

## **MONITORING WELL & MONITORING SUMP PIT SAMPLING INFORMATION For Manure Storage Facilities**

Monitoring wells are usually installed as leak detection means around earthen manure storage facilities, confined livestock areas (outdoors or covered), and manure or mortalities composting facilities. In all cases for concrete or steel manure storage structures, for plastic lined manure storage facilities constructed after 2006, and in some situations with covered confined livestock areas, a special leak detection system is installed to collect any manure that would leak through defects in the floor or walls of the facilities; in this event, the manure would be routed to one or more sump pits located immediately outside the facilities. These sump pits shall be considered as monitoring wells for the purpose of *The Livestock Manure and Mortalities Management Regulation* MR 42/98 and are subject to the sampling requirements pursuant to section 6.1 of the regulation.

### **Equipment:**

You will require appropriate sample bottles (consult testing laboratory for requirements) and a dedicated bailer for each monitoring well (known suppliers are: Norwest Laboratories, ALS Labs, Rice Engineering, etc.). Bailers should not be used for multiple wells, as this may introduce cross-contamination of samples. A bailer is typically a long (2 to 3 feet), weighted polyethylene or Teflon tube with a ball check valve and a detachable drain tube. Once samples are collected, the bailers should be tied or fastened to the monitoring well and stored within the well for the next sample. Disposable latex gloves are to be used when performing all purging and sampling procedures (new pair for each sample) to prevent contamination of sample.

### **Dates of sampling:**

Sampling of monitoring wells shall be carried out between 30 days to 60 days after snow melt, and before July 1<sup>st</sup> of every year, unless notified otherwise in writing by the director. The objective is to sample at a time where the water table is generally elevated, but after normal drainage of snowmelt water has subsided.

### **Measurement of water level in monitoring wells and leak detection systems:**

This measurement must be completed prior to purging and/or sampling the water in the monitoring well or sump pit. Using a measuring tape to which a suitable floater is installed at the one end of the tape, or a string tied to a lead weight and fishing floater, the depth from the top of the well casing or sump pit opening to the water level shall be measured. The elevation difference between the soil surface at the base of the well or sump pit and the top of the casing or pit is to be reported at the same time to allow for estimating the depth to the water level from the surface.

If a bailer was left into the monitoring well and is submerged, leave the bailer in the well and take the water level measurements as above. If the bailer is not completely submerged, remove it from the well but return all water contained in the bailer back into the well before measuring the depth to water in the well.

### **Well Purging:**

Prior to obtaining the monitoring well sample, the well should first be purged to remove all stagnant water so that representative water samples can be taken. Ensure that the string or twine attached to the bailer is long enough for the bailer to reach the bottom of the well. Begin removing water and dispose of on ground away from base of well. Monitoring wells should be purged dry, or if wells recover quickly, a minimum of 3 well volumes is typically required to be purged before samples are taken.

Note: Typically for a 2 inch diameter monitoring well, one well volume is equal to approximately 2 liters per meter (3.3 feet) of standing water. Therefore, a well with 2 meters of water within it should be purged until 12 liters are removed or the well becomes dry, whichever comes first.

### **Recharge Period:**

Once the well has been purged, the water level should be allowed to recover to approximately 80% of the well's original volume. This can only take a few minutes for fast recharging wells or a few hours to several days for slow recharging wells.

### **Sample Collection: (with dedicated bailer)**

Collect sample water in bailer (wearing new disposable latex gloves) and pour slowly into sample bottles, ensuring that there is very little turbulence or air incorporated into the sample. Any preservatives supplied by the laboratory in a separate vial should be poured into sample bottle immediately after the sample is obtained.

### **Sample Analysis:**

Samples should be submitted and analyzed for the following parameters (annual minimum requirements);

Nitrate/Nitrite, Ammonia (NH<sub>3</sub>), Chloride (Cl), and electrical conductivity (EC).

### **Sample Storage/Transportation:**

Samples should be placed in a cooler and kept on ice/ice packs immediately after collection in field. If temporarily storing sample before submission for analysis, they should be stored kept cool (refrigerator or cooler). Samples should be sent to the laboratory, on ice/ice packs, within 24 hours of collection. Ensure that all samples have date, time of sample and monitoring well location clearly labeled on all bottles and that all chain of custody forms are properly filled out.

Note: Do not send in samples to the laboratory on a Friday or before a holiday because analysis will likely take place after the maximum holding time and new samples may need to be taken and submitted

For comparison purposes, the monitoring well labeling shall be consistent from year to year; to that effect, the wells shall bear a permanent well identification number consisting of its cardinal position relative to the manure facility centre and well number on the site (e.g. NE-1, NW-2, etc...).

**Results:**

All results from analysis of samples shall be forwarded to:

**Environmental Services  
Manitoba Conservation  
1007 Century Street  
Winnipeg, MB  
R3H 0W4  
Fax (204) 948-2420**

The operation name, legal description of the site and the facility's permit number shall be clearly stated in a cover letter with each laboratory report submissions or, alternatively, through annotations to that effect written directly on each laboratory report sheet. If at time of sampling, any well(s) are dry, inform Manitoba Conservation of this situation in writing via a letter identifying which monitoring well was dry, along with the site information mentioned above.

If sample concentrations exceed criteria and are identified as a concern, additional samples may be required.

For any further questions regarding sampling procedures please contact your regional Manitoba Conservation office. For specific questions regarding sample analysis, bottles, holding times, and paperwork please contact your laboratory representative.

**Office and Staff Locations**

Environmental Operations

Steinbach	(204) 346-6060
Winkler	(204) 325-1750
Winnipeg	(204) 945-7100
Selkirk	(204) 785-5030
Gimli	(204) 642-6095
Brandon	(204) 726-6064
Lac Du Bonnet	(204) 345-1486

Environmental Services	(204) 945-8541
Manure Management Plan	(204) 945-3078
Source Water Monitoring	(204) 945-5168