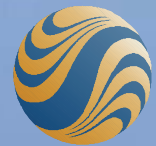


Dual Phase Vacuum Extraction Pilot Studies

Greg Saretzky, M.Sc., P.Eng.

Tony Gregov, BAIEM

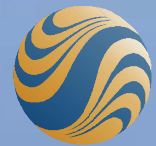
Tim Robbie, B.Sc. P.Eng.



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Outline

- Introduction
- Background
- Assessment of Remedial Alternatives
- Dual Phase Vacuum Extraction (DPVE)
- Remediation Equipment
- Results
- Summary



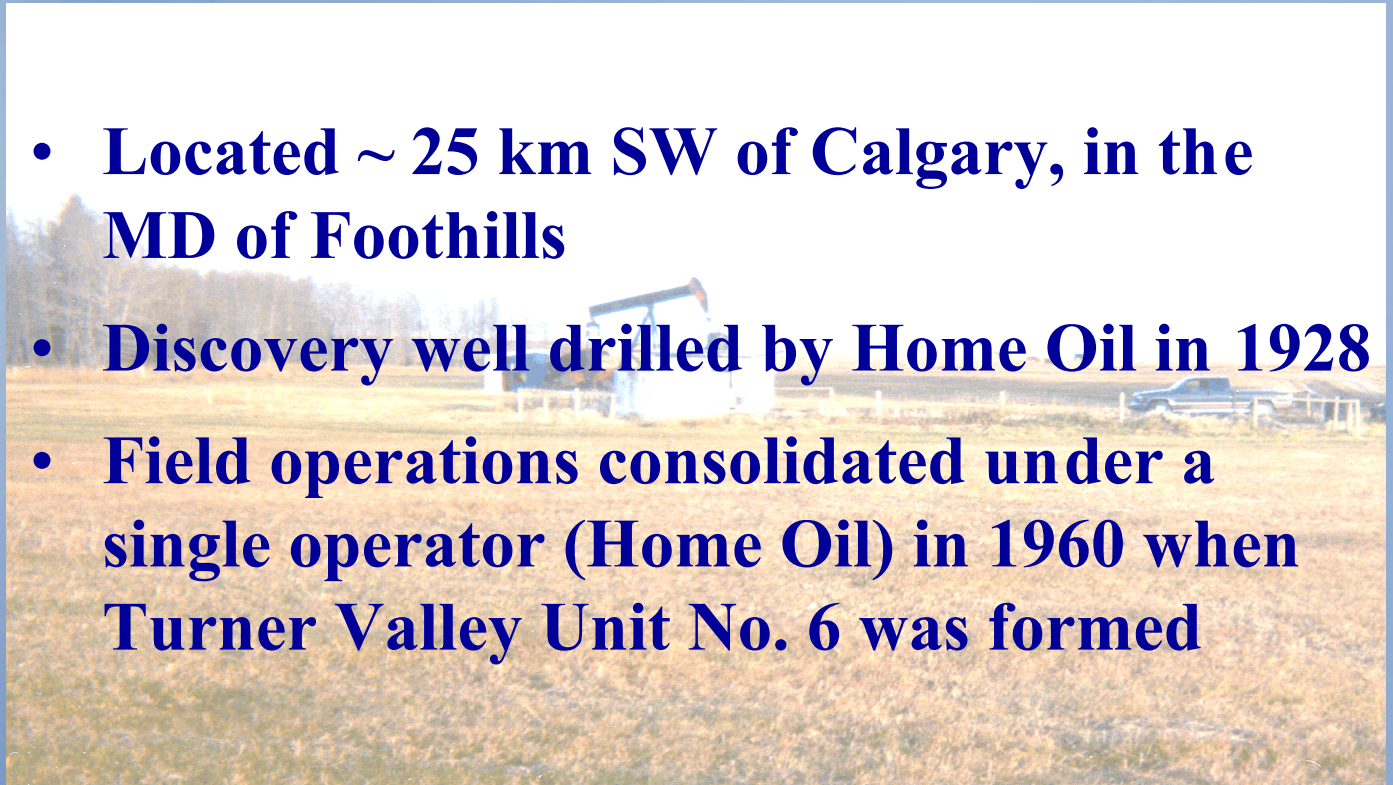
Why is Turner Valley Unique?

- Oldest field in Alberta
- Many facilities (30) within a small area
- Subdivision pressure
- Long term (10 year) project

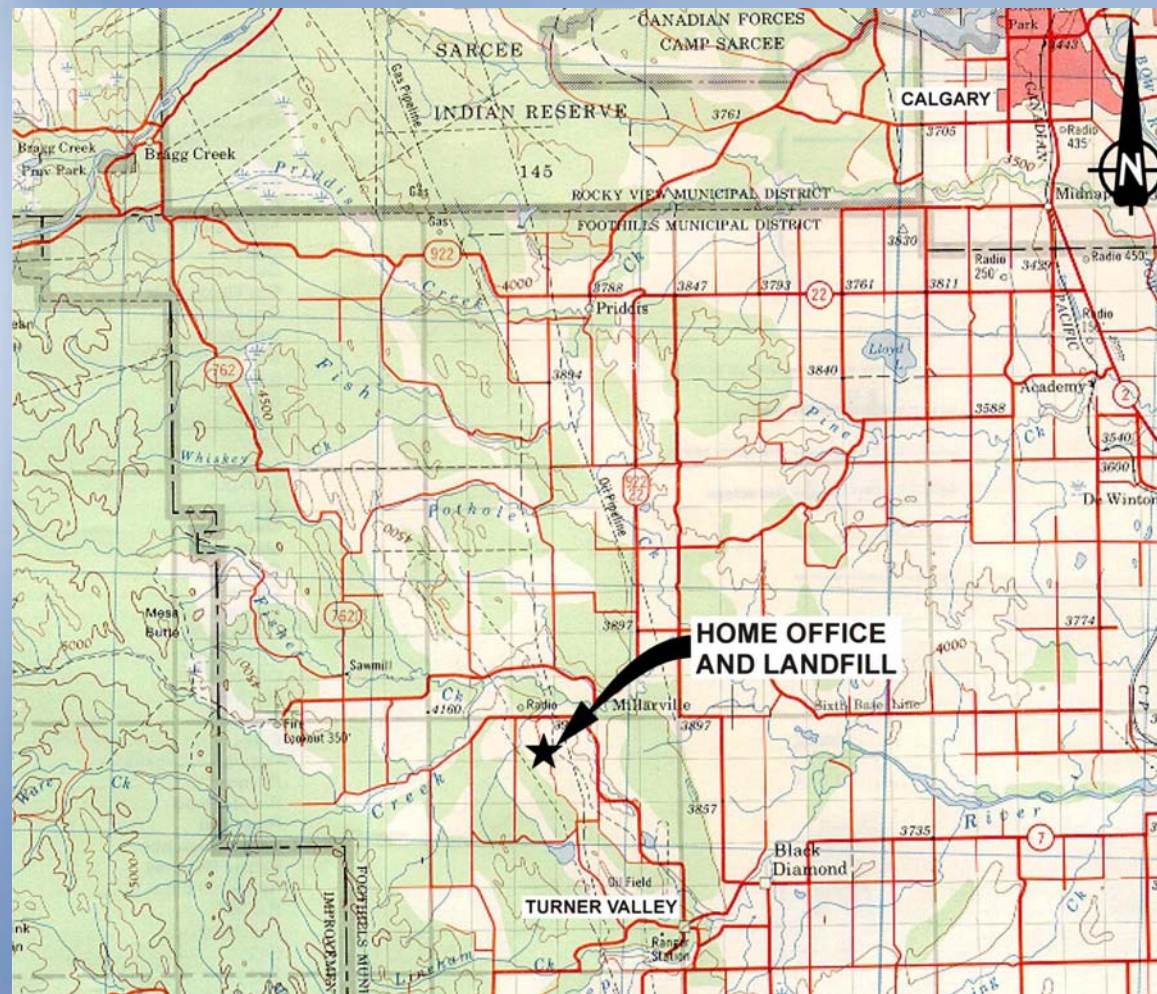
Turner Valley Unit No. 6

Background / History

- **Located ~ 25 km SW of Calgary, in the MD of Foothills**
- **Discovery well drilled by Home Oil in 1928**
- **Field operations consolidated under a single operator (Home Oil) in 1960 when Turner Valley Unit No. 6 was formed**



Field Location Map



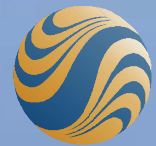
devon



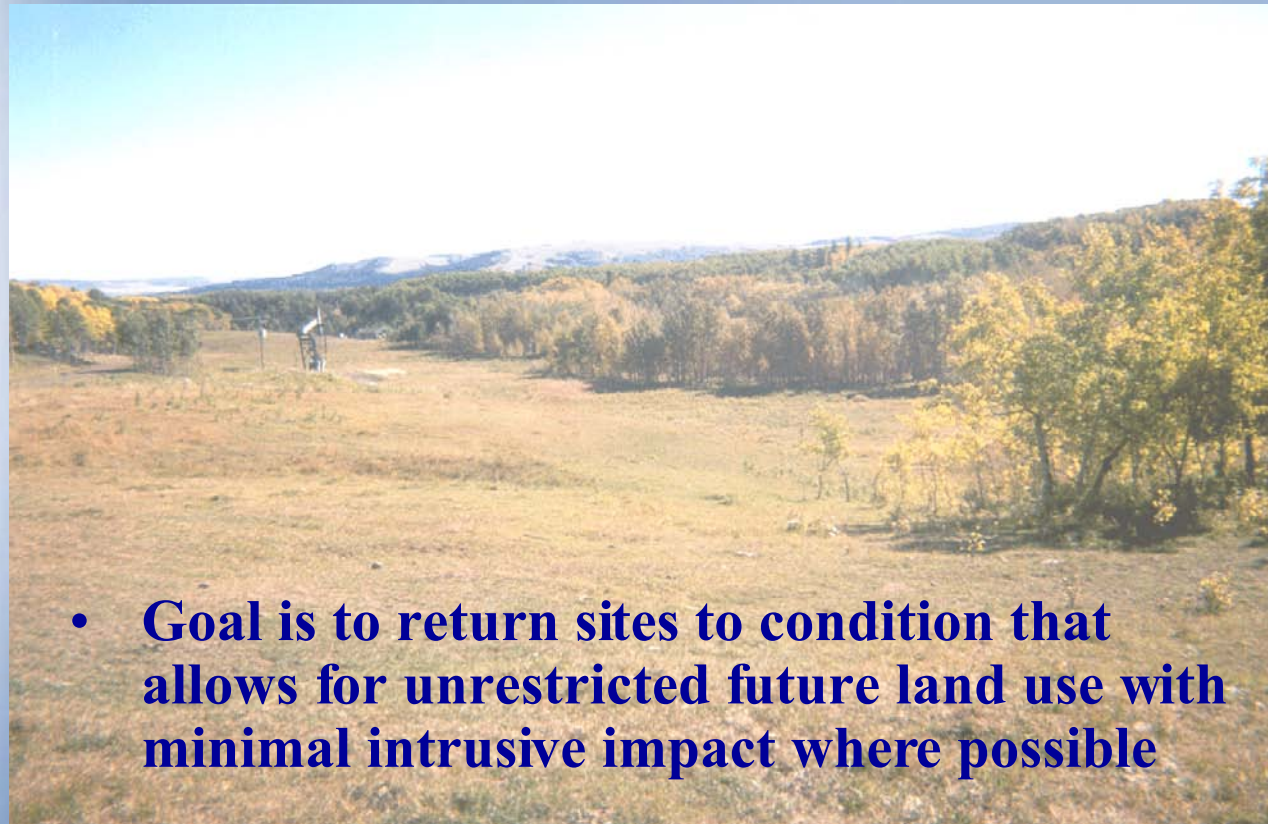
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Assessment of Remedial Alternatives

- Describes objectives, approach, framework for decision making
- Includes decision protocols
- Ensures decisions are consistent and defensible
- Holistic
- Forward looking



Remediation Goal

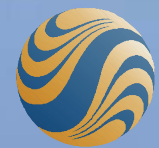
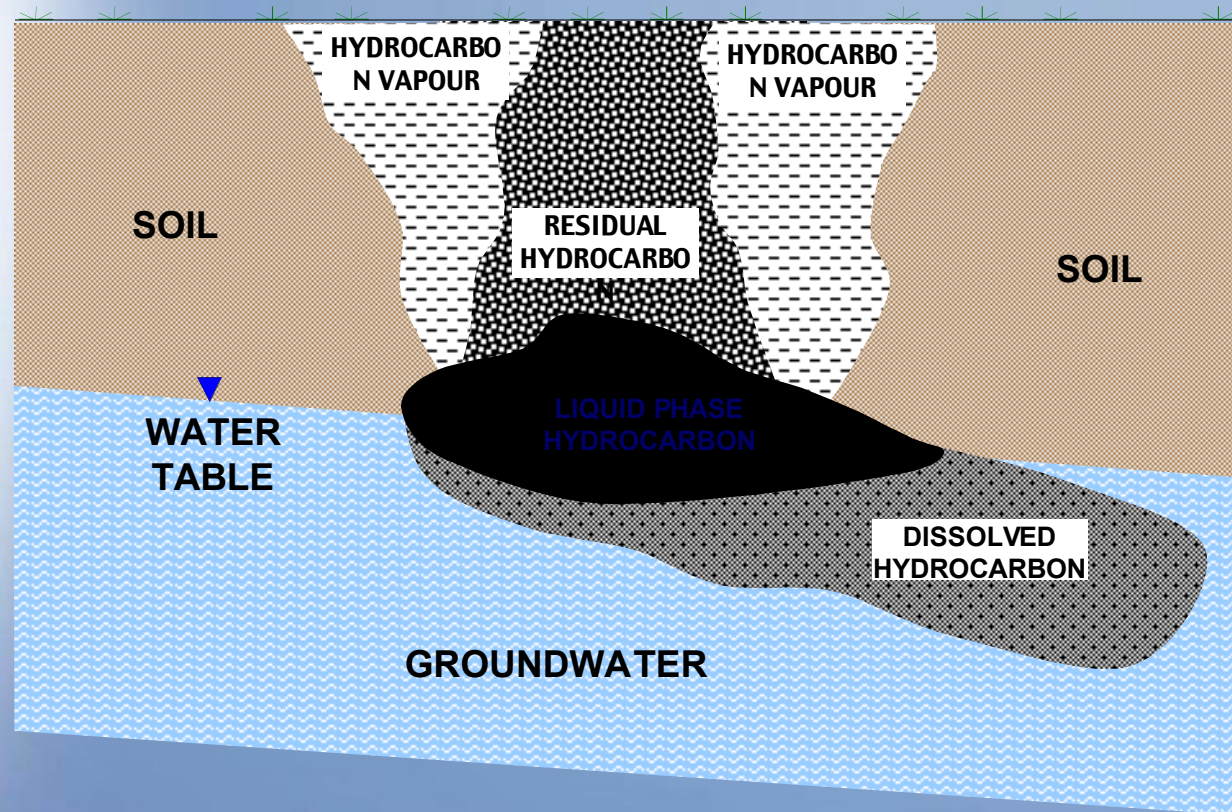


- **Goal is to return sites to condition that allows for unrestricted future land use with minimal intrusive impact where possible**

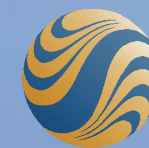
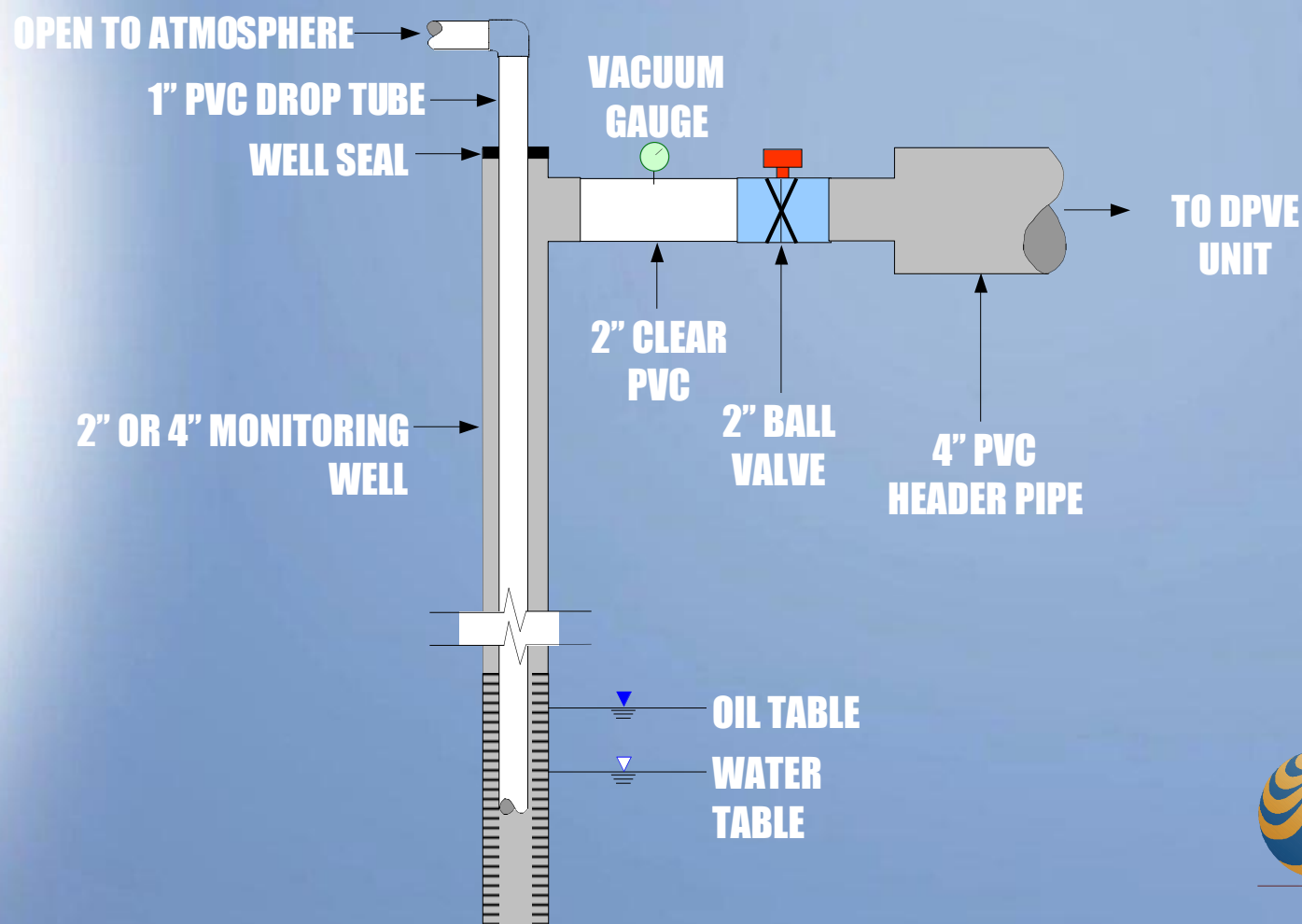


Four Hydrocarbon Phases

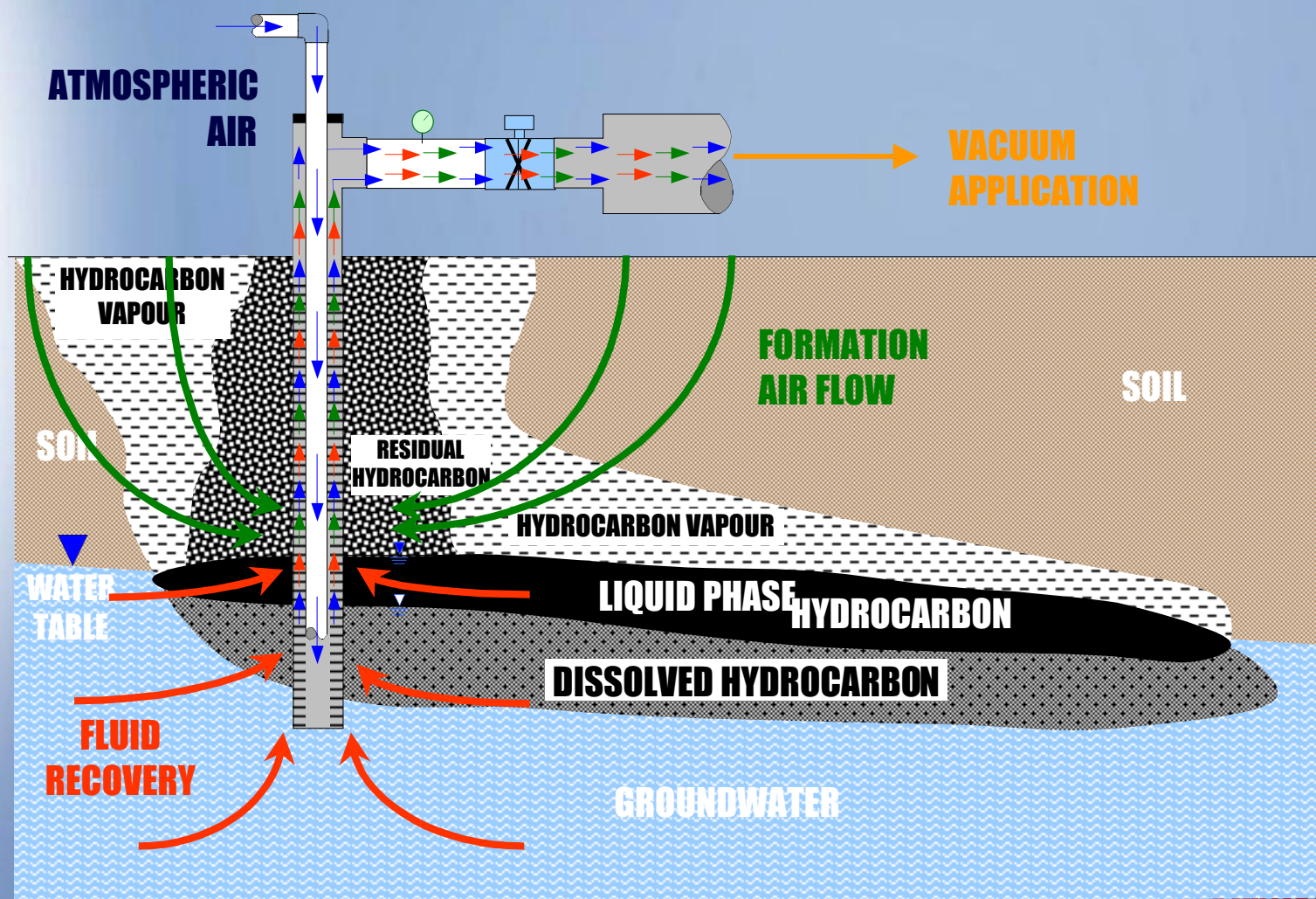
Vapour, residual, dissolved and liquid



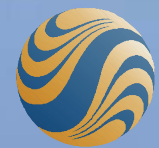
Recovery Well Configuration



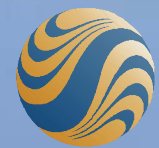
DPVE Operation



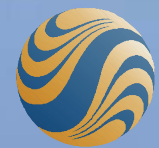
System Photograph



Recovery Well Photograph

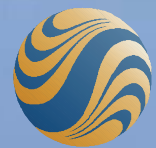


Header Pipe Network

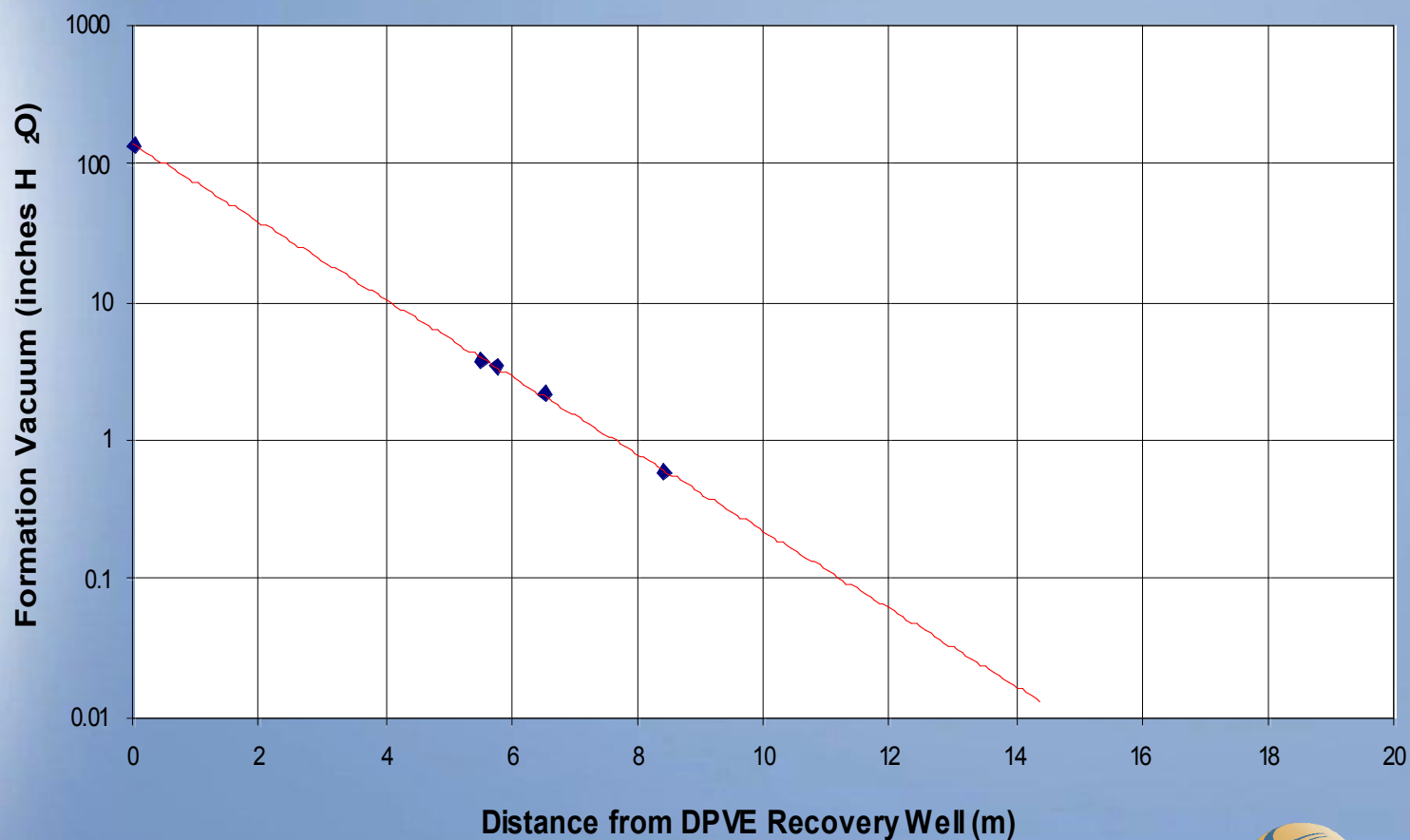


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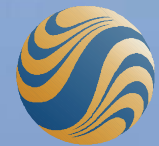
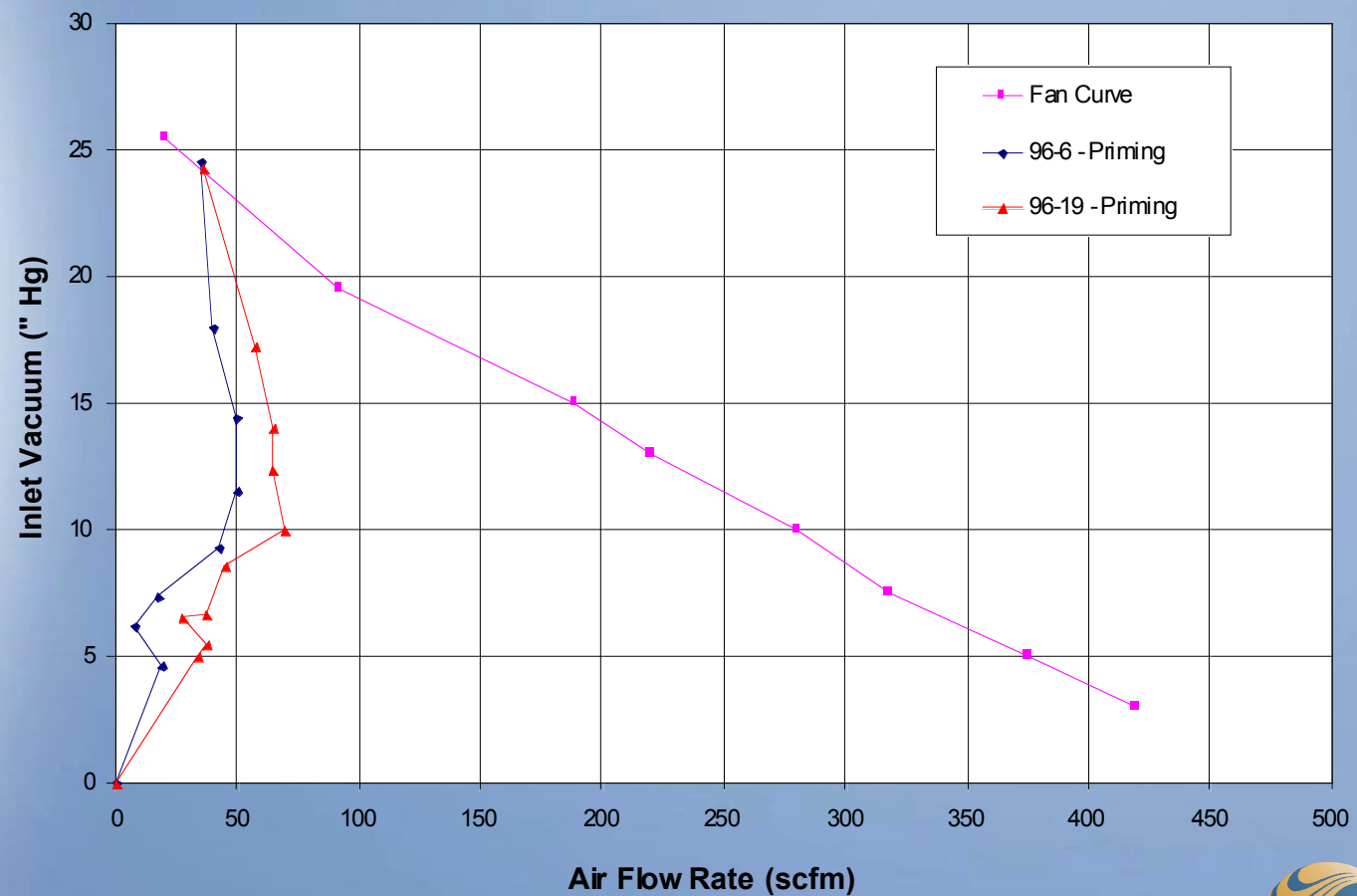
Construction



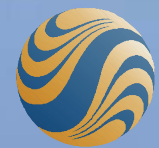
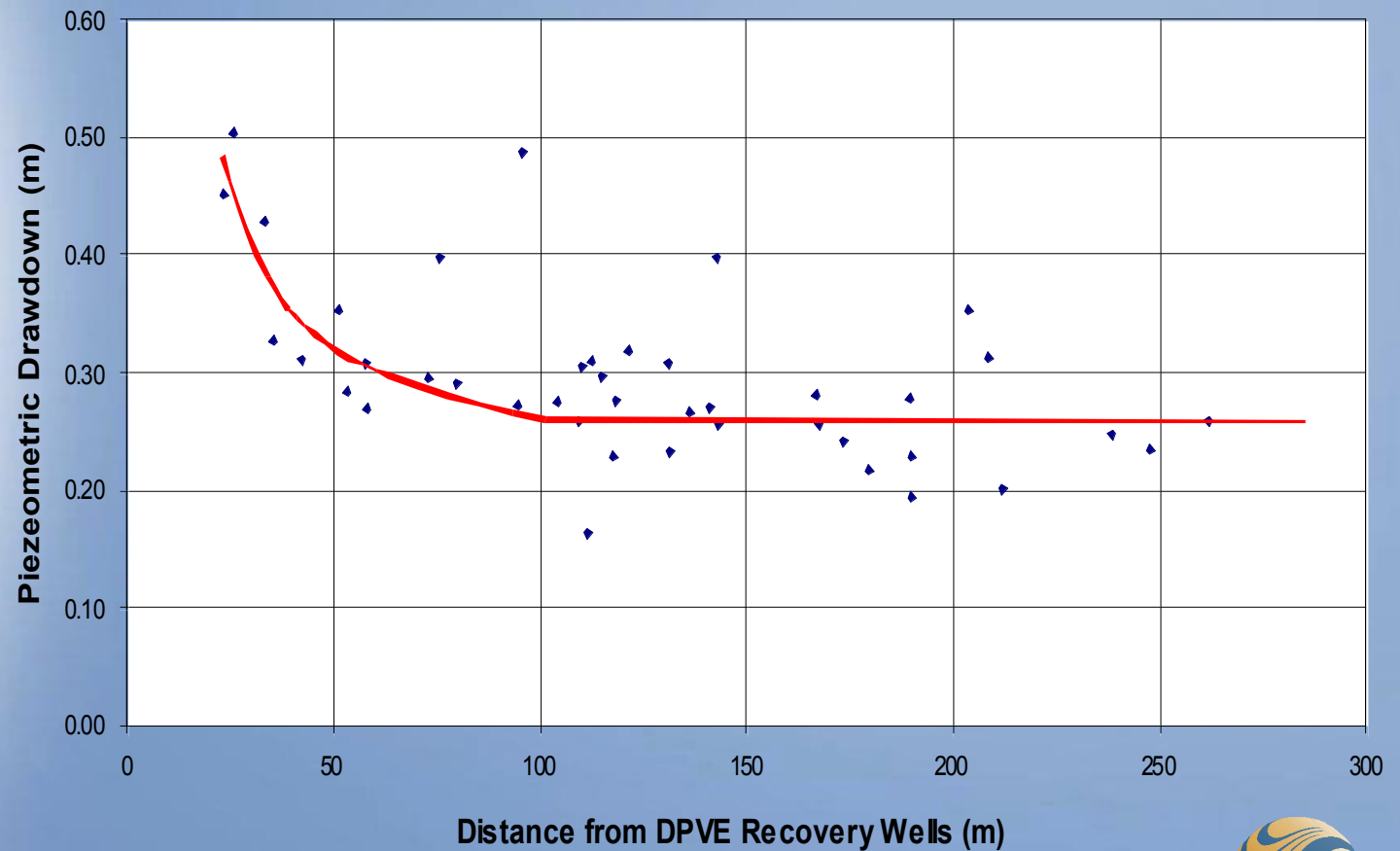
Results - Pneumatic Radius of Influence



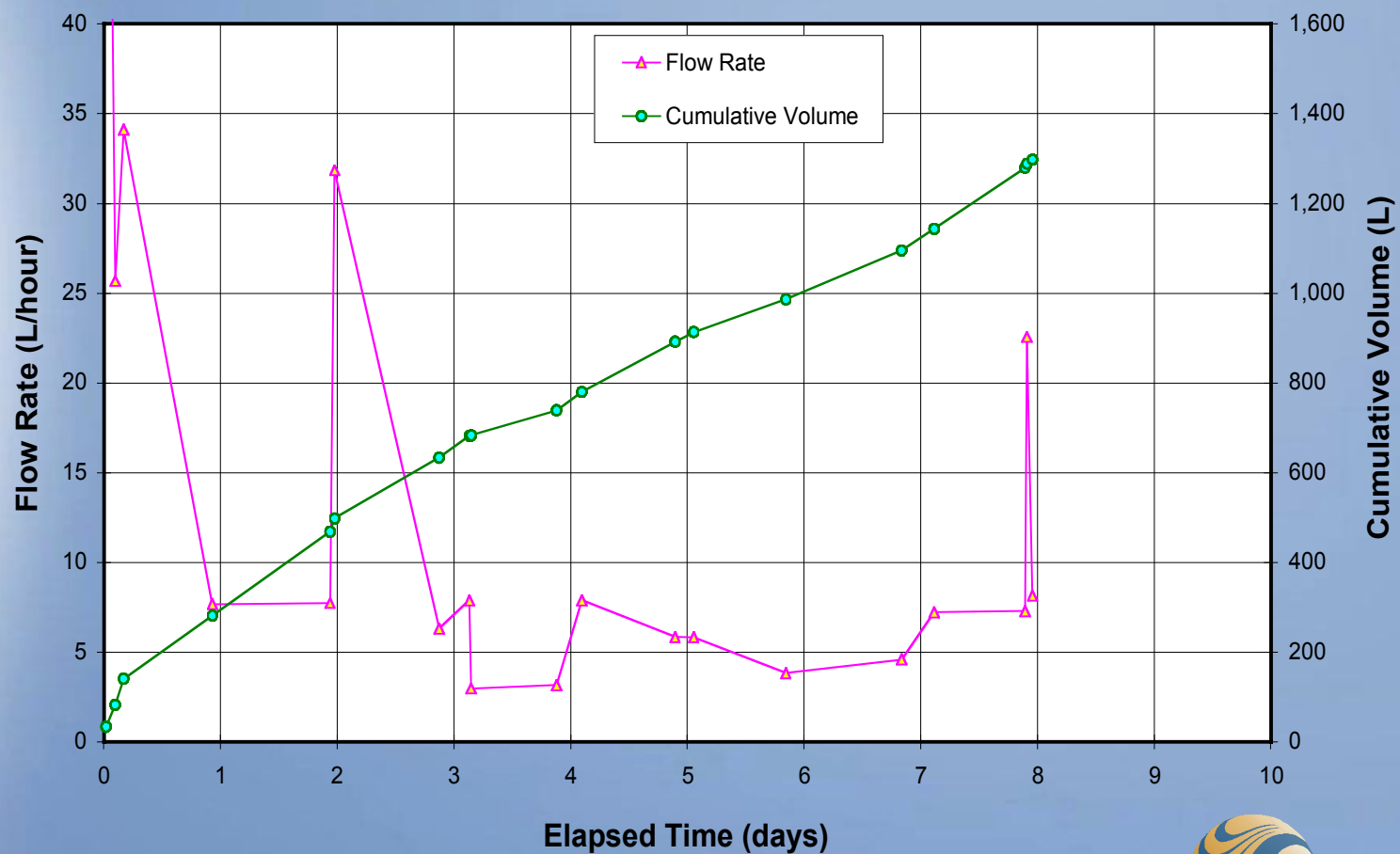
Results - DPVE System Curves



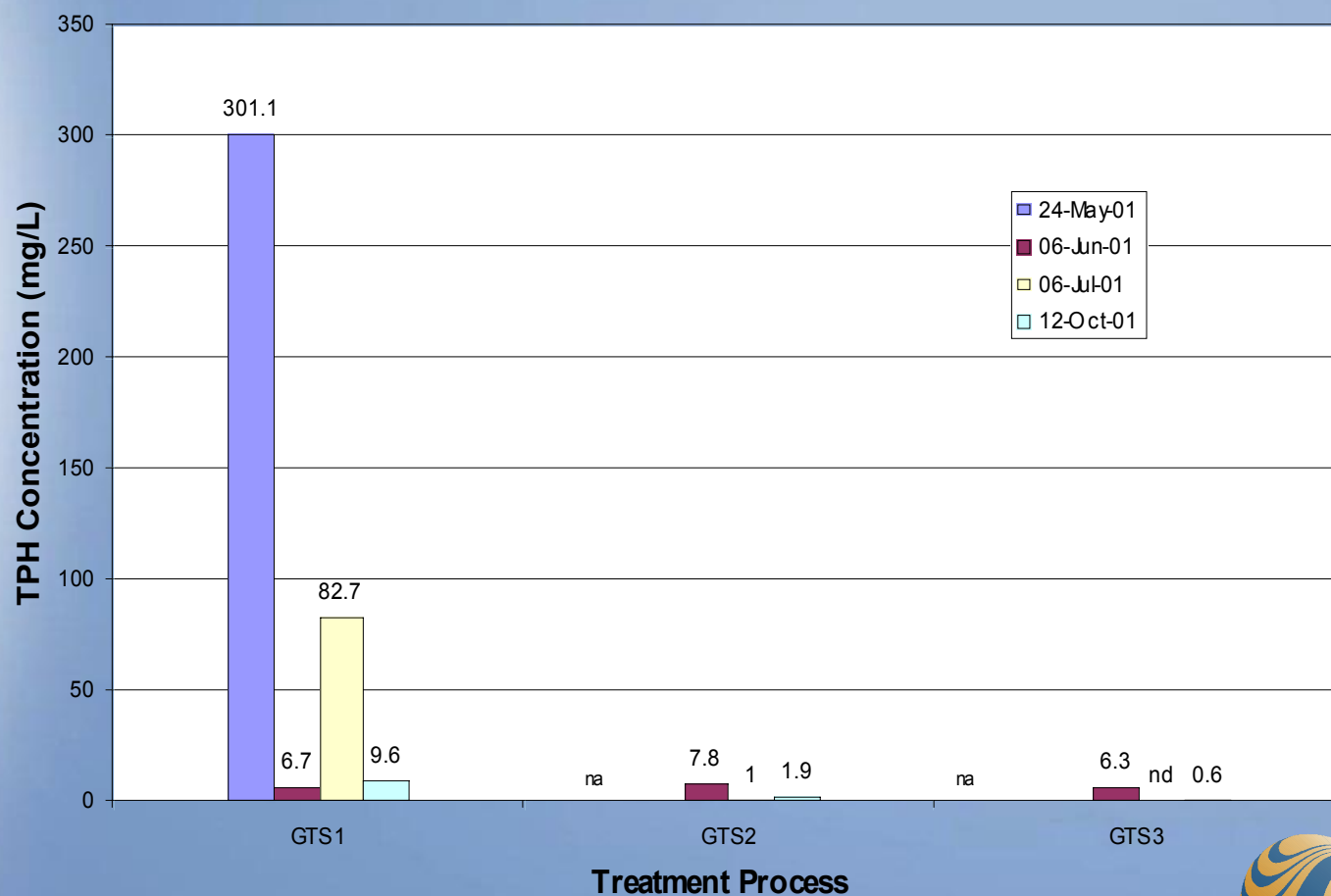
Results - Hydraulic Radius of Influence



Results - Hydrocarbon Recovery

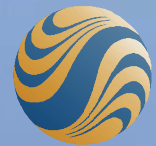


Results - Groundwater Treatment System



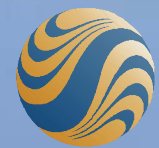
Summary

- Pilot study an effective means of determining the hydrocarbon recovery potential
- Cost effective in terms of significantly lower input costs as compared to capital costs of a full scale system
- Valuable information in order to refine the remedial action plan
- Information required for full scale implementation



Acknowledgements

**Devon Canada Corporation
Ground Effects Environmental
Services Inc.**



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