

Water Well Flooding: What Do You Do?



Michael J. Schnieders, PG, PH-GW
Hydrogeologist
Water Systems Engineering, Inc.

Part of a series of webinars by the National Ground Water Association with support from the U.S. Environmental Protection Agency



Water Well Flooding: What Do You Do?

- Why should I be worried?
- What steps do I take before a flood?
- What do I do when a flood is imminent?
- How do I respond to a flooded well?
- Who can help me with a flooded well?
- Additional Resources



Water Well Flooding: *Why should I be worried?*

Flooding is regarded as the most common environmental hazard impacting mankind



Photo Courtesy: Connecticut Post

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Water Well Flooding: *Why should I be worried?*



Photo Courtesy: Nebraska Land Magazine

Flooding not only changes our landscape, but can dramatically impact our watersheds and aquifers

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Water Well Flooding: *Why should I be worried?*

Flooding of a water well can...

- Damage or destabilize the well structure
- Introduce a variety of natural and anthropogenic contaminants
- Introduce sediment into the borehole

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Water Well Flooding: *Why should I be worried?*



Depending on the area - or even the specific spot where your well is located, flooding can threaten:

- The quality of your water supply
- The condition of your well system

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Water Well Flooding: *Why should I be worried?*

Compromised water
quality from flooding
may lead to illness or
fatal disease



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Water Well Flooding: *What steps can I take before a flood?*

Well owners should assess the vulnerability of
their well systems to flooding

Several Questions to Ask:

- **Where is the well located?**
- **How is the well constructed?**
- **What condition is the well in?**

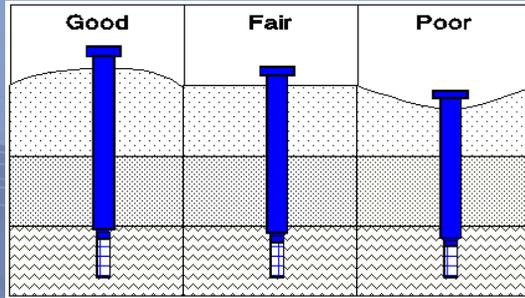
Use this information to develop a plan!

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Well location:

If the wellhead is located up and away from the water flow rather than in a low-lying area...



...the chances of surface water pooling around the wellhead or topping the well cap are lessened.

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Well location:



Photo Courtesy: Clark County, WA

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Well location:

The Level of Risk Increases with the Proximity to Flooding



Identify the Flood Plain
and areas of Flood Risk.

Contact your local
Sanitarian or County
Health Department for the
current flood map

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Well Location and Land Management:



Oftentimes, landscaping can be used
to manage surface water run-off to avoid
flooding or pooling of water around a well.

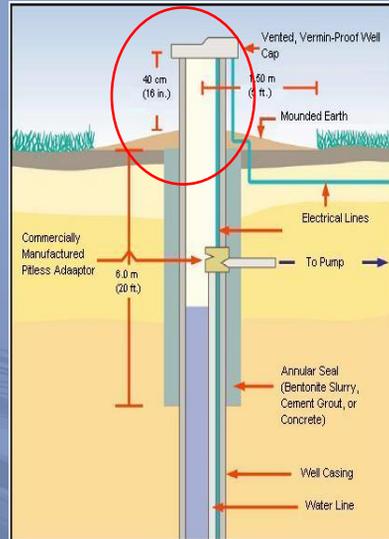
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Well Construction:

Wells that are cased above the high-water level are less vulnerable to flooding.

This minimizes the chances of flood waters topping the well casing and entering the well through the vent in the well cap.



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Well Construction:



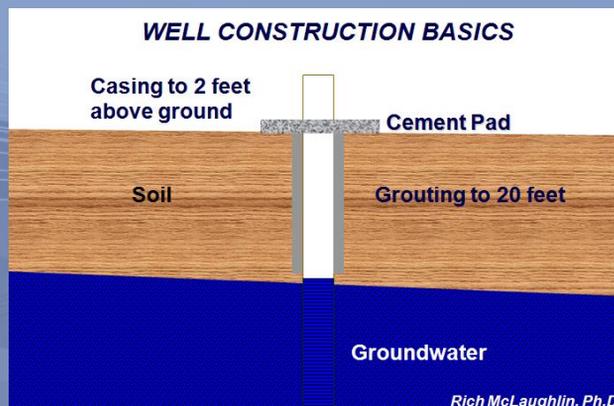
Wells that are cased above the high-water level are less vulnerable to flooding....

However, this does not alleviate all potential for problems

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Well Construction:

Special grout, when properly installed in the space between the outside of the well casing and the inside of the drilled hole (annulus) can prevent surface water from infiltrating the well.



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Well Construction:



Regular Inspection of the Well Head and Surface Seal are encouraged – *especially* in areas prone to flooding, subsidence, or impacted by extreme drought conditions.

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Condition of the Well:

The condition of the well prior to a flooding event can significantly impact the level of concern and type of response needed.

Damage and deterioration can occur on the surface and subsurface of the well.

Water Wells naturally foul due to the water chemistry and native bacteria within the aquifer. Wells also age and the materials used in construction can degrade over time with use.

- A well that is properly maintained can minimize or eliminate the well's vulnerability to flooding and reduce the steps necessary to return it to active use.

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Condition of the Well:



Deterioration of the well casing, grout or surface seals could provide an entry point for floodwater into a well.

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Condition of the Well:



Biomass and scale accumulations on a well screen

Wells that are dirty or fouled prior to a flooding event are harder to clean, disinfect and restore to active use.

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What do I do when a flood is imminent?

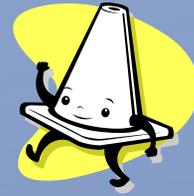
- Turn the power to the well system off.
- “seal” the well
- Sandbag the vicinity of the well / well house
- Alert your well professional



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How do I respond to a flooded well?

- Arrange an alternative water supply
- Contact a Well Professional to:
 - Evacuate the surrounding area of debris and standing water
 - Pump the well
 - Clean the well and make any repairs if necessary
 - Disinfect
- Sample & Test the Water Quality



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Arrange For An Alternate Water Supply

Arrange for a temporary alternative water supply, such as bottled water.

Do not allow anyone to use the flooded well even for animals or agriculture, until it has been tested and deemed “safe”

Note: Boiling water for 2-3 minutes can kill bacteria but may not be effective against other types of contamination, such as chemical contamination.



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Contact A Water Well Professional

Contact a Licensed Water Well Contractor for a well assessment and to better understand specific risks in your area.

Note: This could take some time if many wells have been flooded. Have this information on hand, prior to flooding, just as you would your trusted mechanic.



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Contact A Water Well Professional

Many dangers exist around a flooded or damaged well, such as electrocution. A licensed Water Well Contractor who understands the wells in your area can be an excellent source of information and assistance.

Note: You should not drink the water from a flooded well until the well has been cleaned, serviced, disinfected and then tested so that the water is proven safe to drink.



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Remove debris and standing water



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Pump the well to flush introduced water

Floodwaters can pick up substances that have spilled, such as chemicals in storage bins or tanks.

Extensive pumping of the well and aquifer may be required to eliminate contamination.



Photo Courtesy: Blue Daze Blog



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Pump the well to flush introduced water



Photo Courtesy: Stanford University



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Clean the well and make any repairs if necessary

Even under normal conditions wells may become damaged or fouled.

Returning the well to active service may require a variety of repairs and cleaning prior to disinfection



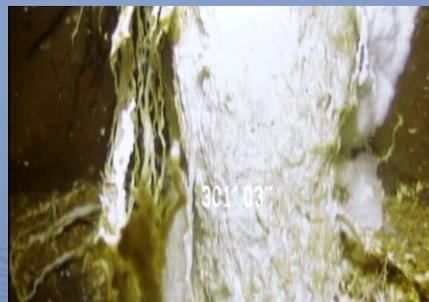
Photo Courtesy: Pepe Pump Inc.

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Clean the well and make any repairs if necessary



Photo Courtesy: Weston Engineering



A well impacted by Hurricane Katrina flood waters exhibited significant fouling.

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Well Disinfection after Flooding:

The well must be disinfected and tested prior to being returned to active use.

Note: even under normal circumstances, proper disinfection of a water well can be difficult for the untrained.



Photo Courtesy: Oregon Health Authority

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Well Disinfection after Flooding:

Successful disinfection is more than just pouring chlorine down the hole

Key Points:

- Correct dosage
- Correct treatment volume
- pH buffering
- Application
- Sufficient Contact time

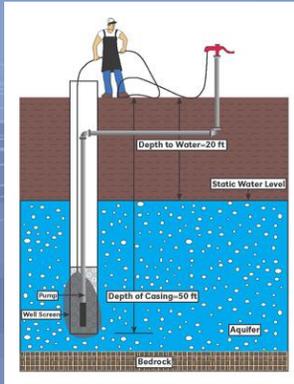


Photo Courtesy: Virginia Tech Extension

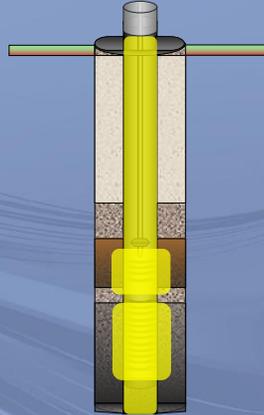
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Well Disinfection after Flooding:

The proper application, agitation, and contact time are very important for effective disinfection



Recirculating water through a nearby hydrant after the introduction of concentrated chlorine into a well in order to thoroughly mix chlorine with the well water.



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Well Disinfection after Flooding:

Allow sufficient contact time for the chlorine solution to remain downhole

Note: The amount of contact time needed is calculated by dividing 1000 by the chlorine concentration.

So, for a 200 ppm chlorine concentration, you'd need a minimum of 5 hours contact time.



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Well Disinfection after Flooding:

At a minimum, flooded wells should be tested for Coliform Occurrence.



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Well Disinfection after Flooding:

[For recommendations on local well water testing and specific contaminants in your area:](#)

1. Check with your local health or environmental health department
2. Check with a certified drinking water testing laboratory in the area



Well Disinfection after Flooding:

Flooded wells should be tested periodically after the well has been restored.

This can detect the reappearance of any residual contamination that was not completely removed.



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For state requirements or recommendations for well water testing:

- Go to "Water Testing" under the Water Quality tab of www.wellowner.org

To find a certified drinking water testing lab in your area:

- Also go to "Water Testing" under the Water Quality tab of www.wellowner.org.



Contact your local Sanitarian or County Health Department regarding local concerns

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Well Disinfection after Flooding:

Larger wells, older “hand-dug” wells, and specialty wells may require special disinfection measures and a professional should be contacted



Photo Courtesy: Marcellus-Shale.US

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Summary

- Flooding can harm well systems, impacting the structure, water quality, and long-term usefulness of a well.
- Make sure your well is maintained properly and “trouble-free” before a flood is imminent.
- Should flooding occur, respond accordingly .
- Contact a Certified Well Professional when trouble strikes.
- Continue to monitor flooded wells after they have been returned to active use.

Who Can Help?



To Find a Local Certified Water Well Contractors



Go to "Find a water well contractor" on the main page of www.wellowner.org



National Ground Water Association
601 Dempsey Road
Westerville, Ohio 43081
800 551.7379 (614 898.7791)
www.ngwa.org | www.wellowner.org

