Project Description – Proposed underground HDPE pipe to transport polished water from tat-Tomna Reservoir to Tal-Ghajn (limits of Mellieha) through trenchless methods

Background Information

Currently Treated Sewage Effluent ends up at sea, except for a small percentage which is polished at Sant' Antnin Sewage Treatment Plant and transferred to various reservoirs for agricultural and industrial use. During the 2007-2013 programming period, WSC invested in 3 polishing plants (2 in Malta and 1 in Gozo) to enable the use of highly polished reclaimed water for industry and the general public.

There is a high potential for the use of this highly polished reclaimed water resource particularly by various industrial sectors, subject to the attainment of the right qualitative standards and the eventual acceptance of this new resource by consumers.

WSC is currently seeking EU funding through the 2014 – 2017 cohesion funds to invest in developing a dedicated network to distribute highly polished reclaimed water, termed 'New Water'.

The Water Services Corporation will develop distribution networks of around 16 km in length to deliver the New Water in the North of Malta, including the agricultural and industrial sectors.

Description of the Project - Proposed underground HDPE pipe

This application is a continuation of the two major projects mentioned below and further distribution. These include:

PA/02281/12 – Construction of a Polishing Plant at Ic-Cumnija, Mellieha

PA/02290/12 – Trenchless infrastructure works from Tat-Tomna, Mellieha to Bingemma (Mgarr)

There is an application in progress, namely PA/05334/17 for the new water servicing of various rural streets from Il-Mizieb, Mellieha through St.Paul`s Bay to Bingemma.

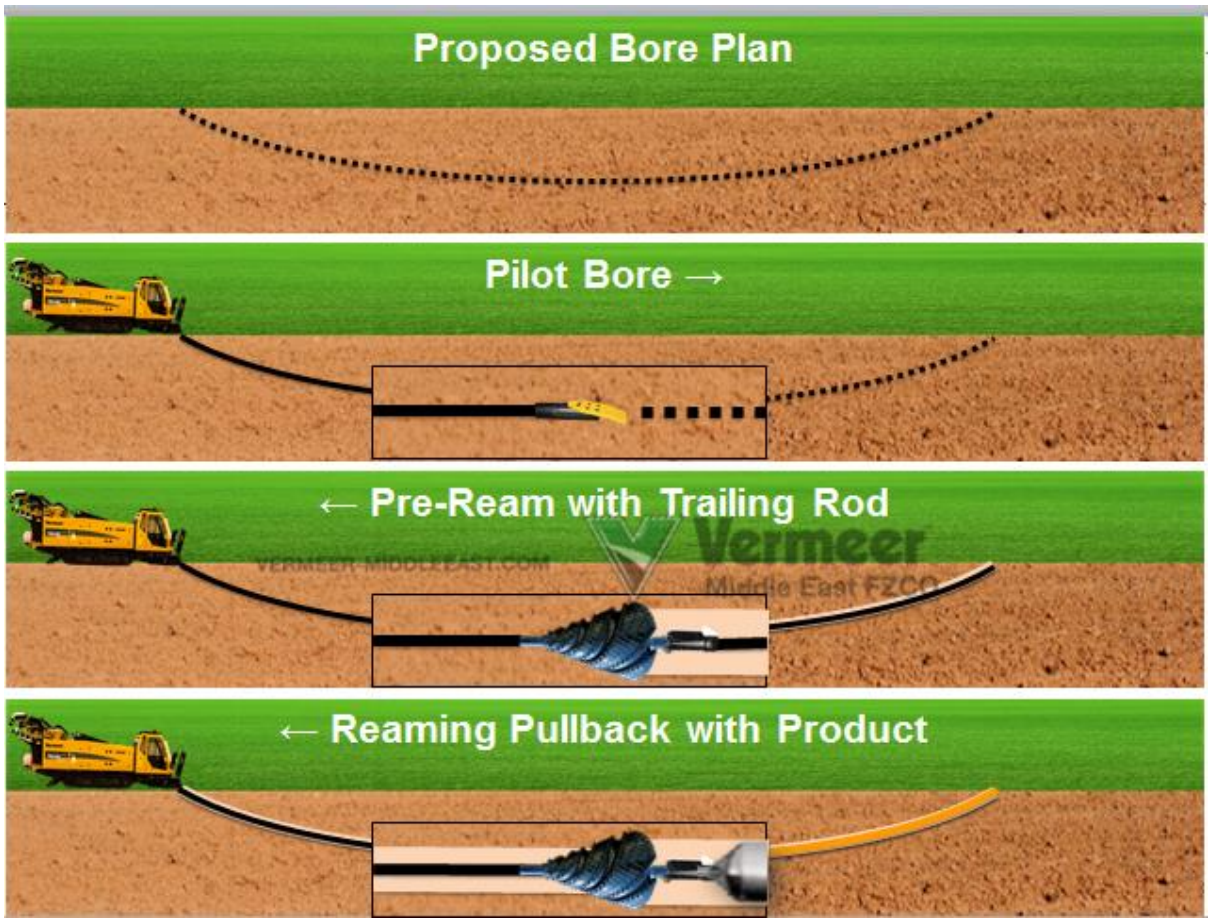
The proposal we are submitting in this application will consist of a new distribution network that shall be feeding the area known as Tal-Ghajn through a new underground pipe from the existing underground reservoir located in the area known as 'Tat-Tomna', limits of Mellieha. This reservoir was recently internally lined to make it water proof.

The system to be used will be an underground horizontal directional drilling (HDD) process very similar to the project in the approved PA/02290/12 mentioned above. This has already proved to be a very reliable and safe system, which is ideal in ODZ environments with practically no intrusion on the garigue.

HDD is a steerable trenchless method of installing underground pipes in a shallow arc along a pre-scribed bore path by using a surface-launched drilling rig, with minimal impact on the surrounding area.

Directional Drilling is used when trenching or excavating is not practical, such as this case when the garrigue involved is of such natural value. It is suitable for a variety of soil conditions and jobs including road, landscape and river crossings. Pipe can be made of materials such as PVC, polyethylene, poly-propylene, ductile iron, and steel as long as it can be pulled through the drilled hole.

The image below shows the technicalities involved



A reamer will be stationed at Tat-Tomna to start pre-reaming along the proposed bore line which reaches the other end at Tal-Ghajn. Following the first pre-reaming process, the drill heads are changed until the proper reaming diameter is reached to the point at Tal-Ghajn. The drilled bore will be around 550 mm in diameter enough to include the 450 mm internal diameter HDPE pipe. The total length between the two nodes is around 900 metres.

Once the bore is drilled the reamer will be positioned at Tal-Ghajn to pull the pipes which will be welded at Tat-Tomna, thus pulling the whole stretch at one go from Tat-Tomna to Tal-Ghajn. An underground manhole will be constructed at Tal-Ghajn. A manhole will be extended at Tat-Tomna. Both will not be visible from any street.

During the drilling process, in both the start pit and the finishing pit, where the pipeline is welded and pulled through, there will be great care to ensure that the use of the drilling fluids will not lead to dispersion. A self-contained, closed, drilling fluid mixing system shall be of sufficient size to mix and deliver drilling fluid composed of bentonite clay, potable water and appropriate additives. Mixing

system shall be able to molecularly shear individual bentonite particles from the dry powder to avoid clumping and ensure thorough mixing. The drilling fluid reservoir tank shall have adequate capacity to eliminate any overspill. Mixing system shall continually agitate the drilling fluid during drilling operations. The drilling fluid and any additives shall be environmentally safe and be approved for such usage. No diesel fuel shall be used. Bentonite, a natural clay, and other non-toxic polymer muds are used. While it is viable to recycle this material, if it accidentally overspills, the area will be easily cleaned with water. There will be earth bags to contain any unlikely overspills

In case of a very unlikely fuel and lubricants dispersion from the machinery, the company is organized enough to effectively use the right material already available and to dispose the contaminated material in the proper way.

There will be a temporary storage area at Tat-Tomna similar to that approved in PA/02290/12 (Trenchless infrastructure works from Tat-Tomna, Mellieha to Bingemma). The water tanks will be located within the storage area even for operational considerations. The entry and exit point will be through the existing fenced gate. This is the area owned by WSC with its own old entrance gate, and there will be no damage to existing trees or rubble walls. The existing carriageway will be the access route used and there will be no alteration to the existing terrain.

A detailed work plan of the area will be submitted by the WSC Contractor in the CMP to be approved as a post decision requirement.

It should be emphasized that this location at Tat-Tomna is basically disturbed land and WSC has no intention to use areas within its perimeter that are not already disturbed.

The HDPE pipes to be used will be welded together within the Tat-Tomna site and will be pulled from this location through the reamer at Tal-Ghajn. The reamer at Tal-Ghajn will be only temporary on site until the reaming bits are recovered and carted away to the storage at Tat-Tomna.

The material/crushed rock to be bored and extracted will have a volume of around 300 cubic metres. This will be temporarily stored at Tat-Tomna to be carted away to an approved dumping site.

As soon as the process is finalized and the pipes are pushed through, the storage area and reamers will be removed away from site.

Duration of Project

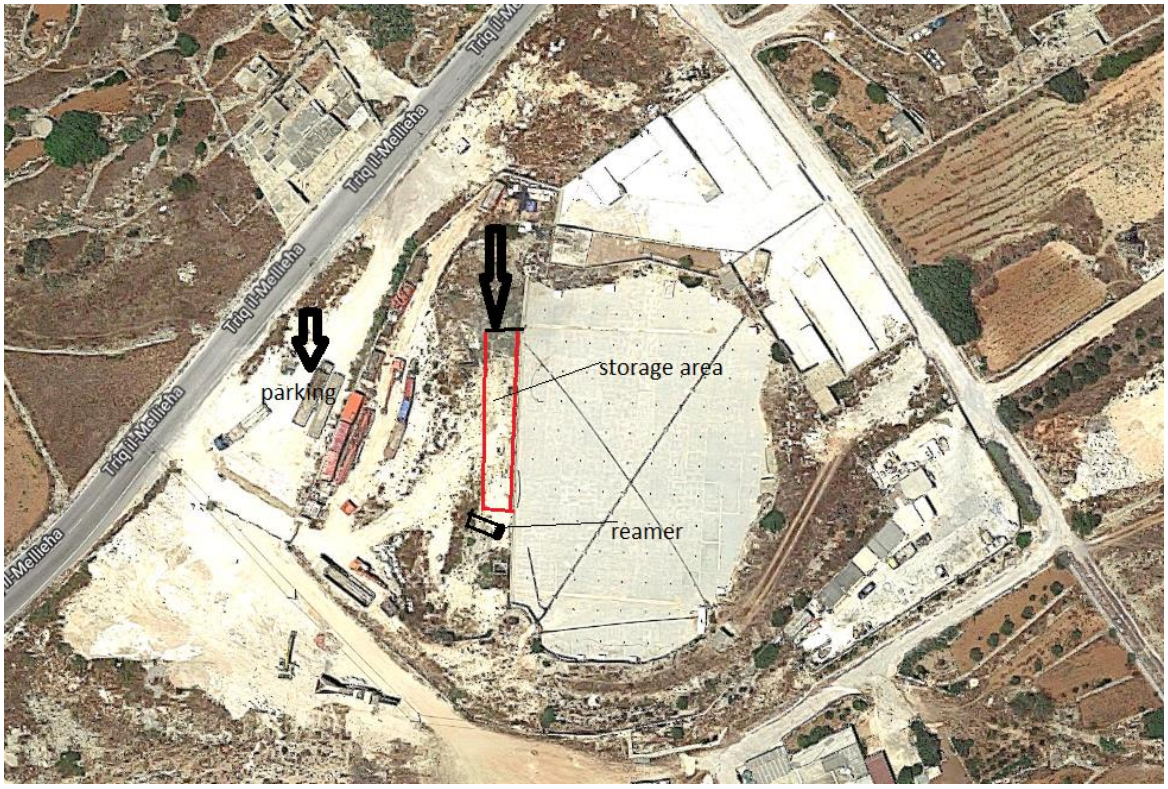
The duration of the project will be 30 weeks and will be envisaged to be carried out as follows:

Preparation of sites	1	weeks
Pre-reaming process	9	weeks
Reaming process	8	weeks
Welding and fusion of pipes	6	weeks
Pipe pulling	1	weeks
Construction of manholes	4	weeks

Clearing of sites 1 weeks

Parking and storage

The plan below is an indication of the position of temporary parking, reamer position and storage area at tat-Tomna area, which will be for the duration of the project process



The plan below is an indication of the position of temporary storage/parking, reamer position (at end point) at Tal-Ghajn Area. The pulling process is a very short period of work, so the disruption to the already infrequent traffic will be brief.

Changes to site

There will be only two sites where top ground level work will be carried out. The site at Tat-Tomna is already disturbed and will be used for the reaming position and finally for the connections of the pipe through a manhole on site. Due to the depression of the site proper, the manhole cannot be seen from ground level. Actually, the whole process will not be visible from ground level.

At Tal-Ghajn, an underground manhole will be constructed to connect the new water line to the new system to be distributed. Only the manhole covers will be visible at ground level since all the connections will be buried in the manhole below.

Images and Diagrams

Hdd route from Tat-Tomna to Tal-Ghajn

Ortophoto of tat-Tomna indicating position of reservoir

Pathway to Tal-Ghajn

Tat-Tomna from main road

Image of reamer used in HDD projects

pipe pulling in previous contracts

Land Uses

Tat-Tomna site is the location of the existing old reservoir, already disturbed site with a ramp from main gate to the reservoir. The area in front of the reservoir was already used as a reamer site in the previous contract mentioned above (PA/02290/12).

Image of position of reamer in previous contract in the same location at Tat-Tomna

The HDPE pipes will be pulled, following reaming below the existing garrigue. There will be no intervention on the garrigue itself. The pipes will reach Tal-Ghajn at Ground level from Tat-Tomna at the point mentioned above and a manhole constructed. The point where the pipes will be pulled will be in existing beaten earth, in an existing passageway and not through undisturbed garrigue. No disturbance of ground is envisaged except at Tal-Ghajn, where the distribution to the fields below will be continued (currently processed through another application).

Physical characteristics of site

Environmental Impacts, heritage, noise and vibration

The impacts can be compared to the very similar HDD project carried out in 2015 from Tat-Tomna to Bingemma. In this case a similar HDPE pipe was pulled beneath the existing garrigue with virtually no visible impact whatsoever. The pipe from Tat-Tomna was pulled from Triq il-Biedja, Manikata, an image is being shown below.

In the lower part of the process, drilling will be slightly within but below the buffer known as Ir-Razzett Tax-Xitan (Ta` Randa).

The connection at Tal-Ghajn will be in proximity of an AEI Ecology zone.

The noise and vibration will be insignificant. In the previous similar HDD system we received no complaints from anyone on noise or vibration.

Kindly be guided accordingly.

Mario Balzan