Appendix 10.3

Water Sampling Protocol

Introduction

Enviros Consulting Ltd. sampling protocol is derived from in house documents and experience which is in turn based on the UK's Environment Agency's "Guidance on Monitoring of Landfill Leachate, Groundwater and Surface Water" (2001) document and the Republic of Ireland's Environmental Protection Agency's "Landfill Monitoring Manual" (2002).

Monitoring personnel

Monitoring and sampling at the Pass of Kilbride site was undertaken by Enda Hoey. Enda is a qualified environmental scientist, fully conversant with sampling procedures and equipment and has undergone all appropriate training.

Surface Water

When surface water samples are taken the following procedure is followed:

- An appropriate sampling point is identified. Wherever possible stagnant low flowing areas are avoided. Areas of floating debris are avoided.
- Using fresh clean gloves the appropriate sampling containers are submerged in the flowing watercourse. Care is taken not to disturb the stream. Where it is necessary to stand in the stream the samples are collected up stream of the sampler.
- Sample containers are submerged to just below the surface.
- Sample containers (except for those containing preservation fluids) are rinsed at least three times before the sample is taken. Care is taken not to pour rinse water back into the sampling area.
- Samples are taken direct into sample containers to avoid cross contamination between sampling containers.
- Samples are identified with a unique identifier stating sample type, location, date and time.
- Detailed field notes are taken noting smells, visible oils and grease, floating debris, etc.

Groundwater

All groundwater monitoring points were fitted with individual and dedicated purge and sampling apparatus. This procedure was carried out in order to eliminate cross contamination between boreholes during sampling.

Boreholes were sampled using a 12-volt submersible purge pump. Between sampling rounds the pumps remained in each of the wells in order to minimise disturbance and prevent cross contamination. During fitting care was taken to ensure that each of the pumps did not come into contact with the ground, as this is possibly a source of contamination.

Since all of the groundwater wells at the site were newly constructed it was necessary to develop each of the wells before any sampling could proceed. Well development is essential in order to increase the yield and efficiency of the well before putting it into operation. It is recommended to flush out the well for at least an hour before any testing is carried out. The reason for cleaning is that during the drilling of the well large quantities of fine sediment (clay, silt, sand) may be brought into the well. Some of this sediment can enter fissures in the strata and block them, reducing the water inflow into the well.

When sampling groundwater the following procedure is followed:

- Using a water level meter the top of the water table in the borehole is recorded (the time of this dipping is also recorded).
- The overall depth of the well is recorded using the dipper as a plumb line. The well's internal diameter is also recorded.
- The volume of the borehole is then calculated.
- A suitable clean or new sampling apparatus is installed.

  To avoid collecting stagnant and unrepresentative groundwater samples three borehole volumes are purged before the samples are taken.
- Purge quantities are recorded by catching this water in graduated buckets. This purge water is then disposed of away from the borehole.
- Care is taken not to disturb sediment within the borehole so as to protect the well's screen and to minimise suspended solids in the sample.
- Before sampling commences clean disposable gloves are worn. During purging clean gloves are used primarily to prevent the transportation of contaminants but also for personal protection.
- Sample containers (except for those containing preservation fluids) are rinsed at least three times before the sample is taken.
- Samples are taken directly into the sample containers to avoid cross contamination between sampling containers. Care is taken not to touch the rim of the containers with the bailer or pump tubing. Care is taken not to agitate the samples so the loss of volatile organic compounds is minimised and samples are not excessively oxygenated.
- Samples are identified with a unique identifier stating sample type, location, date and time.
- Detailed field notes are taken throughout the purge noting smells, visible oils and grease, colloidal matter, etc.

Sample bottles

Only sample containers requested by the lab for sample storage and transport are used. Any necessary sample preservatives are defined and supplied by the contracted labs.

Sample transportation

A Chain of Custody form is filled out for each batch of samples. This lists the samples that are included in each transportation, the sample codes, the requested analysis and the time and date of dispatch to the labs. A signed copy of the Chain of Custody is sent with the samples and the sampling personnel retain the other.

Samples are transported in cool boxes and are arranged so as to reach the contracted labs within 12 hours of the sample time.