APPENDIX A

WISCONSIN ADMINISTRATIVE CODE,
WELLHEAD PROTECTION PLAN
WELL HEAD PROTECTION PLAN. A well head protection plan shall be provided for all new wells for municipal water systems. The owner of the municipal water system or its agent shall develop the plan. No new municipal well may be placed into service until the department has approved the well head protection plan. The plan shall include all of the following:

(a) Identification of the groundwater flow direction.

(b) Identification of the zone of influence for the well consisting of the distance to one foot of aquifer drawdown at the anticipated final pumping rate when pumpage of the well is assumed to be continuous without recharge for 30 days. The zone of influence shall be calculated using the Theis Method with or without groundwater modeling unless another method is approved by the department.

(c) Identification of the recharge area for the well. The recharge area shall be calculated using the Uniform Flow Equation or be computer modeled unless another method is approved by the department. *Note: A copy of A Template For Preparing Well Head Protection Plans For Municipal Wells, in which use of the Uniform Flow Equation is discussed, may be obtained from the department.*

(d) Identification of the potential contamination sources within 0.5 mile of the well location and an assessment of the potential for the existing contamination sources within the recharge area of the well to negatively impact the well water quality. The potential contamination sources shall be summarized in a table or list including distance and direction from the well site and shall also be shown on a map surrounding the well site. The table or list shall include information obtained by checking the department's database of contaminated properties, established in accordance with ss. 292.12 (3), 292.31 (1), and 292.57, Stats. *Note: The department's database of contaminated properties, established in accordance with ss. 292.12 (3), 292.31 (1), and 292.57, Stats., can be found on the department's Bureau for Remediation and Redevelopment internet web site. The Bureau for Remediation and Redevelopment Tracking System (BRRTS) is an on-line database that provides information on areas of known contaminated soil or groundwater and tracks the status of the cleanup actions. RR Sites Map is the program's geographic information system that provides a map-based system of contaminated properties in Wisconsin. Information that appears on the RR program's database and GIS applications can also be obtained by contacting the regional drinking water staff person responsible for the water system. A copy of A Guide For Conducting Potential Contaminant Source Inventories For Wellhead Protection may be obtained from the department.*

(e) Establishment of a well head protection area for the proposed well. The well head 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 well head protection area may be determined by a hydrogeologic investigation.

(f) A public education program for well head 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, which assesses alternatives for addressing potential contamination sources, describes the local ordinances, zoning requirements, monitoring program, and other local initiatives proposed within the well head protection area established in par. (e), and addresses maintaining the minimum contamination source separation distances established by well siting in sub. (5) (d). *Note: A copy of Example Wellhead Protection Ordinances may be obtained from the department's Bureau of Drinking Water and Groundwater located in Madison.*

(j) The well head protection plan shall be labeled with the name and signature of the person who prepared the plan, the date that the plan was signed, and the name of the company or water system which the person represents. An owner approval letter shall be submitted when required in accordance with s. NR 811.10.

[https://docs.legis.wisconsin.gov/code/admin_code/nr/800/811/II/12](https://docs.legis.wisconsin.gov/code/admin_code/nr/800/811/II/12) - accessed June 1, 2013
APPENDIX B

SURVEY PLAT - UNIT WELL 07
GLYDE A GALLAGHER PLAT OF SHERMAN AVE., SUBD.

LOT 5

LOT 4

BLOCK 1

Possible Future
Suction Well

PUMP HOUSE

Driveway

136.5

30'

6 1/2'

SHERMAN AVE.
PROPERTY SEARCH RESULTS: LEGAL DESCRIPTION

OWNER(S)
CITY OF MADISON
WATER UT
WELL # 7
119 E OLIN AVE
MADISON, WI 53713-1431

PROPERTY ADDRESS: 1613 N Sherman Ave
Parcel Number: 081031215016
Information current as of 12/3/11 12:00AM

(Notice: This description may be abbreviated and is for assessment purposes only. It should not be used to transfer property)

Lot Number: 0
Block: 0

CLYDE A. GALLAGHER'S SHERMAN AVENUE. SUBDIVISION, BLK 1, LOTS 4 & 5.

RELATED DETAILS
• Pay Taxes Online
• Sales for this Area
• Refuse Collection
  ◦ District: 09A
  ◦ Schedule

SCHOOL DETAILS
District: Madison
• Emerson
• Sherman
• East

CITY HALL
Aldermanic District: 12
Ald. Satya Rhodes-Conway
• Who are my elected officials?
• Where do I vote?
APPENDIX C

UNIT WELL 07 CONSTRUCTION REPORT AND FORMATION LOG
<table>
<thead>
<tr>
<th>Depth</th>
<th>Interval</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>5</td>
<td>Clay, brown</td>
</tr>
<tr>
<td>5-30</td>
<td>25</td>
<td>Till, sandy, yellow-gray</td>
</tr>
<tr>
<td>30-65</td>
<td>35</td>
<td>Sandstone, fine, yellow-gray, dolomitic</td>
</tr>
<tr>
<td>65-80</td>
<td>15</td>
<td>Sandstone, fine, light gray, dolomitic</td>
</tr>
<tr>
<td>80-100</td>
<td>10</td>
<td>Sandstone, fine, gray, pink, glauconitic, dol</td>
</tr>
<tr>
<td>90-110</td>
<td>20</td>
<td>Sandstone, fine to coarse, lt. gray, dol.</td>
</tr>
<tr>
<td>110-140</td>
<td>30</td>
<td>Sandstone, medium to fine, light gray</td>
</tr>
<tr>
<td>140-155</td>
<td>15</td>
<td>Sandstone, medium to fine, yel-gray, dol.</td>
</tr>
<tr>
<td>155-170</td>
<td>15</td>
<td>Sandstone, medium to fine, yellow-gray</td>
</tr>
<tr>
<td>170-185</td>
<td>15</td>
<td>Sandstone, medium to fine, yel.-gray, dol.</td>
</tr>
<tr>
<td>185-215</td>
<td>30</td>
<td>Sandstone, fine to medium, light gray, dolomitic</td>
</tr>
<tr>
<td>215-225</td>
<td>10</td>
<td>Shale, silt, y, pink, dolomitic</td>
</tr>
<tr>
<td>225-240</td>
<td>15</td>
<td>Sandstone, fine to silty, gray, dolomitic</td>
</tr>
<tr>
<td>240-250</td>
<td>10</td>
<td>Sandstone, medium to fine, gray, dol.</td>
</tr>
<tr>
<td>250-270</td>
<td>20</td>
<td>Sandstone, fine to medium, lt. gray, dolomitic</td>
</tr>
<tr>
<td>270-305</td>
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<td>Sandstone, medium to fine, light gray</td>
</tr>
<tr>
<td>305-315</td>
<td>10</td>
<td>Sandstone, medium to fine, lt. gray, dol.</td>
</tr>
<tr>
<td>315-325</td>
<td>10</td>
<td>Sandstone, medium to fine, light gray</td>
</tr>
<tr>
<td>325-365</td>
<td>60</td>
<td>Sandstone, fine to medium, light gray, dolomitic</td>
</tr>
<tr>
<td>365-395</td>
<td>10</td>
<td>Sandstone, medium to fine, light gray</td>
</tr>
<tr>
<td>395-425</td>
<td>30</td>
<td>Sandstone, fine to medium, light gray, dolomitic</td>
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<tr>
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<td>Sandstone, fine to medium, light gray</td>
</tr>
<tr>
<td>440-450</td>
<td>10</td>
<td>Sandstone, fine to medium, lt. gray, dol.</td>
</tr>
<tr>
<td>450-480</td>
<td>30</td>
<td>Sandstone, medium to fine, light gray, dolomitic</td>
</tr>
<tr>
<td>480-495</td>
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<td>Sandstone, coarse to fine, light gray</td>
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<tr>
<td>495-540</td>
<td>45</td>
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<td>540-580</td>
<td>40</td>
<td>Sandstone, fine to coarse, light gray</td>
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<td>580-595</td>
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<td>595-600</td>
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<td>Sandstone, fine, pink</td>
</tr>
<tr>
<td>600-665</td>
<td>65</td>
<td>Sandstone, fine, light gray</td>
</tr>
<tr>
<td>665-690</td>
<td>25</td>
<td>Sandstone, medium to fine, light gray</td>
</tr>
<tr>
<td>690-700</td>
<td>10</td>
<td>Sandstone, fine to medium, light pink</td>
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<tr>
<td>700-725</td>
<td>25</td>
<td>Sandstone, fine to coarse, light gray</td>
</tr>
<tr>
<td>725-736.8</td>
<td>17</td>
<td>Granite, red, decomposed</td>
</tr>
</tbody>
</table>

Operations: Drift; Fremont (formerly Lazenby); Drubach (Galena Valley); Eau Claire; Mt. Simon; Pre-Cambrian. Total: 1,137 feet to 1,140 feet. Shot 540: 220#/60#, 175', 43' water. Shot 675: 200#/175', 34', 37' water. Shot 710: 220#/175', 34', 37' water.
Well Construction Reports

WI Unique Well No: BF507  High Capacity Well No: 57712
County Well Location: Dane  DNR Region: South Central
County: Dane  Muni Type: C
Municipality: MADISON  Construction Type: 1
DNR Received Date: 01/01/1939
Constructor Address: 2700 E 80TH ST  Constructor City: BLOOMINGTON
Constructor State: MN  Constructor Zip: 55425-1322
Status: New Well  Original Year:
Replacement Reason: Previous WI Well No:
Replacement WI Well No: 1
Other Const. Type: Category: Municipal/Community
Well Depth: 736 ft  # Services:
Facility Type: Highest Point on Property:
In Floodplain:
Rotary - Air:
Reverse Rotary:
Cable Bit Diameter: in  Temp Outer Casing:
Temp Casing Diameter: in  Temp Casing Removed:
Why not removed?: Other Drilling method:
Other Drilling Description:
Screen Diameter: Screen From:
inches  feet
Screen To: feet
Static Water level: 43 feet  Pumping level: 137 feet
Pumping at: 1750  Pumping units:
For: Hour(s)  Well Starting Depth: 0 inches
Developed: Disinfected:
Capped: Proper Seal:
Seal Description:
Rig Operator Signed on:
Common Well Number: 007  Geologic Log Number:
DNR Facility ID: 113022470  Calculated Specific Capacity: 186
Well Name: SHERMAN AVE #7
Water Quality Comments:
Drilling Difficulty:
Exception Areas:
Distances in Feet to Nearest Objects
No Records returned
# Drillhole Dimensions

<table>
<thead>
<tr>
<th>Diameter (in)</th>
<th>From Depth (ft.)</th>
<th>To Depth (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>0</td>
<td>40.7</td>
</tr>
<tr>
<td>23</td>
<td>40.7</td>
<td>237.6</td>
</tr>
<tr>
<td>16</td>
<td>237.6</td>
<td>736.8</td>
</tr>
</tbody>
</table>

# Casing & Liner

<table>
<thead>
<tr>
<th>Diameter (inches)</th>
<th>Description</th>
<th>From Depth (ft.)</th>
<th>To Depth (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td></td>
<td>0</td>
<td>40.7</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td>40.7</td>
<td>237.6</td>
</tr>
</tbody>
</table>

# Grout or Other Sealant Materials

<table>
<thead>
<tr>
<th>Kind of Sealing Material</th>
<th>From Depth (ft.)</th>
<th>To Depth (ft.)</th>
<th>Amount</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEMENT</td>
<td>0</td>
<td>237.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

# Geology

<table>
<thead>
<tr>
<th>Geology</th>
<th>Geology Description</th>
<th>Driller's Description</th>
<th>USGS Code</th>
<th>From Depth (feet)</th>
<th>To Depth (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-C</td>
<td>Tan/Brown; Clay;</td>
<td>CLAY</td>
<td></td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Y-TS</td>
<td>Yellow; Till; Sandy;</td>
<td>TILL</td>
<td></td>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td>-NNL</td>
<td>Fine; Sandstone; Limey or Dolomitic;</td>
<td>SANDSTONE FRANCO</td>
<td></td>
<td>30</td>
<td>110</td>
</tr>
<tr>
<td>--N--</td>
<td>Sandstone;</td>
<td>SANDSTONE DRESB</td>
<td></td>
<td>110</td>
<td>170</td>
</tr>
<tr>
<td>--NL</td>
<td>Sandstone; Limey or Dolomitic;</td>
<td>SANDSTONE EC</td>
<td></td>
<td>170</td>
<td>215</td>
</tr>
<tr>
<td>P-IM</td>
<td>Pink; Shale; Silty;</td>
<td>SHALE EC</td>
<td></td>
<td>215</td>
<td>225</td>
</tr>
<tr>
<td>G-NL</td>
<td>Gray; Sandstone; Limey or Dolomitic;</td>
<td>SANDSTONE EC</td>
<td></td>
<td>225</td>
<td>480</td>
</tr>
<tr>
<td>--N--</td>
<td>Sandstone;</td>
<td>SANDSTOE MT SIMON</td>
<td></td>
<td>480</td>
<td>725</td>
</tr>
<tr>
<td>-DQ--</td>
<td>Decomposed/Weathered; Granite;</td>
<td>GRANITE PC</td>
<td></td>
<td>725</td>
<td>736</td>
</tr>
</tbody>
</table>
## Samples

<table>
<thead>
<tr>
<th>Sample Date</th>
<th>Collected By</th>
<th>Description</th>
<th>Laboratory</th>
<th>Lab Sample ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/30/1993</td>
<td>AFC</td>
<td>MADISON WATER UTILITY</td>
<td>Wisconsin State Laboratory of Hygiene</td>
<td>ID110653</td>
</tr>
<tr>
<td>08/23/1993</td>
<td>DUKES-WINTERS</td>
<td>1709 N. SHERMAN AVE. DISCHARGE BOOSTER PUMP SAMPLE TAP</td>
<td>Wisconsin State Laboratory of Hygiene</td>
<td>IE005449</td>
</tr>
<tr>
<td>04/29/1994</td>
<td>CASTILLO</td>
<td>1709 N SHERMAN AVE BOOSTER PUMP SAMPLE TAP</td>
<td>Wisconsin State Laboratory of Hygiene</td>
<td>IE024286</td>
</tr>
</tbody>
</table>

Records 1 to 3 of 3

- Abandonment (0 Rows)
- Variances (0 Rows)
- Rehabilitation/Redevelopment (0 Rows)

### Other DNR information on this Well
- Public Water Supply System
- Groundwater Retrieval Network Data

Last Revised: 01/28/2009
Hicap Well Report

County: 13 Dane
Region: 1 South Central Region
Basin: MRB Mississippi River

Owner ID: 81511
Mail To: OWNER
Phone: - -
Email: 

Owner Well No: 8007
Hicap No Pump Code: 
QQ: SW Q: NW Sect: 31 Township: 8 Range: 10 Dir: E Govt Lot: 
Method: 
Latitude: Deg Min Method: 
Longitude: Deg Min Location Tolerance (ft): 

Civil Town Name: MADISON(CITY OF)
Street Addr: 709 NORTH SHERMAN
City: 
Well Name: BF507-CITY WELL #7-193
Comment: 

Classification: 9 Public Water Supply
Well Use: 
Status: 0 ACTIVE
Status Date: 

Normal Pumpage: 620 (1000 gpd)
Max Pumpage: 3240 (1000 gpd)
Pump Capacity: 2250 (gpm)

Trout Stream: (FT) (Miles)
ERW/ORW: (FT) (Miles)
Spring: (FT) (Miles)
Protected Spring: 

File Location: PUBLIC H2O
Driller: 391 MC CARTHY WELL CO

Well Depth: 736.8
Depth to Rock: 30
First Rock Code: 05 Sandstone

Geology

<table>
<thead>
<tr>
<th>Geology</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Unconsolidated Sand</td>
</tr>
<tr>
<td>02</td>
<td>Unconsolidated Clay</td>
</tr>
<tr>
<td>09</td>
<td>Cambrian</td>
</tr>
<tr>
<td>10</td>
<td>Pre-Cambrian</td>
</tr>
</tbody>
</table>

Diameter (IN) Length(ft) Depth(ft)

| Enlarged Drillhole: | 23 |
| Lower Drillhole:    | 16 | 499.2 |
| Primary Casing:      | 18 |
| Liner Casing:        | 
| Screen:              | 
| Sealing:             | 

Yield Test Hours: 
Static Water Level: 43 feet
Gallons per minute: 2250
Pumping Water Level: 137 feet
Specific Capacity: 18.6
Pumpage Report Flag: 

Created: 12/29/98 By: Migration Last changed: 02/10/99 By: RODDAC
APPENDIX D
CITY OF MADISON ZONING MAP
APPENDIX E

POTENTIOMETRIC SURFACE - LOWER BEDROCK (MOUNT SIMON) AQUIFER AND AREAS OF RECHARGE AND DISCHARGE
Figure E-1. Simulated 2000 heads in Mt. Simon aquifer. Contours in feet above mean sea level (msl).
Areas of recharge to and discharge from the Mount Simon aquifer, based on water level measurements.
A: Areas of recharge; B: areas of discharge.

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

POTENTIOMETRIC SURFACE - WATER TABLE ELEVATION
Figure F-1. Simulated 2000 water table. Contours in feet above mean sea level (msl).
APPENDIX G

DISTANCE-DRAWDOWN CALCULATION
(ZONE OF INFLUENCE)
Appendix G - Distance Drawdown Calculations - Unit Well 07

By Specific Capacity Method - Calculate Transmissivity:
\[
\frac{Q}{s} = \frac{T}{2000}
\]
\[
\frac{2250}{94} = \frac{T}{2000} \text{ (confined aquifer conditions)}
\]
\[
T = \frac{47,872 \text{ gpd/ft}}{2000}
\]

By Theis Equations:
\[
\frac{Q}{s} = \frac{T}{114.6 \times W(u)}
\]
\[
- \text{ And -}
\]
\[
u = \frac{1.87 \times r^2 \times S}{T \times t}
\]

- Where -
\[
T = 47,872 \text{ gpd/ft} \quad \text{Transmissivity by Specific Capacity Method}
\]
\[
Q = 2250 \text{ gpm} \quad \text{Pumping Rate (WI-DNR Hicap Well Report)}
\]
\[
s = 94 \text{ ft} \quad \text{Drawdown (WI-DNR Hicap Well Report)}
\]
\[
S = 0.0003 \quad \text{Storage Coefficient (Bradbury, 2001)}
\]
\[
t = 30 \text{ days} \quad \text{Time}
\]
\[
r = \text{ft} \quad \text{Distance From Well}
\]
\[
W(u) = \text{Value corresponding to "u" value in Groundwater and Wells Appendix}
\]

Drawdown at Various Distances After 30 Days:

<table>
<thead>
<tr>
<th>Radius, r (ft)</th>
<th>u</th>
<th>W(u)</th>
<th>Drawdown, s (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>3.91E-06</td>
<td>11.9</td>
<td>52.575</td>
</tr>
<tr>
<td>250</td>
<td>2.44E-05</td>
<td>10.1</td>
<td>44.622</td>
</tr>
<tr>
<td>500</td>
<td>9.77E-05</td>
<td>8.7</td>
<td>38.437</td>
</tr>
<tr>
<td>750</td>
<td>0.00022</td>
<td>7.8</td>
<td>34.461</td>
</tr>
<tr>
<td>1000</td>
<td>0.000391</td>
<td>7.3</td>
<td>32.252</td>
</tr>
<tr>
<td>2500</td>
<td>0.002441</td>
<td>5.5</td>
<td>24.299</td>
</tr>
<tr>
<td>5000</td>
<td>0.009766</td>
<td>4.1</td>
<td>18.114</td>
</tr>
<tr>
<td>5280</td>
<td>0.01089</td>
<td>4</td>
<td>17.672</td>
</tr>
<tr>
<td>10000</td>
<td>0.039063</td>
<td>2.7</td>
<td>11.929</td>
</tr>
<tr>
<td>20000</td>
<td>0.15625</td>
<td>1.4</td>
<td>6.185</td>
</tr>
<tr>
<td>30000</td>
<td>0.351563</td>
<td>0.79</td>
<td>3.490</td>
</tr>
<tr>
<td>40000</td>
<td>0.625</td>
<td>0.43</td>
<td>1.900</td>
</tr>
<tr>
<td>50000</td>
<td>0.976563</td>
<td>0.23</td>
<td>1.016</td>
</tr>
<tr>
<td>134000</td>
<td>7.014063</td>
<td>0.0001155</td>
<td>0.001</td>
</tr>
<tr>
<td>135000</td>
<td>7.119141</td>
<td>0.0001032</td>
<td>0.000</td>
</tr>
</tbody>
</table>

* = 25.57 mi

Radius Cone of Depression (1 ft Drawdown After 30 Days of Continuous Pumping):
\[
\frac{Q}{s} = \frac{T}{114.6 \times W(u)}
\]
\[
- \text{ Equals -}
\]
\[
W(u) = \frac{s \times T}{114.6 \times Q}
\]
\[
- \text{ Set Drawdown to 1 and Solve -}
\]
\[
W(u) = \frac{1 \times 47872}{114.6 \times 2250}
\]
\[
W(u) = 0.18566
\]
\[
\text{Therefore: } u = 1.1
\]
\[
\text{Therefore: } r = 53,066 \text{ ft}
\]
\[
r = 10.05 \text{ mi}
\]
APPENDIX H

ULTIMATE ZOCS FOR MUNICIPAL WELLS IN DANE COUNTY
Fig. 2
Ultimate Zones of Contribution for Municipalities in Dane County, WI.

UNIT WELL 7

Source: Bradbury, 1998
APPENDIX I

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

Animal waste facilities
Asphalt products manufacturing
Auto body repair businesses
Auto sales & service
Auto salvage yards (junk yards)
Bus or truck terminals
Commercial animal confinement facilities
Commercial bulk fertilizer and/or pesticide facilities (storage, mixing 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 products storage tanks
Unsewered residential, commercial, or industrial development
Vehicle repair shops
Wastewater treatment or disposal facilities
ZONE B – PROHIBITED USES

Animal waste facilities
Asphalt products manufacturing
Auto body repair businesses
Auto salvage yards (junk yards)
Bus or truck terminals
Commercial animal confinement facilities
Commercial bulk fertilizer and/or pesticide facilities (storage, mixing or loading)
Dry cleaning businesses/facilities
Electroplating businesses/facilities
Exterminating businesses/facilities
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 disposal facilities
<table>
<thead>
<tr>
<th>Source</th>
<th>Health, Environmental, or Aesthetic Contaminant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NATURALLY OCCURRING SOURCES</strong></td>
<td></td>
</tr>
<tr>
<td>Rocks and soils</td>
<td>Aesthetic Contaminants: Iron and iron bacteria; manganese; calcium and magnesium (hardness)</td>
</tr>
<tr>
<td></td>
<td>Health and Environmental Contaminants: Arsenic; asbestos; metals; chlorides; fluorides; sulfates; sulfate-reducing bacteria and other microorganisms</td>
</tr>
<tr>
<td>Contaminated water</td>
<td>Excessive sodium; bacteria; viruses; low pH (acid) water</td>
</tr>
<tr>
<td>Decaying organic matter</td>
<td>Bacteria</td>
</tr>
<tr>
<td>Geological radioactive gas</td>
<td>Radionuclides (radon, etc.)</td>
</tr>
<tr>
<td>Natural hydrogeological events and formations</td>
<td>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</td>
</tr>
<tr>
<td><strong>AGRICULTURAL SOURCES</strong></td>
<td></td>
</tr>
<tr>
<td>Animal feedlots and burial areas</td>
<td>Livestock sewage wastes; nitrates; phosphates; chloride; chemical sprays and dips for controlling insect, bacterial, viral, and fungal pests on livestock; coliform⁵ and noncoliform bacteria; viruses</td>
</tr>
<tr>
<td>Manure spreading areas and storage pits</td>
<td>Livestock sewage wastes; nitrates</td>
</tr>
<tr>
<td>Livestock waste disposal areas</td>
<td>Livestock sewage wastes; nitrates</td>
</tr>
<tr>
<td>Crop areas and irrigation sites</td>
<td>Pesticides;⁶ fertilizers;⁶ gasoline and motor oils from chemical applicators</td>
</tr>
<tr>
<td>Chemical storage areas and containers</td>
<td>Pesticide⁶ and fertilizer⁶ residues</td>
</tr>
<tr>
<td>Farm machinery areas</td>
<td>Automotive wastes;⁷ welding wastes</td>
</tr>
<tr>
<td>Agricultural drainage wells and canals</td>
<td>Pesticides;⁶ fertilizers;⁶ 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)</td>
</tr>
<tr>
<td><strong>RESIDENTIAL SOURCES</strong></td>
<td></td>
</tr>
<tr>
<td>Common household maintenance and hobbies</td>
<td>Common Household Products:⁸ 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;⁹ photochemicals; printing ink; other common products Wall and Furniture Treatments: Paints; varnishes; stains; dyes; wood preservatives (creosote); paint and lacquer thinners; paint and varnish removers and deglossers; paint brush cleaners; floor and furniture strippers Mechanical Repair and Other Maintenance Products: Automotive wastes;⁷ 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</td>
</tr>
<tr>
<td>Lawns and gardens</td>
<td>Fertilizers;⁶ herbicides and other pesticides used for lawn and garden maintenance¹⁰</td>
</tr>
<tr>
<td>Swimming pools</td>
<td>Swimming pool maintenance chemicals¹¹</td>
</tr>
<tr>
<td>Septic systems, cesspools, and sewer lines</td>
<td>Septage; coliform and noncoliform bacteria;⁴ viruses; nitrates; heavy metals; synthetic detergents; cooking and motor oils; bleach; pesticides;⁶;¹⁰ paints; paint thinner; photographic chemicals; swimming pool chemicals;¹¹ septic tank/cesspool cleaner chemicals;¹⁰ elevated levels of chloride, sulfate, calcium, magnesium, potassium, and phosphate</td>
</tr>
<tr>
<td>Underground storage tanks</td>
<td>Home heating oil</td>
</tr>
<tr>
<td>Apartments and condominiums</td>
<td>Swimming pool maintenance chemicals;¹¹ pesticides for lawn and garden maintenance and cockroach, termite, ant, rodent, and other pest control;⁶;¹⁰ wastes from onsite sewage treatment plants; household hazardous wastes⁸</td>
</tr>
<tr>
<td>Source</td>
<td>Health, Environmental, or Aesthetic Contaminant¹,²,³</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td><strong>MUNICIPAL SOURCES</strong></td>
<td></td>
</tr>
<tr>
<td>Schools and government offices and grounds</td>
<td>Solvents; pesticides⁵,¹⁰ acids; alkalis; waste oils; machinery/vehicle servicing wastes; gasoline and heating oil from storage tanks; general building wastes¹³</td>
</tr>
<tr>
<td>Park lands</td>
<td>Fertilizers⁶, herbicides¹⁰ insecticides⁹</td>
</tr>
<tr>
<td>Public and residential areas infested with mosquitoes, gypsy moths, ticks, ants, or other pests</td>
<td>Pesticides⁵,⁹</td>
</tr>
<tr>
<td>Highways, road maintenance depots, and deicing operations</td>
<td>Herbicides in highway rights-of-way⁵,¹⁰ road salt (sodium and calcium chloride); road salt anticaking additives (ferric ferrocyanide, sodium ferrocyanide); road salt anticorrosives (phosphate and chromate); automotive wastes⁷</td>
</tr>
<tr>
<td>Municipal sewage treatment plants and sewer lines</td>
<td>Municipal wastewater; sludge;¹⁴ treatment chemicals¹⁵</td>
</tr>
<tr>
<td>Storage, treatment, and disposal ponds, lagoons, and other surface impoundments</td>
<td>Sewage wastewater; nitrates; other liquid wastes; microbiological contaminants</td>
</tr>
<tr>
<td>Land areas applied with wastewater or wastewater byproducts</td>
<td>Organic matter; nitrate; inorganic salts; heavy metals; coliform and noncoliform bacteria;² viruses; nitrates; sludge;¹⁴ nonhazardous wastes¹⁸</td>
</tr>
<tr>
<td>Storm water drains and basins</td>
<td>Urban runoff; gasoline; oil; other petroleum products; road salt; microbiological contaminants</td>
</tr>
<tr>
<td>Combined sewer overflows (municipal sewers and storm water drains)</td>
<td>Municipal wastewater; sludge;¹⁴ treatment chemicals;¹⁵ urban runoff; gasoline; oil; other petroleum products; road salt; microbial contaminants</td>
</tr>
<tr>
<td>Recycling/reduction facilities</td>
<td>Residential and commercial solid waste residues</td>
</tr>
<tr>
<td>Municipal waste landfills</td>
<td>Leachate; organic and inorganic chemical contaminants; wastes from households⁸ and businesses;¹⁵ nitrates; oils; metals</td>
</tr>
<tr>
<td>Open dumping and burning sites, closed dumps</td>
<td>Organic and inorganic chemicals; metals; oils; wastes from households⁸ and businesses¹³</td>
</tr>
<tr>
<td>Municipal incinerators</td>
<td>Heavy metals; hydrocarbons; formaldehyde; methane; ethane; ethylene; acetylene; sulfur and nitrogen compounds</td>
</tr>
<tr>
<td>Water supply wells, monitoring wells, older wells, domestic and livestock wells, unsealed and abandoned wells, and test hole wells</td>
<td>Surface runoff; effluents from barnyards, feedlots, septic tanks, or cesspools; gasoline; used motor oil; road salt</td>
</tr>
<tr>
<td>Sumps and dry wells</td>
<td>Storm water runoff; spilled liquids; used oil; antifreeze; gasoline; other petroleum products; road salt; pesticides⁵ and a wide variety of other substances</td>
</tr>
<tr>
<td>Drainage wells</td>
<td>Pesticides⁵,¹⁰ bacteria</td>
</tr>
<tr>
<td>Well pumping that causes inter-aquifer leakage, induced filtration, landward migration of sea water in coastal areas; etc.</td>
<td>Saltwater; excessively mineralized water</td>
</tr>
<tr>
<td>Artificial ground water recharge</td>
<td>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</td>
</tr>
<tr>
<td><strong>COMMERCIAL SOURCES</strong></td>
<td></td>
</tr>
<tr>
<td>Airports, abandoned airfields</td>
<td>Jet fuels; deicers; diesel fuel; chlorinated solvents; automotive wastes⁷ heating oil; building wastes¹³</td>
</tr>
<tr>
<td>Auto repair shops</td>
<td>Waste oils; solvents; acids; paints; automotive wastes⁷ miscellaneous cutting oils</td>
</tr>
<tr>
<td>Barber and beauty shops</td>
<td>Perm solutions; dyes; miscellaneous chemicals contained in hair rinses</td>
</tr>
<tr>
<td>Boat yards and marinas</td>
<td>Diesel fuels; oil; septage from boat waste disposal areas; wood preservative and treatment chemicals; paints; waxes; varnishes; automotive wastes⁷</td>
</tr>
<tr>
<td>Source</td>
<td>Health, Environmental, or Aesthetic Contaminant^{1,2,3}</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Rowling alleys</td>
<td>Epoxy; urethane-based floor finish</td>
</tr>
<tr>
<td>Car dealerships (especially those with service departments)</td>
<td>Automotive wastes;{^7} waste oils; solvents; miscellaneous wastes</td>
</tr>
<tr>
<td>Car washes</td>
<td>Soaps; detergents; waxes; miscellaneous chemicals</td>
</tr>
<tr>
<td>Camp grounds</td>
<td>Septage; gasoline; diesel fuel from boats; pesticides for controlling mosquitoes, ants, ticks, gypsy moths, and other pests;{^5,6} household hazardous wastes from recreational vehicles (RVs){^6}</td>
</tr>
<tr>
<td>Carpet stores</td>
<td>Glues and other adhesives; fuel from storage tanks if forklifts are used</td>
</tr>
<tr>
<td>Cemeteries</td>
<td>Leachate; lawn and garden maintenance chemicals{^10}</td>
</tr>
<tr>
<td>Construction trade areas and materials (plumbing, heating and air conditioning, painting, paper hanging, decorating, drywall and plastering, acoustical insulation, carpentry, flooring, rooting and sheet metal, wrecking and demolition, etc.)</td>
<td>Solvents; asbestos; paints; glues and other adhesives; waste insulation; lacquers; tars; sealants; epoxy waste; miscellaneous chemical wastes</td>
</tr>
<tr>
<td>Country clubs</td>
<td>Fertilizers;{^6} herbicides;{^5,10} pesticides for controlling mosquitoes, ticks, ants, gypsy moths, and other pests;{^9} swimming pool chemicals;{^11} automotive wastes</td>
</tr>
<tr>
<td>Dry cleaners</td>
<td>Solvents (perchloroethylene, petroleum solvents, Freon); spotting chemicals (trichloroethane, methylenechlorofrom, ammonia, peroxides, hydrochloric acid, rust removers, amyl acetate)</td>
</tr>
<tr>
<td>Funeral services and crematories</td>
<td>Formaldehyde; wetting agents; fumigants; solvents</td>
</tr>
<tr>
<td>Furniture repair and finishing shops</td>
<td>Paints; solvents; degreasing and solvent recovery sludges</td>
</tr>
<tr>
<td>Gasoline service stations</td>
<td>Oils; solvents; miscellaneous wastes</td>
</tr>
<tr>
<td>Golf courses</td>
<td>Fertilizers;{^6} herbicides;{^5,10} pesticides for controlling mosquitoes, ticks, ants, gypsy moths, and other pests{^9}</td>
</tr>
<tr>
<td>Hardware/umber/parts stores</td>
<td>Hazardous chemical products in inventories; heating oil and fork lift fuel from storage tanks, wood-staining and treating products such as creosote</td>
</tr>
<tr>
<td>Heating oil companies, underground storage tanks</td>
<td>Heating oil; wastes from truck maintenance areas{^7}</td>
</tr>
<tr>
<td>Horticultural practices, garden nurseries, florists</td>
<td>Herbicides, insecticides, fungicides, and other pesticides{^10}</td>
</tr>
<tr>
<td>Jewelry/metal plating shops</td>
<td>Sodium and hydrogen cyanide; metallic salts; hydrochloric acid; sulfuric acid; chromic acid</td>
</tr>
<tr>
<td>Laundromats</td>
<td>Detergents; bleaches; fabric dyes</td>
</tr>
<tr>
<td>Medical institutions</td>
<td>X-ray developers and fixers;{^17} infectious wastes; radiological wastes; biological wastes; disinfectants; asbestos; beryllium; dental acids; miscellaneous chemicals</td>
</tr>
<tr>
<td>Office buildings and office complexes</td>
<td>Building wastes;{^13} lawn and garden maintenance chemicals;{^10} gasoline; motor oil</td>
</tr>
<tr>
<td>Paint stores</td>
<td>Paints; paint thinners; lacquers; varnishes; other wood treatments</td>
</tr>
<tr>
<td>Pharmacies</td>
<td>Spilled and returned products</td>
</tr>
<tr>
<td>Photography shops, photo processing laboratories</td>
<td>Biosludges; silver sludges; cyanides; miscellaneous sludges</td>
</tr>
<tr>
<td>Print shops</td>
<td>Solvents; inks; dyes; oils; photographic chemicals</td>
</tr>
<tr>
<td>Railroad tracks and yards</td>
<td>Diesel fuel; herbicides for rights-of-way; creosote for preserving wood ties</td>
</tr>
<tr>
<td>Research laboratories</td>
<td>X-ray developers and fixers;{^17} infectious wastes; radiological wastes; biological wastes; disinfectants; asbestos; beryllium; solvents; infectious materials; drugs; disinfectants (quaternary ammonia, hexachlorophene, peroxides, chlornexade, bleach); miscellaneous chemicals</td>
</tr>
</tbody>
</table>

^{1,2,3} The superscript numbers indicate the specific sources of the contaminants.
Table 4-4. Potential Sources of Ground Water Contamination (continued)

<table>
<thead>
<tr>
<th>Source</th>
<th>Health, Environmental, or Aesthetic Contaminant$^{1,2,3}$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COMMERCIAL SOURCES (continued)</strong></td>
<td></td>
</tr>
<tr>
<td>Scrap and junk yards</td>
<td>Any wastes from businesses$^9$ and households,$^9$ oils</td>
</tr>
<tr>
<td>Sports and hobby shops</td>
<td>Gunpowder and ammunition; rocket engine fuel; model airplane glue</td>
</tr>
<tr>
<td>Above-ground and underground storage tanks</td>
<td>Heating oil; diesel fuel; gasoline; other petroleum products; other commercially used chemicals</td>
</tr>
<tr>
<td>Transportation services for passenger transit (local and interurban)</td>
<td>Waste oil; solvents; gasoline and diesel fuel from vehicles and storage tanks; fuel oil; other automotive wastes$^7$</td>
</tr>
<tr>
<td>Veterinary services</td>
<td>Solvents; infectious materials; vaccines; drugs; disinfectants (quaternary ammonia, hexachlorophene, peroxides, chloroxenade, bleach); x-ray developers and fixers$^{17}$</td>
</tr>
<tr>
<td><strong>INDUSTRIAL SOURCES</strong></td>
<td></td>
</tr>
<tr>
<td>Material stockpiles (coal, metallic ores, phosphates, gypsum)</td>
<td>Acid drainage; other hazardous and nonhazardous wastes$^{16}$</td>
</tr>
<tr>
<td>Waste tailing ponds (commonly for the disposal of mining wastes)</td>
<td>Acids; metals; dissolved solids; radioactive ores; other hazardous and nonhazardous wastes$^{15}$</td>
</tr>
<tr>
<td>Transport and transfer stations (trucking terminals and rail yards)</td>
<td>Fuel tanks; repair shop wastes;$^7$ other hazardous and nonhazardous wastes$^{15}$</td>
</tr>
<tr>
<td>Above-ground and underground storage tanks and containers</td>
<td>Heating oil; diesel and gasoline fuel; other petroleum products; hazardous and nonhazardous materials and wastes$^{16}$</td>
</tr>
<tr>
<td>Storage, treatment, and disposal ponds, lagoons, and other surface impoundments</td>
<td>Hazardous and nonhazardous liquid wastes,$^{16}$ septage; sludge$^{14}$</td>
</tr>
<tr>
<td>Chemical landfills</td>
<td>Leachate; hazardous and nonhazardous wastes,$^{16}$ nitrates</td>
</tr>
<tr>
<td>Radioactive waste disposal sites</td>
<td>Radioactive wastes from medical facilities, power plants, and defense operations; radionuclides (uranium, plutonium)</td>
</tr>
<tr>
<td>Unattended wet and dry excavation sites (unregulated dumps)</td>
<td>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</td>
</tr>
<tr>
<td>Operating and abandoned production and exploratory wells (for gas, oil, coal, geothermal, and heat recovery); test hole wells; monitoring and excavation wells</td>
<td>Metals; acids; minerals; sulfides; other hazardous and nonhazardous chemicals$^{16}$</td>
</tr>
<tr>
<td>Dry wells</td>
<td>Saline water from wells pumped to keep them dry</td>
</tr>
<tr>
<td>Injection wells</td>
<td>Highly toxic wastes; hazardous and nonhazardous industrial wastes,$^{16}$ oil-field brines</td>
</tr>
<tr>
<td>Well drilling operations</td>
<td>Brines associated with oil and gas operations</td>
</tr>
<tr>
<td><strong>INDUSTRIAL PROCESSES (PRESENTLY OPERATED OR TORN-DOWN FACILITIES)</strong></td>
<td></td>
</tr>
<tr>
<td>Asphalt plants</td>
<td>Petroleum derivatives</td>
</tr>
<tr>
<td>Communications equipment manufacturers</td>
<td>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</td>
</tr>
<tr>
<td>Electric and electronic equipment manufacturers and storage facilities</td>
<td>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</td>
</tr>
<tr>
<td>Electroplaters</td>
<td>Boric, hydrochloric, hydrofluoric, and sulfuric acids; sodium and potassium hydroxide; chromic acid; sodium and hydrogen cyanide; metallic salts</td>
</tr>
<tr>
<td>Foundries and metal fabricators</td>
<td>Paint wastes; acids; heavy metals; metal sludges; plating wastes; oils; solvents; explosive wastes</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Source</th>
<th>Health, Environmental, or Aesthetic Contaminant¹ ² ³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furniture and fixtures manufacturers</td>
<td>Paints; solvents; degreasing sludges; solvent recovery sludges</td>
</tr>
<tr>
<td>Machine and metalworking shops</td>
<td>Solvents; metals; miscellaneous organics; sludges; oily metal shavings; lubricant and cutting oils; degreasers (tetrachloroethylene); metal marking fluids; mold-release agents</td>
</tr>
<tr>
<td>Mining operations (surface and underground), underground storage mines</td>
<td>Mine spoils or tailings that often contain metals; acids; highly corrosive mineralized waters; metal sulfides</td>
</tr>
<tr>
<td>Unsealed abandoned mines used as waste pits</td>
<td>Metals; acids; minerals; sulfides; other hazardous and nonhazardous chemicals¹⁶</td>
</tr>
<tr>
<td>Paper mills</td>
<td>Metals; acids; minerals; sulfides; other hazardous and nonhazardous chemicals¹⁶  organic sludges; sodium hydroxide; chloride; hypochlorite; chlorine dioxide; hydrogen peroxide</td>
</tr>
<tr>
<td>Petroleum production and storage companies, secondary recovery of petroleum</td>
<td>Hydrocarbons; oil-field brines (highly mineralized salt solutions)</td>
</tr>
<tr>
<td>Industrial pipelines</td>
<td>Corrosive fluids; hydrocarbons; other hazardous and nonhazardous materials and wastes¹⁶</td>
</tr>
<tr>
<td>Photo processing laboratories</td>
<td>Cyanides; biosludges; silver sludges; miscellaneous sludges</td>
</tr>
<tr>
<td>Plastics materials and synthetics producers</td>
<td>Solvents; oils; miscellaneous organics and inorganics (phenols, resins); paint wastes; cyanides; acids; alkalis; wastewater treatment sludges; cellulose esters; surfactant; glycols; phenols; formaldehyde; peroxides; etc.</td>
</tr>
<tr>
<td>Primary metal industries (blast furnaces, steel works, and rolling mills)</td>
<td>Heavy metal wastewater treatment sludge; pickling liquor; waste oil; ammonia scrubber liquor; acid tar sludge; alkaline cleaners; degreasing solvents; slag; metal dust</td>
</tr>
<tr>
<td>Publishers, printers, and allied industries</td>
<td>Solvents; inks; dyes; oils; miscellaneous organics; photographic chemicals</td>
</tr>
<tr>
<td>Public utilities (phone, electric power, gas)</td>
<td>PCBs from transformers and capacitors; oils; solvents; sludges; acid solution; metal plating solutions (chromium, nickel, cadmium); herbicides from utility rights-of-way</td>
</tr>
<tr>
<td>Sawmills and planers</td>
<td>Treated wood residue (copper quinolate, mercury, sodium bazide); tanner gas; paint sludges; solvents; creosote; coating and gluing wastes</td>
</tr>
<tr>
<td>Stone, clay, and glass manufacturers</td>
<td>Solvents; oils and grease; alkalis; acetic wastes; tannery waste; phenolic solids or sludges; heavy metal sludges; phenolic solids or sludges; metal-finishing sludge</td>
</tr>
<tr>
<td>Welders</td>
<td>Oxygen, acetylene</td>
</tr>
<tr>
<td>Wood preserving facilities</td>
<td>Wood preservatives; creosote</td>
</tr>
</tbody>
</table>

¹In 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.

²Contaminants 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.

³This 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.

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

⁵Pesticides 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.

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

Toxic or hazardous components of common household products are noted in Table 3-2.

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.

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.

Swimming pool chemicals can contain free and combined chlorine; bromine; iodine; mercury-based, copper-based, and quaternary algaecides; cyanuric acid; calcium or sodium hypochlorite; muriatic acid; sodium carbonate.

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

Common wastes from public and commercial buildings include automotive wastes; rock salt; and residues from cleaning products that may contain chemicals such as xylenes, glycol esters, isopropanol, 1,1,1-trichloroethane, sulfonates, chlorinated phenol, and cresols.

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

Municipal wastewater treatment chemicals include calcium oxide; alum; activated alum, carbon, and silica; polymers; ion exchange resins; sodium hydroxide; chloride; ozone; and corrosion inhibitors.

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.

X-ray developers and fixers may contain reclaimable silver, glutaraldehyde, hydroquinone, phenedone, potassium bromide, sodium sulfite, sodium carbonate, thiosulfates, and potassium alum.

This table lists potential ground water contaminants from many common industries, but it does not address all industries.

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

<table>
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<tr>
<th>LEAST RISK</th>
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<tr>
<td>A.</td>
<td>1. Land surrounding a well or reservoir, owned by a water company.</td>
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<td></td>
<td>2. Permanent open space dedicated to passive recreation.</td>
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<td></td>
<td>3. Federal, state, municipal, and private parks.</td>
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<td></td>
<td>4. Woodlands managed for forest products.</td>
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<td></td>
<td>5. Permanent open space dedicated to active recreation.</td>
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<td>B.</td>
<td>1. Field crops: pasture, hay, grains, vegetables.</td>
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<td></td>
<td>2. Low density residential: lots larger than 2 acres.</td>
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<td></td>
<td>3. Churches, municipal offices.</td>
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<tr>
<td>C.</td>
<td>1. Agricultural production: dairy, livestock, poultry, nurseries, orchards, farmlands.</td>
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<tr>
<td></td>
<td>2. Golf course, quarries.</td>
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<td></td>
<td>3. Medium density residential: lots from 1/2 to 1 acre.</td>
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<td>D.</td>
<td>1. Institutional uses: schools, hospitals, nursing homes, prisons, garages, salt storage, sewage treatment facilities.</td>
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<tr>
<td></td>
<td>2. High density housing: lots smaller than 1/2 acre.</td>
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<tr>
<td></td>
<td>3. Commercial uses: limited hazardous material storage and only sewage disposal.</td>
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</tr>
<tr>
<td>E.</td>
<td>1. Retail commercial: gasoline, farm equipment, automotive, sales and services; dry cleaners; photo processor; medical arts; furniture stripping; machine shops; radiator repair; printers; fuel oil distributors.</td>
<td></td>
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<tr>
<td></td>
<td>2. Industrial: all forms of manufacturing and processing, research facilities.</td>
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<table>
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<tr>
<th>GREATEST RISK</th>
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<tbody>
<tr>
<td>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.</td>
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</tbody>
</table>

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

CLEAN SWEEP COLLECTION PROGRAM
What is Clean Sweep?

Clean Sweep is a place to bring hazardous household materials such as Oil-Based Paints and Paint-Related Products, Pesticides & Poisons, Household Products Containing Organic Solvents, Ignitables, and Aerosols, and Rechargeable Batteries.

Why Clean Sweep?

By providing the public with an opportunity to safely dispose of such hazardous products, we keep these products out of landfills and lower the environmental risks associated with such improper disposal. The payoff is a cleaner, healthier environment.

What's New

The Dane County Clean Sweep will be closed for Thanksgiving weekend 2013 on Thursday November 28th, Friday November 29th, and Saturday November 30th.

As of November 1st 2012 the Clean Sweep facility located 2302 Fish Hatchery Road is permanently closed and cannot accept any materials.

The new year round facility, located at 7102 US Hwy 12, Madison WI 53718, (Beltline/12/18 East toward Cambridge) across from the Yahara Hills Golf Course at the Dane County Landfill is now open.

All Clean Sweep customers do not have to stop at the scale and should proceed directly to the Clean Sweep building and stop under the canopy. Clean Sweep staff will provide you with further instructions. Clean Sweep customers include those coming to pick up free materials from our Product Exchange.

Please remember that leaving materials at the site when we are closed is illegal and can lead to a $2,000 forfeiture

NEW FEES APPLY.

Hours:
Tuesdays - Fridays: 7:00am - 2:45pm
Saturdays: 8:00am - 10:45am
Closed Sundays, Mondays and Holidays

Thank you for having patience with us as we update our website during our transition.

New Fees for 2013

- **Dane County Households & Farms: $10.00 per trip**
  for all household hazardous waste and electronics. One television or computer monitor is included with the trip fee. Additional televisions and monitors will be billed at an additional $10.00 each.

- **Businesses: Fees based on weight and type of waste**
  Businesses must qualify as Very Small Quantity Generators (VSQG’s) and must schedule an appointment prior to bringing wastes to the collection facility. Out-of-County businesses are welcome. Call (608) 243-0368 for more information.

- **Out-of-County Households & Farms: $75.00 per trip**
  No latex paint or electronics accepted from out-of-county residents.

*We reserve the right to impose additional fees for large quantities of materials or loads from multiple households. Customers with large loads are urged to call (608)243-0368 in advance to determine the applicability of any additional fees.*

Now Accepting Electronics

- Get rid of your old TV or computer monitor for $10. Other electronics accepted free of charge. Please see our [Household page](http://www.danecountycleansweep.com/) for details.

*Please note that there have been some rule changes for our Product Exchange program. Please see the [Exchange page](http://www.danecountycleansweep.com/) for details.*

Business Waste Program

- Appointments are now being accepted on a year round basis for the disposal of business-generated hazardous materials. Click on the business waste program link below for details.

Agricultural Clean Sweep Grants

Dane County received a Wisconsin Department of Agriculture, Trade and Consumer Protection (WDATCP) agricultural clean sweep grant award for 2013. This grant underwrites our disposal costs so there will be no cost to farmers to dispose of agriculturally-related and household wastes through the Dane County Clean Sweep program in 2013, and agricultural businesses will pay only one-half the normal business cost to dispose of agriculturally-related waste materials.

Educational Game

Check out an entertaining and educational game on the hazards present in your home. The National Institute of Health proves that learning can be fun. Play [Tox Mystery](http://www.danecountycleansweep.com/) today!
Agricultural Waste Program

The Agricultural Waste Program allows agricultural businesses and farmers to dispose of hazardous materials and wastes conveniently and cost-effectively using state subsidies. Additional information on the status of the ag program.

Household Hazardous Waste Program

The Household Hazardous Waste Program provides an opportunity for residents of Dane County to safely dispose of hazardous waste. More on household hazardous waste.

Business Waste Program

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

Product Exchange

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.

Other Recycling Programs

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.

Dane County Home Page
Dane County Public Works

City of Madison Home Page
Public Health Madison Dane County

http://www.danecountycleansweep.com/
Household Hazardous Waste Program

Clean Sweep provides an opportunity for residents of Madison and Dane County to safely dispose of hazardous waste.

2013 Collection Season

We will be opening our new facility on May 1st 2013.

Hours:
Tuesdays - Fridays: 7:00 - 2:45
Saturdays: 8:00 - 10:45
Closed Sundays, Mondays and Holidays.

We are now (as of May 1st 2013) located at
7102 US Hwy 12, Madison WI 53718,
(Beltline/12/18 East toward Cambridge)
across from the Yahara Hills Golf Course at the Dane County Landfill.

Guidelines for Materials Brought to Clean Sweep

Waste materials should be packaged in boxes or rigid totes to keep products upright and prevent spillage during transportation to the collection facility. Keep materials in their original containers. DO NOT PACK OR CO-MINGLE YOUR WASTE MATERIALS IN PLASTIC TRASH BAGS. Individual items may be bagged in plastic if the original container is compromised. Do not mix any materials. Upon arrival at the landfill site, follow the entrance road, drive past the scale, go directly to the Clean Sweep building, and stop under the canopy. Clean Sweep staff will greet you and direct you to the counter (inside of the walk-in door under the canopy) to collect your payment. You will be asked to furnish proof of residency. If you have items or materials that are subject to fees, you will pay at this point. Payment is to be in the form of cash or credit card (Visa or Mastercard only). No checks or currency larger than $20 bills are accepted. After payment of fees, Clean Sweep staff will assist you in unloading your vehicle. Facility operators reserve the right to refuse any waste or material deemed unacceptable. If you are bringing gasoline or other fuels to Clean Sweep, remember to transport your fuel in an approved container (no more than 6 gal. size). Clean Sweep staff will pour off the fuels and return your container, time permitting. Unapproved or unsafe fuel containers will not be returned.

Fee Structure

- Dane County Households & Farms: $10.00 per trip for all household hazardous waste and electronics. One television or computer monitor is included with the trip fee. Additional televisions and monitors will be billed at an additional $10.00 each.
• Out-of-County Households & Farms: $75.00 per trip
  No latex paint or electronics accepted from out-of-county residents

We reserve the right to impose additional fees for large quantities of materials or loads from multiple households. Customers with large loads are urged to call (608) 243-0368 in advance to determine the applicability of any additional fees.

Electronics

Electronics will be accepted from Dane County residents/households only. Fees apply to TV's and computer monitors. **NO ELECTRONICS ACCEPTED FROM BUSINESSES.** All electronic materials will be responsibly handled in an environmentally safe and secure manner, using the best data wiping software available. Electronic materials accepted at Dane County Clean Sweep include: Monitors, laptops, servers, TV's, printers, computers, printer/fax/scanners, DVD players, stereo equipment, VCR's, video game consoles, computer peripherals, mice/keyboards, PDA/cell phones, all computer parts, MP3/iPods/etc., telephones, UPS batteries, copiers, typewriters, cash registers, networking equipment, and cable boxes. Also accepting radios, digital clocks, digital cameras, and remotes. **ALL BATTERIES MUST BE REMOVED FROM ELECTRONIC ITEMS.** The listing of the types of electronic materials accepted at Dane County Clean Sweep is subject to change.

Disposal options for common items

Although we do our best to accept as much household hazardous waste as possible, there are some things we cannot take off your hands. Click on the items below to display information regarding their disposal.

Note: If an item is in this list, it does not necessarily mean that Clean Sweep will accept it.

Clean Sweep does not accept tires, paper or cardboard products, yard waste, construction, debris, rubbish, glass, solid metals, solid waste, appliances, etc. Contact your local official, trash hauler, or private recycler for details.

Please click on the item of interest to learn about its proper disposal. Your disposal instructions will appear in the disposal instructions box beneath the list.
**Disposal Instructions**

Aerosol cans  
Acids and Bases  
Asbestos  
Ammunition  
Antifreeze and oil filters  
Batteries  
Ballasts  
Brake, transmission, power steering fluid  
Computers  
Cooking oil  
Driveway sealer – Solvent-based (tar, asphalt)  
Electronics  
Explosives, and fireworks  
Fertilizer  
Fire extinguishers  
Flammable solvents, fuels and aerosols  
Fluorescent light bulbs
Agriculture

Dane County received a Wisconsin Department of Agriculture, Trade and Consumer Protection (WDATCP) agricultural clean sweep grant award for 2013. This grant underwrites our disposal costs so there will be no cost to farmers to dispose of agriculturally-related and household wastes through the Dane County Clean Sweep program in 2013, and agricultural businesses will pay only one-half the normal business cost to dispose of agriculturally-related waste materials.

2013 Appointment Scheduling

Agricultural chemicals are accepted by appointment only. See the "Make an Appointment" section below.

Appointments for the 2013 season will be available Tuesdays-Fridays.

The Agricultural Hazardous Waste Disposal Program

Because Dane County received a DATCP ag grant for 2013, agricultural businesses will be charged only one-half of the full small business charge for the disposal of agriculturally-related waste.

Fees

- **Dane County Households & Farms:** $10.00 per trip for all household hazardous waste and electronics. One television or computer monitor is included with the trip fee. Additional televisions and monitors will be billed at an additional $10.00 each.
- **Agricultural Businesses:** Fees based on weight & type of waste
  - Click [here](http://www.danecountycleansweep.com/agriculture.aspx) for a sample application and current pricing. (1/2 price for 2013.)
- **Out-of-County Farms:** $75.00 per trip
  - No latex paint or electronics accepted from out-of-county farms.

Items acceptable under the Agricultural Clean Sweep

- Unused, damaged, cancelled, 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, 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 cylinder 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.

How to Transport Materials to Clean Sweep

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.

Make an Appointment

Appointments for the 2013 season will be available Tuesdays-Fridays.

If you'd like to set up an appointment to bring in your agricultural hazardous waste, please fill out our online registration form. If you have questions about the program or if you are unsure whether you qualify, you can find answers in the registration form or by contacting the Dane County Landfill at 608-838-9555 (phone), 608-267-3105 (fax), or email Dave Radisewitz at radisewitz.david@countyofdane.com.
What's Happening?

The Clean Sweep Collection Program for households has been a service provided jointly by Dane County and the City of Madison. These two municipalities are sponsoring a program for businesses that generate small amounts of hazardous materials. The program referred to as the Business Waste Disposal Program will allow businesses to drop off, by appointment, hazardous materials at a collection point for proper disposal.

State law requires all Wisconsin businesses producing hazardous materials to manage and dispose of their materials/wastes properly. Options for businesses generating small amounts of waste are not readily available and those available are often viewed by business as complicated and costly. This program is designed to allow small generators to dispose of hazardous materials/waste in a simpler and less costly manner.

To participate, businesses will be required to pay the costs associated with handling and disposal. However, costs are expected to be lower for participants in this program than the cost of individual companies arranging for disposal on their own.

Who Can Participate?

In order to participate, a business may not generate more waste than is defined in the WDNR definition of a Very Small Quantity Generator (VSQG). A VSQG produces less than 100 kilograms (220 pounds or 22 gallons) of hazardous waste and less than 2.2 gallons of acutely hazardous waste per month. Through the VSQG program, businesses are allowed to dispose of hazardous materials/waste containers up to 55 gallons in size.

Businesses producing more than 264 gallons of materials/waste per year must manage or dispose of their wastes through a hazardous waste contractor and are NOT eligible to participate in this project.

What Hazardous Wastes Could My Business Have?

Hazardous materials/wastes are those that are toxic, flammable, corrosive, or reactive. Some examples of common hazardous materials/wastes from small generators are:

- Parts-washer solvents
- Paint-gun cleaners
- PCB wastes
- Acids and bases
- Laboratory wastes
- Solvent-based cleaners/degreasers
- Petroleum based products
- Automotive products
- Etching compounds
- PCB contaminated oils
- Inks
- Mercury/amalgam thins
- Strippers
- Paints
- Pesticides
- Herbicides
- Insecticides
- Dioxin
- Oils

What Materials Will be Accepted? (among others)

- Paint and paint-related materials
- Solvent materials, thinners, strippers, inks, solvent-based materials/wastes
- Corrosives
- Poisons and pesticides
- Lab chemicals
- Petroleum-based materials/wastes
- Heavy metals and heavy metal-based materials wastes
- Used photographic and x-ray fixers
- Mercury-Amalgam

Wastes Not Accepted

- Explosives
- Infectious (medical) wastes
- Radioactive wastes
- Certain poisons, pesticides and reactive wastes

For More Information . . .

Dave Radisewitz, CHMM, Clean Sweep Coordinator
210 Martin Luther King, Jr. Blvd., Rm. 507
Madison, WI 53703
www.danecountycleansweep.com
(608) 243-0368 (Information Line)
(608) 243-0347 (Direct Line)
(608) 267-3105 (Fax)
dradisewitz@publichealthmdc.com
How to Apply

Businesses must apply for and receive prior approval from the Clean Sweep Coordinator for specific types and quantities of materials/wastes. Upon approval by the coordinator, the generator will be given an appointment for drop off of the materials/wastes. Small business collections will normally be scheduled on Wednesday mornings.

What Will It Cost?

Participants are required to pay for their share of the handling and disposal costs, which include contractor costs, testing (if required), handling/packaging and transportation from the collection site. The program expects costs to be significantly lower than they would be individually because of the larger quantity of materials/wastes. The final invoice will include the cost per pound determined at drop off and any additional charges that may be incurred.

How to Transport Your Materials/Wastes

Container sizes up to 55 gallons will be accepted. All containers must be securely closed, clearly labeled, and accompanied by the shipping papers. The generator must have the capacity to offload their own containers from the vehicle in which they are transported.

Accepted Product/Waste Streams Defined

The waste streams outlined (on page 4 of this brochure) are based on the program's method of disposal for each waste stream. They reflect how the program processes the materials in order to comply with the waste hauler's transportation requirements as well as the most efficient method of packaging to facilitate disposal of the materials when they reach final destination.

The goals of the program are to reuse (use the product as it was originally intended) or recycle (process and reuse the material) as great a percentage of the materials collected as possible while being cost effective. The materials that cannot be recycled or reused are disposed of.

Materials in different waste streams should not be combined. If this is done, you will be charged at the rate for the highest priced material in the mixture, regardless of quantity (e.g., 1 qt. halogenated solvent mixed with 2 gals. of non-halogenated solvent will result in a charge for 2 gals. and 1 qt. of halogenated solvent).

The product/waste streams defined below are commonly collected and include but are not limited to the items listed. Any product/material for disposal that is not listed below may be included in the product inventory form for review and approval.

How Can My Business Participate?

Step 1: Fill out the attached application and return to the Clean Sweep Coordinator. Be sure to fill out all sections of the application form. Or, visit our website at: www.danecountycleansweep.com and use our on-line forms or call the Clean Sweep Coordinator at 243-0347.

Step 2: The application will be reviewed and your eligibility determined. In reviewing the application, we will determine your VSOQ status and decide whether the wastes you listed can be disposed of through the program.

Step 3: You will be notified by phone of your appointment date and time. Appointments are scheduled on Thursday mornings during the Clean Sweep season.

Step 4: Safely bring your materials/waste to the collection site at your scheduled time. The collection site is located at the Clean Sweep facility at the Dane County Highway Garage, 2302 Fish Hatchery Rd. Only the types and quantities of materials/wastes listed on your pre-approved application will be accepted.

Step 5: All materials will be weighed and a receipt issued. A final bill will be sent to you that may include additional charges due to costs of disposal, testing and handling. This receipt should be retained for three years per WDNR requirements.
Date: __/__/__

**Certification**

I realize that the Dane County Business Waste Disposal Program will bill my business for disposal (and other associated costs) of the receipted wastes, and I will be obligated to pay these charges upon receipt of an invoice. I understand that only the types and quantities of wastes approved by the Dane County Business Waste Disposal Program can be disposed of through this project. I understand that the Dane County Business Waste Disposal Program is not assuming liability for my wastes and that future liability remains with my business.

Furthermore, I ____________________________ certify that I am (Print Name)

currently knowledgeable of the hazardous waste regulations as they pertain to my business and certify that the hazardous waste listed was generated by a Very Small Quantity Generator of hazardous waste. I further certify that a copy of this receipt shall be kept in the business files at the place of hazardous waste generation for regulatory review for a minimum of three years from this date.

I certify that I have reviewed the information in this application and that, to the best of my knowledge, it is accurate.

Signature ____________________________ Date __/__/__

<table>
<thead>
<tr>
<th>Material/Waste Chemical &amp; Trade Name</th>
<th>Use</th>
<th>Solid or Liquid</th>
<th>Size of Container (1 gal. 55 drum)</th>
<th>No. of Containers</th>
<th>MSDS (Y/N)</th>
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Definitions

Paints & Other Oil-Based Products: Latex (water-based) and oil or solvent-based paints; varnish, stains, and polyurethane; paints containing lead or other heavy metals; industrial and specification paints and coatings; oil-based products such as tung or linseed oil and other sealants or industrial waxes, or refinishing products; fuel oil; automotive products such as brake, power steering, and hydraulic fluids.

- Do not mix water-based with oil or solvent-based materials. While they are disposed at the same rate, the method of disposal varies.
- If the container (5 gallon size or less) is less than 1/3 full, is water based, and is liquid, flush down an indoor drain (not in septic systems). These products include latex paint, latex paint additives, wallpapering products and floor finishes in which the instructions for use include mixing with water. Semisolids or non-liquid water-based materials such as latex glues, adhesives, caulking or joint compound may be put in your normal trash.
- The material is hazardous if the container indicates that the material is flammable or combustible. Small amounts (less than an inch or two in the bottom of the container) may be dried out by adding absorbent such as oil dry or shredded newspaper to absorb the liquid. When this has dried, the container may be thrown into the regular trash.

Non-Halogenated Solvents: Concrete and deck preservatives and sealers; thinners, turpentine, lacquer thinner, acetone, and products containing petroleum distillates; solvent based automotive products such as Heet, gasoline and gasoline and oil mixtures.

Halogenated Solvents: Materials containing chloride such as parts cleaners/degreasers and strippers. Chemicals to look for are methylene chloride, MEK, 1,1,1-trichloroethane, carbon tetrachloride, and trichloroethylene.

Accepted Product/Waste Steams Defined

Pesticides, Poisons, & Cyanides: pesticides, herbicides and fungicides used for normal commercial or household lawn care; poisons contain heavy metals such as mercury, mercury amalgam, lead or potassium dichromate; cyanides such as Cyanogas. Fertilizers not containing a pesticide may be landfilled as well as pH altering chemicals such as sulfur and lime.


Flammable Solids: Isocyanate based resins, cyanoacrylate esters, thermite (reactive w/air), copper (reactive w/air), bronze, aluminum powder, ethyl ether, sodium hydrosulfite based brighteners (ethers, cleaners), lithium batteries, naphthalene and paraformaldehyde.

Flammable Liquids: Flammable or combustible materials that have not hardened such as resins, epoxy, adhesives, glues and caulking, foundation and roofing tars. The materials included here may be any flammable or combustible product listed in the paint category that has deteriorated to a point where it cannot be reconstituted or where it cannot be reused or recycled but has not hardened completely. If solid, the material is no longer hazardous and may be put in the landfill. Flammable liquids are treated.

Acids/Alkalis: Acids such as acetic, sulfuric, phosphoric, oxalic, muriatic, perchloric, hydrofluoric acid; etching compounds like ferric chlorides; jewelry making compounds like gold cyanide and nitric acid; and alkalinics such as phosphate cleaners, sodium/calcium hydroxide.

PCB Waste - Ballasts: Old ballasts/transformers. New ballasts/transformers will state that they do not contain PCBs and may be put in the landfill.

PCB Waste - Non-Ballasts: Automotive processes that generate PCBs and some paints. PCB contamination may be unknown until testing is performed.

Pressurized Containers: Aerosol cans containing paints, pesticides, cleansers, strippers, degreasers, or any commonly used product in a standard aerosol container, 1-pound propane cylinders, 20-pound propane cylinders. All others upon approval.

Metallic Mercury: Liquid mercury and that found in barometers, thermometers, light switches, etc.

Organic Peroxides: Wood bleach (hydrogen peroxide), dicamyl peroxide, methyl ethyl ketone peroxide, hardener w/peroxides.
Product Exchange Program

This program allows you to bring in chemicals that are still useable, including paint, thinners, solvents, and pesticides. We make these products available free to the public at our on-site product exchange store. Please note that in accordance with Dane County ordinance Chapter 80 and City of Madison ordinance MGO 7.48, Clean Sweep cannot provide phosphorus containing lawn fertilizer in the Product Exchange. If you're looking for any other free materials that Clean Sweep has on its shelves, stop by and see what may be useful to you. The Product Exchange is open during normal Clean Sweep program hours.

The City of Madison/Dane County Clean Sweep Facility cannot, and does not, guarantee the integrity, safety, usability, or effectiveness of the products taken from the Product Exchange. When you take products from this facility, you do so at your own risk. Every product is provided “as is”, and there are no express or implied warranties, including but not limited to warranties of merchantability and fitness for particular purpose.

All Product Exchange customers should proceed directly to the Clean Sweep building and stop under the canopy. Clean Sweep staff will provide you with further instructions.

2013 Program Changes

Dane County’s new household hazardous waste facility features a larger area devoted to product reuse and exchange. Products that are received in good condition are stocked on the shelves of the product exchange room for redistribution to the public. This program is FREE to Dane County residents (non-residents are prohibited). In order to promote safety, discourage hoarding and facilitate fair distribution of product exchange materials to the general public, product exchange customers will be allowed a single entry per week to the product exchange room. The amount of product taken by each customer shall be limited to an amount which the customer can physically carry to their vehicle upon exiting the building. Re-entry is prohibited. Materials taken from the product exchange room are for personal use only and are not to be resold. Product exchange customers shall not test any product, open any container or mix or combine any chemicals or containers in the product exchange room! Persons suspected of reselling or hoarding large amounts of materials taken from the Product Exchange or otherwise violating facility rules will be banned from the facility and may be held responsible for disposal costs of any returned materials.

Madison Freecycle

Madison Freecycle is an email list and Yahoo! group whose purpose is to "reduce waste by providing an alternative to sending unneeded, but still usable items to the landfill." Check them out if you've got


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something of use that you don't want to throw away or if you're looking for free items.

**Madison Stuff Exchange**

The *Madison Stuff Exchange* "provides area residents and businesses with a convenient way to exchange, re-use, or sell items they no longer need or want." The difference between the Stuff Exchange and the Freecycle is that some items on the Stuff Exchange may be sold for up to $99.
APPENDIX K

CITY OF MADISON WELL ABANDONMENT ORDINANCE -
DANE COUNTY ORDINANCE RELATING TO PRIVATE WATER SYSTEMS
13.20 TAMPERING WITH WATER METERS PROHIBITED.

(1) No person shall modify, tamper with or in any manner interfere with, or make any connection to a water meter installed by the Madison Water Utility or to said meter’s electrical and mechanical connections or apparatuses or water pipes leading to said meters without the written authorization of the Water Utility General Manager or unless authorized by law.

(2) Any person violating this section may be subject to a forfeiture of not less than one-hundred dollars ($100) nor more than one-thousand dollars ($1,000).

(Cr. by Ord. 7848, 11-5-82)

(Sec. 13.20 Am. by Ord. 12,357, Adopted 3-16-99)

13.205 TAMPERING WITH WATER UTILITY MAINS AND PROPERTY.

(1) No person shall modify, tamper with or in any manner interfere with, or make any connection to any Madison Water Utility pipe, service, or owned facility or any other appurtenance without the authorization of the Water Utility Manager or his or her agent unless authorized by law.

(2) No person shall turn any valve or corporation cock without the authorization of the Water Utility Manager or his or her agent unless authorized by law.

(3) Any person violating this section may be subject to a forfeiture of not less than two hundred dollars ($200) nor more than two thousand dollars ($2000) each day or portion thereof shall be considered a separate violation.

(Sec. 13.205 Cr. by ORD-08-00117, 10-24-08)

13.21 WELL OPERATION PERMITS AND WELL ABANDONMENT.

(1) **Purpose.** The purpose of this ordinance is to prevent the contamination of groundwater and to protect the 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 public water supply are properly abandoned, and that existing private wells meet State requirements for construction and water quality. Improperly abandoned wells represent potential direct pathways for groundwater contamination to enter the municipal drinking water supply. This ordinance is enacted pursuant to an exercise of the City’s police power and Wis. Admin. Code ch. NR 810.16. (Am. by ORD-09-00124, Pub. 8-20-09, Eff. 1-1-10)

(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.**

General Manager shall mean the General Manager of the Madison Water Utility, or his or her designee.

Noncomplying means a well or pump installation which does not comply with the provisions of Wis. Admin. Code ch. NR 812, 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 Wis. Admin. Code chs. NR 809 or 140, 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 Wis. Admin. Code ch. NR 812.

(4) Abandonment Required. All wells located in the City of Madison or on premises served by the Madison Water Utility shall be abandoned by the owner of the property if there is no valid well operation permit issued by the Madison Water Utility under sub. (5) for the well, or if so required under Wis. Admin. Code § NR 812.26(2). Abandonment under this subsection shall proceed according to the requirements of sub. (6). Upon receiving an abandonment notice from the Madison Water Utility, the owner has ninety (90) days to either make an application for a well operation permit under sub. (5) or abandon the well under sub. (6), otherwise the Madison Water Utility may proceed with abatement under sub. (8). (Am. by Ord. 12,567, 5-3-00)

(5) Well Operation Permit.

(a) Permit Required. No person may operate or maintain a well without a valid well operation permit issued under this subsection.

(b) Permit Process.

1. Application and Permit Fee. Well operation permit applications and requests for permit renewals or modifications shall be made on forms provided by the Madison Water Utility. A well operation permit fee shall be set by the Water Utility General Manager, and will go into effect upon approval by the Water Utility Board. Payment of the permit fee shall accompany the application, renewal or modification request.

2. Issuance. If the requirements of this subsection are met, the Madison Water Utility may grant or modify a well operation permit to a private well owner to operate or maintain a well for a period not to exceed five (5) years. If the requirements of this subsection are not met, the Madison Water Utility may reject the permit application, permit renewal request, or permit modification request, providing the applicant with the reasons for the denial of the issuance, renewal, or modification of the well operation permit in writing.

3. Renewal. An owner may request renewal of a valid well operation permit by submitting information verifying that the requirements of this subsection are met, and that there is a continued need for the well. A request to renew a valid well operation permit must be made to the Madison Water Utility within the six (6) months prior to the expiration of the permit. Failure to timely request a renewal of a valid well operation permit will result in expiration of the permit, and the issuance of an abandonment notice by the Madison Water Utility.

4. Modification Upon Water Main Connection. Upon the connection of a property served by a permitted well to the water main, an owner may request a modification of a valid well operation permit to accommodate the continued use of the well by submitting information verifying that the requirements of this subsection are met. A request to modify a valid well operation permit must be made to the Madison Water Utility within ten (10) days of the connection to the water main. Failure to timely request a modification of a valid well operation permit will result in expiration of the permit, and the issuance of an abandonment notice by the Madison Water Utility.

5. Conditions. The following conditions must be met for issuance, renewal or modification of a well operation permit:

a. The well and pump installation have been certified by a licensed well driller or pump installer to meet, or are upgraded to meet, the requirements of Wis. Admin. Code ch. NR 812.

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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.

6. Termination of Permit. A well operation permit issued or renewed under this subsection shall automatically terminate upon the permit holder’s conveyance of the property pursuant to Wis. Stat. ch. 706, or upon connection of the property served by the well to the water main unless the permit is modified under para. 4.

(c) Testing and Inspection Requirements.
1. Conditional Inspection and Testing. As a condition of the issuance, renewal or modification of a well operation permit, the Madison Water Utility, or its agent, may conduct inspections or have water quality tests conducted to obtain or verify information necessary for consideration of a permit application or renewal, including up to two (2) bacterial examinations of water samples obtained from the well, one (1) nitrate test, and the inspection of the well by a licensed well driller or pump installer to confirm that the well and pump installation meet the requirements of Wis. Admin. Code ch. NR 812. If any additional tests or inspections are required, they shall be performed at the applicant’s expense.

   a. As a condition of all well operation permits issued, renewed or modified under this subsection, the permit holder must submit periodic water quality testing data conducted at the well owner’s expense to the Madison Water Utility. This testing shall be done annually, on the anniversary date of the issuance, renewal or modification of the well operation permit, or as otherwise determined by the General Manager.

   b. At a minimum, such annual water quality tests must include results for coliform bacteria and nitrate. Additional testing results may be requested by the Madison Water Utility.

   c. If a water quality test under this paragraph reveals that the water quality does not meet the standards of Wis. Admin. Code ch. NR 809, the property owner shall be given ninety (90) days to bring the well into compliance. The failure to do so will result in the well operation permit being voided.

   d. A property owner who fails to submit the annual testing data to the Madison Water Utility as required under this paragraph is subject to the penalties set forth in Sec. 13.23, MGO.

3. Inspection Upon Transfer of Property. Whenever real property with a well on the premises is conveyed pursuant to Wis. Stat. ch. 706, 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.

4. Periodic Inspections. 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 Wis. Stat. § 66.0119. 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.
(d) **Appeal.** If a person’s application for a well operation permit, or renewal or modification of a well operation permit, is denied by the Madison Water Utility, or a permit is voided as provided for in sub. (c)2.c. for failure to comply with the annual testing requirement, the person may appeal within fifteen (15) days of the mailing of the permit denial or voiding notice. Appeal shall be to the Water Utility Board. All requests for appeal shall be filed with the City Clerk and the General Manager, and must inform the Water Utility Board of the reasons for the appeal. Within forty-five (45) days, the Water Utility Board shall hold a hearing at which the parties may offer testimony and documents. Either at or within twenty (20) days of the hearing, the Water Utility Board shall affirm, modify, or reverse the determination that the well operation permit should be denied or voided. Appeal from the action of the Water Utility Board shall be to Circuit Court within thirty (30) days of the determination of the Board.

(e) **Revocation of Permit.** If, at any time after the issuance or modification of a well operation permit, the General Manager determines that a well is a serious hazard to the health or safety of the public, the General Manager may immediately revoke the well operation permit and proceed under sub. (8). The General Manager shall include the reasons for the revocation of the well operation permit in the abatement order issued under that subsection.

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

(6) **Abandonment Procedures.**

(a) All wells subject to this ordinance that are abandoned shall be abandoned by a licensed well driller or pump installer according to the procedures and methods of Wis. Admin. Code § NR 812. 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 sub. (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)

(7) **Well Abandonment Rebate.** Upon the proper abandonment of a well pursuant to this section, the City Engineer, in consultation with the Water Utility General Manager and the Public Health Director, is authorized to issue a rebate to the owner of a property located in the City of Madison or that is served by the Madison Water Utility of up to fifty percent (50%) of the cost to the owner of the abandonment of the well, up to a maximum rebate of one thousand dollars ($1000.00). In determining the amount of the rebate, any contributions made by Dane County under Dane County Ordinance 46.42 or the Wisconsin Department of Natural Resources under the Well Compensation Program (Chapter NR 123) shall not be considered, provided that the rebate issued by the City under this subsection, when combined with any contribution made by Dane County and WDNR, shall not exceed the total cost to the owner of abandoning the well. No rebate shall be issued to the owner of a property against whom the City has either issued a citation or made a written referral to the City Attorney for non-compliance with the requirements of this section. Rebates issued under this subsection shall be funded out of the landfill remediation fee as set forth in Sec. 35.025, MGO. (Cr. by ORD-09-00124, Pub. 8-20-09, Eff. 1-1-10)

(8) **Abatement.** If the General Manager of the Water Utility determines that an existing well is a serious hazard to the health or safety of the public, then the General Manager may order the owner or operator to abandon or repair the well at the owner or operator’s expense, pursuant to this subsection. A well without a valid well operation permit issued under this section shall be deemed a public nuisance under this section.
(a) **Summary Abatement.**

1. **Order of Abatement.** If the General Manager determines that a well constitutes a public nuisance and that there is imminent danger to the public health, safety, peace, comfort or welfare, he or she may, without notice or hearing, issue an order to the owner and/or well operator reciting the existence of a public nuisance constituting imminent danger to the public and requiring immediate action be taken as he or she deems necessary to abate the nuisance, including abandonment of the well. Notwithstanding any other provisions of this subsection, the order shall be effective immediately. Any person to whom such order is directed shall comply with the order immediately.

2. **Abatement by the Utility.** Whenever the owner or operator shall refuse or neglect to remove or abate the condition described in the order, the General Manager may, in his or her discretion, enter upon the property and cause the nuisance to be removed or abated, including abandonment of the well, and the Water Utility shall recover the expenses incurred thereby from the owner or operator of the property. The expenses so incurred shall be levied as a special charge against the property.

(b) **Nonsummary Abatement.**

1. **Order of Abatement.** If the General Manager determines that a well constitutes a public nuisance but that the nature of such nuisance is not such as to threaten imminent danger to the public health, safety, peace, comfort or welfare, he or she shall issue an order reciting the existence of a public nuisance and requiring the owner and/or operator of the property to remove or abate the condition described in the order within the time period specified therein, including abandonment of the well. The order shall be served personally on the owner of the property, as well as the operator if different from the owner and applicable to the described nuisance, or, at the option of the General Manager, the notice may be mailed to the last known address of the person to be served by registered mail with return receipt requested. If the owner or the operator cannot be served, the order may be served by posting it on the main entrance of the premises and by publishing as a class 1 notice under Wis. Stat. ch. 985. The time limit specified in the order runs from the date of service or publication.

2. **Abatement by the Utility.** If the owner or operator fails or refuses to comply within the time period prescribed, the General Manager may enter upon the property and cause the nuisance to be removed or abated, including abandonment of the well, and the Water Utility shall recover the expenses incurred thereby from the owner or operator of the property. The expenses so incurred shall be levied as a special charge against the property.

(c) **Remedy from Order.** The order of the General Manager shall not be appealable to the Water Utility Board. Any person affected by orders issued under this subsection shall timely apply to the circuit court for an order restraining the Water Utility and the General Manager from entering on the premises and abating or removing the nuisance, or be forever barred.

(d) **Abatement in Accordance with State Law.** Nothing in this article shall be construed as prohibiting the abatement of public nuisances by the Water Utility or its officials in accordance with the laws of the state. The Water Utility or its officials may choose to proceed with an action under state law, upon authorization by the Water Utility Board.

(9) This law does not supersede the State Plumbing Code, Wis. Admin. Code § NR 811 or Chapter 18 of the Madison General Ordinances entitled “Plumbing Code” but is supplementary to them.

(Renum. by ORD-09-00124, Pub. 8-20-09, Eff. 1-1-10)

(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; ORD-11-00170, 12-21-11; ORD-13-00018, 2-12-13)
CHAPTER 45
RELATING TO PRIVATE WATER SYSTEMS

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.

45.02 Jurisdiction. This provision applies 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 Department of Public Health for Madison and Dane County.
(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 noncommunity 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; (1) am., OA 22, 2012-13, pub. 11/21/12.]
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.

[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 landfill, 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 28, 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 Board of Health for Madison and Dane County 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.

[History: am., OA 22, 2012-13, pub. 11/21/12.]

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.]

45.51 FEE SCHEDULES. (1) The fee for a well siting permit shall be $100.00.

(2) The fee for a transfer of a well siting permit shall be $42.00.

(3) The fee for a re-inspection of a well site shall be $32.00.

[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; am., OA 25, 2006-07, pub. 12/29/06, eff. 01/01/07; (1) am., OA 31, 2009-10, pub. 11/25/09, eff. 01/01/10; (1) – (3) am., OA 22, 2012-13, pub. 11/21/12.]

[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
# UW 7 WHPA Private Well Summary

## Private Well Surveillance:

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## Abandonment Summary:

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<tr>
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<tr>
<td>Known wells still to be abandoned</td>
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## Permitted Private Wells within 100 year capture Zone:

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## Known well(s) to be abandoned:

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</tr>
</tbody>
</table>

## Wells Abandoned:

- 1719 Boyd Ave
- 1742 Boyd Ave
- 1502 Farragut St
- 1434 Fremont Avenue
- 1438 Fremont Avenue
- 1509 Fremont Avenue
- 1510 Fremont Avenue
- 1513 Fremont Avenue
- 1518 Fremont Avenue
- 1609 Fremont Avenue
- 1701 Fremont Avenue
- 1708 Fremont Avenue
- 1817 Heath Ave
- 1437 Hooker Avenue
- 1510 Hooker Avenue
- 1610 Hooker Avenue
- 1614 Hooker Avenue
- 1721 Hooker Avenue
- 1726 Hooker Avenue
- 1734 Hooker Avenue
- 1910 Huxley Avenue
- 1918 Huxley Avenue
- 1929 Huxley Avenue
- 1802 Kropf Avenue
- 1713 Porter Ave
- 1718 Porter Ave
- 1738 Schlimgen Ave
- 1918 Schlimgen Ave
- 1432 Sheridan Dr
- 1610 Sheridan Dr
- 1721 Sheridan Dr
- 1717 Sheridan Dr
- 1721 Sheridan Dr
- 1834 Sheridan Dr
- 1606 N. Sherman Ave
- 1706 N. Sherman Ave
- 1710 N. Sherman Ave
- 1730 N. Sherman Ave
- 2001 N. Sherman Ave
- 1506 Steensland Dr
- 1745 Winchester St
- 1745 Winchester St
- 1801 Winchester St
Answers to Your Questions on Well Filling and Sealing

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

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

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

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

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

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

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

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

Who can perform proper well filling and sealing work?

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

How should a well be properly filled and sealed?

First determine the construction and condition of the well

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

IMPORTANT INFORMATION TO KNOW WHEN REQUESTING A WELL CONSTRUCTION REPORT:

To request a report, you must furnish a legal description in terms of 1/4 - 1/4 Section, 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) uwex.edu/wgns/well.htm.

Specific forms include:
- To request a Well Construction Report for a specific well uwex.edu/wgns/pdfs/wcrpdf/wellord.pdf.
- To request a Well Construction Report for an area uwex.edu/wgns/pdfs/wcrpdf/wellord2.pdf.
A site inspection will help you locate the well and see what condition it is in. You should determine if the well is easily accessible in the yard; or if it is in a pit or a basement. It’s possible the top of the well is buried in the yard, in which case you may be able to find it using a metal detector. During your inspection you can also check to see if the pump has been removed.

**Clearing, filling and sealing the well**

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

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

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

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

**Driven-point (sand-point) wells**

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

Many driven-point wells terminate in pits or in the basements of buildings. Since April 10, 1953 such well locations have been prohibited by the State Well Code.
If your well was constructed after this date, the well does not comply and must be properly filled and sealed except when the DNR approves its continued use.

**Dug wells**

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

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

**Well filling and sealing**

Unconsolidated portion backfill with:
- clay slurry
- clay type clean soil

- Remove upper 5 feet of curbing

Unconsolidated overburden

Bedrock portion filled with cement

Fractured bedrock

If a drilled well extends below the dug well it must be filled first according to drilled well requirements.

**Well pits**

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

---

**Well filling and sealing using bentonite chips**

In Wisconsin approved bentonite chips may be used to fill wells and drill holes. The chips may be used for both sand and gravel formation wells and bedrock wells. They may only be used for wells & drillholes meeting the following specifications:
- 4 inches or larger in diameter.
- Not more than 500 feet deep.
- Not more than 350 feet of water standing in the well or drillhole.

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

Bentonite chips may also be used for the following:
- To fill dug wells.
- As an alternative to concrete in the top 5 feet when clay slurry is used to fill a well or drillhole from the bottom up to the 5-foot depth.

*(Note: Bentonite chips come in two basic size ranges (1/4" - 7/16" and 1/2" - 1/4" chips). The 1/4" - 7/16" chips should be used for 4-inch diameter wells. Bentonite chips are irregularly shaped pieces of sodium bentonite clay that look very much like crushed limestone. They should not be confused with pellets or tablets which are not allowed.)*

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

1. Determine the construction details of the well or drillhole including at least the:
   a. Well or drillhole diameter, by simply measuring the inside diameter of the well casing pipe or drillhole; and
   b. Well or drillhole depth, by lowering a weighted line down to the bottom. (Make sure the weight is securely attached).

2. Remove the pump, pump piping and any other material obstructions or debris in the well or drillhole that could prevent complete filling and sealing.

3. Calculate the volume of the well or drillhole to determine the number of bags of chips that will be required by using:
   a. The attached Table I page 5; OR
   b. The formula:  \( \pi \frac{r^2 h}{0.69} \)  
      \[ r = \text{well radius (in feet)} \]
      \[ h = \text{well depth (in feet)} \]
      \[ 0.69 = \text{number of ft}^3 \text{ filled by one 50 lb. bag} \]

   *(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 about 3 minutes per bag. Pour at this rate so bridging of the chips does not occur – the chips must fall all the way to the bottom of the well. (Do not use a conductor-tremie pipe). Check well periodically with weighted line for possible bridging of chips.

6. Make sure the well "accepts" the entire number of bags calculated to fill it. If it doesn't, bridging may have occurred. The point of bridging must be broken so the bentonite chips will fall to the bottom. If the bridge cannot be broken, the well may have to be drilled out and re-filled with neat cement grout.

7. If the standing water in the well does not rise to the surface during the filling procedure, clean, uncontaminated water must be poured down into the well (through the chips) until water rises up to the top of the well and stays there. The chips will then swell and create an impermeable plug in the well.

<table>
<thead>
<tr>
<th>Hole diameter</th>
<th>Hole volume (ft³/foot)</th>
<th>Pounds bentonite chips to fill 1 ft</th>
<th>Feet filled by one bag bentonite chips</th>
<th>Bags bentonite chips to fill 100 ft</th>
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<tr>
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<td>15</td>
<td>1.227</td>
<td>88.3</td>
<td>0.57</td>
<td>176.6</td>
</tr>
<tr>
<td>18</td>
<td>1.767</td>
<td>127.2</td>
<td>0.39</td>
<td>254.4</td>
</tr>
<tr>
<td>20</td>
<td>2.182</td>
<td>157.1</td>
<td>0.32</td>
<td>314.2</td>
</tr>
<tr>
<td>25</td>
<td>3.409</td>
<td>245.4</td>
<td>0.20</td>
<td>490.8</td>
</tr>
<tr>
<td>30</td>
<td>4.909</td>
<td>353.4</td>
<td>0.14</td>
<td>706.8</td>
</tr>
<tr>
<td>Well type</td>
<td>Clean clay or silty or clean native soil</td>
<td>Approved bentonite chips</td>
<td>Neat cement grout</td>
<td>Concrete</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------------------------------</td>
<td>--------------------------</td>
<td>-----------------</td>
<td>---------</td>
</tr>
<tr>
<td>Driven-Point (sand-point) wells &amp; drillholes ≤ 2 1/2” diameter</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Wells &amp; drillholes &gt; 2 1/2” diameter</td>
<td>No</td>
<td>Yes, provided well is 4” minimum diameter &amp; 500’ maximum depth</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Dug wells</td>
<td>Yes (top 5’ of curbing must be removed following filling)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Bedrock wells not extending through Maquoketa Shale</td>
<td>No</td>
<td>Yes, provided 4” minimum diameter &amp; 500’ maximum depth</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Bedrock wells extending through Maquoketa Shale</td>
<td>No</td>
<td>Yes in top 500’ &amp; for 40’ plugs at top &amp; bottom of Maquoketa Shale contact surfaces</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Dug wells</td>
<td>Yes, but only in unconsolidated portion of well</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Well pits</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

- 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 1/2 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’ Impervious 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:

<table>
<thead>
<tr>
<th>Product</th>
<th>Manufacturer/Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABI Plug</td>
<td>ABI, Inc.</td>
</tr>
<tr>
<td>Bentonite Plug</td>
<td>Loresto (medium: ¼ - ⅜ and coarse ½ - ¾&quot;&quot;)</td>
</tr>
<tr>
<td>Black Hills Bentonite Plug</td>
<td>Black Hills Bentonite, LLC</td>
</tr>
<tr>
<td>CETCO Chip</td>
<td>CETCO (medium: ¼ - ⅜&quot; &amp; coarse; ⅜ - ⅞&quot;&quot;)</td>
</tr>
<tr>
<td>Cowboy Brand</td>
<td>Cowboy Mining Co. (Fine, Medium &amp; Coarse)</td>
</tr>
<tr>
<td>Econoplug</td>
<td>Economy Mud Products Co. (both medium chips: ⅛&quot; to ⅜&quot; and coarse chips: ½&quot; to ¾&quot;’) (mfg. by Wyo-Ben, Inc.)</td>
</tr>
<tr>
<td>Enviroplug</td>
<td>Wyo-Ben, Inc. (both medium chips: ⅛&quot; to ⅜&quot; and coarse chips: ½&quot; to ¾&quot;’)</td>
</tr>
<tr>
<td>Federal Plug</td>
<td>M-1 Drilling Fluids (Federal) – 100% of chipped sodium bentonite (both medium chips: ⅛&quot; to ⅜&quot; and coarse chips: ½&quot; to ¾&quot;)</td>
</tr>
<tr>
<td>Holeplug</td>
<td>Baroid Industrial Drilling Products (¾&quot; and ¾&quot; chips)</td>
</tr>
<tr>
<td>Kwik Plug</td>
<td>Federal Summit (¾&quot; and ¾&quot; chips)</td>
</tr>
<tr>
<td>Naturapel</td>
<td>Wyo-Ben, Inc. (chips)</td>
</tr>
<tr>
<td>Opti Seal</td>
<td>Bentonite Corp. (¾&quot; and ¾&quot; chips)</td>
</tr>
<tr>
<td>PdsCo Plug</td>
<td>PdsCo. (Polymer Drilling Systems)[medium and coarse chips]</td>
</tr>
<tr>
<td>Permaplug</td>
<td>Cathodic Engineering Equipment Co. (both coarse chips: ¾&quot; and medium chips: ⅞&quot;)</td>
</tr>
<tr>
<td>Pure Gold Chips</td>
<td>CETCO (both medium ¼&quot; to ⅜&quot; and coarse ⅜&quot; to ¾&quot; chips)</td>
</tr>
<tr>
<td>Tower Plug</td>
<td>Black Hills Bentonite, LLC (⅜&quot; and ¾&quot; chips)</td>
</tr>
<tr>
<td>Well-Plug</td>
<td>Fluidrill Mud Systems (from Black Hills Bentonite) 100% chipped bentonite (⅜&quot; and ¾&quot; chips)</td>
</tr>
</tbody>
</table>
Conductor (tremie) pipe used for well filling and sealing shall be any of the following:

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

What administrative rules cover well filling and sealing?

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

Where can I obtain additional information?

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

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

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.
YOU & YOUR WELL

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

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For more information, request the following brochures: Well Abandonment (PUB-DG-016), Bacteriological Contamination of Drinking Water (PUB-DG 003), Driven-Point (Sand-Point) Wells (PUB-DG-022 92)

PUB-DG-002 2007
Is there a new well in your future? Perhaps you are building a new home, or are simply considering replacing or upgrading an existing water supply. Whatever the case, here is some information that can help you.

**Who regulates water wells?**
Wisconsin has had well regulations since 1936, and today is recognized as a national leader in well protection. NR 812, (formerly NR 112), Wis. Adm. Code, is administered by the Department of Natural Resources (DNR). The Well Code is based on the sound premise that if a well and water system is properly located, constructed, installed and maintained the well should provide safe water continuously without the need for treatment. Most county zoning and public health offices have a copy of the Well Code. For information about the code, contact a DNR regional water supply staff person or a licensed well driller or pump installer. Consult with licensed individuals or neighbors for background information on water quality.

**When is an approval required prior to construction?**
A DNR Notification Number is required prior to construction. You may obtain a DNR Notification Number online at: [dnr.wi.gov](http://dnr.wi.gov). Under “Online Services” click on Well Construction Notification and answer the questions. Be sure to print a copy for your records. A second option is that you may also visit one of the 1500 locations throughout Wisconsin where hunting & fishing licenses are sold. You will receive a receipt for your records which displays a DNR Notification Number. Also, some DNR approved county ordinances require that a “well permit” be obtained prior to construction. Check with your county health department or zoning office.

State statutes require that any owner who constructs and/or operates a well or combination of wells on one property that are capable of producing 70 or more gallons per minute, in aggregate, must obtain an approval from the DNR prior to construction.

Approvals are also required for constructing school water systems, wastewater treatment plant water systems and community water systems governed under chapter NR 811 and for the installation of some types of water treatment.

**Who can construct wells? Who can install pumps?**
**Well Driller**—Only those persons holding a current well drilling license from the Department of Natural Resources may construct or reconstruct (deepen or install a liner or screen) potable wells.

**Pump Installer**—Only those persons holding a current pump installer license from the Department of Natural Resources may install and replace pumps, pitless adapters and accessory piping and pressure tanks on both drilled and driven point potable wells.

**Exceptions**—A well drilling license is not required for constructing driven point wells.

A license is not required for a person constructing a well or installing a pump on property owned and occupied by him or her. State law requires, however, that no matter who does the work, it must comply with the State Private Well Code (ch. NR 812), and a Well Construction Report must be submitted to DNR.

A license is not required for an individual constructing a nonpotable well or installing a pump in a nonpotable well, however the installation must comply with the well code.

**What are the responsibilities of a well constructor to the owner?**
The well must be constructed or reconstructed in compliance with ch. NR 812, and upon completion of a well construction or reconstruction, a well driller or point driver is required to:

1. Test pump and flush the well.
2. Disinfect the well.
3. Collect a water sample for a bacteriological test; submit the sample to a laboratory certified for bacteriological testing; and provide a report of the results to the owner within 10 days of receiving the water test results. (The DNR recommends that the water also be tested for nitrates.)
4. Provide the owner or his agent with a copy of a Well Construction Report, that describes how the well was constructed, within 30 days of completion of the well. The report assigns a unique number to the well.

The water sample test results and well construction report must also be sent to the Department.

**What are the responsibilities of a pump installer to the owner?**
A pump installer must install the pump, the pitless adapter, pressure tank and sample faucet in compliance with the Well Code, disinfect the pump and distribution system after installation, flush it, take a water sample for bacteriological analysis (as described in #3 above) and report the results to the owner.

The pump installer may delegate the sample collection to the owner or another agent, by leaving the sample bottle, instructions and form, but the pump installer is still responsible for the sample collection.

**Some private well location requirements (from NR 812)**
Always ensure that your well is located upslope and as far as possible from potential sources of contamination, but at least:

- 8 feet from an approved gravity building sewer pipe or 25 feet from building sewers made of other non-approved materials or a pressurized building sewer.
- 8 feet from a swimming pool.
- 100 feet from any buried petroleum tank, except that only 25 feet of separation is required for a buried fuel oil tank if the tank is used only for private residential heating.
- 25 feet from a septic or holding tank, or from a laundry or wastewater sump.
- 25 feet from the high water mark of a lake, pond or stream.
- 50 feet from a privy, dry well, soil absorption system (“drainfield”) or mound system.
- 50 feet from a municipal collector sewer.
- 50 feet from an animal yard or animal shelter.
- 250 feet from a sludge disposal area, a salvage yard or a salt storage area.
- 250 feet from an absorption, storage, retention or treatment pond; ridge and furrow system; or spray irrigation waste disposal site.
- 1,200 feet from any existing, proposed or abandoned landfill site.

**NOTE:** This list is not complete. Consult NR 812 or the DNR for specific requirements. Figures A and B show well location requirements.
Some general DOs and DON'Ts

DO Make certain the well constructor extends the well casing pipe at least 12 inches above the finished ground surface and two feet above a floodplain. (Future landscaping must be taken into account.)

DON'T Install a well in the basement or in a crawl space of your home. (The well would not be accessible for repair.) If the basement is of the walk-out type, installation is permissible. (Offset pumps may be installed in dry basements.)

DO Properly install a vermin-proof well cap and electrical conduit to prevent entrance of insects into the well.

DON'T Construct a well, pump, or pressure tank pit. A well may not terminate in a pit or an alcove. The DNR does not allow pits because of the potential for flooding and subsequent contamination of the water supply. (Pitless adapters have made pits obsolete.)

DO Make certain the well constructor extends the well casing pipe at least 12 inches above the finished ground surface and two feet above a floodplain. (Future landscaping must be taken into account.)

DON'T Install unprotected buried suction line between a well and a pump or pressure tank in a basement. If the pipe were to develop a hole or crack, it could allow surface water to get into the water supply. Instead use a pitless adapter or unit with a pressurized piping arrangement. Do not install a non-pressure conduit to enclose the suction piping between a well and a basement.

DO Collect a water sample for bacteriological analysis at least once each year and anytime you notice a change in taste, odor, color or appearance. Also sample for nitrate if the water is to be used for an infant or a pregnant woman.

DON'T Use a well for disposal or drainage of solid wastes, sewage, surface water or wastewater. This can contaminate an aquifer.

DO Properly install a vermin-proof well cap and electrical conduit to prevent entrance of insects into the well.

DON'T Install an accessible downward-facing, non-threaded sampling faucet between the pump and the pressure tank at least 12 inches above the floor to allow for sampling water directly from the well.

DO Use only code-complying well casing pipe. (see NR 812.17).

DO Make certain the well constructor extends the well casing pipe at least 12 inches above the finished ground surface and two feet above a floodplain. (Future landscaping must be taken into account.)

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DO Use only code-complying well casing pipe. (see NR 812.17).

Types of acceptable pump installations

Offset Pump Installations (pump usually installed offset from the well in basement of house) with a seal-cross fitting or a flange adapter and pressurized, concentric discharge. Connections should be made below frost depth to eliminate the potential for freezing.

1. Offset shallow-well pump for driven point well (Figure C)
2. Packer jet assembly for offset for driven point well pump (Figure D)
**Submersible Pumps** installed within well, below water level with:

1. An above-ground discharge pipe enclosed in a heated shelter (Figure E); or
2. Approved above-ground discharge unit, directed to an inside pressure tank (Figure F); or
3. A below-ground discharge with approved pitless adapter or pitless unit (Figure G); or
4. A buried pitless receiver tank (Figure H).

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**Figure E** Submersible pump with above-ground discharge in pumphouse

**Figure F** Approved above-ground discharge unit

**Figure G** Submersible pump with below-ground discharge

**Figure H** Submersible pump with pitless receiver tank

**Figure I** Example of a vermin-proof cap

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**Well Code requirements have been simplified for this pamphlet.**

For specific details on the Wisconsin Well Code (NR 812), look on our website at: [dnr.wi.gov/org/water/dwg/code.htm](http://dnr.wi.gov/org/water/dwg/code.htm). If you have questions on the specifics of NR 812, please contact staff at one of the following offices.

**Northern Region**
810 W. Maple Street
Spooner, WI 54801
(715) 635-2101
or
107 Sutliff Avenue
Rhineland, WI 54501
(715) 365-8900

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

**West Central Region**
1300 W. Clairemont
PO Box 4001
Eau Claire, WI 54702-4001
(715) 837-3700

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

**Northeast Region**
2984 Shawano Avenue
P.O. Box 10448
Green Bay, WI 54307-0448
(920) 662-5100

**Central Office**
101 S. Webster
P.O. Box 7921
Madison, WI 53707-7921
(608) 266-0821
APPENDIX M

CITY OF MADISON WELLHEAD PROTECTION ORDINANCE
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 fifty dollars ($50) nor more than one thousand dollars ($1,000). Each day or portion thereof such violation continues shall be considered a separate offense. 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; Am. by ORD-06-00135, 10-6-06)
SUBCHAPTER 28H: OVERLAY DISTRICTS

28.101 APPLICABILITY.
The requirements of the overlay 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 primary zoning district classification of those zoning lots.
In the event of a conflict between the provisions of any overlay district and the underlying primary zoning district, the provisions of the overlay district shall apply, except where otherwise specified.

28.102 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) Protection Zones.
Each wellhead shall have two (2) zones of protection around it.
(a) Zone A is 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 is the smaller of the following:
   1. 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
   2. The area within a twelve hundred (1,200) foot radius around the well, except for the area in Zone A.

(3) Uses.
All uses in Zones A and B of any Wellhead Protection District shall be approved by the Water Utility General Manager or his/her designee. A use may be approved with conditions. Approval by the Water Utility General Manager or his/her designee is 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, MGO.
(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.

(4) 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.
(5) Wellhead Protection District No. 6.
The location of Well No. 6 and the surrounding Zone A and Zone B are shown in Sec. 28.102(12)(a).
(a) Wellhead Protection District No. 6.

(6) Wellhead Protection District No. 7.
The location of Well No. 7 and the surrounding Zone A and Zone B are shown in Sec. 28.102(16)(a).
(a) Map of Wellhead Protection District No. 7.
APPENDIX N

WATER CONSERVATION INFORMATION
HOME CONSERVATION

Madison Water Utility led an effort to develop a comprehensive water conservation program for the city. Completed in 2008, the Water Utility Water Conservation and Sustainability Plan looks at a variety of things that can be done by the city and its residents and businesses to reduce our impact on the water resources that help make Madison such a great place to live, work and play. View the plan here (PDF).

HOW DO WE USE WATER?

Daily indoor per capita water use in the U.S. is 69.3 gallons. Here is how it breaks down:

<table>
<thead>
<tr>
<th>Use</th>
<th>Gallons per Capita</th>
<th>Percentage of Total Daily Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Showers</td>
<td>11.6</td>
<td>16.8%</td>
</tr>
<tr>
<td>Clothes Washers</td>
<td>15.0</td>
<td>21.7%</td>
</tr>
<tr>
<td>Dishwashers</td>
<td>1.0</td>
<td>1.4%</td>
</tr>
<tr>
<td>Toilets</td>
<td>18.5</td>
<td>26.7%</td>
</tr>
<tr>
<td>Baths</td>
<td>1.2</td>
<td>1.7%</td>
</tr>
<tr>
<td>Leaks</td>
<td>9.5</td>
<td>13.7%</td>
</tr>
<tr>
<td>Faucets</td>
<td>10.9</td>
<td>15.7%</td>
</tr>
<tr>
<td>Other Domestic Uses</td>
<td>1.6</td>
<td>2.2%</td>
</tr>
</tbody>
</table>

By installing more efficient water fixtures and regularly checking for leaks, households can reduce daily per capita water use by about 35% to about 45.2 gallons per day. Here's how it breaks down for households using conservation measures:

<table>
<thead>
<tr>
<th>Use</th>
<th>Gallons per Capita</th>
<th>Percentage of Total Daily Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Showers</td>
<td>8.8</td>
<td>19.5%</td>
</tr>
<tr>
<td>Clothes Washers</td>
<td>10.0</td>
<td>22.1%</td>
</tr>
<tr>
<td>Toilets</td>
<td>8.2</td>
<td>18.0%</td>
</tr>
<tr>
<td>Dishwashers</td>
<td>0.7</td>
<td>1.5%</td>
</tr>
<tr>
<td>Baths</td>
<td>1.2</td>
<td>2.7%</td>
</tr>
<tr>
<td>Leaks</td>
<td>4.0</td>
<td>8.8%</td>
</tr>
<tr>
<td>Faucets</td>
<td>10.8</td>
<td>23.9%</td>
</tr>
<tr>
<td>Other Domestic Uses</td>
<td>1.6</td>
<td>3.4%</td>
</tr>
</tbody>
</table>

Source: Handbook of Water Use and Conservation, Amy Vickers

IS THERE A LEAK?

Any water-using device or pipe connection can leak. There is usually some evidence of such problems, but the evidence isn't always obvious: A toilet leak can be noisy but it can also be rather quiet; a dripping faucet can be overlooked. Checking the water meter can be a good way of finding out if there is a water leak:

- The meter in the basement may have a small
(1/4-inch) "leak detector" dial, a blue gear-like fitting visible on the face of the meter with no numbers or markings. If there is any movement of that dial when water isn't in use, there is likely to be a leak. (Be sure the water softener isn't cycling and no other water-using appliances are operating when you check this.)

- The meter in the basement shows movement of water through the meter, registering on a digital display, including tenths and hundredths, and often on a one-cubic-foot dial showing the precise amount of water being used. Checking the meter for any change in the display or movement on the dial after a period of time when no water has been used will reveal whether any water is being lost.
- The register on the outside of the house shows a digital display to tenths of cubic foot (7.48 gallons) and can also be checked for any registration when no water has been in active use.

REPAIR LEAKY FAUCETS
At one drop a second, a leaky faucet can waste 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. View Drip Calculator, American Water Works Association.

TOILET LEAKS
Listen and watch for toilet leaks. 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.

BACKFLOW PREVENTION DEVICES
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.

GOOD PRACTICES
- Install water-saving devices: Aerators for kitchen and bath taps, flow regulators for shower heads and toilet tanks, and high-efficiency toilets to reduce the amount of water used in every flush.
- 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.
- Use nontoxic and biodegradable soaps and
cleansers, or try environmentally friendly options: Baking soda provides abrasive nontoxic cleaning; vinegar's acidity makes it a good cleaning option when mixed with water; borax is an effective laundry cleaning agent as well as abrasive.

- Turn off the tap when not actively rinsing (toothbrush or razor as well as in the kitchen) or washing hands.
- 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, and makes very good sense all of the time.
- Activities that use significant amounts of water--both indoors and outdoors--can be timed to help manage periods of high demand for electricity.
- When it's time to replace appliances, purchase more energy-efficient and water-efficient ones. Initial costs may take some time to be offset by water savings, but savings for electricity use are often very quick, rebates are sometimes offered, and there are often other features on the newer appliances that help compensate for the aggravation, expense, and use of resources involved with replacing the earlier model.
- Household toxic wastes? Flushing or pouring toxic substances down the drain and into the sanitary sewer system isn't a good practice for disposing of them. Toxic materials may end up in our water supply, or someone else's.
- How about that garbage disposal? Instead of grinding up food wastes and sending them into the sanitary sewer system, use them for making compost--or grind them up into pretty-near compost in the food processor or blender to speed things along.