

## A303 Amesbury to Berwick Down: Summary of Appendix 2 Written Representation

By Sweetwater Resources Ltd

Representing M & R Hosier, Westfield and Boreland Farms – Ref: 20020373

### Summary

1. The water supplies for two homes, the farm and livestock are provided by two boreholes A (no water treatment) and B (ultra violet only), cannot kill oocysts from Cryptosporidium).
2. Loss of water could result in loss of business and home, either due to pollution from pathogens and/or reduced yield.
3. If water was lost the options are:-
  - a. Construct new borehole. To obtain a competent water well driller and complete the works could take at least 6 months. To tanker in 30 cubic metres per (daily licence), construct a new borehole and ancillary works would cost at least £278,000. The maximum distance for pumping from the lorry is 300m. The distance from the lorry to reservoir is 1000m and is across a valley. Storage, hardstanding, a pump and an electrical supply would have to be constructed before tankering operations started.
  - b. To construct a new water mains could take a year. Wessex Water has been contacted but no quotation has been received. Tankering cost for a year would be approximately £416,000 and 10,000 cubic metres would be £22,000.
  - c. In both cases, construction of a new borehole and/or mains supply would require alteration to existing water distribution system. As much of the farm is within the World Heritage Site and the water distribution system was installed prior to the scheme being created, the cost and time involved are unknown.
4. The farm comprises pasture supporting livestock and cereals overlying Chalk and hence the aquifer is vulnerable to pollution. At BH A, groundwater is approximately 30m below ground level. Most ground water flow is via horizontal beds/fractures from the proposed Tunnel A 303 in a south east direction towards Boreholes A and B.
5. Due to fracture flow there is risk of the following:-
  - a. The cutting removes the protective topsoil and Chalk which enables the water table to be within at least 3m of the surface and may arise above it, therefore greatly reducing the protection afforded by attenuation.
  - b. The presence of dead animals from road kill( deer etc., in the cutting and living within the embankment greatly increases risk from contamination via , due to rotting carcasses , faeces and urine.
  - c. The actions of the TBM and injection of grout could block fissures which supply the water to Boreholes A and B. It is possible to measure the volume and pressure of grout pumped into the Chalk but not how far it travels along fissures. As the fissures can be several millimetres in width and the bed and groundwater flow towards the south east this could be far.
  - d. Heavy rainfall producing fast groundwater flows could wash Chalk slurry and /or grout from the TBM which could flow via fissures into the boreholes blocking them or the pumps.
  - e. Any increase in turbidity would reduce the effectiveness of the UV and so increase the risk of disease from pathogens.
6. HE have shown ignorance of the requirements of the Private Water Supplies (PWS) Act 2016 under which Boreland Farm has to supply water. HE have failed to sample and analyse water according to the PWS 2016, especially pathogens. HE did not volunteer their specifications for preventing contamination or their hygiene and disinfection procedures in relation to the ground investigation water monitoring boreholes.
  - a. HE have not sampled and tested pathogens in the water by a DWI approved laboratory.
  - b. Have allowed ground investigation water monitoring boreholes to be constructed and left open which could allow animals to fall in and/or defecate and their rotting carcasses would produce pathogens. Absence of security guards means somebody could have maliciously contaminated the groundwater.



- c. Did not supply information that the drillers are free from infectious diseases; that overalls and gloves are free from pathogens and the drilling rigs were clean and free from pathogens. Drilling equipment and casing should have been steam cleaned using water containing 50mg/l chlorine to ensure removal of mud, manure and faeces. Only construction risk assessments and construction methods were supplied when asked for additional information.
  - d. Did not ensure the sanitary seals were at least 50mm wide, 6m deep, comprising 50:50 cement water and were installed via Tremi pipes from the base.
  - e. The Farm was not provided with any instructions of the ongoing farm management, especially muck spreading, around the area of the ground investigation water monitoring boreholes in line with good management practice of water protection.
7. HE have not undertaken the following assessments of Boreholes A and B
    - a. Tracer tests to determine absence/presence of fissures between site and BHs A and B and if present the travel time of groundwater flow (maximum and minimum velocities).
    - b. Seasonal variations in rest water and pump water levels, pumping tests to assess yield, drawdown and efficiency, undertaken geophysical logging such as conductivity, temperature calliper, flow velocity ( pumped and un-pumped ) to determine elevation of major flow horizons.
  8. The first indication of pathogenic pollution of the water from Borehole A would be illness.