MNGN210 Introductory Mining Engineering, Fall 2014

Homework # 2: Mining Terminology and Mining Law

Due: ????, 2014

Q1) Define the following terms:

a) **Ore :** A natural aggregation of one or more solid minerals that can be mined, processed and sold at a profit.
b) **Mineral**: A naturally occurring substance, usually inorganic, having definite chemical composition and distinctive physical characteristics.
c) **Ore deposit:** economic occurrence of minerals that can be extracted at a profit.

Q2) List and briefly describe the four basic surface mining techniques

1. **Open Pit Mining** –designed to extract non-bedded mineral deposits that lie near the surface such as massive, stock-work, and porphyry type deposits of copper, gold, iron, etc.
2. **Strip Mining** –designed to extract a bedded deposit such as coal or phosphates.
3. **Quarry Mining** –designed to extract building stone such as slate, marble, granite, etc. The term is also used for surface mining of crushed stone (aggregates).
4. **Placer Mining** –for the extraction of alluvial deposits (often stream sediments) of heavy minerals: gold, titanium, rutile, etc.

Q3) The strike of a 3 meter wide silver vein is approximately East to West, and the dip is approximately 70^{o} to the South.

Neatly sketch and label a typical underground mine for this vein deposit with vertical shaft access from the footwall side of the vein.

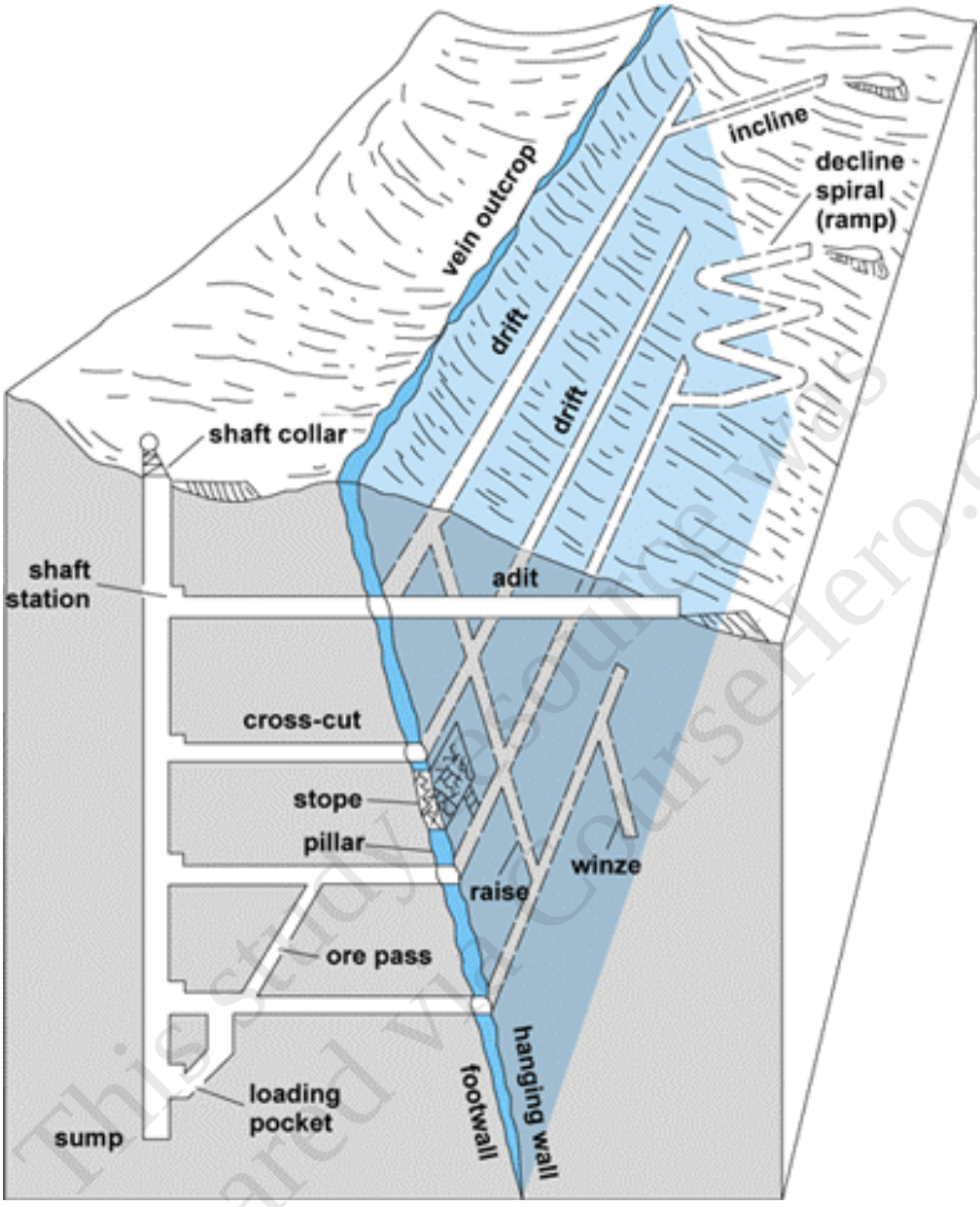
Show the following features in a **plan view** (view seen from above looking down) and a **vertical cross section view** (seen from the East looking West).

a) Hangingwall
b) Footwall
c) Access Shaft
d) Drifts
e) Two Levels
f) Ventilation Shaft
g) Crosscuts
h) Raise(s)
i) Stope(s)

Not every item in the list above needs to be shown in both views.

See sketches in course notes and lecture, and three examples that follow.

Q3 –Example underground mine, vertical section.



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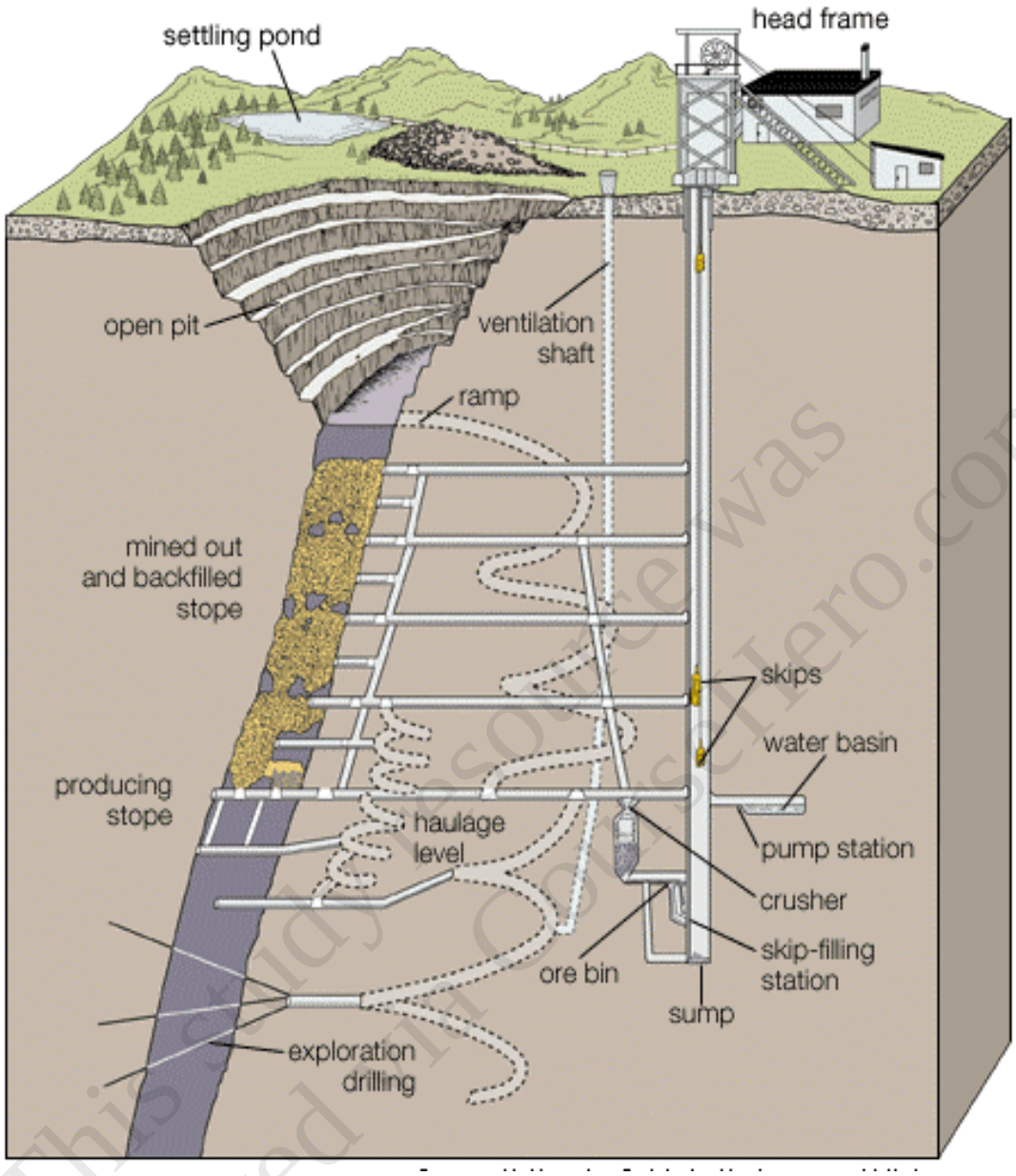

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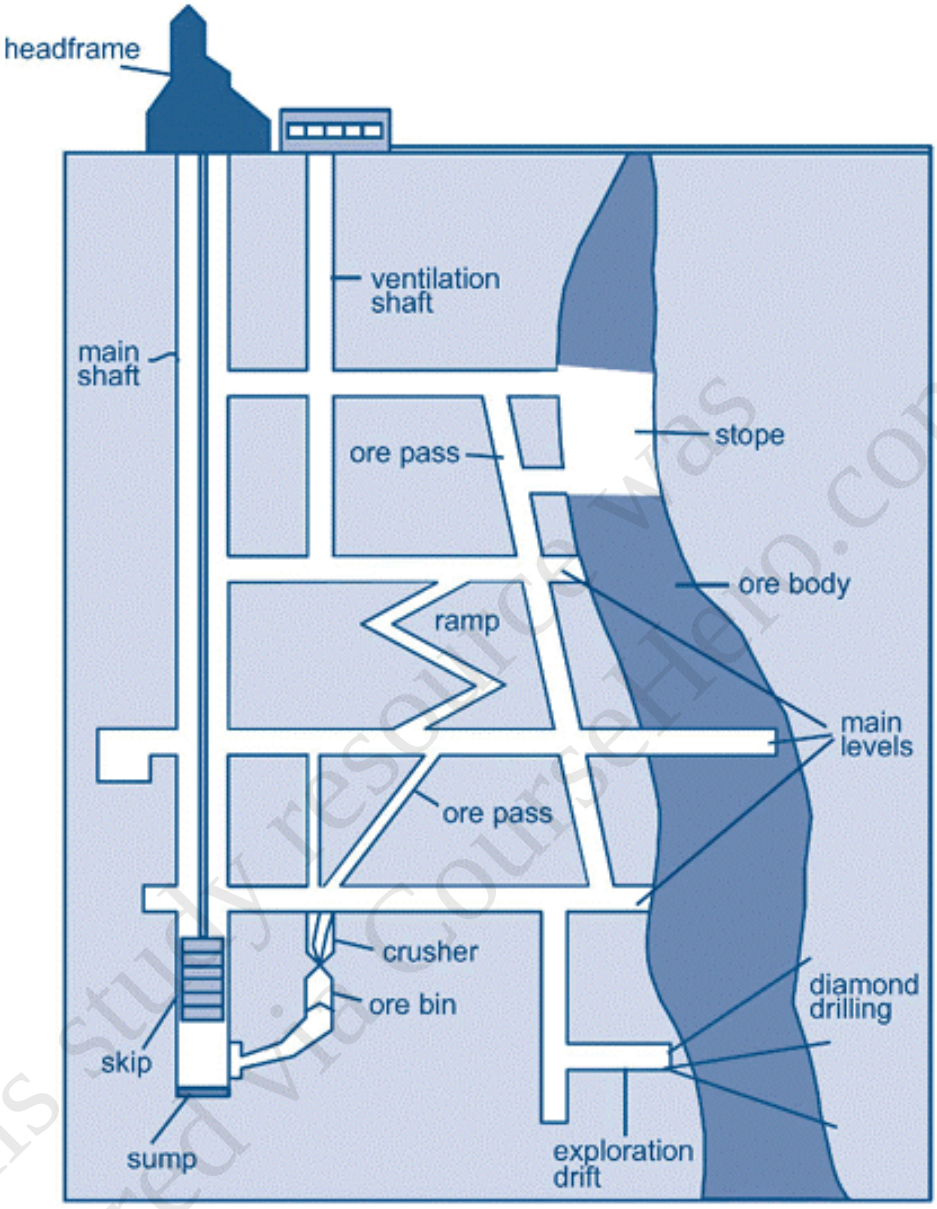


Q4)

a) List and describe with dimensions and area (where applicable), each of the four types of mine claims defined in the Mining Law of 1872.

i) Lode Claims

Area - approx. 202/3 acres

Dimensions - (max) 1500ft along strike

600ft across vein usually 300 ft on each side of vein

Description - Zone of mineralized rock lying with in boundaries clearly separated from neighboring rock.

ii) Placer Claims

Area - 20 acres (preferred square in shape)

Dimension - Preferred (208.7 ft x 208.7 ft.)

Description - Superficial deposit occupying active or ancient stream bed or beach, washed or weathered from vein (alluvial deposit)

iii) Tunnel Claim

Description - Horizontal excavation (adit) made for discovery of lodes and veins not appearing at the surface. Right to drive 3000 ft tunnel (adit). Cylindrical area 3000*3000' seldom used now.

iv)Mill Site Claim

Area- 5 acres

Dimension - none given

Description- Non mineral lands that must be utilized for mining & milling purposes

b) What types of land open for mining claims?

i) Federal Lands: open to location

1) Range land- these are under BLM management
2) National forest- managed by US Forest Service
3) Homesteads with mineral rights reserved

ii) Federal Lands: Restricted in use

1) National Parks & Monuments
2) Wilderness areas
3) Game refuges
4) Military Reservations

iii) Sate Lands

-Subject to state mining laws

iv) Private lands

-Subject to negotiation with the owner

c) What are the steps involved in claim location?

i) Discovery on each claim
ii) Minimum of $500 improvements on claim
iii) Surveyed by a registered surveyor
iv) Pay fees: Lode-$5/ac, Placer -$2.50/ac

d) Define patented and unpatented mining claims?

With a patented claim a title to the land is received, and the claim becomes private property.

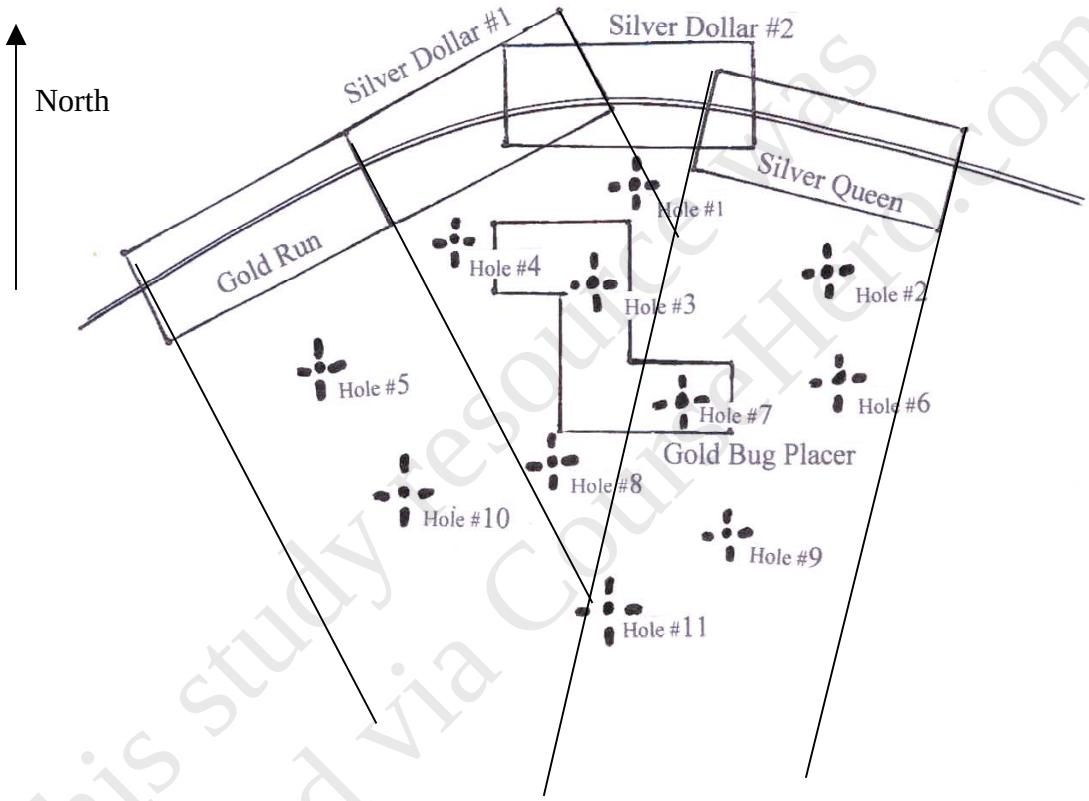
With an unpatened claim the title belong to the government and the claimant has the right to the minerals.

e) Describe the Mineral Leasing Act of 1920. What minerals are placed under the act?

Certain minerals withdraw from location and were placed under the leasing Act which provides for their development through prospecting permits and leasing. These minerals are placed under the act coal, sodium, potassium, phosphate, native asphalt, solid or semisolid bitumen, bituminous rock.

Q5) Most of the mining claims, shown in the following map, are located so that they cover the outcrop of a "vein" type gold-silver type mineral deposit. The south dipping vein has been sampled by a series of vertical drill holes. Many of these holes, also shown on the following map, have encountered potentially economic concentrations of gold and silver where the holes intercept the vein.

Determine which of the 5 mining claims owns the vein minerals in each of the drill holes.



Claim	Location Dates	Drill Holes
Silver Dollar #1	January 2, 2001	_None_____
Silver Dollar #2	January 3, 2001	_1,3,4,8_____
Silver Queen	January 1, 2001	_2,6,7,9,11_____
Gold Run	June 15, 2002	_5,10_____
Gold Bug Placer	September 15, 2002	_None_____