

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

NR 845 Level 5

Well Filling and Sealing

April 28, 2021 | DNR.WI.GOV



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Authority for State, County and Municipal Well Filling and Sealing Programs

- Chapters 280 and 281 of Wisc. Stats. give DNR authority to protect groundwater and public health.
- Allows DNR to authorize counties to adopt ordinances
- Private and non-community wells are under NR 812
- Community wells are under NR 811
- Drillholes/Exploratory Boreholes also under NR 812

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County Responsibilities

- Adopt a filling and sealing ordinance
- Follow-up on filling and sealing (f/s) unsafe, hazardous, noncomplying and unused wells
- Follow-up with enforcement as needed
- Municipalities within counties may also have f/s and cross-connection ordinances

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Definitions

- **Well or Drillhole?**



- Well: Deeper than wide, >10' deep, to obtain groundwater
- Drillhole: Deeper than wide, > 10' deep

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Definitions

- **Dug Well:** a large diameter hole, side walls are supported by curbing



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Definitions

- **Pit:** Below ground structure that may contain the well, pump, pressure tank, valves, etc.



Includes pumphouses and alcoves adjoining a basement

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Definitions

- **Filling and sealing:** filling a well, drillhole, pit, or reservoir with material so it will not act as a vertical conduit to contaminate another well, groundwater or an aquifer.



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Why is Filling and Sealing Important?

- Prevention of groundwater contamination
- Unused wells provide a direct path for contaminants
- Often forgotten



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When to fill and seal?

- Bacteriological contamination
- Hazard to health or human safety



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When to fill and seal?

- Non-complying wells
- 90 days after well has been removed from service
- Contaminated wells
- Unsuccessful well or drillhole
- Exploratory drillholes/Geologic boreholes



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How to find wells/drillholes that should be f/s?

- **Counties can be the first line of education and communication**

- Ask about unused wells when issuing permits
- Counties have perfect opportunity to educate



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How to find wells/drillholes that should be f/s?

- F/s of exploratory drillholes regulated under NR 812
- Does your ordinance include drillholes?
- Sand mining?
 - Include in permitting



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How to find wells/drillholes that should be f/s?

- Look for indicators of unused wells



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How to find wells/drillholes that should be f/s?

- Look for wells in use that aren't code-compliant
- Measure separation distances...compliance can change
- Well construction issues
 - Can be difficult to ID – ask DNR for help



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How to find wells/drillholes that should be f/s?

- Review WCRs and follow-up on replacement wells
- Search Well Abandonment Report (WAR) database for verification



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Who can fill/seal a well or drillhole?

- Licensed well driller or pump installer
- Well owners shall hire a licensed individual/business complete the filling and sealing.



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Well Driller/Pump Installer Responsibilities

- Educate replacement well owners
- Report non-complying and unsealed/unused wells to DNR
- WD/PI must report whether or not they filled and sealed wells removed from service



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Temporary Filling and Sealing No Longer allowed

- Does not apply to seasonal systems or hi-capacity systems
- Well needs to be functional – pump, power, etc.



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Preparation for Filling and Sealing

- Gather information
- Remove all obstructions
- Casing usually left in place



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Materials allowed to fill and seal wells

- Dependent on:
 - Size of well or drillhole
 - Formation (unconsolidated vs bedrock)
 - NR812.26(6)



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Materials allowed to fill and seal wells

- Neat cement grout
- Sand cement grout
- Concrete
- Bentonite Chips
- Bentonite Pellets
- Granular Bentonite (Drillholes < 3" in diameter and not extending below the water table)
- Drilling mud and cuttings (Drillholes \geq 3" in diameter in unconsolidated formations and only up to 10 feet bgs.)
- Chlorinated sand-free pea gravel (Bedrock wells > 250 feet, only up to the 250' depth or 20' below casing whichever is greater)
- Native soil, clean clay or silt (Dug wells in unconsolidated formations only)
- Only neat cement grout or bentonite pellets may be used to fill and seal wells \leq 3" in diameter

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Filling and sealing material placement

- Poured or pumped down well or drillhole - <3" diameter
- Gravity tremie
- Pumped tremie
- Screen for bentonite chips



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Other Requirements

Driven-point wells

- Pulling casing and pipe no longer allowed
- Neat cement or Bentonite Pellets for $\leq 3''$ in diameter

Dug Wells

- Top five feet of curbing removed or caved into the well
- Fill with clean clay or native soil, bentonite chips, concrete, or neat cement grout
- In bedrock, required to fill to 2' above bedrock with neat cement, concrete, or bentonite chips/pellets

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Other Requirements

UngROUTED casing or Liner pipe

- Remove or if unable
 - Casing or liner shall be ripped or perforated every 5'
 - Procedures outlined in NR 812.26(5)(g)



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Other Requirements

Artesian/flowing wells

- Reduce flow as much as possible before starting
 - Inflatable packer
 - Extending well casing



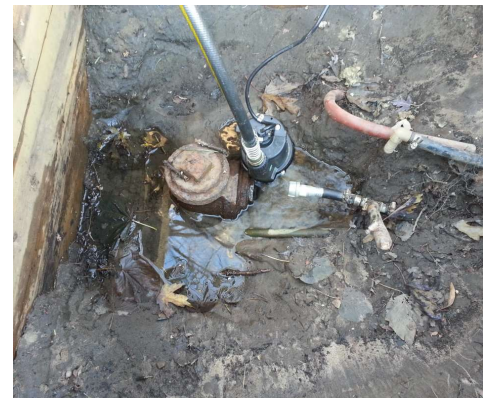
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Other Requirements

Well Pits

- Code requires filling the pit when a well is filled or extended out of the pit
- All equipment shall be removed
- Valve pits still exempt



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Other Requirements

Non-pressure conduits

- Basement end of NPC must be permanently sealed with a watertight cap or seal when well is filled and sealed

Heat exchange drillholes

- Loops should be removed prior to filling and sealing
 - If not possible all fluid needs to be removed and the loops filled with grout

Cutting off casing

- Casing pipe and filling and sealing material may be terminated as much as 3' bgs or future building foundation

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How much material is needed?

Calculating Volume

- If no WCR, depth and diameter measurements needed
- Utilize available tables
- MiSwaco, Baroid IDP (phone apps)
- Back of bag calculations



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What to watch for?

- Pump, piping, and other obstructions removed
- Using appropriate type/volume of sealing material
- Ensure proper placement of filling/sealing material
- Ensure casing not removed



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Common Issues/Problems

- Blockages in well – stuck pumps are common
 - Entomb pump in neat cement
- Inadequate volume of sealing material
- Bridging occurred
- Tremie pipe not used



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Stuck Pumps

- Procedures now included in code
 - NR812.26(5)(b)
- Reasonable attempt using best available technology
- Entomb pump and seal entire well with neat cement



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Filling and Sealing Forms

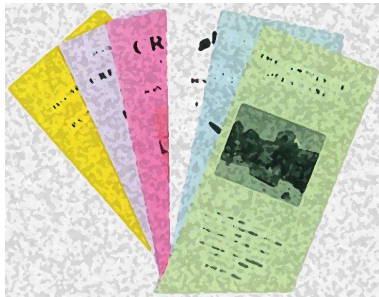
- Reporting within 30 days of filling/sealing
 - All reports submitted electronically
- Form completeness
 - Location...GPS coordinates
 - Well Owner name and address
 - Well Formation
 - Depth (casing and total)
 - Casing diameter
 - Volume and type of sealing material
 - Person performing work/license numbers

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Information and Education

- Critical for a successful filling and sealing program
- Resources
 - DNR brochures
 - DNR website



Well filling and sealing

Abandoned or unused wells pose a great threat to the safety and quality of ground water supplies. An unused well provides a direct path for contaminants and pollutant underground aquifers that supply working wells.

Wells must be properly filled when they are removed from service. If your property municipal drinking water system, a municipal well filling and sealing ordinance may require you to obtain a permit or permanently fill and seal any private wells on your property and exploratory boreholes must also be properly filled and sealed when they are no longer in use.

As of June 1, 2008, only licensed well drillers and pump installers can fill and seal wells in Wisconsin.

A well is considered to be permanently abandoned when it has been completely filled by a licensed well driller or pump installer using materials and methods as prescribed in [§12.26, Wisconsin Administrative Code](#). This generally means that the pump piping inside of the well casing has been removed and the well has been filled from the top with proper filling materials, such as cement grout, concrete grout, concrete, a clay chips.

Topics

- [Answers to your Questions on Well Filling and Sealing](#)
- Verification process for wells formerly filled and sealed: [Verification Guidance](#)
- Search for completed [Well Filling and Sealing Reports](#)
- Submit an electronic [Well Filling and Sealing Report](#)
 - First time user? Create a WAMS User ID through the [DNR Switchboard](#).

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Well Filling and Sealing Grants

- Funded through DNR Well Compensation Program
- Provide up to 75% cost-sharing for well filling and sealing services for families earning less than \$65,000
- Work completed prior to grant application will not be reimbursed



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