Case Study - Initial Summary:

**Cascade³ solution overcomes sanding challenges and eliminates requirement for gravel packing**

Cascade³ saves client $1million and insures against loss of injectivity in unconsolidated sandstone formation

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**Well Data**

- **Location:** Sub-Saharan Africa
- **Well type:** Water Injector
- **Installation date:** February 2019
- **System design rates:** 5,000bwpd per well

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**Background**

Tendeka collaborated with an operator to provide a sand control solution, delivering a system which extends well life and maintains longevity of injection while simplifying operations, saving money and reducing health and safety concerns, when considered against gravel packing.

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**The Challenge**

Based on detailed sanding studies the operator had identified a high risk of sand ingress which standalone screen solution could not address. Such particulates can become mobile during periods when water injection is shut-down, either during planned shutdowns or in unplanned instances, such as loss of pump functionality. In the event that sand migrates into the completion, a loss of injectivity may be observed, which reduces the effectiveness of the injector's pressure support or sweep capacity. Ultimately, this can lead to the loss of a well and possibly the requirement to workover or drill a new well.

Comparable levels of sand control may be provided by gravel packing, however; the equipment spread required to pump the pack could cost in the region of $500k per well, in addition to the cost of conventional sand screens.

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**Tendeka’s Solution**

The client opted to install Tendeka’s Cascade³ system, which provides a unique flow-checking mechanism at the sandface.

Cascade³ mitigates the 3 main causes of water injection well failure, namely; crossflow, backflow and water hammer effects.

Placing an array of non-return valves across the reservoir prevents fluid backflow from entering the well, ensuring that no fine particles enter the lower completion. Cascade³ is unlike a conventional water injection valve, where inter-layer crossflow can mobilize sand into the completion below the valve’s location.

The Cascade³ valves were protected by utilising Tendeka’s FloDirect Wire Wrap Screen offering robust sand control.

Furthermore, from a health and safety perspective, Cascade³ may provide further benefits over gravel packing mitigating equipment and personnel on location.

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**Project Results**

The Cascade³ screens were delivered to the site in a ready-to-run condition, deployment of the solution went seamlessly.

At present the client has 2 Cascade³ wells injecting at a rate of 5,000bwpd at a Wellhead Pressure of 1,200psi. No sand issues have been encountered to date.