DUNNET BAY
750M HDD SEA OUTFALL & CIVILS
SCOTTISH WATER

Entirely renew an outfall in Dunnet Bay, Scotland.

STOCKTON

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The significantly longer outfall will remove the need for chemical disinfection which is currently required during the bathing season to ensure that the bathing water quality at Dunnet Beach is maintained.

PROJECT SUMMARY

- **Outfall for treated sewerage**
- **750m to the subsea exit point**
- **Dive services provided**
- **Decommissioning of ageing treatment plant**

THE PROJECT
Stockton Drilling was contracted by ABV on behalf of Scottish Water to entirely renew an outfall in Dunnet Bay.

SCOPE OF WORK
- Initial feasibility study to determine the most cost effective way to renew an existing outfall that exited too close to the internationally recognised bathing waters of Dunnet bay, bringing it inline with clean water regulations, thus removing the need to acid dose effluent.
- Directionally drill a 750 meter outfall and install pipe plus seafloor diffuser.
- Supply weld and test said 280mm HDPE pipe renew shore side treatment facilities, including open cut pipeline and manhole installation.
- Commission the new outfall and decommission the existing outfall and redundant treatment works.

METHOD
A 750 metre HDD drill was proposed and Stockton Drilling mobilised its 250 tonne HDD drilling rig. Access was improved to the location and a temporary site was established. Drilling commenced with a 12 inch pilot gyro hybrid steering assembly followed by an 18 inch reamer. This was completed by utilising an in-house environmentally friendly fluid design that helped to control the challenging faulted Caithness flagstone formations, along with HDX tooling to combat the hardest layers found within the flagstone formation. Stockton Drilling opted for a forward reaming operation to minimise the risk of breakout to sea and keep maritime operations to a minimum on one of Scotland's most exposed coastlines.

The drill was successfully completed with no breakouts to sea and minimal delays punching out on to the seabed in 8 metres of water, within metres of the target zone. The drilling assembly was then supported by air bags and pushed out onto a work vessel where the forward reaming assembly was removed and a towing assembly secured. Once the drill had been completed with the assemblies changed a challenging maritime operation took place.

A 750 metre, 280mm PE100 pipe that had been welded on rollers and pressure tested off site was launched and towed offshore to a work vessel, attached to the assembly and then pulled beneath the seabed till it emerged at the rig side with minimal pull forces seen throughout the operation. The pipe was pulled to a specified depth beneath the sand where a post installation pressure test was completed to ensure the integrity of the pipe.

Once the pipe was in place the challenges continued. A 4 metre diameter diving habitat was placed on the seafloor and excavated in place around the outfall pipe allowing the divers a safe working area to fit the required elbow, upright, tideflex valve and subsea diffuser.

Concurrently onshore 6 new manholes and pipework were placed to connect the new outfall and pipework with the existing works. This included a jetting port and valve to enable the outfall to be pressured and flushed if it were required. The redundant acid dosing equipment was made safe and removed along with all above ground buildings. The now redundant acid dosing chambers and exiting outfall were decommissioned.

The operation was totally managed by Stockton and its partners on behalf of ABV and its client Scottish Water.

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