

The local government of a newly built town has contracted with an electrical company to provide energy to the town. The company generates electricity primarily through the burning of coal and has built a new power plant for the town. A nearby deposit of coal was discovered close to the surface. To access the coal, the company decides to remove the overburden and vegetation over the deposit.

3. Respond to parts A, B, C, D, E, F, and G.

A. **Identify** a type of surface mining the company could use to access the coal.

B. **Describe** an environmental problem associated with surface mining.

C. The town is located downwind of the new coal-burning power plant.

Describe an environmental problem the town could experience as a result of the electricity generation at the coal-burning power plant.

D. The local government is concerned about the environmental consequences of using coal to generate electricity for the town.

Propose a realistic solution the local government could enact that would reduce the negative environmental consequences of using coal to generate electricity.

E. Burning one pound of coal produces an average of 0.88 kilowatt-hours (kWh) of electricity.

An average household in the United States uses 1.064×10^4 kWh of electricity each year.

Calculate how many pounds of coal would need to be burned to generate enough electricity to power a town with 11,000 houses for a year. **Show** your work.

F. Researchers are concerned about the impact of noise pollution on songbirds in a forest near the power plant. Since the power plant was installed, bird species richness has declined from 7.5 species per hectare to 6.0 species per hectare.

Calculate the percent change in bird species per hectare since the power plant was installed. **Show** your work.

G. The town has been growing since it was built and had a growth rate of 5.38% in 2022, with a population of 26,250.

Assuming that the growth rate remains constant, **calculate** the year in which the population will reach 52,500. **Show** your work.

STOP

END OF EXAM