

1 **15A NCAC 2C .0102 has been amended with changes as published in 15:5 NCR 546 – 547 as follows:**

2
3 **.0102 DEFINITIONS**

4 As used herein, unless the context otherwise requires:

5 (1) "Abandon" means to discontinue the use of and to seal the well according to the requirements of ~~Rule 15A~~
6 NCAC 2C .0113 .0113 of this Section.

7 (2) "Access port" means an opening in the well casing or well head installed for the primary purpose of
8 determining the position of the water level in the well.

9 (3) "Agent" means any person who by mutual and legal agreement with a well owner has authority to act in his
10 behalf in executing applications for permits. The agent may be either general agent or a limited agent
11 authorized to do one particular act.

12 (4) "ASTM" means the American Society for Testing and Materials.

13 (5) "Casing" means pipe or tubing constructed of specified materials and having specified dimensions and
14 weights, that is installed in a borehole, during or after completion of the borehole, to support the side of the
15 hole and thereby prevent caving, to allow completion of a well, to prevent formation material from entering
16 the well, to prevent the loss of drilling fluids into permeable formations, and to prevent entry of ~~undesirable~~
17 water. contamination.

18 (6) "Clay" means a substance comprised of natural, inorganic, finely ground crystalline mineral fragments which,
19 when mixed with water, forms a pasty, moldable mass that preserves its shape when air dried.

20 ~~(6)~~ (7) "Commission" means the North Carolina Environmental Management Commission or its successor, unless
21 otherwise indicated.

22 ~~(7)~~ (8) "Consolidated rock" means rock that is firm and coherent, solidified or cemented, such as granite, gneiss,
23 limestone, slate or sandstone, that has not been decomposed by weathering.

24 ~~(8)~~ (9) "Contamination" means the introduction of foreign materials of such nature, quality, and quantity into the
25 groundwaters as to ~~cause degradation of the quality of the water~~ exceed the groundwater quality standards
26 specified in 15A NCAC 2L (Classifications and Water Quality Standards Applicable to the Groundwaters of
27 North Carolina).

28 ~~(9)~~(10) "Department" means the Department of ~~Environment, Health, Environment~~ and Natural Resources.

29 ~~(10)~~(11) "Designed capacity" shall mean that capacity that is equal to the ~~rate of discharge~~ or yield that is specified
30 prior to construction of the well.

31 ~~(11)~~(12) "Director" means the Director of the Division of ~~Environmental Management. Water Quality.~~

32 ~~(12)~~(13) "Division" means the Division of ~~Environmental Management. Water Quality.~~

33 ~~(13)~~(14) "Domestic use" means water used for drinking, bathing, or other household purposes, livestock, or gardens.

34 (15) "Formation Material" means naturally occurring material generated during the drilling process that
35 is composed of sands, silts, clays or fragments of rock and which is not in a dissolved state.

36 ~~(14)~~(16) "GPM" and "GPD" mean gallons per minute and gallons per day, respectively.

37 ~~(15)~~(17) "Grout" shall mean and include the following:

- 1 (a) "Neat cement grout" means a mixture of not more than six gallons of clear, potable water to one 94
2 pound bag of portland cement. Up to five percent, by weight, of bentonite clay may be used to
3 improve flow and reduce shrinkage.
- 4 (b) "Sand cement grout" means a mixture of not more than two parts sand and one part cement and not
5 more than six gallons of clear, potable water per 94 pound bag of portland cement.
- 6 (c) "Concrete grout" means a mixture of not more than two parts gravel to one part cement and not more
7 than six gallons of clear, potable water per 94 pound bag of portland cement. One hundred percent of
8 the gravel must pass through a one-half inch mesh screen.
- 9 (d) "Gravel cement grout, sand cement grout or rock cutting cement grout" means a mixture of not more
10 than two parts gravel and sand or rock cuttings to one part cement and not more than six gallons of
11 clear, potable water per 94 pound bag of portland cement.
- 12 (e) "Bentonite grout" means the mixture of no less than one and one-half pounds of commercial **granulated**
13 bentonite with sufficient clear, potable water to produce a grout weighing no less than 9.4 pounds per
14 gallon of mixture. Non-organic, non-toxic substances may be added to improve particle distribution
15 and pumpability. Bentonite grout may only be used in those instances where specifically approved in
16 this ~~Section~~. **Section and only as recommended by the manufacturer.**
- 17 (f) "Specialty grout" means a mixture of non-organic, non-toxic materials with characteristics of expansion,
18 chemical-resistance, rate or heat of hydration, viscosity, density or temperature-sensitivity applicable
19 to specific grouting requirements. ~~Speciality~~ **Specialty** grouts may not be used without prior approval
20 by the Director. **Approval of the use of specialty grouts shall be based on a demonstration that the**
21 **mixture will not adversely impact human health or the environment.**
- 22 ~~(16)~~(18) "Liner pipe" means pipe that is installed inside a completed and cased well for the purpose of ~~sealing off~~
23 ~~undesirable water~~ preventing the entrance of contamination into the well or for repairing ruptured or
24 punctured casing or screens.
- 25 ~~(17)~~(19) "Monitoring well" means any well constructed for the primary purpose of obtaining samples of
26 groundwater or other liquids for examination or testing, or for the observation or measurement of
27 groundwater levels. This definition excludes lysimeters, tensiometers, and other devices used to investigate
28 the characteristics of the unsaturated ~~zone~~. zone but includes piezometers, a type of monitor well constructed
29 solely for the purpose of determining groundwater levels.
- 30 ~~(18)~~(20) "Owner" means any person who holds the fee or other property rights in the well being constructed. A well
31 is real property and its construction on land rests ownership in the land owner in the absence of contrary
32 agreement in writing.
- 33 ~~(19)~~(21) "Pitless adapters" or "pitless units" are devices specifically manufactured to the standards specified under ~~Rule~~
34 15A NCAC 2C .0107(i) (5) of this Section for the purpose of allowing a subsurface lateral connection between
35 a well and plumbing appurtenances.
- 36 ~~(20)~~(22) "Public water system" means a water system as defined in 15A NCAC 18C (Rules Governing Public Water
37 Supplies).

- 1 ~~(21)~~(23) "Recovery well" means any well constructed for the purpose of removing contaminated groundwater or other
2 liquids from the subsurface.
- 3 ~~(22)~~(24) "Settleable solids" means the volume of solid particles in a well-mixed one liter sample which will settle out
4 of suspension, in the bottom of an Imhoff Cone, after one hour.
- 5 ~~(23)~~(25) "Site" means the land or water area where any facility, activity or situation is physically located, including
6 adjacent or nearby land used in connection with the facility, activity or situation.
- 7 ~~(24)~~(26) "Specific capacity" means the yield of the well expressed in gallons per minute per foot of draw-down of the
8 water level ~~(gpm/ft.-dd).~~ (gpm/ft.-dd) per unit of time.
- 9 ~~(25)~~(27) "Static water level" means the level at which the water stands in the well when the well is not being pumped
10 and is expressed as the distance from a fixed reference point to the water level in the well.
- 11 ~~(26)~~(28) "Suspended solids" means the weight of those solid particles in a sample which are retained by a standard
12 glass microfiber filter, with pore openings of one and one-half microns, when dried at a temperature of 103
13 to 105 degrees Fahrenheit.
- 14 ~~(27)~~(29) "Temporary well" means a ~~monitor~~ well, other than a water supply well, or a well that is constructed to
15 determine aquifer characteristics, and which will be properly abandoned or converted to a permanent
16 ~~monitoring~~ well within five days (120 hours) of the completion of drilling of the borehole.
- 17 ~~(28)~~(30) "Turbidity" means the cloudiness in water, due to the presence of suspended particles such as clay and silt,
18 that may create esthetic problems or analytical difficulties for determining contamination. ~~Turbidity~~ Turbidity,
19 measured in Nephelometric Turbidity Units ~~(NTU)~~ (NTU), is based on a comparison of the cloudiness in the
20 water with that in a specially prepared standard.
- 21 (31) "Vent" means an opening in the well casing or well head, installed for the purpose of allowing changes in
22 the water level in a well due to natural atmospheric changes or to pumping. A vent can also serve as an access
23 port.
- 24 ~~(29)~~(32) "Well" means any excavation that is cored, bored, drilled, jetted, dug or otherwise constructed for the purpose
25 of locating, testing, developing, draining or recharging any groundwater reservoirs or aquifer, or that may
26 control, divert, or otherwise cause the movement of water from or into any aquifer. ~~Provided, however, this~~
27 ~~shall not include a well constructed by an individual on land which is owned or leased by him, appurtenant~~
28 ~~to a single family dwelling, and intended for domestic use (including household purposes, farm livestock or~~
29 ~~gardens).~~
- 30 ~~(30)~~(33) "Well capacity" shall mean the maximum quantity of water that a well will yield ~~continuously.~~ continuously
31 as determined by methods outlined in 15A NCAC 2C .0110.
- 32 ~~(31)~~(34) "Well head" means the upper terminal of the well including adapters, ports, valves, seals, and other
33 attachments.
- 34 ~~(32)~~(35) "Well system" means two or more ~~wells serving the same facility.~~ cross-connected wells.
- 35 (36) "Yield" means the amount of water or other fluid that can be extracted from a well under a given set of
36 conditions.
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- 1 *History Note: Authority G.S. 87-85; 87-87; 143-214.2; 143-215.3;*
- 2 *Eff. February 1, 1976;*
- 3 *Amended Eff. April 1, 2001; December 1, 1992; July 1, 1988; March 1, 1985; September 1, 1984*

1 15A NCAC 2C .0103 has been amended with changes as published in 15:5 NCR 547– 548 as follows:

2
3 **.0103 REGISTRATION**

4 ~~(a) Well Driller Registration:~~

5 ~~(1) Every person, firm or corporation engaged in the business of drilling, boring, coring or constructing wells in~~
6 ~~any manner with the use of power machinery in the state shall register annually with the~~
7 ~~department. Department.~~

8 ~~(2) Registration shall be accomplished, during the period from January 1 to January 31 of each year, by~~
9 ~~completing and submitting to the department a registration application form provided by the department for~~
10 ~~this purpose.~~

11 ~~(3) A non refundable processing fee, in the form of a check or money order made payable to N.C. Department~~
12 ~~of Environment, Health, Environment and Natural Resources, shall be submitted with each registration~~
13 ~~application form. Fees, for the year in which the registration will be valid, are as follows:~~

14 ~~(A) For renewal of registration by any person, firm or corporation having registered at any time during the~~
15 ~~five calendar years prior to the date of application:~~

16 ~~(i) fifty dollars (\$50.00) for applications postmarked prior to February 1; and~~

17 ~~(ii) sixty dollars (\$60.00) for application postmarked after January 31.~~

18 ~~(B) For registration by any person, firm or corporation that did not register at any time during the five~~
19 ~~calendar years prior to the date of application:~~

20 ~~(i) fifty dollars (\$50.00) for applications postmarked prior to February 1; or~~

21 ~~(ii) for each succeeding calendar month after January, the fee shall be reduced by three dollars (\$3.00)~~
22 ~~from that due in the proceeding month. As examples, the fee for applications postmarked February 1~~
23 ~~through 29 would be forty seven dollars (\$47.00), while the fee for applications postmarked November~~
24 ~~1 through 30 would be twenty dollars (\$20.00).~~

25 ~~(4) An application is incomplete until the required processing fee has been received. Incorrect or incomplete~~
26 ~~applications may be returned to the applicant.~~

27 ~~(5) Upon receipt of a properly completed application form, the applicant shall be issued a certificate of~~
28 ~~registration.~~

29
30 ~~(b) Pump Installer Registration:~~

31 (1) All persons, firms, or corporations engaged in the business of installing or repairing pumps or other
32 equipment in wells shall register bi-annually with the ~~department~~ Department.

33 (2) Registration shall be accomplished, during the period from April 1 to April 30 of every odd-numbered
34 year, by completing and submitting to the department a registration form provided by the department for
35 this purpose.

36 (3) Upon receipt of a properly completed application form, the applicant will be issued a certificate of registration.

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*History Note: Authority G.S. 87-87; 143-215.3(a)(1a); 143-355(e);
Eff. February 1, 1976;
Amended Eff. April 1, 2001; December 1, 1992; July 1, 1988; April 20, 1978.*

1 **15A NCAC 2C .0105 has been amended with changes as published in 15:5 NCR 548 - 549 as follows:**

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3 **.0105 PERMITS**

4 (a) It is the finding of the Commission that the entire geographical area of the state is vulnerable to groundwater
5 pollution from improperly located, constructed, operated, altered, or abandoned non-water supply wells and water supply
6 wells not constructed in accordance with the standards set forth in ~~Rule 15A NCAC 2C .0107~~ of this Section. Therefore,
7 in order to ~~insure~~ **ensure** reasonable protection of the groundwater resources, prior permission from the Division must
8 be obtained for the construction of the types of wells enumerated in Paragraph (b) of this Rule.

9 (b) No person shall locate or construct any of the following wells until a permit has been issued by the Director:

- 10 (1) any water-well or well system with a design capacity of 100,000 gallons per day (gpd) or greater;
- 11 (2) any well added to an existing system where the total design capacity of such existing well system and added
12 well will equal or exceed 100,000 gpd;
- 13 (3) any monitoring well, constructed to assess the impact of an activity not permitted by the state, when installed
14 on property other than that on which the unpermitted activity took place;
- 15 (4) any recovery well;
- 16 ~~(5) any well intended for the recovery of minerals or ores;~~
- 17 ~~(6) any oil or gas exploration or recovery well;~~
- 18 ~~(7)(5)~~ any well for recharge or injection purposes;
- 19 ~~(8)(6)~~ any well with a design deviation from the standards specified under the rules of this ~~Subchapter~~ **Subchapter**;

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21 (c) The Director may delegate, through a Memorandum of Agreement, to another governmental agency, the
22 authority to permit wells that are an integral part of a facility requiring a permit from the agency. Provided, however,
23 that the permittee comply with all provisions of this Subchapter, including construction standards and the reporting
24 requirements as specified in ~~Rule 15A NCAC 2C .0114~~. In the absence of such agreement, all wells specified in
25 Paragraph (b) of this Rule require a well construction permit in addition to any other permits.

26 (d) An application for a permit shall be submitted by the owner or his agent. In the event that the permit applicant
27 is not the owner of the property on which the well or well system is to be constructed, the permit application must contain
28 written approval from the property owner and a statement that the applicant assumes total responsibility for ensuring that
29 the well(s) will be located, constructed, maintained and abandoned in accordance with the requirements of this
30 Subchapter.

31 (e) The application shall be submitted ~~in duplicate~~ to the Division, on forms furnished by the Division, and shall
32 include the following:

- 33 (1) For all wells:
- 34 (A) the owner's name (facility name);
- 35 (B) the owner's mailing address (facility address);
- 36 (C) description of the well type and activity requiring a permit;

- 1 (D) facility location (map);
- 2 (E) a map of the facility and general site area, to scale, showing the locations of:
- 3 (i) all property boundaries, at least one of which is referenced to a minimum of two landmarks such as
- 4 identified roads, intersections, streams or lakes within 500 feet of proposed well or well
- 5 system;
- 6 (ii) all existing wells, identified by type of use, within 500 feet of proposed well or well system;
- 7 (iii) the proposed well or well system;
- 8 (iv) any test borings within 500 feet of proposed well or well system; and
- 9 (v) all sources of known or potential groundwater contamination (such as septic tank systems;
- 10 pesticide, chemical or fuel storage areas; animal feedlots; landfills or other waste disposal areas)
- 11 within 500 feet of the proposed well site;
- 12 (F) the well drilling contractor's name and state [redacted] certification number, if known;
- 13 (G) construction diagram of the proposed well(s) including specifications describing all materials to be
- 14 used, methods of construction and means for assuring the integrity and quality of the finished well(s).
- 15 (2) For water supply wells or well systems with a designed capacity of 100,000 gpd or greater the application shall
- 16 include, in addition to the information required in Subparagraph (e)(1) of this Rule:
- 17 (A) the number, yield and location of existing wells in the system;
- 18 (B) the design capacity of the proposed well(s);
- 19 (C) any other ~~information that the Division may reasonably deem~~ well construction information or site
- 20 ~~specific information deemed necessary.~~ necessary by the Director for the protection of human health
- 21 ~~and the environment.~~
- 22 (3) For those monitoring wells with a design deviation from the specifications of ~~Rule 15A NCAC 2C~~ .0108 of
- 23 this Section, in addition to the information required in Subparagraph (e)(1) of this Rule:
- 24 (A) a description of the subsurface conditions sufficient to evaluate the site. Data from test borings, wells
- 25 pumping tests, etc., may be required as necessary;
- 26 (B) a description of the quantity, character and origin of the contamination;
- 27 (C) justification for the necessity of the design deviation; and
- 28 (D) any other ~~information that the Division may reasonably deem~~ well construction information or site
- 29 ~~specific information deemed necessary.~~ necessary by the Director for the protection of human health
- 30 ~~and the environment.~~
- 31 (4) For those recovery wells with a design deviation from the specifications in ~~Rule 15A NCAC 2C~~ .0108 of this
- 32 Section, in addition to the information required in Subparagraph (e)(1) and Parts (e)(3)(A), (B) and (C) of this
- 33 Rule, the application shall describe the disposition of any fluids recovered if the disposal of those fluids will
- 34 have an impact on any existing wells other than those installed for the express purpose of measuring the
- 35 effectiveness of the recovery well(s).
- 36 (f) In the event of an emergency, monitoring wells or recovery wells may be constructed after verbal approval
- 37 is provided by the Director or his delegate. After-the-fact applications shall be submitted by the driller or owner within

1 ten days after construction begins. The application shall include construction details of the monitoring well(s) or
2 recovery ~~well(s).~~ well(s) and include the name of the person who gave verbal approval and the time and date that
3 approval was given.
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5 (g) It shall be the responsibility of the well owner or his agent to see that a permit is secured prior to the beginning
6 of construction of any well for which a permit is required under the rules of this Subchapter.
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10 *History Note: Authority G.S. 87-87; 143-215.1*

11 *Eff. February 1, 1976;*

12 *Amended Eff. April 1, 2001; December 1, 1992; March 1, 1985; September 1, 1984; April 20, 1978.*
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1 15A NCAC 2C .0107 has been amended with changes as published in 15:5 NCR 549– 554 as follows:

3 **.0107 STANDARDS OF CONSTRUCTION: WATER-SUPPLY WELLS**

4 (a) Location.

- 5 (1) The well shall not be located in an area generally subject to flooding. Areas which have a propensity for
6 flooding include those with concave slope, alluvial or colluvial soils, gullies, depressions, and drainage ways.
7 (2) The minimum horizontal separation between a well, intended for a single-family residence or other non-public
8 water system, and potential sources of groundwater ~~contamination~~ contamination, which exists at the time the
9 well is constructed, shall be as follows unless otherwise specified:

- 10 (A) Septic tank and drainfield 100 ft.
11 (B) Other subsurface ground absorption waste disposal system 100 ft.
12 (C) Industrial or municipal sludge-spreading or wastewater-irrigation sites 100 ft.
13 (D) Water-tight sewage or liquid-waste collection or transfer facility 50 ft.
14 (E) Other sewage and liquid-waste collection or transfer facility 100 ft.
15 (F) Cesspools and privies 100 ft.
16 (G) Animal feedlots or manure piles 100 ft.
17 (H) Fertilizer, pesticide, herbicide or other chemical storage areas 100 ft.
18 (I) Non-hazardous waste storage, treatment or disposal lagoons 100 ft.
19 (J) Sanitary landfills 500 ft.
20 (K) Other non-hazardous solid waste ~~landfills~~ landfills, such as Land Clearing and Inert Debris
21 (LCID) landfills 100 ft.
22 (L) Animal barns 100 ft.
23 (M) Building ~~foundations~~ foundations, excluding the foundation of a structure housing the
24 well head ~~50 ft.~~ 25 ft.
25 (N) Surface water bodies which act as sources of groundwater recharge, such as
26 ponds, lakes and reservoirs 50 ft.
27 (O) All other surface water bodies , such as brooks, creeks, streams, rivers, sounds,
28 bays and tidal estuaries 25 ft.
29 (P) Chemical or petroleum fuel underground storage tanks regulated under 15A NCAC 2N:
30 (i) with secondary containment 50 ft.
31 (ii) without secondary containment 100 ft.
32 (Q) Above ground or underground storage tanks
33 which contain petroleum fuels used for heating equipment, boilers or furnaces 50 ft.
34 (R) All other potential sources of groundwater contamination ~~100 ft.~~ 50 ft.
35 (3) For a well serving a-an existing single-family dwelling where lot size or other fixed conditions preclude the
36 separation distances specified in Subparagraph (a)(2) of this Rule, the required separation distances shall
37 be the maximum possible but shall in no case be less than the following:

- 1 (A) Septic tank and drainfield 50 ft.
- 2 (B) Water-tight sewage or liquid-waste collection or transfer facility 25 ft.
- 3 ~~(C) Building foundations 25 ft.~~
- 4 (C) Animal barns. 50 ft.
- 5 ~~(D) Cesspool or privies 50 ft.~~
- 6 (4) A well or well system, serving more than one single-family dwelling but with a designed capacity of less than
- 7 100,000 gpd, must meet the separation requirements specified in Subparagraph (a) (2) of this Rule;
- 8 (5) A well or well system with a designed capacity of 100,000 gpd or greater must be located a sufficient distance
- 9 from known or anticipated sources of groundwater contamination so as to prevent a violation of applicable
- 10 groundwater quality standards, resulting from the movement of contaminants, in response to the operation of
- 11 the well or well system at the proposed rate and schedule of pumping;
- 12 (6) Actual separation distances must conform with the most stringent of applicable federal, state or local
- 13 requirements;
- 14 (7) Wells drilled for public water supply systems regulated by the Division of Environmental Health shall meet
- 15 the siting and all other requirements of that Division.
- 16 (b) Source of water.
- 17 (1) The source of water for any well intended for domestic use shall not be from a water bearing zone or aquifer
- 18 that is known to be contaminated;
- 19 (2) In designated areas described in ~~Rule 15A NCAC 2C~~.0117 of this Section, the source shall be greater than
- 20 35 feet;
- 21 (3) In designated areas described in ~~Rule 15A NCAC 2C~~.0116 of this Section, the source may be less than 20
- 22 feet, but in no case less than 10 feet; and
- 23 (4) In all other areas the source shall be at least 20 feet below land surface.
- 24 (c) Drilling Fluids and Additives. Drilling Fluids and Additives shall not contain organic or toxic substances
- 25 or include water obtained from surface water bodies or water from a non-potable supply and may be comprised only of:
- 26 (1) the formational material encountered during drilling; or
- 27 (2) materials manufactured specifically for the purpose of borehole conditioning or water well
- 28 construction.
- 29 (d) Casing.
- 30 (1) If steel casing is used, then:
- 31 (A) The casing shall be new, seamless or electric-resistance welded galvanized or black steel pipe.
- 32 Galvanizing shall be done in accordance with requirements of ASTM A-120.
- 33 (B) The casing, threads and couplings shall meet or exceed the specifications of ASTM A-53, A-120 or
- 34 A589.
- 35 (C) The minimum wall thickness for a given diameter shall equal or exceed that specified in Table 1.
- 36
- 37

TABLE 1: MINIMUM WALL THICKNESS FOR STEEL CASING:

Nominal Diameter (in.)	Wall Thickness (in.)
For 3-1/2" or smaller pipe, schedule 40 is required	
4	0.142
5	0.156
5-1/2	0.164
6	0.185
8	0.250
10	0.279
12	0.330
14 and larger	0.375

(D) Stainless steel casing, threads, and couplings shall conform in specifications to the general requirements in ASTM A-530 and also shall conform to the specific requirements in the ASTM standard that best describes the chemical makeup of the stainless steel casing that is intended for use in the construction

- 1 of the well;
- 2 (E) Stainless steel casing shall have a minimum wall thickness that is equivalent to standard schedule
- 3 number 10S;
- 4 (F) Steel casing shall be equipped with a drive shoe if the casing is driven in a consolidated rock formation.
- 5 formation and for any other wells if the casing is driven in a consolidated rock formation. The drive
- 6 shoe shall be made of forged, high carbon, tempered seamless steel and shall have a beveled, hardened
- 7 cutting edge. A drive shoe will not be required for wells in which ~~the~~ a cement or concrete grout
- 8 surrounds and extends the entire length of the casing.
- 9 (2) If Thermoplastic Casing is used, then:
- 10 (A) the casing shall be new;
- 11 (B) the casing and joints shall meet or exceed all the specifications of ASTM F-480-81, except that the
- 12 outside diameters will not be restricted to those listed in F-480;
- 13 (C) the maximum depth of installation for a given SDR or Schedule number shall not exceed that listed in
- 14 Table 2; Table 2 unless the well drilling contractor can provide the Division, upon request, with written
- 15 documentation from the manufacturer of the casing stating that the casing may safely be used at the
- 16 depth at which it is to be installed.

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19 TABLE 2: Maximum allowable depths (in feet) of Installation of

20 Thermoplastic Water Well Casing

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22 Nominal Diameter (in inches)

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25 Schedule

26 Number 2 2.5 3 3.5 4 5 6 8 10 12 14 16

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29 Schedule

30 40- 485 635 415 315 253 180 130 85 65 65 50 50

31

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33 Schedule

34 80- 1460 1685 1170 920 755 550 495 340 290 270 265 255

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37 SDR Number All Diameters (in inches)

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3	SDR 41	20
4		
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6	SDR 32.5	50
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9	SDR 27.5	100
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11		
12	SDR 26	95
13		
14	SDR 21	185
15		
16		
17	SDR 17	355
18		
19		
20	SDR 13.5	735
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- 22
- 23 (D) The top of the casing shall be terminated by the drilling contractor at least twelve inches above land
- 24 surface.
- 25 (E) For wells in which the casing will extend into consolidated rock, ~~it is recommended that~~ thermoplastic
- 26 casing shall be equipped with a ~~section of steel casing at least three feet in length, or other device~~
- 27 ~~approved by the Director, a coupling, or other device approved by the manufacturer of the casing, that~~
- 28 is sufficient to protect the physical integrity of the thermoplastic casing during the processes of seating
- 29 and grouting the casing and subsequent drilling operations.
- 30 (F) Thermoplastic casing shall not be driven into consolidated rock.
- 31 (3) In constructing any well, all water-bearing zones that are known to contain polluted, saline, or other
- 32 non-potable water shall be adequately cased and cemented off so that pollution of ~~the~~ overlying and
- 33 underlying groundwater zones will not occur.
- 34 (4) Every well shall be cased so that the bottom of the casing extends to a minimum depth as follows:
- 35 (A) Wells located within the area described in Rule 15A NCAC 2C .0117 of this Section shall be cased from
- 36 land surface to a depth of at least 35 feet.
- 37 (B) Wells located within the area described in Rule 15A NCAC 2C .0116 of this Section shall be cased from

1 land surface to a depth of at least 10 feet.

2 (C) Wells located in any other area shall be cased from land surface to a depth of at least 20 feet.

3 (5) The top of the casing shall be terminated by the drilling contractor at least 12 inches above land surface.

4 (6) The casing in wells constructed to obtain water from a consolidated rock formation shall be:

5 (A) adequate to prevent any formational material from entering the well in excess of the levels specified
6 in Paragraph (h) of this Rule; and

7 (B) ~~Firmly~~firmly seated at least ~~one foot~~ five feet into the rock.

8 (7) The casing in wells constructed to obtain water from an unconsolidated rock formation (such as gravel, sand
9 or shells) shall extend at least one foot into the top of the water-bearing formation.

10 (8) Upon completion of the well, the well casing shall be sufficiently free of obstacles including formation material
11 as necessary to allow for the installation and proper operation of pumps and associated equipment.

12 (e) Grouting.

13 (1) Casing shall be grouted to a minimum depth of twenty feet below land surface except that:

14 (A) In those areas designated by the Director to meet the criteria of Rule 15A NCAC 2C .0116 of this
15 Section, grout shall extend to a depth of two feet above the screen or, for open end wells, to the bottom
16 of the casing, but in no case less than 10 feet.

17 (B) In those areas designated in Rule 15A NCAC 2C .0117 of this Section, grout shall extend to a minimum
18 of 35 feet below land surface.

19 (C) The casing shall be grouted as necessary to seal ~~off-off, from the producing zone(s),~~ all aquifers or
20 zones with water ~~of a poorer quality containing organic or other contaminants of such type and quantity~~
21 as to render water from those aquifers or zones unsafe or harmful or unsuitable for human consumption
22 and general use, and quantity than that of the producing zone(s).

23 (2) For large diameter ~~wells~~ wells, commonly referred to as "bored" wells, cased with concrete pipe or ceramic
24 tile, the following shall apply:

25 (A) The diameter of the bore hole shall be at least six inches larger than the outside diameter of the casing;

26 (B) The annular space around the casing shall be filled with a cement-type grout to a depth of at least 20
27 feet, excepting those designated areas specified in Rules 15A NCAC 2C .0116 and 15A NCAC 2C
28 .0117 of this Section. The grout shall be placed in accordance with the requirements of this Paragraph.

29 (3) Bentonite grout may be only used in that portion of the borehole that is ~~below the water table throughout the~~
30 year, at least three feet below land surface. That portion of the borehole above the bentonite grout, up to
31 land surface, shall be filled with a concrete or cement-type grout.

32 (4) Grout shall be placed around the casing by one of the following methods:

33 (A) Pressure. Grout shall be pumped or forced under pressure through the bottom of the casing until it fills
34 the annular area around the casing and overflows at the surface.

35 (B) Pumping. Grout shall be pumped into place through a hose or pipe extended to the bottom of the
36 annular space which can be raised as the grout is applied. The grout hose or pipe should remain
37 submerged in grout during the entire application.

1 (C) Other. Grout may be emplaced in the annular space by gravity flow in such a way to insure ensure
2 complete filling of the space to a maximum depth of 20 feet below land surface.

3 (5) If an outer casing is installed, it shall be grouted by either the pumping or pressure method.

4 (6) ~~The liquid and solid components of All~~ all grout mixtures shall be thoroughly blended prepared prior to
5 ~~emplacement.~~ emplacement below land surface.

6 (7) The well shall be grouted within five working days after the casing is set.

7 (8) No additives which will accelerate the process of hydration shall be used in grout for thermoplastic well casing.

8 (9) Where grouting is required by the provisions of this Section, the grout shall extend outward from the casing
9 wall to a minimum thickness equal to either one-third of the diameter of the outside dimension of the casing
10 or two inches, whichever is greater; excepting, however, that large diameter bored wells shall meet the
11 requirements of Subparagraph (e)(2) of this Rule.

12 (f) Well Screens.

13 (1) The well, if constructed to obtain water from an unconsolidated rock formation, shall be equipped with a
14 screen that will adequately prevent the entrance of formation material into the well after the well has been
15 developed and completed by the well contractor.

16 (2) The well screen be of a design to permit the optimum development of the aquifer with minimum head loss
17 consistent with the intended use of the well. The openings shall be designed to prevent clogging and shall
18 be free of rough edges, irregularities or other defects that may accelerate or contribute to corrosion or
19 clogging.

20 (3) Multi-screen wells shall not connect aquifers or zones which have differences in water quality which would
21 result in contamination of any aquifer or zone.

22 (g) Gravel-and Sand-Packed Wells.

23 (1) In constructing a gravel-or sand-packed well:

24 (A) The packing material shall be composed of quartz, granite, or similar mineral or rock material and shall
25 be clean, of uniform size, water-washed and free from clay, silt, or other deleterious material.

26 (B) The size of the packing material shall be determined from a grain size analysis of the formation
27 material and shall be of a size sufficient to prohibit the entrance of formation material into the well in
28 concentrations above those permitted by Paragraph (h) of this Rule.

29 (C) The packing material shall be placed in the annular space around the screens and casing by a fluid
30 circulation method, preferably through a conductor pipe to insure ensure accurate placement and
31 avoid bridging.

32 (D) The packing material shall be adequately disinfected.

33 ~~(E) For gravel or sand packed wells in which an outer casing, that is grouted its entire length, does not~~
34 ~~extend to the top of the producing zone, a grout neat cement plug of at least 10 feet in vertical thickness~~
35 ~~shall be placed in the annular area between the inner casing and formation opposite the first natural clay~~
36 ~~formation above the top screen. The remaining space shall be filled with grout or clay except the upper~~
37 ~~20 feet, which shall be filled with grout.~~

1 ~~(F)~~ (E) Centering guides must be installed within five feet of the top packing material to ensure even
2 distribution of the packing material in the borehole.

3 (2) The packing material shall not connect aquifers or zones which have differences in water quality that would
4 result in deterioration of the water quality in any aquifer or zone.

5 (h) Well Development.

6 (1) All water supply wells shall be properly developed by the well driller;

7 (2) Development shall include removal of formation materials, mud, drilling fluids and additives such that the
8 water contains no more than:

9 (A) five milliliters per liter of settleable solids; and

10 (B) ten NTUs of turbidity as suspended solids.

11 (3) Development shall not require efforts to reduce or eliminate the presence of dissolved constituents
12 which are indigenous to the ground water quality in that area. Typical dissolved constituents include, but are
13 not limited to, aluminum, calcium, chloride, iron, magnesium, manganese, sodium and sulphate.

14 (i) Well Head Completion.

15 (1) Access Port. Every water supply well and such other wells as may be specified by the Commission shall be
16 equipped with a usable access port or air line. The access port shall be at least one half inch inside diameter
17 opening so that the position of the water level can be determined at any time. Such port shall be installed and
18 maintained in such manner as to prevent entrance of water or foreign material.

19 (2) Well Contractor Identification Plate.

20 (A) An identification plate, showing the drilling contractor and registration certification number and the
21 information
22 specified in Part (i)(2)(E) of this Rule, shall be installed on the well within 72 hours after completion
23 of the drilling.

24 (B) The identification plate shall be constructed of a durable weatherproof, rustproof metal, or equivalent
25 material approved by the Director.

26 (C) The identification plate shall be ~~permanently~~ securely attached to either the aboveground portion of the
27 well casing, surface grout pad well casing or enclosure floor around the casing where it is readily
28 visible.

29 (D) The identification plate shall not be removed ~~from the well casing or enclosure floor~~ by any person.

30 (E) The identification plate shall be stamped or otherwise imprinted with a ~~permanent marking~~ permanent,
31 legible markings to show the:

32 (i) total depth of well;

33 (ii) casing depth (ft.) and inside diameter (in.);

34 (iii) screened intervals of screened wells;

35 (iv) packing interval of gravel-or sand-packed wells;

36 (v) yield, in gallons per minute (gpm), or specific capacity in gallons per minute per foot of
37 drawdown (gpm/ft.-dd);

- 1 (vi) static water level and date measured; and
2 (vii) date well completed.
- 3 (3) Pump Installer Identification Plate.
- 4 (A) An identification plate, ~~displaying~~ showing the name and registration number of the pump installation
5 contractor, and the information specified in Part (i)(3)(D) of this Rule, shall be ~~permanently~~ securely
6 attached to either the aboveground portion of the well casing, surface grout pad or the enclosure floor
7 if present, within 72 hours after completion of the pump installation;
- 8 (B) The identification plate shall be constructed of a durable waterproof, rustproof metal, or equivalent
9 material approved by the Director;
- 10 (C) The identification plate shall not be removed ~~from the well casing or enclosure floor~~ by any person;
11 and
- 12 (D) The identification plate shall be stamped or otherwise imprinted with a ~~permanent marking~~ permanent,
13 legible, markings to show the:
- 14 (i) date the pump was installed;
15 (ii) the depth of the pump intake; and
16 (iii) the horsepower rating of the pump.
- 17 (4) Valved flow. Every artesian well that flows under natural artesian pressure shall be equipped with a valve so
18 that the flow can be completely stopped. Well owners shall be responsible for the installation, operation and
19 maintenance of the valve.
- 20 (5) Pitless adapters or pitless units shall be allowed as a method of well head completion under the following
21 conditions:
- 22 (A) The pitless device shall be manufactured specifically for the purpose of water well construction;
23 (B) Design, installation and performance standards shall be those specified in PAS-1 (Pitless Adapter
24 Standard No. 1) as adopted by the Water System Council's Pitless Adapter Division;
25 (C) The pitless device will be compatible with the well casing;
26 (D) The top of the pitless device shall extend at least ~~8~~ eight inches above land surface;
27 (E) The pitless device shall have an access port.
- 28 (6) All openings for piping, wiring, and vents shall enter into the well at least ~~eight~~ 12 inches above land surface,
29 except where pitless adapters or pitless units are used, and shall be adequately sealed to preclude the entrance
30 of contaminants into the well.

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34 *History Note: Authority G.S. 87-87; 87-88;*

35 *Eff. February 1, 1976;*

36 *Amended Eff. April 1, 2001; December 1, 1992; March 1, 1985; September 1, 1984; April 20, 1978.*

1 15A NCAC 2C .0108 has been amended with changes as published in 15:5 NCR 554 – 555 as follows:

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3 **.0108 STANDARDS OF CONSTRUCTION: WELLS OTHER THAN WATER SUPPLY**

4 (a) No well shall be located, constructed, operated, or repaired in any manner that may adversely impact the
5 quality of groundwater. ~~Any test hole or boring shall be permanently abandoned by the driller in accordance with Rule~~
6 ~~.0113 of this Section within two days after drilling or two days after testing is complete, whichever is less restrictive;~~
7 ~~except in the case that a test well is being converted to a production well, in which case conversion shall be completed~~
8 ~~within 30 days.~~

9 (b) Injection wells shall conform to the standards set forth in Section .0200 of this Subchapter.

10 (c) Monitoring wells and recovery wells ~~be~~ shall be located, designed, constructed, operated and abandoned
11 with materials and by methods which are compatible with the chemical and physical properties of the contaminants
12 involved, specific site conditions and specific subsurface conditions. Specific construction standards will be itemized
13 in the construction permit, if such a permit is required, but the following general requirements will apply:

14 ~~(1) For wells from which samples of groundwater or other liquids will be obtained for the purpose of examination~~
15 ~~for testing, or for the recovery of polluted groundwater:~~

16 ~~(A)~~(1) The borehole shall not penetrate to a depth greater than the depth to be monitored or the depth from which
17 contaminants are to be recovered.

18 ~~(B)~~(2) The well shall not hydraulically ~~connect~~ connect:

19 (A) separate aquifers ~~aquifers~~ ; or

20 (B) those portions of a single aquifer where known or suspected contamination would occur in separate and
21 definable layers within the aquifer.

22 ~~(C)~~(3) The well construction materials shall be compatible with the depth of the well and the contaminants to be
23 monitored or recovered.

24 ~~(D)~~(4) The well shall be constructed in such a manner that water or contaminants from the land surface cannot
25 migrate along the borehole annulus into ~~the~~ any packing material or well screen area.

26 ~~(E)~~(5) Packing material placed around the screen shall extend ~~to a depth~~ at least one foot above the top of the screen.
27 Unless the depth of the screen necessitates a thinner seal; a ~~A~~ one foot thick seal, comprised of bentonitic
28 clay or other material approved by the Director, shall be emplaced directly above and in contact with the
29 packing material.

30 ~~(F)~~(6) Grout shall be placed in the annular space between the outermost casing and the borehole wall from the land
31 surface to the top of the bentonite clay seal above any well screen or to the bottom of the casing for open end
32 wells. To provide stability for the well casing, the uppermost three feet of grout below land surface must be
33 a concrete or cement-type grout.

34 ~~(G)~~(7) All wells shall be ~~secured~~ secured ,with a locking well cap, to reasonably ~~insure~~ ensure against unauthorized
35 access and use.

36 ~~(H)~~(8) All wells shall be afforded reasonable protection against damage during construction and use.

37 ~~(I)~~(9) Any wells ~~which~~ that are would flowing flow under natural artesian wells conditions shall be valved so that

1 the flow can be regulated.

2 ~~(J)~~(10) The well casing shall be terminated no less than 12 inches above land surface datum unless both of the
3 following conditions are met:

- 4 (i) ~~(A)~~ site-specific conditions directly related to business activities, such as vehicle traffic, would endanger
5 the physical integrity of the well; and
6 (ii) ~~(B)~~ the well head is completed in such a manner so as to preclude surficial contaminants from entering the
7 well.

8 ~~(K)~~(11) Each well shall have ~~permanently~~ securely affixed an identification plate constructed of a durable material
9 and shall contain the following information:

- 10 (i) ~~(A)~~ drilling ~~contractor~~ contractor, or pump installation contractor, name and applicable certification or
11 registration number; numbers;
12 (ii) ~~(B)~~ date well completed;
13 (iii) ~~(C)~~ total depth of well;
14 (iv) ~~(D)~~ a warning that the well is not for water supply and that the groundwater may contain hazardous
15 materials; and
16 (v) ~~(E)~~ depth(s) to the top(s) and bottom(s) of the screen(s).

17 ~~(L)~~(12) Each well shall be developed such that the level of turbidity or settleable solids does not preclude accurate
18 chemical analyses of any fluid samples collected.

19 ~~(2) For any permanent well which will only be used to measure groundwater levels, the following general~~
20 ~~requirements will apply:~~

- 21 ~~(A) The well shall not hydraulically connect separate aquifers;~~
22 ~~(B) The well shall be constructed in such a manner that water or contaminants from the land surface cannot~~
23 ~~migrate along the borehole channel into the any packing material or well screen areas.;~~
24 ~~(C) Grout shall be placed in the annular space between the casing and the borehole from land surface to~~
25 ~~the clay seal above the packing material or to the bottom of the casing for open end wells;~~
26 ~~(D) Unless the wells will not be left unattended, such as during a well capacity or aquifer capacity test, all~~
27 ~~wells shall be secured to reasonably insure against unauthorized access and use;~~
28 ~~(E) All wells shall be afforded reasonable protection against damage during construction and use;~~
29 ~~(F) Any well which is a flowing artesian well shall be valved such that flow can be regulated;~~
30 ~~(G) The well casing shall be terminated no less than 12 inches above land surface datum unless both of the~~
31 ~~following conditions are met:~~
32 ~~(i) site specific conditions related to business activities, such as vehicle traffic, would endanger~~
33 ~~the physical integrity of the well; and~~
34 ~~(ii) the well head is completed in such a manner so as to preclude surficial contaminants from~~
35 ~~entering the well.~~
36 ~~(H) an identification plate constructed of a rustproof, durable material shall be permanently affixed to the~~
37 ~~well and shall contain the following information:~~

- 1 (i) ~~drilling contractor name and registration number;~~
2 (ii) ~~date well completed;~~
3 (iii) ~~total depth of well; and~~
4 (iv) ~~a warning that the well is not a water supply well and that the groundwater may contain~~
5 ~~contamination.~~

6 (d) Wells constructed for the purpose of monitoring or testing for the presence of liquids associated with tanks
7 regulated under 15A NCAC 2N (Criteria and Standards Applicable to Underground Storage Tanks) shall be constructed
8 in accordance with 15A NCAC 2N .0504.

9 (e) Wells constructed for the purpose of monitoring for the presence of vapors associated with tanks regulated
10 under 15A NCAC 2N shall:

- 11 (1) be constructed in such a manner as to prevent the entrance of surficial contaminants or water into or alongside
12 the well casing; and
13 (2) be provided with a lockable cap in order to reasonably ~~insure~~ ensure against unauthorized access and use.

14 (f) Temporary wells and all other non-water supply wells shall be constructed in such a manner as to preclude
15 the vertical migration of contaminants within and along the borehole channel.

16 (g) For monitoring, sand-or gravel packed wells, centering guides must be evenly distributed in the borehole.

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20 *History Note: Authority G.S. 87-87; 87-88;*

21 *Eff. February 1, 1976;*

22 *Amended Eff. April 1, 2001; December 1, 1992; September 1, 1984; April 20, 1978.*

1 **15A NCAC 2C .0110 has been amended as published in 15:5 NCR 555 - 556 as follows:**

2
3 **.0110 WELL TESTS FOR YIELD**

4 (a) Every water supply well shall be tested for capacity by a method and for a period of time ~~acceptable to the~~
5 ~~department, as specified in this Rule.~~

6 (b) The permittee may be required as a permit condition to test any well for capacity by a method stipulated in the
7 permit.

8 (c) Standard methods for testing domestic well capacities include:

9 (1) Pump Method

10 (A) select a permanent measuring point, such as the top of the casing;

11 (B) measure and record the static water level below or above the measuring point prior to starting the pump;

12 (C) measure and record the discharge rate at intervals of 10 minutes or less;

13 (D) measure and record water levels using a steel or electric tape at intervals of 10 minutes or less;

14 (E) continue the test for a period of at least one hour;

15 (F) make measurements within an accuracy of plus or minus ~~0.25 of an~~ one inch.

16 (2) Bailer Method

17 (A) select a permanent measuring point, such as the top of the casing;

18 (B) measure and record the static water level below or above the measuring point prior to starting the
19 bailing procedure;

20 (C) bail the water out of the well as rapidly as possible for a period of at least one hour; determine and
21 record the bailing rate in gallons per minute at the end of the bailing period;

22 (D) measure and record the water level immediately after stopping bailing process.

23 (3) Air Rotary Drill Method

24 (A) measure and record the amount of water being injected into the well during drilling operations;

25 (B) measure and record the discharge rate in gallons per minute at intervals of one hour or less during
26 drilling operations;

27 (C) after completion of the drilling, continue to blow the water out of the well for at least 30 minutes and
28 measure and record the discharge rate in gallons per minute at intervals of 10 minutes or less during
29 the period;

30 (D) measure and record the water level immediately after discharge ceases.

31 (4) Air Lift Method

32 (A) Measurements shall be made through a pipe placed in the well;

33 (B) The pipe shall have a minimum inside diameter of at least five-tenths of an inch and shall extend from
34 top of the well head to a point inside the well that is below the bottom of the air line;

35 (C) Measure and record the static water level prior to starting the air compressor;

36 (D) Measure and record the discharge rate at intervals of 10 minutes or less;

37 (E) Measure and record the pumping level using a steel or electric tape at intervals of 10 minutes or less;

1 (F) Continue the test for a period of at least one hour.

2 (d) Public, Industrial and Irrigation Wells. Every public, industrial and irrigation well upon completion, shall
3 be tested for capacity by the drilling contractor (except when the owner specifies another agent) by the following or
4 equivalent method:

- 5 (1) The water level in the well to be pumped and any observation wells shall be measured and recorded prior to
6 starting the test.
- 7 (2) The well shall be tested by a pump of sufficient size and lift capacity to satisfactorily test the yield of the well,
8 consistent with the well diameter and purpose.
- 9 (3) The pump shall be equipped with sufficient throttling devices to reduce the discharge rate to approximately
10 25 percent of the maximum capacity of the pump.
- 11 (4) The test shall be conducted for a period of at least 24 hours without interruption and shall be continued for
12 a period of at least four hours after the pumping water level stabilizes (ceases to decline). When the total
13 water requirements for wells other than public, community or municipal supply wells are less than 100,000
14 gpd, the well shall be tested for a period and in a manner to satisfactorily show the capacity of the well, or
15 that the capacity of the well is sufficient to meet the intended purpose.
- 16 (5) The pump discharge shall be set at a constant rate or rates that can be maintained throughout the testing
17 period. If the well is tested at two or more pumping rates (a step-drawdown test), the pumping water level
18 shall be stabilized for a period of at least four hours for each pumping rate.
- 19 (6) The pump discharge rate shall be measured by an orifice meter, flowmeter, weir, or equivalent metering
20 device. The metering device shall have an accuracy within plus or minus five percent.
- 21 (7) The discharge rate of the pump and time shall be measured and recorded at intervals of 10 minutes or less
22 during the first two hours of the pumping period for each pumping rate. If the pumping rate is relatively
23 constant after the first two hours of pumping, discharge measurements and recording may be made at longer
24 time intervals but not to exceed one hour.
- 25 (8) The water level in each well and time shall be measured and recorded at intervals of five minutes or less
26 during the first hour of pumping and at intervals of 10 minutes or less during the second hour of pumping.
27 After the second hour of pumping, the water level in each well shall be measured at such intervals that the
28 lowering of the pumping water level does not exceed ~~0.25 of an inch~~ three inches between measurements.
- 29 (9) A reference point for water level measurements (preferably the top of the casing) shall be selected and
30 recorded for the pumping well and each observation well to be measured during the test. All water level
31 measurements shall be made from the selected reference points.
- 32 (10) All water level measurements shall be made with a steel or electric tape or equivalent measuring device.
- 33 (11) All water level measurements shall be made within an accuracy of plus or minus ~~0.25 of a foot (three inches).~~
34 one inch.
- 35 (12) After the completion of the pumping period, measurements of the water level recovery rate, in the pumped
36 well, shall be made for a period of at least two hours in the same manner as the drawdown.
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History Note: Authority G.S. 87-87; 87-88;
Eff. February 1, 1976;
Amended Eff. April 1, 2001; December 1, 1992; September 1, 1984; April 20, 1978.

1 15A NCAC 2C .0111 has been amended with changes as published in 15:5 NCR 557 as follows:

2
3 **.0111 DISINFECTION OF WATER SUPPLY WELLS**

4 All water supply wells shall be disinfected upon completion of construction, maintenance, repairs, pump
5 installation and testing as follows:

6 (1) Chlorination.

7 (a) Chlorine shall be placed in the well in sufficient quantities to produce a chlorine residual of at least 100 parts
8 per million (ppm) in the well. A chlorine solution may be prepared by dissolving high test calcium
9 hypochlorite (trade names include HTH, Chlor-Tabs, etc.) in water. Do not use stabilized chlorine tablets or
10 hypochlorite products containing fungicides, algaecides, or other disinfectants. Follow manufacturers
11 directions with storing, transporting, and using calcium hypochlorite products. About 0.12 lbs. or two
12 ounces three ounces of hypochlorite containing 70 percent 65 percent to 75 percent available chlorine
13 is needed per 100 gallons of water for at least a 100 ppm chlorine residual. As an example, a well having a
14 diameter of six inches, has a volume of about one and five tenths 1.5 gallons per foot. If the well has 200 feet
15 of water, the minimum amount of hypochlorite required would be 0.36 lbs. (1.5 x 200 feet = 300 gallons, 0.12
16 lbs. per 100 gallons, 0.12 x 3 = 0.36 lbs.) 9 ounces. (1.5 gallons/foot x 200 feet = 300 gallons at 3 ounces
17 per 100 gallons; 3 ounces x 3 = 9 ounces.)

18 (b) The chlorine shall be placed in the well by one of the following or equivalent methods:

19 (a) Chlorine tablets may be dropped in the top of the well and allowed to settle to the bottom.

20 (ii) Chlorine solutions shall be placed in the bottom of the well by using a bailer or by pouring the
21 solution through the drill rod, hose, or pipe placed in the bottom of the well. The solution shall
22 be flushed out of the drill rod, hose, or pipe by using water or air.

23 (c) Agitate the water in the well to insure ensure thorough dispersion of the chlorine.

24 (d) The well casing, pump column and any other equipment above the water level in the well shall be thoroughly
25 rinsed with the chlorine solution as a part of the disinfecting process.

26 (e) The chlorine solution shall stand in the well for a period of at least 24 hours.

27 (f) The well shall be pumped until the system is clear of the chlorine before the system is placed in use.

28 (2) Other materials and methods of disinfection, at least as effective as those in Item (1) of this Rule, may be used
29 upon prior approval by the Director.

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32 *History Note: Authority G.S. 87-87; 87-88;*

33 *Eff. February 1, 1976;*

34 *Amended Eff. April 1, 2001; December 1, 1992; July 1, 1988; September 1, 1984.*

35

1 **15A NCAC 2C .0112 has been amended as published in 15:5 NCR 557 as follows:**

2
3 **.0112 WELL MAINTENANCE: REPAIR: GROUNDWATER RESOURCES**

4 (a) Every well shall be maintained by the owner in a condition whereby it will conserve and protect the
5 groundwater resources, and whereby it will not be a source or channel of contamination or pollution to the water supply
6 or any aquifer.

7 (b) All materials used in the maintenance, replacement, or repair of any well shall meet the requirements for
8 new installation.

9 (c) Broken, punctured or otherwise defective or unserviceable casing, screens, fixtures, seals, or any part of
10 the well head shall be repaired or replaced, or the well shall be properly abandoned.

11 (d) National Science Foundation (NSF) approved PVC pipe rated at 160 PSI may be used for liner casing. The
12 annular space around the liner casing shall be at least five-eighths inches and shall be completely filled with neat-cement
13 grout.

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15 *History Note: Authority G.S. 87-87; 87-88;*

16 *Eff. February 1, 1976;*

17 *Amended Eff. April 1, 2001; December 1, 1992; September 1, 1984.*

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1 **15A NCAC 2C .0113 has been amended with changes as published in 15:5 NCR 557 – 558 as follows:**

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3 **.0113 ABANDONMENT OF WELLS**

4 (a) Any well which has been ~~abandoned~~ temporarily abandoned, ~~either temporarily or permanently~~, shall be
5 abandoned in accordance with one of the following procedures:

6 ~~(1)~~ ~~Procedures for temporary abandonment of wells:~~

7 ~~(A)~~(1) Upon temporary removal from service or prior to being put into service, the well shall be sealed with a
8 water-tight cap or seal compatible with casing and installed so that it cannot be removed easily by hand.

9 ~~(B)~~(2) The well shall be maintained whereby it is not a source or channel ~~of~~ contamination during temporary
10 abandonment.

11 ~~(C)~~(3) Every temporarily abandoned well shall be protected with a casing.

12 (b) Any well which has been abandoned permanently shall be abandoned in accordance with the following
13 procedures:

14 ~~(2)~~(1) Procedures for permanent abandonment of ~~wells:~~ wells, other than bored and hand dug wells:

15 (A) All casing and screen materials may be removed prior to initiation of abandonment procedures if such
16 removal will not cause or contribute to contamination of the groundwaters. Any casing not grouted
17 in accordance with ~~Rule .0107 Paragraph (d)~~ 15A NCAC 2C .0107(e) of this Section shall
18 be removed or properly grouted.

19 (B) The entire depth of the well shall be sounded before it is sealed to ensure freedom from obstructions
20 that may interfere with sealing operations.

21 ~~The well shall be thoroughly disinfected prior to sealing. Using a~~ hypochlorite solution (such as
22 HTH), disinfect the well in accordance with 15A NCAC 2C .0111. Do not use a common
23 commercial household liquid bleach, as this is too weak a solution to ensure proper disinfection.

24 (D) In the case of gravel-packed wells in which the casing and screens have not been removed,
25 neat-cement, or bentonite grout shall be injected into the well completely filling it from the bottom of
26 the casing to the top.

27 ~~(F)~~(E) Wells, other than "bored" wells, constructed in unconsolidated formations shall be completely filled
28 with cement grout, or bentonite grout by introducing it through a pipe extending to the bottom of the
29 well which can be raised as the well is filled.

30 ~~(G)~~(F) Wells constructed in consolidated rock formations or that penetrate zones of consolidated rock may
31 be filled with cement grout, bentonite grout, sand, gravel or drill cuttings opposite the zones of
32 consolidated rock. The top of the cement grout, bentonite grout, sand, gravel or cutting fill shall ~~be~~
33 terminate at least ~~five~~ 10 feet below the top of the consolidated rock or five feet below the
34 bottom of casing. Cement grout or bentonite grout shall be placed beginning 10 feet below the
35 top of the consolidated rock or five feet below the bottom of casing and extend five feet above
36 the top of consolidated rock. The remainder of the well, above the upper zone of consolidated rock,
37 shall be filled with cement grout or bentonite grout up to land surface, only. For any well in which the

1 depth of casing or the depth of the bedrock is not known or cannot be confirmed, then the entire length
2 of the well shall be filled with cement grout or bentonite grout up to land surface.

3 ~~(H)~~(G) Test-Temporary wells or monitor wells:

4 (i) less than 20 feet in depth which do not penetrate the water table shall be abandoned by
5 filling the entire well up to land surface with cement grout, dry clay, bentonite grout, or
6 material excavated during drilling of the well and then compacted in place, in such
7 manner as to prevent the well from being a channel allowing the vertical movement of
8 water or a source of contamination to the groundwater supply.

9 (ii) Test wells or borings that penetrate the water table shall be abandoned by completely
10 filling with a bentonite or cement-cement - type grout.

11 (2) For bored wells or hand dug wells, constructed into unconsolidated material.

12 (A) For wells that do not have standing water in ~~then~~ them at any time during the year:

13 (i) Remove all plumbing or piping entering the well, along with any obstructions in the
14 well;


15 (ii) Remove as much of the well casing as possible and then fill the entire well up to land
16 surface with cement grout, concrete grout, bentonite grout, dry clay, or material
17 excavated during drilling of the well and then compacted in place.

18 (B) For wells that do have standing water in them during all or part of the year:

19 (i) Remove all plumbing or piping into the well, along with any obstructions inside the well;

20 (ii) Remove as much of the well tile casing as possible, but no less than to a depth of three
21 feet below land surface;

22 (iii) Remove all soil or other subsurface material present down to the top of the remaining
23 well casing, and extending to a width of at least 12 inches outside of the well
24 casing on all sides;

25 (iv) Using a  hypochlorite solution (such as HTH), disinfect the well in accordance with
26 15A NCAC 2C .0111 of this Subchapter. Do not use a common commercial household
27 liquid bleach, as this is too weak a solution to ensure proper disinfection.

28 (v) Fill the well up to the top of the remaining casing with cement grout, concrete grout,
29 bentonite grout, dry clay, or material excavated during drilling of the well and then
30 compacted in place.

31 (vi) Pour a one foot thick concrete grout or cement grout plug that fills the entire
32 excavated area above the top of the casing, including the area extending on all sides of
33 the casing out to a width of at least 12 inches on all sides;

34 (vii) Complete the abandonment process by filling the remainder of the well above the
35 concrete or cement plug with additional concrete grout, cement grout, or soil.

36 ~~(b)~~(c) Any well which acts as a source or channel of contamination shall be repaired or permanently abandoned
37 within 30 days of receipt of notice from the department.

1 (↔) (d) The drilling contractor shall permanently abandon any well in which the casing has not been installed or
2 from which the casing has been removed, prior to removing his equipment from the site.

3 (↔) (e) The owner shall be responsible for permanent abandonment of a well ~~except:~~ except that:

4 (1) ~~As otherwise specified in these Rules; or~~

5 (2) (1) The well driller is responsible for ~~if~~-well abandonment if abandonment is required because the
6 driller improperly locates, constructs, repairs or completes the ~~well.~~ well; or

7 (2) The person who installs, repairs or removes the well pump is responsible for well abandonment if that
8 abandonment is required because of improper well pump installation, repair or removal.

9

10 *History Note: Authority G.S. 87-87; 87-88;*

11 *Eff. February 1, 1976;*

12 *Amended Eff. April 1, 2001; December 1, 1992; September 1, 1984; April 20, 1978.*

1 **15A NCAC 2C .0114 has been amended as published in 15:5 NCR 559 as follows:**

2
3 **.0114 DATA AND RECORDS REQUIRED**

4 (a) Well Cuttings.

- 5 (1) Samples of formation cuttings shall be collected and furnished to the Division from ~~all any wells well~~ when
6 such samples are requested by the ~~Division~~ Division prior to completion of the drilling or boring activities.
- 7 (2) Samples or representatives cuttings shall be obtained for depth intervals of 10 feet or less beginning at the land
8 surface. Representative cuttings shall also be collected at depths of each significant change in formation.
- 9 (3) Samples of cuttings shall be placed in containers furnished by the Division and such containers shall be filled,
10 sealed and properly labeled with indelible-type markers, showing the well owner, well number if applicable,
11 and depth interval the sample represents.
- 12 (4) Each set of samples shall be placed in a suitable container(s) showing the location, owner, well number if
13 applicable, driller, depth interval, and date.
- 14 (5) Samples shall be retained by the driller until delivery instructions are received from the Division or for a period
15 of at least 60 days after the well record form (GW-1), indicating said samples are available, has been received
16 by the Division.
- 17 (6) The furnishing of samples to any person or agency other than the Division shall not constitute compliance with
18 the department's request and shall not relieve the driller of his obligation to the department.

19 (b) Reports.

- 20 (1) Any person completing or abandoning any well shall submit to the Division a record of the construction or
21 abandonment. For public water supply wells, a copy of each completion or abandonment record shall also be
22 submitted to the Health Department responsible for the county in which the well is located. The record shall
23 be on forms provided by the Division and shall include certification that construction or abandonment was
24 completed as required by these Rules, the owner's name and address, well location, diameter, depth, yield, and
25 any other information the Division may reasonably require.
- 26 (2) The certified record of completion or abandonment shall be submitted within a period of thirty days after
27 completion or abandonment.
- 28 (3) The furnishing of records to any person or agency other than the Division shall not constitute compliance with
29 the reporting requirement and shall not relieve the driller of his obligation to the Department.

30
31 *History Note: Authority G.S. 87-87; 87-88;*

32 *Eff. February 1, 1976;*

33 *Amended Eff. April 1, 2001; December 1, 1992; September 1, 1984; April 20, 1978.*

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1 **15A NCAC 2C .0117 has been amended as published in 15:5 NCR 559 – 560 as follows:**

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3 **.0117 DESIGNATED AREAS: WELLS CASED TO MINIMUM DEPTH OF 35 FEET**

4 (a) Wells drilled in areas underlain by metavolcanic rocks identified on the ~~1958~~ 1985 State Geologic Map as
5 bedded argillites of the Carolina Slate Belt shall be cased to a minimum depth of 35 feet. These areas are generally
6 described as follows:

- 7 (1) Anson County generally west of a line beginning at the intersection of the runs of the Pee Dee River and
8 Buffalo Creek, thence generally northeast to SR 1627, thence generally south along SR 1627 to the intersection
9 with SR 1632, thence generally west along SR 1632 to the intersection with US 52, thence generally south
10 along US 52 to the intersection with SR 1418, thence generally southwest along SR 1418 to the intersection
11 of US 74, thence generally west along US 74 to the intersection of SR 1251, thence generally southwest along
12 SR 1251 to the intersection with SR 1240, thence generally southeast along SR 1240 to the intersection with
13 SR 1252, thence generally south along SR 1252 to the intersection with SR 1003, thence generally ~~southeast~~
14 west along SR 1003 to the ~~intersection with SR 1228, thence generally southwest along SR 1228 to the Union~~
15 County line;
- 16 (2) Cabarrus County generally ~~west~~ east of a line beginning at the intersection of ~~SR 1121 and the Mecklenburg~~
17 ~~County line, thence generally northeast along SR 1121 to the intersection with SR 1123, thence generally~~
18 ~~northeast along SR 1123 to the intersection with SR 1145, thence generally northeast along SR 1145 to the~~
19 ~~intersection with SR 1143, thence generally east along SR 1143 to the intersection with US 601, thence~~
20 ~~generally southeast along US 601 to the intersection of SR 1006, thence generally northeast along SR 1006~~
21 ~~to the intersection with NC 49, thence generally northeast along NC 49 SR 1113 and the Union County line,~~
22 thence generally northeast along SR 1113 to the intersection with SR 1114, thence generally east along SR
23 1114 to the Stanly County line, thence generally northeast along the county line to the intersection with SR
24 1100, thence generally northeast along SR 1100 to the intersection of with SR 2622, thence generally southeast
25 along SR 2622 to the intersection with SR 2617, thence generally northeast along SR 2617 to the intersection
26 with SR 2611, thence generally north along SR 2611 to the intersection with NC 73, thence generally east
27 along NC 73 to the intersection with SR 2453, thence generally northeast along SR 2453 to the intersection
28 with SR 2444, thence generally northeast along SR 2444 to the Rowan County line;
- 29 (3) Davidson County generally east of a line starting at the intersection of the runs of Abbots Creek and the Yadkin
30 River in High Rock Lake, thence generally north along Abbots Creek to ~~SR 2294~~ NC 8 bridge, thence
31 generally ~~northeast along SR 2294 to the intersection of SR 2380, thence generally north along SR 2380 to the~~
32 ~~intersection of SR 2248, thence generally north along SR 2248 to the intersection of SR 2256, thence generally~~
33 ~~east along SR 2256 to the intersection of SR 2205, thence generally east along SR 2205~~ north along NC 8 to
34 the intersection with Interstate 85, thence generally northeast along Interstate 85 to the intersection with US
35 64, thence generally southeast along US 64 to the Randolph County line;
- 36 (4) Montgomery County generally west of a line beginning at the intersection of SR 1134 with the Randolph
37 County line, thence generally south along SR 1134 to the intersection with SR 1303, thence generally south

1 along SR 1303 to the intersection with NC 109, thence generally southeast along NC 109 to the intersection
2 with SR 1150, thence generally south along SR 1150 to the intersection with ~~NC 24 and NC 27~~ NC 73, thence
3 ~~generally east along NC 24 and NC 27 to the intersection with SR 1134, thence generally southeast along SR~~
4 ~~1134 to the intersection with NC 109, thence generally south along NC 109 to the intersection with SR 1546,~~
5 ~~thence generally southeast along SR 1546 to the intersection with SR 1118, thence generally south along SR~~
6 ~~1118 thence generally southeast along NC 73 to the intersection with SR 1112, thence generally east along SR~~
7 ~~1112 to the intersection with SR 1130, thence generally northeast along SR 1130 to the intersection with SR~~
8 ~~1132, thence generally southeast along SR 1132 to the intersection with SR 1174, thence generally east along~~
9 ~~SR 1174 to the intersection with NC 109, thence generally north along NC 109 to the intersection with SR~~
10 ~~1546, generally southeast along SR 1546 to the intersection of SR 1543, thence generally south along SR 1543~~
11 ~~to the intersection with NC 73, thence generally west along NC 73 to the intersection with SR 1118, thence~~
12 ~~generally southwest along SR 1118 to the intersection with SR 1116, thence generally west along SR 1116 to~~
13 ~~the intersection with NC 109, thence generally south along NC 109 to the intersection~~ with the Richmond
14 County line;

15 (5) Randolph County generally west of a line beginning at the intersection of ~~SR 1344~~ US 64 with the Davidson
16 County line, thence generally ~~northeast~~ east along ~~SR 1344~~ US 64 to the intersection of ~~US 64~~, thence generally
17 ~~southeast along US 64 to the intersection with SR 1318, thence generally south along SR 1318 to the intersection~~
18 ~~with SR 1193, thence generally east along SR 1193 with NC 49, thence generally southwest along NC 49 to the~~
19 intersection with SR 1107, thence generally south along SR 1107 to the intersection with SR 1105, thence
20 southeast along SR 1105 to the intersection with the Montgomery County line;

21 (6) Rowan County generally east of a line beginning at the intersection of ~~SR 2352~~ 2142 with the Cabarrus County
22 line, thence north along SR ~~2352~~ 2142 to the intersection with SR ~~2350~~ 2162, thence generally ~~northwest~~ along
23 ~~SR 2350 to the intersection with SR 2351, thence generally north along SR 2351 to the intersection with US 52,~~
24 ~~thence generally northwest along US 52 to the intersection with SR 2140, thence generally north along SR 2140~~
25 ~~to the intersection with Reedy Creek, thence generally northeast along Reedy Creek~~ SR 2162 to the intersection
26 with the run of the Yadkin River in High Rock Lake;

27 (7) Union County generally east of a line beginning at the intersection of ~~NC 16~~ SR 1117 with the South
28 Carolina-North Carolina State line, thence generally north along ~~NC 16~~ SR 1117 to the intersection with SR
29 ~~1315, thence generally east along SR 1315 to the intersection with SR 1341, thence generally north along SR~~
30 ~~1341 to the intersection with SR 1347, thence generally north along SR 1347 to the intersection with SR 1338,~~
31 ~~thence north along SR 1338 to the intersection with SR 1344, thence generally north along SR 1344 to the~~
32 ~~intersection with the Mecklenburg~~ SR 1008, thence generally northeast along SR 1008 to the intersection with
33 SR 1514, thence generally north along SR 1514 to the intersection with SR 1520, thence generally northeast
34 along SR 1520 to the intersection with NC 218, thence generally east along NC 218 to the intersection with US
35 601, thence generally north along US 601 to the intersection with SR 1600, thence generally northeast along SR
36 1600 to the intersection with the Cabarrus County line;

37 (8) Stanly County -- all.

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(b) The roads describing the boundaries of the designated areas do not necessarily coincide with the rock unit boundaries. Therefore, any well drilled within 400 feet of a road described as a boundary of a designated area shall be cased to the same minimum depth as those within the described area.

*History Note: Authority G.S. 87-87;
Eff. April 20, 1978.
Amended Eff. April 1, 2001.*

1 **15A NCAC 2C .0118 has been amended with changes as published in 15:5 NCR 560 –561 as follows:**

2
3 **.0118 VARIANCE**

4 (a) The Director may grant a variance from any construction standard under the rules of this Section. Any
5 variance will be in writing, and may be granted upon oral or written application to the Director, by the person responsible
6 for the construction of the well for which the variance is sought, if the Director finds facts to support the following
7 conclusions:

8 (1) that the use of the well will not endanger human health and welfare or the groundwater;

9 (2) that construction in accordance with the standards was not technically feasible in such a manner as to
10 afford a reasonable water supply at a reasonable cost.

11 (b) The Director may require the variance applicant to submit such information as he deems necessary to make
12 a decision to grant or deny the variance. The Director may impose such conditions on a variance or the use of a well for
13 which a variance is granted as he deems necessary to protect human health and welfare and the groundwater resources.
14 The findings of fact supporting any variance under this Rule shall be in writing and made part of the variance.

15 (c) The Director shall respond in writing to a request for a variance within 30 days from the receipt of the
16 variance request.

17 ~~(d)~~ A variance applicant who is dissatisfied with the decision of the Director may commence a contested case by filing
18 a petition under G.S. 150B-23 within 60 days after receipt of the decision.

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20 *History Note: Authority G.S. 87-87; 87-88; 150B-23;*

21 *Eff. April 20, 1978;*

22 *Amended Eff. April 1, 2001; December 1, 1992; September 1, 1988; September 1, 1984.*

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