WAIVER APPLICATION PACKET
for Pesticides/SOCs/PCBs Analyses

Enclosed is the susceptibility waiver application form (*Enclosure 1*) for the pesticides/SOCs/PCBs analyses. Only groundwater systems serving fewer than 3,301 people are eligible for this waiver. To apply for the waiver, water systems must have at least one pesticides/SOCs/PCBs sample for each entry point in the system analyzed for all the regulated contaminants listed in *Enclosure 2*.

The application form must be completed, signed and include (at the minimum) the most recent nitrate and pesticides/SOCs/PCBs results for each entry point in your system. If the most recent results are more than three (3) years old, you must perform new analyses. You should also include any other information that supports your water system's eligibility for the waiver. If available, include a copy of your well and water system plans and specifications approval letter(s). We may contact the person who signs the application form for an explanation of the response, and the Public Water Supply (PWS) Section regional staff may visit your site to verify any information.

The waiver may be granted on an entry point basis for your system. Once you receive a waiver, additional quarterly monitoring for pesticides/SOCs/PCBs may not be required for that entry point. Therefore, it is important that the entry point location code for each entry point be correct. The entry point location code written on the application should match the analyses results form received from the laboratory.

The application must be completed for each well in your water system. Wells that constitute one entry point must be identified on the application and show the same entry point location code. The following information is provided to help you complete Section C:

A. If you do not have enough information to identify the "zone of influence," you may use a 1,000-foot radius around the well. We may increase the distance as necessary to protect public health.

B. To answer question C1, use the list of point or non-point sources in Section B of the application.

C. For question C2, compare the construction of your well with the requirements of 15A NCAC 18C Rules Governing Public Water Systems, Section .0402 "Water Supply Wells" (*Enclosure 3)* and 15A NCAC 2C Well Construction Standards, Section .0107 "Standards of Construction: Water Supply Wells" (*Enclosure 4*). In general, if your water system is approved by the Plan Review Unit of the PWS Section, the well probably meets these requirements.

D. In question C4, regarding environmental persistence: are leaks or spills of non-volatile organic contaminants in the zone of influence that have not been removed by excavation or on-site treatment?

E. If the answer to question C6 is "no", you must provide a copy of your water system plans and specifications approval letter or other documents to support your answer.

F. For question C7, see the list of regulated contaminants (*Enclosure 2*). You must submit the actual laboratory analysis results report from the laboratory for each entry point.

G. For question C8, you must submit the actual nitrate laboratory analysis result report for each entry point.

A well will not be eligible for a waiver if you answered "yes" to any of questions 4, 5 or 6 in Section C. If questions 4 through 8 all have "no" as the answers, a "yes" answer to any of questions 1 through 3 may cause the system to receive a waiver to monitor annually or once every three years, depending on the outcome of the evaluation.

Please return the application with supporting documentation to:

Compliance Services Branch
Public Water Supply Section
1634 Mail Service Center
Raleigh, N.C. 27699-1634

An application with incomplete documentation (e.g. no test results, contradictory or wrong location codes) will be returned for completion. Therefore, you should wait until you receive a copy of the nitrate and pesticides/SOCs/PCBs results from the laboratory before submitting the application. Please review the Public Water Supply Section's website to determine if new sources and entry points have been added to the State's inventory system before submitting waiver requests for them. The internet address is http://www.ncwater.org/pws/

It may take up to 60 days to process the application if the information provided to the PWS Section is complete. If the information is incomplete or requires verification, processing will take longer.

Enclosures *1*: Susceptibility Waiver Application Form
2: Pesticides/SOCs/PCBs Contaminants List in 141.61(c)
3: Section .0402 of Rules Governing Public Water Systems
4: Section .0107 of the Well Construction Standards

Enclosure 1

State of North Carolina
Susceptibility Waiver Application
Pesticide/Synthetic Organic Chemicals (SOCs)/PCBs Analyses
Well Water Systems Serving Fewer than 3,301 Population

Contact Person:		(Please include your return address below)
Telephone #:		
Email:		
Water System No.		
System Name:		
Population Served:		

A. Complete the following information for each well in your water system. Please note that the entry point location code is a three-digit code which can be characters, numbers, or a combination of both. The location code must be the same as that shown on the Pesticides/SOCs/PCBs analyses reporting form. Wells forming one entry point must be identified below and have the same entry point location code.

Well	Entry Point Code	Well Location Description
# 1		
# 2		
# 3		
# 4		
# _		

B. Locate the point or non-point sources listed below within the zone of influence* of each well in your water system. Place estimated minimum distances from each source to each well in the appropriate boxes in the columns to the right of the sources. Write "NONE" for the distance in each well column if the contamination source is not present for that well.

	DISTANCE TO				
SOURCES	Well #1	Well #2	Well #3	Well #4	Well # ___
Pesticide manufacturer					
Pesticide storage facility					
Pesticide mixing area					
Superfund site					
Landfill/dump					
Wood-preserving facility					
Grain (bulk) storage site					
Military base/depot					
Pesticide spill (known)					
Unused/improperly abandoned well					
Paper mill					
Foundry					
Electroplating business					
Smelting plant					
Plastics manufacturer/molding					
Metal finishing shop					
Polyester manufacturer					
Textile manufacturer					
Chemical manufacturer					
Chemical bulk storage site					
Waste disposal site					
Tobacco farm/golf course/apple orchard					
Chemical spill (known)					
Sludge spreading					
Other					

*If you do not have enough information to identify the "zone of influence," a 1,000-foot radius around the wellhouse may be substituted.

C. Answer "yes" or "no" to each of the following vulnerability questions for each well.

Question	Item Description	Well #1	Well #2	Well #3	Well #4	Well # ___
1	Are there point sources or non-point sources[1] in the zone of influence[2] for this well?					
2	Does well fail to meet the requirements of Section .0402(a) through (d) Water Supply Wells in the "Rules Governing Public Water Systems"? [3]					
3	Is there transport of any pesticides, SOCs, PCBs in the zone of influence? [2] (if yes, attach description)					
4	Is there environmental persistence[4] of any pesticides, SOCs, PCBs in the zone of influence? [2]					
5	Are any PCBs used in the production, storage or distribution of water (i.e., PCBs used in pumps, transformers, etc.)?					
6	If use of pesticides, SOCs, PCBs or accidental spillage in the zone of influence[2] of the well did occur, is the depth of the well, type of soil, and integrity of the well such that there would be contamination of the well water? (Attach a copy of the well approval letter for your water system, if approved.)					
7	Are the previous pesticides/SOCs/PCBs results from this well above the detection limit for any contaminant? (Attach copy of most recent results.[5])					
8	Are the most recent nitrate levels at the water supply source in excess of 5 milligrams per liter (mg/L)? (Attach copy of most recent results.[5])					
9	Has any equipment to remove pesticide/SOCs/PCBs contamination been installed at this site?					

[1] See Section B

[2] See footnote for Section B

[3] See Enclosure 3

[4] Leaks and spills of non-volatile organic chemicals in the zone of influence that have not been removed by excavation or by on-site treatment.

[5] The most recent results cannot be over three years old or new analyses must be performed.

D. Certification

I certify that the answers provided for this waiver application, including vulnerability responses, are to the best of my knowledge truthful and accurate.	
Signature of Owner or Agent	Date of Completion
Print Name of Respondent	Title

Mail completed form (with copies of Pesticides/SOCs/PCBs and Nitrate analysis results) to:

Public Water Supply Section
Compliance Services Branch
ATTN: SOC Rule Manager
1634 Mail Service Center
Raleigh, NC 27699-1634

PESTICIDES/SOCs/PCBs CONTAMINANTS LIST

CONTAM CODE	CONTAMINANT (mg/L)	REGULATORY DETECTION LIMITS	ALLOW. LIMITS	REGULATED (R) UNREG (U)
2005	Endrin	0.00001	0.002	R
2010	Lindane	0.00002	0.0002	R
2015	Methoxychlor	0.0001	0.04	R
2020	Toxaphene	0.001	0.003	R
2021	Carbaryl	0.004	N/A	U
2022	Methomyl	0.004	N/A	U
2031	Dalapon	0.001	0.2	R
2035	Di(2-ethylhexyl)adipate	0.0006	0.4	R
2036	Oxamyl(vydate)	0.002	0.2	R
2037	Simazine	0.00007	0.004	R
2040	Picloram	0.0001	0.5	R
2041	Dinoseb	0.0002	0.007	R
2042	Hexachlorocyclopentadiene	0.0001	0.05	R
2043	Aldicarb Sulfoxide	0.0005	N/A	U
2044	Aldicarb Sulfone	0.0008	N/A	U
2045	Metolachlor	0.0008	N/A	U
2046	Carbofuran	0.0009	0.04	R
2047	Aldicarb	0.0005	N/A	U
2050	Atrazine	0.0001	0.003	R
2051	Alachlor	0.0002	0.002	R
2065	Heptachlor	0.00004	0.0004	R
2066	3-Hydroxycarbofuran	0.004	N/A	U
2067	Heptachlor Epoxide	0.00002	0.0002	R
2070	Dieldrin	0.0002	N/A	U
2076	Butachlor	0.008	N/A	U
2077	Propachlor	0.006	N/A	U
2105	2,4-D	0.0001	0.07	R
2110	2,4,5-TP (Silvex)	0.0002	0.05	R
2274	Hexachlorobenzene	0.0001	0.001	R
2039	Di(2-ethylhexyl)phthalate	0.00132	0.006	R
2306	Benzo(a)pyrene	0.00002	0.0002	R
2326	Pentachlorophenol	0.00004	0.001	R
2356	Aldrin	0.0002	N/A	U
2383	PCB's	0.0001	0.0005	R
2440	Dicamba	0.001	N/A	U
2595	Metribuzin	0.0008	N/A	U
2931	DBCP	0.00002	0.0002	R
2946	Ethylene Dibromide (EDB)	0.00001	0.00005	R
2959	Chlordane	0.0002	0.002	R

15A NCAC 18C .0402 (a) through (d)

.0402 WATER SUPPLY WELLS

(a) Well Construction. The construction of water supply wells shall conform to well construction regulations and standards of the Division of Environmental Management, N.C. Department of Environment, Health, and Natural Resources, codified in 15A NCAC 2C which are hereby incorporated by reference including any subsequent amendments and editions. Copies of this material are available for inspection and may be obtained from the Department of Environment, Health, and Natural Resources, Division of Environmental Health, Public Water Supply Section, P.O. Box 29536, Raleigh, North Carolina 27626-0536 at no charge. *[See current agency name, location and mailing address under "Notes" on first page of this document.]*

(b) Upper Terminal of Well. The well casing shall neither terminate below ground nor in a pit. The pump pedestal for above ground pumps of every water supply well shall project not less than six inches above the concrete floor of the well house, or the concrete slab surrounding the well. The well casing shall project at least one inch above the pump pedestal. For submersible pumps the casing shall project at least six inches above the concrete floor or slab surrounding the well head.

(c) Sanitary Seal. The upper terminal of the well casing shall be sealed watertight with the exception of a vent pipe or vent tube having a downward-directed, screened opening.

(d) Concrete Slab or Well House Floor. Every water supply well shall have a continuous bond concrete slab or well house concrete floor extending at least three feet horizontally around the outside of the well casing. Minimum thickness for the concrete slab or floor shall be four inches.

History Note: *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
Eff. January 1, 1977;
Readopted Eff. December 5, 1977;
Amended Eff. July 1, 1994; September 1, 1990; January 1, 1986; March 31, 1980.

15A NCAC 02C .0107 STANDARDS OF CONSTRUCTION: WATER SUPPLY WELLS

(a) Location.

(1) A water supply well shall not be located in any area where surface water or runoff will accumulate around the well due to depressions, drainage ways, and other landscapes that will concentrate water around the well.

(2) The minimum horizontal separation between a water supply well and potential sources of groundwater contamination, which exist at the time the well is constructed, is as follows unless otherwise specified:

(A)	Septic tank and drainfield, including drainfield repair area	100 feet
(B)	Other subsurface ground absorption waste disposal system	100 feet
(C)	Industrial or municipal residuals disposal or wastewater-irrigation sites	100 feet
(D)	Sewage or liquid-waste collection or transfer facility constructed to water main standards in accordance with 15A NCAC 02T .0305(g)(2) or 15A NCAC 18A .1950(e), as applicable	50 feet
(E)	Other sewage and liquid-waste collection or transfer facility	100 feet
(F)	Cesspools and privies	100 feet
(G)	Animal feedlots, as defined by G.S. 143-215.10B(5), or manure piles	100 feet
(H)	Fertilizer, pesticide, herbicide or other chemical storage areas	100 feet
(I)	Non-hazardous waste storage, treatment or disposal lagoons	100 feet
(J)	Sanitary landfills, municipal solid waste landfill facilities, incinerators, construction and demolition (C&D) landfills and other disposal sites except Land Clearing and Inert Debris landfills	500 feet
(K)	Land Clearing and Inert Debris (LCID) landfills	100 feet
(L)	Animal barns	100 feet
(M)	Building perimeters, including any attached structures	25 feet
(N)	Surface water bodies which act as sources of groundwater recharge, such as ponds, lakes and reservoirs	50 feet
(O)	All other surface water bodies, such as brooks, creeks, streams, rivers, sounds, bays and tidal estuaries	25 feet
(P)	Chemical or petroleum fuel underground storage tank systems regulated under 15A NCAC 02N:	
	(i) with secondary containment	50 feet
	(ii) without secondary containment	100 feet
(Q)	Above ground or underground storage tanks which contain petroleum fuels used for heating equipment, boilers or furnaces, with the exception of tanks used solely for storage of propane, natural gas, or liquefied petroleum gas	50 feet
(R)	All other petroleum or chemical storage tank systems	100 feet
(S)	Gravesites	50 feet
(T)	All other potential sources of groundwater contamination	50 feet

(3) For a water supply well [as defined in G.S. 87-85(13)] on a lot serving a single-family dwelling and intended for domestic use, where lot size or other fixed conditions preclude the separation distances specified in Subparagraph (a)(2) of this Rule, the required horizontal separation distances shall be the maximum possible but shall in no case be less than the following:

(A)	Septic tank and drainfield, including drainfield repair areas, except saprolite systems as defined in 15A NCAC 18A .1956(6)	50 feet
(B)	Sewage or liquid-waste collection or transfer facility constructed to water main standards in accordance with 15A NCAC 02T .0305(g)(2) or 15A NCAC 18A .1950(e), as applicable	25 feet
(C)	Animal barns	50 feet

Minimum separation distances for all other potential sources of groundwater contamination shall be those specified in Subparagraph (a)(2) of this Rule.

(4) In addition to the minimum separation distances specified in Subparagraph (a)(2) of this Rule, a well or well system with a designed capacity of 100,000 gpd or greater shall be located a sufficient distance from known or anticipated sources of groundwater contamination so as to prevent a violation of applicable groundwater quality standards, resulting from the movement of contaminants, in response to the operation of the well or well system at the proposed rate and schedule of pumping.

(5) Wells drilled for public water supply systems regulated by the Division of Environmental Health shall meet the requirements of 15A NCAC 18C.

(b) Source of water.

(1) The source of water for any water supply well shall not be from a water bearing zone or aquifer that is contaminated;

(2) In designated areas described in 15A NCAC 02C .0117 of this Section, the source shall be greater than 35 feet below land surface;

(3) In designated areas described in 15A NCAC 02C .0116 of this Section, the source may be less than 20 feet below land surface, but in no case less than 10 feet below land surface;

(4) For wells constructed with separation distances less than those specified in Subparagraph (a)(2) of this Rule based on lot size or other fixed conditions as specified in Subparagraph (a)(3) of this Rule, the source shall be greater than 35 feet below land surface except in areas described in Rule .0116 of this Section; and

(5) In all other areas the source shall be at least 20 feet below land surface.

(c) Drilling Fluids and Additives. Drilling Fluids and Additives shall not contain organic or toxic substances or include water obtained from surface water bodies or water from a non-potable supply and may be comprised only of:

(1) the formational material encountered during drilling; or

(2) materials manufactured specifically for the purpose of borehole conditioning or water well construction.

(d) Casing.

(1) If steel casing is used:

(A) The casing shall be new, seamless or electric-resistance welded galvanized or black steel pipe. Galvanizing shall be done in accordance with requirements of ASTM A53/A53M-07, which is hereby incorporated by reference, including subsequent amendments and editions, and can be obtained from ASTM International, 100 Barr Harbor Drive, PO Box C 700, West Conshohocken, PA, 19428-2959 at a cost of fifty-one dollars ($51.00);

(B) The casing, threads and couplings shall meet or exceed the specifications of ASTM A53/A53M-07 or A589/589M-06, which is hereby incorporated by reference, including subsequent amendments and editions, and can be obtained from ASTM International, 100 Barr Harbor Drive, PO Box C 700, West Conshohocken, PA, 19428-2959 at a cost of $ fifty-one dollars ($51.00) and forty-three dollars ($43.00), respectively;

(C) The wall thickness for a given diameter shall equal or exceed that specified in Table 1;

TABLE 1: MINIMUM WALL THICKNESS FOR STEEL CASING:

Nominal Diameter (inches)	Wall Thickness (inches)
For 3.5 inch or smaller pipe, schedule 40 is required	
4	0.142
5	0.156
5.5	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 A530/A530M-04a, which is hereby incorporated by reference, including subsequent amendments and editions, and can be obtained from ASTM International, 100 Barr Harbor Drive, PO Box C 700, West Conshohocken, PA, 19428-2959 at a cost of thirty-seven dollars ($37.00), 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 of the well;

(E) Stainless steel casing shall have a minimum wall thickness that is equivalent to standard schedule number 10S; and

(F) Steel casing shall be equipped with a drive shoe if the casing is driven in a consolidated rock formation. The drive shoe shall be made of forged, high carbon, tempered seamless steel and shall have a beveled, hardened cutting edge.

(2) If Thermoplastic Casing is used:

(A) The casing shall be new;

(B) The casing and joints shall meet or exceed all the specifications of ASTM F480-06b, except that the outside diameters shall not be restricted to those listed in ASTM F480-06b, which is hereby incorporated by reference, including subsequent amendments and editions, and can be obtained from ASTM International, 100 Barr Harbor Drive, PO Box C 700, West Conshohocken, PA, 19428-2959 at a cost of fifty-one dollars ($51.00);

(C) The depth of installation for a given SDR or Schedule number shall not exceed that listed in Table 2 unless, upon request of the Department, written documentation from the manufacturer of the casing stating that the casing may safely be used at the depth at which it is to be installed is provided.

TABLE 2: Maximum allowable depths (in feet) of Installation of Thermoplastic Water Well Casing

Nominal Diameter (inches)	Maximum Depth (in feet) for Schedule 40	Maximum Depth (in feet) for Schedule 80
2	485	1460
3	415	1170
3.5	315	920
4	253	755
5	180	550
6	130	495
8	85	340
10	65	290
12	65	270
14	50	265
16	50	255

	Maximum Depth (in feet) for SDR 21	Maximum Depth (in feet) for SDR 17	Maximum Depth (in feet) for SDR 13.5
All Diameters	185	355	735

(D) Thermoplastic casing with wall thickness less than that corresponding to SDR 21 or Schedule 40 shall not be used;

(E) For wells in which the casing will extend into consolidated rock, thermoplastic casing shall be equipped with a coupling, or other device approved by the manufacturer of the casing, that is sufficient to protect the physical integrity of the thermoplastic casing during the processes of seating and grouting the casing and subsequent drilling operations; and

(F) Thermoplastic casing shall not be driven by impact, but may be pushed.

(3) In constructing any well, all water-bearing zones that contain contaminated, saline, or other non-potable water shall be cased and grouted so that contamination of overlying and underlying groundwater zones shall not occur.

(4) Every well shall be cased so that the bottom of the casing extends to a minimum depth as follows:
  (A) Wells located within the area described in Rule .0117 of this Section shall be cased from land surface to a depth of at least 35 feet.
  (B) Wells located within the area described in Rule .0116 of this Section shall be cased from land surface to a depth of at least 10 feet.
  (C) Wells constructed with separation distances less than those specified in Subparagraph (a)(2) of this Rule based on lot size or other fixed conditions as specified in Subparagraph (a)(3) of this Rule shall be cased from land surface to a depth of at least 35 feet except in areas described in Rule .0116 of this Section.
  (D) Wells located in any other area shall be cased from land surface to a depth of at least 20 feet.

(5) The top of the casing shall be terminated at least 12 inches above land surface, regardless of the method of well construction and type of pump to be installed.

(6) The casing in wells constructed to obtain water from a consolidated rock formation shall meet the requirements specified in Subparagraphs (d)(1) through (d)(5) of this Rule and shall be:
  (A) adequate to prevent any formational material from entering the well in excess of the levels specified in Paragraph (h) of this Rule; and
  (B) firmly seated at least five feet into the rock.

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

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

(9) Prior to removing equipment from the site, the top of the casing shall be sealed with a water-tight cap or well seal, as defined in G.S. 87-85(16), to preclude the entrance of contaminants into the well.

(e) Allowable Grouts.

(1) One of the following grouts shall be used wherever grout is required by a rule of this Section. Where a particular type of grout is specified by a Rule of this Section, no other type of grout shall be used.
  (A) Neat cement grout shall consist of a mixture of not more than six gallons of clear, potable water to one 94 pound bag of Portland cement. Up to five percent, by weight, of bentonite may be used to improve flow and reduce shrinkage. If bentonite is used, additional water may be added at a rate not to exceed 0.6 gallons of water for each pound of bentonite.
  (B) Sand cement grout shall consist of a mixture of not more than two parts sand and one part cement and not more than six gallons of clear, potable water per 94 pound bag of Portland cement.
  (C) Concrete grout shall consist of a mixture of not more than two parts gravel or rock cuttings to one part cement and not more than six gallons of clear, potable water per 94 pound bag of Portland cement. One hundred percent of the gravel or rock cuttings must be able to pass through a one-half inch mesh screen.
  (D) Bentonite slurry grout shall consist of a mixture of not more than 24 gallons of clear, potable water to one 50 pound bag of commercial sodium bentonite. Non-organic, non-toxic substances may be added to bentonite slurry grout mixtures to improve particle distribution and pumpability. Bentonite slurry grout may only be used in accordance with the manufacturer's written instructions.
  (E) Bentonite chips or pellets shall consist of pre-screened sodium bentonite chips or compressed sodium bentonite pellets with largest dimension of at least one-fourth inch but not greater than one-fifth of the width of the annular space into which they are to be placed. Bentonite chips or pellets shall be hydrated in place. Bentonite chips or pellets may only be used in accordance with the manufacturer's written instructions.
  (F) Specialty grout shall consist of a mixture of non-organic, non-toxic materials with characteristics of expansion, chemical-resistance, rate or heat of hydration, viscosity, density or temperature-sensitivity applicable to specific grouting requirements. Specialty grouts may not be used without prior approval by the Secretary. Approval of the use of specialty grouts shall be based on a demonstration that the finished grout has a permeability less than 10^{-6} centimeters per second and will not adversely impact human health or the environment.

(2) With the exception of bentonite chips or pellets, the liquid and solid components of all grout mixtures shall be blended prior to emplacement below land surface.

(3) No fly ash, other coal combustion byproducts, or other wastes may be used in any grout.

(f) Grout emplacement.

(1) Casing shall be grouted to a minimum depth of twenty feet below land surface except that:
  (A) In those areas designated by the Director to meet the criteria of Rule .0116 of this Section, grout shall extend to a depth of two feet above the screen or, for open end wells, to the bottom of the casing, but in no case less than 10 feet.
  (B) In those areas designated in Rule .0117 of this Section, grout shall extend to a minimum of 35 feet below land surface.

(2) In addition to the grouting required by Subparagraph (f)(1) of this Rule, the casing shall be grouted as necessary to seal off all aquifers or zones that contain contaminated, saline, or other non-potable water so that contamination of overlying and underlying aquifers or zones shall not occur.

(3) Bentonite slurry grout may be used in that portion of the borehole that is at least three feet below land surface. That portion of the borehole from land surface to at least three feet below land surface shall be filled with a concrete or cement-type grout or bentonite chips or pellets that are hydrated in place.

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

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

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

(C) Other. Grout may be emplaced in the annular space by gravity flow in such a way to ensure complete filling of the space. Gravity flow shall not be used if water or any visible obstruction is present in the annular space within the applicable minimum grout depth specified in Subparagraph (f)(1) of this Rule at the time of grouting, with the exception that bentonite chips or pellets may be used if water is present, if designed for that purpose.

(5) If a Rule of this Section requires grouting of the casing to a depth greater than 20 feet below land surface, the pumping or pressure method shall be used to grout that portion of the borehole deeper than 20 feet below land surface, with the exception of bentonite chips and pellets, used in accordance with Part (f)(4)(C) of this Rule.

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

(7) Bentonite chips or pellets shall be used in compliance with all manufacturer's instructions including pre-screening the material to eliminate fine-grained particles, installation rates, hydration methods, tamping, and other measures to prevent bridging.

(8) Bentonite grout shall not be used to seal zones of water with a chloride concentration of 1,500 milligrams per liter or greater.

(9) The well shall be grouted within seven days after the casing is set.

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

(11) Where grouting is required by the provisions of this Section, the grout shall extend outward in all directions from the casing wall to a minimum thickness equal to either one-third of the diameter of the outside dimension of the casing or two inches, whichever is greater; but in no case shall a well be required to have an annular grout seal thickness greater than four inches.

(12) For wells constructed in locations where flowing artesian conditions are encountered or expected to occur, the well shall be adequately grouted to protect the artesian aquifer, prevent erosion of overlying material and confine the flow within the casing.

(g) Well Screens.

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

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

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

(h) Gravel-and Sand-Packed Wells.

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

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

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

(C) The packing material shall be placed in the annular space around the screens and casing by a fluid circulation method to ensure accurate placement and avoid bridging.

(D) The packing material shall be disinfected.

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

(i) All water supply wells shall be developed by the well contractor. Development shall include removal of formation materials, mud, drilling fluids and additives such that the water contains no more than:

(1) five milliliters per liter of settleable solids; and

(2) 10 NTUs of turbidity as suspended solids.

Development does not require efforts to reduce or eliminate the presence of dissolved constituents which are indigenous to the ground water quality in that area.

(j) Well Head Completion.

(1) Access Port. Every water supply well shall be equipped with a usable access port or air line, except those with a multi-pipe deep well jet pump or adapter mounted on the well casing or well head, and wells with casing two inches or less in diameter where a suction pipe is connected to a suction lift pump. The access port shall be at least one half

inch inside diameter opening so that the position of the water level can be determined at any time. The port shall be installed and maintained in such manner as to prevent entrance of water or foreign material.

(2) Well Contractor Identification Plate.

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

(B) The identification plate shall be constructed of a durable weatherproof, rustproof metal, or other material approved by the Department as equivalent.

(C) The identification plate shall be permanently attached to either the aboveground portion of the well casing, surface grout pad or enclosure floor around the casing where it is readily visible and in a manner that does not obscure the information on the identification plate.

(D) The identification plate shall not be removed by any person.

(E) The identification plate shall be stamped to show the:

(i) total depth of well;

(ii) casing depth (feet) and inside diameter (inches);

(iii) screened intervals of screened wells;

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

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

(vi) static water level and date measured;

(vii) date well completed; and

(viii) the well construction permit number or numbers, if such a permit is required.

(3) Pump Installation Information Plate.

(A) An information plate, showing the well contractor and certification number of the person installing the pump, and the information specified in Part (j)(3)(D) of this Rule, shall be permanently attached to either the aboveground portion of the well casing, surface grout pad or the enclosure floor, if present, where it is readily visible and in a manner that does not obscure the information on the identification plate within 72 hours after completion of the pump installation;

(B) The information plate shall be constructed of a durable waterproof, rustproof metal, or other material approved by the Department as equivalent;

(C) The information plate shall not be removed by any person; and

(D) The information plate shall be stamped or engraved to show the:

(i) date the pump was installed;

(ii) the depth of the pump intake; and

(iii) the horsepower rating of the pump.

(4) Controlled flow. Every artesian flowing well shall be constructed, equipped and operated to prevent the unnecessary discharge of water. Flow shall be completely stopped unless the discharge is for beneficial use and only for the duration of that beneficial use. Flow discharge control shall be provided to conserve the groundwater resource and prevent or reduce the loss of artesian hydraulic head. Flow control may consist of valved pipe connections, watertight pump connections, receiving tank, flowing well pitless adapter, packer or other methods approved by the Department to prevent the loss of artesian hydraulic head and stop the flow of water as referenced in G.S. 87-88(d). Well owners are responsible for the operation and maintenance of the valve.

(5) Pitless adapters or pitless units are allowed as a method of well head completion under the following conditions:

(A) Design, installation and performance standards are those specified in PAS-97(04), which is hereby incorporated by reference, including subsequent amendments and editions, and can be obtained from the Water System Council National Programs Office, 1101 30th Street, N.W., Suite 500, Washington, DC 20007 at no cost;

(B) The pitless device is compatible with the well casing;

(C) The top of the pitless unit extends at least 12 inches above land surface;

(D) The excavation surrounding the casing and pitless device is filled with grout from the top of the casing grout to the land surface; and

(E) The pitless device has an access port.

(6) All openings for piping, wiring, and vents shall enter into the well at least 12 inches above land surface, except where pitless adapters or pitless units are used, and shall be adequately sealed to preclude the entrance of contaminants into the well.

History Note: *Authority G.S. 87-87; 87-88;*
Eff. February 1, 1976;
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