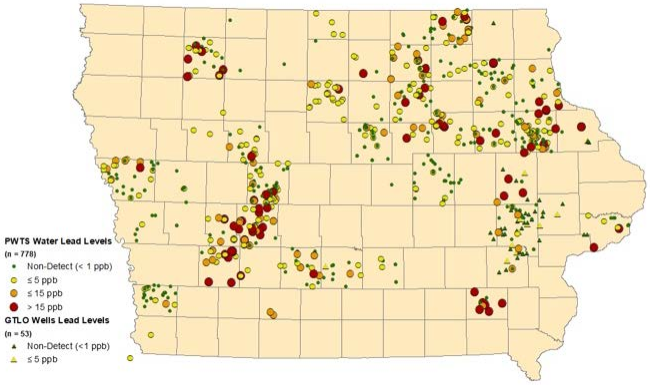
GTLO & CHEEC FACT SHEET: LEAD IOWA'S PRIVATE WELLS

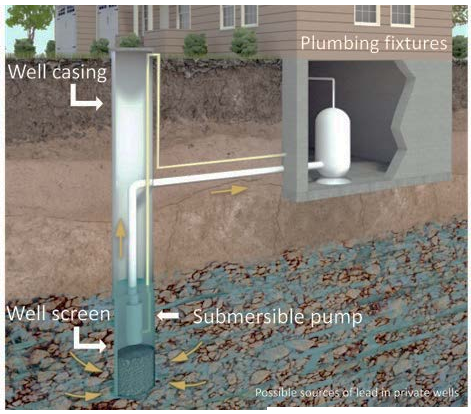
What is known about lead in Iowa wells?

- Nearly 300,000 Iowans (~10% of the population) rely on private wells. [1]
- ~ 900 well water lead samples have been collected in Iowa.
- About 80 of these wells (~ 10%) have lead concentrations greater than the EPA action level of 15 parts per billion (ppb).
- Few states have published data on lead in private wells. Of those published, the percent of wells exceeding the EPA level range from 1.8 to 19%.[2–5]



Where does lead in well water come from?

- Groundwater is rarely a source of high lead concentrations in the U.S.[6]
- In wells, lead most often comes from the corrosion of premise plumbing (inside the home) and potentially lead-bearing components inside the well itself.[7]
- Lead-bearing components in wells could include lead "packers", well screen, submersible pump, well casing, in-ground piping and fittings, and the pitless adapter.
- Brass and galvanized iron pipes and fixtures can be significant sources of lead in homes built before 2014.[8]



Source: US EPA

What are the health implications of lead in private well water?

- Lead is a known neurotoxin and the CDC has deemed that *no level of lead exposure safe.*[9]
- Children drinking from private wells have shown to have higher blood lead levels (BLLs) compared to children drinking from private water (even after controlling for well-known exposure risk factors, such as age of home).[10]
- A study done in Iowa has shown that rural children have the same amount of risk of having elevated BLLs as urban children.[11]

What is the regulatory framework for lead in well water?

- Private water systems fall outside the jurisdiction of the Safe Drinking Water Act (SDWA) that governs public water, and therefore there are no routine testing and treatment requirements (or recommendations) for private wells.
- It is the well owner's sole responsibility to ensure the safety of their water.
- Private well owners have been observed to not implement corrosion control or test for lead in their well water.
- Iowa Admin. Code 567-49 only requires a water sample of new, repaired, or rehabilitated wells be tested for coliform bacteria and nitrate between 10 and 30 days after it is put in use.[12]

How could Iowa's Grants to Counties program help?

- The Grants to Counties program (641 IAC – Chapter 24) was created in 1987 as part of the Groundwater Protection Act to assist private water well owners in Iowa. Funded through the Agricultural Management Account within the State's Groundwater Protection Fund (Iowa Code 455E.11), the Grants to Counties program provides money each year for activities including the testing of private water wells for total nitrate (including nitrite), total coliform bacteria, and arsenic.
- Recent changes to the Grants to Counties Program in fiscal year 2020 now allow counties, with Iowa Department of Public Health (IDPH) approval, to include additional contaminants in well water quality testing so long as there is a national primary drinking water regulation or standing public health advisory issued by the US EPA for the contaminant.
- Although these recent changes would allow Counties to test for lead in private wells with IDPH approval, Counties would need to be aware that lead contamination can be a problem for private well users and proactively request approval for lead testing.
- By changing Iowa Code and associated Administrative Rules to allow inclusion of lead testing as an allowable expense within the Grants to Counties program, more private well users would have their water tested for lead contamination and be able to take action to avoid unsafe exposure to lead in their household based on their testing results.

Literature Cited

(1) Secchi, S.; Cwiertny, D. Iowa ' s Grants to Counties Program : A Valuable but Underutilized Program for Protecting the Public Health of Private Well Users. **2019**, No. August, 1–8.

(2) Pieper, K. J.; Krometis, L. A. H.; Gallagher, D. L.; Benham, B. L.; Edwards, M. Incidence of Waterborne Lead in Private Drinking Water Systems in Virginia. *J. Water Health* **2015**, *13* (3), 897–908. https://doi.org/10.2166/wh.2015.275.

(3) Swistock, B. R.; Clemens, S.; Sharpe, W. E.; Rummel, S. Water Quality and Management of Private Drinking Water Wells in Pennsylvania. *J. Environ. Health* **2013**, *75* (6), 60–66.

(4) Knobeloch, L.; Gorski, P.; Christenson, M.; Anderson, H. Private Drinking Water Quality in Rural Wisconsin. *J. Environ. Health* **2013**, *75* (7), 16–20.

(5) Sanders, A. P.; Desrosiers, T. A.; Warren, J. L.; Herring, A. H.; Enright, D.; Olshan, A. F.; Meyer, R. E.; Fry, R. C. Association between Arsenic, Cadmium, Manganese, and Lead Levels in Private Wells and Birth Defects Prevalence in North Carolina: A Semi-Ecologic Study. *BMC Public Health* **2014**, *14* (1), 1–12. https://doi.org/10.1186/1471-2458-14-955.

(6) Jurgens, B. C.; Parkhurst, D. L.; Belitz, K. Assessing the Lead Solubility Potential of Untreated Groundwater of the United States. *Environ. Sci. Technol.* **2019**, *53* (6), 3095–3103. https://doi.org/10.1021/acs.est.8b04475.

(7) Pieper, K. J.; Nystrom, V. E.; Parks, J.; Jennings, K.; Faircloth, H.; Morgan, J. B.; Bruckner, J.; Edwards, M. A. Elevated Lead in Water of Private Wells Poses Health Risks: Case Study in Macon County, North Carolina. *Environ. Sci. Technol.* **2018**, *52* (7), 4350–4357. https://doi.org/10.1021/acs.est.7b05812.

(8) Pieper, K. J.; Krometis, L. A.; Edwards, M. Quantifying Lead-Leaching Potential from Plumbing Exposed to Aggressive Waters. *J. Am. Water Works Assoc.* **2016**, *108* (9), E458–E466. https://doi.org/10.5942/jawwa.2016.108.0125.

(9) AAP; Statement, P. Prevention of Childhood Lead Toxicity. *Pediatrics* **2016**, *138* (1). https://doi.org/10.1542/peds.2016-1493.

(10) MacDonald Gibson, J.; Fisher, M.; Clonch, A.; MacDonald, J. M.; Cook, P. J. Children Drinking Private Well Water Have Higher Blood Lead than Those with City Water. *Proc. Natl. Acad. Sci. U. S. A.* **2020**, *117* (29), 16898–16907. https://doi.org/10.1073/pnas.2002729117.

(11) Carrel, M.; Zahrieh, D.; Young, S. G.; Oleson, J.; Ryckman, K. K.; Wels, B.; Simmons, D. L.; Saftlas, A. High Prevalence of Elevated Blood Lead Levels in Both Rural and Urban Iowa Newborns: Spatial Patterns and Area-Level Covariates. *PLoS One* **2017**, *12* (5), 1–17. https://doi.org/10.1371/journal.pone.0177930.

(12) Iowa Department of Natural Resources: A consumer information booklet. Non-Public Water Wells and Water Systems. **2007**.