

Back-Diffusion Implications for Remediation Strategy

By

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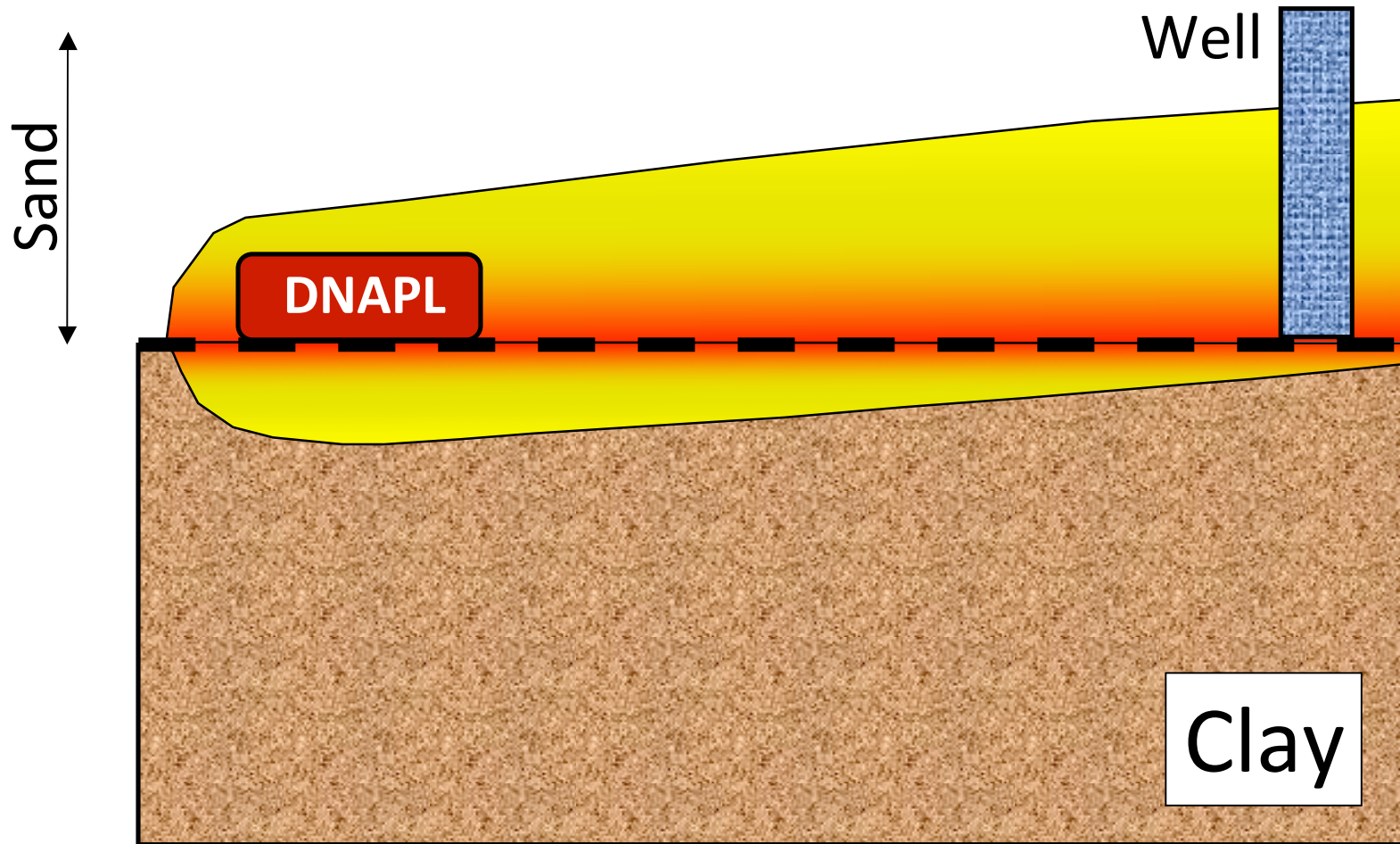
Dr. Ed McBean (University of Guelph)



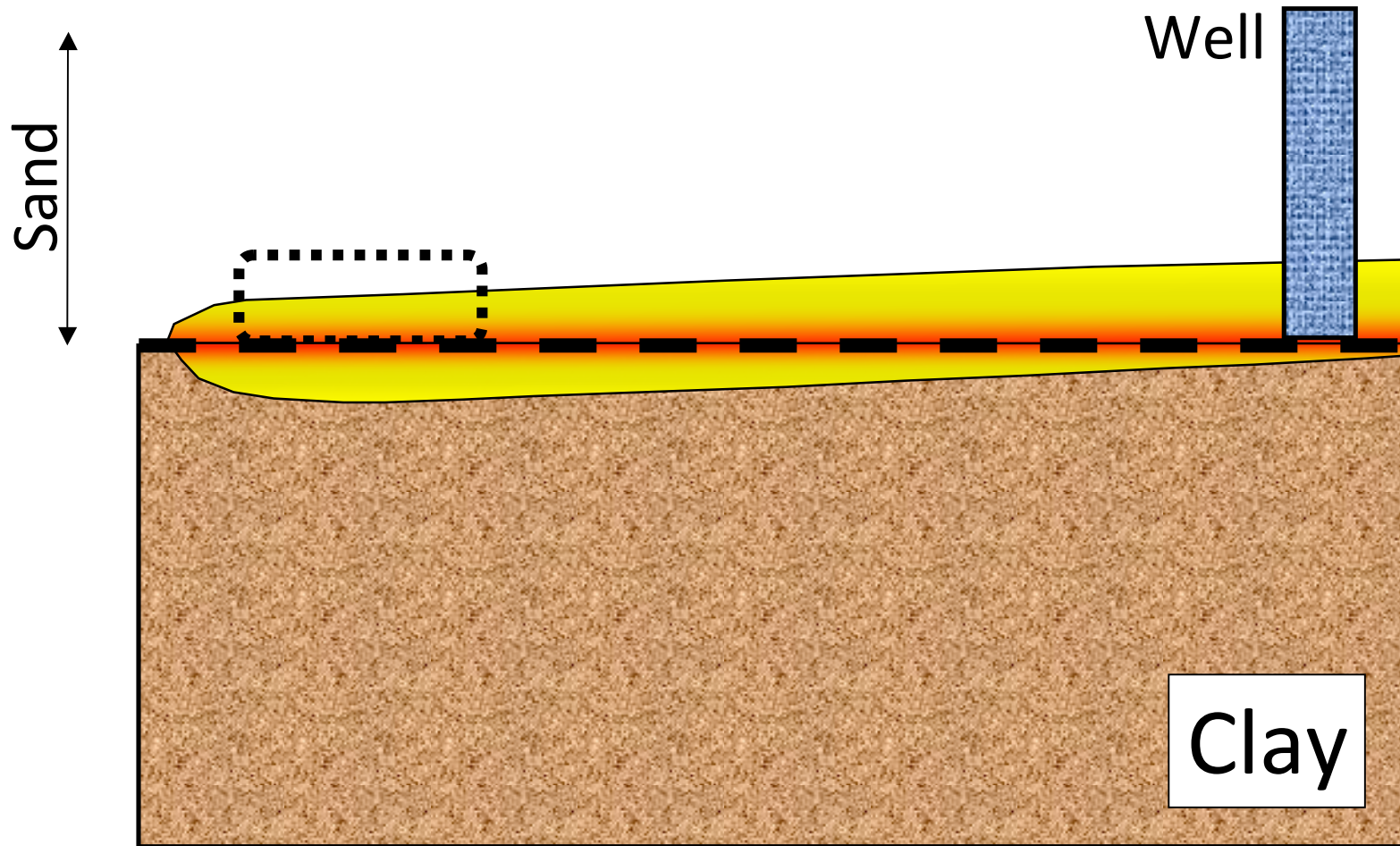
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DNAPL Source Creates GW Plume



Back-Diffusion after Source Treatment



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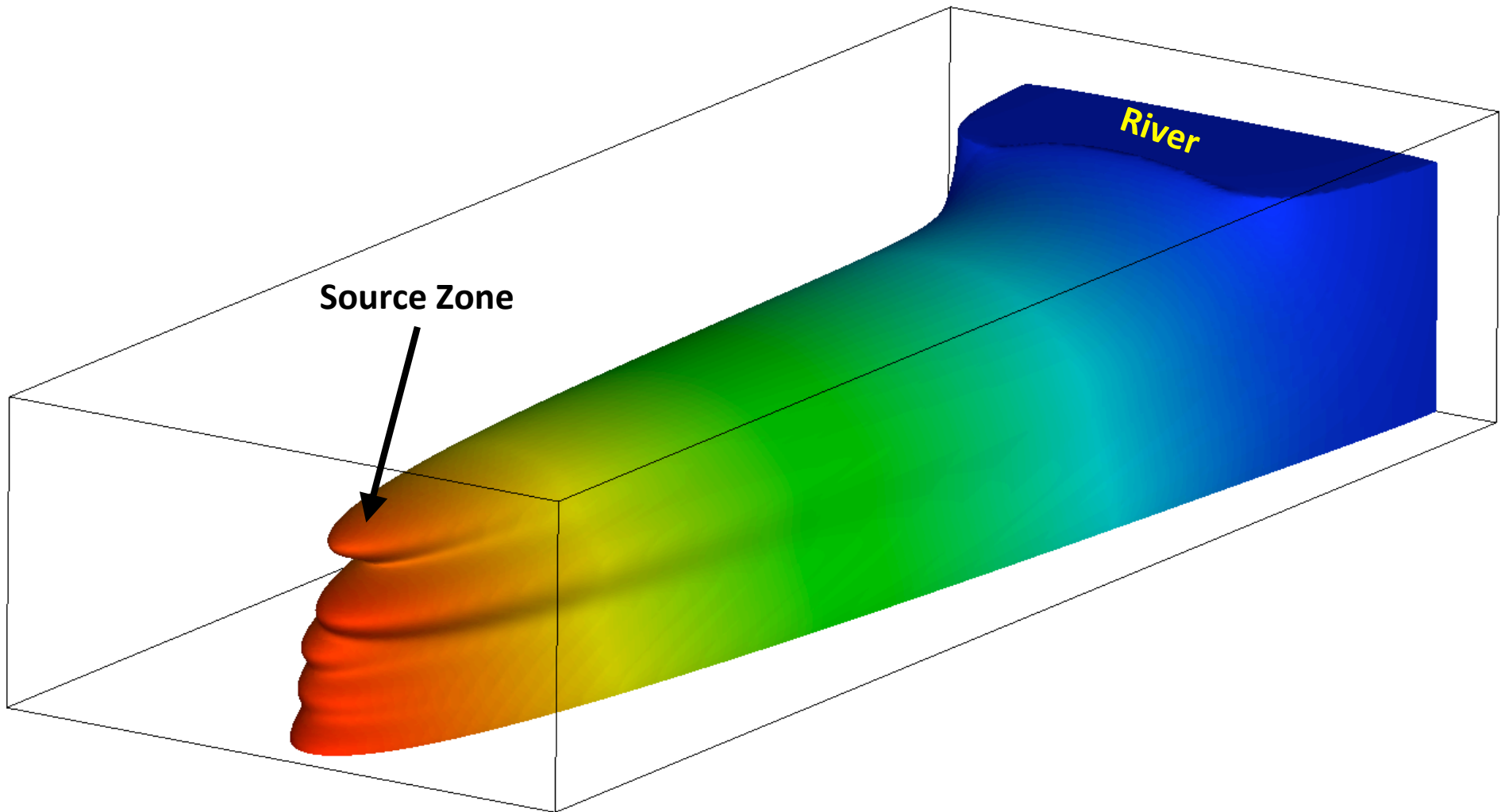
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Study Purpose

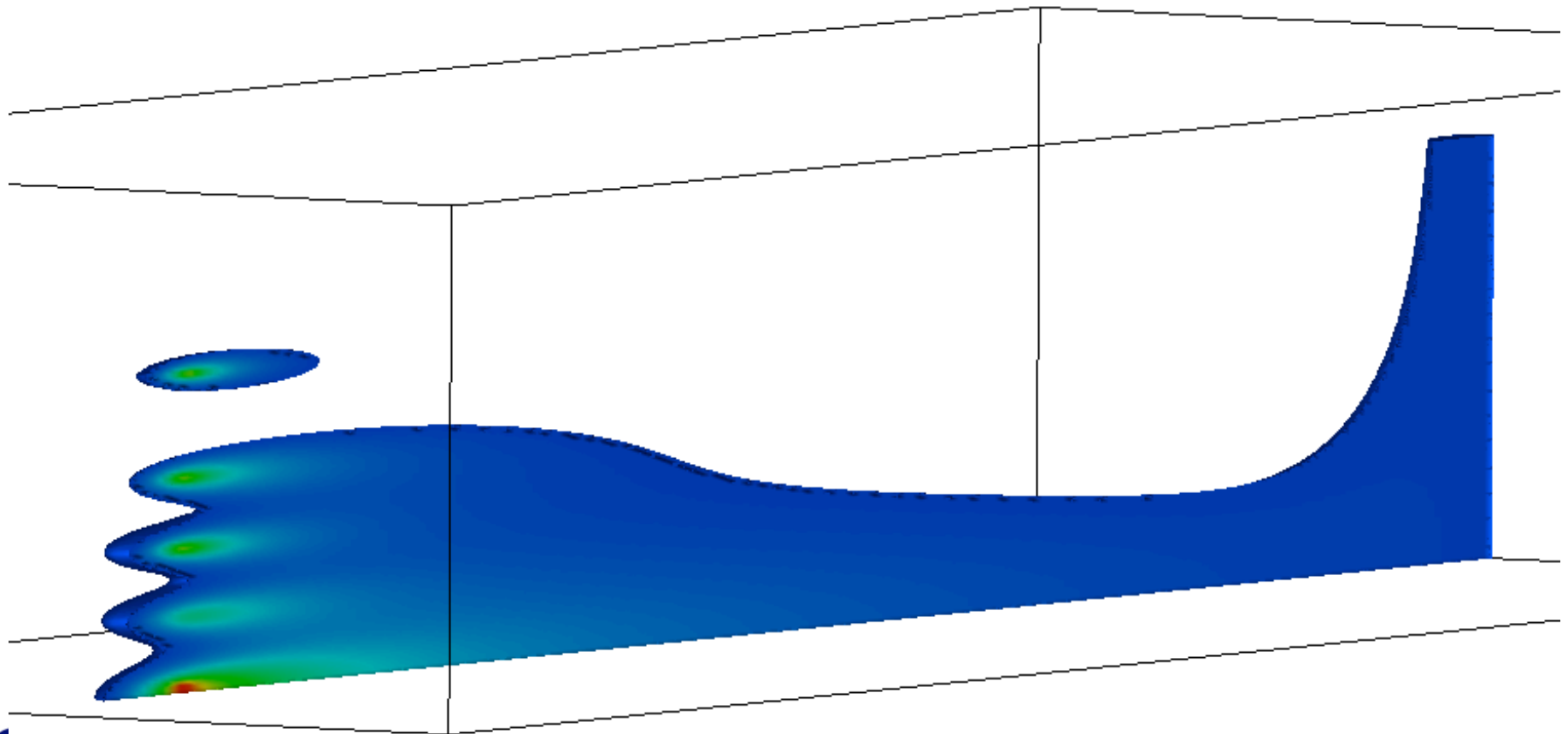
- Back-diffusion influence on:
 - Integrated source and plume strategy
 - Sustainability considerations



Source and Aqueous Plume



Slice Through Plume (C>100 mg/L)



Remedial Evaluation

- Source remediation
 - Enhanced pump-and-treat
 - In-situ bioremediation
 - Thermal
 - Containment (P&T, PRB)
- Plume containment (P&T, PRB)



Methodology

- NAPL Depletion Model (NDM)
 - Remediation timeframe
 - Groundwater concentrations at extraction wells
 - Treatment options
- Net present value costs



Findings

- Back-diffusion → aggressive source remediation is not efficient
 - Balance source treatment and plume management timeframes to optimize costs



Findings

- Enhanced pump-and-treat:
 - Treatment benefit
 - Alternative energy sources improve feasibility



Conclusion

- Remedial decisions require balancing of priorities
 - Cost, sustainability metrics, remediation timeframe, etc.
- Sophisticated analyses required to balance priorities and optimize costs for source/plume management

