

IOWA DEPARTMENT OF NATURAL RESOURCES

LEADING IOWANS IN CARING FOR OUR NATURAL RESOURCES

Iowa Department of Natural Resources Strategy for Ranking Public Water Supplies for Per and PolyfluoroAlkyl Substances Sampling

Introduction

In January 2020 the Iowa Department of Natural Resources (DNR) developed an Action Plan to protect the health of Iowa residents and the environment from a class of chemicals of emerging concern known as per- and polyfluoroalkyl substances (commonly referred to as PFAS). The first of three focus areas of the plan is to “Identify and Minimize Exposure of Iowans to PFAS.” One of the primary exposure pathways for health effects to individuals from PFAS is through drinking water. The initial actions in the DNR’s PFAS action plan is to prioritize testing of public drinking water systems based on DNR Drinking Water Operations Section’s criteria that measures relative susceptibility to surface contaminants and potential industrial use of PFAS chemicals in the vicinity. The general process for prioritizing public drinking water systems is identified in the action plan as:

1. Develop a PFAS Inventory:
 - a. Identify the locations where activities and or businesses operate[d] that may use PFAS chemical(s) in their processes (i.e. airports, fire training areas, certain manufacturing sectors, etc.) based on North American Industrial Codes (NAIC).
 - b. Validate the locations identified in 1a. above to determine if correct parcels are identified (i.e. corporate locations versus manufacturing locations) and the size of parcels.
2. Incorporate drinking water sources (surface water and groundwater) into the data set for comparison against the locations identified in the previous step. The DNR will evaluate potential exposure pathways based on geology, location of private wells, public water supply wells, wellhead protection areas and surface water intakes.
3. Develop a system to score and then rank each location.
4. Perform testing of raw and finished water of public water supplies based on the ranking developed in the previous steps using EPA-validated laboratory methods for analysis. Raw source water may also be sampled if resources allow.

Potential PFAS Sources

The first step in this action will be to identify standard industry codes that may use PFAS chemicals in their processes either in the past or in the present, and the locations of these facilities. Industries are classified into standard industrial code(s) based on what is manufactured. These codes are called North American Industrial Codes (NAIC).

Nationally, certain NAIC have been associated by EPA with specific facilities that have potentially used or manufactured PFAS compounds. This approach will identify potential locations that may have used PFAS, but does not indicate that PFAS chemicals are actually being manufactured, processed, used, or released by the facility.

The second part of identifying potential PFAS sources is to validate that the locations identified by NAICs codes are likely to be an industrial location and not an associated property such as administration work for that industry where the actual manufacturing is completed at a separate location as time and resources allow.

Once a validated list of locations is completed, a computer mapping system can be used to place a buffer area(s) around each location. This buffer area will identify how close a Public Water Supply (PWS) well is to an industry that is potentially associated with the use or manufacture of PFAS chemicals. The buffer diameters will be set at one half mile and one mile around each validated industrial location.

Incorporating drinking water sources

Water supplies in Iowa access their water in a variety of ways. Common methods include traditional wells, both shallow and deep, tapping both confined and unconfined aquifers, surface water intakes, and galleries in alluvial aquifers.

Iowa has approximately 1,820 PWS with 7,150 PWS wells, surface water intakes, and galleries. Of the 7,150 public wells, 2,950 are classified as “active”. Some of these wells are inherently more susceptible to surficial contamination than others based on physical and geological parameters. The DNR Water Supply Section maintains information on many attributes pertaining to each PWS well and these can be used to assess relative risk of individual wells to potential contamination.

DNR Water Supply has previously assigned a susceptibility class to all PWS wells and this susceptibility factor will be used in assessing relative rank. The criteria for assigning susceptibility to surficial contamination are listed in the following table:

Confining bed thickness	Well Susceptibility
<25 ft.	Highly susceptible
25 to 50 ft.	Susceptible
>50 to 100 ft.	Slightly susceptible
>100 ft.	Not susceptible

Confining beds are laterally continuous layers of low permeability material (rock or sediment) that significantly restricts vertical movement of water in the subsurface.

Additionally, surface water intakes and infiltration galleries in alluvial aquifers will also be considered “highly susceptible” since intakes and galleries, directly or indirectly, access surface water that is, by definition, unprotected by a confining layer.

Developing a Scoring System to Rank Each PWS Well

The scoring system to assign rank will account for the amount of confining layer thickness available and the proximity to a validated NAIC code facility.

To account for confining layer thickness, active PWS wells screened in aquifers with less than 25 ft. of confining layer thickness will be assigned a subscore of 4, along with surface intakes and galleries. PWS wells screened in aquifers with 25 ft. to 50 ft. of a confining layer will be assigned a subscore of 3. PWS wells greater than 50 ft. to 100 ft. of a confining layer will be assigned a subscore of 2, and PWS wells with more than 100 ft. of confining layer will be assigned 1 point.

A similar scoring system will be used to assess proximity to standard industrial codes associated with potential PFAS use. PWS wells that are located less than ½ mile from a potential PFAS source will be scored 3 points. PWS wells that are less than 1 mile, but greater than ½ mile, from a potential PFAS source will be assigned 2 points, and PWS wells that are more than 1 mile from a potential PFAS source will be given 1 point.

Once the aquifer subscore and the location subscore are added together, each active PWS well will be assigned a score from 2 to 7. A PWS well with a score of 7, would be screened in an aquifer that has no confining layer (or are a surface water intake) and be located within ½ mile of a validated NAIC code location.

PWS Well Score	Confining Bed Thickness	Proximity to Potential PFAS Source(s)
2	>100 ft.	> 1 mile
3	>100 ft. >50 ft. to 100 ft	½ mile to 1 mile > 1 mile
4	>100 ft. >50 to 100 ft 25 to 50ft	<½ mile ½ mile to 1 mile >1 mile
5	>50 to 100 ft. 25 to 50 ft. <25 ft.	<½ mile 1/2 mile to 1 mile >1 mile
6	25 to 50 ft. <25 ft.	<½ mile ½ mile to 1 mile
7	<25 ft.	<½ mile

Communication Plan

A Communication Plan is being developed to provide a strategy for delivering information regarding specific tasks of the PFAS Action Plan to target audiences. The details of the Communication Plan will be developed outside of this strategy.

In general, communication of this document will include identifying public water supplies, determining outreach mechanisms and a timeline for stakeholder review and feedback.