

**APPENDIX A**

**WISCONSIN ADMINISTRATIVE CODE,  
WELLHEAD PROTECTION PLAN**

The Wisconsin Administrative Code, Chapter NR 811, Section 16(5) states:

5. Wellhead Protection Plan. A wellhead protection plan shall be provided for all new wells for municipal water systems. The plan shall be developed by the owner of the municipal water system or its agent. No new municipal well may be placed into service until the department has approved the wellhead protection plan. The plan shall include but is not limited to:
  - a. Identification of the recharge area for the proposed well.
  - b. Identification of the zone of influence for the proposed well.
  - c. Identification of the groundwater flow direction.
  - d. An inventory of existing potential contamination sources within a ½ mile radius of the proposed well and an assessment of existing potential contamination sources within the recharge area of the well.
  - e. Establishment of a wellhead protection area for the proposed well. The wellhead protection area shall encompass, at a minimum, that portion of the recharge area equivalent to a 5-year time of travel to the well. The wellhead protection area may be determined by a hydrogeologic investigation.
  - f. A public education program for wellhead protection.
  - g. A water conservation program.
  - h. A contingency plan for providing safe water and protecting the well from contamination based on the inventory and assessment of potential contamination sources.
  - i. A management plan, based upon an assessment of alternatives for addressing potential contamination sources, describing the local ordinances, zoning requirements, monitoring program, and other local initiatives proposed within the wellhead protection area established in subpar.(e). The management plan shall address maintaining the separation distances established by well siting in sub.(4)(d).

**APPENDIX B**

**SURVEY PLAT - UNIT WELL 30**

# PLAT OF SURVEY

BEING PART OF LOT 3 & 4 OF CERTIFIED SURVEY MAP NO. 1698,  
 LYING IN THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4  
 OF SECTION 36, TOWNSHIP 07 NORTH,  
 RANGE 9 EAST, CITY OF MADISON, DANE COUNTY, WISCONSIN.

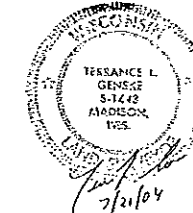
A PART OF LOTS 3 AND 4 OF CERTIFIED SURVEY MAP NO. 1698, RECORDED IN VOL. 7 OF CSM'S  
 P. 61 AND 62, ALSO BEING A PART OF THE SOUTHEAST 1/4 OF THE SOUTHEAST 1/4 OF SECTION 36, T7N, R9E, CITY OF  
 MADISON, DANE COUNTY, WISCONSIN, MORE FULLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SE CORNER OF SECTION 36, T7N, R9E, THENCE N00°53'52"E, 683.61  
 FEET ALONG THE EAST LINE OF THE SE 1/4 OF SAID SECTION 36 TO THE NW CORNER OF SECTION 31, T7N, R10E;  
 THENCE N83°30'05"W, 84.43 FEET TO THE NE CORNER OF LOT 4 OF SAID CERTIFIED SURVEY MAP NUMBER 1698;  
 THENCE S00°51'19"W, 95.65 FEET (RECORDED AS S00°53'52"W, 96.64 FEET ALONG THE EASTLINE OF SAID LOT 3 TO A FOUND IRON BAR;  
 THENCE S01°02'21"W, 68.98 FEET TO A FOUND IRON BAR;  
 THENCE N89°03'19"W, 199.72 FEET TO THE EAST LINE OF LOT 21 OF THE PLAT OF WAYLAND ACRES;  
 THENCE N00°46'01"E, 38.87 FEET (RECORDED AS N00°54'52"E, 62.00 FEET) ALONG THE EAST LINE OF LOT 22 OF SAID PLAT TO A 1" IRON PIPE FOUND;  
 THENCE N00°53'44"E, 62.06 FEET (RECORDED AS N00°54'52"E, 62.00 FEET) ALONG THE EAST LINE OF LOT 23 OF SAID PLAT TO A 1" IRON PIPE FOUND;  
 THENCE N00°58'30"E, 62.05 FEET (RECORDED AS N00°54'52"E, 62.00 FEET) ALONG THE EAST LINE OF LOT 24 OF SAID PLAT TO AN IRON BAR FOUND;  
 THENCE N00°48'58"E, 61.92 FEET (RECORDED AS N00°54'52"E, 62.00 FEET) ALONG THE EAST LINE OF LOT 25 OF SAID PLAT TO AN IRON BAR FOUND;  
 THENCE N00°53'44"E, 46.65 FEET (RECORDED AS N00°54'52"E, 46.65 FEET) ALONG THE EAST LINE OF LOT 25 OF SAID PLAT TO AN IRON BAR FOUND;  
 THENCE S60°51'29"E, 113.41 FEET (RECORDED AS S60°47'09"E, 113.59 FEET) ALONG THE SOUTHERLY EXISTING  
 RIGHT-OF-WAY LINE OF MOORLAND ROAD TO AN IRON BAR FOUND;  
 THENCE S60°45'11"E, 94.33 FEET (RECORDED AS S60°47'09"E, 94.32 FEET) ALONG SAID SOUTHERLY LINE TO AN IRON BAR FOUND  
 AT A POINT OF CURVE CONCAVE TO THE NORTH HAVING A RADIUS OF 393.00 FEET;  
 THENCE SOUTHEASTERLY, 19.06 FEET (RECORDED AS 19.03 FEET) ALONG THE ARC OF SAID CURVE WHOSE LONG  
 CHORD BEARS S62°10'55"E, 19.06 FEET (RECORDED AS S62°10'21"E, 19.03 FEET) TO AN IRON BAR FOUND  
 AND THE POINT OF BEGINNING.

SAID PARCEL CONTAINS 1.00 ACRES, MORE OR LESS.

SUBJECT TO ALL OTHER EASEMENTS AND RESTRICTIONS, RECORDED AND UNRECORDED,  
 I hereby certify that I have surveyed the above described property as shown  
 according to the official records and that this plat of survey is a correct  
 representation of said survey, to the best of my knowledge and belief.

Terrence L. Genske, RLS-1443 Dated 7/21/04  
 Agent for Strand Associates, Inc.



MADISON METRO-SEWERAGE DISTRICT  
 NINE SPRINGS

POINT NO.	COORDINATES	
	N	E
SE COR 36	10000.000	10000.000
NW COR 31	10683.53	10010.71
15	10528.48	9924.15
20	10758.31	9814.29

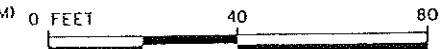
CURVE NO.	CHORD LENGTH	CHORD BEARING	RADIUS		ARC LENGTH	
			LENGTH	BEARING	LENGTH	BEARING
1-2	19.06' (19.03')	S62°10'55"E (S62°10'21"E)	393.00'	(393.00')	19.06'	(19.03')

Surveyed for: City of Madison Water Utility  
 523 E. Main Street  
 Madison, WI 53703

Surveyed by: Strand Associates, Inc.  
 910 W. Wingra Drive  
 Madison, WI 53715  
 (608)251-4843

PROJECT BENCHMARK IS LOCATED ON  
 THE TOP OF BRASS CAP  
 OF NW COR. SEC 31 T7N R10E  
 ELEV. 899.54 NGVD 29 PER  
 CITY OF MADISON INDEX SHEET 71031  
 (SUBTRACT 845.6 TO GET CITY DATUM)

ALL BEARINGS REFERENCED TO THE  
 LINE BETWEEN THE SE COR OF  
 SEC. 36, T7N, R9E AND THE NW COR  
 OF SEC. 31, T7N, R10E AS BEARING  
 N 00°53'52"E.



### LEGEND

- ☆ EVERGREEN TREE
- DECIDUOUS TREE
- EXISTING BUILDINGS
- POWER POLE
- ⬮ SOIL BORING
- ▲ 1" OUTSIDE DIAMETER IRON PIPE FOUND
- ▲ REBAR FOUND (SIZE)
- 3/4" X 18" REBAR SET
- UTILITY EASEMENT
- LOT LINE
- SEPTIC VENT
- WELL CITY OF MADISON WELL CASING
- ⊕ FIRE HYDRANT
- MAN HOLE
- UTILITY PEDESTAL
- UNDERGROUND ELECTRIC
- FIBER OPTIC CABLE
- BURIED TELEPHONE
- BURIED CABLE TV
- BURIED GAS MAIN
- STORM SEWER
- SANITARY SEWER
- WATERMAIN

WISCONSIN STATUTE  
 182.015 REQUIRES  
 A MINIMUM OF 3 WORK  
 DAYS NOTICE BEFORE  
 YOU EXCAVATE

WISCONSIN STATUTE  
 182.015 REQUIRES A  
 MINIMUM OF 3 WORK  
 DAYS NOTICE BEFORE  
 YOU EXCAVATE

CALL DIGGERS/HOTLINE  
 TO OBTAIN LOCATION  
 OF PARTICIPANTS BURIED  
 FACILITIES BEFORE YOU DIG

Note: The location of existing utilities, both underground and overhead are  
 approximate only and have not been independently verified by the owner  
 or its representatives. They were marked by representatives  
 of the utilities. There may be more underground utility installations  
 within the project area that are not shown.

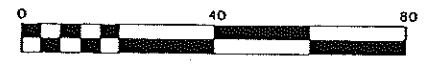
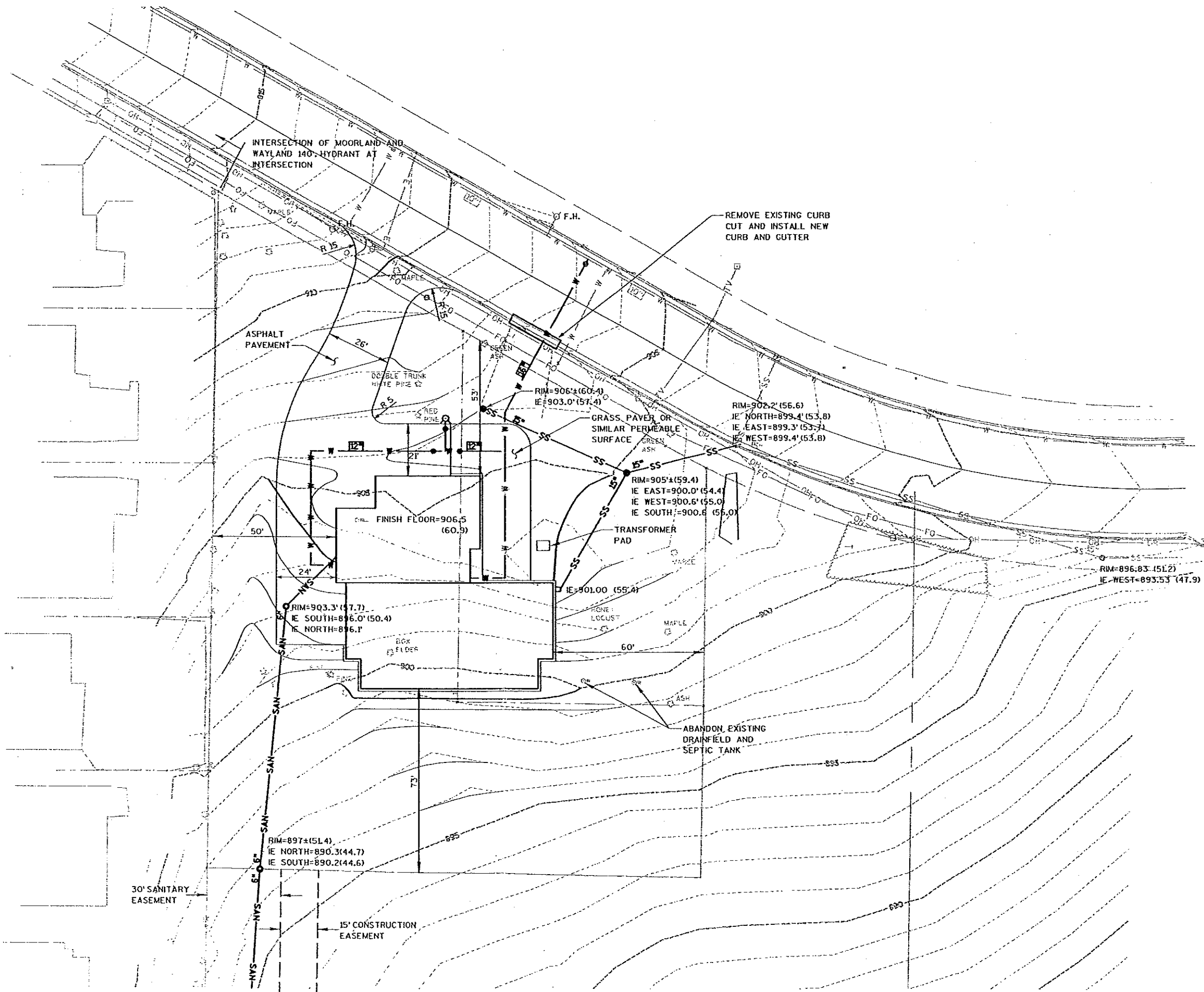
NO.	REVISION	BY	DATE	BY	DATE	CONTRACTOR	CONSTRUCTED	NOTE

DATE: 5/5/04  
 DES BY: TLG  
 DWN BY: TLG  
 PRINTED:

PLAT OF SURVEY  
 WELL NO. 30  
 MADISON, WISCONSIN



DRAWING NO.

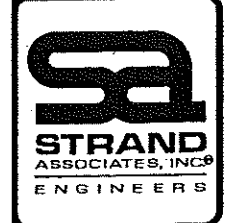


PROJECT BENCH MARK IS LOCATED ON THE TOP OF BRASS CAP OF NW CORNER, SEC 3177N, RIDE ELEV. 899.54 NGVD SHEET 710131 (SUBTRACT 845.6' TO CONVERT TO CITY DATUM)

NO.	REVISIONS	DATE

DATE: DES BY: CHK BY: RECORD DRAWING  
BY: DATE: CONTRACTOR:

**SITE PLAN AND GRADING**  
MADISON UNIT WELL NO. 30  
1113 MOORLAND ROAD  
MADISON WATER UTILITY  
MADISON, WISCONSIN



SHEET  
JOB NO.

**APPENDIX C**

**UNIT WELL 30 CONSTRUCTION REPORT AND FORMATION LOG**

**WISCONSIN UNIQUE WELL NUMBER**  
**Source: WELL CONSTRUCTION** **RG700**

State of WI-Private Water Systems-DG/2 Form 3300-77A  
 Department Of Natural Resources, Box 7921 (Rev 02/02)bw  
 Madison, WI 53707

Property Owner **MADISON, CITY OF** Telephone Number **608-266-4653**  
 Mailing Address **523 E MAIN ST**  
**MADISON** State **WI** Zip Code **53703**  
 County of Well Location **13 DANE** Co Well Permit No **W** Well Completion Date **March 1, 2003**

**1. Well Location** Depth **800** FT  
 T=Town C=City V=Village C of **MADISON** Fire#  
 Street Address or Road Name and Number **1133 MOORLAND RD**  
 Subdivision Name Lot# Block #

Well Constructor **MUNICIPAL WELL & PUMP/MIDWEST** License # **13** Facility ID (Public) **113022470**  
 Address **1212 STOREBECK DR** Public Well Plan Approval# **20020320**  
 City **WAUPUN** State **WI** Zip Code **53963** Date Of Approval **06/04/2002**  
 Hicap Permanent Well # **4333** Common Well # **30** Specific Capacity **11.5** gpm/ft

Gov't Lot or **SE 1/4 of SE 1/4 of Section 36 T 7 N;R 9 E**  
 Latitude Deg. **43** Min. **1.9647**  
 Longitude Deg. **89** Min. **21.9267**

**3. Well Serves** # of homes and or **CITY**  
**M** (eg: barn, restaurant, church, school, industry, etc.) High Capacity: Well? **Y** Property? **Y**  
 M=Munic O=OTM N=NonCom P=Private Z=Other X=NonPot A=Anode L=Loop H=Drillhole

**2. Well Type** **2** (See item 12 below) Lat/Long Method  
 1=New 2=Replacement 3=Reconstruction  
 of previous unique well # **BF505** constructed in **1926**  
 Reason for replaced or reconstructed Well?  
**CODE REQUIREMENTS**  
**1** 1=Drilled 2=Driven Point 3=Jetted 4=Other

**4. Is the well located upslope or sideslope and not downslope from any contamination sources, including those on neighboring properties?** **Y**  
 Well located in floodplain? **N**  
 Distance in feet from well to nearest: (including proposed)

1. Landfill	9. Downspout/ Yard Hydrant	17. Wastewater Sump
2. Building Overhang	10. Privy	18. Paved Animal Barn Pen
3. 1=Septic 2= Holding Tank	11. Foundation Drain to Clearwater	19. Animal Yard or Shelter
4. Sewage Absorption Unit	12. Foundation Drain to Sewer	20. Silo
5. Nonconforming Pit	13. Building Drain 1=Cast Iron or Plastic 2=Other	21. Barn Gutter
6. Buried Home Heating Oil Tank	14. Building Sewer 1=Gravity 2=Pressure 1=Cast Iron or Plastic 2=Other	22. Manure Pipe 1=Gravity 2=Pressure 1=Cast iron or Plastic 2=Other
7. Buried Petroleum Tank	15. Collector Sewer: ___ units ___ in. diam.	23. Other manure Storage
8. 1=Shoreline 2= Swimming Pool	16. Clearwater Sump	24. Ditch
		25. Other NR 812 Waste Source

**5. Well Hole Dimensions and Construction Method**

From (ft)	To (ft)	Construction Method
42.0	surface	40
35.0	40	312
29.0	312	458
24.0	458	800

Lower Open Bedrock

Upper Enlarged Drillhole

-- 1. Rotary - Mud Circulation -----  
 -- 2. Rotary - Air -----  
 -- 3. Rotary - Air and Foam -----  
 -- 4. Drill-Through Casing Hammer  
 X -- 5. Reverse Rotary  
 -- 6. Cable-tool Bit n. dia -----  
 -- 7. Temp. Outer Casing in. dia. \_\_\_ depth ft. Removed?  
 Other

**8. Geology**

Geology Codes	Type, Caving/Noncaving, Color, Hardness, etc	From (ft.)	To (ft.)
__C_	BRN/YELLOW CLAY	0	8
T_YM	BRN SILT W/SAND & GRAVEL	8	23
__N_	SANDSTONE	23	40
I_HN	SANDSTONE WHT SHALE	40	45
__LH	YELLOW L S W/RED SHALE	45	65
__N_	SANDSTONE WHT/YELLOW	65	275
__NH	SANDSTONE W/SHALE	275	300
I_N_	SANDSTONE WHT	300	798
__Q_	RED/BLK GRANITE	798	800

**6. Casing Liner Screen**

Dia. (in.)	Material, Weight, Specification	From (ft.)	To (ft.)
36.0	.500 WALL STEEL CSING ASTMA53 PLAIN END BEV 189.5#/FT	surface	40
30.0	.500 WALL STEEL CASING ASTMA53B 157.53#/FT	2	312

Manufacturer & Method of Assembly

Dia. (in.) Screen type, material & slot size From To

**9. Static Water Level**  
**101.5** feet **B** ground surface  
 A=Above B=Below

**11. Well Is:** 24 in. A Grade  
 A=Above B=Below

Developed? **Y**  
 Disinfected? **Y**  
 Capped? **Y**

**10. Pump Test**  
 Pumping level **292.0** ft. below surface  
 Pumping at **2200.0** GP M **24.0** Hrs

**7. Grout or Other Sealing Material**

Method	From (ft.)	To (ft.)	# Sacks Cement
PRESSURE TREMIE			
Kind of Sealing Material			
NEAT CEMENT	surface	312.0	10 S

**12. Did you notify the owner of the need to permanently abandon and fill all unused wells on this property?** **Y**  
 If no, explain

**13. Initials of Well Constructor or Supervisory Driller** **TG** Date Signed **12/1/03**  
**Initials of Drill Rig Operator (Mandatory unless same as above)** **HA** Date Signed **12/1/03**

**Well Construction Report**  
**WISCONSIN UNIQUE WELL NUMBER** **RG 700**

Property Owner: **Madison, City of** Telephone Number: **608, 266-4653**

Mailing Address: **523 E. Main St.**  
 City: **Madison** State: **WI** Zip Code: **53703**

County of Well Location: **Dane** Co. Well permit No.: **W 03 - 01 - 2003** Well Completion Date (mm-dd-yyyy): **03 - 01 - 2003**

State of WI - Private Water Systems-DG/2 Form 3300-77A  
 Department of Natural Resources, Box 7921 (R 12/00)  
 Madison, WI 53707

Well Constructor (Business Name): **Municipal Well & Pump** License #: **WD013** Facility ID Number (Public Wells): **113022470**

Address: **1212 Starbeck Dr.** Public Well Plan Approval #: **W- 2002 0320**

City: **Waupun** State: **WI** Zip Code: **53963** Date of Approval (mm/dd/yyyy): **06 / 04 / 2002**

Hicap Permanent Well #: \_\_\_\_\_ Common Well #: **030** Specific Capacity: **11.5** gpm/ft

3. Well serves \_\_\_\_\_ # of homes and/or **City** High Capacity: \_\_\_\_\_  
 (Eg: barn, restaurant, church, school, industry, etc.) Well?  Yes  No  
 Property?  Yes  No

1. Well Location  
 Town  City  Village Fire # (If avail.) \_\_\_\_\_  
 of: **Madison**

Street Address or Road Name and Number: **1133 Moorland Rd.**

Subdivision Name \_\_\_\_\_ Lot # \_\_\_\_\_ Block # \_\_\_\_\_

Gov't Lot # \_\_\_\_\_ or **SE** 1/4 of **SE** 1/4 of \_\_\_\_\_  
 Section **36** T **7** N; R **9**  E  W

Latitude Deg. \_\_\_\_\_ Min. \_\_\_\_\_ Sec. \_\_\_\_\_  
 Longitude Deg. \_\_\_\_\_ Min. \_\_\_\_\_ Sec. \_\_\_\_\_

2. Well Type  New  Replacement  Reconstruction  
 (see item 12 below) Lat/Long Method \_\_\_\_\_

of previous unique well # **BF505** constructed in **1926**  
 Reason for replaced or reconstructed well?  
**Code Requirements**

Drilled  Driven Point  Jetted  Other \_\_\_\_\_

4. Is the well located upslope or sideslope and not downslope from any contamination sources, including those on neighboring properties?  Yes  No  
 Well located in floodplain?  Yes  No If no, explain on back side.

Distance in feet from well to nearest: (include proposed)

1. Landfill	9. Downspout/Yard Hydrant	17. Wastewater Sump
2. Building Overhang	10. Privy	18. Paved Animal Barn Pen
3. Septic <input type="checkbox"/> Holding Tank <input type="checkbox"/>	11. Foundation Drain to Clearwater	19. Animal Yard or Shelter
4. Sewage Absorption Unit	12. Foundation Drain to Sewer	20. Silo
5. Nonconforming Pit	13. Building Drain	21. Barn Gutter
6. Buried Home Heating Oil Tank	<input type="checkbox"/> Cast Iron or Plastic <input type="checkbox"/> Other	22. Manure Pipe <input type="checkbox"/> Gravity <input type="checkbox"/> Pressure
7. Buried Petroleum Tank	14. Building Sewer <input type="checkbox"/> Gravity <input type="checkbox"/> Pressure	<input type="checkbox"/> Cast Iron or Plastic <input type="checkbox"/> Other
8. Shoreline <input type="checkbox"/> Swimming Pool <input type="checkbox"/>	<input type="checkbox"/> Cast Iron or Plastic <input type="checkbox"/> Other	23. Other Manure Storage _____
	15. Collector Sewer: _____ units _____ in. diam.	24. Ditch
	16. Clearwater Sump	25. Other NR 812 Waste Source

5. Drillhole Dimensions and Construction Method

From Dia. (in.)	To Dia. (in.)	Upper Enlarged Drillhole	Lower Open Bedrock
42	surface	40	
35	40	312	
29	312	458	X
24	458	800	

Enlarged Drillhole:  
 1. Rotary - Mud Circulation  
 2. Rotary - Air  
 3. Rotary - Air and Foam  
 4. Drill-Through Casing Hammer  
 5. Reverse Rotary  
 6. Cable-tool Bit \_\_\_\_\_ in. dia.  
 7. Temp. Outer Casing \_\_\_\_\_ in. dia.  
 Removed? \_\_\_\_\_ depth ft.  
 Yes  No - If no, explain on back side.

8. Geology

Geology Codes	Type, Caving/Noncaving, Color, Hardness	From (ft.)	To (ft.)
	Brn/yellow clay	surface	8
	Brn silt w/sand & gravel	8	23
	Sandstone	23	40
	Sandstone, wht shale	40	45
	Yellow L.S. w/red shale	45	65
	Sandstone wht./yellow	65	275
	Sandstone w/shale	275	300
	Sandstone wht.	300	798
	Red/blk granite	798	800

6. Casing, Liner, Screen

Dia. (in.)	Material, Weight, Specification	From (ft.)	To (ft.)
36	0.500" wall steel casing ASTM A53-B P.E. Bev. 189.5#/ft.	surface	40
30	0.500" wall steel casing ASTM A-338 P.E. Bev., 157.5#/ft.	40	312
	Screen type, material & slot size	From	To

9. Static Water Level  
 \_\_\_\_\_ ft. above ground surface  
**101.5** ft. below ground surface

11. Well Is:  
 Above Grade  
 Below Grade  
 24 in.

10. Pump Test  
 Pumping level **292** ft. below surface  
 Pumping at **2200** GPM/GPH for **24** Hrs.

Developed?  Yes  No  
 Disinfected?  Yes  No  
 Capped?  Yes  No

7. Grout or Other Sealing Material

Method	From (ft.)	To (ft.)	# Sacks Cement
<u>Pressure Tremie</u>			
Kind of Sealing Material	(ft.)	(ft.)	Cement
Neat Cement	surface	312	1040
(Gravel pack if applicable)			

12. Did you notify the owner of the need to permanently abandon and fill all unused wells on this property?  
 Yes  No If no, explain \_\_\_\_\_

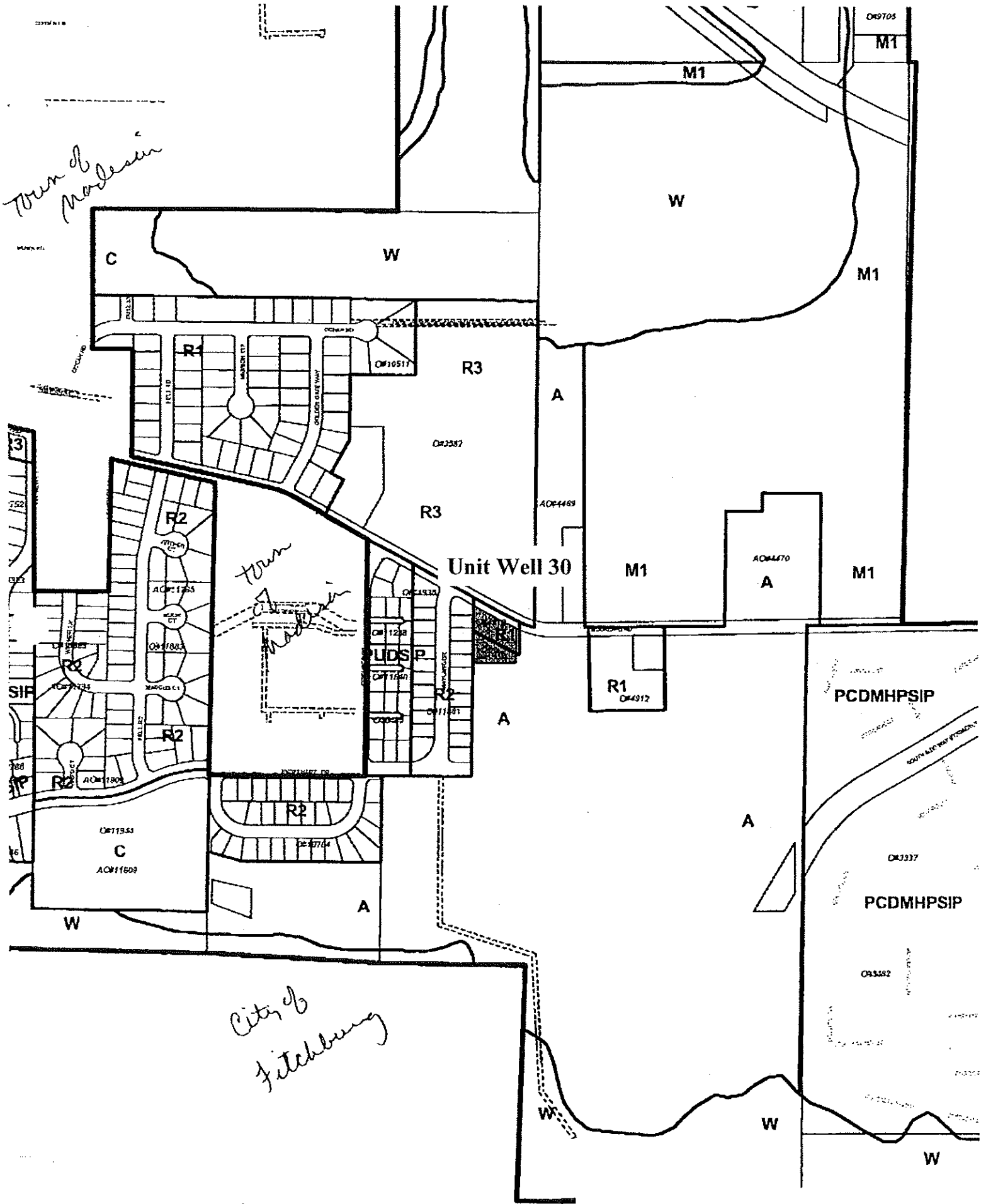
13. Signature of Well Constructor or Supervisory Worker: *Harold Albrecht* Date Signed: **12/1/03**  
 Signature of Drill Rig Operator (Mandatory unless same as above): **Harold Albrecht** Date Signed: **12/1/03**

Make additional comments on reverse side about geology, additional screens, water quality, etc.  
 Comments on reverse side (CHECK ✓, IF YES) Variance Issued  Yes  No



**APPENDIX D**

**CITY OF MADISON ZONING MAP**

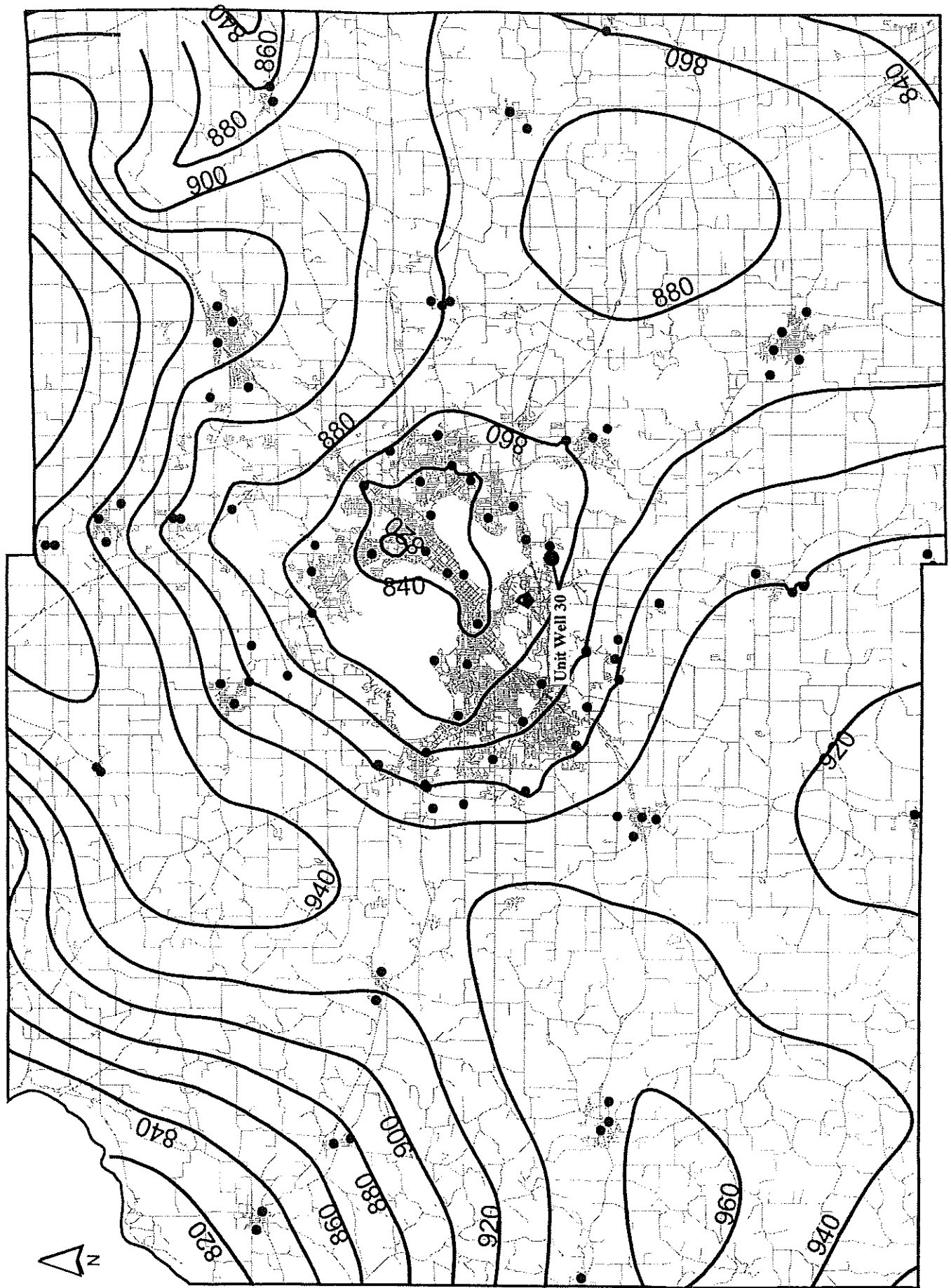


City of Madison Zoning Map (2005)

**APPENDIX E**

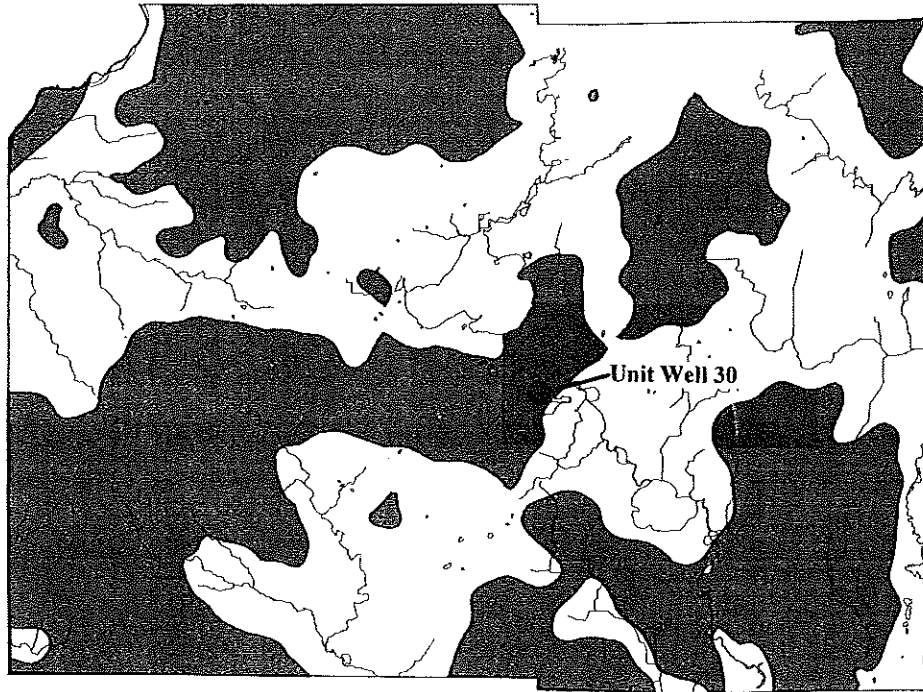
**POTENTIOMETRIC SURFACE - LOWER BEDROCK (MOUNT SIMON)  
AQUIFER AND AREAS OF RECHARGE AND DISCHARGE**

Figur. Simulated 2000 heads in Mt. Simon aquifer. Contours in feet above mean sea level (msl).

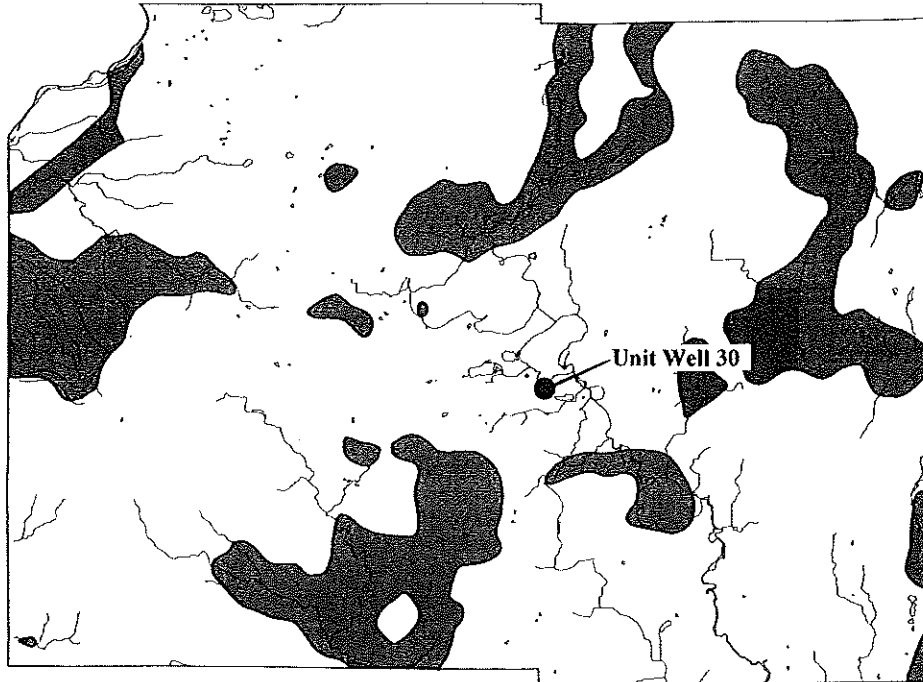


MAP 7

A



B



**Areas of Recharge to and Discharge  
from the Mt. Simon Aquifer\*  
Dane County, Wisconsin**

A: areas of recharge  
B: areas of discharge

0 miles 9



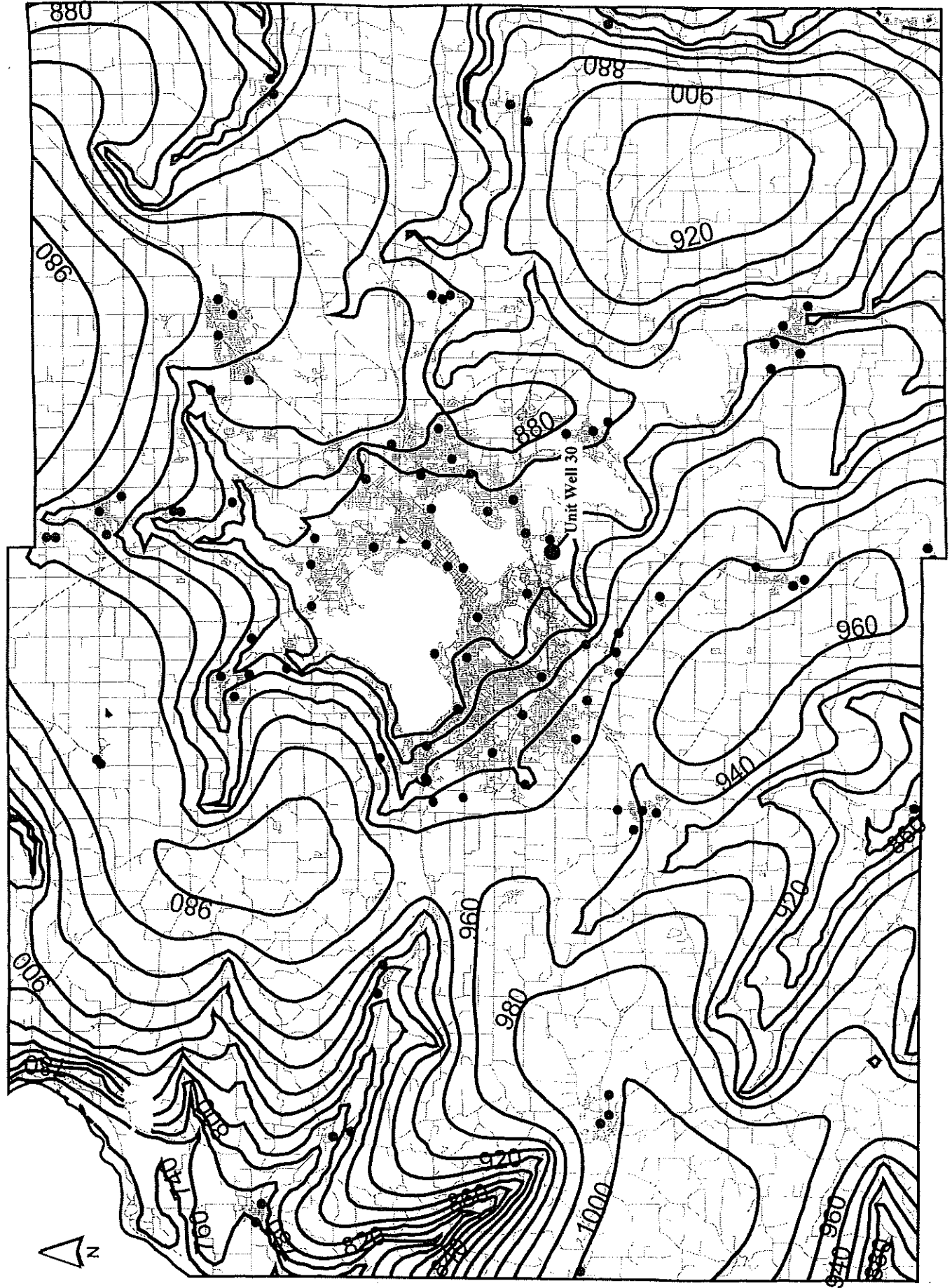
\*Based on measured water levels

Source: *Hydrogeology of Dane County*, Bradbury, et. al., 1999.

**APPENDIX F**

**POTENTIOMETRIC SURFACE - WATER TABLE ELEVATION**

Figure 1. Simulated 2000 water table. Contours in feet above mean sea level (msl).



**APPENDIX G**

**DISTANCE-DRAWDOWN CALCULATION  
(ZONE OF INFLUENCE)**



Distance-Drawdown Calculations  
Using Theis Equation  
With Adjustment For Aquifer Dewatering (Water Table Condition)

Assumptions: **Well 30** **Madison**

Hydraulic Conductivity [K]	74.80	GPD/ft^2
Aquifer Thickness [B]	498	ft.
Storativity [S]	0.00030	
Pumping Rate [Q]	2200.00	gpm
Pumping Duration [TM]	30.000	Days

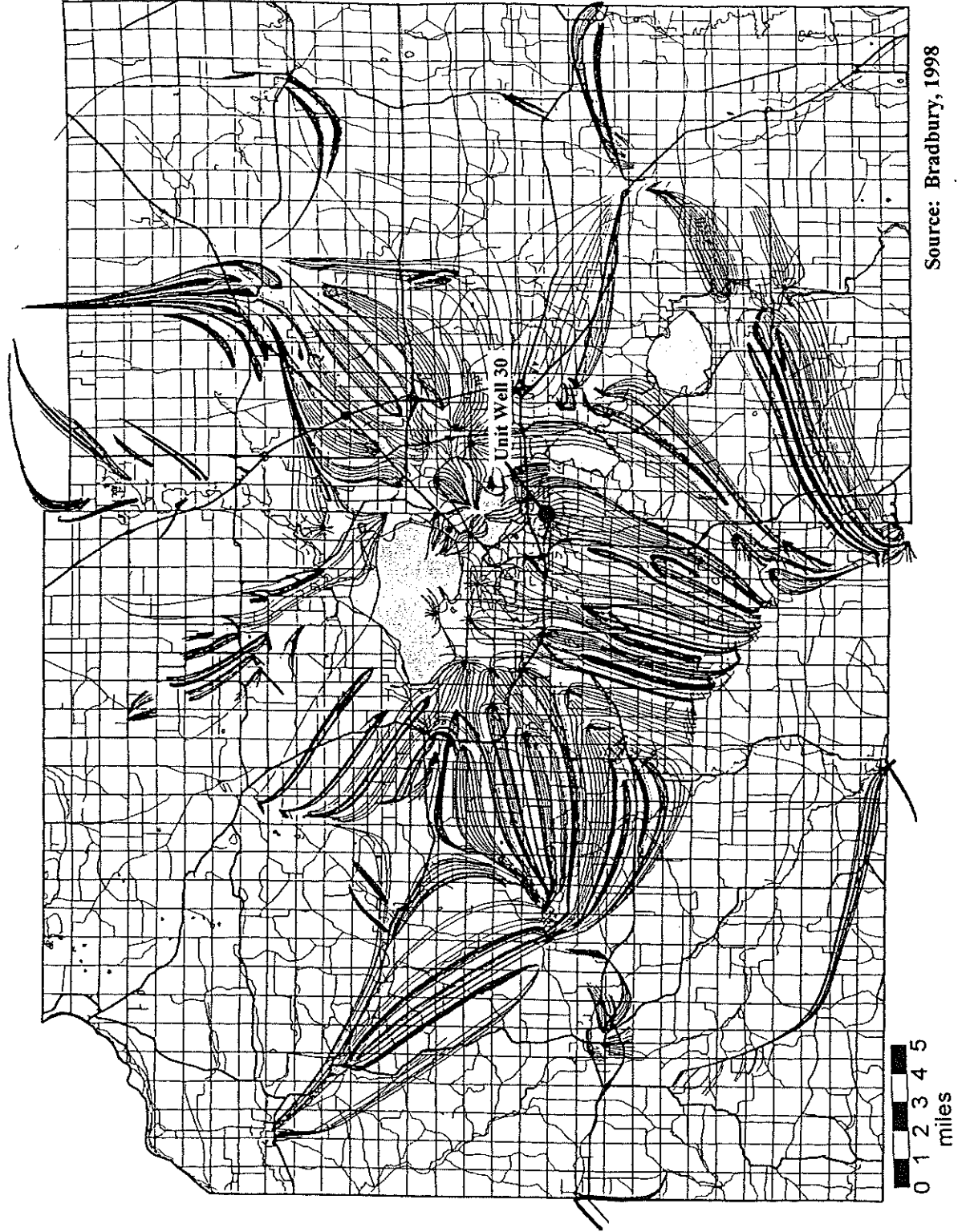
Results:

Radius From Well r (ft.)	Well Function W(u)	Apparent Drawdown s (ft.)	Drawdown Adjusted For Dewatering s' (ft.)
1.50	20.024259	135.52	161.81
5	17.616314	119.22	138.48
10	16.230019	109.84	125.71
20	14.843725	100.46	113.36
30	14.032795	94.97	106.32
40	13.457431	91.08	101.40
50	13.011145	88.06	97.63
75	12.200216	82.57	90.86
100	11.624854	78.67	86.12
200	10.238575	69.29	74.93
300	9.427670	63.80	68.52
400	8.852341	59.91	64.03
500	8.406099	56.89	60.57
750	7.595325	51.40	54.37
1000	7.020181	47.51	50.02
2000	5.635392	38.14	39.72
3000	4.826972	32.67	33.82
5000	3.813314	25.81	26.51
7500	3.017912	20.42	20.86
10000	2.464086	16.68	16.97
15000	1.713419	11.60	11.73
20000	1.219370	8.25	8.32
30450	0.603954	4.09	4.10
40000	0.308799	2.09	2.09
<b>49800</b>	<b>0.147565</b>	<b>1.00</b>	<b>1.00</b>
103499	0.000739	0.01	0.01
<b>103500</b>	<b>0.000739</b>	<b>0.00</b>	<b>0.00</b>

**APPENDIX H**

**ULTIMATE ZOCS FOR MUNICIPAL WELLS IN DANE COUNTY**

**Fig. 2**  
**Ultimate Zones of Contribution for**  
**Municipalities in Dane County, WI.**



Source: Bradbury, 1998

**APPENDIX I**

**PROHIBITED LAND USES IN WHPAs,  
POTENTIAL SOURCES OF GROUNDWATER CONTAMINATION AND LAND USES,  
AND THEIR RELATIVE RISK TO GROUNDWATER**

**TABLE I-1  
RECOMMENDED PROHIBITED LAND USES  
UNIT WELL 30 WELLHEAD PROTECTION ZONES  
MADISON, WISCONSIN**

**ZONE A - PROHIBITED USES**

Commercial animal confinement facilities  
Animal waste facilities  
Asphalt products manufacturing  
Auto body repair businesses  
Auto sales & service  
Auto salvage yards (junk yards)  
Bus or truck terminals  
Commercial bulk fertilizer and/or pesticide facilities (storage, mixing and/or loading)  
Cemeteries  
Dry cleaning businesses/facilities  
Electroplating businesses/facilities  
Exterminating businesses/facilities  
Fuel storage tanks (heating oil)  
Furniture manufacturing and refinishing  
Garage and vehicular towing  
Hazardous and/or toxic materials storage  
Hazardous and/or toxic waste facilities  
Industrial businesses that use hazardous chemicals as defined by the EPA  
Industrial pipelines  
Landfills or waste disposal facilities  
Machine shops  
Paint and coating manufacturing  
Photo processing  
Plastics manufacturing  
Printing and duplicating businesses that use hazardous chemicals as defined by the EPA  
Public and municipal maintenance garages  
Radioactive waste facilities  
Recycling facilities  
Research laboratories  
Retail liquid motor fuel dispensing facilities  
Salt storage  
Septage and/or sewage sludge spreading  
Spray wastewater facilities  
Stormwater impoundments/retention areas  
Underground and aboveground petroleum and chemical product storage tanks  
Unsewered residential, commercial, or industrial development  
Vehicle Repair shops  
Wastewater treatment or disposal facilities

**ZONE B - PROHIBITED USES**

Commercial animal confinement facilities  
Animal waste facilities  
Asphalt products manufacturing  
Auto body repair businesses  
Auto salvage yards (junk yards)  
Bus or truck terminals  
Commercial bulk fertilizer and/or pesticide facilities (storage, mixing and/or loading)  
Dry cleaning businesses/facilities  
Electroplating businesses/facilities  
Exterminating businesses/facilities

**TABLE I-1 (cont.)**

**ZONE B - PROHIBITED USES (cont.)**

Garage and vehicular towing  
Hazardous and/or toxic materials storage  
Hazardous and/or toxic waste facilities  
Industrial businesses that use hazardous chemicals as defined by the EPA  
Landfills or waste disposal facilities  
Manufacturing businesses that use hazardous chemicals as defined by the EPA  
Paint and coating manufacturing  
Printing and duplicating businesses that use hazardous chemicals as defined by the EPA  
Public and municipal maintenance garages  
Radioactive waste facilities  
Recycling facilities  
Retail liquid motor fuel dispensing facilities  
Salt storage  
Septage and/or sewage sludge spreading  
Spray wastewater facilities  
Underground and aboveground petroleum and chemical product storage tanks (less than 600 feet from well)  
Unsewered residential, commercial, or industrial development (if sewage system receives 8,000 gallons per day or more)  
Vehicle Repair shops  
Wastewater treatment or disposal facilities

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**Table 4-4. Potential Sources of Ground Water Contamination**

Source	Health, Environmental, or Aesthetic Contaminant <sup>1,2,3</sup>
<b>NATURALLY OCCURRING SOURCES</b>	
Rocks and soils	<i>Aesthetic Contaminants:</i> Iron and iron bacteria; manganese; calcium and magnesium (hardness) <i>Health and Environmental Contaminants:</i> Arsenic; asbestos; metals; chlorides; fluorides; sulfates; sulfate-reducing bacteria and other microorganisms
Contaminated water	Excessive sodium; bacteria; viruses; low pH (acid) water
Decaying organic matter	Bacteria
Geological radioactive gas	Radionuclides (radon, etc.)
Natural hydrogeological events and formations	Salt-water/brackish water intrusion (or intrusion of other poor quality water); contamination by a variety of substances through sink-hole infiltration in limestone terrains
<b>AGRICULTURAL SOURCES</b>	
Animal feedlots and burial areas	Livestock sewage wastes; nitrates; phosphates; chloride; chemical sprays and dips for controlling insect, bacterial, viral, and fungal pests on livestock; coliform <sup>4</sup> and noncoliform bacteria; viruses
Manure spreading areas and storage pits	Livestock sewage wastes; nitrates
Livestock waste disposal areas	Livestock sewage wastes; nitrates
Crop areas and irrigation sites	Pesticides; <sup>5</sup> fertilizers; <sup>6</sup> gasoline and motor oils from chemical applicators
Chemical storage areas and containers	Pesticide <sup>5</sup> and fertilizer <sup>6</sup> residues
Farm machinery areas	Automotive wastes; <sup>7</sup> welding wastes
Agricultural drainage wells and canals	Pesticides; <sup>5</sup> fertilizers; <sup>6</sup> bacteria; salt water (in areas where the fresh-saltwater interface lies at shallow depths and where the water table is lowered by channelization, pumping, or other causes)
<b>RESIDENTIAL SOURCES</b>	
Common household maintenance and hobbies	<i>Common Household Products:</i> <sup>8</sup> Household cleaners; oven cleaners; drain cleaners; toilet cleaners; disinfectants; metal polishes; jewelry cleaners; shoe polishes; synthetic detergents; bleach; laundry soil and stain removers; spot removers and dry cleaning fluid; solvents; lye or caustic soda; household pesticides; <sup>9</sup> photochemicals; printing ink; other common products <i>Wall and Furniture Treatments:</i> Paints; varnishes; stains; dyes; wood preservatives (creosote); paint and lacquer thinners; paint and varnish removers and deglossers; paint brush cleaners; floor and furniture strippers <i>Mechanical Repair and Other Maintenance Products:</i> Automotive wastes; <sup>7</sup> waste oils; diesel fuel; kerosene; #2 heating oil; grease; degreasers for driveways and garages; metal degreasers; asphalt and roofing tar; tar removers; lubricants; rustproofers; car wash detergents; car waxes and polishes; rock salt; refrigerants
Lawns and gardens	Fertilizers; <sup>5</sup> herbicides and other pesticides used for lawn and garden maintenance <sup>10</sup>
Swimming pools	Swimming pool maintenance chemicals <sup>11</sup>
Septic systems, cesspools, and sewer lines	Septage; coliform and noncoliform bacteria; <sup>4</sup> viruses; nitrates; heavy metals; synthetic detergents; cooking and motor oils; bleach; pesticides; <sup>9,10</sup> paints; paint thinner; photographic chemicals; swimming pool chemicals; <sup>11</sup> septic tank/cesspool cleaner chemicals; <sup>12</sup> elevated levels of chloride, sulfate, calcium, magnesium, potassium, and phosphate
Underground storage tanks	Home heating oil
Apartments and condominiums	Swimming pool maintenance chemicals; <sup>11</sup> pesticides for lawn and garden maintenance and cockroach, termite, ant, rodent, and other pest control; <sup>9,10</sup> wastes from onsite sewage treatment plants; household hazardous wastes <sup>8</sup>

**Table 4-4. Potential Sources of Ground Water Contamination (continued)**

Source	Health, Environmental, or Aesthetic Contaminant <sup>1,2,3</sup>
<b>MUNICIPAL SOURCES</b>	
Schools and government offices and grounds	Solvents; pesticides; <sup>9,10</sup> acids; alkalis; waste oils; machinery/vehicle servicing wastes; gasoline and heating oil from storage tanks; general building wastes <sup>13</sup>
Park lands	Fertilizers; <sup>6</sup> herbicides; <sup>10</sup> insecticides <sup>9</sup>
Public and residential areas infested with mosquitoes, gypsy moths, ticks, ants, or other pests	Pesticides <sup>6,9</sup>
Highways, road maintenance depots, and deicing operations	Herbicides in highway rights-of-way; <sup>5,10</sup> road salt (sodium and calcium chloride); road salt anticaking additives (ferric ferrocyanide, sodium ferrocyanide); road salt anticorrosives (phosphate and chromate); automotive wastes <sup>7</sup>
Municipal sewage treatment plants and sewer lines	Municipal wastewater; sludge; <sup>14</sup> treatment chemicals <sup>15</sup>
Storage, treatment, and disposal ponds, lagoons, and other surface impoundments	Sewage wastewater; nitrates; other liquid wastes; microbiological contaminants
Land areas applied with wastewater or wastewater byproducts	Organic matter; nitrate; inorganic salts; heavy metals; coliform and noncoliform bacteria; <sup>4</sup> viruses; nitrates; sludge; <sup>14</sup> nonhazardous wastes <sup>16</sup>
Storm water drains and basins	Urban runoff; gasoline; oil; other petroleum products; road salt; microbiological contaminants
Combined sewer overflows (municipal sewers and storm water drains)	Municipal wastewater; sludge; <sup>14</sup> treatment chemicals; <sup>15</sup> urban runoff; gasoline; oil; other petroleum products; road salt; microbial contaminants
Recycling/reduction facilities	Residential and commercial solid waste residues
Municipal waste landfills	Leachate; organic and inorganic chemical contaminants; wastes from households <sup>8</sup> and businesses; <sup>13</sup> nitrates; oils; metals
Open dumping and burning sites, closed dumps	Organic and inorganic chemicals; metals; oils; wastes from households <sup>8</sup> and businesses <sup>13</sup>
Municipal incinerators	Heavy metals; hydrocarbons; formaldehyde; methane; ethane; ethylene; acetylene; sulfur and nitrogen compounds
Water supply wells, monitoring wells, older wells, domestic and livestock wells, unsealed and abandoned wells, and test hole wells	Surface runoff; effluents from barnyards, feedlots, septic tanks, or cesspools; gasoline; used motor oil; road salt
Sumps and dry wells	Storm water runoff; spilled liquids; used oil; antifreeze; gasoline; other petroleum products; road salt; pesticides; <sup>5</sup> and a wide variety of other substances
Drainage wells	Pesticides; <sup>9,10</sup> bacteria
Well pumping that causes inter-aquifer leakage, induced filtration, landward migration of sea water in coastal areas; etc.	Saltwater; excessively mineralized water
Artificial ground water recharge	Storm water runoff; excess irrigation water; stream flow; cooling water; treated sewage effluent; other substances that may contain contaminants, such as nitrates, metals, detergents, synthetic organic compounds, bacteria, and viruses
<b>COMMERCIAL SOURCES</b>	
Airports, abandoned airfields	Jet fuels; deicers; diesel fuel; chlorinated solvents; automotive wastes; <sup>7</sup> heating oil; building wastes <sup>13</sup>
Auto repair shops	Waste oils; solvents; acids; paints; automotive wastes; <sup>7</sup> miscellaneous cutting oils
Barber and beauty shops	Perm solutions; dyes; miscellaneous chemicals contained in hair rinses
Boat yards and marinas	Diesel fuels; oil; septage from boat waste disposal areas; wood preservative and treatment chemicals; paints; waxes; varnishes; automotive wastes <sup>7</sup>



**Table 4-4. Potential Sources of Ground Water Contamination (continued)**

Source	Health, Environmental, or Aesthetic Contaminant <sup>1,2,3</sup>
Bowling alleys	Epoxy; urethane-based floor finish
Car dealerships (especially those with service departments)	Automotive wastes; <sup>7</sup> waste oils; solvents; miscellaneous wastes
Car washes	Soaps; detergents; waxes; miscellaneous chemicals
Camp grounds	Septage; gasoline; diesel fuel from boats; pesticides for controlling mosquitoes, ants, ticks, gypsy moths, and other pests; <sup>5,9</sup> household hazardous wastes from recreational vehicles (RVs) <sup>8</sup>
Carpet stores	Glues and other adhesives; fuel from storage tanks if forklifts are used
Cemeteries	Leachate; lawn and garden maintenance chemicals <sup>10</sup>
Construction trade areas and materials (plumbing, heating and air conditioning, painting, paper hanging, decorating, drywall and plastering, acoustical insulation, carpentry, flooring, roofing and sheet metal, wrecking and demolition, etc.)	Solvents; asbestos; paints; glues and other adhesives; waste insulation; lacquers; tars; sealants; epoxy waste; miscellaneous chemical wastes
Country clubs	Fertilizers; <sup>6</sup> herbicides; <sup>5,10</sup> pesticides for controlling mosquitoes, ticks, ants, gypsy moths, and other pests; <sup>9</sup> swimming pool chemicals; <sup>11</sup> automotive wastes
Dry cleaners	Solvents (perchloroethylene, petroleum solvents, Freon); spotting chemicals (trichloroethane, methylchloroform, ammonia, peroxides, hydrochloric acid, rust removers, amyl acetate)
Funeral services and crematories	Formaldehyde; wetting agents; fumigants; solvents
Furniture repair and finishing shops	Paints; solvents; degreasing and solvent recovery sludges
Gasoline services stations	Oils; solvents; miscellaneous wastes
Golf courses	Fertilizers; <sup>6</sup> herbicides; <sup>5,10</sup> pesticides for controlling mosquitoes, ticks, ants, gypsy moths, and other pests <sup>9</sup>
Hardware/lumber/parts stores	Hazardous chemical products in inventories; heating oil and fork lift fuel from storage tanks; wood-staining and treating products such as creosote
Heating oil companies, underground storage tanks	Heating oil; wastes from truck maintenance areas <sup>7</sup>
Horticultural practices, garden nurseries, florists	Herbicides, insecticides, fungicides, and other pesticides <sup>10</sup>
Jewelry/metal plating shops	Sodium and hydrogen cyanide; metallic salts; hydrochloric acid; sulfuric acid; chromic acid
Laundromats	Detergents; bleaches; fabric dyes
Medical institutions	X-ray developers and fixers; <sup>17</sup> infectious wastes; radiological wastes; biological wastes; disinfectants; asbestos; beryllium; dental acids; miscellaneous chemicals
Office buildings and office complexes	Building wastes; <sup>13</sup> lawn and garden maintenance chemicals; <sup>10</sup> gasoline; motor oil
Paint stores	Paints; paint thinners; lacquers; varnishes; other wood treatments
Pharmacies	Spilled and returned products
Photography shops, photo processing laboratories	Biosludges; silver sludges; cyanides; miscellaneous sludges
Print shops	Solvents; inks; dyes; oils; photographic chemicals
Railroad tracks and yards	Diesel fuel; herbicides for rights-of-way; creosote for preserving wood ties
Research laboratories	X-ray developers and fixers; <sup>17</sup> infectious wastes; radiological wastes; biological wastes; disinfectants; asbestos; beryllium; solvents; infectious materials; drugs; disinfectants (quaternary ammonia, hexachlorophene, peroxides, chlornexade, bleach); miscellaneous chemicals

**Table 4-4. Potential Sources of Ground Water Contamination (continued)**

Source	Health, Environmental, or Aesthetic Contaminant <sup>1,2,3</sup>
<b>COMMERCIAL SOURCES (continued)</b>	
Scrap and junk yards	Any wastes from businesses <sup>13</sup> and households; <sup>8</sup> oils
Sports and hobby shops	Gunpowder and ammunition; rocket engine fuel; model airplane glue
Above-ground and underground storage tanks	Heating oil; diesel fuel; gasoline; other petroleum products; other commercially used chemicals
Transportation services for passenger transit (local and interurban)	Waste oil; solvents; gasoline and diesel fuel from vehicles and storage tanks; fuel oil; other automotive wastes <sup>7</sup>
Veterinary services	Solvents; infectious materials; vaccines; drugs; disinfectants (quaternary ammonia, hexachlorophene, peroxides, chlornexade, bleach); x-ray developers and fixers <sup>17</sup>
<b>INDUSTRIAL SOURCES</b>	
Material stockpiles (coal, metallic ores, phosphates, gypsum)	Acid drainage; other hazardous and nonhazardous wastes <sup>16</sup>
Waste tailing ponds (commonly for the disposal of mining wastes)	Acids; metals; dissolved solids; radioactive ores; other hazardous and nonhazardous wastes <sup>15</sup>
Transport and transfer stations (trucking terminals and rail yards)	Fuel tanks; repair shop wastes; <sup>7</sup> other hazardous and nonhazardous wastes <sup>15</sup>
Above-ground and underground storage tanks and containers	Heating oil; diesel and gasoline fuel; other petroleum products; hazardous and nonhazardous materials and wastes <sup>16</sup>
Storage, treatment, and disposal ponds, lagoons, and other surface impoundments	Hazardous and nonhazardous liquid wastes; <sup>16</sup> septage; sludge <sup>14</sup>
Chemical landfills	Leachate; hazardous and nonhazardous wastes; <sup>16</sup> nitrates
Radioactive waste disposal sites	Radioactive wastes from medical facilities, power plants, and defense operations; radionuclides (uranium, plutonium)
Unattended wet and dry excavation sites (unregulated dumps)	A wide range of substances; solid and liquid wastes; oil-field brines; spent acids from steel mill operations; snow removal piles containing large amounts of salt
Operating and abandoned production and exploratory wells (for gas, oil, coal, geothermal, and heat recovery); test hole wells; monitoring and excavation wells	Metals; acids; minerals; sulfides; other hazardous and nonhazardous chemicals <sup>16</sup>
Dry wells	Saline water from wells pumped to keep them dry
Injection wells	Highly toxic wastes; hazardous and nonhazardous industrial wastes; <sup>16</sup> oil-field brines
Well drilling operations	Brines associated with oil and gas operations
<b>INDUSTRIAL PROCESSES (PRESENTLY OPERATED OR TORN-DOWN FACILITIES)<sup>18</sup></b>	
Asphalt plants	Petroleum derivatives
Communications equipment manufacturers	Nitric, hydrochloric, and sulfuric acid wastes; heavy metal sludges; copper-contaminated etchant (e.g., ammonium persulfate); cutting oil and degreasing solvent (trichloroethane, Freon, or trichloroethylene); waste oils; corrosive soldering flux; paint sludge; waste plating solution
Electric and electronic equipment manufacturers and storage facilities	Cyanides; metal sludges; caustics (chromic acid); solvents; oils; alkalis; acids; paints and paint sludges; calcium fluoride sludges; methylene chloride; perchloroethylene; trichloroethane; acetone; methanol; toluene; PCBs
Electroplaters	Boric, hydrochloric, hydrofluoric, and sulfuric acids; sodium and potassium hydroxide; chromic acid; sodium and hydrogen cyanide; metallic salts
Foundries and metal fabricators	Paint wastes; acids; heavy metals; metal sludges; plating wastes; oils; solvents; explosive wastes

**Table 4-4. Potential Sources of Ground Water Contamination (continued)**

Source	Health, Environmental, or Aesthetic Contaminant <sup>1,2,3</sup>
Furniture and fixtures manufacturers	Paints; solvents; degreasing sludges; solvent recovery sludges
Machine and metalworking shops	Solvents; metals; miscellaneous organics; sludges; oily metal shavings; lubricant and cutting oils; degreasers (tetrachlorethylene); metal marking fluids; mold-release agents
Mining operations (surface and underground), underground storage mines	Mine spoils or tailings that often contain metals; acids; highly corrosive mineralized waters; metal sulfides
Unsealed abandoned mines used as waste pits	Metals; acids; minerals; sulfides; other hazardous and nonhazardous chemicals <sup>16</sup>
Paper mills	Metals; acids; minerals; sulfides; other hazardous and nonhazardous chemicals <sup>16</sup> ; organic sludges; sodium hydroxide; chlorine; hypochlorite; chlorine dioxide; hydrogen peroxide
Petroleum production and storage companies, secondary recovery of petroleum	Hydrocarbons; oil-field brines (highly mineralized salt solutions)
Industrial pipelines	Corrosive fluids; hydrocarbons; other hazardous and nonhazardous materials and wastes <sup>16</sup>
Photo processing laboratories	Cyanides; biosludges; silver sludges; miscellaneous sludges
Plastics materials and synthetics producers	Solvents; oils; miscellaneous organics and inorganics (phenols, resins); paint wastes; cyanides; acids; alkalis; wastewater treatment sludges; cellulose esters; surfactant; glycols; phenols; formaldehyde; peroxides; etc.
Primary metal industries (blast furnaces, steel works, and rolling mills)	Heavy metal wastewater treatment sludge; pickling liquor; waste oil; ammonia scrubber liquor; acid tar sludge; alkaline cleaners; degreasing solvents; slag; metal dust
Publishers, printers, and allied industries	Solvents; inks; dyes; oils; miscellaneous organics; photographic chemicals
Public utilities (phone, electric power, gas)	PCBs from transformers and capacitors; oils; solvents; sludges; acid solution; metal plating solutions (chromium, nickel, cadmium); herbicides from utility rights-of-way
Sawmills and planers	Treated wood residue (copper quinolate, mercury, sodium bazide); tanner gas; paint sludges; solvents; creosote; coating and gluing wastes
Stone, clay, and glass manufacturers	Solvents; oils and grease; alkalis; acetic wastes; asbestos; heavy metal sludges; phenolic solids or sludges; metal-finishing sludge
Welders	Oxygen, acetylene
Wood preserving facilities	Wood preservatives; creosote

<sup>1</sup>In general, ground water contamination stems from the *misuse and improper disposal* of liquid and solid wastes; the *illegal dumping or abandonment* of household, commercial, or industrial chemicals; the *accidental spilling* of chemicals from trucks, railways, aircraft, handling facilities, and storage tanks; or the *improper siting, design, construction, operation, or maintenance* of agricultural, residential, municipal, commercial, and industrial drinking water wells and liquid and solid waste disposal facilities. Contaminants also can stem from *atmospheric pollutants*, such as airborne sulfur and nitrogen compounds, which are created by smoke, flue dust, aerosols, and automobile emissions, fall as acid rain, and percolate through the soil. When the sources listed in this table are used and managed properly, ground water contamination is not likely to occur.

<sup>2</sup>Contaminants can reach ground water from activities occurring on the land surface, such as industrial waste storage; from sources below the land surface but above the water table, such as septic systems; from structures beneath the water table, such as wells; or from contaminated recharge water.

<sup>3</sup>This table lists the most common wastes, but not all potential wastes. For example, it is not possible to list all potential contaminants contained in storm water runoff or research laboratory wastes.

<sup>4</sup>Coliform bacteria can indicate the presence of pathogenic (disease-causing) microorganisms that may be transmitted in human feces. Diseases such as typhoid fever, hepatitis, diarrhea, and dysentery can result from sewage contamination of water supplies.

<sup>5</sup>Pesticides include herbicides, insecticides, rodenticides, fungicides, and avicides. EPA has registered approximately 50,000 different pesticide products for use in the United States. Many are highly toxic and quite mobile in the subsurface. An EPA survey found that the most common pesticides found in drinking water wells were DCPA (dacthal) and atrazine, which EPA classifies as *moderately toxic* (class 3) and *slightly toxic* (class 4) materials, respectively.

<sup>6</sup>The EPA National Pesticides Survey found that the use of fertilizers correlates to nitrate contamination of ground water supplies.

<sup>7</sup>Automotive wastes can include gasoline; antifreeze; automatic transmission fluid; battery acid; engine and radiator flushes; engine and metal degreasers; hydraulic (brake) fluid; and motor oils.

<sup>8</sup>Toxic or hazardous components of common household products are noted in Table 3-2.

<sup>9</sup>Common household pesticides for controlling pests such as ants, termites, bees, wasps, flies, cockroaches, silverfish, mites, ticks, fleas, worms, rats, and mice can contain active ingredients including naphthalene, phosphorus, xylene, chloroform, heavy metals, chlorinated hydrocarbons, arsenic, strychnine, kerosene, nitrosamines, and dioxin.

<sup>10</sup>Common pesticides used for lawn and garden maintenance (i.e., weed killers, and mite, grub, and aphid controls) include such chemicals as 2,4-D; chlorpyrifos; diazinon; benomyl; captan; dicofol; and methoxychlor.

<sup>11</sup>Swimming pool chemicals can contain free and combined chlorine; bromine; iodine; mercury-based, copper-based, and quaternary alginates; cyanuric acid; calcium or sodium hypochlorite; muriatic acid; sodium carbonate.

<sup>12</sup>Septic tank/cesspool cleaners include synthetic organic chemicals such as 1,1,1 trichloroethane, tetrachloroethylene, carbon tetrachloride, and methylene chloride.

<sup>13</sup>Common wastes from public and commercial buildings include automotive wastes; rock salt; and residues from cleaning products that may contain chemicals such as xylenols, glycol esters, isopropanol, 1,1,1-trichloroethane, sulfonates, chlorinated phenols, and cresols.

<sup>14</sup>Municipal wastewater treatment sludge can contain organic matter; nitrates; inorganic salts; heavy metals; coliform and noncoliform bacteria; and viruses.

<sup>15</sup>Municipal wastewater treatment chemicals include calcium oxide; alum; activated alum, carbon, and silica; polymers; ion exchange resins; sodium hydroxide; chlorine; ozone; and corrosion inhibitors.

<sup>16</sup>The Resource Conservation and Recovery Act (RCRA) defines a hazardous waste as a solid waste that may cause an increase in mortality or serious illness or pose a substantial threat to human health and the environment when improperly treated, stored, transported, disposed of, or otherwise managed. A waste is hazardous if it exhibits characteristics of ignitability, corrosivity, reactivity, and/or toxicity. Not covered by RCRA regulations are domestic sewage; irrigation waters or industrial discharges allowed by the Clean Water Act; certain nuclear and mining wastes; household wastes; agricultural wastes (excluding some pesticides); and small quantity hazardous wastes (i.e., less than 220 pounds per month) generated by businesses.

<sup>17</sup>X-ray developers and fixers may contain reclaimable silver, glutaldehyde, hydroquinone, phenedone, potassium bromide, sodium sulfite, sodium carbonate, thiosulfates, and potassium alum.

<sup>18</sup>This table lists potential ground water contaminants from many common industries, but it does not address all industries.

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**Table 4-5. Land Uses and Their Relative Risk to Ground Water**

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<b>LEAST RISK</b>	<ul style="list-style-type: none"><li>A. <ul style="list-style-type: none"><li>1. Land surrounding a well or reservoir, owned by a water company.</li><li>2. Permanent open space dedicated to passive recreation.</li><li>3. Federal, state, municipal, and private parks.</li><li>4. Woodlands managed for forest products.</li><li>5. Permanent open space dedicated to active recreation.</li></ul></li><li>B. <ul style="list-style-type: none"><li>1. Field crops: pasture, hay, grains, vegetables.</li><li>2. Low density residential: lots larger than 2 acres.</li><li>3. Churches, municipal offices.</li></ul></li><li>C. <ul style="list-style-type: none"><li>1. Agricultural production: dairy, livestock, poultry, nurseries, orchards, berries.</li><li>2. Golf course, quarries.</li><li>3. Medium density residential: lots from 1/2 to 1 acre.</li></ul></li><li>D. <ul style="list-style-type: none"><li>1. Institutional uses: schools, hospitals, nursing homes, prisons, garages, salt storage, sewage treatment facilities.</li><li>2. High density housing: lots smaller than 1/2 acre.</li><li>3. Commercial uses: limited hazardous material storage and only sewage disposal.</li></ul></li><li>E. <ul style="list-style-type: none"><li>1. Retail commercial: gasoline, farm equipment, automotive, sales and services; dry cleaners; photo processor; medical arts; furniture strippers; machine shops; radiator repair; printers; fuel oil distributors.</li><li>2. Industrial: all forms of manufacturing and processing, research facilities.</li><li>3. Underground storage of chemicals, petroleum.</li></ul></li></ul>
<b>GREATEST RISK</b>	<ul style="list-style-type: none"><li>4. Waste disposal: pits, ponds, lagoons, injection wells used for waste disposal; bulky waste and domestic garbage landfills; hazardous waste treatment, storage and disposal sites.</li></ul>

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Source: Adapted from U.S. EPA, 1989a.

**APPENDIX J**

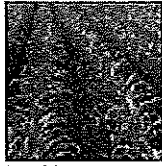
**CLEAN SWEEP COLLECTION PROGRAM**



Dane County

# CLEANSWEEP

City of Madison



Ag Cleansweep



Household Hazardous Waste



Small Businesses



Product Exchange

The 2006 Collection Season will open on Tuesday May 2, 2006.. We will be open on Tuesdays, Wednesdays, Fridays, and Saturdays from 7:30 a.m. – 2:00 p.m. The last day of the 2006 season will be Tuesday October 31st.

Stop by and visit us in Madison at 2302 Fish Hatchery Road (on the north end of the Dane County Highway Garage property). [\[View map to CleanSweep site\]](#)

For more information, call our recorded information line at 608-294-5366 or contact Dave Radisewitz at 608-294-5358 or email him at [dradisewitz@cityofmadison.com](mailto:dradisewitz@cityofmadison.com).

**What's new**

Clean Sweep is currently open. We will be open on Tuesdays, Wednesdays, Fridays, and Saturdays from 7:30 a.m. – 2:00 p.m. The last day of the 2006 season will be Tuesday October 31st.

The Household Hazardous Waste Program provides an opportunity for residents of Dane County to safely dispose of hazardous waste, free of charge. [More on household hazardous waste](#)

The Product Exchange is a program for residents to take, free of charge, the high quality and usable products brought into Clean Sweep. [More on the product exchange](#)

The Business Waste Program allows businesses to dispose of hazardous materials and wastes conveniently and cost-effectively. [More on the business waste program](#)

The Agricultural Waste Program helps farmers and agricultural businesses to dispose of unwanted, unused, damaged or banned hazardous chemicals, including pesticides. [More on the ag program](#)

More information on recycling programs can be found at Dane County Department of Public Works [Recycling Page](#) and also at the City of Madison [Streets & Recycling Page](#).

**Hot links**

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[\[Dane County Home Page\]](#)

[\[Dane County Public Works\]](#)

[\[Madison Department of Public Health\]](#)

[\[City of Madison Home Page\]](#)



2006 Hours:

**Tuesday, Wednesday, Friday, Saturday**  
**7:30 am - 2:00 pm**  
**May 2 through October 31**

Location:

**Dane County Highway Garage**  
 2302 Fish Hatchery Rd. (north end)  
 corner of Fish Hatchery and Badger Roads  
 Tel: (608) 294-5366  
[www.danecountycleansweep.com](http://www.danecountycleansweep.com)

**Common materials we DO NOT accept and their recycling & disposal options for HOUSEHOLDS only**

<b>Material</b>	<b>What To Do With It</b>
<b>AMMO, EXPLOSIVES &amp; FIREWORKS</b>	Dane County Sheriff's Office Bomb Squad Technician, 255-2345
<b>ANTIFREEZE AND OIL FILTERS</b>	Jiffy Lube* (closest to Clean Sweep site) 2605 Fish Hatchery Rd., 251-7741
<b>BALLASTS</b> If they are electronic or say "No PCBs"  If they contain oil and DO NOT say "No PCBs"	Throw in your trash. Private lamp recyclers/fee charged (see Fluorescent Light Bulbs section)  Clean Sweep
<b>BATTERIES</b> Lead/acid automotive type batteries  Other rechargeable batteries Alkaline & other disposables	Any place that sells them.* All Metals Recycling 1802 South Park St., 255-0960 Batteries Plus Clean Sweep, Batteries Plus, Radio Shack* Throw in your trash. Private lamp recyclers/fee charged (see Fluorescent Light Bulbs section)
<b>CLEANERS, LAUNDRY ADDITIVES, AND OTHER WATER-BASED HOUSEHOLD PRODUCTS</b>	Flush liquids down your sanitary sewer. Throw solids in your trash.
<b>COMPUTERS &amp; ELECTRONICS</b>	Madison Recycling Center*/fee charged 2200 Fish Hatchery Rd., 251-2115
<b>COOKING OIL</b> Liquid vegetable oil  Animal fat, solid vegetable-based oils, greases and lard	Any City of Madison or the Dane County waste oil drop-off site (see Used Oil section)  Solidify by freezing or mixing with oil dry or shredded paper, and place in a plastic bag for disposal in your trash.



Material	What To Do With It
<p><b>DRIVEWAY SEALER/ROOFING TAR</b></p> <p>Hardened</p> <p>Hardened with water on top</p> <p>Solvent-based (tar, asphalt)</p> <p>Water-based semi-solid</p>	<p>Curbside with lid off or in <b>Trash Cart</b> if you have automated trash pick-up.</p> <p>Pour water off then place the dried can curbside with lid off or in <b>Trash Cart</b> if you have automated trash pick-up.</p> <p>Clean Sweep</p> <p>Air dry then place the dried can curbside with lid off or place the dried can in <b>Trash Cart</b> if you have automated trash pick-up.</p>
<p><b>EMPTY AEROSOL CANS</b></p>	<p>Put in with your recyclables (full or partially full ones can be brought to Clean Sweep). (Please remove and recycle tops.)</p>
<p><b>EMPTY HAZARDOUS MATERIAL CONTAINERS</b></p>	<p>Recycle as appropriate or throw in your trash (no drums &gt;5 gallons).</p>
<p><b>FERTILIZER</b></p> <p>Fertilizer that does not contain pesticides or herbicides</p> <p>Fertilizer that contains pesticides or herbicides (weed-n-feed, insect control)</p>	<p>Throw in your trash.</p> <p>Clean Sweep</p>
<p><b>FIRE EXTINGUISHERS</b></p>	<p>Automatic Fire Protection 804 Walsh Rd., 241-1993</p>
<p><b>FLUORESCENT – INCLUDE COMPACT LIGHT BULBS/TUBES/OTHER LAMPS</b></p> <p>Please note that City of Madison and Dane County Ordinances require that all stores that sell fluorescent lamps accept used lamps for recycling. Incandescent lamps can be thrown in your trash or brought to a private lamp recycler. All other lamps should be brought to a private lamp recycler.</p>	<p><b>PRIVATE LAMP RECYCLERS*</b></p> <p>PKK Lighting/fee charged 7182 Hwy. 14, Capital Ct., 836-7821</p> <p>BJ Electric Supply Inc./fee charged 805 Plaenert Dr., 257-4777</p> <p>Midwest Lamp Recycling/fee charged 3224 Kingsley Way, 275-6766</p>
<p><b>INFECTIOUS/MEDICAL WASTES/SHARPS</b></p>	<p>Check with your local pharmacy</p>
<p><b>PROPANE CYLINDERS</b></p> <p>Empty 20 pound tanks with open valves from City of Madison Residents</p> <p>20 pound tanks</p> <p>1 pound cylinders</p>	<p>Madison Streets Division East or West</p> <p>Most places that refill them/fee charged (call first)</p> <p>Clean Sweep</p>
<p><b>RADIOACTIVE MATERIALS, INCLUDING SMOKE DETECTORS</b></p>	<p>Return them to the manufacturer. (Smoke detectors that do not contain americium or radioactive materials can be thrown in your trash.)</p>
<p><b>SOLID/SEMI-SOLID LATEX MATERIALS, CAULK, JOINT COMPOUND, GLUE</b></p>	<p>Throw in your trash.</p>
<p><b>USED MOTOR OIL &amp; OTHER AUTOMOTIVE FLUIDS (not antifreeze)</b></p> <p>Please note that City of Madison and Dane County oil drop off sites accept hydraulic fluid, transmission fluid, power steering fluid and brake fluid.</p>	<p>Dane County Oil Drop Off Site: 2302 Fish Hatchery Rd.</p> <p>City of Madison Oil Drop Off Sites:</p> <p>East: City Garage, First and East Johnson St., Monona Golf Course, Monona Dr., and E. Dean Ave.</p> <p>Northeast: Wheeler and School Rds.</p> <p>West: Glenway Golf Course, 3747 Speedway Rd.</p> <p>Your Local Service Garage*</p>

Clean Sweep does not take tires, paper or cardboard products, yard waste, construction debris, rubbish, glass, solid metals, solid waste, etc. Contact your local government or trash hauler for details.

\*For additional locations, contact your local municipal recycling staff, or check the Dane County recycling website at [www.co.dane.wi.us/pubworks/recycle.htm](http://www.co.dane.wi.us/pubworks/recycle.htm)

The Clean Sweep & Product Exchange attempts to reuse or recycle as much of the material as possible that is brought into the facility. To do this cost effectively, the program accepts only those materials for which there is no other disposal option in the County. The listed municipal agencies or private businesses will accept the materials not accepted by Clean Sweep. For additional locations, contact your local municipal recycling staff, or check the Dane County recycling website at [www.co.dane.wi.us/pubworks/recycle.htm](http://www.co.dane.wi.us/pubworks/recycle.htm). Listings on these sheets do not imply endorsements or recommendations of firms or their services.

## Take to Clean Sweep - Households Only

### OIL-BASED PAINTS AND PAINT-RELATED PRODUCTS

Oil or Solvent-Based Paints including automotive paints. Solvents such as finish removers, furniture strippers, stain, shellac, varnish, thinner, turpentine, & furniture strippers.

### PESTICIDES & POISONS

Mercury and mercury containing products (no lamps), cyanide, stump remover, pool chemicals, herbicides, insecticides, pet pesticides, weed-n-feed or pest control fertilizers, PCB containing ballasts, banned pesticides including *Aldrin, Chlordane, DBCP, DDT, Dieldrin, Endrin, Helptachlor, Kepone, Lindane, Mirex, Silvex, Toxaphene, 2,4,5-T, Diazinon*.

### HOUSEHOLD PRODUCTS CONTAINING ORGANIC SOLVENTS

Photographic fixer, pastes, polishes, caulks that are combustible or flammable. Check the label for *Mineral Spirits, Petroleum Distillates, Phenol, Carbon Tetrachloride, Benzene, Diethyl or Dimethyl Phthalate, Methylene Chloride, Toluene, Xylene, Chlorinated Solvents* (see "Recycling Hazardous Materials" on back).

### IGNITABLES, AEROSOLS

Full or partially full aerosol cans, **1 pound** propane cylinders, gasoline, kerosene, fuel oil, solvent-based driveway sealant. Clean Sweep does not accept 20 pound propane cylinders.

### NON-AUTOMOTIVE RECHARGEABLE BATTERIES

Clean Sweep accepts sealed rechargeable batteries. These batteries are commonly found in cordless power tools, cellular and cordless phones, laptop computers, camcorders, digital cameras, and remote control toys. We accept the following battery types: Nickel Cadmium (Ni-Cd), Nickel Metal Hydride (Ni-MH), Lithium Ion (Li-ion) and Small Sealed Lead (Pb).

## Latex Paint & Water-Based Driveway Sealer

LATEX PAINT AND WATER-BASED DRIVEWAY SEALER ARE NOT HAZARDOUS. Dry them with latex paint dryer, kitty litter, oil dry or newspapers and place curbside for trash pick-up. Make sure the lids are off when you set them at your curb, or place them in your **Trash Cart** if you have automated trash pick-up.

If the material is hard on the bottom with some liquid on top, pour the liquid down an **indoor** drain and place the dried can at your curb without the lid or place the dried can in your **Trash Cart** if you have automated trash pick-up. You may flush small amounts of **latex paint** (less than 1/3 full container) down an **indoor** drain. Clean Sweep will accept containers of latex paint that are more than half full.

*“Buy Only What You Need, Use What You Buy”*

## How to Transport

Products and materials should be packaged to keep them from spilling or breaking on the way to Clean Sweep. Leave materials in their original containers. DO NOT MIX like or unlike materials together. Leaking containers may be placed, as is, in another container. Label the outside container.

## Recycling Hazardous Products

### DIRTY THINNERS

Reuse thinner and other solvents for rinsing brushes and guns. Let **solids** from dirty thinner, turpentine, etc., settle in the bottom of a clear container. Filter the remaining liquid through cheese cloth or an old nylon until the solvent is clear. Dry and dispose of the particles and paint chips in your regular trash.

### GASOLINE

Gasoline drained from a snowblower, lawn mower, chainsaw, etc. that is mixed with oil may be used up in your vehicle. Check the gasoline to see if it is clear except for the color of the oil used. If clear, pour into your gas tank on a 10:1 ratio (ten [10] gallons of new gas to one gallon of old gas). The small amount of oil in the old gas will not affect the performance of your vehicle. If your gas cannot be used in this way, bring into Clean Sweep in a container you can leave.

## Product Exchange

Need a pint of stain or gallon of basement paint? Does your roof need patching or are you stripping a piece of furniture? Products brought in by you and your neighbors that are perfectly good and usable are made available, free of charge, for you or your neighbors.

For other recycling locations throughout Dane County, contact your local recycling office or county web page at [www.co.dane.wi.us/pubworks/recyc.htm](http://www.co.dane.wi.us/pubworks/recyc.htm). For more information on City of Madison curbside services and disposal options, refer to the “Recyclopedia” or [www.cityofmadison.com/streets/streets.html](http://www.cityofmadison.com/streets/streets.html), or call Clean Sweep at 294-5366. Please see our website at [www.danecountycleansweep.com](http://www.danecountycleansweep.com).

## What is an Agricultural Clean Sweep?

It is an annual opportunity to dispose of unwanted, unused, damaged, or banned hazardous chemicals, especially pesticides, from farms, abandoned farm operations, and agricultural businesses. **All farmers and agricultural-related businesses from Dane County are invited to participate.**

### Agricultural Clean Sweep is a "pre-registration only" program.

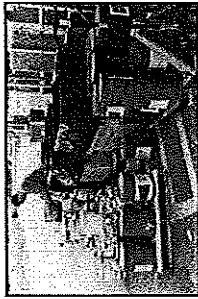
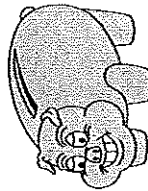
Carefully read this flyer and register at least one week prior to the scheduled event.

The Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) and Dane County provide funding for the program.

## What Does It Cost to Participate?

The first 200 pounds of chemicals are FREE for farmers. Waste amounts over 200 pounds may require a per pound charge. This fee will be waived if pre-

registered waste quantities can be paid for with available grant dollars.



## Agricultural Business Participation

Businesses that meet pesticide licensing categories regulated by DATCP can now receive disposal services. These categories include co-ops, golf courses, rights-of-way applicators, aerial applicators, feed mills, landscape companies and any local government agencies, including schools.

DATCP offers a 50 percent disposal subsidy for waste pesticides. Businesses must pay the remaining balance. Agricultural businesses must pre-register with the listed contact person. Read this flyer **before** contacting the listed coordinator.

## Unknown Chemicals and Drums

You can often find chemicals of unknown origin around farms or agricultural businesses. Clean Sweep can accept most unknown chemicals, **but you must pre-register unknown chemicals over 50 pounds or 5 gallons in size!** Clean Sweep will also accept 30- and 55-gallon drums but you must also pre-register them.

## What Chemicals Can Clean Sweep Accept?

- Unused, damaged, canceled, banned, or otherwise unwanted agricultural chemicals, including herbicides, insecticides, fungicides, rodenticides, and wood preservatives.
- Common pesticides such as 2,4-D; captan; malathion; DDT; parathion; toxaphene; chlordane; heptachlor; lindane; 2,4,5-T; diazinon; and pentachlorophenol.
- Other agricultural chemicals including veterinary supplies, lead paint, acid washes, wood finishes, solvents, and engine cleaners.

## Unacceptable Chemicals

- Explosives, including detonators and blasting caps
- Radioactives, including smoke alarms
- Infectious and biological wastes
- Propane cylinders\*

\*Certain compressed gas cylinders will be accepted - however, you must pre-register to determine whether or not your particular cylinder is acceptable. There are no exceptions to this rule.



## Required Pre-Registration Form

(Use a separate page if necessary.)  
Or to complete this form on-line access:  
[www.danecounty/cleanwseep.com](http://www.danecounty/cleanwseep.com)

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_

E-mail: \_\_\_\_\_

1. Estimate the total amount of dry chemical wastes, (powders, granulars, flowables) you have for disposal: \_\_\_\_\_ pounds.  
Identify the chemical and indicate total content of each container.  
\_\_\_\_\_  
\_\_\_\_\_

2. Estimate the total amount of liquid chemical wastes (emulsions, solvents, lead paints) you have for disposal: \_\_\_\_\_ gallons.  
Identify the chemical and indicate how much liquid is in each container.  
\_\_\_\_\_  
\_\_\_\_\_

3. Do you have any 30- or 55-gallon drums for disposal? Yes \_\_\_ No \_\_\_  
If yes, number each drum, identify the chemical and indicate total content of each drum.  
\_\_\_\_\_  
\_\_\_\_\_



4. Do you have any unknown chemicals in quantities greater than 50 pounds or 5 gallons?  
Yes \_\_\_ No \_\_\_

If yes, list number of containers and sizes.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

5. Do you have any compressed gas cylinders? \_\_\_ Yes \_\_\_ No \_\_\_  
If yes, indicate what type and size of each cylinder.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. Requested collection dates:  
First Choice: \_\_\_/\_\_\_/\_\_\_  
Second Choice: \_\_\_/\_\_\_/\_\_\_

All farmers, abandoned farms operations, and agricultural related businesses from Dane County are invited to participate.

### Clean Sweep Coordinator

Mail or fax registration:  
Dave Radisevitz, CHMM  
210 Martin Luther King, Jr. Blvd., # 507  
Madison, WI 53703  
(608) 267-3105 (Fax)

(608) 294-5366 (Information Line)  
(608) 294-5358 (Direct Line)  
dradisevitz@cityofmadison.com

### Pre-Registration: Easy as 1-2-3!

Pre-registration is on a first-come, first-serve basis. We will take pre-registrations for as long as grant dollars remain available. Agricultural businesses must follow the instructions on this flyer.

1. Inspect your barns, sheds, and the basement to see if you have any old chemicals, especially pesticides, for disposal.
2. If you locate unwanted chemicals, write down the type and quantity. **DO NOT** mix chemicals together. Leave them in original containers.
3. Fill out the pre-registration form on this flyer and mail to the cleansweep representative. Or, better yet, go to [www.danecountycleansweep.com](http://www.danecountycleansweep.com) and fill out an on-line form. **REMEMBER:** This is a limited funding program.

### Collection Dates

Agricultural Clean Sweeps will be held EVERY Wednesday beginning with the third Wednesday in May. The final Agricultural Clean Sweep will be held on the second Wednesday in October.

**PRE-REGISTRATION IS REQUIRED!**

Location: Dane Co. Highway Garage  
2302 Fish Hatchery Rd.  
Madison, WI

*The exact time and date for your drop-off will be assigned upon registration.*

DANE COUNTY/CITY OF MADISON AGRICULTURAL CLEAN SWEEP  
210 MARTIN LUTHER KING JR BLVD RM 516  
MADISON WI 53703

## AGRICULTURAL CLEAN SWEEP Pre-Registration



Hazardous Chemical  
Collection Service  
for  
Farmers, Abandoned  
Farm Operations, &  
Agricultural Businesses  
of Dane County,  
Wisconsin

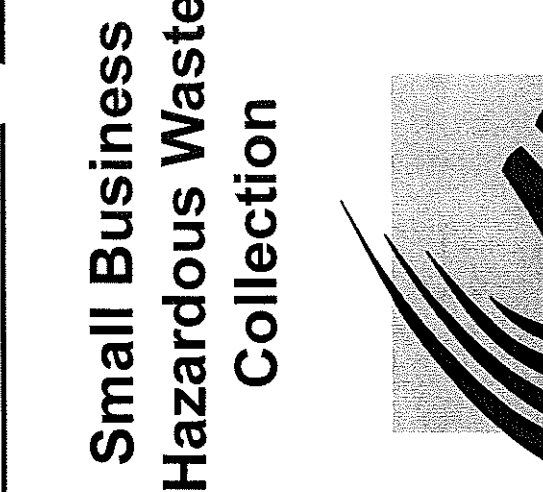
#### Sponsors

- Dane County
- City of Madison
- UW-Extension, Dane County
- Wisconsin Department of Agricultural, Trade and Consumer Protection

*Pre-registration is required  
one week prior to scheduled event.*

608-294-5358

[www.danecountycleansweep.com](http://www.danecountycleansweep.com)



**Dane County Clean Sweep**

Location: 2302 Fish Hatchery Rd.  
Madison, WI 53713

*We are available at a convenient location and time for you.*

Call (608) 294-5366 for more information and registration information. You may register on-line at [www.danecountycleansweep.com](http://www.danecountycleansweep.com). After completing an inventory of the material you will bring, a scheduled date and drop off time will be provided to you. Appointments are made on Wednesday mornings.

**Clean Sweep Coordinator**

Dave Radisewitz, CHMM  
210 Martin Luther King, Jr. Blvd., Rm. 507  
Madison, WI 53703  
[www.danecountycleansweep.com](http://www.danecountycleansweep.com)  
(608) 294-5366 (Information Line)  
(608) 294-5358 (Direct Line)  
(608) 267-3105 (Fax)  
[dradisewitz@cityofmadison.com](mailto:dradisewitz@cityofmadison.com)

DANE COUNTY/CITY OF MADISON CLEAN SWEEP  
210 MARTIN LUTHER KING JR BLVD RM 507  
MADISON WI 53703

**Small Business  
Hazardous Waste  
Collection**



Madison Department of Public Health  
210 Martin Luther King, Jr. Blvd., Room 507  
Madison, WI 53703  
(608) 294-5358

## Business Convenience

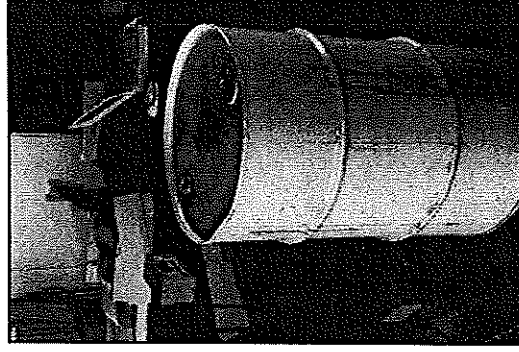
Businesses can dispose of hazardous materials and wastes conveniently and cost effectively through the Dane County Clean Sweep Small Business Hazardous Waste Disposal Program. Businesses classified as VSQGs<sup>1</sup> can dispose of their hazardous materials or wastes simply and conveniently by supplying an inventory of materials for disposal. The business then schedules an appointment to drop off their materials on one of the Wednesdays during the Clean Sweep season (May through October).

Common hazardous wastes that are accepted include:<sup>2</sup>

- Automotive Products
- Ballasts
- Corrosives
- Insecticides and Pesticides
- Mercury
- Paints
- Paint-Related Products
- Solvents
- Solvent-Based Products
- Solvent-Based Cleaners
- Degreasers and Strippers
- Adhesives, Glues and Caulks

<sup>1</sup>To meet the legal classification of a Very Small Quantity Generator (VSQG), businesses must generate 220 pounds or less of hazardous waste in a month and store no more than 2,200 pounds of hazardous waste on site at any time. They may have no more than two pounds of acutely hazardous waste on site. All VSQG participants are responsible for the proper packing and transportation of their waste materials to the Clean Sweep site. A VSQG is responsible for their waste from "cradle to grave" under CERCLA.

<sup>2</sup>A complete list of materials and products and the costs associated with disposal will be provided upon request.



## Benefits for Business

### Reduced Costs

State law requires that all Wisconsin businesses producing hazardous waste manage and dispose of their materials and wastes properly. For generators of large quantities of waste this means hiring a chemical contractor to sort, package, and transport the waste to a licensed facility. This option proves very costly for generators of small quantities of waste, especially if they have different waste streams (e.g., solvents and paints). Because the program is an add-on to the Household Hazardous Waste Program, economies of scale provide significant cost savings.

### Reduced Regulations

The Dane County Clean Sweep, through approval of the Wisconsin Department of Natural Resources, has designed a program to assist generators of small quantities of waste to simply, safely and cost effectively dispose of their materials. Ordinarily the procedures required and the paperwork involved is confusing and complicated. Through special rulemaking by the Wisconsin DNR, manifest requirements are waived and Clean Sweep programs have been authorized to accept business waste.

### Proper Treatment

As a VSQG, you may consider your waste to be properly managed by using a Clean Sweep program. Facilities to which this waste is sent are audited regularly. And to minimize liability, these materials are disposed through a hierarchy of disposal: **Reuse, Recycle, Treatment, or Incineration**. By using a hierarchy of disposal, wastes are disposed of in the most cost efficient and environmentally conscious manner.

**APPENDIX K**

**CITY OF MADISON WELL ABANDONMENT ORDINANCE -  
DANE COUNTY ORDINANCE RELATING TO PRIVATE WATER SYSTEM**



## 13.21 WELL ABANDONMENT.

- (1) Purpose . To prevent contamination of groundwater and to protect public health, safety and welfare by assuring that unused, unsafe or noncomplying wells, wells which may serve as conduits for contamination or wells which may be illegally cross-connected to the Madison Water Utility are properly abandoned.
- (2) Applicability . This ordinance applies to all wells located in the City of Madison or on premises served by the Madison Water Utility.
- (3) Definitions .

Noncomplying means a well or pump installation which does not comply with the provisions of Ch. NR 812, Wisconsin Administrative Code, in effect at the time the well was constructed, a contamination source was installed, the pump was installed or work was done on either the well or pump installation.

Pump installation means the pump and related equipment used for withdrawing water from a well including the discharge piping, the underground connections, pitless adapters, pressure tanks, pits, sampling faucets and well seals or caps.

Unsafe means a well or pump installation which produces water which is bacteriologically contaminated or contaminated with substances in excess of the standards of Chapters NR 809 or 140, Wisconsin Administrative Code, or for which a Health Advisory has been issued by the Department of Natural Resources.

Unused means a well or pump installation which is not in use or does not have a functional pumping system.

Well means an excavation or opening into the ground made by digging, boring, drilling, driving, or other methods for the purpose of obtaining groundwater for consumption or other use. Wells for the express purpose of monitoring the quality of ground water and/or gases and/or soil characteristics are exempt from this Ordinance.

Well abandonment means the filling and sealing of a well according to the provisions of Chap. NR 812, Wisconsin Administrative Code.

- (4) Abandonment Required . All wells located in the City of Madison or on premises served by the Madison Water Utility shall be abandoned if no valid well operation permit has been obtained from the Madison Water Utility or if so required under NR Sec. 812.26(2), Wisconsin Administrative Code. An application for a well operation permit shall be made within ninety (90) days of the date of any abandonment notice from the Madison Water Utility. (Am. by Ord. 12,567, 5-3-00)
- (5) Well Operation Permit . No person may operate a well without having obtained a well operation permit. The Madison Water Utility may grant a permit to a private well owner to operate a well for a period not to exceed five (5) years providing the conditions of this section are met. An owner may request renewal of a well operation permit by submitting information verifying that the conditions of this section are met. The Madison Water Utility, or its agent, may conduct inspections or have water

quality tests conducted at the applicant's expense to obtain or verify information necessary for consideration of a permit application or renewal. Permit applications and renewals shall be made on forms provided by the Madison Water Utility. A permit fee of one hundred dollars (\$100) shall accompany the application. This fee shall include the cost of conducting bacterial examinations of water samples obtained from the well. The Madison Water Utility may require abandonment of a well for failure to renew a permit or to pay renewal fee within ninety (90) days of the date of any abandonment notice from the Madison Water Utility; otherwise, abandonment shall be required. The following conditions must be met for issuance or renewal of a well operation permit:

- (a) The well and pump installation meet or are upgraded to meet the requirements of Chap. NR 812, Wisconsin Administrative Code.
- (b) The well construction and pump installation have a history of producing bacteriologically safe water as evidenced by at least two (2) samplings taken a minimum of two (2) weeks apart. No exception to this condition may be made for unsafe wells, unless the Department of Natural Resources approves, in writing, the continued use of the well.
- (c) There are no cross-connections between the well and pump installation and the Madison Water Utility.

(Am. by Ord. 12,567, 5-3-00)

- (6) Required Inspection. Whenever real property with a well on the premises is conveyed pursuant to Chapter 706, Wisconsin Statutes, the seller shall contact the Madison Water Utility at least fourteen (14) days prior to the transfer of property. Upon proper notice, the Madison Water Utility may conduct an inspection to determine whether the well should be permitted or abandoned under this section.
- (7) A representative of the Madison Water Utility shall have the power and authority at all reasonable times, for any proper purpose, to enter upon any property in the City of Madison and make inspection thereof. If entry is refused, such representative may obtain a special inspection warrant under Section 66.0119, Wisconsin Statutes. Upon request by a representative of the Madison Water Utility, the owner, lessee or occupant of any property so served shall furnish to the inspection agency any pertinent information regarding the well on such property if such information is known to such owner, lessee or occupant. (Am. by Ord. 12,567, 5-3-00)
- (8) Abandonment Procedures.
  - (a) All wells abandoned under the jurisdiction of this ordinance or rule shall be abandoned according to the procedures and methods of Chap. NR 812, Wisconsin Administrative Code. All debris, pump, piping, unsealed liners and any other obstructions which may interfere with sealing operations shall be removed prior to abandonment.
  - (b) The owner of the well, or the owner's agent, shall notify the Madison Water Utility at least forty-eight (48) hours prior to commencement of any well abandonment activities. The abandonment of the well may be observed by the

## Madison Water Utility.

- (c) An abandonment report form, supplied by the Department of Natural Resources, shall be submitted by the well owner to the Madison Water Utility and the Department of Natural Resources within ten (10) days of the completion of the well abandonment.
- (d) The Madison Water Utility may require any person who has abandoned a well not in compliance with Subdivision (a) to return and take corrective action so that the well is abandoned by him or her in a complying manner. (Cr. by Ord. 12,567, 5-3-00)
- (9) This law does not supersede the State Plumbing Code, Section NR 811, Wisconsin Administrative Code, or Chapter 18 of the Madison General Ordinances entitled "Plumbing Code" but is supplementary to them.
- (10) Penalties. The penalty for violation of this section may be not less than twenty-five dollars (\$25) nor more than one thousand dollars (\$1,000) and the cost of prosecution. Each day of violation is a separate offense. If any person fails to comply with this ordinance for more than ten (10) days after receiving written notice of the violation, the City may impose a penalty and cause the well abandonment to be performed and the expense to be assessed as a special tax against the property.

(Sec. 13.21 Cr. by Ord. 10,136, 11-14-90; Am. by Ord. 12,345, 3-12-99; Am. by Ord. 12,567, 5-3-00; Ord. 13,500, 1-23-04)

**TITLE 9  
HEALTH AND SANITATION**

- Chapter 45 Relating to Private Water Systems
- Chapter 46 Private Sewage System Ordinance and Health Ordinance
- Chapter 47 Animal Control

**CHAPTER 45  
RELATING TO PRIVATE WATER SYSTEMS**

- 45.01 Authority and Adoption.
- 45.02 Jurisdiction.
- 45.03 Purpose.
- 45.04 Intent.
- 45.05 Effective Date.
- 45.06 Severability and Non-liability.
- 45.07 Repeal.
- 45.08 Definitions.  
*[45.09 - 45.10 reserved.]*
- 45.11 County Responsibilities; Private Well Location Permits.
- 45.12 County Responsibilities; Existing Private Water Systems.
- 45.13 Cooperation With Other Units.
- 45.14 Administrator.
- 45.15 Qualifications of Administrator.
- 45.16 Powers of Administrator.
- 45.17 Duties of Administrator.  
*[45.18 - 45.20 reserved.]*
- 45.21 Requirements and Permits.
- 45.22 Appeals.
- 45.23 Violations.
- 45.24 Administrative Directives and Orders.
- 45.25 Enforcement Actions.  
*[45.26 - 45.50 reserved.]*
- 45.51 Fee Schedules.  
*[45.52 - 45.99 reserved.]*

**45.01 AUTHORITY AND ADOPTION.** (1) This ordinance is adopted under the authority of ss. 59.067 and 162.07, Wis. Stats., and Ch. NR 845, Wis. Admin. Code.

(2) This ordinance is subject to the provisions of ss. 59.067 and 162.07, Wis. Stats., and all rules promulgated thereunder regulating private water systems.

(3) This ordinance may not be more lenient nor more stringent than the rules promulgated pursuant to ch. 162, Stats.

(4) Failure to comply with any of the provisions of such regulations shall constitute a violation of this ordinance, actionable according to the penalties provided herein.

(5) This ordinance applies to the entire county and includes cities, towns, villages and sanitary districts in the county.

**45.02 JURISDICTION.** The provisions of this ordinance shall apply to all private water systems within Dane County.

**45.03 PURPOSE.** The purpose of this ordinance is to protect the drinking water and groundwater resources of the county by governing access to groundwater through regulating (1) private well location and (2) existing private water systems.

**45.04 INTENT.** The intent of this ordinance is to regulate (1) the locations of wells and (2) existing water systems and to provide for the administration and enforcement of this ordinance.

**45.05 EFFECTIVE DATE.** (1) This ordinance shall be effective July 1, 1987 for well location. **[HISTORY:** (2) rep., OA 29, 1995-96, pub. 12/06/95.]

**45.06 SEVERABILITY AND NON-LIABILITY.** If any section, provision or portion of this ordinance is adjudged unconstitutional or invalid by a court of competent jurisdiction, the remainder of this ordinance shall not be affected. The county asserts that there is no liability on the part of the board of supervisors, its agencies or employees for any health hazards or damages that may occur as a result of reliance upon, and compliance with, this ordinance.

**45.07 REPEAL.** All other county ordinances or parts of ordinances inconsistent or conflicting with this ordinance, to the extent of the inconsistency only, are repealed.

**45.08 DEFINITIONS.** As used in this ordinance, the following words and phrases have the meanings indicated:

(1) *Administrator* means the county employee designated by the county executive to issue permits for private well location and to administer ch. NR 812, Wis. Admin. Code, in the county as authorized by the department. The administrator is hereby empowered to delegate his or her authority under this ordinance to any or all of the certified well inspectors employed by the community support and health services department of the County of Dane.

(2) *Central office* means the department's bureau of water supply, located in Madison, which functions as the coordinating authority for the statewide water supply program.

(3) *Community water system* has the meaning designated in s. NR 811.02(7), Wis. Admin. Code.

(4) *County* means the County of Dane.

(5) *County office staff* means county office personnel trained to answer general well location questions and to accept permit applications.

(6) *Delegation level* means the program level, as set forth in s. NR 845.05, Wis. Admin. Code, at which a county is authorized to administer and enforce ch. NR 812, Wis. Admin. Code.

(7) *Department* means the Department of Natural Resources of the State of Wisconsin.

(8) *District office* means the department's office located in Madison, Wisconsin.

(10) *Existing installations* has the meaning designated in ch. NR 812, Wis. Admin. Code.

(11) *Health hazard* means a condition which constitutes:

(a) A violation of ch. NR 812, Wis. Admin. Code, regarding the installation, construction, operation or maintenance of a private well; or

(b) Confirmed bacteriologically unsafe well water quality.

(11m) *Large parcel* means, for the purpose of this ordinance, a parcel having dimensions such that all boundary lines cannot be shown on a sheet of paper not to exceed 8½ inches by 11 inches for a plan diagram that has a scale of 1 inch equals 100 feet or smaller.

(12) *Noncommunity water system* means a public water supply system that serves at least 25 people at least 60 days each year. A noncommunity water system commonly serves a transient population rather than permanent year-round residents. This is typically an individual well serving a restaurant, industry, service station, tavern, motel, campground or church.

(13) *Noncomplying well* means a private water system not in compliance with all provisions of ch. NR 812, Wis. Admin. Code, in effect at the time the well was constructed.

(14) *Person* means an individual, corporation, company, association, cooperative, trust, institution, partnership, state, public utility, sanitary district, municipality or federal agency.

(15) *Personal interest* means having a financial interest in a property or being related by marriage or birth to a person having a financial interest in a property.

(16) *Primary drinking water standards* means those maximum contaminant levels which

represent minimum public health standards set forth in ch. NR 809, Wis. Admin. Code.

(17) *Private water system* means the water collection, storage and treatment facilities and all structures, piping and appurtenances by which water is provided for human consumption by other than community water systems. For the purpose of this ordinance, it includes non-community water systems.

(18) *Private water systems ordinance* means a county ordinance, approved by the department, regulating private water systems at the county's authorized delegation level.

(19) *Private well* means, for the purpose of this ordinance, any drilled, driven point, dug, bored or jetted well constructed for the purpose of obtaining groundwater for potable use, including wells constructed in special well casing depth areas, wells constructed to potable well standards regardless of the intended use of the well and noncommunity wells. It does not include springs, or private or public wells that require written plan approval from the department.

(20) *Public water system* has the meaning designated in ch. NR 812, Wis. Admin. Code.

(21) *Reconstruction* means modifying the original construction of a private well. It includes, but is not limited to, deepening, lining, installing or replacing a screen, underreaming, hydrofracturing and blasting.

(22) *Variance* means an approval issued by the department under ch. NR 812, Wis. Admin. Code, allowing a private water system to vary from ch. NR 812, Wis. Admin. Code, requirements if department approved conditions are met.

(23) *Water system* means the water collection, storage, treatment facilities and all structures, piping and appurtenances by which water is provided.

(24) *Well* has the meaning designated in ch. 162, Wis. Stats.

(25) *Well construction* means the procedures, methods, materials and equipment used during the construction or reconstruction of a private well.

(25m) *Well constructor* means any person who constructs a well.

(26) *Well location permit* means a permit, or comparable registration system, issued by the county which allows the construction or reconstruction of a private well.

[HISTORY: (1) am., Sub. 1 to OA 43, 1987-88, pub. 06/18/88; (9) rep., (12) am. and (25m) cr., OA 29, 1995-96, pub. 12/06/95; (11m) cr. and (19) am., OA 21, 2002-03, pub. 03/04/03.]

[45.09 - 45.10 reserved.]

**45.11 COUNTY RESPONSIBILITIES; PRIVATE WELL LOCATION PERMITS.**

In accepting Level 1 and Level 5 responsibility from the department, the county hereby agrees to:

(1) Issue permits authorizing the location of new and replacement private wells, including drilled, driven point, dug, bored or jetted wells, or the reconstruction or rehabilitation of existing private wells.

(2) Conduct inspections of wells for which well location permits are required as soon as possible after the well is constructed.

(3) Determine whether the casing height of a permitted well complies with ch. NR 812, Wis. Admin. Code, and that there is a cap or seal on the upper terminus of the well.

(4) Require the abandonment of wells not in service, or that will be taken out of service, if the well is unused, noncomplying or bacteriologically unsafe. The county may require abandonment of a well or drillhole as per s. NR 812.26, Wis. Admin. Code, or which has other chemical compounds, including inorganic and organic compounds, for which state health advisory limits have been issued, after consultation with and approval by the department.

(5) Require upgrading of all inspected private wells that are not in compliance with the minimum private well locational distances in ch. NR 812, Wis. Admin. Code.

[HISTORY: (intro.) am., OA 29, 1995-96, pub. 12/06/95; (4) am., OA 21, 2002-03, pub. 03/04/03; (4) am., OA 10, 2003-04, pub. 09/12/03.]

**45.12 COUNTY RESPONSIBILITIES; EXISTING PRIVATE WATER SYSTEMS.**

(1) On the request of a property owner or a lending institution, the administrator will conduct an evaluation of the well and collect a water sample for coliform bacteria analysis and, if also requested, collect a nitrate-nitrogen sample from the private water supply.

(2) The administrator will conduct a private water system evaluation whenever any water sample is collected as part of a complaint or problem follow-up, unless directed not to do so by the department.

(3) The administrator shall require upgrading of all inspected private water systems that are not in compliance with the minimum private well location standards of ch. NR 812, Wis. Admin. Code.

[HISTORY: 45.12 am., OA 29, 1995-96, pub. 12/06/95.]

**45.13 COOPERATION WITH OTHER UNITS.**

The administrator shall cooperate with all other governmental units and agencies in the enforcement of all state and local laws and regulations pertaining to matters in this ordinance.

**45.14 ADMINISTRATOR.** (1) The county director of environmental health shall act as the Dane County administrator and is assigned the duties of administering the private water system program in accordance with department rules.

(2) The administrator shall have the power and duty to enforce the provisions of this ordinance and all other ordinances, laws and orders of the county and of the State of Wisconsin which relate to the construction, alteration or installation of all private water systems within the county, at the county's authorized delegation level.

**45.15 QUALIFICATIONS OF ADMINISTRATOR.**

(1) The administrator shall be informed on the principles and practices of private well construction. If the administrator has a personal interest in the construction or modification of any well subject to the provisions of ch. 162, Wis. Stats., ch. NR 812, Wis. Admin. Code, or county ordinance, the county executive shall, after consultation with the department, designate another knowledgeable person to examine the application to issue the required permit(s) and to make the necessary inspections.

**45.16 POWERS OF ADMINISTRATOR.** The administrator shall have all the powers necessary to enforce the provisions of this ordinance commensurate with the level or levels of the county's delegated authority, including the following:

(1) In the discharge of his or her duties, the administrator or an authorized assistant may enter any building or property upon presentation of the proper credential, during reasonable hours for the purpose of inspecting the private water system and may request the owner or operator to produce the private well location required under this ordinance. No person may interfere with the administrator or an authorized assistant in the performance of his or her duties. Any person interfering shall be in violation of this ordinance and subject to penalty as provided by this ordinance. If consent to enter property for inspection purposes is denied, the administrator may obtain a special inspection warrant under ss. 66.122 and 66.123, Wis. Stats.

- (2) Order any person owning, operating or installing a private water system to abandon, repair or place it in a complying safe or sanitary condition if the system is found to be unused, bacteriologically unsafe or not in compliance with ch. NR 812, Wis. Admin. Code, or this ordinance.
- (3) Prohibit the use of any new well which is found to be installed, located, constructed, operated or maintained so as to be a health hazard to the users, neighbors or community.
- (4) Appoint assistants to aid in processing applications for well location permits.
- (5) Enforce any or all ordinances applicable to private water systems in accordance with department rules.
- (6) If the administrator of the private water systems ordinance or an authorized assistant determines that the location or construction of a private well does not comply with this ordinance, the administrator or assistant shall post, in a conspicuous place upon the site, a suspension of work order demanding cessation of work. The administrator shall notify the well constructor and property owner in writing of the noncompliance and the nature of the work to be discontinued and corrected, identifying the location and the name of the person issuing the order. It shall be a violation of this ordinance to engage in work at conflict with the terms of an order or to make an unauthorized removal of a posted order. Work may resume on the site only under the direction of the administrator.

[HISTORY: (3) am., OA 29, 1995-96, pub. 12/06/95.]

**45.17 DUTIES OF ADMINISTRATOR.** It shall be the duty of the administrator to enforce the provisions of this ordinance and perform the following duties commensurate with the level or levels of the county's delegated authority:

- (1) Record all permits, fees, inspections and other official actions and make an annual report thereon to the county board of supervisors.
- (2) Provide the department with copies of all permits and correspondence as required by ch. NR 845, Wis. Admin. Code.
- (3) Inspect the location of new private water systems upon completion.
- (5) Investigate and record all private water system complaints.
- (6) Investigate cases of noncompliance with this ordinance, ch. NR 812, Wis. Admin. Code, and ch. 162, Wis. Stats., issue orders to abate the noncompliance and submit complaints to the corporation counsel for enforcement.
- (7) Refer complaints and cases of noncompliance believed to be or known to be

beyond the scope of the county's delegation level to the department.

- (8) Cooperate with all other governmental units and agencies in the enforcement of all state and local laws and regulations of matters related to this ordinance.
- (9) Assist the department as specified in ch. NR 845, Wis. Admin. Code.
- (10) Refer variance requests and actions which require department approval to the department.
- (11) Advise owners not to drink or use water from private water systems under conditions specified in ch. NR 845, Wis. Admin. Code.
- (12) The administrator, a trained county inspector or county office staff shall be available at the administrator's office for answering questions regarding permit applications and for accepting applications for well location for a minimum of four regularly scheduled hours each working day.

[HISTORY: (4) rep., OA 29, 1995-96, pub. 12/06/95.]

[45.18 - 45.20 reserved.]

**45.21 REQUIREMENTS AND PERMITS. (1)**

No person may install a private well or water system unless the owner of the property on which the private water system is to be installed holds a valid well location permit issued by the county or has made arrangements to acquire a permit by notifying the administrator prior to construction. Notification shall include providing the administrator with the property owner's name and address, property legal description, proposed starting date and identification of the person who will be obtaining the permit. Unless other arrangements are made in advance, the permit shall be applied for on the first workday following initial construction.

- (2) No private water system may be located, installed or operated within the jurisdictional limits of the county without the appropriate permit being obtained in compliance with sub. (1) above and without being in full compliance with the provisions of this ordinance and all other applicable state and local laws and regulations. Permit applications for the location of a well shall be made by the property owner or the property owner's designated agent. Permits shall be issued from the office of the administrator.
- (3) The permit application shall be on forms provided by the administrator, and shall include the following:
  - (a) A site plan diagram. The plan diagram shall be submitted on paper not less than 8½ by 11 inches and shall include the location of all

structures, septic tanks, septic absorption fields, underground fuel storage tanks, animal yards and other sources of contamination; at least one property line, the property access road and nearest public road. Distances shall be provided by dimension or to scale. For large parcels the plan must include a small scale diagram showing all property lines and adjacent roads in addition to the large scale diagram showing site details.

**(b)** A copy of any variance granted by the department including proof that the variance has been properly recorded.

**(4)** Well location permit applications shall be signed by the property owner or the property owner's designated agent. Well location permit applications shall be submitted to the administrator at least 2 working days prior to construction if the property owner or well constructor is interested in receiving information about potential contamination sources such as landfills, underground storage tanks, primary and replacement on-site sewage disposal system areas on the development site and on adjacent properties, and special casing areas. When a well permit application is submitted less than 2 working days prior to construction, the well constructor shall be responsible for maintaining full compliance with all provisions of ch. NR 812, Wis. Admin. Code. The permit application may be submitted by the property owner or the property owner's designated agent and shall be issued to the property owner.

**(5)(a)** The administrator shall assist applicants by answering questions and providing forms, reviewing applications and approve, disapprove or notify an applicant of the need to seek a variance or special approval from the department or return the permit application due to incompleteness for all private water systems to be constructed or modified in the county, within 2 working days following submission of the permit application. The administrator may reserve final approval or disapproval of a permit which requires department action until the variance or special approval request has been acted on by the department.

**(b)** If a permit is disapproved because an applicant submits an incomplete or inaccurate application, one-half of the application fee shall be retained by the county. Any reapplication shall require the same fee as a new application.

**(7)** The administrator shall issue written notice to each applicant whose permit application is disapproved. An application shall be disapproved if the well construction would result in noncompliance with ch. NR 812, Wis. Admin.

Code, or if a well construction variance or special approval request was denied by the department. Each notice shall:

**(a)** State the specific reason for denial.

**(b)** Inform the applicant of the right to request a special approval or a variance from the department and the procedures for making such a request.

**(8)** When construction occurs on a weekend or holiday, notification shall be provided to the administrator on the first workday following the weekend or holiday in the same manner as described in sub. 4 above. Unless other arrangements are made with the administrator, the permit application shall be obtained on the first workday following the weekend or holiday. The well constructor shall be responsible for maintaining full compliance with all provisions of ch. NR 812, Wis. Admin. Code.

**(10)** A permit transfer application shall be submitted to the county when there is a change of property owner after the application is submitted but before well construction is completed. Failure to submit a transfer application to the county shall invalidate a previously issued permit. The application shall be on a form made available by the administrator.

**(11)** As soon as the well location permit is received it shall be displayed conspicuously at the well site during construction, for a minimum of seven (7) days following completion of construction or until the well has been inspected by county staff, whichever occurs first.

**(12)** A well location permit shall be valid for a period of one year or until construction is completed, whichever comes first. If the permit expires, a new application shall be submitted to the administrator. Reapplications shall be evaluated so that construction will comply with the provisions of ch. NR 812, Wis. Admin. Code, in effect at the time of the reapplication. The administrator may require additional inspection and fees for reapplications.

**(13)** A well location permit is not required nor shall be issued by the county for private water systems requiring written plan approval from the department.

**(14)** Any permit issued under this section shall be void if any false or inaccurate statement is made or if any inaccuracy is shown on any application for a permit.

**(15)** No permit may be issued to any property owner or designated agent of the property owner who is in violation of this ordinance, until the



violation has been corrected, unless the permit is to allow correction of the violation.

[HISTORY: (5)(a) and (b) am., Sub. 1 to OA 43, 1987-88, pub. 06/18/88; (1), (2), (4), (5), (7), (8), (10), (11) and (15) am. and (6) and (9) rep., OA 29, 1995-96, pub. 12/06/95; (3) am., OA 21, 2002-03, pub. 03/04/03; (3)(a) am., OA 10, 2003-04, pub. 09/12/03.]

**45.22 APPEALS.** Persons seeking to appeal a decision of the administrator under this ordinance shall file written letters of appeal with the administrator. The administrator shall place the appeal on the agenda of the county board of health and the appeal shall be given a due process proceeding in accord with s. 46.17. The board shall decide whether to uphold, uphold with modifications or reverse the administrator's decision based upon the terms and intent of this ordinance and of relevant state laws and administrative rules. No appellate decision of the committee shall have the effect of approving an existing or proposed condition that would violate this ordinance or state law or administrative rule. Appeals that may only be approved by the granting of a variance to ch. NR 812, Wis. Admin. Code, shall be referred to the department pursuant to ch. NR 845, Wis. Admin. Code. Board appellate decisions shall be made in writing and shall be filed in the administrator's office. Appeals of decisions made by authorized agents on behalf of the administrator shall be made first to the administrator and then be appealable as provided herein.

**45.23 VIOLATIONS.** The administrator shall investigate violations of this ordinance and ch. NR 812, Wis. Admin. Code, at the county's authorized delegation level(s), issue orders to abate the violations and submit orders to the corporation counsel for enforcement.

**45.24 ADMINISTRATIVE DIRECTIVES AND ORDERS.** (1) The administrator, after investigation and a determination that a violation exists, may issue a written field directive. This field directive may consist of a hand written note on an inspection report, or similar paper, identifying the violation that has occurred and assigning a date by which the violation must be corrected, and shall include the inspector's telephone number and office address. (2) A formal letter may be issued which states the violation, the ordinance, administrative rule or statutory section violated, the date the violation was noted, the name of the inspector who noted

the violation and the date by which the correction must be made.

(3) Upon discovery and after documentation of a violation, the administrator may issue a correction order. The administrator may use a stepped enforcement procedure by issuing a directive before an order or may proceed directly to issuing a correction order. An order shall include the following:

- (a) The location of the violation (site).
- (b) The name of the parties: owner, permittee, well constructor.
- (c) The section of the ordinance and Wisconsin Administrative Code violated.
- (d) The date of inspection of the site where the violation occurred.
- (e) The name of the person who conducted the inspection which revealed the violation.
- (f) The date by which the correction must be completed.
- (g) The name of the person who must be contacted regarding subsequent inspection of the site.
- (h) A statement that if the order is not complied with, the administrator will refer the violation to the corporation counsel with a recommendation to seek injunctive relief or forfeitures, or both, from the circuit court of Dane County. Orders must be signed by the administrator.
- (i) Orders shall be served on the owner or well constructor by certified mail. Where appropriate, the administrator may request the sheriff to serve any particular order. The administrator shall report all orders that have not been complied with to the corporation counsel for enforcement.

[HISTORY: (3)(i) am., Sub. 1 to OA 43, 1987-88, pub. 06/18/88.]

**45.25 ENFORCEMENT ACTIONS.** (1) An enforcement action may be brought by the corporation counsel against a person or persons for any of the following violations:

- (a) Failure to comply with any provision of this ordinance;
- (b) Failure to comply with any permit specification or requirement;
- (c) Failure to comply with any directive or order issued by the county administrator;
- (d) Resisting, obstructing or interfering with the county administrator's or an authorized assistant's actions undertaken pursuant to this ordinance.

(2) The county corporation counsel may, for any violation, seek injunctive relief or forfeitures of not less than \$50.00 nor more than \$200.00, or both, for each violation.

(3) Each day a violation exists is a separate offense.

(4) Any person who has the ability to pay any forfeiture entered against him or her under this ordinance but refuses to do so may be confined in the county jail until such forfeiture is paid, but in no event to exceed thirty (30) days. In determining whether an individual has the ability to pay a forfeiture imposed under this section, all items of income and all assets may be considered regardless of whether or not the income or assets are subject to garnishment, lien or attachment by judgment creditors under the laws of this state.

[HISTORY: (2) am., OA 16, 2000-01, pub. 02/05/01.]

*[45.26 - 45.50 reserved.]*

**45.51 FEE SCHEDULES.** (1) The fee for a well siting permit shall be \$72.00.

(2) The fee for a transfer of a well siting permit shall be \$36.00.

(3) The fee for a re-inspection of a well site shall be \$27.00.

[HISTORY: (1) and (2) am., and (4) rep., OA 21, 2002-03, pub. 03/04/03; (1) – (3) am., OA 37, 2003-04, pub. 04/28/04.]

*[45.52 – 45.99 reserved.]*

#### END OF CHAPTER

[HISTORY: Ch. 45 cr., OA 4, 1987-88, pub. 09/14/87; references throughout chap. 45 to NR 11.03(2), NR 109, NR 112, NR 145 and NR 145.05 were changed to, respectively, NR 811.02(7), NR 809, NR 812, NR 845 and NR 845.05, OA 29, 1995-96, pub. 12/06/95. ]

**APPENDIX L**

**PRIVATE WELLS AND WELL ABANDONMENT INFORMATION**

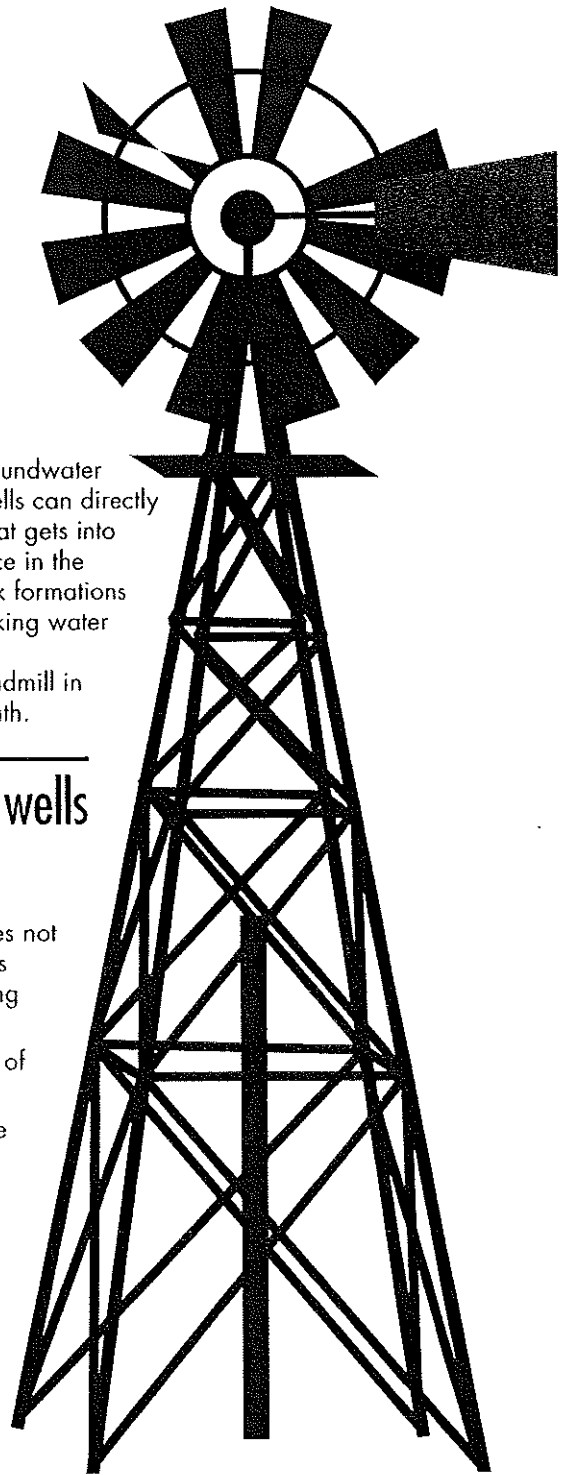
# Answers to Your Questions on Well Abandonment

## Why are unused and improperly abandoned wells threats to groundwater?

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. Whenever you see an old deteriorating windmill in the countryside, there is likely an improperly abandoned well underneath.

## How can unused and improperly abandoned 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 pose safety hazards for small children and animals. Several years ago a small boy fell into an unfinished well in Italy and died after a valiant rescue attempt. In 1987, a small girl fell into a well in Midland, Texas and was rescued but only after three days of hard work. In 1987, an 11-year old boy fell through a wooden cover into an old dug well on a farm in Missouri and drowned. Although such occurrences are infrequent, they should never be allowed to happen.
- ♣ Improperly abandoned flowing wells can be a nuisance and may lower artesian pressure in neighboring wells.



## When should wells be properly abandoned?

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 (NR 812) 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 abandoned 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.

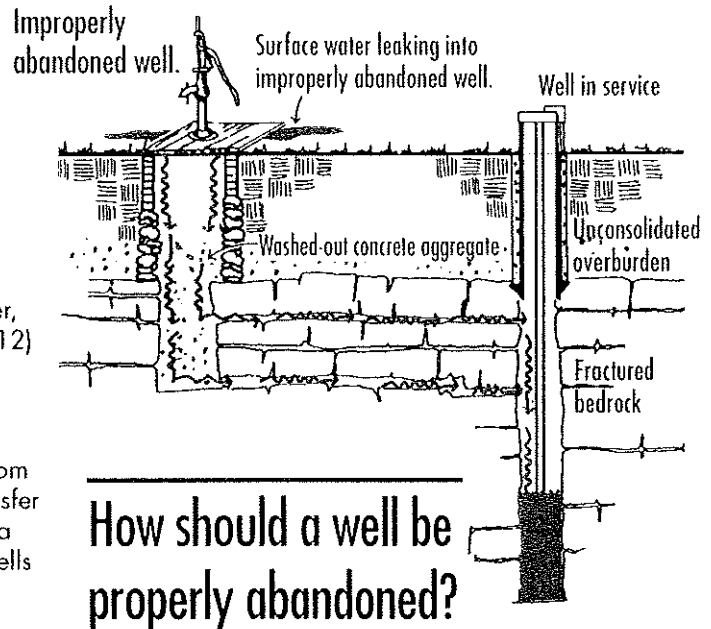
In another case, a buried well having only a stone set on the top of the open casing caused severe contamination of the drinking water pumped from another well on the same property. The unused well was near both an animal yard and a sewage absorption field and thus provided direct access for the entrance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

Chapters NR 811 and NR 812, Wis. Adm. Codes, require proper abandonment, by permanent filling, of unused wells.

## Who can perform proper well abandonment work?

Although current law allows any person to do well abandonment work, the DNR recommends that licensed Well Drillers and Pump Installers be hired to fill wells. 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.



## How should a well be properly abandoned?

### First determine the construction and condition of the well

The first step in proper abandonment 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 with DNR. 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  $\frac{1}{4}$  -  $\frac{1}{4}$  Section,  $\frac{1}{4}$  - 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) [www.uwex.edu/wgnhs/well.htm](http://www.uwex.edu/wgnhs/well.htm).

### Specific forms include:

- ♣ To request a Well Construction Report for a specific well [www.uwex.edu/wgnhs/pdfs/wcrpdf/private\\_wells.pdf](http://www.uwex.edu/wgnhs/pdfs/wcrpdf/private_wells.pdf).
- ♣ To request a Well Construction Report for an area [www.uwex.edu/wgnhs/pdfs/wcrpdf/wellord2.pdf](http://www.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 and filling the well

Before the well is filled, 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 bentonite chips. Well Drillers and Pump Installers are familiar with these materials and know how to calculate and place the proper volume of material. If you choose to fill the well yourself, contact the DNR for the proper mixture of materials and methods for determining material volume.

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, do 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 well can be as much a threat to groundwater quality as an open well.

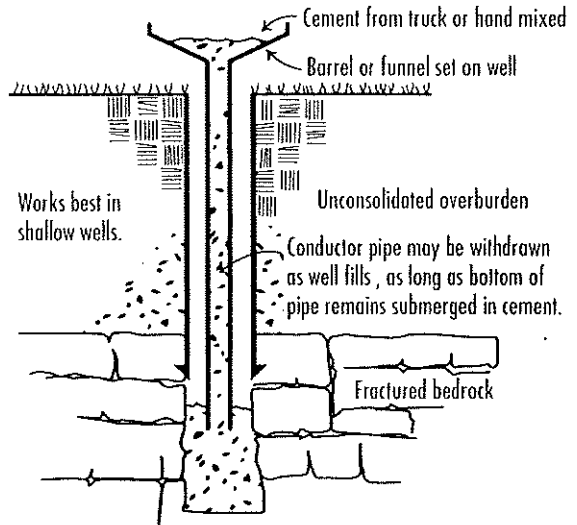
After properly filling the well from the bottom up, the filling material may terminate a few feet below the ground surface to allow the top of the casing to be cut off, if preferred. The casing may also be left in place. If the well discharged through a non-pressure conduit, the end of this conduit (in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

### Flowing wells

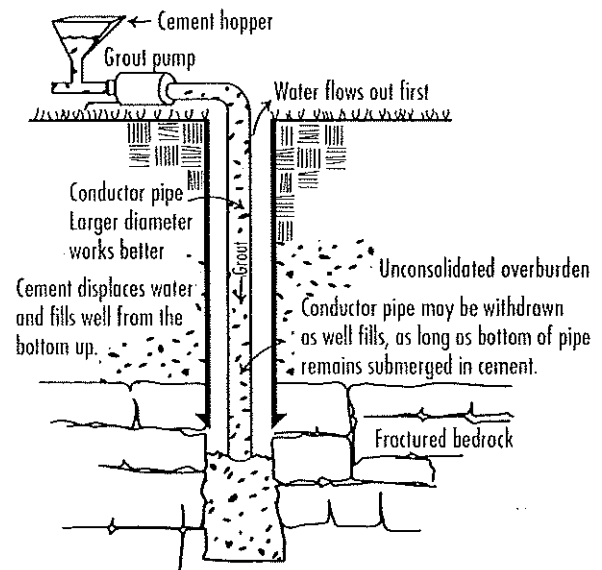
Flowing artesian wells that flow at high rates may require special techniques to reduce the flow before the well is filled. Contact the DNR for more information.

For very deep, large-diameter drilled wells, contact the DNR Bureau of Drinking Water and Groundwater staff for acceptable alternate procedures and materials. In some cases chlorinated, sand-free pea gravel may be used to fill the lower portions of bedrock wells to reduce the cost of material.

### Gravity method for well abandonment



### Pumped method for well abandonment



### Driven-point (sand-point) wells

Driven-point or jetted wells 2 inches or less in diameter must be filled with neat cement grout. You may simply pour the grout down the casing, or, if you wish, pump it down through a conductor pipe. You may pull the drive pipe and screen before pouring the grout 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

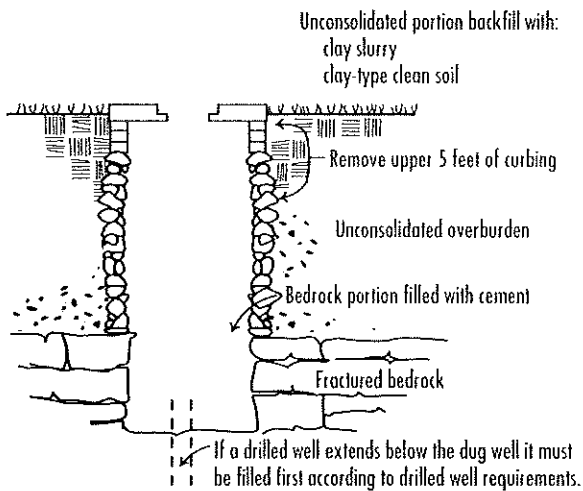
Code. If your well was constructed after this date, the well does not comply and must be properly abandoned and filled except when the department approves its continued use.

### Dug wells

To properly abandon a dug well, 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.) You must fill the dug well with clean clay, silt, clean native clay or silt-type soil (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. You may cave the curbing into the dug well while the well is being filled if you do it in a manner to prevent plugging of the filling material part-way down; or you may also do this step near the end of the filling procedure.

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

### Dug well abandonment



### Well pits

When a pit well is abandoned, the pit structure must also be filled. To properly abandon 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 Abandonment Using Chipped Bentonite

In Wisconsin chipped bentonite products 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 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: Chipped bentonite 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.)

Chipped bentonite 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 (1/4" - 3/8" and 1/2" - 3/4" chips). The 1/4" - 3/8" 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).

### Use the following procedures when using chipped bentonite:

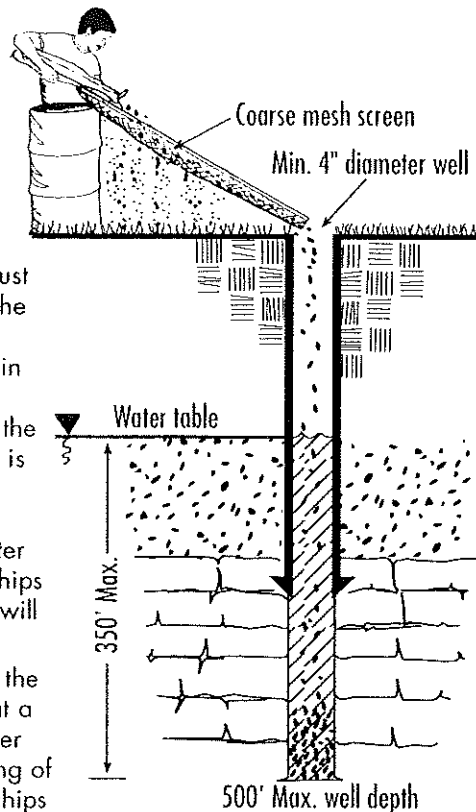
1. Determine the construction details of the well or drillhole including at least the:
  - a. Well or drillhole diameter, by simply measuring the inside diameter of the well casing pipe or drillhole; and
  - b. Well or drillhole depth, by lowering a weighted line down to the bottom. (Make sure the weight 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.
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:  $\pi r^2 h$ 

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

$$0.69 = \text{number of ft}^3 \text{ filled by one 50 lb. bag}$$

(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 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 1 - Method for Determining the Number of 50 lb. Bags of Chipped Bentonite to Fill a Well**

Hole Size and Volume Table				
Hole Diameter Inches	Hole Volume (ft <sup>3</sup> /foot)	Pounds Chipped Bentonite To Fill 1 Ft	Feet Filled By One Bag Chipped Bentonite	Bags Chipped Bentonite to fill 100 Ft
4	0.087	6.3	7.9	12.6
4-1/2	0.110	7.9	6.3	15.8
5	0.136	9.8	5.1	19.6
5-1/2	0.165	11.9	4.2	23.8
6	0.196	14.1	3.5	28.2
6-1/2	0.230	16.6	3.0	33.2
7	0.267	19.2	2.6	38.4
7-1/2	0.307	22.1	2.3	44.2
8	0.349	25.1	2.0	50.2
8-1/2	0.394	28.4	1.8	56.8
9	0.442	31.8	1.6	63.6
9-1/2	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 Abandonment**

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		
<b>Unconsolidated Formation Wells</b>	Driven-Point (sand-point) Wells ↓ & Drillholes ≤ 2 1/2" diameter	No	No	Yes	No	No	No	No	Material may be poured without using a conductor pipe
	Wells & Drillholes > 2 1/2" 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
<b>Bedrock Wells</b>	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
<b>Well Pits</b>	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 1/3 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:**

<b>ABI Plug</b> .....	ABI, Inc.
<b>Cowboy Brand</b> ..	Cowboy Mining Co. (Fine, Medium & Coarse)
<b>Econoplug</b> .....	Economy Mud Products Co. (both medium chips: 1/4" to 3/8" and coarse chips: 1/2" to 3/4")(mfg. by Wyo-Ben, Inc.)
<b>Enviroplug</b> .....	Wyo-Ben, Inc. (both medium chips: 1/4" to 3/8" and coarse chips: 1/2" to 3/4")
<b>Federal Plug</b> .....	M-1 Drilling Fluids (Federal) – 100% of chipped sodium bentonite (both medium chips: 1/4" to 3/8" and coarse chips: 1/2" to 3/4")
<b>Holeplug</b> .....	N.L. Baroid, Inc. (3/8" and 3/4" chips)
<b>Kwik Plug</b> .....	Federal Summit (3/8" and 3/4" chips)
<b>Naturapel</b> .....	Wyo-Ben, Inc. (chips)
<b>Opti Seal</b> .....	Bentonite Corp. (3/8" and 3/4" chips)
<b>PdsCo Plug</b> .....	PdsCo. (Polymer Drilling Systems)(medium and coarse chips)
<b>Permaplug</b> .....	Cathodic Engineering Equipment Co. (both coarse chips: 3/4" and medium chips: 3/8")
<b>Pure Gold Chips</b> ..	CETCO (both medium 1/4" to 3/8" and coarse 3/8" to 3/4" chips)
<b>Tower Plug</b> .....	Black Hills Bentonite Co. (3/8" and 3/4" chips)
<b>Volclay Chips</b> ....	American Colloid Co. (both medium chips: 1/4" to 3/8" and coarse chips: 1/2" to 3/4")
<b>Well-Plug</b> .....	Fluidril Mud Systems (from Black Hills Bentonite) 100% chipped bentonite (3/8" and 3/4" chips)

### **Conductor (tremie) pipe used for well abandonment 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 abandonment 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 abandonment report forms (Form #3300-5B or 3300-5W) are available from the DNR's central or regional offices or from counties delegated to enforce the State Well Code. You must use these forms to report how the well was filled and document that the well no longer exists. The form must be completed and signed by the person performing the abandonment work. The second copy is the owner's copy. Send the original to the appropriate DNR regional office indicated at the end of this brochure or to the appropriate county office.

## 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 or report improperly abandoned wells?

The DNR has five regional offices statewide to serve you. Call the nearest one to talk to a drinking water and groundwater specialist assigned to your county.

The DNR Drinking Water staff directory is also found on the Internet at: [dnr.wi.gov/org/water/dwg](http://dnr.wi.gov/org/water/dwg). Click on "Staff Contacts" at the bottom left side of the page.

For further information on drinking water supplies and groundwater quality check the DNR website at [dnr.wi.gov/org/water/dwg/index.htm](http://dnr.wi.gov/org/water/dwg/index.htm). Also check the UW Extension website at: [ecommerce.uwex.edu/](http://ecommerce.uwex.edu/). Click on "Water Quality" under the "Natural Resources" drop-down menu.

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

*The Wisconsin Department of Natural Resources provides equal opportunity in its employment, programs, services and functions under an Affirmative Action Plan. If you have any questions, please write to: Equal Opportunity Office, Department of the Interior, Washington, D.C. 20240.*

*This publication is available in alternative format (large print, Braille, audiotape, etc) upon request. Please call (608) 266-0821 for more information.*

### Region Offices

**Northern Region**  
810 W. Maple Street  
Spooner, WI 54801  
(715) 635-2101

107 Sulliff Ave.  
Rhineland, WI 54501  
(715) 365-8900

**West Central Region**  
1300 West Clairemont  
P.O. Box 4001  
Eau Claire, WI 54702-4001  
(715) 839-3700

**Northeast Region**  
1125 N. Military Avenue  
P.O. Box 10448  
Green Bay, WI 54307  
(920) 492-5800

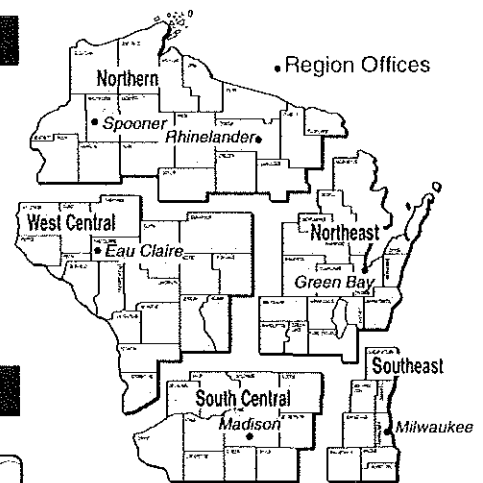
**Southeast Region**  
2300 N. Dr. Martin Luther King Jr. Dr.  
P.O. Box 12436  
Milwaukee, WI 53212  
(414) 263-8500

**South Central Region**  
3911 Fish Hatchery Road  
Fitchburg, WI 53711  
(608) 275-3266

### Central Office:

**Street Address**  
101 S. Webster Street  
Madison, WI  
(608) 266-0821

**Mailing Address**  
PO Box 7921  
Madison, WI 53707-7921



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**APPENDIX M**

**CITY OF MADISON WELLHEAD PROTECTION ORDINANCE**

- (d) The Madison Water Utility may require any person who has abandoned a well not in compliance with Subdivision (a) to return and take corrective action so that the well is abandoned by him or her in a complying manner. (Cr. by Ord. 12,567, 5-3-00)
- (9) This law does not supersede the State Plumbing Code, Section NR 811, Wisconsin Administrative Code, or Chapter 18 of the Madison General Ordinances entitled "Plumbing Code" but is supplementary to them.
- (10) Penalties . The penalty for violation of this section may be not less than twenty-five dollars (\$25) nor more than one thousand dollars (\$1,000) and the cost of prosecution. Each day of violation is a separate offense. If any person fails to comply with this ordinance for more than ten (10) days after receiving written notice of the violation, the City may impose a penalty and cause the well abandonment to be performed and the expense to be assessed as a special tax against the property.
- (Sec. 13.21 Cr. by Ord. 10,136, 11-14-90; Am. by Ord. 12,345, 3-12-99; Am. by Ord. 12,567, 5-3-00; Ord. 13,500, 1-23-04)

### 13.22 WELLHEAD PROTECTION.

- (1) To prevent contamination of wells supplying municipal water systems, the Water Utility General Manager or his/her designee shall review all proposed uses on zoning lots in Zones A and B in Wellhead Protection Districts.
- (2) Review will be based on the presence, use, or storage on the lot of hazardous chemicals, as defined by the Environmental Protection Agency. Consideration will be given to factors including but not limited to the following: whether the zoning lot is in Zone A or Zone B, effective storage or containment of particular hazardous chemicals, and the magnitude and/or frequency of use of the hazardous chemicals. Approval of the use may be contingent on specific conditions being met. A current list of hazardous chemicals, as defined by the Environmental Protection Agency, shall be maintained. (Cr. by Ord. 13,106, 7-23-02)

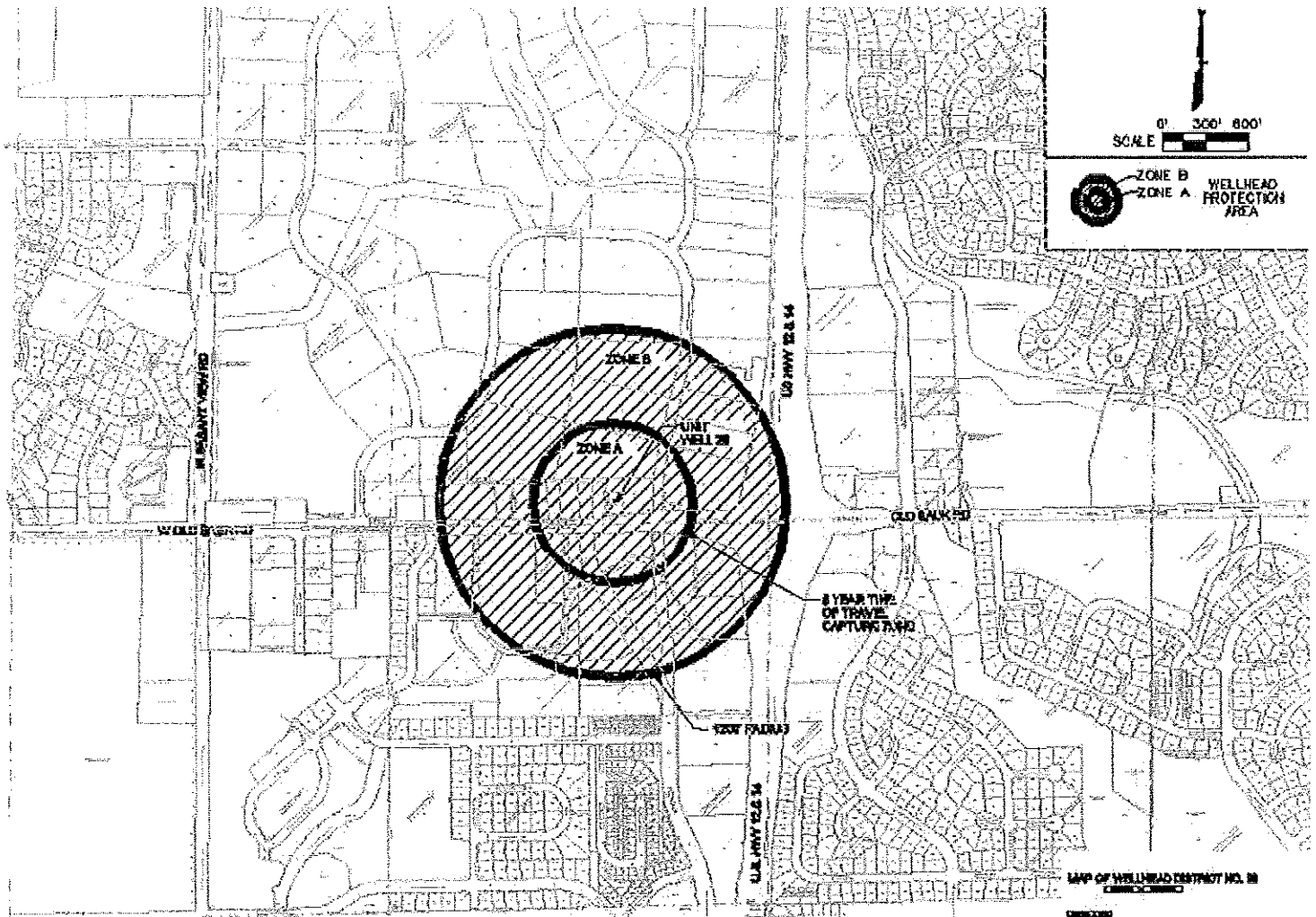
**13.23 PENALTY.** Any person violating any provision of this chapter for which a separate penalty has not been imposed shall be punished by a fine of not less than twenty-five dollars (\$25) nor more than one thousand dollars (\$1,000).

The word "fine" as used in this chapter shall be synonymous with the term "forfeiture".

(Am. by Ord. 12,357, Adopted 3-16-99; Renumbered to Sec. 13.23 by Ord. 13,106, 7-23-02 )

**28.107 WELLHEAD PROTECTION DISTRICTS.**

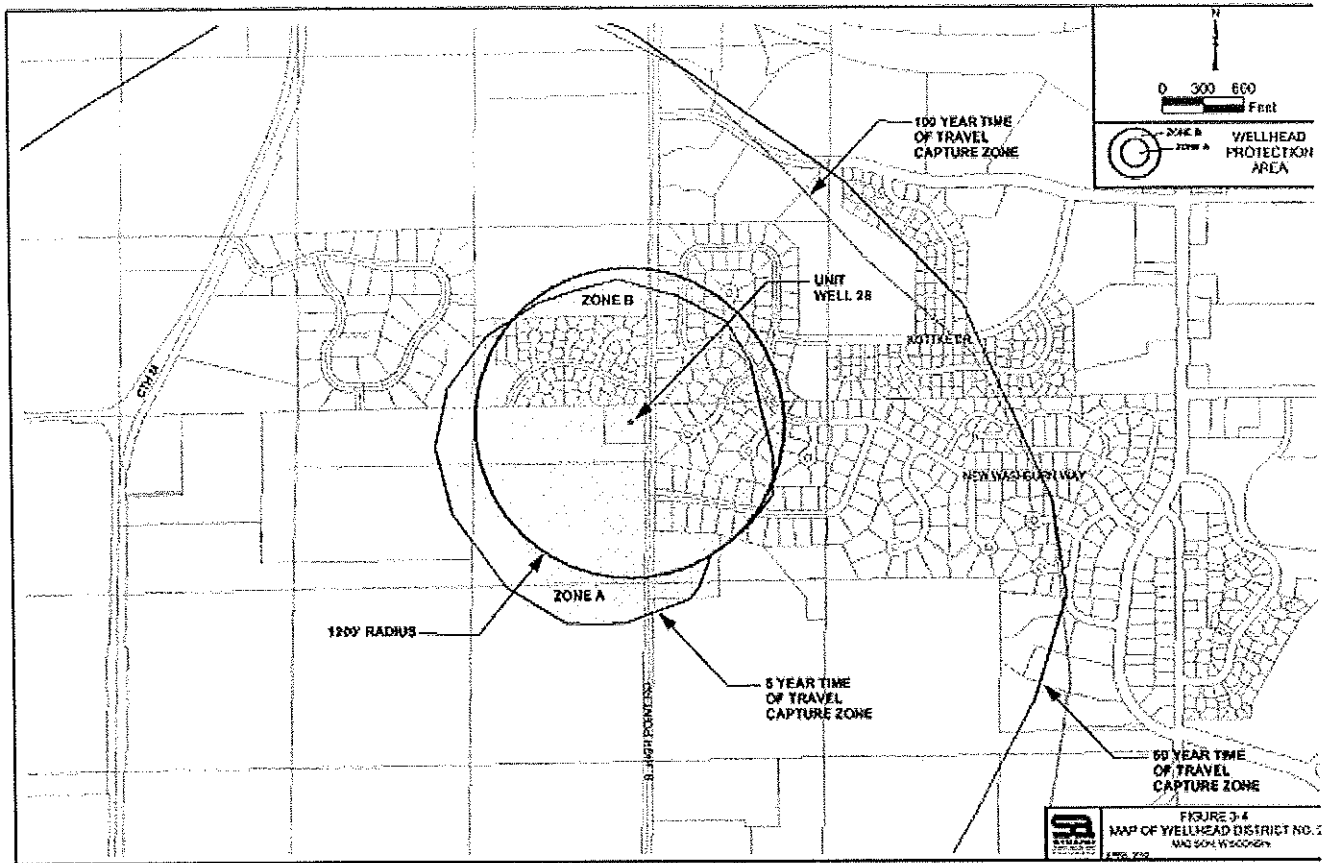
- (1) Statement of Purpose. The Common Council of the City of Madison finds that certain uses can seriously threaten or degrade groundwater quality. To promote the public health, safety, and general welfare of the City of Madison, the Wellhead Protection Districts are created to protect municipal water supplies.
- (2) Applicability. The requirements of the Wellhead Protection Districts shall apply to all zoning lots located in such districts in addition to all requirements in the Madison General Ordinances that apply to the principal zoning district classification of said zoning lots.
- (3) Protection Zones. Each wellhead shall have two (2) zones of protection around it.
  - (a) Zone A shall be the area around the well in which it has been determined that groundwater and potential contaminants will take five (5) years or less to reach the pumping well.
  - (b) Zone B shall be the smaller of the area around the well in which it has been determined that groundwater and potential contaminants will take one hundred (100 ) years or less to reach the pumping well, or the area within a twelve hundred (1,200) foot radius around the well, except for the area in Zone A.
- (4) Uses. All uses in Zones A and B of any Wellhead Protection District shall be approved by the Water Utility General Manger or his/her designee. A use may be approved with conditions. Approval by the Water Utility General Manager or his/her designee shall be in addition to all other approvals required for the proposed use.
  - (a) Permitted Uses In Zones A and B. Any use allowed as permitted in the principal zoning district, except those uses not approved pursuant to Sec. 13.22.
  - (b) Conditional Uses In Zones A and B. Any use allowed as a conditional use in the principal zoning district except those uses not approved pursuant to Sec. 13.22. All conditional uses are subject to the provisions of Sec. 28.12(11).
- (5) Existing Uses. Any lawful use existing at the time of the creation of a Wellhead Protection District may be continued, however, no expansion or enlargement of such use is allowed without approval pursuant to Sec. 13.22 by the Water Utility General Manager or his/her designee.
- (6) Wellhead Protection District No. 28. The location of Well No. 28 and the surrounding Zone A and Zone B are shown in Section 28.107(6)(a).
  - (a) Map of Wellhead District No. 28.



(Sec. 28.107 Cr. by Ord. 13,106, 7-23-02)

(7) Wellhead Protection District No. 26. The location of Well No. 26 and the surrounding Zone A and Zone B are shown in Sect. 28.107(7)(a).

(a) Map of Wellhead District No. 26.

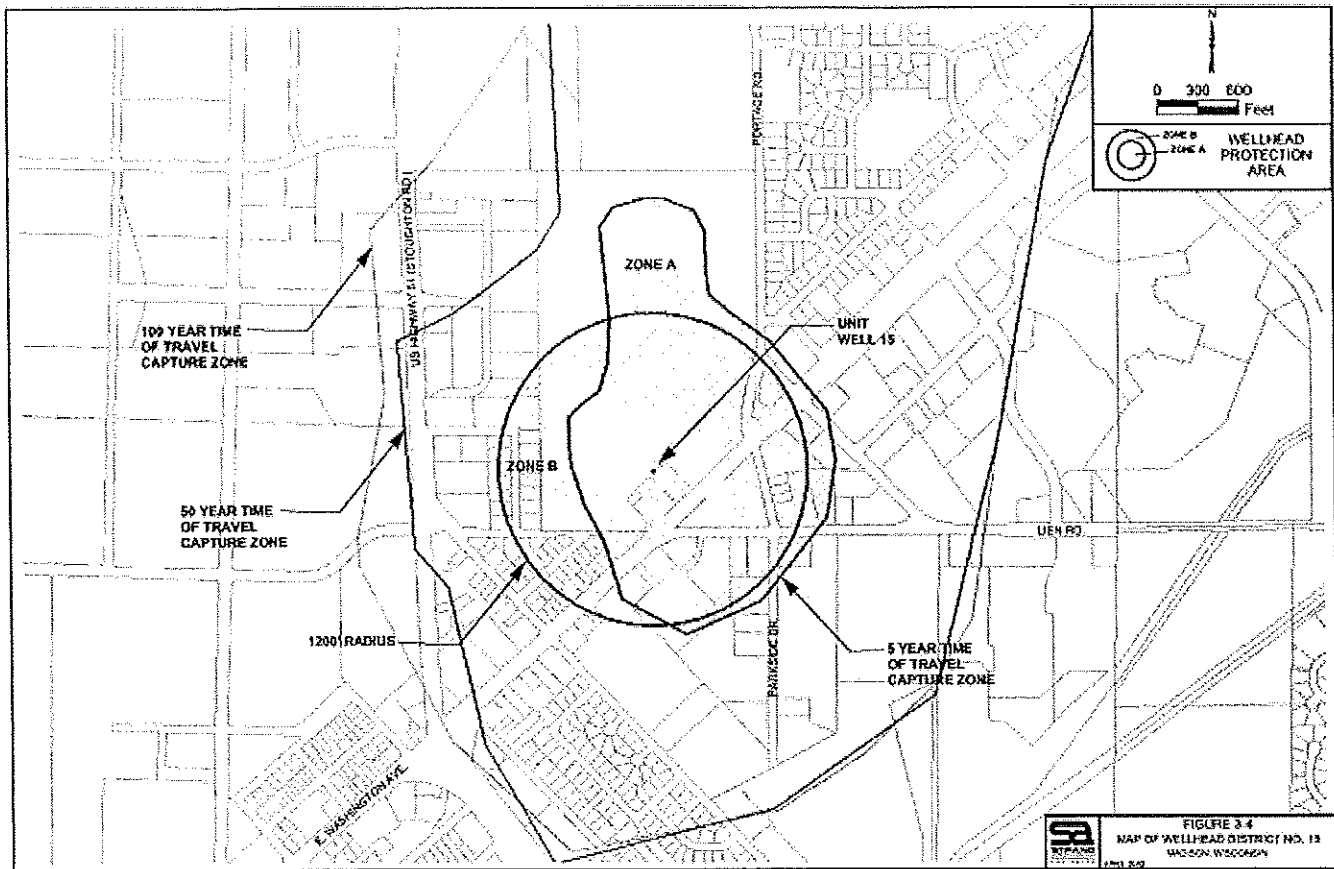


(Cr. by Ord. 13,503, 2-10-04)

(8) Wellhead Protection District No. 15. The location of Well No. 15 and the surrounding Zone A and Zone B are shown in Sect. 28.107(8)(a).

(a) Map of Wellhead District No. 15.

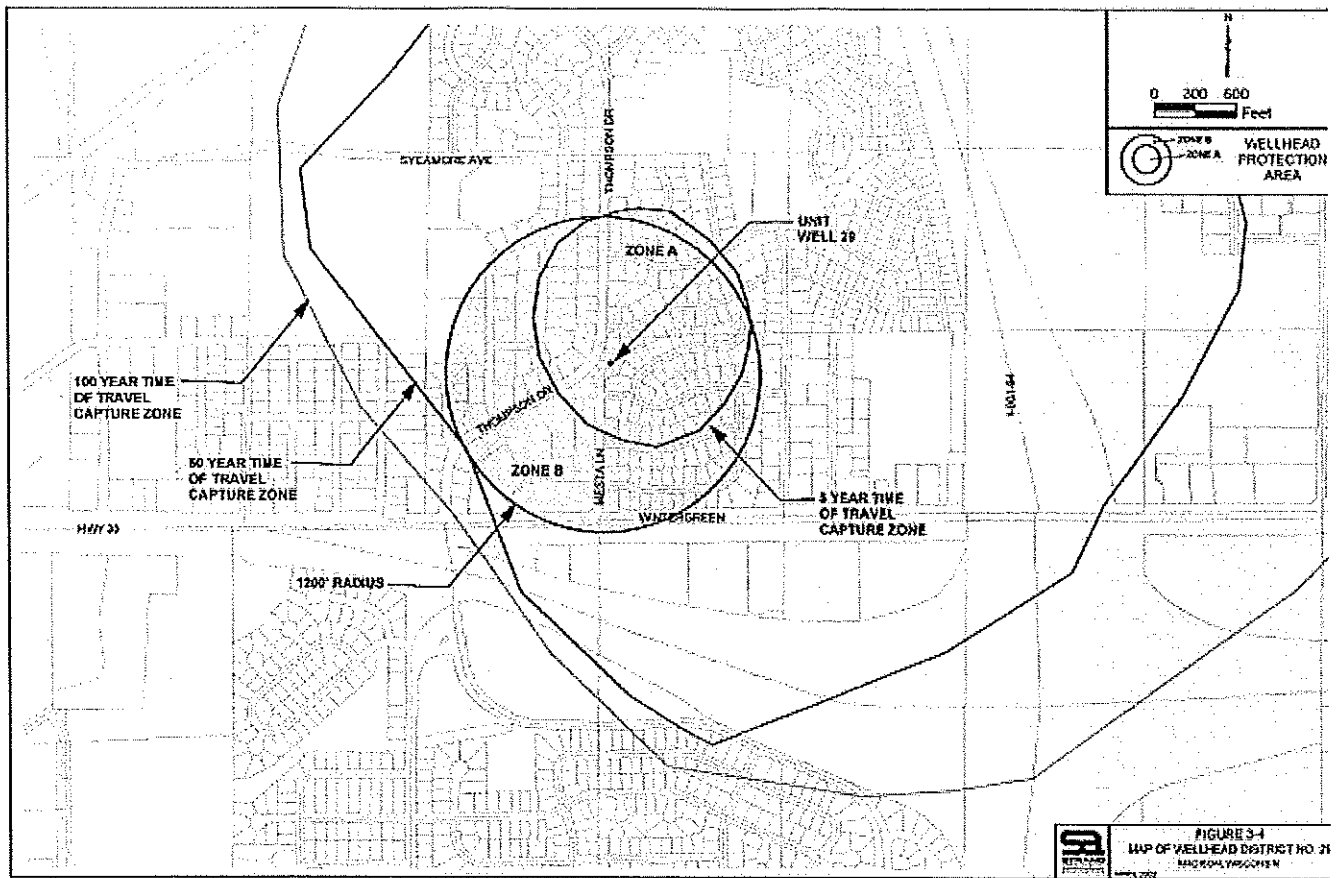




r. by Ord. 13,503, 2-10-04)

- (9) Wellhead Protection District No. 29. The location of Well No. 29 and the surrounding Zone A and Zone B are shown in Sec. 28.107(9)(a).

(a) Map of Wellhead Protection District No. 29.



(Cr. by Ord. 13,538, 3/17/04)

**APPENDIX N**

**WATER CONSERVATION INFORMATION**

# MADISON WATER UTILITY

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## Water Conservation and Groundwater Protection

Hydrologic studies have shown that the aquifer supplying Madison's water will support the community's projected water demands indefinitely, if we continue appropriate management and reasonable conservation measures--water to use and to protect! News elsewhere on the planet is not so favorable; [click here](#) for a link to a UW-Madison site on world water issues. [Click here](#) for a link to Madison Metropolitan Sewerage suggestions for safer ways to clean and care for our surroundings.

Go to: [Lawn and Garden](#) || [Plumbing](#) || [Practices](#)

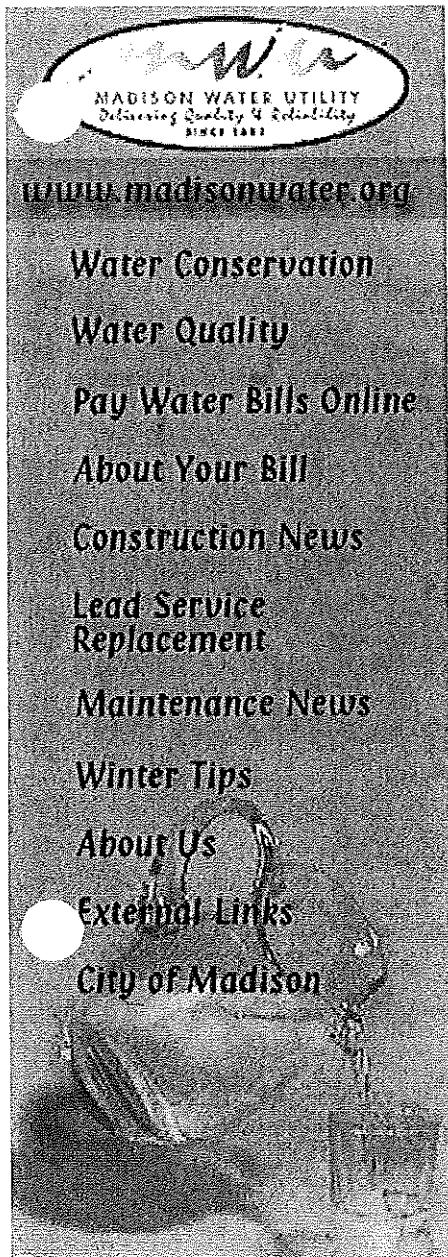
### Lawn and Garden

It's a perfect spring season so far--frequent light rains providing the best conditions for plant root development as perennials break dormancy, bulbs wink out of the earth, and shrubs and trees shake off dead wood prior to starting new growth.

We can remember **ONLY RAIN IN THE STORM DRAIN** this year! Help prevent nutrient and toxin runoff to our lakes and waterways by helping rain stay where it falls. As for the material that was plowed from streets that remains on the terraces--there isn't much salt or sand in it this year, since there weren't many snowfalls. So it's a good opportunity to let the terrace grow through it.

Go to: [Get good information](#) || [Have soil tested](#) || [Nutrients in fertilizer and green waste](#) || [Phosphorus ban](#) || [Spreader](#) || [Check weather](#) || [Watering](#) || [Best type of grass for your lawn](#) || [Clippings](#) || [Native plant landscaping](#) || [Weed control](#) || [Pest control](#) || [Rain gardens](#)

- **Get good information.** There are good ways to care for a traditional lawn and garden with limited watering and chemical use, and there are good alternatives to traditional practices. *The Utility observes a no-fertilizer, no-pesticide (including no-herbicide) policy for its facilities.* Poor grass growth often has more to do with shade and compaction than with lack of nutrients, lack of water, or the presence of weeds or insects. Good practices allow the best use of water and suppress weeds.



#### MADISON WATER UTILITY

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- **Have soil tested to see whether nutrient levels are deficient before applying fertilizer.** (*UW Extension Soil and Plant Analysis Lab, 262-4364, tests soil samples for nutrients, pH (acidity/alkalinity) and content of organic matter. The cost is \$15.*) With few exceptions, residential soil tests in Madison show no nutrient deficiencies and high levels of most nutrients, particularly phosphorus.

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- **Nutrients in fertilizers and green waste, whether commercial chemical fertilizers, organic fertilizers, composted materials or leaves and plant materials washed into storm sewers, can contaminate surface waters and groundwater: ONLY RAIN IN THE STORM DRAIN!** A soil test reveals whether supplementation is needed, and if so what nutrients, in what amounts, may be recommended. **Most soils in our area are not deficient in nitrogen, phosphorus or potash.** If you just don't feel right about not complying with merchandisers' messages that you must fertilize, try applying 1/3 or 1/2 the amount recommended on the container or bag--less if you are limiting watering--and apply it in the fall. A commercial fertilizer labeled 15-3-3 contains 15% nitrogen, 3% phosphate and 3% potash--and 79% other unspecified components. Fertilizers with a high proportion of Water Insoluble Nitrogen (WIN) are more costly but release nutrients more slowly. They help prevent "burn" on the lawn and limit the potential for groundwater contamination--a good long-range value. Potential advantages of using composted garden materials as a source of nutrients include that good compost can serve as moisture-conserving and temperature-moderating mulch. Heavy metals and other unnamed materials that may be present in commercial products may also be avoided.
- **What does the phosphorus ban mean?** Madison and Dane County now limit the sale of lawn fertilizers containing phosphorus in an effort to reduce phosphorus runoff to area lakes. Phosphorus in the soil is required for flower development--but there's usually plenty of phosphorus already there, and lawn grasses aren't grown for flowers or seeds. We may see little difference in existing lawns as a result of the change. **Get the facts for your lawn and garden--have the soil tested.** Allow grass clippings to fall back on to the lawn (making sure they stay on the lawn and aren't washed into the storm sewer). These and other recommended cultural practices may more than make up for the absence of phosphate in purchased lawn fertilizers.

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- **If you do fertilize and use a spreader, clean it after each use--over a grassy area well away from the storm sewer.**
- **Check weather reporting or buy a rain gauge to monitor whether watering in addition to rain is needed.** Garden centers and UW Extension offices have good information, as does Greater Madison Healthy Lawn Team (<http://www.healthylawnteam.org>). Most lawn experts agree that an established lawn requires only an inch of water per week to remain healthy and active. During drought, turfgrass plants need only 1/4 inch of water per month to survive.
- **If lawn and garden do need water, scheduling watering before 8 a.m. or after 8 p.m. can minimize water lost to evaporation.** Avoid watering when it's windy. Position the sprinkler to avoid losing water on driveway or sidewalks. Slow water flow will provide better use of the water than heavy sprinkling that the ground can't absorb. Using a soaking-type system further minimizes water loss. Water less frequently,

slower and deeper for optimum lawn and garden health. *Aerate the lawn to make the surface less impervious and to encourage root growth--rent a serious aerator that removes plugs and drops them back on the lawn, and do so several times a season.* If you do apply fertilizer, water it in lightly immediately afterward to prevent later runoff. In garden plantings, use mulches to reduce weed growth and evaporation.

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- **Consider the type of grass best-suited for your lawn**--for example, fescues may perform better than Kentucky bluegrass in our area. Seed with a mix of the best-available varieties of fescues, perennial ryegrass and Kentucky bluegrass, in descending order of quantity, mulch with clean straw, and fuss over the plantings in critical early stages. Mow to a height of two to three inches to encourage healthier plants, shade the soil and reduce evaporation of moisture. Sharpen mower blades frequently, and avoid removing more than 1/3 the length of the grass at one mowing. (Mowing cuts the leaf portion of the grass plant growing up from the stem at the plant's base.) And consider that in their untended cycles grasses become dormant in extremely hot and dry conditions. We can artificially extend their optimal seasons of cool and damp conditions, but the environmental cost for doing so may be high. *An alternative? Try white clover in the lawn. It stays green through conditions when grasses go dormant, it fixes nitrogen in the soil, and it doesn't mind being trampled. Its flowers may attract bees, so if that's a concern keep it mowed.*

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- **Leave clippings** for natural enrichment and to minimize evaporation. Spread out any big clumps of clippings. "Thatch" in the lawn isn't made up of grass clippings, it's a layer of living and dead stems and roots that develop at the surface. It isn't all bad, only too-great development of thatch is bad. Excess fertilization, soil compaction and shallow watering encourage excess thatch. The slight enrichment of grass clippings encourages healthy plant growth without adding to a thatch barrier at the surface.

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- **Landscape with plants native to our area** that don't require a lot of watering. Check with your favorite garden center, mail-order source, gardening society or farmers' market vendor (and see the section on Rain Gardens, below, for a helpful link). [Click here](#) for a comprehensive plant listing.
- **Lawn weed control** measures based on *good mowing, watering and nutrient monitoring practices* can be effective and satisfying! Digging dandelions down to 4-5 inches of root in spring before the big first bloom has big effects in limiting their growth and spread, particularly if followed up with a second or third digging. If you do want to use chemicals--and if you still do after reading the label, read the label again. Try one of the new corn syrup based weedkilling products. Consider spraying individual dandelions rather than applying a fertilizer-herbicide blend to the entire lawn. Keeping the lawn at least two inches tall shades out crabgrass, and crabgrass is usually not a problem in shade. Avoid applying fertilizer in July and August, when cool-weather grasses are at least partially dormant and nutrients will encourage crabgrass. And to kill a weed? Full-strength household vinegar.

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- **Pest control:** *Know which insects are beneficial, which are in fact damaging plants, and which are just passing through.* And try the least-persistent, least-toxic remedies--insecticidal soap; a solution of dish soap and oil in water sprayed on shelled insects; isopropyl alcohol on aphids; a 1:9 milk:water solution to kill plant mildew; hand picking. Share your good ideas for your yard with your neighbors. Read labels. Buy the smallest size container of any chemical, so that you aren't warehousing scary stuff. And think about where the scary stuff used is going.
- **Rain Gardens--It's All Downhill From Here:** Rain garden plantings help manage the runoff of water displaced by buildings, paved areas, and compacted planted areas. Such runoff carries sediments, yard wastes, pesticides and nutrients into surface water and eventually ground water. Let's aim for **ONLY RAIN IN THE STORM DRAIN!** Rain gardens can manage 30% more water than lawn, using the garden plants' processing of water to slow and filter the runoff. Even small city properties can provide such plantings to deal with water from downspouts, other roof drainage, driveway and lawn--and use areas already dedicated to flower gardens with "rain garden" goals in mind. Effective rain gardens should be sited more than ten feet away from a building's foundation, and areas that don't drain well aren't good prospects unless they're improved by digging down to provide a base of rock, gravel and sand under the soil and plantings. But small rain gardens with appropriate plants can be put in place to provide a buffer between higher- and lower-elevation impervious areas. They're not prairies, though native plants are important in rain garden plantings, with their hardiness even in the face of sometimes-harsh city conditions. Which plants? Comprehensive descriptions of [rain garden plants](#) for our area, their light and soil requirements, height, color, season of bloom and other qualities (such as attractiveness to butterflies or birds) are provided at this link. UW Extension's brochure on rain gardens is available by calling 608/262-3346 or [online at this link](#).

## Plumbing

Go to: [Drip Calculator](#) || [Repair leaky faucets](#) || [Toilet links](#) || [Backflow prevention devices](#)

[Check a drip calculator](#)

- **Repair leaky faucets.** At one drop a second, a leaky faucet wastes more than 3000 gallons of water in a year. Most leaks are easily repaired with basic know-how and simple tools. Good reference books and articles are available, hardware store and home center staff can be very helpful--and the cost of a plumber may be minor compared to the costs of damage.
- **Listen and watch for toilet leaks.** Many can be heard. To test for "flapper" leaks, put a coloring agent--food coloring, egg dye or other water-soluble color--in the toilet tank, and check to see whether any of the color leaks into the toilet bowl within ten minutes. Flapper replacement is the most common

remedy for such leaks. Check float ball assemblies for corrosion of metal components that may prevent the shutoff of water refilling the tank so that it runs over into the overflow pipe; such leaks won't show in a dye test but can cause great water loss.

- **Install Backflow prevention devices** on outdoor faucets, sprinkler system, and laundry tubs, or any other threaded faucet. The devices, available in most hardware stores, prevent possible contamination by reverse flow of products used in the home or garden into the water distribution system.

## Practices

[Go to: Install water-saving devices](#) || [Use efficient settings](#) || [Use of the tap](#) || [General H2O habits](#) || [Electrical energy](#).

- **Install water-saving devices.** Aerators for kitchen and bath taps, flow regulators for shower heads and toilet tanks, and displacement devices to reduce the amount of water used in older toilets can make significant reductions in water used. Use automatic shutoff attachments on hoses, and don't let the water run unnecessarily while washing the car or for other outdoor uses.
- **Use the most efficient settings** for dishwashers and clothes washing machines. Full loads are often the most efficient. When it's time to replace appliances, consider water efficiency in your choice.
- **Turn off the tap** when not actively rinsing toothbrush or razor.
- **Think of practices** and habits that might be changed to make a difference. Can showers be shorter? Sidewalk and driveway swept rather than hosed?
- **Electrical energy** is needed to pump water from the well and send it to our homes and work places. Conserving energy and water is critical during electrical power shortages. When it's time to replace appliances, purchase more energy-efficient and water-efficient ones. ([Click here for information on Energy Star appliances](#) and Focus on Energy.) Activities that use significant amounts of water--both indoors and outdoors--can be timed to help manage periods of high demand for electricity.

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## Environmental Initiatives: Water Conservation

### Other Resources:

- [City of Madison Water Quality Initiatives](#)
- [Sustain Dane](#)
- [My Fair Lakes.com](#)
- [Dane County Rain Garden Information](#)
- [UW Extension Home & Garden](#)



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## Water Conservation Tips

- **Good Watering Practices**
  - Don't water the pavement. Position sprinklers so that water lands on the lawn or garden, not in areas where it is not needed.
  - Check weather reporting or buy a rain gauge to monitor whether watering in addition to rain is needed; most established lawn and garden plantings do well on an inch of water per week.
  - During drought, turf grass plants need only 1/4 inch of water a month to survive. If lawn and garden do need water, limit loss to evaporation.
  - Water before 8:00 a.m. when it isn't windy, position a sprinkler to avoid losing water on driveway or sidewalks, and water slowly so the soil can absorb the water.
  - Water the lawn only when needed. Step on the grass; if it springs back up when you move your foot, it does not need water.
  - Water less frequently and thoroughly. A good soaking is better than watering frequently and will allow the roots to grow to greater depths and help make turf more drought tolerant. Lawns need about 1 inch per week. Hint: Place 3-5 empty tuna or cat food cans at varied distances from the sprinkler. The time it takes to fill the cans is about how long you should water your lawn.
- **Collect rainwater in a rain barrel or cistern**
  - Water that runs off of hard surfaces such as your roof can be collected and reused to water plants. Rain water is "soft," without groundwater minerals or municipal treatment, so it's more plant-friendly than tap water. Capturing water from gutters and downspouts in a well-designed rain barrel conserves the municipal supply while providing the best water for lawn and garden. To learn more, go to: [Sustain Dane](#), <http://www.sustaindane.org/>
- **Only Rain In The Storm Drain!**
  - Everything from our streets drains to surface waters and someone's ground water, so we need to try to keep plant material, toxins and debris

out of the storm sewers.

- **Rain gardens**

- Manage rainfall on your property as much as possible, using the contour of the area and plantings to slow down the flow of water, use it and offer it back to the atmosphere. To learn more, go to the City of Madison Engineering, Water Quality Initiatives, <http://www.cityofmadison.com/engineering/stormwater/>