

Drinking Water Information in the Willow Creek

Agricultural Water Quality Management Area

Oregon Department of Environmental Quality, Drinking Water Protection Program

1/4/2021

- Public drinking water systems in the Willow Creek Agricultural Water Quality Management Area utilize groundwater sources to serve approximately 10,788 persons regularly.
- Recent alerts for coliform bacteria are common, including four community water systems. None had violations for the *E. coli* maximum contaminant limit (MCL). The City of Lexington had a violation of the total coliform MCL.
- Three water systems had alerts for elevated nitrate concentrations. Lamb Weston has multiple recent nitrate MCL violations.
- Forty-three of 139 private well results in the area had elevated nitrate concentrations (≥ 7 mg/L).
- Contaminants in water supplies potentially related to agriculture co-occur with human populations, agricultural land uses, and aquifers susceptible to contaminant infiltration. Measures to reduce the movement of bacteria and leachable nitrate in soils and managing irrigation to prevent leaching in this area would reduce risk to groundwater sources of drinking water, reducing treatment costs for communities and protecting public health. Resources for addressing risks to drinking water supplies can be found in the [Groundwater Resource Guide](#)
- This management area includes the [Lower Umatilla Basin Groundwater Management Area](#) (LUBGWMA). Groundwater Management Areas are designated by DEQ when groundwater in an area has elevated contaminant concentrations resulting, at least in part, from nonpoint sources. The LUGWMA was designated in 1990 due to nitrate contamination concerns. There are myriad resources available about the areas including strategies for mitigating nonpoint source pollution located at the link above.
- Seven of the 15 public wells and 132 of the 139 RET results are located within the LUBGWMA.

Seventeen public water systems obtain domestic drinking water from groundwater sources in the Willow Creek Agricultural Water Quality Management Area. Drinking water is an important beneficial use under the federal Clean Water Act. When CWA standards are met in source waters, a drinking water treatment plant using standard technology can generate water meeting the Safe Drinking Water Act maximum contaminant limits (MCLs). There are eight community public water systems in the plan area serving approximately 7,589 people on a regular basis, in addition to visitors at recreation sites. There are seven active non-transient, non-community workplace or school public water systems serving 2,180 persons regularly. The two remaining active public water systems are transient non-community systems and non-public, state-regulated systems with an estimated service population of 1,019. See Table 1 below for a list of public water systems, their classifications, sources and activity status, and populations served.

Agricultural land uses (e.g. wheat, irrigated crops, livestock) are present near many of the public water system wells and springs in the area. The agricultural areas in the northern part of the area, within the LUGWMA and near the towns of Boardman and Irrigon, have the majority of both intensive agriculture and human population. Forestland is prevalent in the uplands in the southeast.

Bacteria

Six public water systems in the management area have recent alerts for detections of *E. coli*. None has recent violations for the *E. coli* MCL. The City of Lexington has a violation of the total coliform MCL. These PWSs with bacterial detections are marked in **Bold** text in Table 1.

Nitrates

Nitrate alerts (generated when nitrate exceeds 5 mg/L) exist for Country Garden Estates Mobile Home Park, the Port of Morrow, and Lamb Weston. Lamb Weston has over 20 nitrate alerts and four MCL violations in 2020. The drinking water MCL for nitrates is 10 mg/L.

These contaminants are often related to animal and cropland agriculture. The locations of nitrate contamination of private domestic wells (see below) and public drinking water sources is near to agricultural land use such as row crops and livestock, near Irrigon and Boardman and the western border of the town of Umatilla, in the very northeastern section of the management area.

The soils through most of the Ag WQMA have high, moderately high, or moderate nitrate leaching potential, according to the National Cooperative Soil Survey, based on slope, precipitation, and land use. Nitrate from fertilizers and septic systems can readily penetrate to the aquifers used for drinking water when leaching potential is high or very high, and bacteria removal through soil filtration can be less effective in sandy soils.

Oregon Health Authority rated some of the public water system wells in the Ag WQMA for contaminant susceptibility for land use impacts to drinking water sources based on Source Water Assessments, aquifer characteristics, and well locations and construction. Most of the evaluated PWS wells rate as high susceptibility. The nitrate and other contamination issues described above and the ready movement of nitrogen into aquifers in the area verify this susceptibility. Measures to reduce leachable nitrate in soils would reduce risk to groundwater sources of drinking water.

DEQ only addresses drinking water issues identified for PUBLIC water systems. A query of Oregon Water Resources' water rights database for private domestic points of diversion (using a threshold of 0.005 cfs for domestic surface water rights that are household use only, not irrigation) identified two private domestic water rights in the Willow Creek WQMA. There are also numerous private groundwater wells for domestic use. The Domestic Well Testing Act database (real estate transaction testing data) for 1989-2018 indicates 43 significant detections of nitrate (≥ 7 mg/L) in private wells out of 139 total wells included in the database for this area. Of those private wells, 28 had nitrate concentrations of ≥ 10 mg/L. The private wells with high nitrate are primarily concentrated in the northeast portion of the area where residences are the most numerous. Attention may be needed to well depth, well construction, nitrate leaching potential of local soils, and proximity to nutrient sources such as septic systems, fertilizer use sites, and high concentrations of livestock in these areas. This would be consistent with the recommendations of the LUBGWMA.

Other

Other contaminants not related to agriculture within the management area include arsenic and sodium.

Drinking Water Protection staff are happy to provide additional details, maps, and recommendations upon request.

Table 1. Public Water Systems in the Willow Creek Ag WQMA

Note: Table 1 does not include public water systems which purchase drinking water from these water systems but does include the population served by wholesale customers in the Total Population. **Bold text indicates PWSs w/ recent bacteria alerts.**

PWS ID	Public Water System Name	Drinking Water Source	System Type	Population
Groundwater Systems				
4100130	City of Boardman	3 wells (2 active, 1 emergency)	C	3,500
4100369	City of Heppner	4 wells	C	1,291
4100370	Black Mountain Water District	5 springs	C	43
4100402	City of Lone	2 wells (1 active, 1 inactive)	C	330
4100403	City of Irrigon	2 wells	C	1,885
4100479	City of Lexington	2 wells (1 active, 1 inactive)	C	280
4101136	US Army Depot-Umatilla Admin	3 wells (2 active, 1 inactive)	NTNC	40
4101182	Country Garden Estates Mobile Home Park	1 well	C	175
4101214	Shady Rest Mobile Court	1 well	C	110
4101328	Port of Morrow	6 wells (5 active, 1 inactive)	NTNC	1,350
4105884	Cascade Specialties, Inc.	1 well	NTNC	35
4190513	PGE Boardman Coal Fire Plant	1 well	NTNC	100
4193659	ODOT Boardman Rest Area	2 wells	NC	
4194664	US Army Depot-Umatilla North	3 wells INACTIVE System	NP	20
4194562	Lamb Weston	3 wells (2 active, 1 inactive)	NTNC	500
4195174	Columbia River Dairy	6 wells (5 active, 1 inactive)	NTNC	215
4195180	Willow Creek Dairy	2 wells INACTIVE System	NTNC	30

System Type

C - "Community Water System (C)" means a public water system that has 15 or more service connections used by year-round residents, or that regularly serves 25 or more year-round residents.

NTNC - "Non-Transient Non-Community Water System (NTNC)" means a public water system that is not a Community Water System and that regularly serves at least 25 of the same persons over 6 months per year.

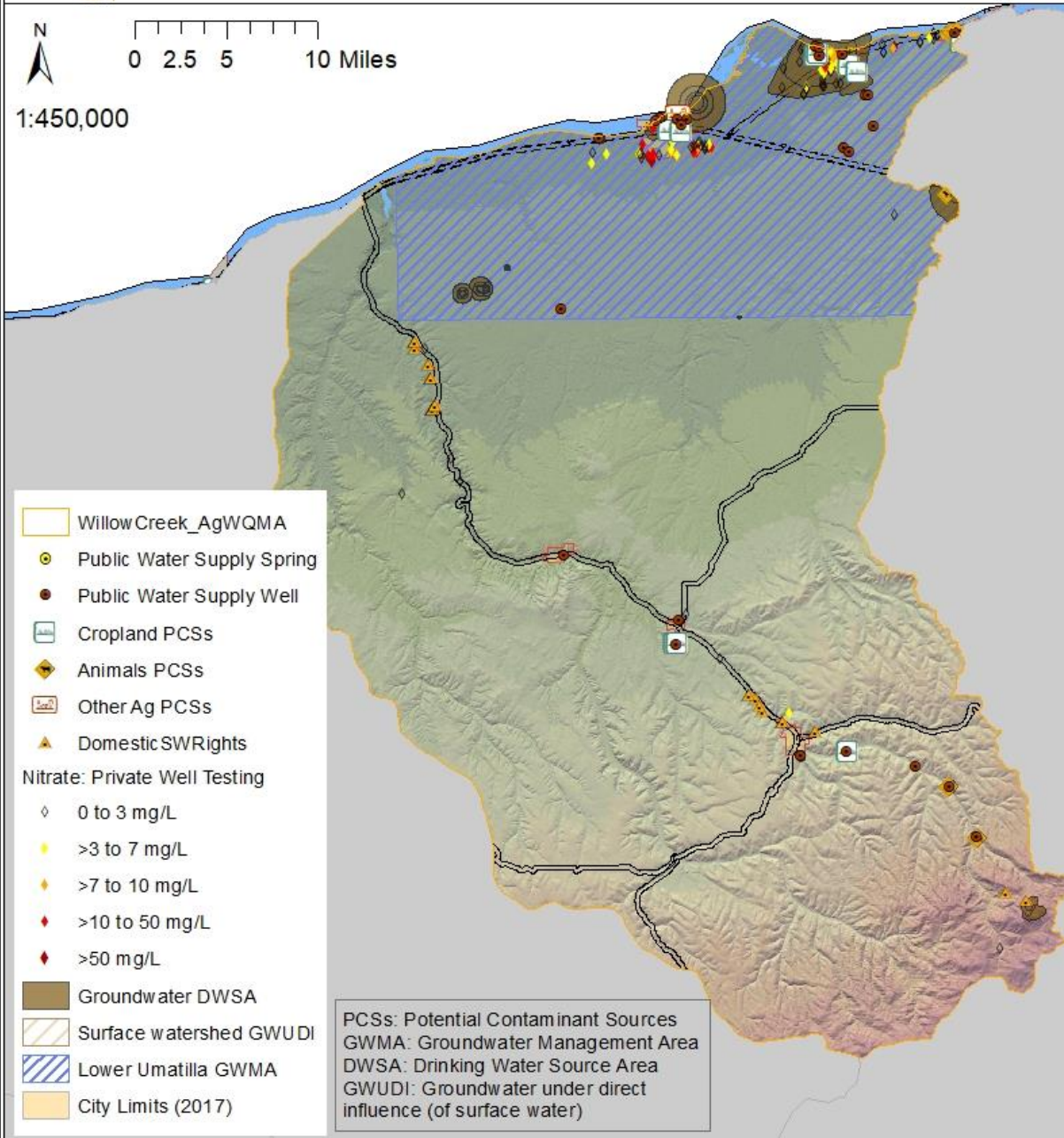
NC - "Transient Non-Community Water System (NC)" means a public water system that serves a transient population of 25 or more persons.

NP - "State Regulated Water System (NP)" means a public water system, which serves 4 to 14 service connections or serves 10 to 24 people. Monitoring requirements for these systems are the same as those for Transient Non-Community water systems.



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Drinking Water Source Areas for Public Water Systems in Willow Creek Agricultural Water Quality Management Area



The Drinking Water Source Area (DWSA) delineations define areas that supply the drinking water system. For groundwater this is defined as the area on the surface that overlies that portion of the aquifer that supplies water to a well or spring. DWSAs for wells typically show the 1-, 2-, 5-, and 10- or 15-yr time of travel zones that indicate the amount of time it takes groundwater to move to the wellhead. DWSAs for springs typically show area of short-, intermediate-, and long-term groundwater flow to the spring. DWSAs for surface water represents the watershed that supplies the waterbody where the intake is located.



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Drinking Water Source Areas for Public Water Systems in Willow Creek Ag WQMA: Nitrate Leaching Potential

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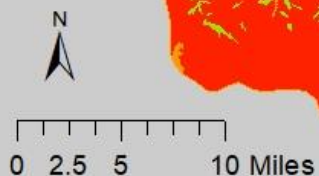
- Willow Creek_AgWQMA
- Public Water Supply Spring
- Public Water Supply Well
- Cropland PCs
- Animals PCs
- Other Ag PCs
- Domestic SWRights_Willow

Nitrate: Private Well Testing

- 0 to 3 mg/L
- >3 to 7 mg/L
- >7 to 10 mg/L
- >10 to 50 mg/L
- >50 mg/L

Nitrate Leaching Rating

- Not rated or not available
- Low
- Moderate
- Moderately high
- High

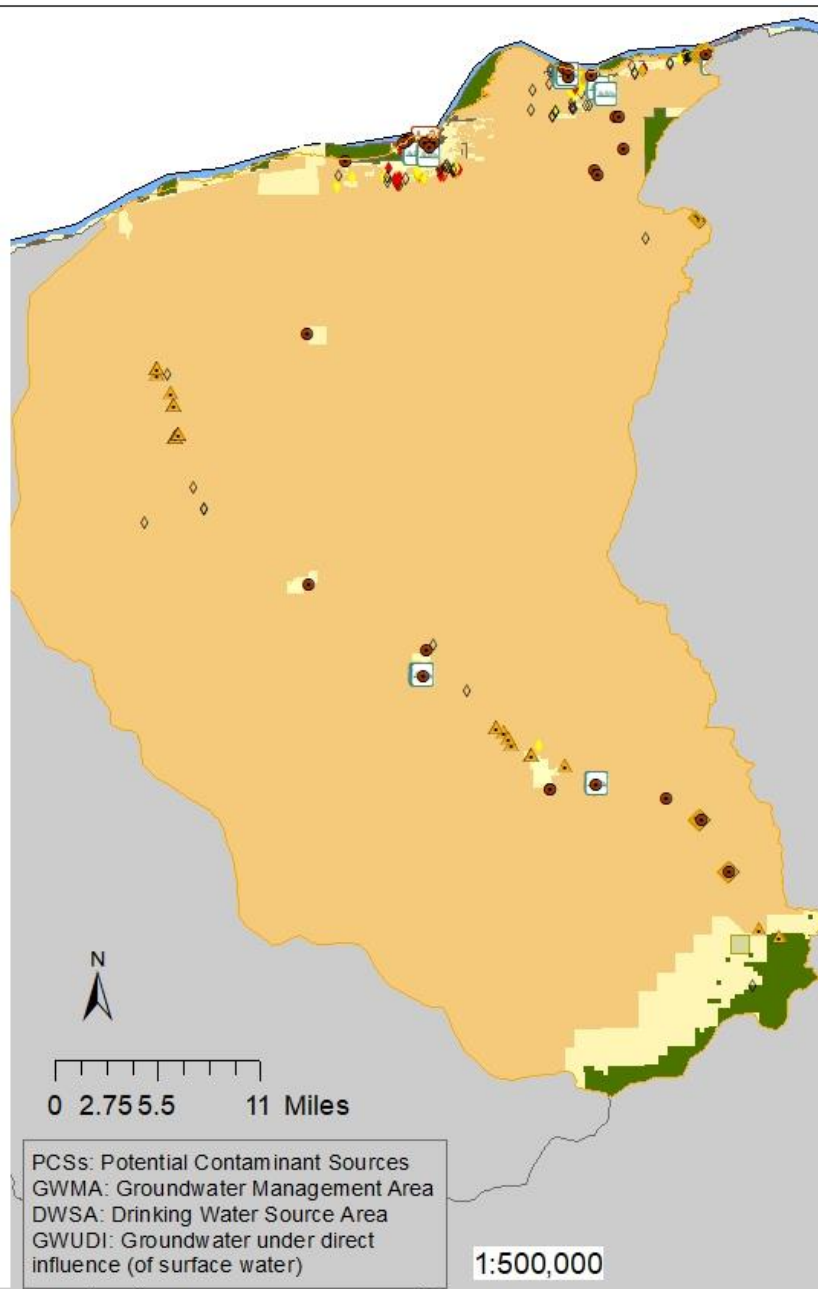
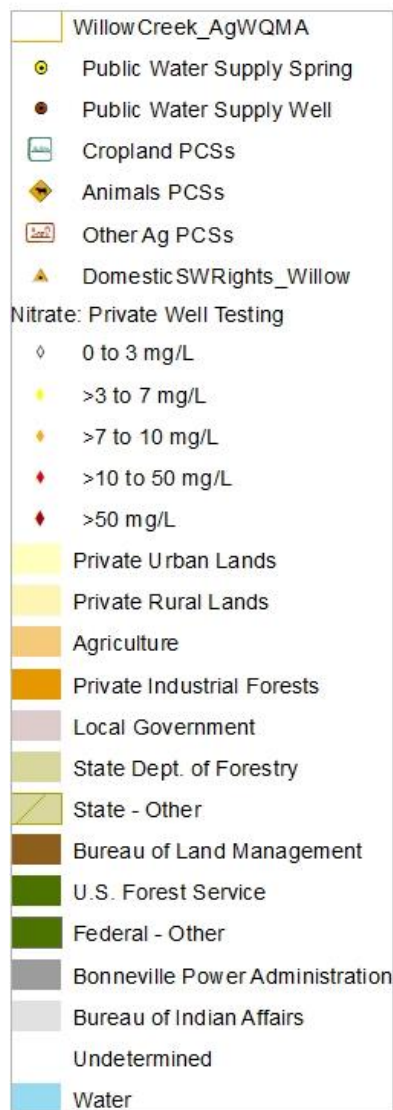


PCSS: Potential Contaminant Sources
GWMA: Groundwater Management Area
DWSA: Drinking Water Source Area
GWUDI: Groundwater under direct influence (of surface water)

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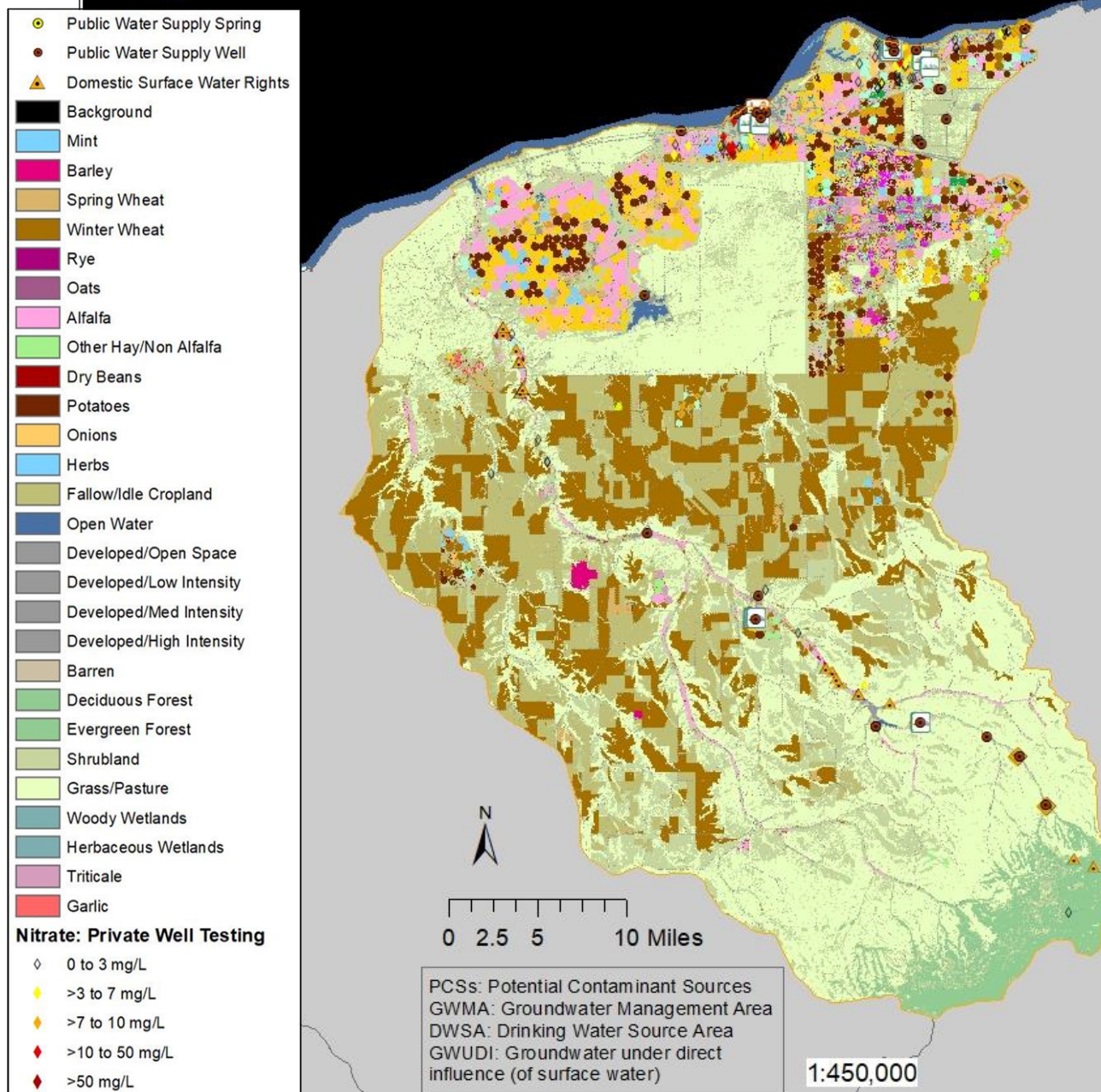
Drinking Water Source Areas for Public Water Systems in Willow Creek Ag WQMA: Land Use/Ownership



The Drinking Water Source Area (DWSA) delineations define areas that supply the drinking water system. For groundwater this is defined as the area on the surface that overlies that portion of the aquifer that supplies water to a well or spring. DWSAs for wells typically show the 1-, 2-, 5-, and 10- or 15-yr time of travel zones that indicate the amount of time it takes groundwater to move to the wellhead. DWSAs for springs typically show area of short-, intermediate-, and long-term groundwater flow to the spring. DWSAs for surface water represents the watershed that supplies the waterbody where the intake is located.



Drinking Water Source Areas for Public Water Systems in Willow Creek Ag WQMA: Crops (2019 NASS)



The Drinking Water Source Area (DWSA) delineations define areas that supply the drinking water system. For groundwater this is defined as the area on the surface that overlies that portion of the aquifer that supplies water to a well or spring. DWSAs for wells typically show the 1-, 2-, 5-, and 10- or 15-yr time of travel zones that indicate the amount of time it takes groundwater to move to the wellhead. DWSAs for springs typically show area of short-, intermediate-, and long-term groundwater flow to the spring. DWSAs for surface water represents the watershed that supplies the waterbody where the intake is located.