RockSolid™ - A Potential Game Changer in P&A

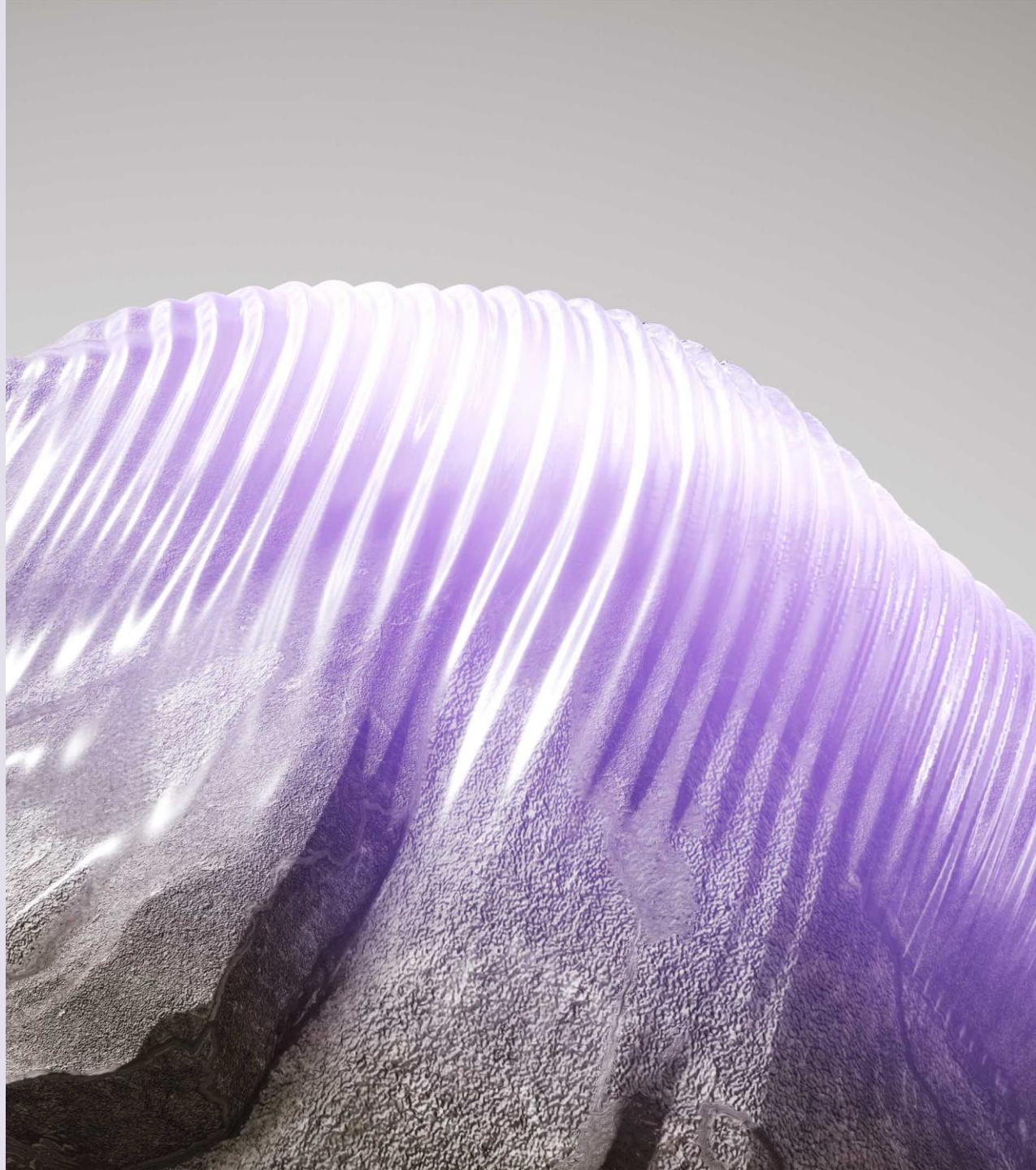
8th May 2025

Stian Tøndel and Kristian Solhaug

Interwell

Agenda

What is RockSolid™ ?
Status & timelines
Barrier
Seal potential
Strategy & Applications
9-5/8" development
Regulatory



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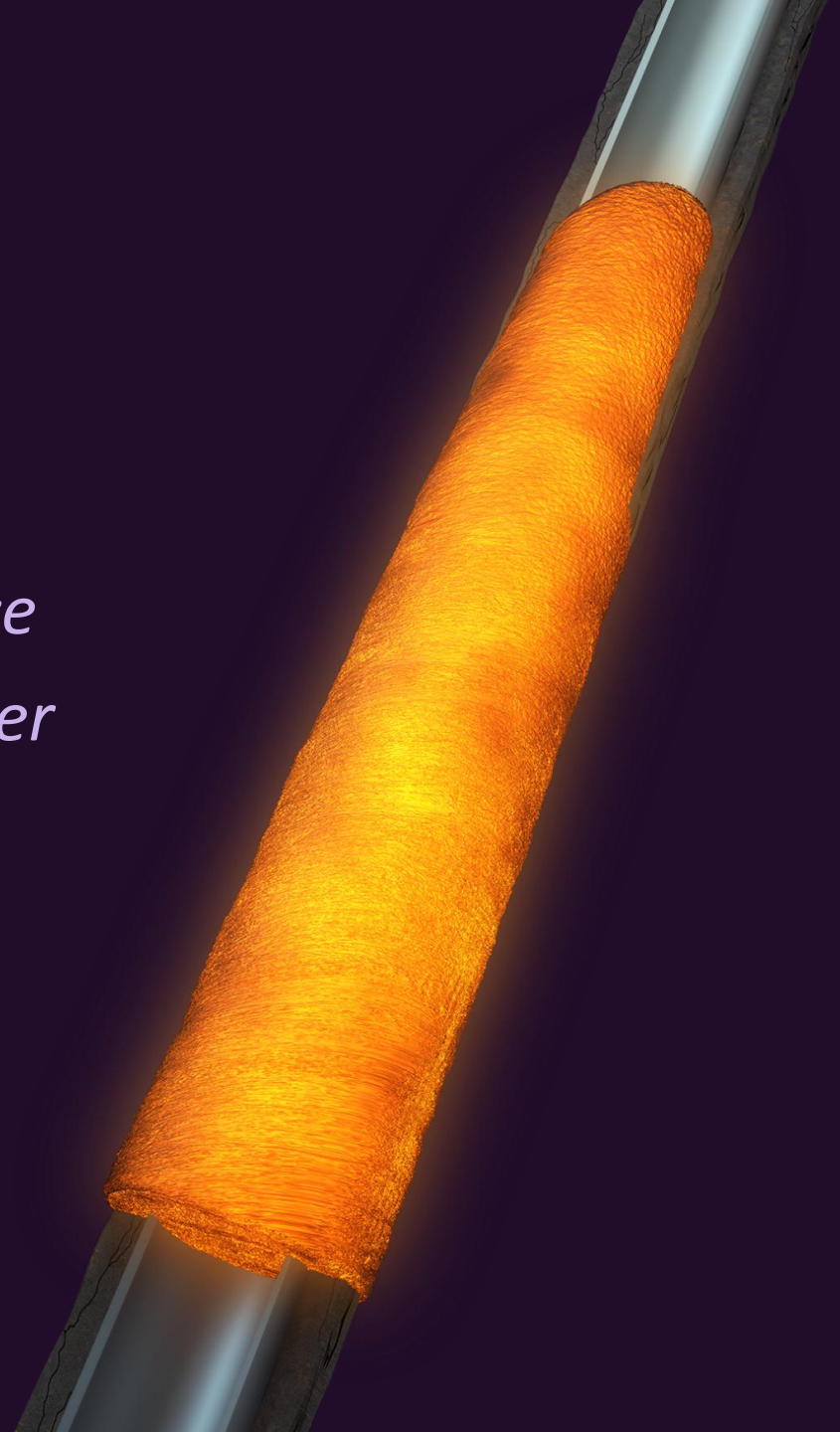
*What is **RockSolid™**?*

Single-run, rigless wireline solution that:

- *Removes man-made materials up to borehole face*
- *Replaces with uninterrupted bismuth-based barrier*

*It is powered by **thermite**.*



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Interwell P&A RS

→ Commercial; 4.5" and 5.5"

Rock to Rock

- → For 7" Single String application - TRL 6 – TRL 7 Q2 2025
- → For 9-5/8" Single String application - TRL 6 2026/2027
- → For 5,5" or 7" inside 9-5/8" Thru Tubing / Dual String

Other Application areas

- → Metal-to-Metal Barrier and NCS bismuth qualification
- → CCS
- → Zonal isolation

Key Focus Areas

- → Technology Development & Qualification
- → Standards and regulations
  - Bismuth approved deep-set well barrier material NCS
- → Monitoring/verification

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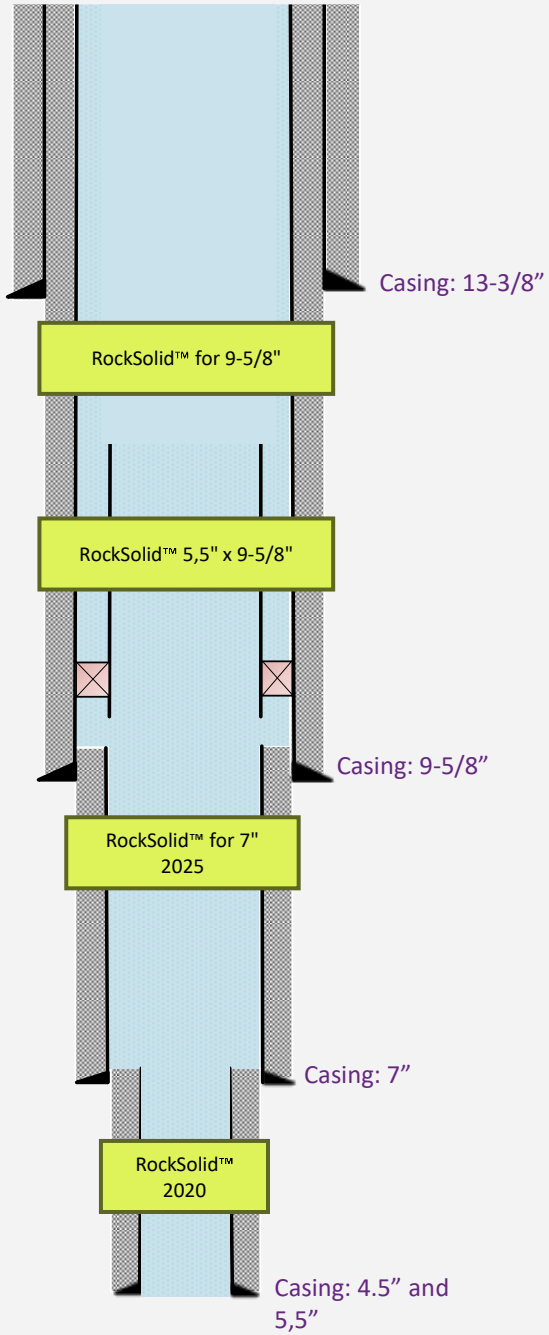

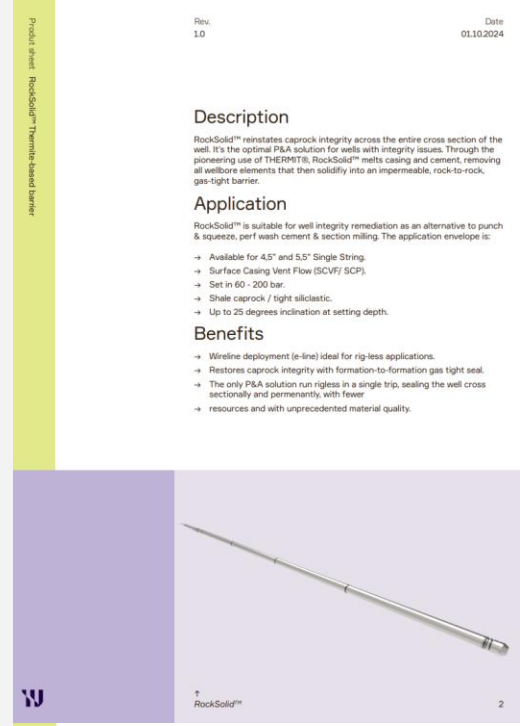
Product sheet RockSolid™ Thermite-based barrier

Rev. 1.0 Date 01.10.2024

Description

RockSolid™ reinstates caprock integrity across the entire cross section of the well. It's the optimal P&A solution for wells with integrity issues. Through the pioneering use of THERMIT®, RockSolid™ melts casing and cement, removing all wellbore elements that then solidifiy into an impermeable, rock-to-rock, gas-tight barrier.

Application

RockSolid™ is suitable for well integrity remediation as an alternative to punch & squeeze, perf wash cement & section milling. The application envelope is:

- → Available for 4,5" and 5,5" Single String.
- → Surface Casing Vent Flow (SCVF/ SCP).
- → Set in 60 - 200 bar.
- → Shale caprock / tight siliclastic.
- → Up to 25 degrees inclination at setting depth.

Benefits

- → Wireline deployment (e-line) ideal for rig-less applications.
- → Restores caprock integrity with formation-to-formation gas tight seal.
- → The only P&A solution run rigless in a single trip, sealing the well cross sectionally and permenantly, with fewer
- → resources and with unprecedented material quality.

RockSolid™

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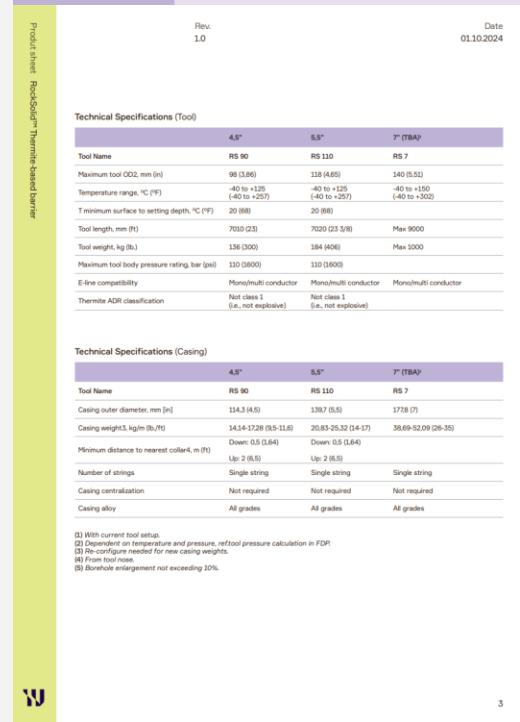
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Technical Specifications (Tool)

	4,5"	5,5"	7" (TBA)¹
Tool Name	**RS 90**	**RS 110**	**RS 7**
Maximum tool OD2, mm (in)	98 (3,86)	118 (4,65)	140 (5,51)
Temperature range, °C (°F)	-40 to +125 (-40 to +257)	-40 to +125 (-40 to +257)	-40 to +150 (-40 to +302)
T minimum surface to setting depth, °C (°F)	20 (68)	20 (68)	
Tool length, mm (ft)	7010 (23)	7020 (23 3/8)	Max 9000
Tool weight, kg (lb.)	136 (300)	184 (406)	Max 1000
Maximum tool body pressure rating, bar (psi)	110 (1600)	110 (1600)	
E-line compatibility	Mono/multi conductor	Mono/multi conductor	Mono/multi conductor
Thermite ADR classification	Not class 1 (i.e., not explosive)	Not class 1 (i.e., not explosive)	

Technical Specifications (Casing)

	4,5"	5,5"	7" (TBA)¹
Tool Name	**RS 90**	**RS 110**	**RS 7**
Casing outer diameter, mm [in]	114,3 (4,5)	139,7 (5,5)	177,8 (7)
Casing weight3, kg/m (lb./ft)	14,14-17,28 (9,5-11,6)	20,83-25,32 (14-17)	38,69-52,09 (26-35)
Minimum distance to nearest collar4, m (ft)	Down: 0,5 (1,64) Up: 2 (6,5)	Down: 0,5 (1,64) Up: 2 (6,5)	
Number of strings	Single string	Single string	Single string
Casing centralization	Not required	Not required	Not required
Casing alloy	All grades	All grades	All grades

(1) *With current tool setup.*
(2) *Dependent on temperature and pressure, refTool pressure calculation in FDP.*
(3) *Re-configure needed for new casing weights.*
(4) *From tool nose.*
(5) *Borehole enlargement not exceeding 10%.*

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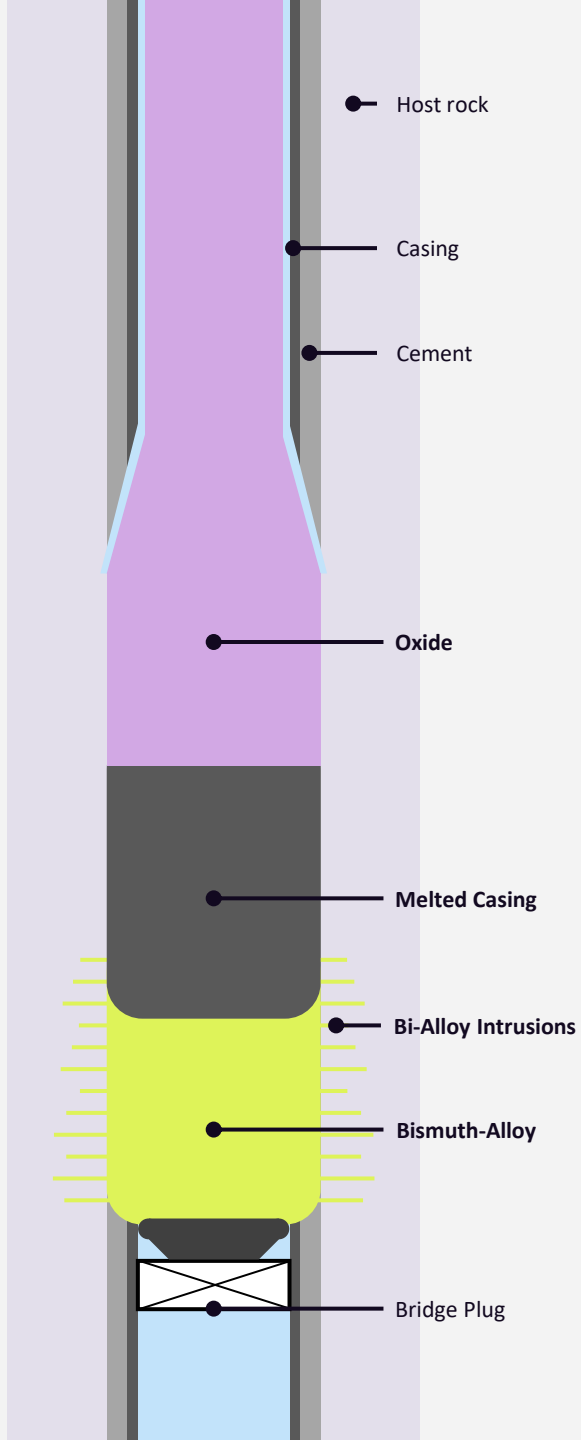
RockSolid™ 3-phase Barrier Schematic

- The RockSolid™ barrier is a combination 3 specific materials . Each of the barrier materials is a result from the thermite reaction and melting of the man-made well elements, solidifying to an eternal gas sealing barrier.

RockSolid™ Formation-to-Formation Barrier System

- **Oxide**
  Mineralogic composition analogous to magmatic rock such as basalt, produced as a result from the thermite reaction melting and mixing with decomposed annular cement.
- **Melted Casing**
  Steel originating from the casing that has been melted as part of the exothermic reaction, composed of steel with similar material structure as the original casing steel.
- **Bismuth-Alloy**
  A proprietary bismuth-based alloy tailored to benefit from the best corrosion resistance, creep, reach and seal towards formation. Combined with extremely low viscosity to penetrate and seal any host rock fractures as small as 1µm.



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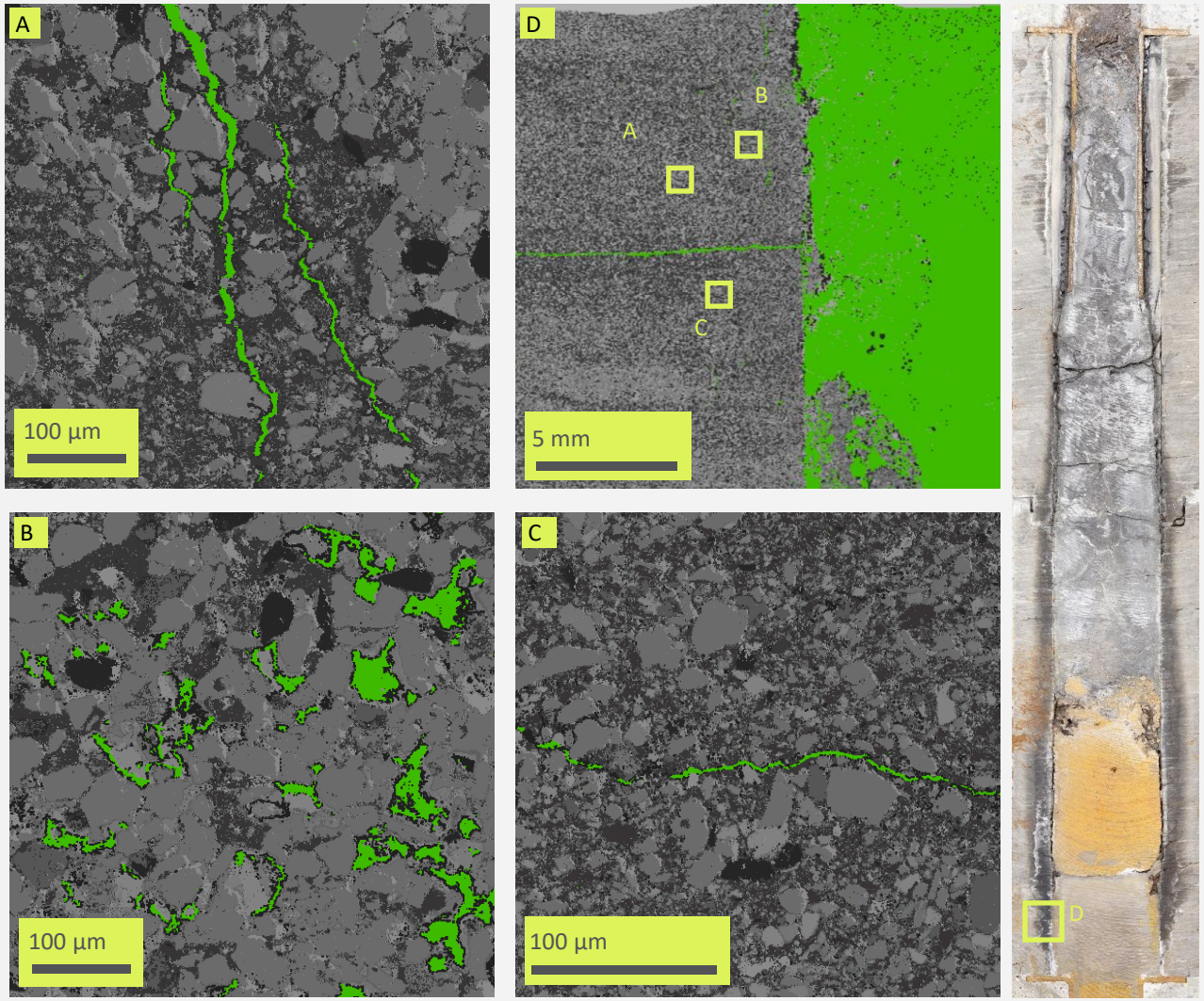
Seal Potential

Observations

- All casing & cement removed
- Barrier fills 360o rock-to-rock
- Alloy is pervasive into rock
- Fills voids at least ≥1 micron
- Potential bond to steel and formation



Full Scale Test | 5.5'' 17# | Cemented Casing | 7-7/8'' Borehole | Mud rock/ Shale Host Rock | 150 bar

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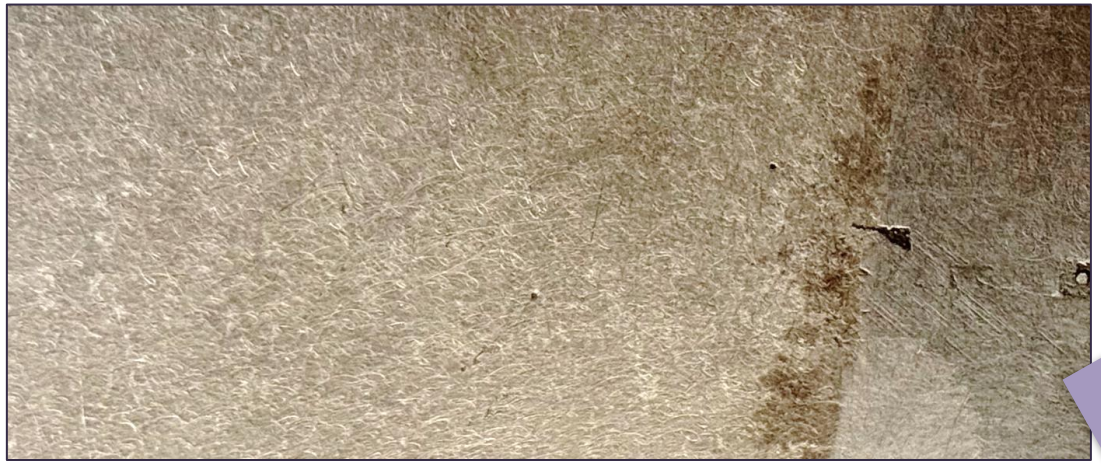
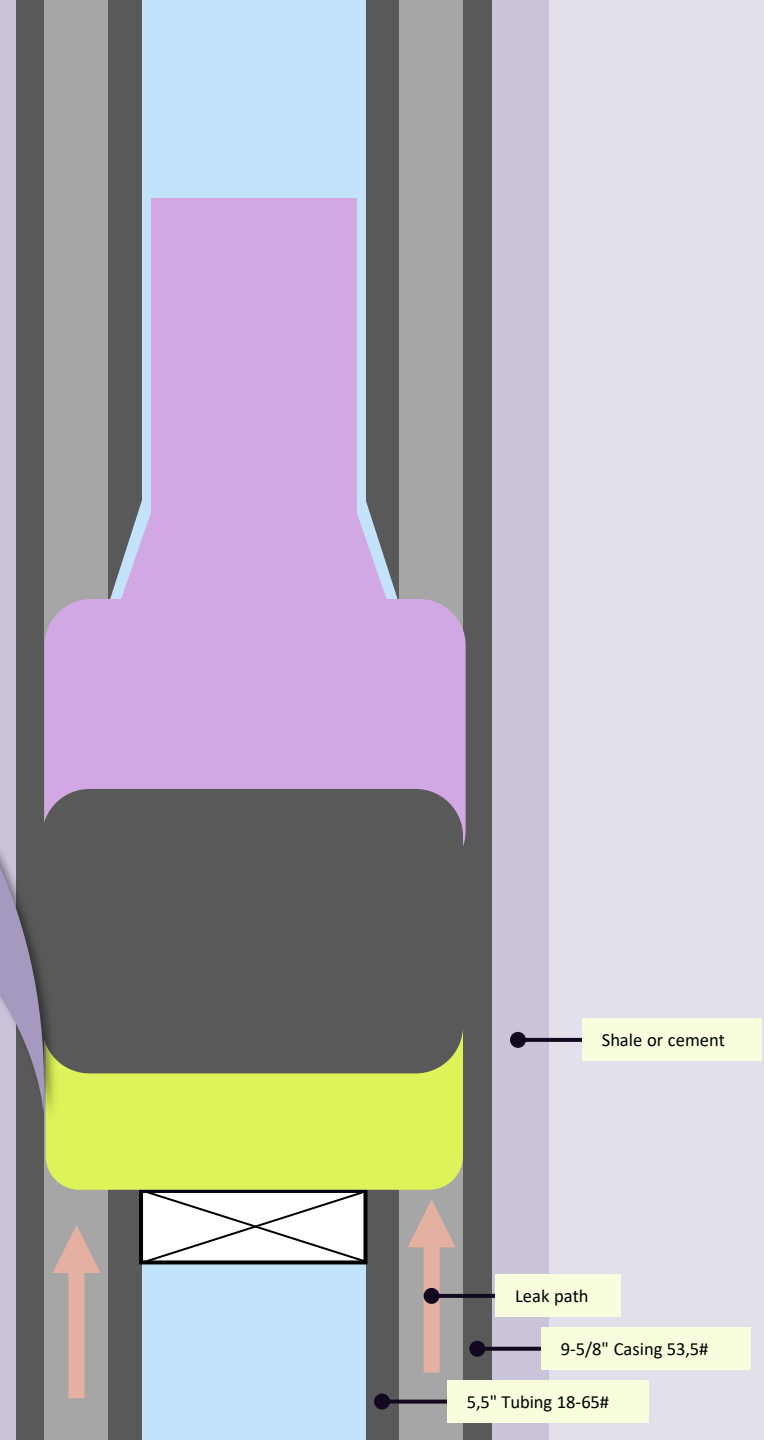
Bismuth / Casing Steel



Scope Objective – Seal annulus inside 9-5/8" Casing

- → Deploy tool inside tubing and pass through any restrictions
  - → Melt tubing and establish annular seal towards 9-5/8" Casing
- → Application variations
  - → 4,5" – 6 5/8” Tubing sizes
- → Primary goal: Seal annulus between tubing and casing. Monitor and verification of barrier over 3 years



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RockSolid™ Technology

4,5" Single String

5,5" Single String

7" Single String

9-5/8" Single String

4,5" - 9-5/8" Thru tubing

Commercialization → Development

Application

SCVF / SCP

Zonal Isolation

P&A Reservoir Barrier

Pre-P&A

CO_2

Verification Monitoring

Operational

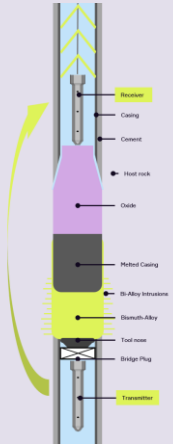
SNL, Isotope, XLOT, Inflow
> 20 verified barriers

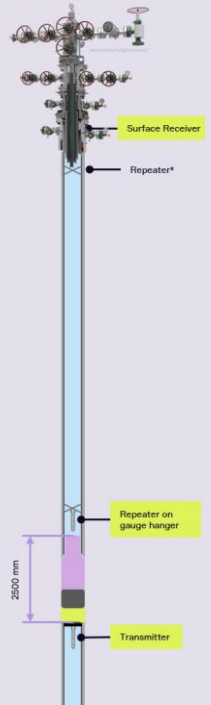
Process verification

> 300 comparable test
(2015-2025)

Electromagnetic

Verified pressure across Barrier (2019)





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Scope 9-5/8"

1. Development requirements
2. Long term sealing capability
3. Test program (small to full scale)
4. Operations and verification program
5. Barrier verification and monitoring system
6. Technology qualification plan

7. Regulatory requirements and gap analysis
8. Pilot well and field trials program

→ **Goal:**

Install RockSolid™ 9-5/8" single string North Sea 2026-2028

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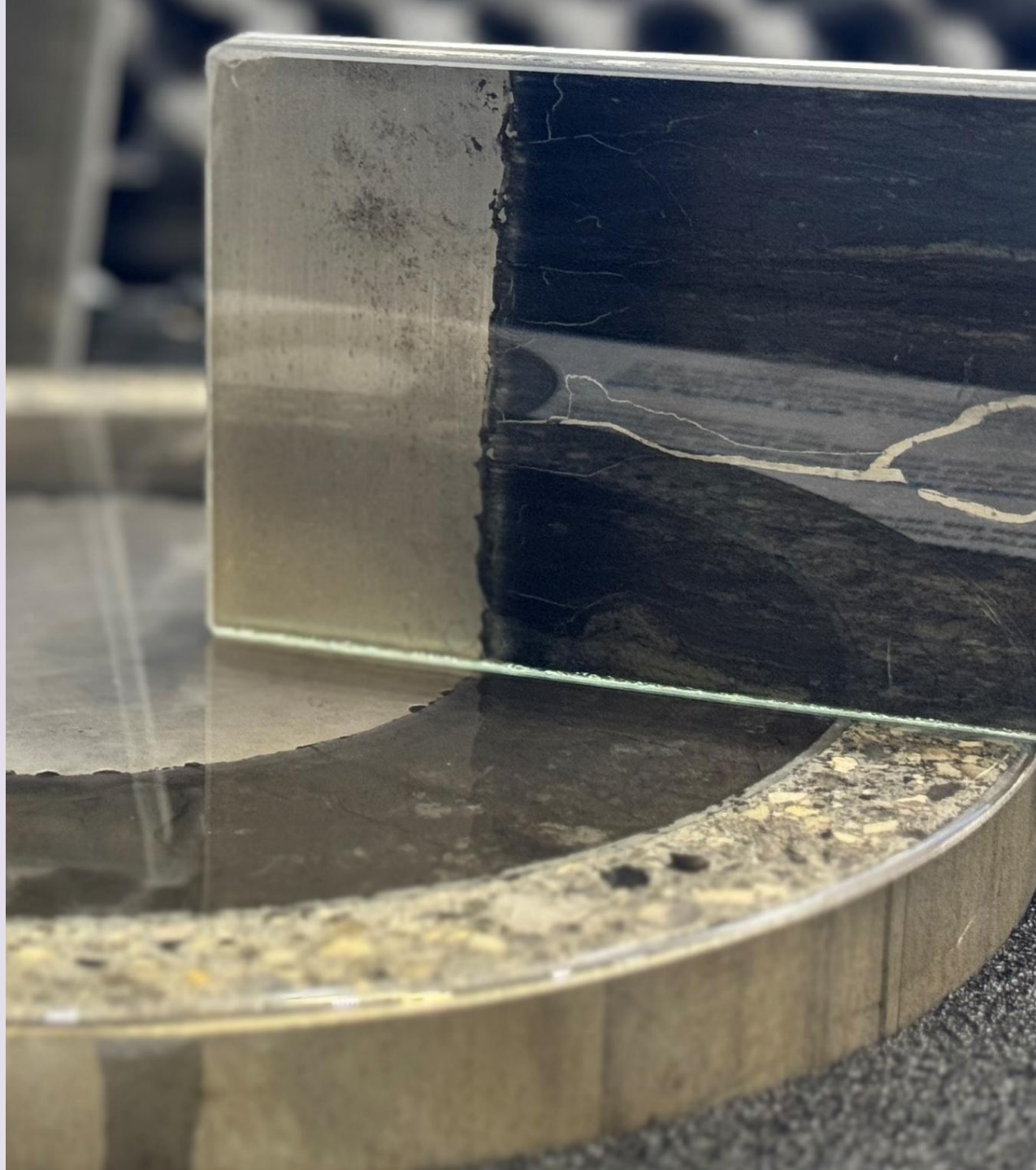


Regulatory acceptance & Qualification Methodology

CANADA

Alberta Energy Regulator (AER)

Since 2015, Interwell and AER have worked closely together to ensure the acceptance of the RockSolid™ technology onshore Canada. Piloting and field trials has been critical parts of the Qualification Plan.

NORWAY

Havindustritilsynet (HAVTIL)

Since 2013, Havtil have been a key stakeholder for the development of the RockSolid™ Technology. As a neutral part in industry projects, and as an important guiding regulator for qualification activities.

Technical

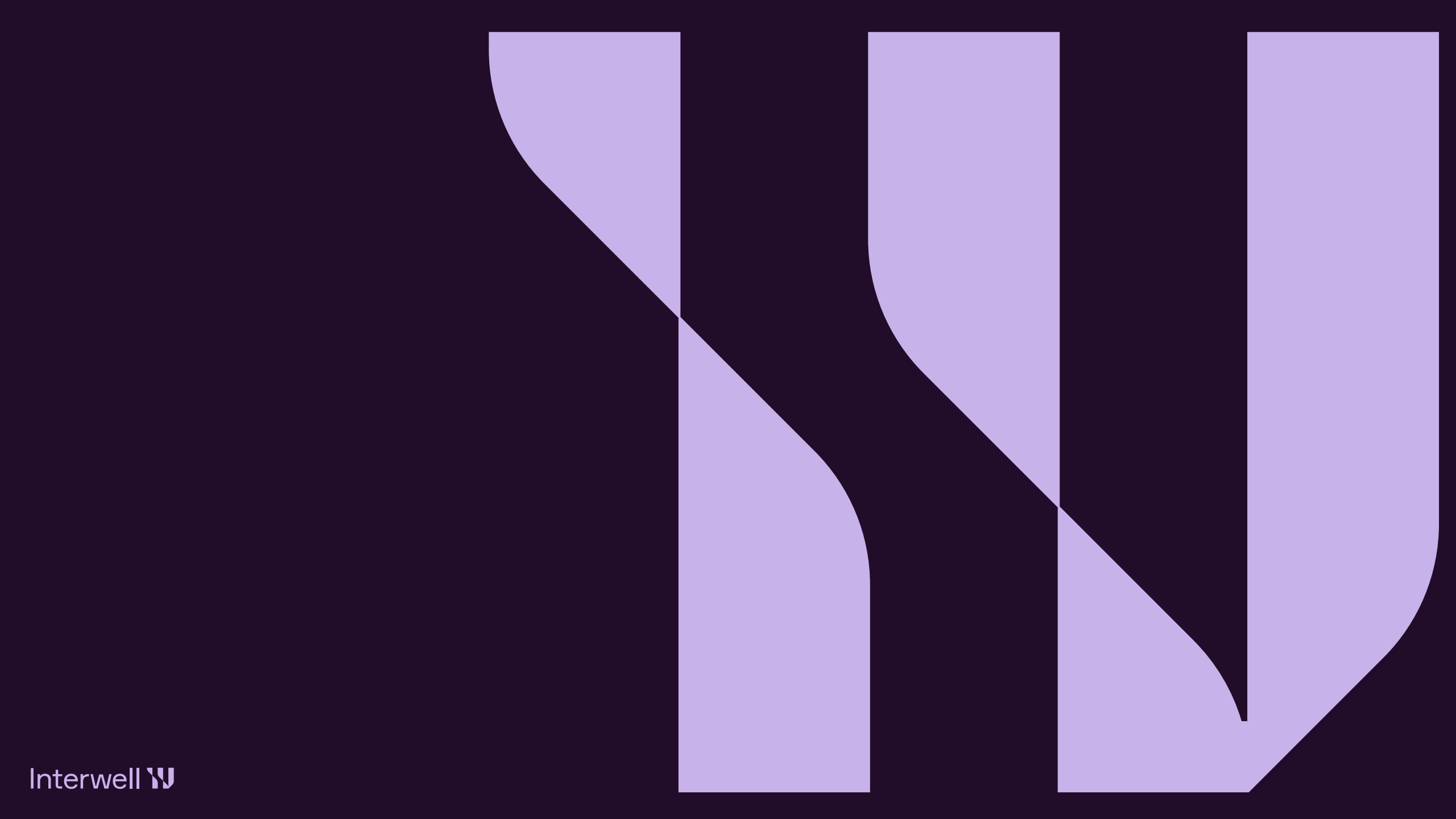
Technology Qualification Plan (RP-A203)

- Testing and documentation
- Confidence and supporting evidence
- **Regulations, guidelines and industry best practices**
- **Stakeholder questions and uncertainties**

Operational

Operational Experience – Field deployments

- Full scale testing of critical functionality
- **Well operations and field experience**
- **Barrier placement and quality assurance**
- Verification methodology and results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