**Section 730.112 Construction Requirements**

a) All Class I injection wells must be sited in such a fashion that they inject into a formation which is beneath the lowermost formation containing, within 402 meters (one-quarter mile) of the well bore, an underground source of drinking water.

b) All Class I injection wells must be cased and cemented to prevent the movement of fluids into or between underground sources of drinking water. The casing and cement used in the construction of each newly drilled well must be designed for the life expectancy of the well. In determining and specifying casing and cementing requirements, the following factors must be considered:

1) The depth to the injection zone;

2) The injection pressure, external pressure, internal pressure, and axial loading;

3) The hole size;

4) The size and grade of all casing strings (wall thickness, diameter, nominal weight, length, joint specification, and construction material);

5) The corrosiveness of injected fluid, formation fluids, and temperatures;

6) The lithology of injection and confining intervals; and

7) The type or grade of cement.

c) A Class I injection well, except a municipal well injecting non-corrosive wastes, must protect underground sources of drinking water against movement of fluids from the injection zone upward through the well. An operator may do this by injecting fluids through tubing with a packer set immediately above the injection zone, or tubing with an approved fluid seal as an alternative. The tubing, packer, and fluid seal must be designed for the expected service.

1) The use of other alternatives to a packer may be allowed with the written approval of the Agency. To obtain approval, the operator must submit a written request to the Agency that sets forth the proposed alternative and all technical data supporting its use. The Agency must approve the request if the alternative method will reliably provide a comparable level of protection to underground sources of drinking water. The Agency may approve an alternative method solely for an individual well; however, the Agency may promulgate criteria approving alternatives pursuant to 35 Ill. Adm. Code 702.106.

2) In determining and specifying requirements for tubing, packer, or alternatives the following factors shall be considered:

A) The depth of setting;

B) Characteristics of the injection fluid (chemical content, corrosiveness, and density);

C) The injection pressure;

D) The annular pressure;

E) The rate, temperature, and volume of injected fluid; and

F) The size of casing.

d) Appropriate logs and other tests must be conducted during the drilling and construction of new Class I injection wells. A descriptive report interpreting the results of such logs and tests must be prepared by a knowledgeable log analyst and submitted to the Agency. At a minimum, such logs and tests must include the following information:

1) Deviation checks on all holes constructed by first drilling a pilot hole, and then enlarging the pilot hole by reaming or another method. Such checks must be at sufficiently frequent intervals to assure that vertical avenues for fluid migration in the form of diverging holes are not created during drilling.

2) Such other logs and tests as may be needed after taking into account the availability of similar data in the area of the drilling site, the construction plan, and the need for additional information, that may arise from time to time as the construction of the well progresses. In determining which logs and tests must be required, the following logs must be considered for use in the following situations:

A) For surface casing intended to protect underground sources of drinking water, the following:

i) Resistivity, spontaneous potential, and caliper logs before the casing is installed; and

ii) A cement bond, temperature, or density log after the casing is set and cemented.

B) For intermediate and long strings of casing intended to facilitate injection, the following:

i) Resistivity, spontaneous potential, porosity, and gamma ray logs before the casing is installed;

ii) Fracture finder logs; and

iii) A cement bond, temperature, or density log after the casing is set and cemented.

e) At a minimum, the following information concerning the injection formation must be determined or calculated for new Class I injection wells:

1) Fluid pressure;

2) Temperature;

3) Fracture pressure;

4) Other physical and chemical characteristics of the injection matrix; and

5) Physical and chemical characteristics of the formation fluids.

(Source: Amended at 31 Ill. Reg. 1281, effective December 20, 2006)