

Guidelines for decommissioning (abandonment) of Water Wells

The Water Well Regulation- *Clean Water Act (90-79)*, Section 27 states that: “27 Where a well is not in use and its continued existence might constitute a safety hazard or allow a contaminant to enter the aquifer, the owner of the well shall fill and seal the well using a method approved by the Minister sufficient to prevent the vertical movement of water in the well.”

If an individual or company is being contracted to carry out all operations incidental to the abandonment of water wells, they must be a licensed water well contractor who holds a valid New Brunswick Water Well Contractors Permit.

Approved Method 1 – Drilled Wells

1. **a.** The entire well may be filled with bentonite clay or bentonite grout, or alternatively, suitable uncontaminated material (e.g. sand, drill cuttings, etc.) should be placed opposite the aquifers or water bearing fracture zones with bentonite grout placed opposite impermeable zones between the aquifers. **b.** If the distance between the aquifers is such that it is impractical to fill the borehole with grout for the entire length, suitable uncontaminated material may be used to fill the borehole provided that bentonite grout plugs of no less than 1.5 m (5ft) in thickness are placed within every 5 m (15ft) interval of fill between the aquifers or water bearing fracture zones.
2. If the casing is left in the borehole; **a.** the casing shall be cut off (1m or 3ft) below ground surface. In all water well abandonment the top three metres (10 ft) (below where the casing is cut off) shall be filled with bentonite grout. In certain cases it may be advisable to cap the top of the well with concrete. **b.** a bentonite plug

(3m or 10 ft in thickness) shall be placed straddling the position of the casing drive shoe seal or the bottom of the casing where it seats in the rock, such that approximately 0.5 to 1m (1.5 to 3 ft) of bentonite is inside the casing. **c.** If the casing is less than or equal to 10m (30 ft), then fill the entire casing with grout, if the casing is greater than 10 m (30 ft), apply condition **2a**, **2b** and **1b**.

Approved Method 2- Dug Wells

The well should be backfilled with suitable uncontaminated material (e.g. sand, drill cuttings, clean fill, etc.) to 0.5 m (1.5 ft) below the static water level. A bentonite or grout seal should extend from this level to 0.5 m (1.5 ft) above the water table. The remaining cavity should be filled with suitable uncontaminated material that should extend to within 1 m (3 ft) below the final ground surface, and 0.5 m (1.5 ft) bentonite or grout seal should be placed on top. The remaining space is then filled with impervious natural material (e.g. clay, or hardpan) or native soil and slightly mounded in order to prevent surface water runoff from entering the well; seed or sod to establish ground cover. If water table is close to the land surface, the lower bentonite plug should simply extend to 1 m (3 ft) below ground surface.

Approved Method 3 – Monitoring wells

This section applies to monitoring wells used for monitoring purposes only, not for wells used for potable purposes. Wells used for potable purposes must be decommissioned as per the applicable Approved Method 1 or 2 of this Guideline.

Responsible Parties or owners of contaminated sites are required by the Department to have monitoring wells decommissioned upon completion of the Management Process outlined in the Department's "*Guideline for the Management of Contaminated Sites*". Owners of sanitary landfills, dumps, composting facilities or other waste management facilities are also required to decommission monitoring wells once they are no longer in active use.

All monitoring wells must be decommissioned under the direction of a Site Professional licensed by the New Brunswick Association of Professional Engineers and Geoscientists to practice in New Brunswick.

- a) The approved decommissioning method for **single monitoring wells**, with an intact bentonite seal in the annulus, and which intersect a shallow groundwater table located in surficial deposits/weathered bedrock, is as follows:

Remove the casing and cap, or if it cannot be removed, cut it off 0.6 m below the ground surface. Fill the remaining casing (or hole if the casing has been removed) to 0.6 m below the ground surface with bentonite pellets or chips while tamping to prevent bridging of the chips or bentonite. Ensure that the bentonite is saturated to provide an effective seal. Fill the remainder of the casing (or hole if the casing has been removed) with silica sand or overburden material to surface.

The Site Professional will advise the Department, in writing, upon completion of the monitoring well decommissioning. This correspondence will be placed in the appropriate Departmental file.

- b) A site-specific decommissioning plan must be submitted for DELG for the following types of monitoring well installations:
 - i. Installations where groundwater contains chloride concentrations in excess of 10,000 mg/L;
 - ii. Multilevel well installations;
 - iii. Monitoring wells which may compromise the effectiveness of a low-permeability geological unit which overlies a water-bearing unit;
 - iv. Monitoring wells greater than or equal to 150 mm in diameter;
 - v. Monitoring wells lacking an intact bentonite seal in the annulus;
 - vi. Any other type of monitoring well installation which does not meet the definition in Part a).

The site-specific monitoring plan must include the following:

- A site plan showing the monitoring well locations;
- Monitoring well logs indicating geological strata and water table elevations;
- A drawing of the proposed decommissioned well design;
- Rationale for the design, which includes consideration of hydrogeological factors and mitigation of risks to the environment;
- Methodology for decommissioning, including the types of materials and techniques to be used.

Other optional information such as geological cross-sections or reference documents may be included.

The decommissioning plan must be submitted to the appropriate Branch Administrator in the Environmental Management Division, affixed with the applicable Departmental file number and professional seal. The plan will be co-reviewed by professional staff within the Environmental Management Division and within the Sciences and Planning Division. The Responsible Party or property owner and the Site Professional will be notified of the results of the Departmental review and given approval to proceed with decommissioning if the plan is found to be acceptable.