11.64. **Solve:** **(a)** The change in the potential energy of 1.0 kg of water in falling 25 m is $\Delta U_g = -mgh =$ $-(1.0 \text{ kg})(9.8 \text{ m/s}^2)(25 \text{ m}) = -245 \text{ J} \approx -0.25 \text{ kJ}$

(b) The power required of the dam is

$$P = \frac{W}{t} = \frac{W}{1 \text{ s}} = 50 \times 10^6 \text{ Watts} \Rightarrow W = 50 \times 10^6 \text{ J}$$

That is, 50×10^6 J of energy is required per second for the dam. Out of the 245 J of lost potential energy, $(245 \text{ J})(0.80) = 196 \text{ J}$ is converted to electrical energy. Thus, the amount of water needed per second is $(50 \times 10^6 \text{ J})(1 \text{ kg}/196 \text{ J}) = 255{,}000 \text{ kg} \approx 2.6 \times 10^5 \text{ kg}$.