CASE STUDY

Water-well turbidity reduction in a slotted screen France

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CONTEXT

Gravel Pack Isolation in Drinkable Water Well
Nominal: 13.41in / 340.5mm
Drift: 13.25in / 336.5mm

From 775.6ft to 812.5ft
From 236.4m to 247.7m
Depth of zone to seal

SOLUTION

13-3/8in Internal Pressure Patch
RIH OD: 10.90in / 277mm
Steel thickness: 0.12in / 3mm
Sealing thickness: 0.08in / 2.25mm

40ft / 12m
Patch Length

< 435psi / 3MPa
Pressure transmitted to the screen

OPERATIONAL CHARACTERISTICS

3500 psi / 24 MPa
Expansion pressure

13.38in / 340.0mm
Patch Nominal ID
13.25in / 336.5mm
Patch Drift ID

CONTEXT

In a 1600ft well, a 4ft-long zone produced **turbid water** above a given pumping rate. Length of the stainless steel screen -1300ft- raised concerns on the possibility to efficiently treat this area. Indeed, turbidity could travel along the gravel pack and contaminate the main flow.
Length of the patch was studied as to allow the maximum turbidity-free flow at an acceptable pumping rate, taking into account possible fluid-level change caused by patch-induced pressure losses.
Also, the screen geometry (0.23in thick with 0.08in oblong slots) questioned the possibility of expanding and anchoring the patch without damaging the strainer.

SOLUTION

It was decided to set a **40ft patch** to steady the flow behind the patch and thus prevent the production of turbid water.
Saltel Industries performed shop tests on an identical slotted screen and determined that the patch could be anchored with no damage to the slotted-casing, if less than 650psi was transmitted to the casing.

The key points in order to avoid screen damage were:

- an accurate positioning of the expansion packer when expanding (to avoid the contact of the inflated packer with the screen)
- the pressure monitoring (to avoid applying too much pressure to the screen through the patch)

SETTING

Positioning of the patch was made by pipe tally since water was too trouble for video positioning.

The patch has been expanded in 17 steps.

Test-Patch Expanded in a strainer

RESULTS

Video check confirmed the good setting of the patch and it has been observed that the screen has not been expanded above or below the patch.

The client was satisfied by the solution since the patch increased the turbidity threshold point, enabling production gain of 125 US barrels per hour with no turbidity. Also, for a given pumping rate, no fluid level drop was observed compared to previously.

Turbidity vs flow rate