Mineral Resources On-Line Spatial Data

Governor Mine

Past Producer in Los Angeles county in California, United States with commodities Gold, Silver, Copper

Geologic Information

Identification information

Deposit ID	10310624
Record type	Site
Current site name	Governor Mine
Alternate or previous names	New York

Comments on the site identification

- The Governor Mine was known as the New York Mine until 1932.

Geographic coordinates

Geographic coordinates:	-118.20573, 34.50653 (WGS84)
Elevation	1070
Location accuracy	100 *(meters)*
Relative position	7 miles southwest of Palmdale.

Geographic context

Political divisions (FIPS codes)

Los Angeles (county)
California (state)
United States (country)

North America (continent)
Land (continent)

USGS map quadrangles

Ritter Ridge (quadrangle 1:24,000 scale)
Lancaster (quadrangle 1:100,000 scale)
Los Angeles (quadrangle 1:250,000 scale)

Hydrologic units (watersheds)

Santa Clara (hydrologic unit)
Ventura-San Gabriel Coastal (hydrologic accounting unit)
Southern California Coastal (hydrologic subregion)
California (hydrologic region)

Geographic areas

Country	State	County
United States	California	Los Angeles

Public Land Survey System information

Meridian	Township	Range	Section	Fraction	State
San Bernardino	005N	013W	23		California

Comments on the location information

- The location point selected for latitude and longitude is the adit symbol as shown on the USGS Ritter Ridge 7.5-minute quadrangle map. The mine is easily accessible by freeway (State Highway 14) from Palmdale to the northeast and Santa Clarita to the southwest and then by short paved and dirt roads.

Commodities

Commodity	Importance of the commodity
Gold	Primary
Silver	Primary
Copper	Secondary

Comments on the commodity information

- Commodity Info: the character of the ore is quartz with native gold and a small percentage of iron sulfides. One sign of good ore was rust-stained quartz. The quartz-vein complex was reported to consist of a single thick vein, which would split into narrower seams in places. On the 400-foot level, ore grades were over one oz/ton over an 18-foot

width of the vein complex (length unknown).
- Ore Materials: Native gold
- Gangue Materials: Quartz, pyrite

Materials information

Materials	Type of material
Gold	Ore
Quartz	Gangue
Pyrite	Gangue

Alteration

Type	Local
Description of alteration	Silicic; quartz Oxidation; along main shear zone

Mineral occurrence model information

Model code	273
USGS model code	36a
Deposit model name	Low-sulfide Au-quartz vein
Mark3 model number	27

Host and associated rocks

Host or associated	Host
Rock type	Plutonic Rock> Mafic Intrusive Rock> Diorite
Stratigraphic age (youngest)	Mesozoic

Host or associated	Host
Rock type	Plutonic Rock> Granitoid> Granodiorite
Rock unit name	Lowe Granodiorite
Chronological age	220
Dating method	U-Pb (zircon)
Stratigraphic age (youngest)	Late Triassic

Host or associated	Associated
Rock type	Plutonic Rock> Granitoid> Syenite
Chronological age	1120
Dating method	U-Pb (zircon)
Stratigraphic age (youngest)	Mesoproterozoic

Host or associated	Associated
Rock type	Plutonic Rock> Granitoid> Granite
Stratigraphic age (youngest)	Cretaceous

Geologic units near the site, calculated from the appropriate geologic map

(1) Precambrian granitic rocks, unit 2, (San Gabriel Mountains Anorthosite)

Geologic structures

Type	Description	Terms
Regional	Vincent Thrust	
Local	The shear zone mentioned above trends N20W and dips 75NE. It averages about 4 feet wide, but reaches thicknesses of 18-25 feet. The zone is known to extend for at least 500 feet along strike and to at least 1,000 feet in depth.	

Ore body information

General form	Tabular

Controls for ore emplacement

Ore control descriptions	Mineralization (native gold) is largely controlled by, and confined to, a master shear zone in the plutonic host rock.

Comments on the geologic information

- INTRODUCTION

  This region of California is noted for its structural complexity and abundant tectonic activity. It is part of the Transverse Ranges geomorphic province, which is characterized by a series of generally east-west-trending ranges that are being squeezed upward by the

interaction of the Pacific Plate and North American Plate along the San Andreas Fault. This province extends for about 500 km, but is only about 16 to 80 km wide (Dibblee, 1982b). The Governor Mine deposit is situated approximately in the center of the province.

REGIONAL SETTING

Because of its anomalous east-west structural trend, great variety of Precambrian and younger rocks, important petroleum resources, proximity to several universities, and significance concerning both regional seismic hazards and local landslide hazards, the Transverse Ranges Province has received considerable attention through both basic geologic mapping and specialized topical research. Tom Dibblee alone has mapped numerous quadrangles throughout the province at scales of 1:24,000 and 1:62,500. Included in this massive collection of work is the Ritter Ridge 7.5-minute quadrangle, which covers the Governor Mine deposit (Dibblee, 1997). Local and regional geologic features have been covered in classical papers by many authors. A modern interpretation of the province?s features and history is presented in Dibblee (1982b).

The Transverse Ranges Province has undergone an exceptionally complex geologic history. It is characterized by displaced and rotated allocthonous terranes, which have been spliced together along major faults. Locally, the province is expressed by the San Gabriel Mountains, which rise to over 10,000 feet elevation and contain the Governor Mine deposit. This range is bounded by and has been uplifted along the San Andreas and San Gabriel faults. The present geomorphic character of the range is a relatively recent feature of the landscape, largely developed during the Quaternary.

Stratigraphy

The central and eastern Transverse Ranges are composed of a basement complex of igneous and metamorphic terranes most of which consist of continental crust. A major component of this complex is the San Gabriel Terrane, which has been cut and displaced by right-lateral movement on the San Andreas Fault so that pieces are strung out along the fault in southern California. Deposited on top of this basement are various Cenozoic marine and non-marine sedimentary and volcanic deposits; these were partially eroded as the Transverse Ranges were later elevated to their present height. Within the San Gabriel Mountains, gneiss has been dated at 1,670 m.y. and 1,715 m.y. (Silver, 1966; Ehlig, 1981), which represents some of the oldest rock in California. Intruded into this gneissic unit is a syenite-anorthosite-gabbro unit dated at about 1,200 Ma. There is no record of later intrusive activity until emplacement of the Lowe Granodiorite about 220 Ma. All of these units were subsequently invaded by late Mesozoic plutons.

Structure

The individual terranes of basement that make up the San Gabriel Mountains are spliced together by mylonite zones and faults within the San Andreas Fault system. Between the San Andreas Fault on the north and the San Gabriel Fault on the south, the interior of the San Gabriel Mountains contains a set of NE-trending left-lateral en echelon faults. The block has been uplifted probably due to its position within a locus of north-south compression where the San Andreas Fault system assumes a more east-west trend. Through paleomagnetic measurements, Terres and Luyendyk (1985) determined that the San Gabriel Mountains have had a net clockwise rotation of about 37 degrees since the

middle Miocene.

- Metallogeny

Despite the geologic complexity of this region, it is not noted for highly-productive metallic mineral deposits. The Governor Mine deposit is one of the few significant ones within the Transverse Ranges Province proper. Nonetheless, the presence of placer deposits in various locations within the San Gabriel Mountains indicates the presence of local lode-gold deposits. Regarding technical studies that apply to this region, Hutchinson and Albers (1992) presented an overview of metallogenesis in the Cordillera of the western U.S., which includes California. Albers (1981) and Albers and Fraticelli (1984) presented studies of metallogeny specific to California. Fife and Minch (1982) edited a volume that described the mineral wealth of the Transverse Ranges. There are no known published detailed studies of the metallogenesis of the deposits in the San Gabriel Mountains.

GEOLOGY AT GOVERNOR MINE DEPOSIT

Stratigraphy

The rock types in the immediate area of the Governor Mine consist of plutonic and gneissic rocks that make up the north-south ridge in which the deposit is situated. The dry washes along the east and west flanks of the ridge are covered with Quaternary alluvium of two ages, an older one which is more extensive, and a younger one that underlies the most recently active stream channels. Along the ridge at the deposit, Dibblee (1997) mapped several intrusive bodies. Thought to be oldest within this complex is a body of gray banded gneiss of probable Precambrian age. Interpreted to be next oldest at about 1,200 Ma is a syenite body. This unit is intruded on the north by the Lowe (?) Granodiorite (about 220 Ma), diorite (Mesozoic or older), and granitic rock (late Mesozoic or older). Ehlig (1981) included all of these rocks as a complex of Precambrian gneiss and amphibolite with Mesozoic granitic intrusions. A few miles north of the Governor Mine deposit is the Sierra Pelona, a topographic high underlain by mica schist and chlorite schist assigned to the Pelona Schist of Mesozoic age (Ehlig, 1981; Dibblee, 1997; 1982a); the protolith is interpreted to be turbidite sequences with some basaltic tuffs, possibly a metamorphosed part of the Franciscan Complex or Great Valley Group of northern and central California. Jacobson and others (2000) reported that this protolith is Late Cretaceous (70-80 m.y.) in age based on U-Pb dating of detrital zircons in the schist; metamorphism of the protolith took place about 60-65 Ma during its emplacement as a subduction complex. Plutons younger than 80 Ma are common in the Mojave Desert and Transverse Ranges, which may be the approximate age of the youngest granitic rocks at the Governor Mine deposit. About 35-40 miles southeast of the Governor Mine deposit, the Pelona Schist is intruded by granitic rock dated at about 14-18 Ma (Miller and Morton, 1977). The Pelona Schist and gneiss-plutonic complex are separated by an ENE-trending zone of mylonite, which averages about 500 feet thick. Dibblee (1997) showed this zone with a vertical dip in the Governor Mine area, but Ehlig (1981) reported the mylonite zone in other areas to be shallow to moderate in dip.

Structure

The general strike of fold axes and foliations in this area is ENE. The Pelona Schist of the Sierra Pelona is folded into a series of antiforms and synforms, which trend ENE. Dips of

foliation of the schist range from moderate to steep. Measured foliations in the gneiss at the deposit are vertical or nearly so. The zone of mylonite that separates the Pelona Schist from the gneiss-plutonic complex at the deposit is interpreted to be a segment of the Vincent Thrust, a major tectonic feature of the San Gabriel Mountains and eastern Transverse Ranges. This segment is about 2 miles north of the deposit. Few faults have been mapped otherwise in this immediate area.

- At the deposit proper, the plutonic rock has been sheared and fractured. These structures were later invaded by hydrothermal fluids to form a master complex of gold-bearing quartz veins, which was exploited. Jones (1937) reported that some of the crushed plutonic rock adjacent to the quartz also comprised low-grade ore. Early literature reported the vein complex to trend northeasterly with a dip to the northwest, while later literature reported the trend to be N20W and dip 75NE; the latter attitudes are considered more reliable. The vein complex ranges in width from a few to about 25 feet, with an average of about 4 feet. It is known to extend to a depth of at least 1,000 feet based on observations in the deepest workings of the Governor Mine. Post-mineral dikes cut and displace the complex in places. At shallow levels, the complex is displaced several tens of feet by a subhorizontal fault. Faulting of the complex is more pronounced, however, at the lowest levels of the mine. It is not known if the Vincent Thrust had any influence on this deposit as a conduit for hydrothermal fluids.

Alteration and Mineralization

Because of the nature of the country rock (fractured plutonic rock), alteration does not appear to be pervasive at this deposit. The deposit consists of quartz veins and oxidized country rock, which fill fractures and shear zones in the plutonic rock. Mineralization consists of native gold and iron sulfides; silver and copper mineralization are also reported (Gay and Hoffman, 1954) . Secondary copper mineralization can be observed today in surface exposures of quartz-bearing shear zones at the mine. Based on both descriptions in the literature and mapping by Dibblee (1997), it appears that mineralization here and in the nearby Red Rover Mine (about one mile directly west) is mainly associated with the diorite unit. Reported structural trends of the mineralized zone at the Red Rover Mine (N20W, steep dip to SW) are similar to those at the Governor Mine, which suggests a possible genetic connection of the two and a preferred orientation of mineralization in this immediate area. Ore grade appears to have some consistency along the vein complex. High-grade pockets were encountered, but there is no report of extensive barren zones, such as are characteristic of Mother Lode gold deposits in the Sierra Nevada of northern California. It is possible that undiscovered adjacent ore bodies, similar to the main vein complex exploited at the Governor Mine, may be present.

Age of the mineralization is uncertain, but based on probable ages of the plutonic rock it is inferred to be no older than mid- to late Mesozoic. It is not clear how the mineralization is spatially or temporally controlled in the plutonic rocks of the site. For example, there is nothing in the literature to indicate if the mineralization is confined solely to the older dioritic complex and Lowe (?) Granodiorite (thus intruded by and older than the younger granitic complex) or if the mineralization invaded both the older dioritic complex and the younger granitic complex and is thus post-late Mesozoic. Furthermore, it is not known if the reported nearby Tertiary granitic intrusive activity in the Pelona Schist may have driven metal-bearing hydrothermal systems in this region.

Economic Information

Economic information about the deposit and operations

Operation type	Surface-Underground
Development status	Past Producer
Commodity type	Metallic
Deposit size	Small
Significant	Yes
Discovery year	1880

Mining district

District name	Cedar District
District name	Acton District

Land status

Ownership category	Private
Area name	Los Angeles County Planning Department

Ownership information

Type	Owner
Operator	Great Western Agriculture, Inc.

Comments on the workings information

- Underground workings at the Governor Mine are the most extensive of any gold mine in Los Angeles County (Gay and Hoffman, 1954). Jones (1937) reported that the original workings at the New York Mine were open cuts. Adits, shafts, raises and winzes were later developed. It has been developed to a depth of about 1,000 feet. Workings are present over the entire hill (elevation 3701 on the Ritter Ridge 7.5-minute quadrangle) in the northeast quarter of Section 23. These include shafts and adits and accompanying dumps. During the 1930s, workings consisted of 4 levels driven off a vertical shaft that reached a depth of 430 feet. This shaft was sunk from the main tunnel, which was 800 feet long. The longest drift from this shaft was about 225 feet (200-level). By 1940, the vertical shaft had reached a depth of 720 feet, with 8 levels at approximately 100-foot intervals. The longest drift was 329 feet from the shaft. By 1954, the shaft had reached 1,000 feet, with drifts up to 500 feet. During this interval, the 100-foot level became the

main haulage adit. In 1952, the mine was accessible only to the 500-foot level and was flooded below the 700-foot level.

Comments on other economic factors

- This mine, along with the nearby Red Rover Mine, comprise the most productive gold-mining area in Los Angeles County. Both were active producers during the 1930s and early 1940s.
  Production at the Governor Mine deposit has been intermittent since about 1880. It is noteable as the largest gold producer in Los Angeles County. Periods of idleness and exploration alternated with production. The total output of the mine is estimated at about $1,500,000 (Gay and Hoffman, 1954).

Comments on development

- Placer gold was mined in the San Gabriel Mountains as early as 1834. Lode mining in this district probably began in the 1870s or 1880s. The Governor Mine, originally known as the New York Mine, may have been worked as early as about 1880. Documents researched did not indicate how the deposit was discovered, but it is probable that outcrop of the mineralized shear zone led to its discovery. The mine was relocated in 1889 (Preston, 1889). In 1897, the vein complex was lost underground, and the mine was closed. It was not reopened until 1932, when it was renamed in honor of California?s Governor Henry Gage. It then operated continuously until 1942; its most productive period was 1937-1940 when rich ore bodies were exploited on the 400-foot level. The Governor Mine employed 40-45 men in 1940.

  The history of exploration at this deposit is poorly known; it is known that the most extensive and productive mining was accomplished from 1932-1942. In the 1930s, the Anaconda Mining Company considered the ore bodies to be too small and irregular to be of interest to the company for development. Exploration was conducted at this deposit in the middle 1980s by Great Western Agriculture, Inc. Core drilling of unknown extent and results was conducted by this company probably about 1985. The company intended to mine just south of the old workings. History subsequent to this operation is unknown. There was no activity or equipment at the site in early 2001.

  In 1880s, ore was processed at a 5-stamp mill; sluices and amalgamation were used in the processing. In the 1930s, the milling was done first at Acton Junction, about one mile south of the mine, and then about 4-5 miles southeast of the mine, about one mile south of the settlement of Acton. The first mill had two stamps. Amalgamation was also used at this facility. The second mill, which replaced the first, was more sophisticated and reportedly could process 150 tons of ore per day. From about 1934 to 1940, the mills processed about 55,000 tons of ore, with a recovery of 94% reported. A later attempt to cyanide the mill tailings was not profitable. In 1950, the mill was dismantled.

  Finding adequate sources of water was a major problem at the mine. In 1889, water was transported to the mill via a 4,200-foot pipe.

Reference Information

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Deposit	Jones, C.C., 1937, Report on the Governor Mine: 15 p. (CDMG Mineral Resources Files, Sacramento)

General comments

Subject category	Comment text
Deposit	The deposit consists of a quartz-vein complex that fills shear zones and fractures in plutonic rock of intermediate composition (quartz diorite to granodiorite). Sulfides (iron, copper) are present in small quantities. Textures of veins (massive, milky quartz) indicate deposition below shallow depths. Gold is present in native form.

Subject category	Comment text
Environment	The Governor Mine deposit is situated in a landscape of hills and valleys of generally moderate relief. The deposit is along a north-south-trending spur that projects southward from a higher east-west -trending ridge known as the Sierra Pelona. The Sierra Pelona attains elevations over 5,000 feet here, while the summit of the Governor Mine ridge is 3,700 feet. The area is drained by washes that are generally dry except during storms. The drainages flow southward to the settlement of Acton, where they join the drainage system of Soledad Canyon. Depth to water table in this area is not known, but the mine was reported to be flooded below the 700-foot level in 1952. Vegetation is typical of the arid higher elevations that are transitional between the western Mojave Desert and the interior Transverse Ranges of southern California. It consists generally of sparse grass, sagebrush, and small juniper trees. The climate is hot and dry in summer and cold in winter. Average total precipitation at nearby Palmdale is about 8 inches, a small fraction of which may occur as snow. The immediate site is undeveloped, but the dry washes west and east of the ridge contain scattered residences, which are grouped either in small tracts or as single estates. The mine site contains several dumps, which are mainly near the caved main adit on the northeast side of the ridge, but are also present on the southwest side of the ridge. Dirt roads traverse the site and are easily accessible. Observed workings are caved or partially filled, and a few are enclosed by chain-link fences with razor wire, which have been vandalized to some degree to allow access.

Reporter information

Type	Date	Name	Affiliation	Comment
Reporter	07-SEP-2001	Higgins, Chris T.	California Division of Mines and Geology	
Editor	01-SEP-2007	Schruben, Paul G.	U.S. Geological Survey	Converted from S&A FileMaker format to Oracle. Edit checks on rocks, units, and ages with Geolex search, and other fields.

Time of information access: 2013-12-04 15:57:40