

# Hatfield-3303: Monitoring effectiveness of steam assisted gravity drainage (SAGD) operations

Monitoring effectiveness of steam assisted gravity drainage (SAGD) operations

## Challenge

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------|--------------------------------------|
| Challenge ID:                                                                                                                                                                                                                                                                                                                                | HCP-3303                                                                       | Originator:                     | Onshore: Hatfield                    |
| Title:                                                                                                                                                                                                                                                                                                                                       | Monitoring effectiveness of steam assisted gravity drainage (SAGD) operations. |                                 |                                      |
| Theme:                                                                                                                                                                                                                                                                                                                                       | ON 3.3: Subsidence monitoring - Reservoir management                           |                                 |                                      |
| Consortium Lead:                                                                                                                                                                                                                                                                                                                             | C-CORE                                                                         | Interviewed Company:            | C-CORE                               |
| Geography:                                                                                                                                                                                                                                                                                                                                   | ON.REG.03 - Canada                                                             |                                 |                                      |
| Challenge Description                                                                                                                                                                                                                                                                                                                        |                                                                                |                                 |                                      |
| What is not possible / not adequately addressed at present?                                                                                                                                                                                                                                                                                  |                                                                                |                                 |                                      |
| Need to identify effectiveness of steam chamber operations (e.g. with long linear horizontal drilling activity at depths of 100 - 700m). Track / monitor the distribution of injected steam based on reservoir model, surface thermal profile, and ground movement. Determine if the expected volume of bitumen produced based on water use. |                                                                                |                                 |                                      |
| What effect does this challenge have on operations?                                                                                                                                                                                                                                                                                          |                                                                                |                                 |                                      |
| Optimization could lead to increased oil production, reduced costs of steam production; and reduces waste-water. Goal is reduction of steam-to-oil ratio.                                                                                                                                                                                    |                                                                                |                                 |                                      |
| Thematic information requirements:                                                                                                                                                                                                                                                                                                           | Surface motion (horizontal and vertical)                                       |                                 |                                      |
| What do you currently do to address this challenge?                                                                                                                                                                                                                                                                                          |                                                                                |                                 |                                      |
| How is this challenge conventionally addressed?                                                                                                                                                                                                                                                                                              |                                                                                |                                 |                                      |
| Limited InSAR. Reservoir models. Drill/well logs.                                                                                                                                                                                                                                                                                            |                                                                                |                                 |                                      |
| What kind of solutions do you envisage could address this challenge?                                                                                                                                                                                                                                                                         |                                                                                |                                 |                                      |
| High-resolution thermal maps. Improved InSAR capability in vegetated environments.                                                                                                                                                                                                                                                           |                                                                                |                                 |                                      |
| What is your view on the capability of technology to meet this need?                                                                                                                                                                                                                                                                         |                                                                                |                                 |                                      |
| Are you currently using EO tech? If not, why not?                                                                                                                                                                                                                                                                                            |                                                                                |                                 |                                      |
| Resolution is too low at the moment - need thermal imaging with resolution of several metres.                                                                                                                                                                                                                                                |                                                                                |                                 |                                      |
| Challenge Classification                                                                                                                                                                                                                                                                                                                     |                                                                                |                                 |                                      |
| Impact on Lifecycle (0=none, 4=high):                                                                                                                                                                                                                                                                                                        |                                                                                | Climate / Topography / Urgency: |                                      |
| Pre-license:                                                                                                                                                                                                                                                                                                                                 | 1                                                                              | Climate class:                  | Generic climate                      |
| Exploration:                                                                                                                                                                                                                                                                                                                                 | 2                                                                              | Topographic class:              | Not specific                         |
| Development:                                                                                                                                                                                                                                                                                                                                 | 2                                                                              | Seasonal variations:            | Any season                           |
| Production:                                                                                                                                                                                                                                                                                                                                  | 4                                                                              | Impact area:                    | Cost reduction, Increased production |
| Decommissioning:                                                                                                                                                                                                                                                                                                                             | 3                                                                              | Technology urgency:             | 1 - Mid-Term (5-10 years)            |
| Challenge Information Requirements                                                                                                                                                                                                                                                                                                           |                                                                                |                                 |                                      |
| Update frequency:                                                                                                                                                                                                                                                                                                                            | Daily                                                                          |                                 |                                      |
| Data currently used:                                                                                                                                                                                                                                                                                                                         | LiDAR<br>Airphotos<br>High resolution imagery<br>InSAR                         |                                 |                                      |

|                       |               |
|-----------------------|---------------|
| Spatial resolution:   | Basin         |
| Thematic accuracy:    | Not specific  |
| Required formats:     | Not Specific  |
| Timeliness (Vintage): | Within a week |
| Geographic extents:   | License       |
| Existing standards:   | None          |

## Relevant products

### Content by label

There is no content with the specified labels