Mass Balance–Salt in a Storm Sewer

CENG 340–Introduction to Environmental Engineering
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(adapted from *Environmental Engineering* by Davis and Cornwell)
A storm sewer is carrying snow melt containing 1,200 g/L of sodium chloride into a small stream. The stream has a naturally occurring sodium chloride concentration of 20 mg/L. If the storm sewer flow rate is 2000 L/min and the stream flow rate is 2.0 m^3/s, what is the concentration of the salt in the stream after the discharge point? Assume that the sewer flow and stream flow are completely mixed, and that the salt is a conservative substance (it does not react) and that the system is at steady state?

Step 1:

Underline any words or phrases that are unclear to you–i.e., even if you understand the English, there are a few key phrases in the problem that we have not covered.

Step 2:

Draw a mass balance diagram.

Step 3:

Write a mass balance equation:

Step 4:

Solve the mass balance equation: