SHEBOYGAN COUNTY PLANNING AND CONSERVATION DEPARTMENT

WELL ABANDONMENT PROGRAM

FOR TECHNICAL AND FINANCIAL ASSISTANCE
CALL US AT (920) 459-1370

SHEBOYGAN COUNTY PLANNING & CONSERVATION DEPARTMENT

Well Abandonment Program-Cost Sharing Assistance Procedure

Any interested landowner in Sheboygan County should contact the Planning and Conservation Department at (920) 459-1370.

Landowner will be required to enter into a cost share contract with the PCD to set aside the cost share amount. This contract must be approved by the Sheboygan County Planning, Resources, Agriculture and Extension Committee before actual well abandonment takes place.

If the landowner has contacted a well abandonment contractor they should obtain a written estimate for the well abandonment cost. This written estimate will be the basis for the cost share contract amount.

A contract can also be prepared without a written estimate, with the estimate based on the average well abandonment costs in Sheboygan County.

Cost share amount is a maximum of 70% (with a cap of $1000 per well) of the total cost of the well abandonment.

Cost share contract must be approved by the Sheboygan County Planning, Resources, Agriculture and Extension Committee. The committee holds their meetings on the first Thursday of each month.

After approval landowner contacts well driller for well abandonment.

After abandonment, well abandonment contractor sends landowner the abandonment costs bill as well as the State and PCD required Form 3300-5, Well/Drillhole/Borehole Abandonment form.

After abandonment landowner must pay contactor the cost of the well abandonment.

Landowner should submit the paid well abandonment invoice as well as Form 3300-5, Well//Drillhole/Borehole Abandonment form to the Sheboygan County PCD Office, 508 New York Avenue, Sheboygan, WI 53081.

Payment will be approved by the Sheboygan County Planning, Resources, Agriculture and Extension Committee. Payment in the amount of 70% (with a cap of $1000 per well) of the well abandonment costs will be issued by check in approximately two weeks after approval and be sent to the landowner.

SHEBOYGAN COUNTY WELL ABANDONMENT PROGRAM FREQUENTLY ASKED QUESTIONS

The Sheboygan County Planning and Conservation Department is offering a well abandonment program for all landowners in Sheboygan County in 2014. The purpose of the program is to provide technical and financial assistance in order to properly abandon unused wells.

Why a Well Abandonment Program for Sheboygan County? Unused and improperly abandoned wells are a significant threat to groundwater quality. If not properly filled with impermeable material, abandoned wells can directly channel contaminated surface or soil water into groundwater. Water that gets into abandoned wells bypasses the purifying action that normally takes place in the upper layers of the soil.

Because groundwater flows in soil and bedrock formations (aquifers), contamination that enters old wells can move to nearby drinking water wells. Many thousands of improperly abandoned wells are threatening groundwater in Wisconsin, including Sheboygan County.

Whenever you see an old deteriorating windmill site in the countryside, there is likely an improperly abandoned well underneath. Also, many older farmsteads have abandoned wells. These sites may also include hand dug wells, driven-point (sand-point) wells and well pits.

Who can perform proper well abandonment work? As of June 1, 2008, only licensed well drillers and pump installers may be hired to fill and seal wells. (List available) These contractors are familiar with correct abandonment materials and procedures, are knowledgeable about wells, and have access to the necessary equipment.

It's usually more economical to fill an old unused well at the same time the Well Driller is at the site constructing a new well. After proper abandonment, a Well/DrillHole/Borehole Abandonment Certification Form must be completed and submitted to the Planning & Conservation Department (PCD) and Department of Natural Resources as required under Wisconsin Statutes.

I have an abandoned well. How much will it cost to properly seal and what financial assistance can I receive? The PCD has found from assisting landowners over the years that most wells can be properly sealed for under $1000. The Sheboygan County PCD will cost share a well abandonment project at a maximum of 70% (with a cap of $1000 per well). For example, this means the PCD will make a payment of $700 (total cost of $1000) to the landowner for the cost of abandonment.

How do I get started and who do I contact if I want to participate in the Well Abandonment Program? Call the Sheboygan County PCD at (920) 459-1370. Staff will set up an appointment with you to review the process. A contract will need to be signed by both parties to secure the cost sharing dollars for the project. Contact a well abandonment contractor to obtain an estimate for sealing your abandoned well. After contract approval, the well abandonment contractor can perform the work for you, and provide you the proper well abandonment certification that is required. Submit the bill and certification for well sealing to the PCD for processing. After approval, payment will usually be made to you in approximately two weeks.

State of Wis., Dept. of Natural Resources
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing

Form 3300-005 (R 4/08)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

☐ **Verification Only of Fill and Seal**

Route to:
☐ Drinking Water ☐ Watershed/Wastewater ☐ Remediation/Redevelopment
☐ Waste Management ☐ Other: _____

1. Well Location Information

County | WI Unique Well # of Removed Well (_ _ _ _ _) | Hicap #

Lattitude / Longitude (Degrees and Minutes) | Method Code (see instructions)
_ _ ° _ _ . _ _ _ 'N
_ _ ° _ _ . _ _ _ 'W

¼ / ¼ | ¼ | Section | Township N | Range ☐ E ☐ W
or Gov't Lot #

Well Street Address

Well City, Village or Town | Well ZIP Code

Subdivision Name | Lot #

Reason For Removal From Service | WI Unique Well # of Replacement Well (_ _ _ _ _)

2. Facility / Owner Information

Facility Name

Facility ID (FID or PWS)

License/Permit/Monitoring #

Original Well Owner

Present Well Owner

Mailing Address of Present Owner

City of Present Owner | State | ZIP Code

3. Well / Drillhole / Borehole Information

☐ Monitoring Well
☐ Water Well
☐ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy)

If a Well Construction Report is available, please attach.

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (specify): _____

Formation Type:
☐ Unconsolidated Formation ☐ Bedrock

Total Well Depth From Ground Surface (ft.) | Casing Diameter (in.)

Lower Drillhole Diameter (in.) | Casing Depth (ft.)

Was well annular space grouted? ☐ Yes ☐ No ☐ Unknown

If yes, to what depth (feet)? | Depth to Water (feet)

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	☐ Yes	☐ No	☐ N/A
Liner(s) removed?	☐ Yes	☐ No	☐ N/A
Screen removed?	☐ Yes	☐ No	☐ N/A
Casing left in place?	☐ Yes	☐ No	☐ N/A
Was casing cut off below surface?	☐ Yes	☐ No	☐ N/A
Did sealing material rise to surface?	☐ Yes	☐ No	☐ N/A
Did material settle after 24 hours?	☐ Yes	☐ No	☐ N/A
If yes, was hole retopped?	☐ Yes	☐ No	☐ N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	☐ Yes	☐ No	☐ N/A

Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Screened & Poured (Bentonite Chips) ☐ Other (Explain): _____

Sealing Materials
☐ Neat Cement Grout ☐ Clay-Sand Slurry (11 lb./gal. wt.)
☐ Sand-Cement (Concrete) Grout ☐ Bentonite-Sand Slurry " "
☐ Concrete ☐ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
☐ Bentonite Chips ☐ Bentonite - Cement Grout
☐ Granular Bentonite ☐ Bentonite - Sand Slurry

5. Material Used To Fill Well / Drillhole

From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Surface			

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing | License # | Date of Filling & Sealing (mm/dd/yyyy)

Street or Route | Telephone Number ( )

City | State | ZIP Code

Signature of Person Doing Work | Date Signed

DNR Use Only

Date Received | Noted By

Comments

Instructions

Well Filling and Sealing

Wisconsin Administrative Code (NR811, NR 812, and NR 141 requires well owners to permanently fill and seal any unused wells/drillholes/boreholes on their property. **As of June 1, 2008 water supply wells can only be filled and sealed by licensed well drillers and pump installers.**

1. Remove any pump, pump piping, debris or other obstacles that could interfere with the sealing operation.
2. Except when bentonite chips are used, the sealing material must be placed with the use of a conductor (tremie) pipe to fill the entire well column to the top with required sealing material. Refer to NR 812 and NR 141 for more details on filling and sealing requirements.

General Instructions: Fill out Well/Drillhole/Borehole Filling & Sealing Form 3300-005 as completely as possible for each well or borehole filled and sealed. Information should be provided for every box on the form where available. Sign each form. Please note that these forms are subject to change. (Personally identifiable information on these forms is not intended to be used for any other purpose.)

Verification Only of Fill and Seal: If you are only verifying that filling and sealing has previously occurred on a well and are NOT performing any filling and sealing work on the well, check the box near the top of the form. Complete Parts 1 and 2 of the form completely and any information you can provide in Parts 3, 4 and 5. You must provide comments in Part 6 as to the method used to verify both the filling and sealing of the well. Complete Part 7, excluding the date of Filling and Sealing. It will be implied that you did not do the filling and sealing work as stated in Part 7.

Route to: Check the appropriate routing box on the top of the form to assure proper routing to the DNR program requiring this well be filled and sealed. Mail the form and any attachments to the Department of Natural Resources, PO Box 7921, Madison, WI 53707-7921.

If you do any work to fill or seal the well, you must complete this form as intended and do not check the Verification Only of Fill and Seal box.

(1) **WELL LOCATION INFORMATION**

WI Unique Well #: Fill in the 2 alphabetic and 3 numeric Wisconsin Unique Well Number (WUWN) of the well being filled and sealed. Check the well, sample tap in the house or the fuse box for a WUWN if one has been assigned to the well.

Hicap #: If this was a high capacity well, enter the number assigned to the well by the Department.

Well Location: The well location can be determined by latitude and longitude coordinates in degrees and decimal minutes (to the thousandths, for example, latitude 43°04.347'N longitude 89°24.803'W) using a Global Positioning System (GPS) unit. If using GPS, check the method code for the GPS unit. The location can also be determined using Public Land Survey (Gov't Lot or ¼ /¼, ¼, Section, Township and Range).

Method Code: This field lists data collection method codes for latitude and longitude coordinates. This field must be entered if a latitude/longitude coordinate is entered.

GPS006 - Mapping or recreational grade GPS receiver with no differential correction and selective availability off
GPS007 - Mapping or recreational grade GPS receiver with no differential correction and selective availability on
GPS008 - GPS receiver grade and or differential correction procedures unknown

(2) **FACILITY / OWNER INFORMATION**

If the well is located at a commercial or government facility, fill in the name of landfill, wastewater treatment facility, surface impoundment, spill or project.

Facility ID: Fill in the nine digits Facility ID (FID or PWS) assigned to the site by the Department.

License/Permit/Monitoring #: Fill in number assigned to facility by the Department. If unknown, leave blank.

Present Well Owner: Fill in the name, address, city, state and ZIP code of the present owner.

(3) **WELL/DRILLHOLE/BOREHOLE INFORMATION**

Original Construction Date: Fill in the original date of construction for the well or boring in mm/dd/yyyy format.

Depth to Water: Enter depth to water from ground surface.

(4) **PUMP, LINER, SCREEN, CASING, & SEALING MATERIAL:** Check only one box where Yes, No or Not Applicable is indicated. Check all boxes which apply otherwise.

(5) **MATERIAL USED TO FILL THE WELL/DRILLHOLE:** Enter the description of the filling material, the depth From and To, circle one measurement unit (Yards, Sacks or Volume), and enter the mix ratio or mud weight (in pounds per gallon).

(6) **COMMENTS:** Describe any of the above boxes in more detail or add information as required to describe the filling and sealing procedures.

(7) **NAME OF PERSON OR FIRM DOING SEALING WORK:** Enter the name (first and last) or firm name, address, and phone number of the person who supervised the work.

Date of Filling & Sealing: List Month/Day/Year (mm/dd/yyyy) the well was filled & sealed.

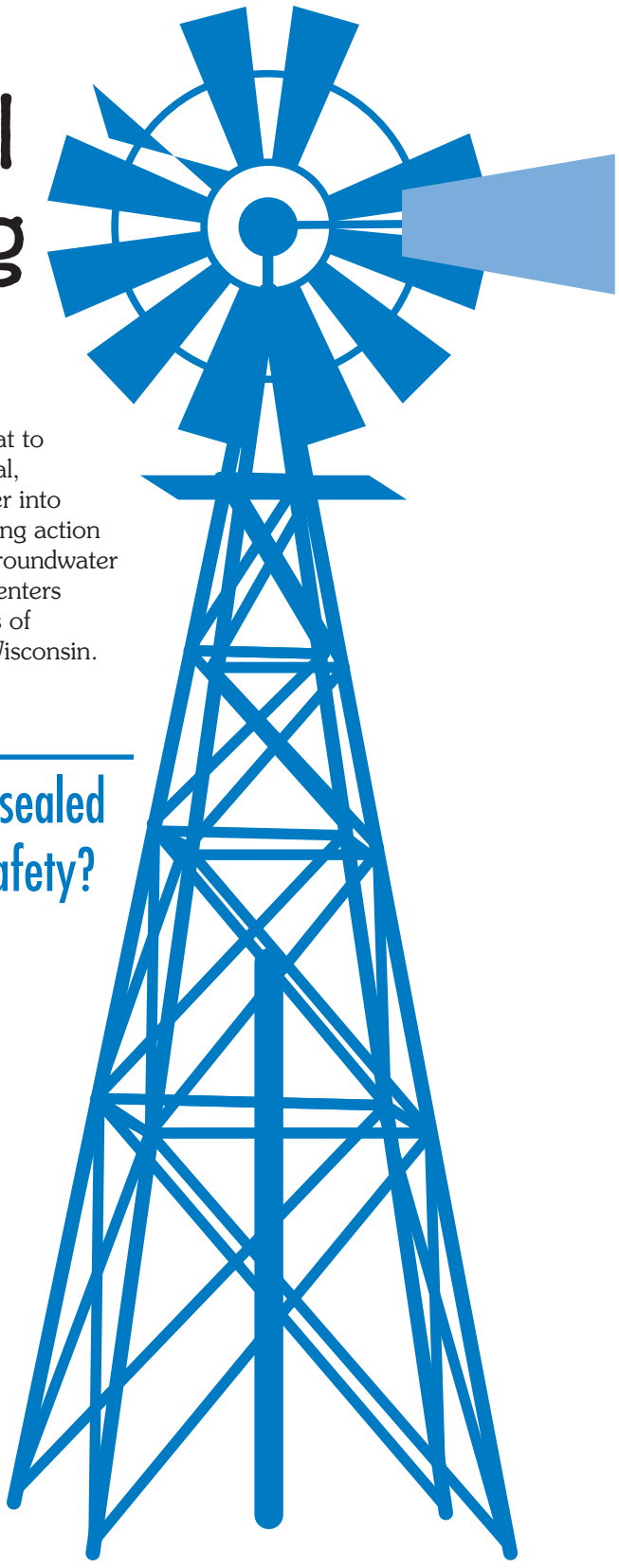
WELL ABANDONMENT CONTRACTORS LIST ALPHABETICAL BY COUNTY

LIC#	NAME / CITY	STATE	ZIP	PHONE #s / E-MAIL		ADDRESS
Sheboygan						
4727	ALBRIGHT, RICHARD WAYNE TWO RIVERS	WI	54241-0002	(920) 793-3214	(920) 323-4503	ALBRIGHT WELDING & PUMP PO BOX 2
6290	ANGER, AARON SHEBOYGAN	WI	53083-	(920) 627-3718 playbird@tds.net		W2068 PLAYBIRD RD
6726	ANHALT WELL DRLG & PUMP INC ASHIPPUN	WI	53003-0352	(920) 474-3757 anhaltwelldrilling@hotmail.com	(920) 474-3760	PO BOX 55 N534 HWY 67
6261	ANHALT, ANTHONY L ASHIPPUN	WI	53003-0352	(920) 474-3757 anhaltwelldrilling@hotmail.com	(920) 474-3760	ANHALT WELL DRLG & PUMP INC PO BOX 55
0067	BERRES, FREDERICK M WEST BEND	WI	53095-9739	(262) 377-2340		5072 FAIRY CHASM RD
7550	C & C WELL SERVICE KAUKAUNA	WI	54130-	(920) 850-7867	(920) 850-7870	N1554 HARRISON ST
6032	EBERHARDT PLBG & HTG INC ADELL	WI	53001-	(920) 994-9203 jnhardt@excel.net		400 WISCONSIN ST
3388	EBERHARDT, JAMES K ADELL	WI	53001-0098	(920) 994-9203 jnhardt@excel.net		PO BOX 98
4181	FRAZIER, WILLIAM C MUSKEGO	WI	53150-9208	(262) 679-3903 wmcfrazier@yahoo.com	(262) 679-3114	FRAZIER WELL SERVICES LLC W188 S7618 OAK GROVE DR
4462	GROUND SOURCE INC DE PERE	WI	54115-9711	(920) 336-3659 www.groundsourcewi.com	(920) 336-7156	3671 MONROE RD
6227	HOGAN, JAMES C MARINETTE	WI	54143-	jhogan2@new.rr.com		COST LESS WELL SERVICE 2406 BOREN DR
0479	HYINK WELL DRILLING INC SHEBOYGAN FALL	WI	53085-2242	(920) 467-0566		N6250 ALPINE RD
5604	JINDRA, WILLIAM ROY MANITOWOC	WI	54220-	(920) 683-3600 billjph@charter.net	(920) 682-3891	5929 CTY HWY B
0786	KARLS MECHANICAL CONTRACTOR CHILTON	WI	53014-0144	(920) 849-2050 jkarls1@verizon.net	(920) 439-1466	954 FORWARD AV PO BOX 144
4874	KARLS, PAUL J CHILTON	WI	53014-9017	(920) 849-2050 joel@karlsmechanical.com	(920) 464-0400	N4277 SANDSTONE LN
0666	KELLER, FRANKLIN F MEQUON	WI	53097-6912	(262) 377-2340 tipbub@att.net	(262) 242-2134	11125 W FREISTADT RD
4347	KLEMME, ANDREW M MAYVILLE	WI	53050-	(920) 387-1635 aklemme2@charter.net	(920) 960-9002	355 WISCONSIN ST
4107	KLEMME, CLARENCE JOHN PLYMOUTH	WI	53073-	(920) 893-9679		N4974 PLEASANT VIEW RD
0560	LAABS WELL DRILLING INC GRAFTON	WI	53024-9757	(262) 375-1020		445 NORTH RIVERVIEW DR
0472	LAABS, ROBERT E GRAFTON	WI	53024-9757	(262) 375-1020	(414) 587-1859	445 N RIVERVIEW DR
0527	LIEBAU LAUN INC MEQUON	WI	53092-3334	(262) 242-1740		1200 W LIEBAU RD 124N
2634	LUISIER PLUMBING INC MANITOWOC	WI	54221-0155	(920) 682-3666 luisier@lakefield.net		PO BOX 155
6156	MEIDL WATER SYSTEMS INC WHITELAW	WI	54247-	(920) 732-1600 randy@meidlwatersystems.com		360 WASHINGTON CT
6347	MEIDL, RANDALL R WHITELAW	WI	54247-9532	(920) 732-1600 randy@meidlwatersystems.com		360 WASHINGTON CT
6113	MEYERS, JAMES OCONTO FALLS	WI	54154-1078	(800) 662-0940 james@luisierdrilling.com	(920) 848-5239	LUISIER WELL DRILLING INC 220 HANK MARKS DR
7231	MILBRATH, MICHAEL D SHEBOYGAN	WI	53083-	(920) 565-2131	(920) 565-3916	SIXEL & SCHWINN INC N7677 RANGELINE RD
0013	MUNICIPAL WELL & PUMP/MIDWES WAUPUN	WI	53963-	(920) 324-3400 tgree@municipalwellandpump.com	(262) 424-2328	1212 STOREBECK DR

WELL ABANDONMENT CONTRACTORS LIST ALPHABETICAL BY COUNTY

LIC#	NAME / CITY	STATE	ZIP	PHONE #s / E-MAIL		ADDRESS
2566	NEUMANN PLBG & HTG INC HOWARDS GROV	WI	53083-1497	(920) 565-3345 info@neumannplumbing.com	(920) 565-3346	1114 MILLERSVILLE AVE
6558	PLATE, CURT KAUKAUNA	WI	54130-	(920) 850-7867	(920) 850-7870	C & C WELL SERVICE N1554 HARRISON ST
6253	PRUEHER, MARK LITTLE FALLS	MN	56345-	(320) 632-3010 Mark.prueher@majordrilling.com	(320) 266-8485	MAJOR DRILLING ENVIRONMENTSL PO BOX 351
0864	RICHERT FRED CO INC MILWAUKEE	WI	53226-	(414) 258-3650		135 N 91ST STREET
4215	RICHERT, H MALCOLM MILWAUKEE	WI	53226-	(414) 258-3650		FRED RICHERT CO 135 N 91ST STREET
6072	ROEKLE, PAUL MAINITOWOC	WI	54220-	(920) 682-9371 proekle@comcast.net		2325 VICTORIA DR
4649	SCHWINN, LEONARD SHEBOYGAN	WI	53083-	(920) 565-2131 sixelschwinn@hotmail.com		N7677 RANGELINE ROAD
4281	SIXEL & SCHWINN INC SHEBOYGAN	WI	53083-	(920) 565-2131		N7677 RANGELINE RD
4657	SIXEL, JEFFREY SHEBOYGAN	WI	53083-	(920) 565-2131		N7677 RANGELINE RD
6363	SOMMER JR, NORBERT SHEBOYGAN FALL	WI	53085-	(920) 564-2695	(920) 918-2285	N B S SERVICES N3297 LEYNSE RD
0037	VAN DE YACHT, BILL DE PERE	WI	54115-9711	(920) 336-3659 www.vandeyachtdrilling.com	(920) 336-7156	GROUND SOURCE INC 3671 MONROE RD
4468	VAN DE YACHT, TOM DE PERE	WI	54115-9244	(920) 336-3659 tom@groundsourcewi.com	(920) 336-3659	1951 HAWTHORNE HEIGHTS DR
4344	VAN ELLS, MARTIN T PLYMOUTH	WI	53073-1060	(920) 893-2392 mvane@municipalwellandpump.com		VAN ELLS PUMP INSTALLATION 835 SUHRKE RD
0654	WAGNER BROTHERS WELL DRILLI MT CALVARY	WI	53057-9720	(920) 753-3301 wagnerbros@wagnerbros.us		W2282 COUNTY HWY WH
0034	WAGNER, CHARLES U MT CALVARY	WI	53057-	(920) 753-3301 wagnerbros@wagnerbros.us		W2282 COUNTY HWY WH
0032	WAGNER, JEROME A FOND DU LAC	WI	54935-5170	(920) 753-3301 wagnerbros@wagnerbros.us		254 ELLIS ST
6685	WATER WELL SOLUTIONS INC OCONOMOWOC	WI	53066-	(920) 474-4777 mike@wwssg.com	(262) 269-6196	N87 W36051 MAPLETON ST
6224	WEBER, MARK N CHILTON	WI	53014-	(920) 849-3360	(920) 849-2400	N2039 S TOWNHALL RD
0099	WEBER, ROGER P CHILTON	WI	53014-	(920) 849-2400 weber1@excel.net		WEBER WELL DRILLING N2253 CTY G
4796	WOLF, JOHN SHEBOYGAN FALL	WI	53085-2222	(920) 467-0566		HYINK WELL DRLG INC N6250 ALPINE RD
6377	WOYAK, DAVID HARTLAND	WI	53029-	(262) 966-7006 dwoyak@wi.rr.com	(262) 490-1020	N82 W28160 MARSHALL DR
7564	ZIDLICKY, DYAN NORTH PRAIRIE	WI	53153-	(262) 392-2540		AQUA WELL & PUMP SYSTEMS INC 124 N OAKRIDGE DR
0107	ZIELIEKE WELL DRILLING INC CAMPBELLSPORT	WI	53010-	(920) 533-4425		N944 ELMORE DR
5372	ZIELIEKE, JEFFERY L CAMPBELLSPORT	WI	53010-8804	(920) 533-4424 waterman10@frontier.com	(920) 533-4424	N1051 ELMORE DR

Answers to Your Questions on Well Filling and Sealing



Why are unused and improperly filled and sealed wells threats to groundwater?

Unused and improperly filled and sealed wells are a significant threat to groundwater quality. If not properly filled with impermeable material, unused wells can directly channel contaminated surface or soil water into groundwater. Water that gets into unused wells bypasses the purifying action that normally takes place in the upper layers of the soil. Because groundwater flows in soil and bedrock formations (aquifers), contamination that enters old wells can move to nearby drinking water wells. Many thousands of improperly filled and sealed wells are threatening groundwater in Wisconsin. Whenever you see an old deteriorating windmill in the countryside, there is likely an improperly filled and sealed well underneath.

How can unused and improperly filled and sealed wells threaten groundwater and personal safety?

- Contaminated surface water can enter a well if the casing pipe does not extend high enough above the ground surface and the well cap has been broken or removed; or if there are cracks or holes in the casing due to damage or deterioration with age.
- Contaminated surface water can seep down along the casing pipe of an improperly constructed well.
- Wells in low areas are sometimes illegally left open to drain surface water from heavy rainfall or snowmelt.
- Open wells offer tempting disposal receptacles for liquid and solid wastes. The disposal of any pollutant or wastewater in a well is prohibited by State codes.
- Large-diameter open wells, especially old dug wells, pose safety hazards for small children and animals. In recent years, there have been instances in Italy, Missouri and Kansas where children have fallen into wells. Although such occurrences are infrequent, they should never be allowed to happen.
- Improperly filled and sealed flowing wells can be a nuisance and may lower artesian pressure in neighboring wells.

When should wells be properly filled and sealed?

Wells must be properly filled when they are removed from service. Wells are removed from service for a number of reasons, including construction of a replacement well, destruction of the building being served, failure of the well to produce safe water, failure of the well to meet the State Well Code (NR812) standards, or when a community water system is extended into an area formerly served by individual private wells.

After wells are removed from service they are seldom used. They often get forgotten after a property transfer and, in time, may get covered by a parking lot or a building. Sometimes in this way all traces of old wells disappear. Such wells can cause groundwater contamination. In one recent case in Wisconsin, a house burned down over an improperly filled and sealed well located in the basement. The well provided a point of entrance into the aquifer and allowed ash-laden water to contaminate the neighbor's well.

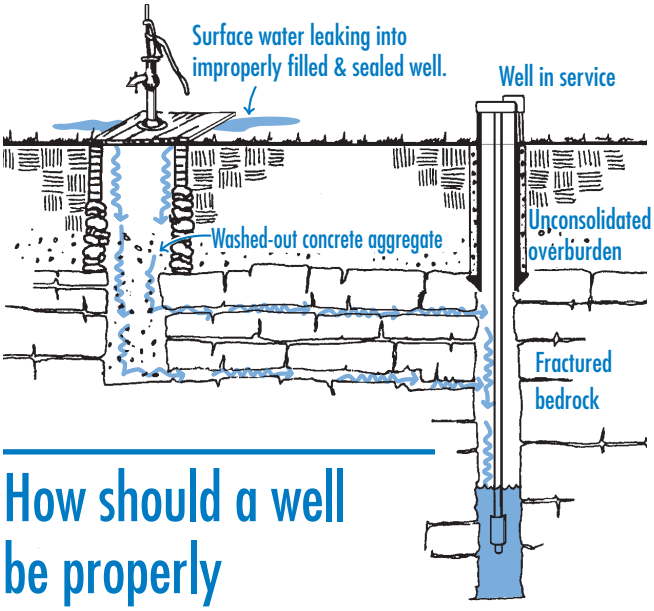
In another case, a buried well having only a stone set on the top of the open casing caused severe contamination of the drinking water pumped from another well on the same property. The unused well was near both an animal yard and a sewage absorption field and thus provided direct access for the entrance of contamination into the groundwater.

After a well gets covered, it is very difficult, if not impossible, to find it and determine if it's causing contamination. When new wells are constructed in an area with improperly filled and sealed wells, they may have to be cased much deeper or to alternate aquifers to provide safe water. These problems can be avoided by the proper filling and sealing of unused wells. Chapters NR811 and NR812, Wis. Adm. Codes, require proper permanent filling and sealing of unused wells.

Who can perform proper well filling and sealing work?

As of June 1, 2008, only licensed well drillers and pump installers may be hired to fill and seal wells. These contractors are familiar with correct filling and sealing materials and procedures, are knowledgeable about wells, and have access to the necessary equipment. It's usually more economical to fill and seal an old unused well at the same time the well driller is at the site constructing a new well.

Improperly filled and sealed well



How should a well be properly filled and sealed?

First determine the construction and condition of the well

The first step in proper well filling and sealing is to obtain information on the construction and condition of the well. Construction information is best obtained from the Well Construction Report on file with the Wisconsin Geological and Natural History Survey (WGNHS) or on DNR's website at dnr.wi.gov. Search for 'Well Construction Reports.' The records date back to 1936.

IMPORTANT INFORMATION TO KNOW WHEN REQUESTING A WELL CONSTRUCTION REPORT:

To request a report, you must furnish a legal description in terms of ¼ - ¼ Section, ¼ - Section, Section, Township and Range designations of the property where the well is located. It's also helpful if you can obtain the name of the well driller, the property owner or agent at the time of drilling, the approximate date of construction and the street address or lot #. The chances of finding the report are greater with more information. Order forms and other information about well construction reports are available on the WGNHS (Wisconsin Geological & Natural History Survey) uwex.edu/wgnhs/well.htm.

Specific forms include:

- To request a Well Construction Report for a specific well uwex.edu/wgnhs/pdfs/wcrpdf/wellord.pdf.
- To request a Well Construction Report for an area uwex.edu/wgnhs/pdfs/wcrpdf/wellord2.pdf.

A site inspection will help you locate the well and see what condition it is in. You should determine if the well is easily accessible in the yard; or if it is in a pit or a basement. It's possible the top of the well is buried in the yard, in which case you may be able to find it using a metal detector.

During your inspection you can also check to see if the pump has been removed.

Clearing, filling and sealing the well

Before the well is filled and sealed, the pump and its associated piping, any ungrouted liner pipe, or other obstacles must be removed from the well. If debris has been thrown in the well, a well driller may have to first drill it out. After the well is cleared, it must be filled from the bottom up with neat cement grout, sand-cement grout, concrete or approved bentonite chips. Well drillers and pump installers are familiar with these materials and know how to calculate and place the proper volume of material.

The filling material must be placed through a conductor (tremie) pipe extending to the bottom of the well except when approved bentonite chips are used according to DNR instructions (see pages 4 and 5). Use of a conductor pipe will assure that the filling material won't be diluted by the water in the well and will not plug in the well part-way down. The bottom of the conductor pipe must be kept submerged in the material during filling, but may be pulled as the well is being filled.

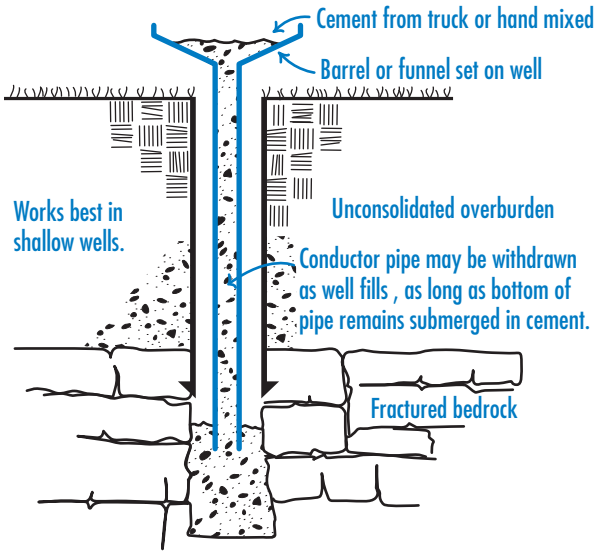
Except when using bentonite chips, a well driller or pump installer may not just pour or dump the filling material into the well without the use of a conductor pipe because this could cause the filling material to become diluted or bridge in the well part-way down. If dilution occurs, the fill material will not be impermeable. If bridging occurs, the well will only get partially filled. An improperly filled and sealed well can be as much a threat to groundwater quality as an open well.

After properly filling and sealing the well from the bottom up, the filling material may terminate a few feet below the ground surface to allow the top of the casing to be cut off, if preferred. The casing may also be left in place. If the well discharged through a non-pressure conduit, the end of this conduit (in the basement) must be sealed watertight with a steel plate.

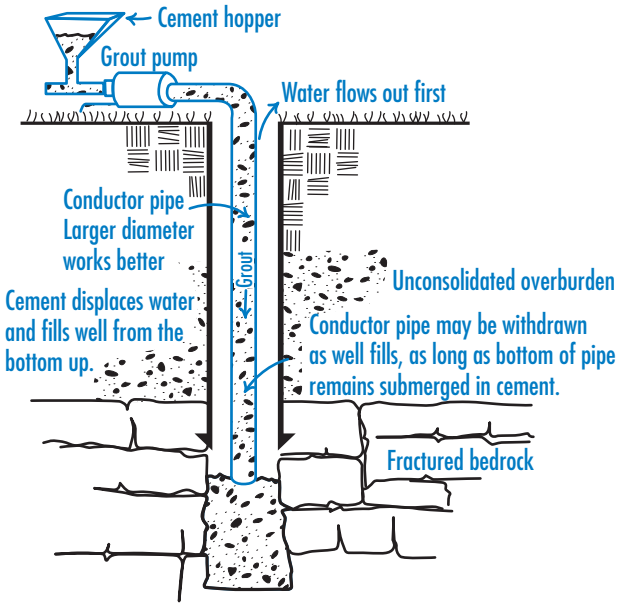
Flowing wells

Flowing artesian wells that flow at high rates may require special techniques to reduce the flow before the well is filled and sealed.

Gravity method for well filling and sealing



Pumped method for well filling and sealing



Driven-point (sand-point) wells

Driven-point or jetted wells 2 inches or less in diameter must be filled with neat cement grout. Only licensed well drillers and pump installers are allowed to fill and seal driven point wells. Grout may be poured down the casing or pumped down through a conducter pipe. The drive pipe and screen may be pulled before the grout is poured if the well is 25-feet deep or less. Bentonite chips may **not** be used for these wells because the chips can too easily bridge in the casing pipe.

Many driven-point wells terminate in pits or in the basements of buildings. Since April 10, 1953 such well locations have been prohibited by the State Well Code.

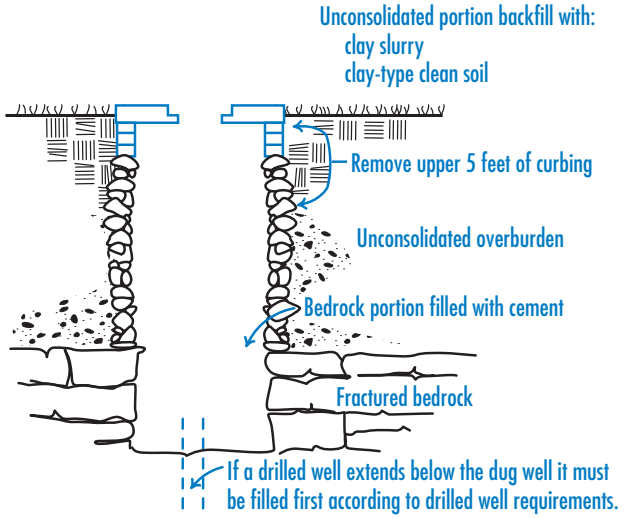
If your well was constructed after this date, the well does not comply and must be properly filled and sealed except when the DNR approves its continued use.

Dug wells

To properly fill and seal a dug well, a well driller or pump installer must first remove the well cover and remove any piping or debris before filling the well. (If a drilled well extends below the dug well it must be filled first.) The dug well must be filled and sealed with clean clay, silt, clean native clay or silt-type soil free of organic material (if compacted), concrete, sand-cement grout or bentonite chips. If the dug well penetrates partially or completely into bedrock, the well must be filled with concrete or sand-cement grout to a point at least two feet above the top of the bedrock. The top 5 feet of curbing of the dug well must be removed to allow for a good contact between the filling material and the soil. The curbing may be caved into the dug well while the well is being filled if it's done in a manner to prevent plugging of the filling material part-way down; or this step may also be done near the end of the filling and sealing procedure.

If the dug well is less than 18 inches in diameter, a conductor (tremie) pipe must be used to place the filling material, except when bentonite chips are used. For very deep or large diameter dug wells, alternate materials may be allowed.

Dug well filling and sealing



Well pits

When a pit well is unused, the pit structure must also be filled and sealed. To properly fill and seal a well pit, perforate or knock in at least one wall, break up or perforate the floor, and then fill the pit with clean native clay, silt, or clean native soil. If the pit is a subsurface pump room (alcove) connected to the building foundation, the pit does not have to be filled.

Well filling and sealing using bentonite chips

In Wisconsin approved bentonite chips may be used to fill wells and drillholes. The chips may be used for both sand and gravel formation wells and bedrock wells. They may only be used for wells & drillholes meeting the following specifications.

- 4 inches or larger in diameter.
- Not more than 500 feet deep.
- Not more than 350 feet of water standing in the well or drillhole.

*(Note: Bentonite chips may **not** be used to fill wells or drillholes filled with drilling mud or clay slurry and may **not** be used for small diameter driven point wells.)*

Bentonite chips may also be used for the following:

- To fill dug wells.
- As an alternative to concrete in the top 5 feet when clay slurry is used to fill a well or drillhole from the bottom up to the 5-foot depth.

(Note: Bentonite chips come in two basic size ranges (¼" - ⅜" and ½" - ¾" chips). The ¼" - ⅜" chips should be used for 4-inch diameter wells. Bentonite chips are irregularly shaped pieces of sodium bentonite clay that look very much like crushed limestone. They should not be confused with pellets or tablets which are not allowed).

Well drillers and pump installers must follow these procedures when using bentonite chips:

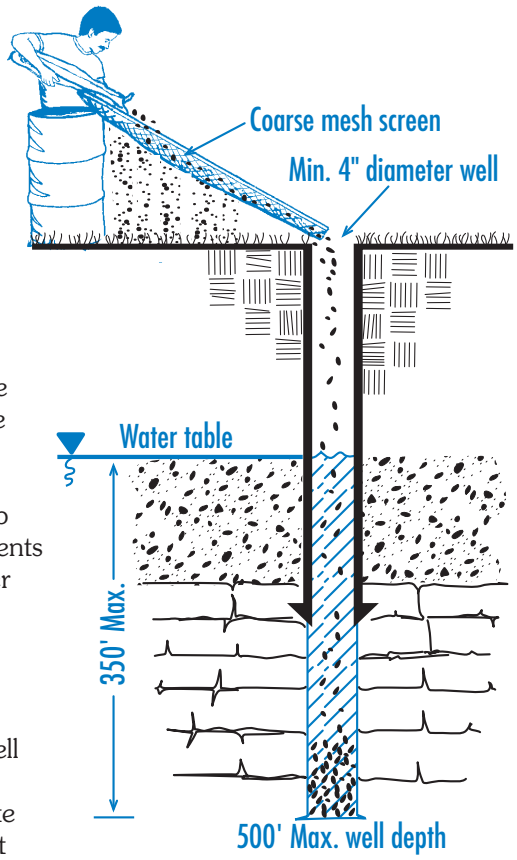
1. Determine the construction details of the well or drillhole including at least the:
   a. Well or drillhole diameter, by simply measuring the inside diameter of the well casing pipe or drillhole; and
   b. Well or drillhole depth, by lowering a weighted line down to the bottom. (Make sure the weight is securely attached).
2. Remove the pump, pump piping and any other material obstructions or debris in the well or drillhole that could prevent complete filling and sealing.
3. Calculate the volume of the well or drillhole to determine the number of bags of chips that will be required by using:
   a. The attached Table I page 5; OR
   b. The formula:

$$\frac{\pi r^2 h}{0.69\ ft^3/bag}$$

   π = pi = 3.14
   r = well radius (in feet)
   h = well depth (in feet)
   0.69 = number of ft^3 filled by one 50 lb. bag

(Remember: Divide the well radius (in inches) by 12 to get the radius in feet.)

4. Fine particles and dust contained in the bags of bentonite chips must not be allowed to enter the well. This is prevented by pouring the bentonite chips out of the bag such that they tumble under their own weight down across a coarse-mesh screen 2 to 3 feet in length. This allows the dust to fall through the screen onto the ground. The screen should be formed into a U-shape like a rain gutter. One end of the screen should be placed on the top of the well casing while the other end is supported at a steep angle. Removal of the dust prevents bridging of the chips at the water table. Do not push or pull the chips down across the screen as this will only create more dust.
5. Pour the bentonite chips across the screen into the top of the well at a rate not faster than about 3 minutes per bag. Pour at this rate so bridging of the chips does not occur – the chips must fall all the way to the bottom of the well. (Do not use a conductor-tremie pipe). Check well periodically with weighted line for possible bridging of chips.



6. Make sure the well "accepts" the entire number of bags calculated to fill it. If it doesn't, bridging may have occurred. The point of bridging must be broken so the bentonite chips will fall to the bottom. If the bridge cannot be broken, the well may have to be drilled out and re-filled with neat cement grout.
7. If the standing water in the well does not rise to the surface during the filling procedure, clean, uncontaminated water must be poured down into the well (through the chips) until water rises up to the top of the well and stays there. The chips will then swell and create an impermeable plug in the well.

Table I - Method for determining the number of 50 lb. bags of bentonite chips to fill a well

Hole size and volume table

Hole diameter inches	Hole volume (ft3/foot)	Pounds bentonite chips to fill 1 ft	Feet filled by one bag bentonite chips	Bags bentonite chips to fill 100 Ft
4	0.087	6.3	7.9	12.6
4-½	0.110	7.9	6.3	15.8
5	0.136	9.8	5.1	19.6
5-½	0.165	11.9	4.2	23.8
6	0.196	14.1	3.5	28.2
6-½	0.230	16.6	3.0	33.2
7	0.267	19.2	2.6	38.4
7-½	0.307	22.1	2.3	44.2
8	0.349	25.1	2.0	50.2
8-½	0.394	28.4	1.8	56.8
9	0.442	31.8	1.6	63.6
9-½	0.492	35.4	1.4	70.8
10	0.545	39.2	1.3	78.4
11	0.660	47.5	1.1	95.0
12	0.785	56.5	0.89	113.0
15	1.227	88.3	0.57	176.6
18	1.767	127.2	0.39	254.4
20	2.182	157.1	0.32	314.2
25	3.409	245.4	0.20	490.8
30	4.909	353.4	0.14	706.8

Table C - Acceptable materials and methods for well filling and sealing

	Well type	Materials							Methods
		Clean clay or silt or clean native soil	Approved bentonite chips ◆	Neat cement grout ■	Concrete ▲	Sand-cement grout	Bentonite-sand slurry w/min. mud wt. 11 lbs/gal	Chlorinated, sand-free pea gravel	
Unconsolidated formation wells	Driven-Point (sand-point) wells ↓ & drillholes ≤ 2 ½" diameter	No	No	Yes	No	No	No	No	Cement grout may be poured without using a conductor ◉ pipe
	Wells & drillholes > 2 ½" diameter	No	Yes, provided well is 4" minimum diameter & 500' maximum depth	Yes	Yes	Yes	Yes, provided top 5' filled with neat cement grout, sand-cement grout or concrete	● Yes, but in depths below 250'	Conductor ◉ pipe required except when bentonite chips or pea gravel is used
	Dug wells ◦	Yes (top 5' of curbing must be removed following filling)	Yes	Yes	Yes	Yes	No	No	Conductor ◉ pipe not required unless well is ≤+18" diameter
Bedrock wells	Bedrock wells not extending through Maquoketa Shale	No	Yes, provided 4" minimum diameter & 500' maximum depth	Yes	Yes	Yes	No	● Yes, but in depths below 250'	Conductor ◉ pipe required except when bentonite chips or pea gravel is used
	Bedrock wells extending through Maquoketa Shale	No	Yes in top 500' & for 40' plugs at top & bottom of Maquoketa Shale contact surfaces	Yes	Yes	Yes	No	● Yes, in depths below 250', but not at Maquoketa Shale contact surfaces	Conductor ◉ pipe required except when bentonite chips or pea gravel is used
	Dug wells ◦	Yes, but only in unconsolidated portion of well	Yes	Yes	Yes	Yes	No	No	Conductor pipe required only for placement of grout or concrete; or if well is ≤+18" diameter
	Well pits	Yes	Yes	Yes	Yes	Yes	No	No	Must perforate floor & 1 wall of pit

◆ *Bentonite chips may only be used for wells **not** deeper than 500 feet and having **not** more than 350 feet of standing water in them. The chips must be poured across a coarse mesh screen such that excess dust does not enter the well. Pour rate should not be faster than 3 min. per 50 lb. bag to prevent bridging.*

■ *Neat cement grout and sand-cement grout must have a density of at least 15.2 lbs per gallon*

▲ *When concrete is used, the gravel size may not exceed ⅓ the inside diameter of the conductor pipe used.*

↓ *Driven-Point (Sand-Point) Wells may be pulled prior to filling the hole if the well is 25' deep or less.*

◉ *The terms conductor pipe and tremie pipe are synonymous. The bottom of the pipe must remain submerged in the grout throughout the filling procedure. Conductor pipe must be metal pipe, thermoplastic pipe rated for at least 100 psi or rubber-covered hose reinforced with braided fiber or steel and rated for at least 300 psi.*

● *40' Impermeable plugs shall be provided at each bedrock formation change. [See s. NR 812.26(7)(a)]*

◦ *The top 5 feet of dug well curbing must be knocked out to provide a soil contact with the filling material.*

"Clean clay or silt or clean native soil" means low permeability soil material, free of organic humus or any other contamination.

"Clay or Bentonite-sand slurry" means a mixture having the minimum ratio of 50 pounds of native clay or approved bentonite mixed with 100 gallons of water (from a known safe and uncontaminated source) and 10-25% sand by volume of the slurry such that a mud weight of at least 11 lbs./gal. is achieved.

"Neat Cement Grout" means a mixture of cement and water in the proportion of one bag of Portland cement (94 lbs.) meeting ASTM C 150, Type I or API-10A, Class A standard; and 5 to 5.5 gallons of water from a known safe and uncontaminated source. Powdered bentonite may be added up to ratio of 5 pounds per 94-pound bag of cement provided 1.3 gallons of water are added for each 2 pounds of bentonite added.

"Concrete (sand-cement) grout" means a mixture of cement, sand and water in the proportion of one bag of Portland cement (as described above), a cubic foot of dry sand and 5 to 5.5 gallons of clean water from a known safe and uncontaminated source.

"Concrete" means a mixture of cement, water, sand and gravel in the proportion of one bag of Portland cement (as described above), an equal measure of gravel (by weight or by volume) and not more than 5.5 gallons of water from a known safe and uncontaminated source. A commercially-prepared mix may be used provided the mix has at least 6 bags of cement per cubic yard.

"Approved chipped bentonite products" are as follows:

ABI Plug ..... ABI, Inc.

Bentonite Plug..... Loresco (medium: ¼ - ⅜ and coarse ½ - ¾")

Black Hills Bentonite Plug...Black Hills Bentonite, LLC

CETCO Chip..... CETCO (medium: ¼ - ⅜" & coarse: ⅜ - ¾")

Cowboy Brand ..... Cowboy Mining Co. (Fine, Medium & Coarse)

Econoplug ..... Economy Mud Products Co. (both medium chips: ¼" to ⅜" and coarse chips: ½" to ¾")(mfg. by Wyo-Ben, Inc.)

Enviroplug ..... Wyo-Ben, Inc. (both medium chips: ¼" to ⅜" and coarse chips: ½" to ¾")

Federal Plug ..... M-1 Drilling Fluids (Federal) – 100% of chipped sodium bentonite (both medium chips: ¼" to ⅜" and coarse chips: ½" to ¾")

Holeplug ..... Baroid Industrial Drilling Products (⅜" and ¾" chips)

Kwik Plug ..... Federal Summit (⅜" and ¾" chips)

Naturapel ..... Wyo-Ben, Inc. (chips)

Opti Seal ..... Bentonite Corp. (⅜" and ¾" chips)

PdsCo Plug ..... PdsCo. (Polymer Drilling Systems)(medium and coarse chips)

Permaplug ..... Cathodic Engineering Equipment Co. (both coarse chips: ¾" and medium chips: ⅜")

Pure Gold Chips..... CETCO (both medium ¼" to ⅜" and coarse ⅜" to ¾" chips)

Tower Plug ..... Black Hills Bentonite, LLC (⅜" and ¾" chips)

Well-Plug ..... Fluidril Mud Systems (from Black Hills Bentonite) 100% chipped bentonite (⅜" and ¾" chips)

Conductor (tremie) pipe used for well filling and sealing shall be any of the following:

1. Metal pipe,
2. Rubber-covered hose reinforced with braided fiber or steel and rated for at least 300 psi, or
3. Thermoplastic pipe rated for at least 100 psi including:
    a. polyvinyl chloride (PVC),
    b. chlorinated polyvinyl chloride (CPVC),
    c. polyethylene (PE),
    d. polybutylene (PB), and
    e. acrylonitrile butadiene styrene (ABS)

Must I report the well filling and sealing to the DNR?

Yes. When groundwater contamination investigations are undertaken, it's important to know the location of active, unused and former wells. Further, this information is important documentation for property transfers. Well Filling and Sealing Reports (Form #3300-005) are available to licensed well drillers and pump installers from DNR central office. Well Filling and Sealing Reports must be used to report how the well was filled and sealed and document that the well no longer exists. The form must be completed, signed, and sent to DNR central office by the licensed person performing the well filling and sealing work. The second copy is the owner's copy.

What administrative rules cover well filling and sealing?

NR 812.26 governs proper abandonment of private water supply wells. The filling requirements are also printed on the back of the well abandonment form. NR141, Wis. Adm. Code, governs the proper abandonment of monitoring wells. NR 811.17, has rules for abandonment of community wells.

Where can I obtain additional information?

For further information on drinking water supplies and groundwater quality check the DNR website at dnr.wi.gov/org/water/dwg/index.htm.
Also check the UW Extension website at:
learningstore.uwex.edu/Drinking-Water-C120.aspx

This brochure was revised by the Wisconsin Department of Natural Resources with assistance from the Education Subcommittee of the Groundwater Coordinating Council.