite Property)
Location  T.05S  Sec. 26  Lat. 32-58-02N  Long. 109-19-35W
Geology  Manganese ore occurs in lenses and short irregular pods along narrow fractures in Gila Conglomerate (Pliocene-Pleistocene).
Fractures strike about N5W and cut gently dipping sedimentary beds at high angles. Two most extensive deposits are located on the northernmost and southernmost fractures; veins occasionally outcrop on surface. Associated with trace amounts of barite.

Mineral Products: manganese, wad, pyrolusite, barite (BaCO₃)

Development and Production: Surface and underground operations; presently inactive. Located in 1938 by W.A. Hult. Property consists of 4 unpatented claims. After several years of initial development work, claims were abandoned; claims were later relocated in 1954 by H.J. Peters.

References:
- USBM Files, Gila Hot Springs Claim
- ABGMT CRIB Data, 1981
- USBM Files, Pyrolusite No. 1
- USGS Guthrie Quad (1:62500)
- Farnham et.al, 1961, p. 98-99
- ADMR Pyrolusite No. 1 Lode Mining Claim File
MAP NO. 4-22/23/24 - 21

Mine Claims M.S. 1654 B
(Petaluma, Rex Monte, Waterloo, Argyle, Napoleon, Glasgow)

Location T.05S Sec. 6 Lat. 33-01-43N
R. 30E Cen. Long. 109-17-51W
Elev. 3600 ft.

Geology Fine flakes of gold in ancient river gravels resting on Gila Conglomerate (Pliocene-Pleistocene) in curves of the San Francisco River. Placer gold is derived from small gold-bearing veins, associated with Morenci granite porphyry dikes (55-56 my) that are exposed in Dorsey and Colorado Gulches, and from small gold veins around Morenci.

Mineral Products placer gold

Development and Production Exploration prospects; extent of development unknown.

References
USBM Files, Claims M.S. 1654 B
USGS Clifton Quad (1:62500)
BLM Mining District Sheet 843
Johnson, M.G., 1972, p. 17-18
Wilson, 1961, p. 65-67
Lindgren, 1905, pl.1
Bennett, 1975 (age dates)

MAP NO. 4-22/23/24-22

Mine Arizona Department of Transportation Gravel Pit.

Location T.05S Sec. 25 Lat. 32-58-08N
R.30E Cen. Long. 109-12-34W
Elev. 3760 ft.

Geology Gravel, sand, silt, and clay deposits of alluvial and lacustrine origin (Quaternary – late Tertiary) covering exposed andesite flows of the Gila River Valley (Oligocene). Sedimentary unit includes tuffaceous, gravel to boulder volcanic conglomerate in lower beds and Gila Conglomerate in upper beds. Massive andesite flow reaches thicknesses of 760 ft. and extends from Morenci region to Guthrie, east of Turtle Mtn.

Mineral Products Sand and gravel

Development and Production Surface workings; active producer.

References
USBM Files, ADOT Gravel Pit
USGS York Valley Quad (1:62500)
Richter and Lawrence, 1981
Wynn, 1981
Dorothy B. Claims (Gold Spot, Banner, Bonny, Red Bird, Gold Nugget, Neel Placers)

Location

T.06S  Sec. 16  Lat. 32-54-37N
R. 28E  Long. 109-29-06W

Elev. 3440 ft.

Geology

Gold placer found in Quaternary - late Tertiary river gravels that mantle terraced bluffs of Gila Conglomerate along Gila River and cover large alluvial flat at confluence of Bonita Creek and Gila River. Gold ranges in size from flakes to wiry particles about 1/4 inch long. Associated with ferruginous chert pebbles and black sand. Gravel deposits average 23-30 ft. thick.

Mineral Products

sand and gravel: containing platinum, iridium, osmium, zircon, silicon, monasite placer gold iron

Development and Production

Exploration prospect; mining and milling facilities constructed in 1980. First claims located in early 1900's; worked intermittently to present. Development included 14 bulldozer trenches of varying depths and with lengths of 400-500 ft. 130 claims totalling 2500 acres; claims extend into Sec. 17, 18, 19, 21, 23, and 28 (T.06S, R.28E). Operators included Mammoth, Schwimmer Mining Co., Rio Gila Gold Mining Co., Neel Placer Co.

References

ABSMT Clippings File/ Neel Placers, Rio Gila, Gold Mining Co.
USBM Files, Dorothy B. Claims
USGS Guthrie Quad (1:62500)
ADMR Neel Placers File
BLM Unpatented Claims Lead File 42716, July 1980
USGS Safford Quad (1:62500)
Wilson, E.D. 1961
Richter and Lawrence, 1981
Johnson, 1972, p. 18-20
USGS CRIB Data, 1979
Mineral Products Unknown.

Development and Production Exploration prospect; extent of development unknown.

References
USBM Files, Prospects
USGS Guthrie Quad (1:62500)
Richter and Lawrence, 1981

MAP NO. 4-22/23/24 25

Mine Pumice No. 2

Location T.06S Sec. 30 Lat. 32-52-41N
R.28E Long. 109-30-18W
Elev. 3000 ft.

Geology Red basaltic andesite cinder and white rhyolite pumice (middle Tertiary) form pyroclastic deposits in andesite and basaltic andesite flow of the Turtle Mtn. - Guthrie Peak region (Middle Tertiary). Andesite flow rocks are fine-grained and locally sparsely porphyritic. Locally includes small units of sedimentary rocks.

Mineral Products Pumice perlite

Development and Production Surface workings; active producer. Operated by Gila Valley Block Co. Extent of development and production unknown.

References
USBM Files, Pumice No. 2
USGS Safford Quad (1:62500)
Wynn, 1981
Wilson and Moore, 1958
Richter and Lawrence, 1981

MAP NO. 4-22/23/24 -26

Mine Prospects

Location T.06S Sec. 28 Lat. 32-52-33N
R.28E SW Long. 109-29-30W
Elev. 3440 ft.

Geology Prospects located in Gila Conglomerate and younger basin-fill deposits (Quaternary-late Tertiary). Tuffaceous, gravel to boulder volcanic conglomerate in lower beds, and semi-indurated volcanic conglomerate with gravel, sand, silt, and clay deposits of alluvial and lacustrine origin in upper beds. Conglomerate beds are massive and poorly sorted.

Mineral Products unknown
Development and Production  Exploration prospects; extent of development unknown.

References
USBM Files, Prospects
USGS Guthrie Quad (1:24000)
Richter and Lawrence, 1981

MAP NO. 4-22/23/24 - 27

Mine  Cinder Pits

Location  T.06S  Sec. 29;28  Lat. 32-52-34N
R.29E  SE; SW  Long. 109-23-42W
          Elev. 4560 ft.

Geology  Cinder pit located on contact between pyroclastic air-fall and volcaniclastic sedimentary deposits (Miocene or Oligocene) to north, and andesite and basaltic andesite of the Turtle Mountain-Guthrie Peak region (Miocene and Oligocene) to south. Volcaniclastic sediments contain thin-bedded, fine-grained vitric tuff; includes lithic-pumice sandstone and locally, massive and poorly sorted volcanic boulder conglomerate beds.

Mineral Products  Pumice; volcanic cinder

Development and Production  Surface workings; active producer. Extent of development and production unknown.

References
USBM Files, Cinder Pit
USGS Guthrie Quad (1:62500)
Richter and Lawrence, 1981

MAP NO. 4-22/23/24 - 28

Mine  Mine

Location  T.06S  Sec.29  Lat.32-53-13N
R.29E  NW of NW  Long. 109-24-21W
          Elev. 4640 ft.

Geology  Prospect shaft located in andesite and basaltic andesite flow complex of the Turtle Mt.-Guthrie Peak region (Miocene-rhyolite flow (Miocene). Rhyolite is flow-laminated and crystal-poor, intermixed with masses and lenses of dark-gray vitrophyre.

Mineral Products  Unknown.

Development and Production  Underground operations, extent of development unknown.

References
USBM Files, Mine
USGS Guthrie Quad (1:62500)
Richter and Lawrence, 1981
**Mine** New Deal

**Location**

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<th>T.07S</th>
<th>Sec. 01</th>
<th>Lat. 32-51-08N</th>
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**Geology** Prospects located in unconsolidated to weakly - consolidated silt, sand, and gravel (Quaternary) on low-lying terraces and stream overflow channels along upper reaches of Yuma Wash (tributary of the Gila River).

**Mineral Products** unknown

**Development and Production** Exploration prospect; extent of development unknown. Claims extend into Sec. 6, 7 and 12 (T.07S, R.28E).

**References**

USBM Files, New Deal
USGS Guthrie Quad (1:62500)
BLM Mining Claims Lead File 79741, July 1980
Wynn, 1981
Richter and Lawrence, 1981

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**Mine** Haigler Pumice Property

(C.N. Greer Pumice, Gila Cinder Mine, Gila Valley Block Co.)

**Location**

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<th>Sec. 06</th>
<th>Lat. 32-51-00N</th>
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**Geology** Claims located on or near contact between pyroclastic air-fall and volcanioclastic sedimentary deposits (Miocene or Oligocene), and andesite and basaltic andesite of the Turtle Mountain - Guthrie Peak region (Miocene and Oligocene). Beds of pumicite and cinders overlain by volcanic ash and underlain by volcanic glass and tuff. Tuff in area is covered at higher elevations by amygdaloidal basalt. Shear cliff, 100 ft. high, exposes bed of pumicite; beds dip 5° - 10°N, and are 10-50 ft. wide, 10-50 ft. thick and are exposed for a distance of about 1.5 miles.

**Mineral Products**

pumice
volcanic cinder
pumicite

**Development and Production** Surface workings; active producer. As of 1963, producing approximately 5000 yds. per year, containing 10% pumice and 90% cinders and scoria. Original Haigler Pumice Property of 30(?) unpatented claims totalling 760 acres was divided in 1961;
340 acres sold to Gila Valley Block Co. (T.07S, R.29E, Sec. 07) and 320 acres retained by A.C. Haigler. Cinders and pumicite used in manufacturing of wallboard, plasters, and building blocks.

References

USBM Files, Haigler Pumice
USGS Guthrie Quad (1:62500)
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Richter and Lawrence, 1981
Wynn, 1981
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