

BACKGROUND

In 2004, a preliminary review of the Baucells report was conducted by Innovative Design Engineering of America, LLC (hereafter IDEA, LLC). The Baucells report was remarkable for the amount of detailed information and planning that it contained. However, due to the unavailability of accurate measuring instruments, the Baucells report provided estimates of the distances and elevations that would be required in order to perform the calculations necessary to specify the equipment.

A field survey of the proposed site was conducted on 9 June 2005 for the purpose of obtaining accurate data with which to perform the required calculations.

A resident volunteer, Mr. Laurent Delugin, provided a tour of the site, and proposed locations for the new cistern and terminal point for delivery of the water. An important change from the Baucells report was that the new plan would utilize only water from Spring No. 2, the other two springs being identified as non-potable sources.

This Engineering Report includes only the flow from Spring No. 2, and uses the flow from that spring as given in the Baucells report (0.16 l/s, or 2.5 GPM).

Waypoints, or stations, were measured with a Garman GPS unit at various positions along the path from the bottom of the valley (where the cistern is proposed to be located) to the top of the restaurant (where the water is to be distributed). It was decided that it would be better to route the pipe along the existing footpath, rather than in a direct line through the fields, in order to minimize the risk of damage to the pipe due to working the fields. A sketch of the proposed route is shown on the attached drawing 8001-02.

Station No. 6 was taken at the cistern location in the morning. Station No. 16 was taken at the same point in the afternoon. The horizontal difference as measured with the Garman GPS was 18 feet. The elevation difference was only 3 feet. We therefore have a high degree of confidence in the repeatability of the coordinates taken. The accuracy is ± 20 feet horizontal and ± 3 feet for the elevations.

SYSTEM DESCRIPTION

Refer to Drawing 8001-01.

Potable water from Spring No. 2 will be fed into a collection device. Because there is a drop in elevation from Spring No. 2 to the location proposed for the pumping station of approximately 66 feet, the collection tank may be either an above-ground tank, or a below-ground cistern. The selection of whether to place the collection tank above or below-ground will best be made after we determine what type of pump is suitable for the application. For instance, if the most economical pump selection is a submersible pump, it will probably make sense to locate the tank below grade. If the pump selected is a progressive cavity pump, it may make more sense to provide an above-ground tank.

The size of the collection device is 4000 Gallons (15.1 m^3). This will be enough to contain approximately 27 hours worth of water as produced by the spring.

The pump is currently envisioned to be solar-powered. Compared to a diesel-driven pump, the advantages of utilizing solar panels include:

- Lower cost over the life of the system
- Reduced maintenance
- Less pollution

Some controls will need to be provided to ensure that the pump is not damaged by running dry.