CASE STUDY #6 - Alta Mining District, Alta, UT

Alta, UT is a small town situated approximately 20 miles east of Salt Lake City, UT, the State Capital. Silver was discovered in the area in 1865 and the town of Alta began life as a mining camp. After the price of silver dropped dramatically in 1873, Alta was all but abandoned by the miners. In 1940, the opening of an alpine ski run signaled a second “life” for Alta that continues to this day. Although the population (400 people in 1995) remains small, large numbers of people have acquired property in the Alta area to build vacation homes. The number of ski resorts and “time-share” properties has increased greatly.

The mean elevation of the Wasatch Mountains in the Alta area is 9,500 feet. At these elevations, snow may be present from September through July. Shown above is an “avalanche chute” typical of high mountain areas that receive a lot of snow fall. At the bottom of the photograph are rock debris and dead trees carried down the chute by numerous avalanches. This type of rugged terrain is typical of Alta. One final note about this photograph is the difference in tree cover. The dark green trees are “old-growth” conifers, probably fir and pine; the pale green trees are young aspen. Fast growing aspen trees are some of the first vegetation to colonize mountain soil that has been burned over or disturbed by rock slide, avalanches, or mining.
Another sight typical of high mountain regions of western North America are piles of tailings and abandoned mine works like those shown above. The amount of tailings present is usually directly proportional to the success and longevity of the mine. Newly arrived residents to the Alta area are often taken aback by the presence of old mines and indications of past (or ongoing) mining activity. And, although this is gross generalization, one of the first things that new residents may do is to organize fellow citizens to ban any further mining, to clean up this kind of “eye sore,” and to erase all evidence that mining ever took place in the area. Lawsuits involving large amounts of money are inevitable.

On the following pages is a set of “hypothetical” exercises related to just such a scenario. While based in Alta, UT for sake of example and not actual fact, this type of situation has played out in numerous old mining towns throughout the western United States. Place annotation on the topographic map as requested and answer the questions.
1. Draw a north arrow on the map.

2. Determine the map scale. HINT: each “square” section is one mile on a side.

3. The contour interval for this map is 40 feet. What is the highest elevation on the map.

4. There are numerous man-made features marked with a “Y” on the map. What are they?
5. There are numerous man-made features marked with “•” on the map. What are they?

6. Evaluate the risk of snow avalanches in this area. HINT: notice Alta ski resort near the bottom of the map.

7. Examine the stream valleys near the top of the map area. Why do you think these valleys have a “U”-shaped cross-section rather than a “V” shape like a typical mountain stream?

8. What is Giardia? HINT: Note the presence of a Game Preserve in the northern part of the map.

9. Evaluate potential problems with using surface (stream) water as a public water supply for the village of Alta, Utah.

10. In a year of unusually high snow melt and runoff, drainage from the Monte Cristo, Eclipse, and Baby McKee mines enters local stream valleys. Several new residents of Alta (freshly arrived from California) are claiming that AMD from these mines is entering the Little Cottonwood River and is contaminating their drinking water. They are threatening to sue the owners of the mines. You are called as an “expert witness.” Evaluate the likelihood of contamination from these mines.

11. Assuming that there really is AMD contamination of the Little Cottonwood River near Alta, are there any other mines nearby that might be a source of the contamination?

12. Detailed analysis of the stream sediments from the Little Cottonwood River, shows high levels of Pb, Zn, and Cu, with traces Ag. What do you think the local mines were producing?

13. For all the mining that has gone on in this area, there don’t seem to be many tailings piles shown on the map. Why not?


15. You are thinking of purchasing a piece of property near Alta to build an new home. The land surface is relatively flat but you notice that the only trees growing on the property are aspen. What questions might you ask the real estate agent beyond “how much does it cost?”