

CASE STUDY#1

CFD assessment of gas emissions from a pond

A CFD assessment was performed to predict the CO₂ emissions from a pond under certain wind conditions. The study has shown that the CO₂ gases are being re-entrained into the nearby building (Figure 1). The emitted concentrations exceeded the recommended threshold values, leading to a human health risk.

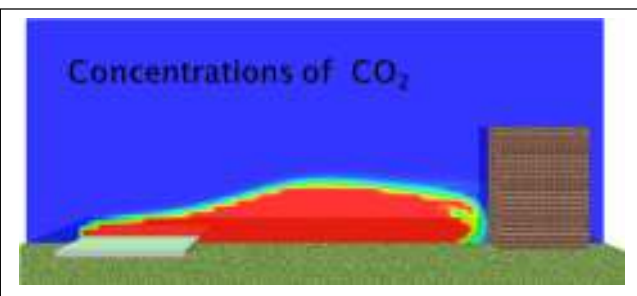
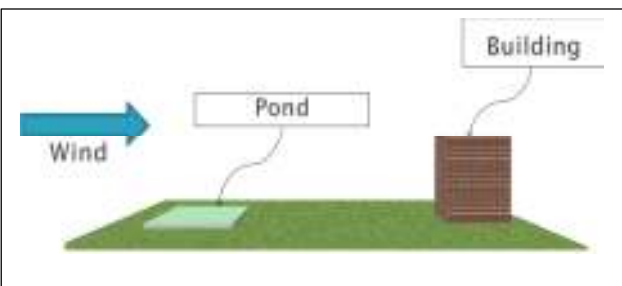


Figure 1: Original design: High gas concentrations reaching the building.

In order to reduce the emissions from the pond, a new design was proposed based on installing a wall around the pond. This wall can be made of trees, a typical hill or real concrete wall. With this new design, the emitted gas concentrations has been dramatically reduced (up to 80% reduction), and only acceptable concentration values are re-entrained into the building under all wind conditions (Figure 2).

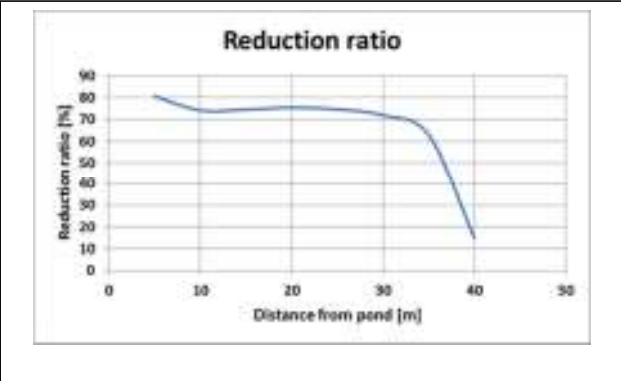
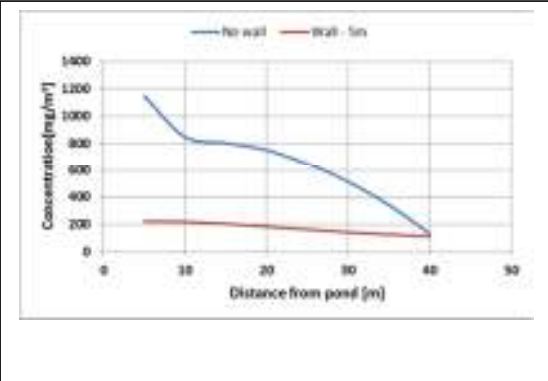
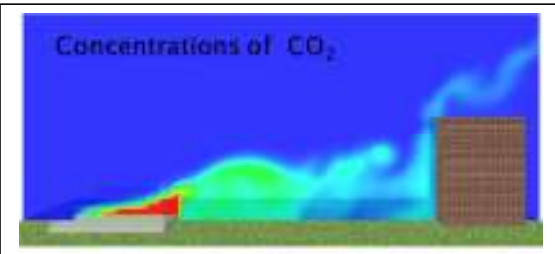


Figure 2: New design: Emitted gas concentrations are dramatically reduced.

CASE STUDY#2

CFD assessment of gas emissions from an underground pipe

A CFD assessment was performed to predict gas emissions from an underground pipe under certain wind conditions. The objective of this study is to determine, under which wind conditions, the gas concentrations will migrate to the building (figure 1).

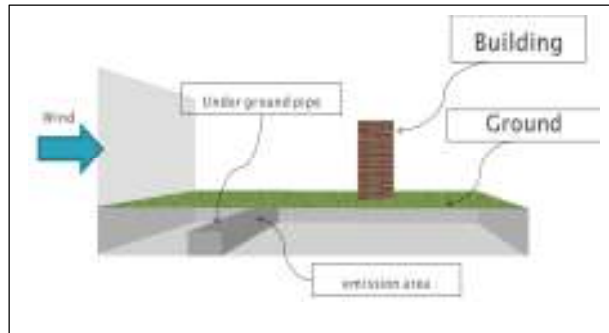


Figure 1: Modeling conditions.

The study has shown that, under certain wind speed (figure 2), the emitted gas will migrate to the building.

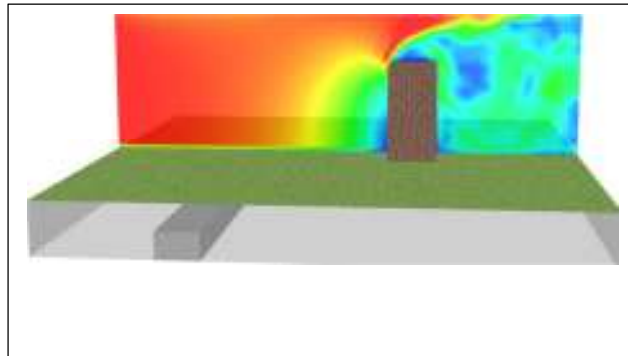


Figure 2: Wind speed distribution.

The migration is occurring underneath the building floor, similar to the vapor intrusion process, as well as through a side wall window (figure3).

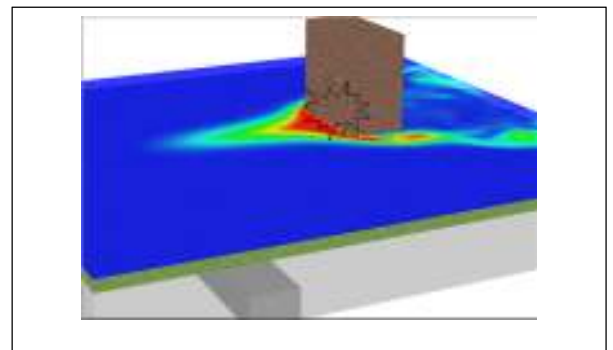
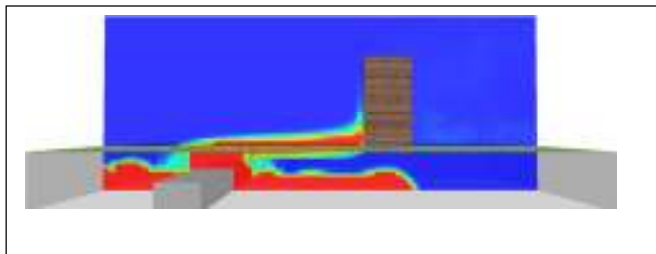


Figure 3: Migration of gas concentrations