Canyon County
Ground Water Quality Improvement and Drinking Water Source Protection Plan



2022

Cover photograph: Indian Creek Restoration in Caldwell, Idaho. Courtesy of the City of Caldwell.

Printed on recycled paper, DEQ, August 2022, PID DWPD, CA code 42268. Costs associated with this publication are available from the State of Idaho Department of Environmental Quality in accordance with Idaho Code § 60-202.

Canyon County
Ground Water Quality Improvement and Drinking Water Source Protection Plan

2022

Plan developed and finalized for publication in 2016

First Update: 2022

Sections updated: 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14

Prepared by
State of Idaho, Department of Environmental Quality
Boise Regional Office
1445 N. Orchard St.
Boise, ID 83706

Acknowledgments

Development and implementation of the comprehensive strategies identified in this ground water quality improvement plan are collaborative efforts of the following:

Idaho Department of Environmental Quality

Idaho State Department of Agriculture

Idaho Department of Water Resources

Idaho Public Health Districts

Idaho Soil and Water Conservation Commission

Idaho Association of Soil Conservation Districts

Natural Resources Conservation Service

University of Idaho Cooperative Extension

Canyon County, Idaho

Public and local government representatives providing input.

CANYON COUNTY
GROUND WATER QUALITY IMPROVEMENT AND DRINKING WATER SOURCE PROTECTION PLAN
CONTENTS

Tab 1	Introduction
Tab 2	Geologic Settings and Ground Water Conditions
Tab 3	Statewide Nitrate Priority Area Maps and Rankings
Tab 4	Canyon County Nitrate Priority Area Maps
Tab 5	Nitrate
Tab 6	Potential Nitrate Sources and Other Ground Water Contaminants
Tab 7	Canyon County Activity Overview and Accomplishments
Tab 8	General Strategies for Improving Ground Water Quality
Tab 9	Drinking Water Source Protection
Tab 10	Surface Water Total Maximum Daily Loads
Tab 11	Agencies, Directories, and Website Resources
Tab 12	Funding Sources
Tab 13	Planning Tools For Local Governments
Tab 14	Public Information and Outreach Materials
Tab 15	Idaho Environmental Guide: A Resource for Local Governments
Tab 16	References

This page intentionally left blank for correct double-sided printing.

Table of Contents

Acronyms and Abbreviations vii
1 Introduction 1-1
2 Geologic Setting and Ground Water Conditions 2-1
2.1 Physical Setting 2-1
2.2 Regional Geology 2-1
2.3 Ground Water Presence and Flow 2-4
2.4 Ground Water Quality 2-6
2.4.1 Southwest District Health Department 2-6
2.4.2 Idaho Department of Water Resources 2-6
3 Statewide Nitrate Priority Areas and Rankings 3-1
4 Canyon County Nitrate Priority Area Maps 4-1
5 Nitrate, Potential Nitrate Sources, and Other Ground Water Contaminants 5-1
5.1 Why is Nitrate a Concern? 5-1
5.2 Drinking Water Maximum Contaminant Level 5-1
5.3 Health Effects 5-2
5.4 Nitrate in Ground Water 5-2
6 Potential Nitrate Sources 6-1
6.1 Well Construction 6-1
6.2 Residential Land Uses 6-1
6.2.1 Fertilizer Application, Irrigation Practices, and Other Residential Activities 6-1
6.2.2 Septic Systems 6-2
6.3 Agriculture 6-3
6.4 Animal Feeding Operations and Dairies 6-4
6.5 Industrial and Municipal Wastewater Land Application Areas 6-5
6.6 Ground Water Recharge 6-5
6.7 Ground Water and Surface Water Interaction 6-5
6.8 Storm Water Disposal 6-6
6.9 Other Ground Water Contaminants 6-6
6.9.1 Petroleum Sources 6-7
6.9.2 Hazardous Chemicals 6-7
6.9.3 Mapping Ground Water and Drinking Water Contaminant Sources 6-7
7 Canyon County Water Quality Activity Overview and Accomplishments 7-1
8 General Strategies For Improving Ground Water Quality 8-1
9 Drinking Water Source Protection 9-1
10 Surface Water Total Maximum Daily Loads 10-1

11 Agencies, Directories, and Website Resources 11-1
11.1 Regulatory Directory and Website Resources 11-2
11.1.1 Idaho Department of Environmental Quality 11-2
11.1.2 Idaho State Department of Agriculture 11-3
11.1.3 Idaho Soil and Water Conservation Commission 11-3
11.1.4 Soil Conservation Districts 11-4
11.1.5 Southwest District Health 11-4
11.1.6 Idaho Department of Water Resources 11-5
11.1.7 Natural Resources Conservation Service 11-5
11.1.8 University of Idaho Extension 11-6
11.1.9 Project WET at Boise Watershed 11-7
11.1.10 General State of Idaho Contacts 11-7
11.1.11 Idaho Water Resource Research Institute 11-7
11.1.12 Idaho's Geospatial Data Clearinghouse 11-7
11.1.13 United States Environmental Protection Agency 11-7
12 Funding Sources 12-1
12.1 Funding Integration Tool for Source Water 12-1
12.2 Enhancing State and Tribal Programs Initiative 12-1
12.3 Section 319 (h) Nonpoint Source Grants, United States Environmental Protection Agency/Idaho Department of Environmental Quality 12-1
12.4 Conservation Technical Assistance, Natural Resources Conservation Service 12-2
12.5 Environmental Quality Incentives Program, Natural Resources Conservation Service 12-2
12.6 Conservation Programs, Natural Resources Conservation Service 12-2
12.7 Source Water Protection Grants, Idaho Department of Environmental Quality 12-3
12.8 Resource Conservation and Rangeland Loan Development Program, Idaho Soil and Water Conservation Commission 12-3
12.9 Financial Programs, Idaho Water Resource Board 12-3
12.10 Aquifer Protection District, Local Initiative 12-3
12.11 Embrace-A-Stream Program, Trout Unlimited 12-4
12.12 Pheasants Forever 12-4
13 Planning Tools for Local Governments 13-1
13.1 Planning Tools 13-1
14 Public Information and Outreach Materials 14-1
15 Idaho Environmental Guide: A Resource for Local Governments 15-1
16 References 16-1

List of Tables

Table 3-1. 2020 ranked nitrate priority areas with score components. 3-5
Table 6-1. Regulatory definition of a large or medium CAFO. 6-4
Table 7-1. Overview of activities completed to improve ground water quality in Valley County. 7-1
Table 8-1. Idaho Department of Environmental Quality implementation tasks for Canyon County. 8-2
Table 8-2. Southwest District Health Department implementation tasks for Canyon County. 8-3
Table 8-3. Local conservation districts with the assistance of Idaho Association of Soil Conservation Districts, and Idaho Soil and Water Conservation Commission implementation tasks for Canyon County. 8-4
Table 8-4. United States Department of Agriculture, Natural Resources Conservation Service implementation tasks for Canyon County. 8-6
Table 8-5. Idaho State Department of Agriculture implementation tasks for Canyon County. 8-8
Table 8-6. Idaho Department of Water Resources implementation tasks for Canyon County. 8-9
Table 8-7. Confined animal feeding operation siting team implementation tasks for Canyon County. 8-9
Table 8-8. University of Idaho Extension implementation tasks for Canyon County. 8-9
Table 8-9. Municipalities implementation tasks for Canyon County. 8-10
Table 11-1.Resources and authorities for ground water quality management in Idaho. 11-1

List of Figures

Figure 2-1. Topographic map of Canyon County, Idaho, and vicinity. 2-2
Figure 2-2. Geologic map of Canyon County. 2-3
Figure 2-3. Ground water flow directions. 2-5
Figure 2-4. IDWR Canyon County results from most recent sampling event. 2-7
Figure 2-5. IDWR Canyon County results from most recent sampling event. 2-8
Figure 2-6. IDWR Canyon County results from most recent sampling event. 2-9
Figure 2-7. IDWR Canyon County results from most recent sampling event. 2-10
Figure 3-1. 2020 ranked nitrate priority areas. 3-2
Figure 3-2. Nitrate priority areas in the Idaho Department of Environmental Quality's Boise region. 3-3
Figure 3-3. Increasing and decreasing trends for 2002, 2008, 2014, and 2020. 3-4
Figure 4-1. Parma nitrate priority area for ground water. 4-2
Figure 4-2. Notus nitrate priority area for ground water. 4-3
Figure 4-3. Purple Sage nitrate priority area for ground water. 4-4
Figure 4-4. Ada Canyon nitrate priority area for ground water. 4-5
Figure 9-1. Public water system source areas relating to Canyon County. 9-2
Figure 9-2. Parma and Notus nitrate priority area overlay on public water systems and city boundaries. 9-3
Figure 9-3. Wilder and Greenleaf nitrate priority area overlay on public water systems and city boundaries. 9-4
Figure 9-4. Caldwell, Middleton, and Nampa nitrate priority area overlay on public water systems and city boundaries. 9-5

Figure 9-5. Bowmont and Melba nitrate priority area overlay on public water systems and city boundaries. 9-6
Figure 9-6. Canyon County domestic and public water system wells. 9-7
Figure 10-1. Interaction between ground water and surface water. 10-1
Figure 10-2. Canyon County watersheds. 10-3

Acronyms and Abbreviations

AFO	animal feeding operation
APA	American Planning Association
BMP	best management practice
CAFO	confined animal feeding operation
DEQ	Idaho Department of Environmental Quality
EDMS	Environmental Data Management System
EPA	United States Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
FITS	Funding Integration Tool for Source Water
GWQP	Ground Water Quality Plan
IASCD	Idaho Association of Soil Conservation Districts
IDAPA	Refers to citations of Idaho administrative rules
IDWR	Idaho Department of Water Resources
IPDES	Idaho Pollutant Discharge Elimination System Program
ISDA	Idaho State Department of Agriculture
ISWC	Idaho Soil and Water Conservation Commission
IWM	irrigation water management
IWRRI	Idaho Water Resources Research Institute
LSAS	large soil absorption systems
LUST	leaking underground storage tank
MCL	maximum contaminant level
mg/L	milligram per liter
NMP	nutrient management plan
NP	nutrient-pathogen
NPA	nitrate priority area
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PWS	public water system
RCRA	Resource Conservation and Recovery Act
SWA	source water assessment
SWDH	Southwest District Health
TMDL	total maximum daily load
USGS	United States Geological Survey
UST	underground storage tank

This page intentionally left blank for correct double-sided printing.

1 Introduction

Drinking water in Canyon County, Idaho, is supplied by ground water pumped from numerous public and private wells. Clean, safe water is a vital resource for the state's economy and human health. Ground water and surface water are commonly interconnected, and both are vulnerable to contamination from nonpoint source pollution due to land use activities (e.g., farming) and point sources (e.g., gas stations) nearby. However, contamination can be prevented through efforts such as education and the use of best management practices (BMPs) to avoid or minimize vulnerability from potential contaminant sources.

Ground water is the source of drinking water for 95% of Idahoans and is often taken for granted since it is concealed underground. Although the quality of ground water in Idaho is generally good, water quality monitoring shows that Idaho's ground water has been significantly degraded in certain portions of the state. This localized degradation negatively impacts water quality and potentially threatens domestic water supplies and other ground water beneficial uses, such as aquaculture, agriculture, mining, and industrial uses.

Nitrate is one of the contaminants responsible for this degradation and is one of the most widespread ground water contaminants in Idaho. Precipitation, irrigation, and sandy soils allow nitrate to percolate through soil and into surface water and ground water. While nitrate is just one of the potential ground water contaminants in Idaho, more is known about nitrate in Idaho ground water than other contaminants. In addition, the presence of nitrate is a good indicator of aquifer vulnerability and the potential for other water quality problems. The Idaho Department of Environmental Quality (DEQ) has defined and prioritized areas with ground water degradation by nitrate to most effectively allocate resources for water quality improvement. These areas are known as nitrate priority areas (NPAs).

This binder serves as the *Canyon County Ground Water Quality Improvement and Drinking Water Source Protection Plan*. The information provided is an educational and informational resource for local governments and land-management entities. It is intended to provide background information for decision making and to help prioritize and coordinate water quality-related activities throughout Canyon County. The information in this binder addresses the following:

- Discusses why nitrates are a concern and describes potential nitrate sources to ground water, as well as the risks associated with high levels of nitrate in ground water.
- Provides statewide NPA maps and rankings and Canyon County maps identifying current NPAs within Canyon County.
- Recognizes activities and accomplishments made to improve ground water quality throughout Canyon County.
- Outlines the general strategies that will be implemented to reduce nitrate contamination in ground water and protect public water supplies.
- Presents information for protecting sources of public drinking water systems to be used during the decision-making process.
- Offers a summary of information relating to surface water quality and impaired streams in Canyon County.

- Provides a list of agency contacts, regulatory directories, and website resources for technical assistance and resource information.
- Assembles sources of funding for BMP implementation.
- Provides multiple public outreach and technical resources for use in strategic planning.

Idaho's Ground Water Quality Protection Act of 1989 (Idaho Code § 39-1) authorized a comprehensive approach for maintaining and improving Idaho's ground water quality. The 1996 *Idaho Ground Water Quality Plan* (GWQP) was written as a result of the act and outlines the various state and local responsibilities for protecting Idaho's ground water quality (Ground Water Quality Council 1996). DEQ is designated as the primary agency to coordinate and administer ground water quality protection programs for the state.

The GWQP, Idaho Ground Water Protection Interagency Cooperative Agreement (January 2008), and DEQ Policy Memorandum PM00-004, Policy for Addressing Degraded Ground Water Quality Areas, provide guidance and direction in identifying, delineating, and prioritizing areas where ground water is significantly degraded.

As the primary agency responsible for ground water quality protection, DEQ chairs the Ground Water Monitoring Technical Committee. This committee meets periodically throughout the year to coordinate monitoring projects, share results and protocols, and develop evaluation criteria. The committee representatives from other agencies include the following:

- Idaho Department of Water Resources (IDWR)
- Idaho State Department of Agriculture (ISDA)
- Idaho Soil and Water Conservation Commission (ISWC)
- Idaho Association of Soil Conservation Districts (IASCD)
- Idaho public health districts
- Idaho Water Resources Research Institute (IWRRI)
- Idaho's universities
- Federal agencies (such as the United States Geological Survey [USGS])

DEQ helped develop the *Canyon County Ground Water Quality Improvement and Drinking Water Protection Plan* in a collaborative effort with IDWR, ISDA, ISWC, IASCD, Southwest District Health (SWDH), University of Idaho Extension, and Natural Resources Conservation Service (NRCS).

2 Geologic Setting and Ground Water Conditions

2.1 Physical Setting[1]

Canyon County is located within the western Snake River Plain, which is a topographic depression that extends across southern Idaho into eastern Oregon. The prominent physiographic feature is the Snake River Canyon (Figure 2-1).

General soil types in Canyon County are mixed alluvial sediments that are well-drained and somewhat excessively drained fine sandy loams, silt loams, and loamy fine sands on fans and terraces.

The general stratigraphy of the western Snake River Plain from the surface downward consists of sedimentary deposits underlain by basalt flows known as the Snake River Group. The Snake River Group is underlain by older sediments and basalt, known as the Idaho Group. The upper zone of sediments is up to 6,000 feet thick. Tertiary volcanics underlie the Idaho Group. The granite Idaho Batholith is generally considered to be the basement rock.

A substantial, laterally extensive layer of clay is found at depths of 300 to 700 feet below ground surface. The clay is important because it represents a significant aquitard in some areas, separating shallow overlying aquifers from deeper zones. The clay, often described in well logs as having a blue or gray color, has been observed as far west as Parma and as far east as Boise. The clay varies from a few feet to a few hundred feet thickness. Wood (2005) indicates the blue clay is the lower part of the Idaho Group. In general, sediments above the blue clay are the coarser-grained sands and gravels rather than the fine-grained interbedded sands, silts, and clays underlying the "blue clay."

2.2 Regional Geology

Canyon County is entirely on the Snake River Plain, between the Snake River on the south and the foothills of the central Idaho Mountains on the north. Much of the county is underlain by Quaternary alluvium of the Boise River and Pleistocene gravel from glacial outwash. This gravel forms high benches above the Boise River (Figure 2-2).

Several normal faults run northwest through the county, parallel with the northern boundary of the western Snake River Plain. Miocene lake beds make up the foothills on the northern boundary of the county.

Quaternary basalt covers the southeastern section of the county. Miocene and Pliocene Lake beds of the Glenns Ferry and Chalk Hills formation are found on the bluffs north of the Snake River (Digital Atlas of Idaho 2002).

Also see the report by Othberg and Gillerman on the geology of the Boise Valley.

[1] Information in this section was taken from the *Lower Boise/Canyon County Ground Water Quality Management Plan*, November 2005.

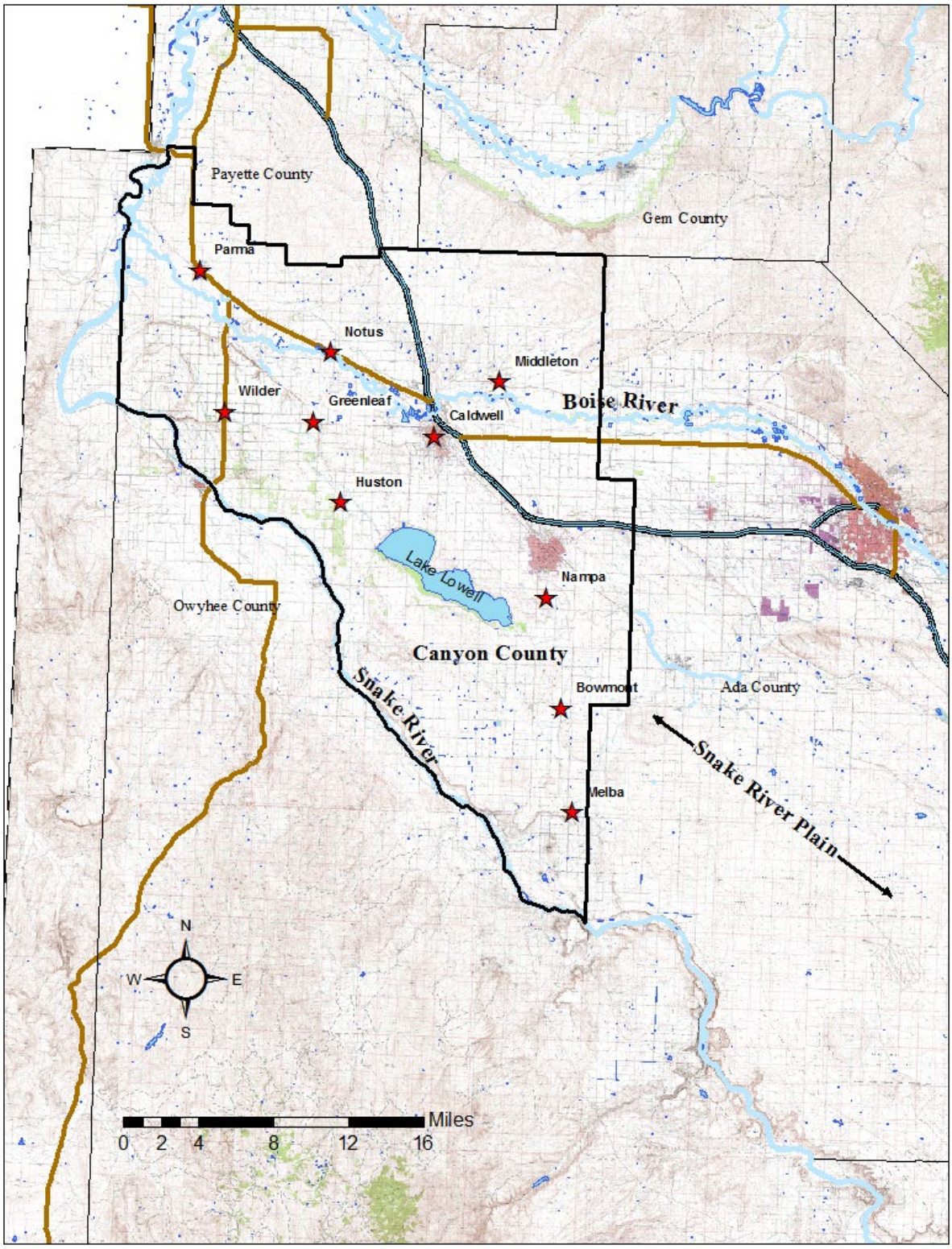


Figure 2-1. Topographic map of Canyon County, Idaho, and vicinity.

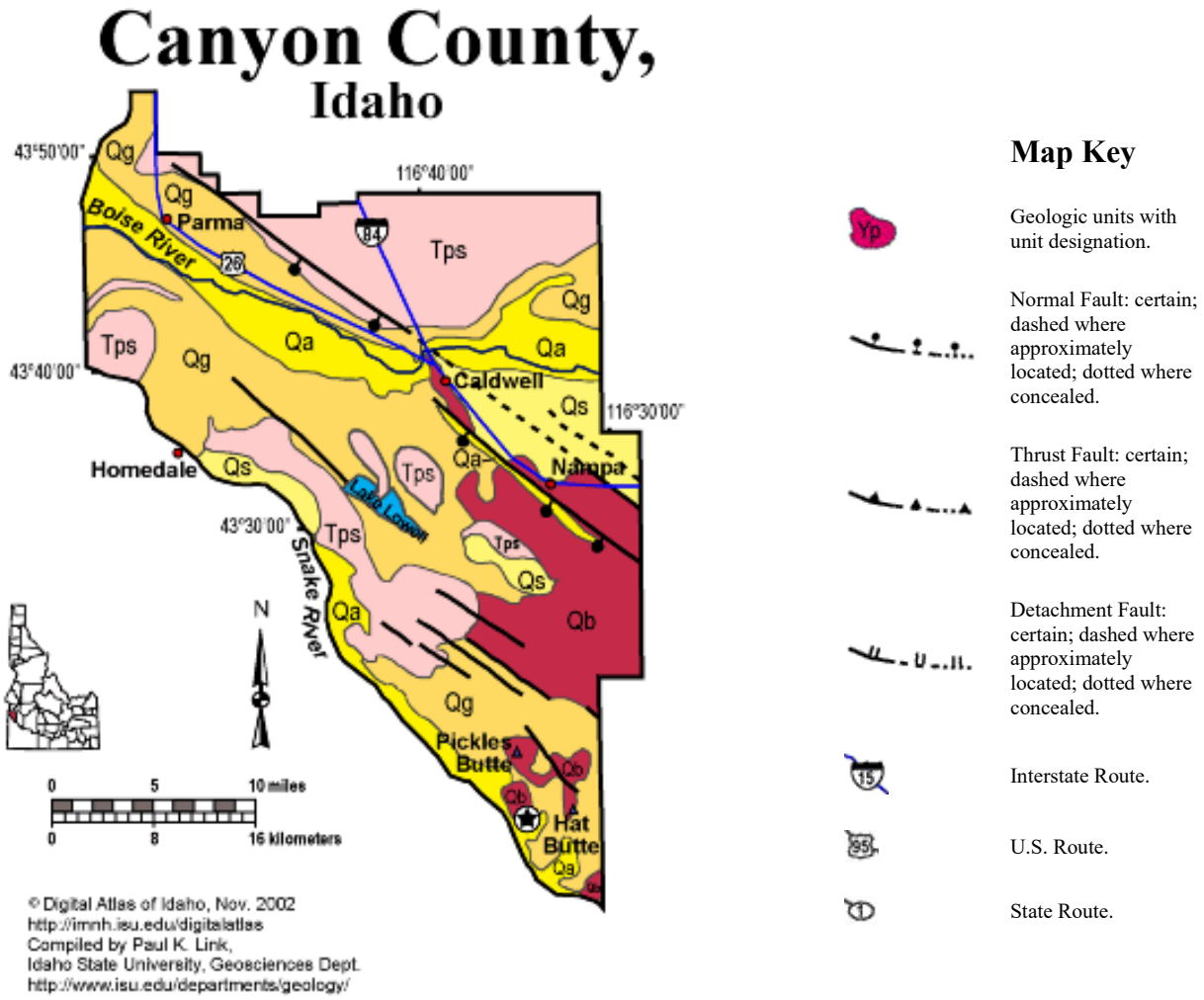


Figure 2-2. Geologic map of Canyon County.

Geologic Units

Qa	Quaternary alluvial deposits
Qg	Gravels and terraces on western Snake River Plain
Qs	Quaternary surficial cover, fluveolian cover on Snake River Plain, alluvial fans (Snake River Group)
Qb	Pleistocene basalt lava
Tps	Pliocene and Upper Miocene stream and lake deposits (Salt Lake Formation, Starlight Formation, Idaho Group)

2.3 Ground Water Presence and Flow[2]

The drinking water aquifers in the Treasure Valley are grouped into two hydrogeologic systems. The Treasure Valley Shallow system consists of those aquifers that are generally within 250 feet of the land surface and above a distinct layer in the earth known as the "blue clay." The Treasure Valley Shallow system is made up of gravels and sands with some thin layers of clay between in some places. The Treasure Valley Deep system consists of the aquifers that are generally deeper than about 250 feet and are below the blue clay. These aquifers are made up of fine-grained sands that are usually separated by thick layers of clay whose color is often blue or gray.

The recharge to the shallow aquifers is largely from seepage from canal systems and infiltration from irrigated agricultural. Additional recharge to the shallow aquifers occurs from interactions with other water bodies (e.g., Lake Lowell), and possibly from upper reaches of the Boise River (e.g., Barber Dam to Capitol Street Bridge) during high flows. Additional recharge sources include mountain front recharge, underflow from the granitic Idaho Batholith and tributary sedimentary aquifers, and direct precipitation.

Discharge from the Treasure Valley Shallow aquifer system often is to local drains or streams. The time from recharge to discharge in these shallow flow systems (residence times) probably ranges from days to tens of years. In contrast, the Treasure Valley Deep aquifer system is thought to discharge primarily to the Boise and Snake Rivers in the western and southwestern parts of the valley.

The general direction of the ground water movement depends on location (Figure 2-3). The topography, Boise River, Snake River, and irrigation ditches have their own impact on the localized ground water direction. The Treasure Valley Deep aquifer system begins at the eastern part of the valley, as indicated by downward hydraulic gradients in the Boise Fan sediments.

[2] Information in this section was taken from the *Lower Boise/Canyon County Ground Water Quality Management Plan*, November 2005.

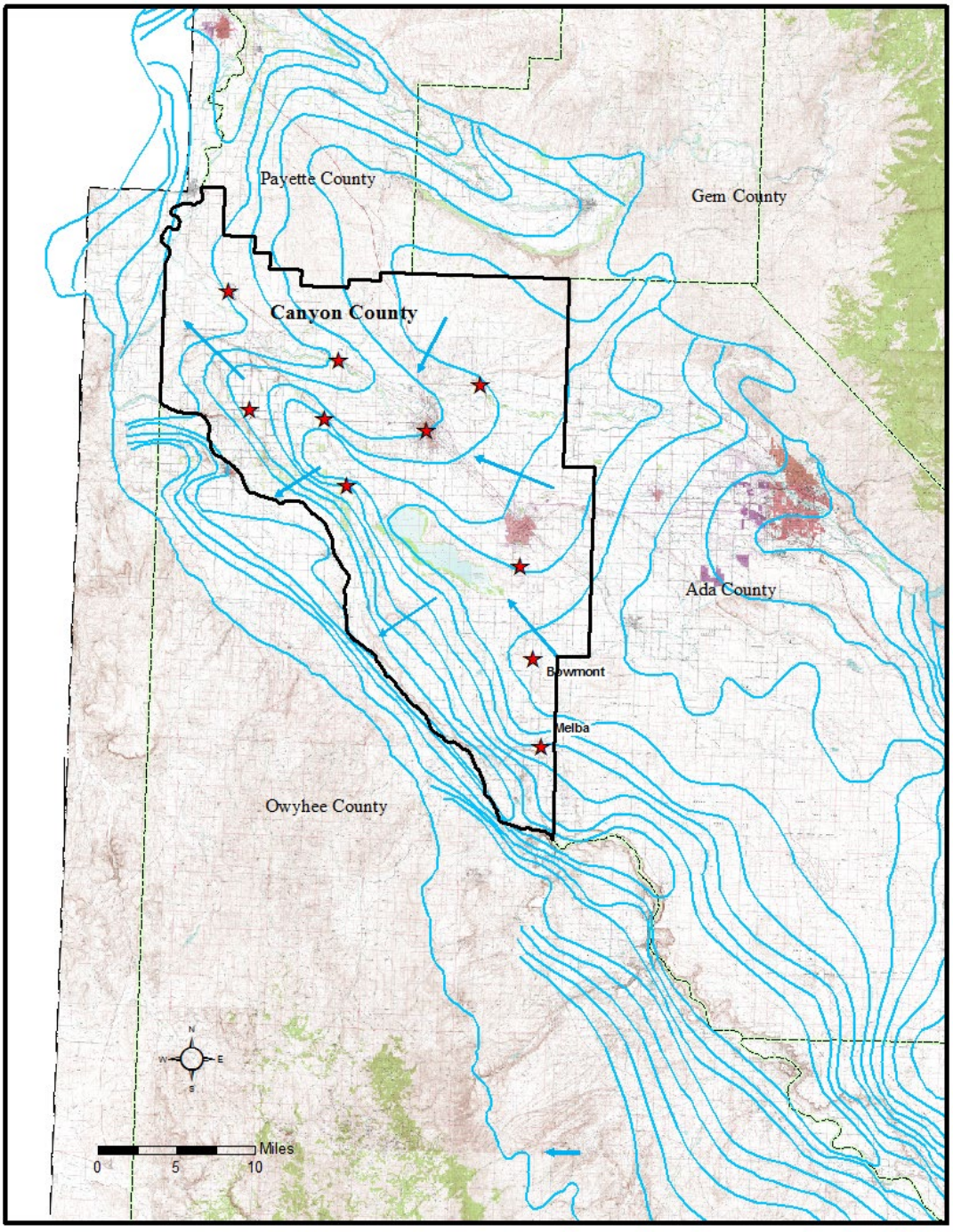


Figure 2-3. Ground water flow directions.

2.4 Ground Water Quality

2.4.1 Southwest District Health Department

SWDH collects water samples from noncommunity public water systems (e.g., schools, restaurants, businesses, and RV parks) and private single wells that serve a single residence. Results from SWDH's sampling are as follows:

- Nitrate and arsenic are present in shallow ground water at concentrations that occasionally exceed the drinking water maximum contaminant level (MCL) of 10 milligrams per liter (mg/L) in Parma.
- Nitrate, arsenic, and uranium have been detected in exceedance of the MCL of 0.010 mg/L (0.030 mg/L for uranium) in ground water in the area that starts east of Notus and extends to Middleton.
- Uranium has been detected in exceedance of the MCL of 0.030 mg/L in ground water in the area that starts south of Middleton and extends to north Nampa. Nitrates in exceedance of the drinking water standard have also been found in this area.
- Arsenic and uranium have been detected in exceedance of the MCL in ground water throughout Nampa.
- Increased fluoride levels have been detected in the deeper aquifer in the area that starts in southern Nampa and extends to Bowmont, usually on the west side of Highway 45 and south of Lake Lowell.
- Increased nitrate levels have been detected in Bowmont and Melba.
- Increased levels of nitrate have been detected in Caldwell from Lake Ave west in wells over 200 feet and wells less than 100 feet. Increased levels of arsenic have been detected on the west side of 10th Ave.
- Increased nitrate and arsenic levels have been detected in the Huston area.
- Increased levels of nitrates, arsenic, and uranium have been detected in the Sunnyslope area.
- Increased levels of nitrates and arsenic have been detected in the Greenleaf/Wilder area.

2.4.2 Idaho Department of Water Resources

IDWR, with help from other state and federal agencies, began the Statewide Groundwater Quality Monitoring Program in 1990. Every year, about 250 monitoring sites are sampled. Most sites are sampled once every 5 years. Water quality results include nutrients, common ions (calcium and magnesium), trace elements (iron, arsenic, and uranium), pesticides, and emerging contaminants. The statewide program provides valuable information about Idaho's ground water quality to private citizens, consulting companies, and governmental entities—as well as provides data for the *Idaho Department of Water Resources Groundwater Quality Sites (EDMS)*.

Water quality concentrations for wells were sampled by IDWR's Statewide Groundwater Quality Monitoring Program in Canyon County from 1990–2021. Data and maps provided by IDWR show concentrations from the most recent sampling event for the selected parameters: arsenic (Figure 2-4. IDWR Canyon County results from most recent sampling event.fluoride (Figure 2-5), nitrate (Figure 2-6), and uranium (Figure 2-7).

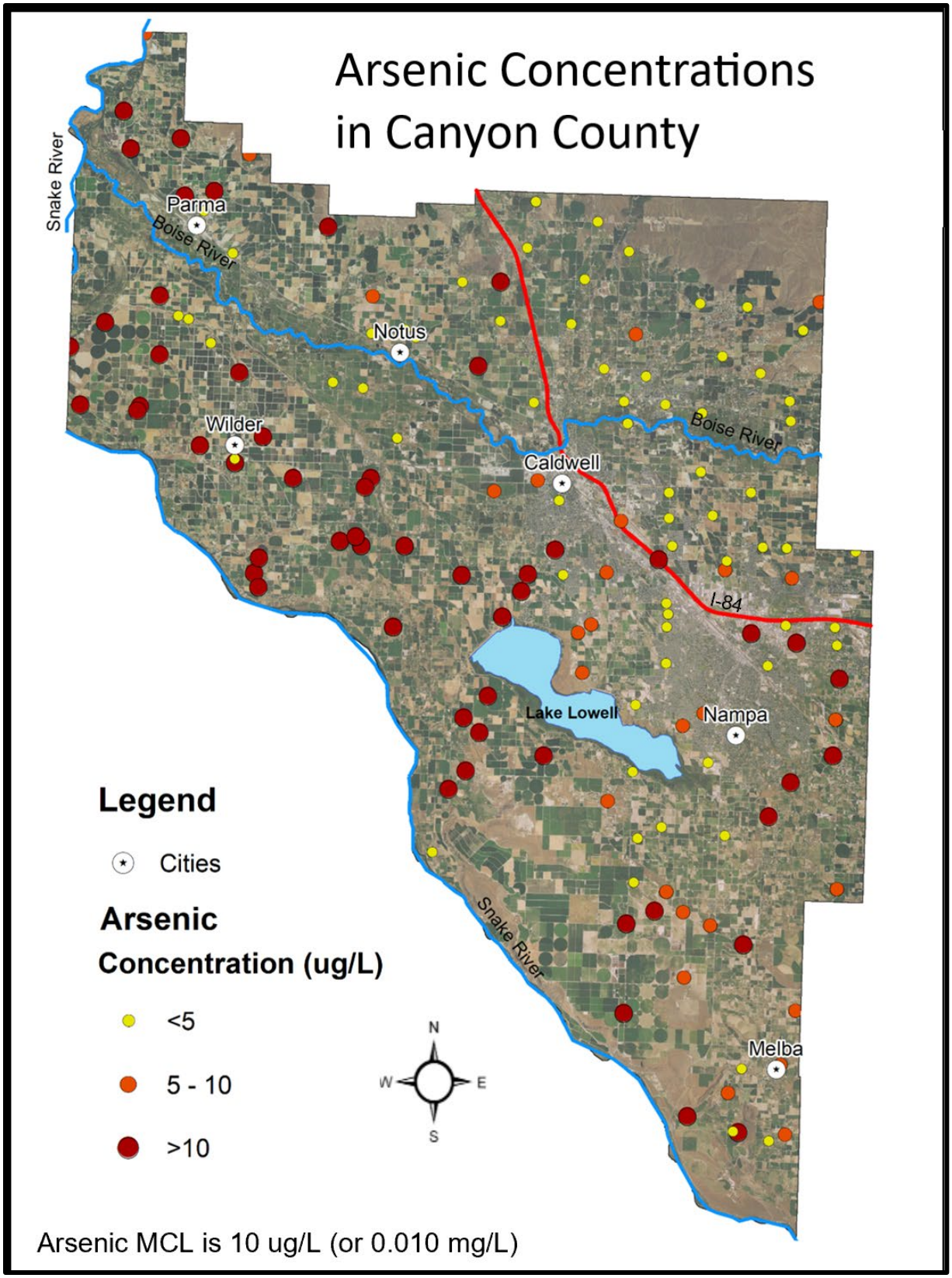


Figure 2-4. IDWR Canyon County results from most recent sampling event.

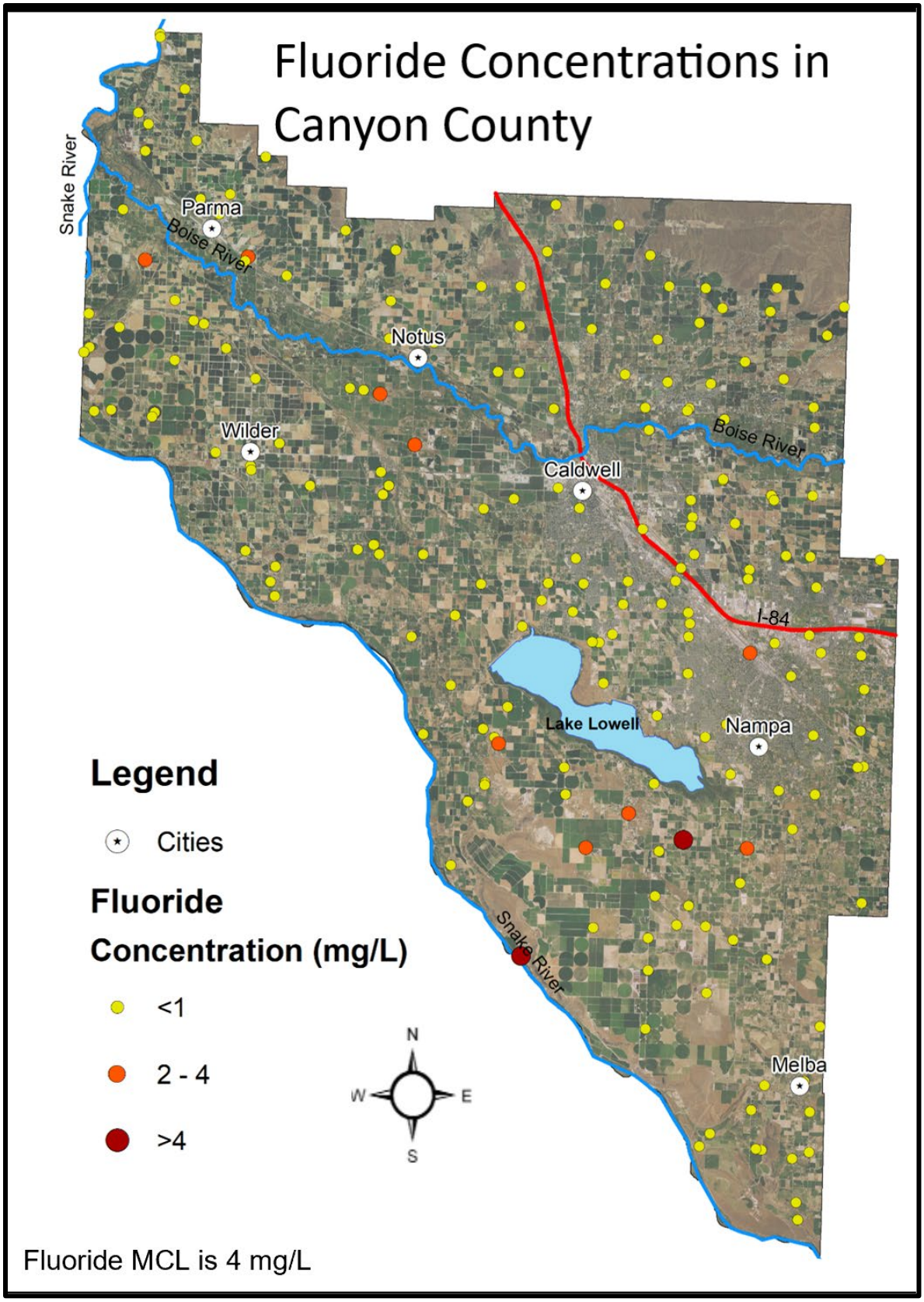


Figure 2-5. IDWR Canyon County results from most recent sampling event.

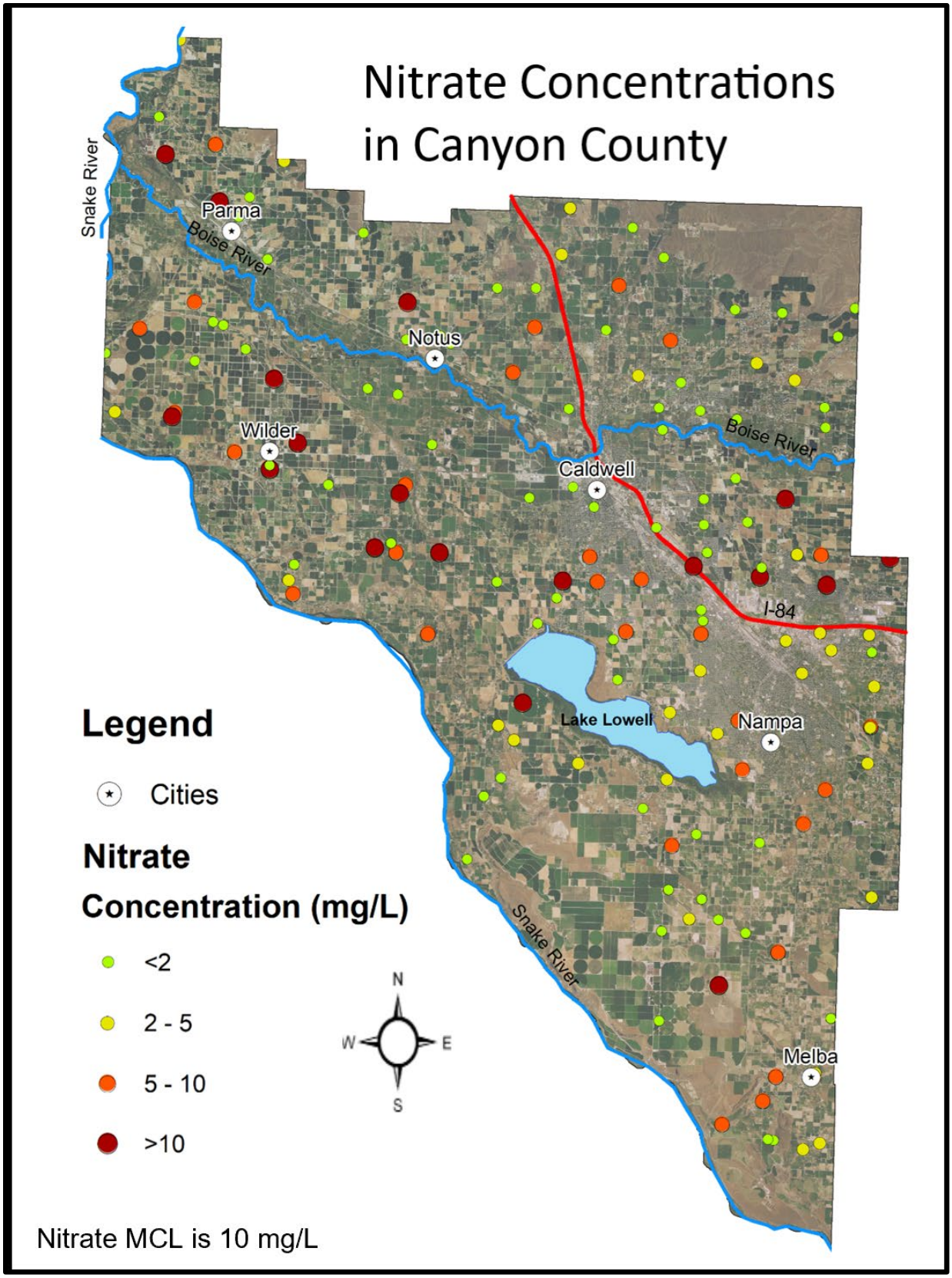


Figure 2-6. IDWR Canyon County results from most recent sampling event.

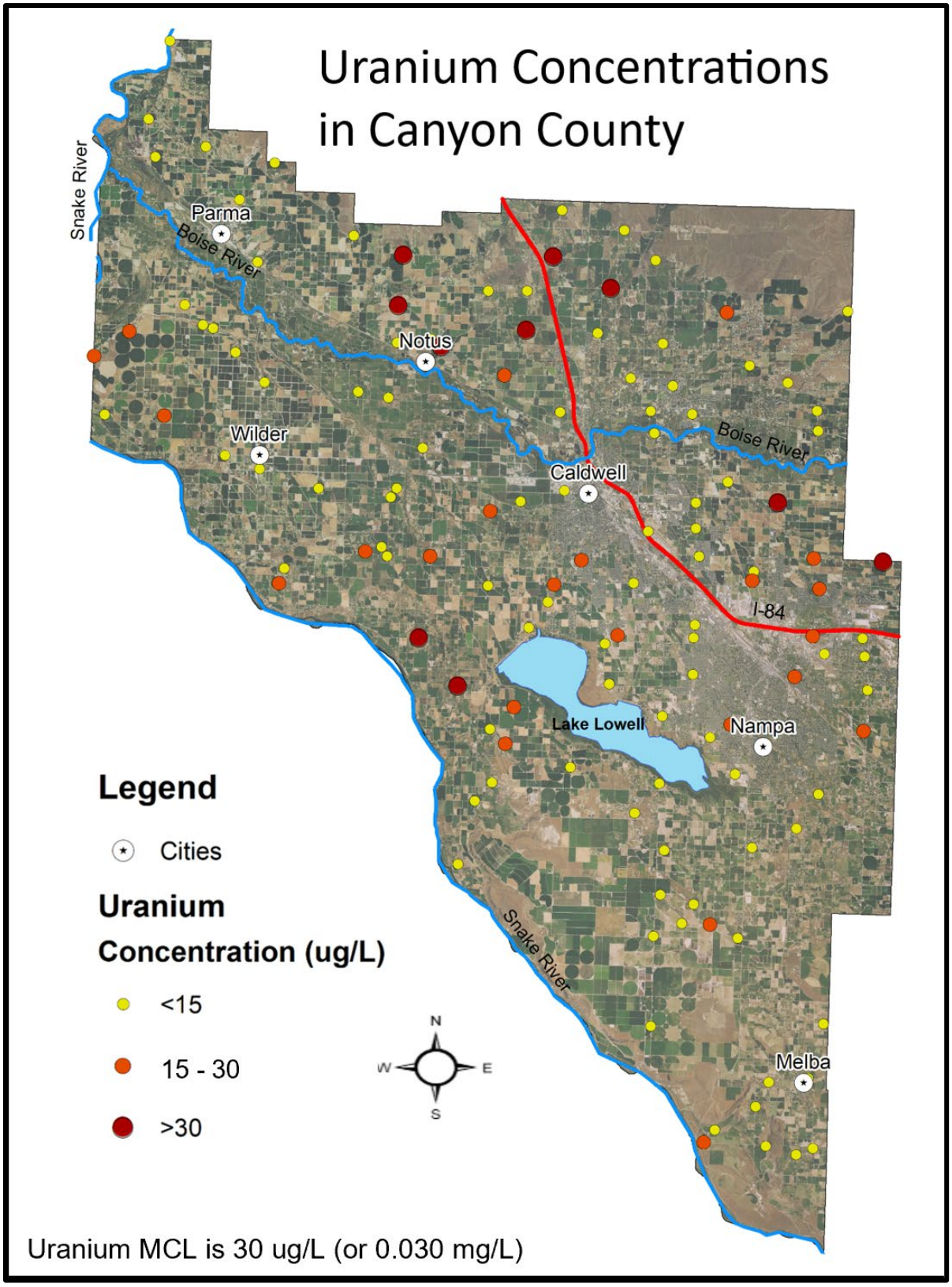


Figure 2-7. IDWR Canyon County results from most recent sampling event.

3 Statewide Nitrate Priority Areas and Rankings

As part of the goal to restore degraded ground water, DEQ has developed a list of NPAs throughout the state where ground water has been compromised due to nitrate contamination. The list ranks NPAs in the state based on severity of nitrate degradation; a ranking of "1" indicates the most severely impacted area in the state. A statewide map depicting current NPAs and rankings is provided in this section.

In 2001, DEQ, in consultation with the Ground Water Monitoring Technical Committee—comprised of staff from IDWR, ISDA, USGS, and the Idaho public health districts—delineated nitrate-degraded ground water areas using ground water quality monitoring analytical results combined with hydrogeologic and land use data. The *first NPA delineation document* was published in 2002.

Data used to define and rank the priority of each area are updated on a continual basis. However, updated NPA delineations and rankings only occur about every 5 years. The *2008 Nitrate Priority Area Delineation and Ranking Process* document was published in 2008 based on data collected prior to 2007.

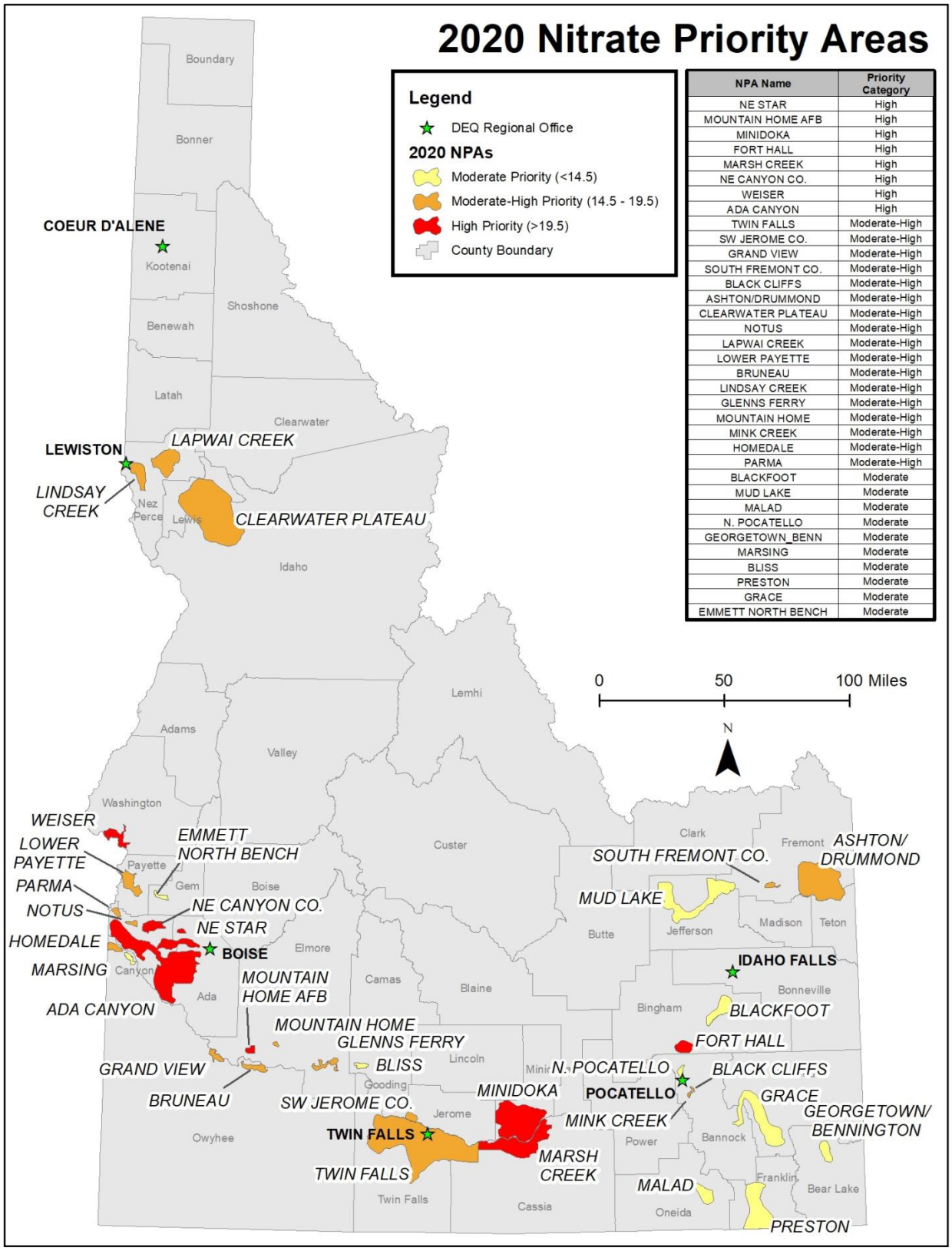
DEQ began reevaluating the NPAs in 2018. The areas, boundaries, and ranking were updated by incorporating data collected from 2007–2011. The *Nitrate Priority Area Trend Analysis* was published in 2020.

The main criteria in identifying a NPA requires 25% of the ground water samples collected, in a hydrogeologically similar area, contain nitrate levels greater than or equal to 5 mg/L or one-half of the 10 mg/L federal drinking water standard for nitrate.

Areas are ranked based on criteria such as population, existing water quality, water quality trends, and other factors. The process also accounts for impacts on the beneficial uses (other than water supply) of an area's ground water.

Figure 3-1 shows 34 NPAs in Idaho, along with their rankings. Figure 3-2 is a map of the NPAs in DEQ's Boise region (Washington, Payette, Gem, Boise, Canyon, Ada, Owyhee, and Elmore Counties). Figure 3-3 shows increasing and decreasing trends for Idaho's NPAs in 2002, 2008, 2014, and 2020.

Table 3-1 summarizes the 2020 statewide ranking of NPAs, with data showing nitrate levels in each area.



NPA Name	Priority Category
NE STAR	High
MOUNTAIN HOME AFB	High
MINIDOKA	High
FORT HALL	High
MARSH CREEK	High
NE CANYON CO.	High
WEISER	High
ADA CANYON	High
TWIN FALLS	Moderate-High
SW JEROME CO.	Moderate-High
GRAND VIEW	Moderate-High
SOUTH FREMONT CO.	Moderate-High
BLACK CLIFFS	Moderate-High
ASHTON/DRUMMOND	Moderate-High
CLEARWATER PLATEAU	Moderate-High
NOTUS	Moderate-High
LAPWAI CREEK	Moderate-High
LOWER PAYETTE	Moderate-High
BRUNEAU	Moderate-High
LINDSAY CREEK	Moderate-High
GLENNS FERRY	Moderate-High
MOUNTAIN HOME	Moderate-High
MINK CREEK	Moderate-High
HOMEDALE	Moderate-High
PARMA	Moderate-High
BLACKFOOT	Moderate
MUD LAKE	Moderate
MALAD	Moderate
N. POCATELLO	Moderate
GEORGETOWN_BENN	Moderate
MARSING	Moderate
BLISS	Moderate
PRESTON	Moderate
GRACE	Moderate
EMMETT NORTH BENCH	Moderate

Figure 3-1. 2020 ranked nitrate priority areas.

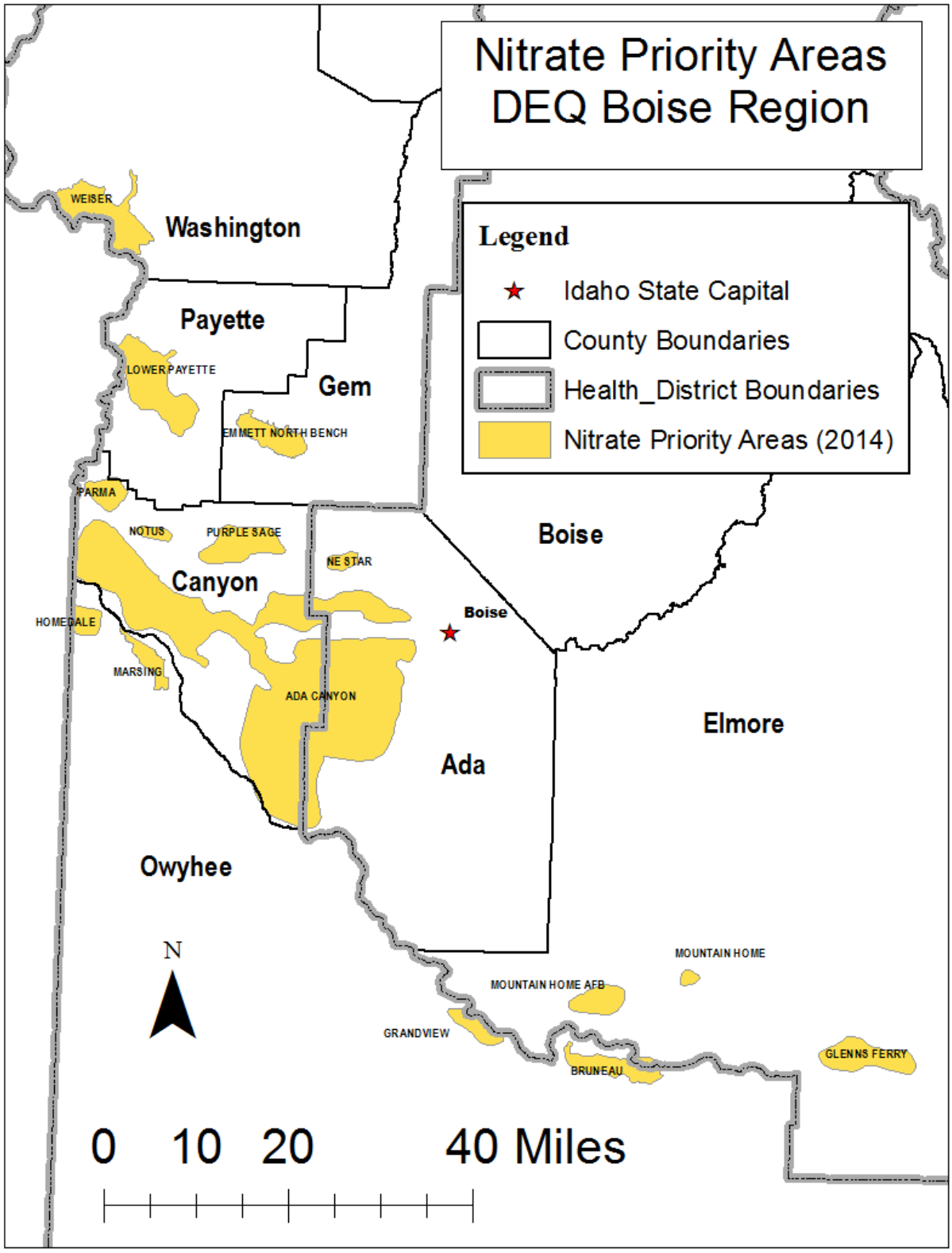


Figure 3-2. Nitrate priority areas in the Idaho Department of Environmental Quality's Boise region.

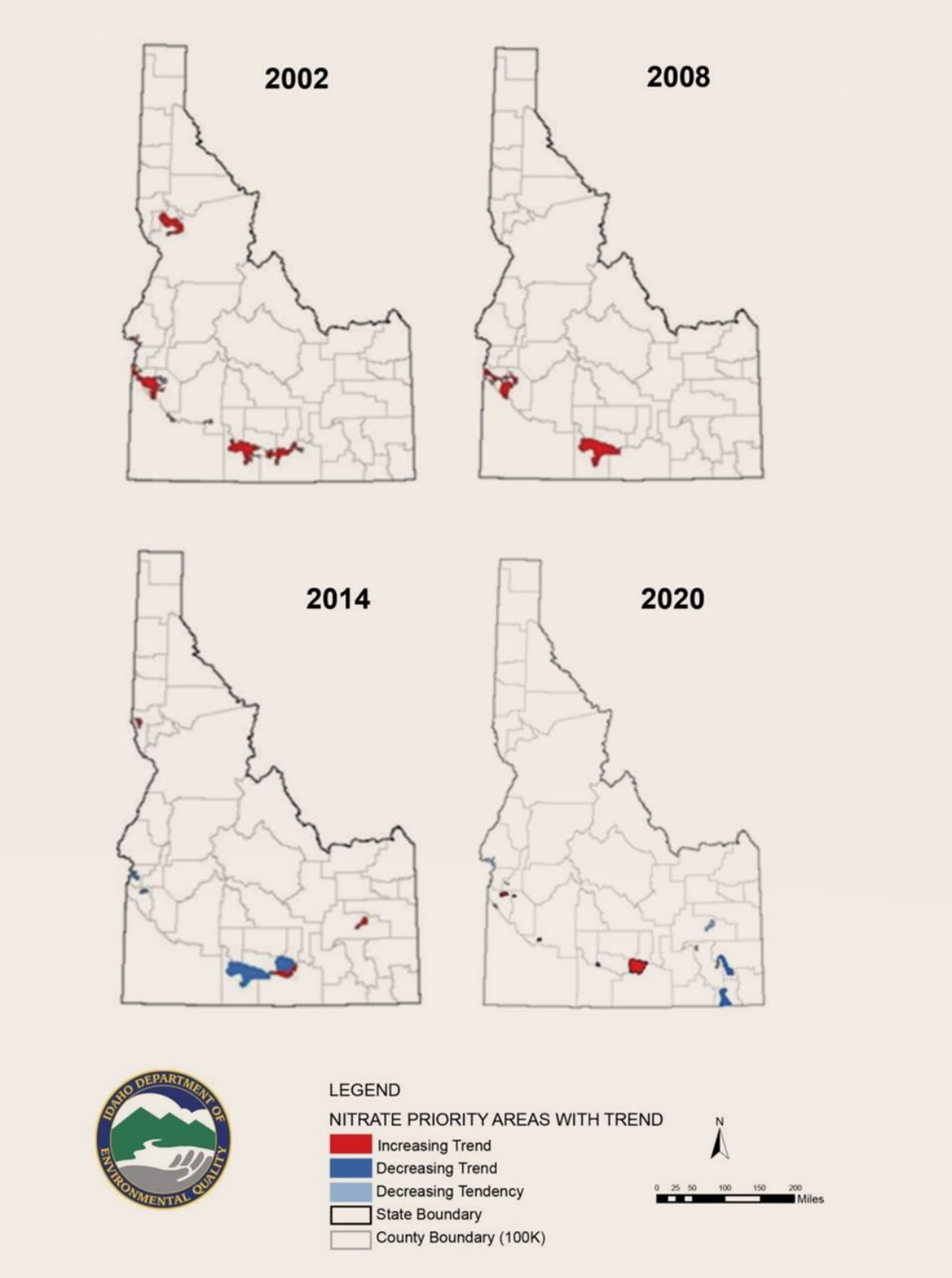


Figure 3-3. Increasing and decreasing trends for 2002, 2008, 2014, and 2020.

Table 3-1. 2020 ranked nitrate priority areas with score components.

Name	Region	Acres	Sq. Miles	Population	Number of Sites	Max. Nitrate	Average Nitrate	Median	PWS Wells	PWS SWA	# ≥ 2mg/L	% ≥ 2mg/L	# ≥ 5mg/L	% ≥ 5mg/L	# ≥ 10mg/L	% ≥ 10mg/L	2007-2016 Trend*	2020 Score	Rounded 2020 Score	2020 Rank
NE STAR	BRO	3,180	5	357	47	44	12.2	7.7	2	5	35	74	29	62	22	47	**Increasing Trend**	24.28	24	1
MOUNTAIN HOME AFB	BRO	5,983	9	3,238	33	27.9	9.4	7.8	7	6	31	94	25	76	11	33	**Increasing Trend**	23.98	24	2
MINIDOKA	TFRO	145,083	227	18,605	347	83	5.1	4.3	48	75	227	65	142	41	27	8	**Increasing Trend**	23.15	23	3
FORT HALL	PRO	17,277	27	1,158	17	23.6	11.7	11.0	3	5	16	94	14	82	10	59	Ins. Data/No Trend	21.88	22	4
MARSH CREEK	TFRO	101,345	158	18,084	403	40	6.8	5.8	55	46	354	88	242	60	81	20	No Trend	21.76	22	5
NE CANYON CO. (PURPLE S.)	BRO	18,653	29	4,847	176	27	5.9	5.4	32	27	149	85	94	53	17	10	**Increasing Trend**	21.35	21	6
WEISER	BRO	21,462	34	7,393	150	60	12.0	10.1	26	24	130	87	118	79	75	50	*Decreasing Tendency*	21.19	21	7
ADA CANYON	BRO	251,883	394	205,419	1117	38.4	5.1	4.2	274	339	837	75	462	41	130	12	*No Trend*	19.75	20	8
TWIN FALLS	TFRO	363,687	568	76,293	719	41	4.9	4.7	111	91	621	86	315	44	30	4	No Trend	19.32	19	9
SW JEROME CO.	TFRO	7,901	12	615	30	30	7.4	5.0	0	0	29	97	15	50	5	17	**Increasing Trend**	19.14	19	10
GRAND VIEW	BRO	9,173	14	596	32	110	13.3	8.2	2	2	30	94	26	81	13	41	Ins. Data/No Trend	19.03	19	11
SOUTH FREMONT CO.	IFRO	4,964	8	156	13	38	14.5	7.9	0	4	11	85	9	69	6	46	Ins. Data/No Trend	18.75	19	12
BLACK CLIFFS	PRO	1,030	2	493	28	28.68	10.3	9.8	2	2	19	68	17	61	14	50	Ins. Data/No Trend	18.41	18	13
ASHTON/DRUMMOND	IFRO	145,111	227	2,367	209	38.3	7.3	6.4	12	16	187	89	148	71	35	17	No Trend	18.03	18	14
CLEARWATER PLATEAU	LRO	268,361	419	3,760	138	52	6.4	4.2	18	22	98	71	61	44	31	22	No Trend	17.82	18	15
NOTUS	BRO	4,288	7	211	20	16	7.6	7.3	1	1	17	85	16	80	6	30	Ins. Data/No Trend	17.7	18	16
LAPWAI CREEK	LRO	49,168	77	1,163	37	18.8	7.4	6.6	5	10	28	76	23	62	11	30	Ins. Data/No Trend	17.62	18	17
LOWER PAYETTE	BRO	26,205	41	7,214	207	61	6.3	4.4	23	37	148	71	96	46	38	18	No Trend	17.52	18	18
BRUNEAU	BRO	13,420	21	32	8	92	22.6	13.1	0	0	7	88	6	75	4	50	Ins. Data/No Trend	17.51	18	19
LINDSAY CREEK	LRO	26,246	41	13,212	65	21	5.6	4.3	19	19	42	65	31	48	15	23	No Trend	17.00	17	20
GLENNS FERRY	BRO	13,398	21	1,578	17	73.3	12.1	6.5	3	2	14	82	11	65	5	29	Ins. Data/No Trend	16.79	17	21
MOUNTAIN HOME	BRO	2,014	3	480	53	40	9.6	5.5	3	3	46	87	29	55	17	32	Ins. Data/No Trend	16.69	17	22
MINK CREEK	PRO	1,576	2	643	34	21	5.4	4.0	6	30	23	68	15	44	8	24	Ins. Data/No Trend	15.96	16	23
HOMEDALE	BRO	8,765	14	1,753	40	17.1	5.4	3.4	9	14	22	55	17	43	10	25	Ins. Data/No Trend	15.75	16	24
PARMA	BRO	4,980	8	998	30	16	5.7	5.2	5	6	19	63	16	53	8	27	Ins. Data/No Trend	15.61	16	25
BLACKFOOT	PRO	32,620	51	1,979	22	16	5.5	5.4	3	24	17	77	12	55	3	14	**Dereasing Tendency**	13.19	13	26
MALAD	PRO	22,379	35	2,803	16	11.51	3.3	2.6	4	4	8	50	4	25	2	13	Ins. Data/No Trend	12.55	13	27
MUD LAKE	IFRO	111,709	175	1,682	97	26	4.3	4.2	18	14	73	75	30	31	5	5	No Trend	12.55	13	28
N. POCATELLO	PRO	5,511	9	23,062	25	8.9	4.4	4.0	26	40	22	88	7	28	2	8	*Decreasing Tendency*	12.46	12	29
GEORGETOWN_BENN	PRO	17,764	28	795	22	13.3	4.2	2.8	2	2	14	64	10	45	2	9	Ins. Data/No Trend	12.43	12	30
MARSING	BRO	5,994	9	393	35	56	12.3	6.6	3	3	24	69	21	60	14	40	**Decreasing Trend**	12.38	12	31
BLISS	TFRO	6,218	10	66	24	19	4.6	2.9	0	0	14	58	9	38	4	17	Ins. Data/No Trend	11.76	12	32
PRESTON	PRO	94,761	148	9,856	82	27.75	5.9	4.5	14	18	56	68	39	48	13	16	**Decreasing Trend**	10.36	10	33
GRACE	PRO	95,693	150	2,737	60	42.57	5.1	2.8	27	19	37	62	18	30	6	10	**Decreasing Trend**	9.74	10	34
EMMETT NORTH BENCH	BRO	5,414	8	424	40	21	4.6	3.7	1	3	32	80	14	35	2	5	**Decreasing Trend**	6.85	7	35

*For this iteration, NPA nitrate concentrations between 2007–2011 and 2012–2016 were compared using previously established statistical methods and the threshold criteria analysis (DEQ 2014, Neely 2013). The methods and results of this nitrate trend analysis are presented in Nitrate Priority Area Trend Analysis, 2011-2016, DEQ 2020.

High Priority
Moderate - High Priority
Moderate Priority

Intentionally left blank for double sided printing

4 Canyon County Nitrate Priority Area Maps

The maps in Figure 4-1, Figure 4-2, Figure 4-3, and Figure 4-4 show the current NPAs identified for Canyon County. The NPA boundaries depicted on these maps are approximate.

If you own a well and live in one of the NPAs, it is particularly important to test your well water on a regular basis. If your well is not in an NPA, this does not rule out the potential for nitrate contamination, so testing your well water regularly is still recommended. See Tab 14, Public Information and Outreach Materials, for private well owner information and analytical laboratory contacts.

More information is provided about nitrates in ground water on DEQ's *Ground Water Quality* web page.

An interactive map-based source of information on ground water quality areas where nitrate concentrations potentially degrade drinking water quality is found at *mapcase.deq.idaho.gov/npa.* If 25% of ground water samples collected in an area contain nitrate levels greater than or equal to one-half the federal drinking water standard (i.e., greater than or equal to 5 mg/L), the area qualifies as an NPA. The federal drinking water standard for nitrate, as set by the United States Environmental Protection Agency (EPA), is 10 mg/L.

To view an interactive map-based source of information on ground water quality analytical data collected by DEQ (or DEQ contractors), go to *mapcase.deq.idaho.gov/gwq/.*

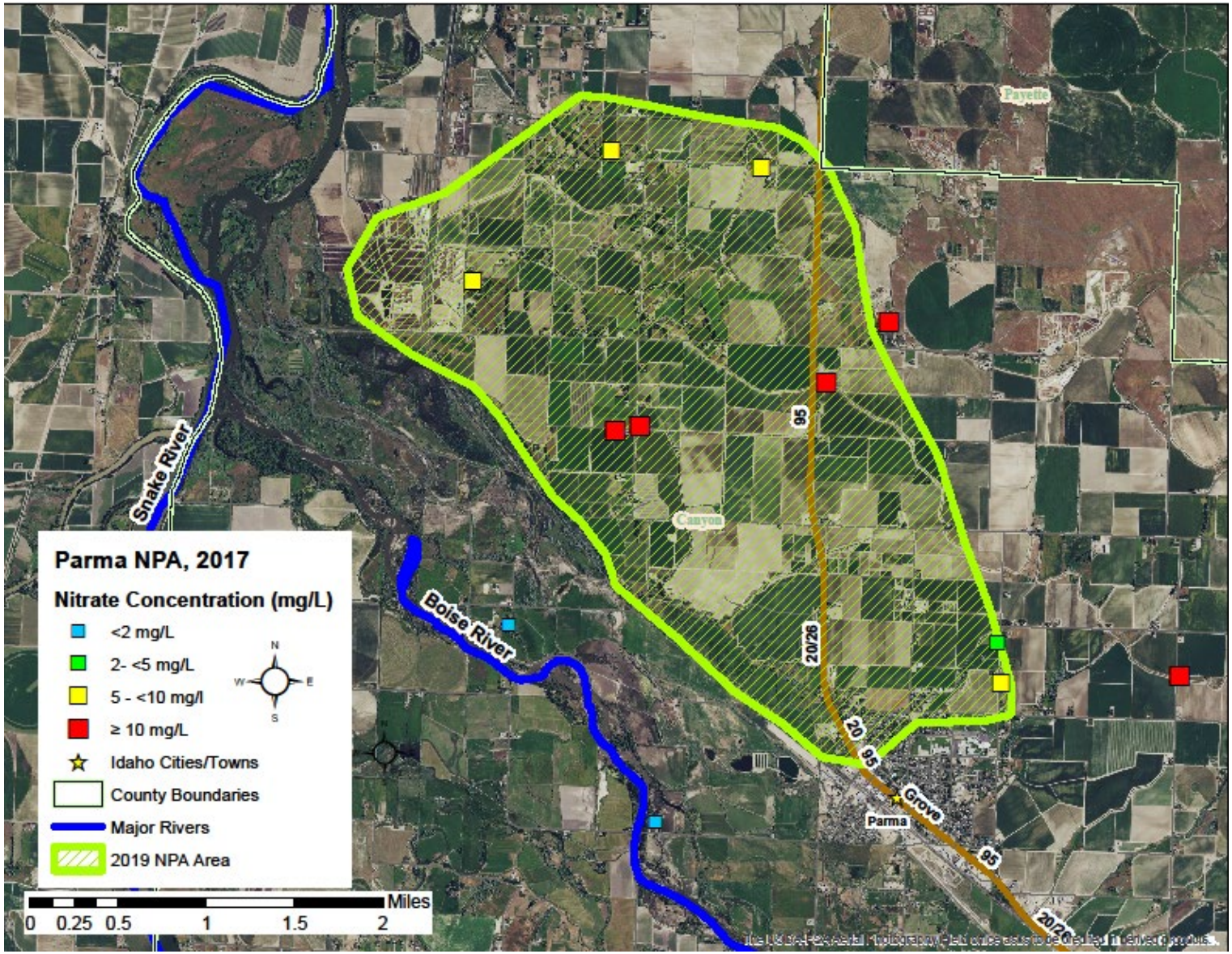


Figure 4-1. Parma nitrate priority area for ground water.

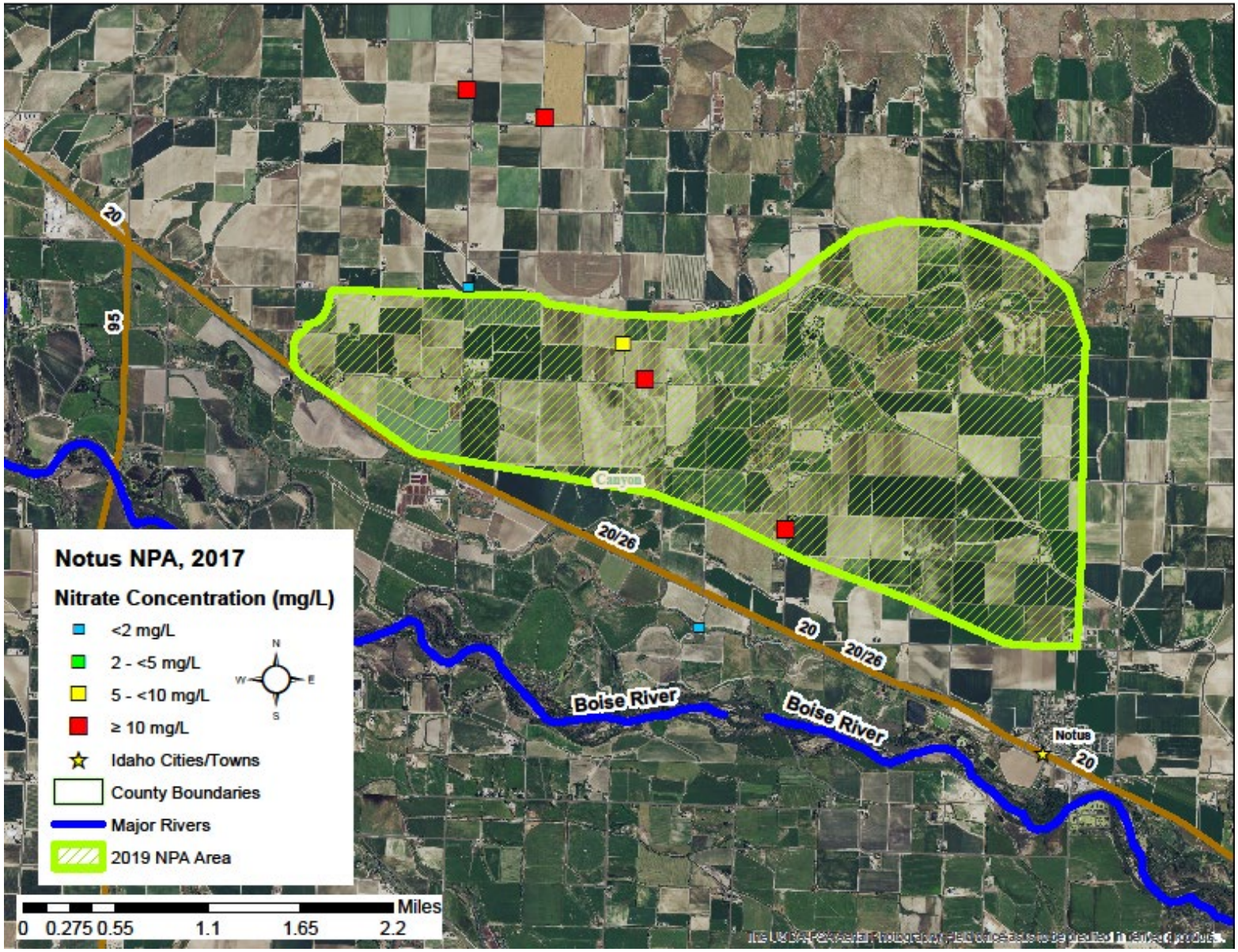


Figure 4-2. Notus nitrate priority area for ground water.

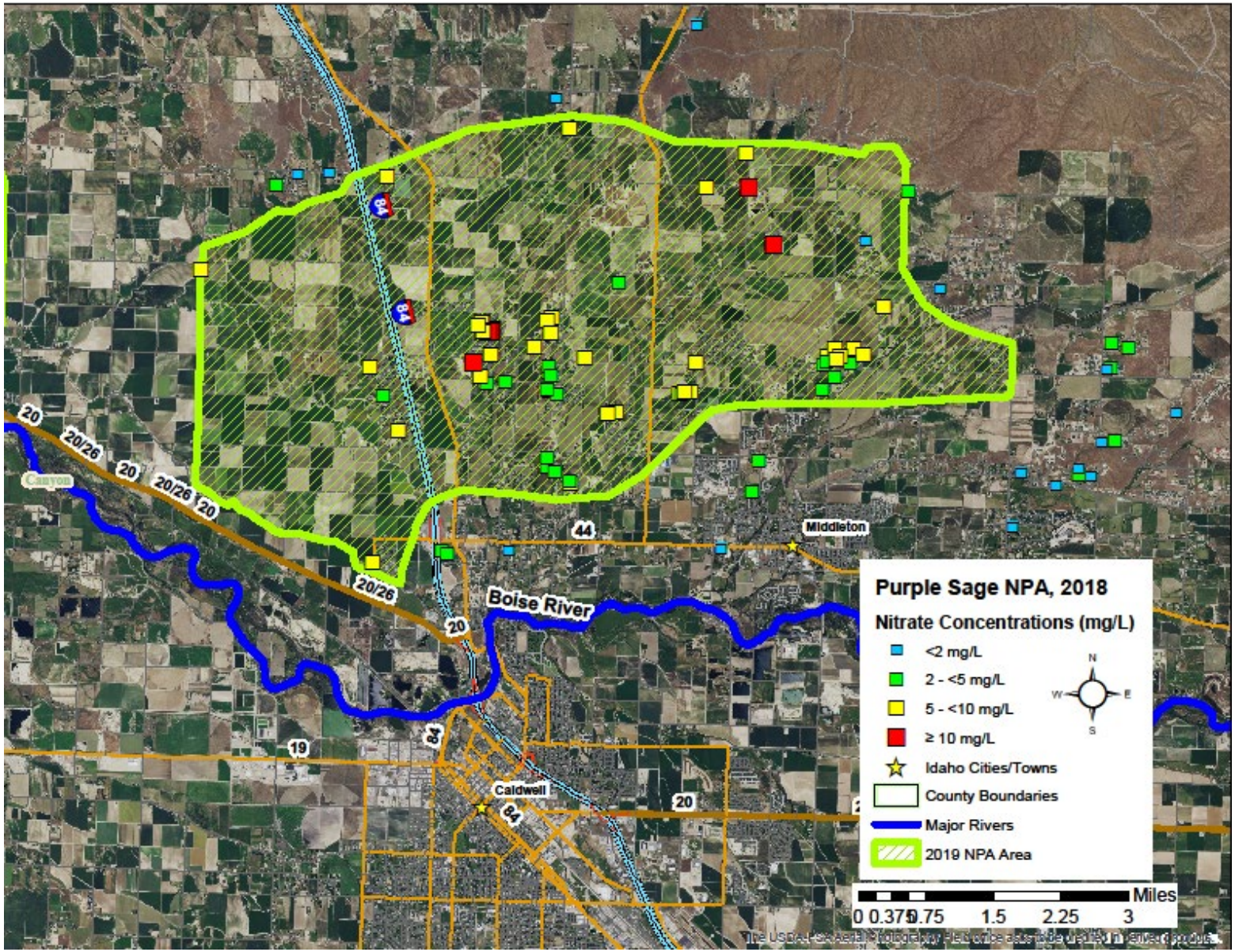


Figure 4-3. Purple Sage nitrate priority area for ground water.

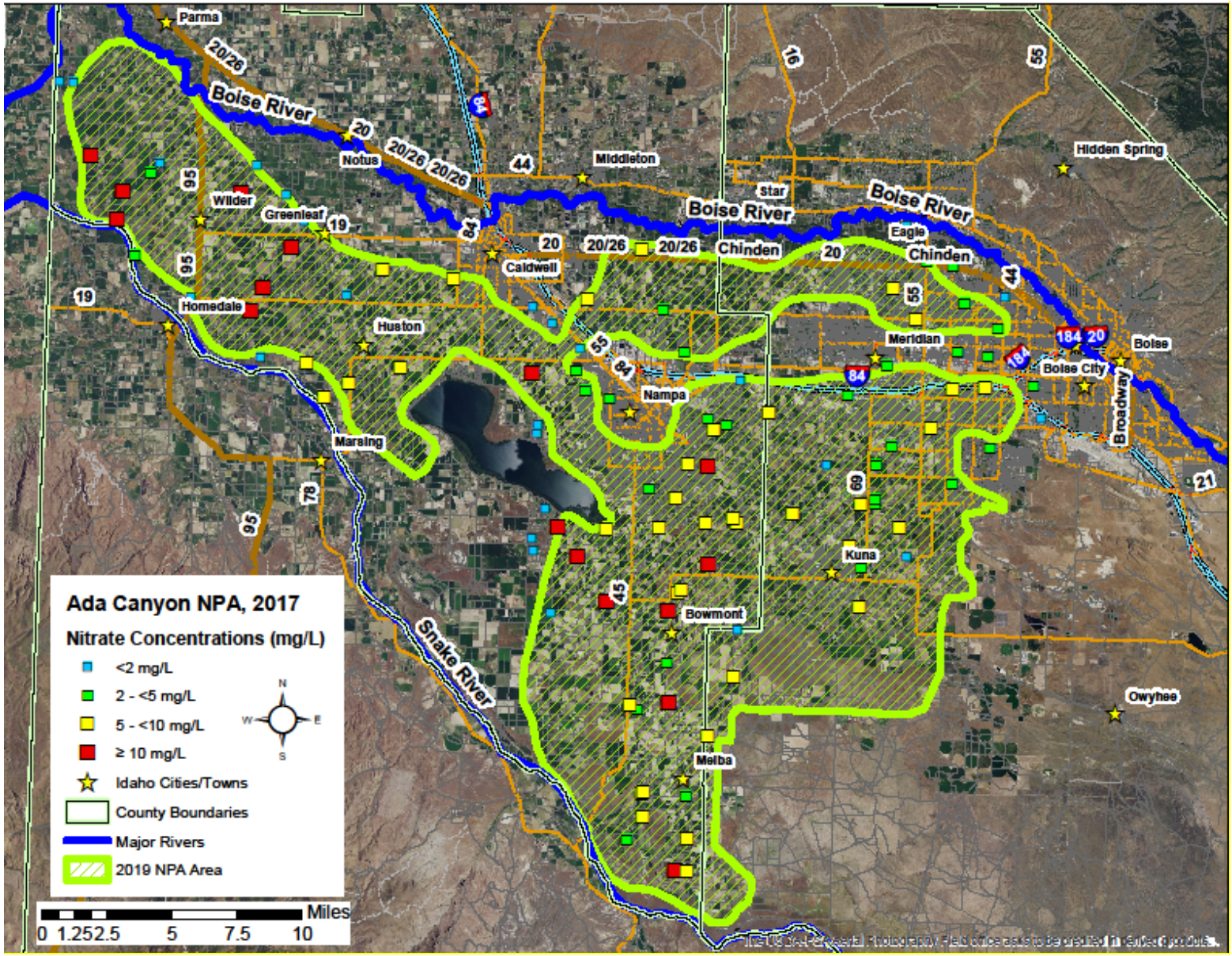


Figure 4-4. Ada Canyon nitrate priority area for ground water.

Intentionally left blank for double sided printing

5 Nitrate, Potential Nitrate Sources, and Other Ground Water Contaminants

5.1 Why is Nitrate a Concern?

Ground water supplies 95% of the water used in Idaho households and provides drinking water to more than 200 Idaho cities and towns. High levels of nitrate in drinking water are associated with adverse health effects. Therefore, strategies aimed at eliminating or minimizing nitrate contamination in the environment are critical.

Nitrate is a form of nitrogen. Nitrogen is an essential nutrient for plant growth; its compounds are vital components of plant foods and fertilizers. A variety of sources generate nitrate, such as precipitation, septic sewer systems, plants, waste from animals, nitrogen-based fertilizers, and other organic matter that returns nitrate to the soil as it decomposes.

Nitrate is the most widespread contaminant in Idaho's ground water; it is also the most preventable. In fact, it is "the most widespread contaminant found in Idaho ground water and the most common contaminant identified in public water drinking systems" (DEQ 2001). Nitrate levels in ground water serve as an indicator of the likelihood that other contaminants will reach the aquifer. While many other contaminants have been identified in Idaho ground water, nitrate's abundance, chemical mobility, and clear association with widespread land uses establishes it as a priority contaminant.

Ground water quality monitoring data collected by DEQ, IDWR, ISDA, and USGS revealed nitrate concentrations, in some areas of Idaho, above or near the MCL for drinking water established by the EPA.

5.2 Drinking Water Maximum Contaminant Level

The drinking water MCL is the highest permissible level of contaminant in drinking water for it to be deemed suitable for human consumption. EPA has established federal drinking water standards, called MCLs, for many contaminants; the MCL for nitrate is 10 mg/L. The Idaho ground water quality standard for nitrate in drinking water is also 10 mg/L. Nitrate concentrations of 2 mg/L or greater generally indicate an anthropogenic (human-caused) impact to ground water.

People who rely on private wells for their drinking water supply are particularly at risk of exposure to high levels of nitrate and other contaminants. Private well owners are not required to test their water on a regular basis and may not be aware a problem exists. See Tab 14, Public Information and Outreach Materials, for private well owner information and analytical laboratory contacts. Public water systems (PWSs) are subject to the Safe Drinking Water Act and are required to test regularly. Nitrate levels in public drinking water must be below 10 mg/L MCL.

5.3 Health Effects

Elevated nitrate levels can pose a health threat for both humans and animals and can be an indicator of other water quality problems. The MCL of 10 mg/L is based on studies assessing the risk of developing methemoglobinemia (also known as blue baby syndrome) in infants as a result of exposure to nitrates. Methemoglobinemia is the inability to absorb oxygen in the blood system. Nitrate levels above the regulatory level have been associated with methemoglobinemia. The condition typically affects newborns and infants up to 6 months of age and occurs when nitrate is converted to nitrite in a child's body. Nitrite reduces oxygen in the child's blood, leading to shortness of breath and blueness of skin. This condition can be serious, causing the child's health to deteriorate rapidly over a period of days, and can result in death. Other populations potentially vulnerable to methemoglobinemia include pregnant women, adults with reduced stomach acidity, adults who lack a hereditary enzyme needed to combat effects of nitrate in their body, and dialysis patients (Cohen and Wiles 1996). Healthy adults are typically not affected short-term by elevated nitrate in water. However, long-term effects for consuming high-nitrate water are uncertain (Mahler et al. 2007).

High-nitrate water is generally a health hazard to animals only when used with high-nitrate feed. Short-term use of water with nitrate levels up to 40 mg/L is generally considered acceptable for animals. Water with nitrate levels greater than 100 mg/L is not recommended for livestock (Mahler et al. 2007). For more information about how water quality can affect animals, visit *Washington State University's College of Veterinary Medicine* website or the *University of Idaho's College of Agricultural and Life Sciences* website.

5.4 Nitrate in Ground Water

Nitrate is soluble in water and can easily pass through soil to ground water supplies. Ground water is the primary source for drinking water in the Canyon County area; therefore, ground water with high nitrate levels can potentially impact drinking water reserves. Nitrate can persist in ground water for decades and accumulate at high levels as more nitrogen is added to the soil every year and leaches into the ground water. High levels of nitrate in soil, ground water, and drinking water can originate from the application of nitrogen in the form of commercial fertilizer and animal waste, legume crop plow-down, and septic tank failures. Shallow wells, wells in sandy soil, or wells that are improperly constructed or maintained are more likely to have nitrate contamination than deeper wells with protective casings and effective well seals. Nitrate in ground water is often an indicator of aquifer vulnerability and may suggest the presence of other contaminants. The presence of higher concentrations of nitrate in ground water is generally associated with certain land use activities (Tab 6). Whenever nitrogen-containing compounds come into contact with soil, a potential for nitrate leaching into ground water exists. Nitrate is highly soluble and will stay as a solution in percolation water after leaving the root zone until it reaches ground water. Nitrate is difficult to remove from water; it cannot be removed from water by boiling, filtration, disinfection, or water softening. Water treatment that is effective in removing nitrate includes distillation, reverse osmosis, and ion exchange.

6 Potential Nitrate Sources

"It's not a matter of who is most responsible.
What's important is that you do what you can in the hope that
what you do matters."—unknown

Sources of nitrate include both point and nonpoint sources. A point source is a distinct and mappable supply of contamination. Nonpoint source pollution occurs with no visible or obvious point from which the contamination originates. Identified below are land use practices often serving as both point and nonpoint sources associated with nitrate contamination. When these land use practices are managed appropriately, they do not result in the degradation of water quality. However, poor management or inadequate control over such land use activities can lead to decreased water quality.

6.1 Well Construction

Older well construction standards did not offer the level of protection to ground water that more current standards require. Older well seals can allow contaminants from the land surface to move down along the outside casing of the well toward ground water. A well with multiple-screened intervals may create cross-contamination between aquifers. Also, improperly abandoned wells provide a direct connection between the land surface and the aquifer, allowing surface contaminants an easy path to ground water. Each circumstance or combination of issues can increase the probability of developing a nitrate contamination problem within an aquifer.

6.2 Residential Land Uses

6.2.1 Fertilizer Application, Irrigation Practices, and Other Residential Activities

The following activities associated with residential development are possible contributors to nitrate problems in residential areas:

- Excessive use of fertilizer on lawns, gardens, and other landscaping
- Excessive use of water on lawns, gardens, and landscaping
- Animal waste management (pastures and kennels)
- Septic system discharge

The combination of these activities may be a potential source of nitrate contamination in ground water.

Pastured animals on small acreages can also degrade ground water if not managed properly. According to Scott Jensen with the Canyon County Cooperative Extension Service, "Pasture management involves more than just grass care. It involves managing the interrelationships among animals, plants, and soil" (Jensen 2002).

6.2.2 Septic Systems

Domestic septic systems may contribute to elevated concentrations of nitrate in ground water. The standard household septic system is not designed to effectively treat wastewater for nitrates. Properly operating systems deliver a certain amount of nitrate to the ground water. In areas underlain by deep, well-drained soils on uplands, nitrate concentrations delivered to ground water may range from 22 to 136 mg/L. In areas with an extremely high water table and poorly-drained soils, nitrate concentrations delivered to ground water may average between 6.9 and 11 mg/L (Scalf et al. 1977).

Ground water problems can occur in areas where high septic densities exist. Primarily, these sites are found within cities' urban growth boundaries or in more isolated subdivisions. Low-density settings have little impact as ground water dilutes the discharged wastewater and spreads pollutants over a large area. As densities increase, discharge volumes increase as well and may overcome the ground water's ability to dilute wastes, which increases the potential for contamination.

The "Individual/Subsurface Sewage Disposal Rules" (IDAPA 58.01.03) establish minimum standards for the design, construction, siting, and use of individual and subsurface sewage disposal systems. These rules also establish requirements for obtaining an installation permit and an installer's registration permit.

These rules are administered by Idaho's seven public health districts under a memorandum of understanding with DEQ. The public health districts permit and inspect septic systems, and, for a fee, also conduct site evaluations to determine the suitability of a location for a septic system.

Septage can present public health hazards and generate strong odors. IDAPA 58.01.03 establishes standards for pumping and cleaning septic systems and transporting and disposing of human excrement. To prevent public health hazards and nuisance conditions, septage must be collected, pumped, transported, stored, and disposed of according to these rules.

In cases where the concentration of nitrate entering ground water may be a problem, additional treatment systems can be placed on the septic tanks, reducing the effluent nitrate concentration to 27 mg/L or 16 mg/L.

DEQ requires a nutrient-pathogen (NP) evaluation for proposed central septic systems located in NPAs, oversensitive resource aquifers, and for all proposed large soil absorption systems (LSAS).

DEQ, the public health district, or county agency may also require an NP evaluation on parcels of land where certain conditions may impact surface water or ground water quality:

- Nutrient and/or pathogen contamination already exists and has the potential to create a health risk.
- Soil depth is shallow.
- A predominance of gravel or coarse-grained sediment exists.
- Ground water is close to the surface (10 feet or less).
- Fractured bedrock is close to the surface (10 feet or less).

This assessment determines the number of septic tanks permitted on a single subdivision site, avoiding any adverse impact on ground water quality. DEQ reviews the NP studies on behalf of each health district.

Additionally, health districts perform day-to-day activities to regulate septic systems. These tasks include conducting site evaluations and inspections, issuing system permits, and issuing septic tank pumper licenses. Health district programs have also been developed to address key issues, such as establishing design standards and acceptable waste management practices for private septic systems; establishing criteria under which sanitary permits are issued to build private septic systems discharging pollutants to waters in the state; and establishing site soil evaluation standards for placement of septic systems.

Other DEQ septic system regulation responsibilities include conducting plan and specification reviews for LSAS or drainfields with greater than 2,500 gallons per day effluent; reviewing NP studies for LSAS; heading the technical guidance committee; reviewing new technologies; and providing training courses for installers and pumpers.

6.3 Agriculture

Agricultural activities generate sources of nitrate through all forms of fertilizers, legume crops, and organic matter. Nitrogen not used by plant growth is stored in the soil and can leach into ground water as nitrate if sufficient water is available to carry the compound through various layers of soil (known as the soil profile).

Several factors influence the degree of nitrogen leaching in agricultural areas. For instance, soil type, irrigation practices, and volume of water applied affect how quickly and easily nitrate leaches through the soil. The nitrogen source itself, application season, and application rate directly impact overall levels of nitrogen introduced. Overapplication of nitrogen can occur in several ways:

- Applying fertilizers at rates greater than what the crop needs or can use
- Failing to account for residual and organic nitrogen sources already present in the soil profile, especially in the form of nitrogen-fixing crops
- Inappropriately timing nutrient application with regard to crop needs
- Failing to account for other nitrogen sources such as irrigation water
- Failing to calibrate solid waste delivery systems to ensure uniform application over the entire land application area
- Failure to conduct nutrient analysis of solid waste and wastewater to determine the appropriate amount for land application

Irrigation systems may include gravity, solid set, hand line, wheel line, drip, surge, and center pivot. All systems have the potential to increase nitrate levels in ground water. Gravity or flood irrigation methods apply large volumes of water and are most effective in leaching nitrate through the soil profile and have the highest potential to degrade ground water quality.

A number of programs and activities address irrigation practices. The University of Idaho's Nutrient and Pest Management Program is an educational effort based on soil testing programs and soil fertility recommendations appropriate to soil type and crop. The NRCS, ISWC, and

local soil and water conservation districts coordinate and implement a number of programs. Their focus is to use cost-sharing BMPs and educational outreach to reduce nutrient loads from agriculture and provide nutrient management planning and engineering technical support. These programs include the Environmental Quality Incentives Program (EQIP), Soil and Water Conservation Assistance Program, and State Water Quality Program for Agriculture. For additional information. visit the NRCS website at *https://www.nrcs.usda.gov/wps/portal/nrcs/site/id/home/*.

6.4 Animal Feeding Operations and Dairies

An Animal Feeding Operation (AFO) is facility where "animals have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period and where vegetation is not sustained in the confinement area during the normal growing season." Sources of nitrate from such animal feeding operations are typically attributed to runoff, facility wastewater, and manure. An AFO is a CAFO (Concentrated Animal Feeding Operation) if it meets the regulatory definition of a large or medium CAFO (Table 6-1) or DEQ has designated it as a CAFO.

The Food & Water Watch and Snake River Waterkeeper filed Petition for Review in the Ninth Circuit challenging EPA's issuance of the Idaho CAFO general permit. As a result, EPA will retain jurisdiction over the general permit until the appeal is resolved. This general permit is due to be renewed in June 2025.

On June 15, 2020, EPA reissued National Pollutant Discharge Elimination System (NPDES) General Permit No. IDG010000, which applies to all CAFOs in Idaho (excluding tribal lands) that have a discharge of pollutants to a water of the United States. This general permit is due for renewal in June 2025. Upon approval of the Idaho Pollutant Discharge Elimination System (IPDES) program to issue general permits on July 1, 2020, any CAFO facility covered under NPDES Permit No. IDG010000 will transfer to DEQ as IPDES General Permit No. IDG010000, and DEQ will be the lead agency for permitting authority, compliance monitoring, and evaluation. DEQ intends to renew the CAFO general permit in 2025.

Table 6-1. Regulatory definition of a large or medium CAFO.

Number of Animals	Type of Animal
700	Mature dairy cows, whether milked or dry
1,000	Veal calves
1,000	Cattle, other than mature dairy cows or veal calves (Cattle includes but is not limited t heifers, steers, bulls, and cow/calf pairs.)
2,500	Swine, each weighing 55 pounds or more
10,000	Swine, each weighing less than 55 pounds
500	Horses
10,000	Sheep or lambs
55,000	Turkeys
30,000	Laying hens or broilers, if the AFO uses a liquid-manure handling system
125,000	Chickens (other than laying hens), if the AFO uses other than a liquid-manure handlin system
82,000	Laying hens, if the AFO uses other than a liquid-manure handling system
30,000	Ducks, if the AFO uses other than a liquid-manure handling system
5,000	Ducks, if the AFO uses a liquid-manure handling system

If the facility does not discharge to a water of the United States, it will not be designated as a CAFO and will not require a NPDES permit. For more information, see EPA's website at *https://www.epa.gov/npdes-permits/npdes-general-permit-concentrated-animal-feeding-operations-cafos-idaho*.

The ISDA has the authority to promulgate and enforce rules for dairy operations. Noncompliance with the rules or discharge violations may result in revocation of authority to sell milk for human consumption. ISDA also conducts dairy waste inspections to prevent waste discharges and evaluate waste collection, treatment, handling, disposal, and management procedures for compliance with the federal Clean Water Act and ISDA regulations.

Additionally, ISDA collects ground water samples for nitrate analysis during annual inspections at all active dairies in Idaho. Every 5 years, ISDA will run nitrogen isotope tests on water samples from each dairy showing nitrate concentrations greater than 5 parts per million. ISDA also has authority to require further compliance and operation changes where evidence indicates a dairy is a nitrate source contributing to aquifer degradation. To date, follow-up has been restricted due to limited staff resources.

6.5 Industrial and Municipal Wastewater Land Application Areas

Wastewater land application facilities generate nutrient-rich that is typically treated to reduce nutrients prior to land application, referred to as recycled water. Such facilities are among the few sources of nitrate regulated by DEQ. These facilities are required to obtain a reuse permit to apply recycled water to land. DEQ's regulatory water reuse permit program requires land appliers to take the following steps:

- Limit recycled water applications to meet crop nutrient and water needs.
- Develop management plans for irrigation and nutrient use.
- Develop water and nutrient budgets.
- Sample wastewater, ground water, soil, and crops as required by permit.
- Prepare reports on how activities are functioning and whether the process is meeting permit limits.
- More information on *reuse permits* is available on DEQ's website.

6.6 Ground Water Recharge

Ground water recharge occurs naturally when water is allowed to seep into the ground. Depending on the specific conditions, recharge with contaminated water may adversely affect the ground water quality.

Managed ground water recharge takes place when water is pumped into a recharge basin or is injected into the ground in compliance with an IDWR permit.

6.7 Ground Water and Surface Water Interaction

The mutual influence and interaction between ground water and surface water quality are important considerations in evaluating sources of nitrate contamination. In some areas, ground

water and surface water are hydraulically connected and combine to form a single water source. Thus, if degraded water quality exists in one, it may degrade the other as well. An example of this is septic system drainfields impacting ground water that then impacts surface water.

6.8 Storm Water Disposal

Storm water is rain or melting snow that does not immediately soak into the ground. Storm water runs off the land and hard surfaces (e.g., streets, parking lots, rooftops) and picks up pollutants (e.g., fertilizers, dirt, pesticides, oil, grease). Eventually, storm water soaks into the ground or discharges to surface water (usually through storm drains), bringing pollutants with it. Federal, state, and local government agencies, businesses, industries, and individual landowners all share responsibility for storm water management. Storm water permits are typically general permits and cover storm water runoff from construction projects, industrial facilities, and municipal separate storm sewer systems.

As land development increases, so does the volume of concentrated storm water runoff. A variety of contaminants, including nutrients, are contained in the runoff. However, nitrate is found in relatively low concentrations in most storm water and has a low-to-moderate potential for contaminating ground water, either through surface percolation (the downward movement of water through soil and rocks) or through subsurface infiltration and injection practices. (Pitt et al. 1994).

Storm water management methods use ponds (retention, detention, evaporation, and infiltration), seepage beds, swales, or a combination. Practices infiltrating storm water (i.e., allowing storm water to enter the soil's surface) have the greatest potential to contribute nitrate to ground water. The *Idaho Catalog of Storm Water Best Management Practices* describes various types of best management practices that can be used to reduce discharge of storm water runoff related pollutants.

Over the past 30 years, a number of local jurisdictions have implemented storm water management functions at various levels of authority. These entities often require detention or retention of storm water runoff during real estate development activities. In practice, jurisdictions requiring on-site control of storm water flows after development activities are completed expect the runoff to be retained on site. This is due to few developments having access to drains, canals, or water bodies for off-site storm water discharge.

DEQ requires permit coverage of storm water discharges according to the applicable federal requirements. DEQ will apply the regulatory criteria in IDAPA 58.01.25.130 to determine which permit type to issue. Three categories of storm water discharges are covered in the IPDES Program: construction, industrial, and municipal activities. DEQ IPDES requirements are found on the *Storm Water* web page.

6.9 Other Ground Water Contaminants

Although nitrate is a common and widespread contaminant in ground water within Canyon County, other potential and major contaminant sources exist and are briefly discussed in this

section. Also note there are several naturally occurring contaminants (metals) present in ground water within Canyon County.

Regardless of the efforts operators and regulators undertake to protect human health and the environment, releases still occur. Accidental spillage, leaking underground pipes, or improper handling of waste materials can all lead to ground water contamination.

6.9.1 Petroleum Sources

Often businesses, such as gas stations, store large quantities of petroleum in underground storage tanks (USTs). Gas tanks and/or piping leaks have the potential to leak benzene, ethyl benzene, toluene, xylenes, and naphthalene that can impact shallow ground water. DEQ conducts inspections of UST facilities on a regular basis to confirm current standards are being met and tanks are not leaking. DEQ inspectors are required to visit each facility at least once every 3 years; however, leaks may still occur even with prevention systems in place. DEQ oversees petroleum release investigation and cleanup under the leaking underground storage tank (LUST) program. An overview of USTs and LUSTs in Idaho is provided on DEQ's *Storage Tank* web page.

6.9.2 Hazardous Chemicals

Businesses in Canyon County often use chemicals as part of their function or process. There are several laws and regulations to govern the purchase, transport, storage, use, and handling of these chemicals. Inspectors at DEQ regularly examine businesses using and storing chemicals considered to be hazardous and operations generating hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Their purpose is to confirm materials are handled properly and facilities are in compliance with hazardous waste rules and regulations. Some of these chemicals do enter the environment and are present in ground water. DEQ oversees chemical release investigation and cleanup activities under its ground water program, RCRA program, and/or remediation program. An overview of hazardous waste management in Idaho is provided on DEQ's *Hazardous Waste* web page.

6.9.3 Mapping Ground Water and Drinking Water Contaminant Sources

EPA offers an online mapping application for several of the federally regulated programs in Idaho affecting ground water and drinking water.

The EPA-managed **MyEnvironment** search application is designed to map a cross section of environmental information based on the user's location. Information includes but is not limited to the following:

- Toxic releases and hazardous waste sites (TOXMAP).
- Superfund information links.
- Brownfields Program information links.
- Hazardous waste information links.
- Cleanups in my community map.
- USGS streamflow levels data for stream gauges.
- Water conditions for local water bodies based on EPA Water Quality and Impaired Stream data.

- EPA local drinking water provider and community water system information from the Safe Drinking Water Information System.
- Water quality monitoring activities—Provides the ability to identify monitoring stations in your neighborhood by the pollutants they measure.
- New and expiring facility permits in my area—This feature reports new and expiring permits (from EPA's Integrated Compliance Information System database) given to facilities that emit pollutants to water in your neighborhood.
- Watershed—This feature shows your area's watershed and connects you to EPA's Surf Your Watershed website, which provides a variety of links to citizen-based groups at work in your watershed, water quality data, and more.
- Fish advisories per area.

To get started, go to *https://enviro.epa.gov/* and enter your location.

If you are interested in other online mapping tools, see Tab 4 and or Tab 7 for links to interactive map-based sources of information on ground water quality.

7 Canyon County Water Quality Activity Overview and Accomplishments

Table 7-1 gives an overview of completed water quality activities and accomplishments in Canyon County.

Table 7-1. Overview of activities completed to improve ground water quality in Valley County.

Drinking Water Systems and Wells	
Number of active public water systems in Canyon County as of 2020	148
Number of Canyon County well permits issued by Idaho Department of Water Resources since January 1950	14,944–2016 16,726–2020
Drinking Water Source Protection Plans	
City of Greenleaf City of Melba City of Middleton City of Notus City of Parma City of Wilder	2004 2020 2007 2014 2015 Draft 9/1/2020
Canyon County Grant Awards for Water Quality Projects §319[a] Grant Awards: Nonpoint Source Implementation for Surface Water and Ground Water	
2011—S443 Canyon County BMPs	$250,000
2014—S521 Continued Canyon County BMPs	$250,000
2018—S593 Continued Treasure Valley BMP Program	$250,000
2020—S692 Continued Treasure Valley BMP Program	$250,000
Total §319 funds since 2010	**$1,000,000**
Canyon County Source Water Protection (SWP) Grants	
2021 City of Melba - Partial Abandonment of Well #1, Convert to Monitoring Well	$10,000
2012 East Lizard Butte Water Corp – Abandonment of Test Well	$2,400
2010 City of Melba – Decommission municipal well	$3,500
Total SWP Grant Awards since 2010	**$15,900**
Surface Water Pollutant Load Allocations (Total Maximum Daily Loads [TMDL])	
Middle Snake River – Succor Creek Subbasin Assessment and TMDL	Completed 2004 Addendum 2007 Addendum 2013
Snake River–Hells Canyon Subbasin	Completed 2004
Lower Boise River Subbasin Assessment and TMDL Lake Lowell TMDL	Completed 2000 Addendum 2008 Addendum 2015 Addendum 2010
a. Refers to § 319 of the federal Clean Water Act.	

This page intentionally left blank for correct double-sided printing

8 General Strategies For Improving Ground Water Quality

The general and regional management strategies provided in this section address nitrate in ground water and offer suggestions to maintain or improve ground water quality in each NPA. These same strategies will also serve to protect and preserve shared ground water and drinking water resources throughout Canyon County.

The implementation of these strategies is voluntary and based on the premise that citizens of Canyon County want to manage their activities to limit potential impacts on their ground water resource. Along with participating entities, state and federal agencies will periodically evaluate the progress and success of these strategies in reducing nitrate levels in each NPA.

The goals of these strategies are as follows:

- Reduce nitrate contamination in each NPA to protect public health.
- Improve ground water quality in Canyon County to an extent that warrants removing the NPAs from the statewide nitrate priority list.
- Protect and preserve the ground water and drinking water resources in the county.

The proposed objectives to support achieving these goals are as follows:

- Make resources available to local governments to assist their decision-making processes.
- Educate the public about health risks associated with drinking water containing high nitrate levels and promote testing of private wells for nitrate concentrations.
- Educate the public about sources of nitrate in ground water to promote prevention, protection, and remediation efforts in maintaining and improving water quality.
- Implement agricultural, industrial, and residential BMPs to reduce nitrate loading of the ground water, thereby improving ground water quality.

Plan development would include the following:

- Gather a team of government and local advocates.
- Seek opportunities to hold education and outreach events.
- Attain grant funding if local communities show interest.

For each implementing agency, there is a table of action items (Table 8-1 through Table 8-9) including general time frames for completing each item. Detailed information regarding the agencies and the resources they offer is found under Tab 11, Agencies, Regulatory Directories, and Website Resources.

Table 8-1. Idaho Department of Environmental Quality implementation tasks for Canyon County.

Action Item	Time Frame
Facilitation and Reporting	
Report implementation updates at Interagency Ground Water Protection Committee meetings (see the Idaho Ground Water Protection Interagency Cooperative Agreement [DEQ 2008])	As necessary
Post summary reports and revised plan on DEQ website.	As necessary
Work with county commissioners and other local officials to evaluate adequacy of local zoning and land use planning initiatives.	As requested
General Information and Education	
Provide copies of the final *Canyon County Ground Water Quality Improvement and Drinking Water Source Protection Plan* and any future updates to local decision makers, including Canyon County commissioners, the Canyon County growth and development office, city planning and zoning office, and Canyon Soil Conservation District. Post plan and revisions on DEQ's website.	As needed
Work with communities to promote proper fertilizer application in parks, cemeteries, schools, and golf courses.	Ongoing
Make the final plan available to public via DEQ's website.	Ongoing
Grant Oversight	
Award and oversee § 319 Clean Water Act grant project funding and source water protection grant projects.	Annually
Public Drinking Water Systems	
Review and approve all plan and specification submittals for engineering design of new public water supplies.	As needed
Prepare source water assessments for all new public water supplies.	As needed
Co-author or write, review, and certify drinking water source protection plans for public water systems (PWSs).	As requested
Require and review PWS monitoring data to confirm drinking water complies with all state and federal maximum contaminant levels.	Frequencies vary
Use sanitary survey inspections to familiarize PWSs with source delineation information, provide an opportunity for PWSs to update their potential contaminant inventory, disseminate relevant outreach and education materials, and solicit involvement in the state's drinking water protection certification program.	As needed
Monitoring	
Compile regional water quality data. With input from other agencies and the public, adjust boundaries of the Canyon County nitrate priority area as appropriate.	2019; approximately every 5 years thereafter
Conduct coordinated ground water monitoring as funds are available to better characterize nitrate concentrations and trends, identify the vertical extent of contamination, and/or identify the presence of nitrate contamination within and outside of the nitrate priority area boundaries.	Regularly
Within a regional context, assess whether a ground water quality monitoring project is warranted and whether funding is available.	Second quarter of each year

Table 8-2. Southwest District Health Department implementation tasks for Canyon County.

Action Item	Time Frame
Septic Systems	
Provide information about treatment system options and septic system maintenance at public locations in cities that are in or near nitrate priority areas and at the Canyon County courthouse.	Ongoing
Continue with the review and permitting of all new, expanded, and replacement septic systems.	As requested
Inspect existing septic systems when new homes or home extensions are added.	As needed
Private Water Supply Wells and Public Health	
Provide information regarding the responsibilities of being a private well owner/user at public locations in cities in or near nitrate priority areas and at Canyon County offices. Include information and resources for understanding proper well location with respect to potential sources of contamination, installation procedures, and wellhead maintenance.	Ongoing
Provide information about the health effects of nitrate at public locations in cities that are in or near nitrate priority areas and at Canyon County offices.	Ongoing
Promote regular testing of private wells to determine if any contamination is present.	Ongoing
Provide sample bottles and information about analytical laboratories for testing of private wells.	As requested

Table 8-3. Local conservation districts with the assistance of Idaho Association of Soil Conservation Districts, and Idaho Soil and Water Conservation Commission implementation tasks for Canyon County.

Action Item	Time Frame
Public Awareness, Education, and Outreach	
Prepare an information and education plan that includes timelines, public service announcements, brochures, mailings, demonstrations, and tours.	Ongoing
Contact producers to inform them of the following: –Water quality goals and objectives for projects implemented –Potential agricultural impacts of nitrate contamination in ground water –Benefits of proper nutrient management plan (NMP) –Irrigation water management (IWM) benefits –Details on incentive programs –Information and education programs	Ongoing
Conduct IWM outreach: –Conduct irrigation workshops. –Make soil moisture monitoring equipment available to producers interested in optimizing their irrigation applications. –Encourage sprinkler irrigators to take advantage of the Idaho Power Energy Efficiency for Agricultural Irrigation program.	As requested Ongoing
Identify additional high-priority landowners and offer them information on the benefits of implementing NMP and IWM, using data and outputs compiled over the course of the project.	Ongoing
Work with communities to promote proper fertilizer application in parks, cemeteries, schools, and golf courses.	Ongoing
Work with county commissioners and other local officials to evaluate adequacy of local zoning and land use planning initiatives.	As requested
Provide information and training to private landowners who accept manure or compost from animal feeding operations for use as fertilizer. Develop and distribute the following information and training: –Identify target audience. –Create informational brochures, flyers, or pamphlets as guidance for proper storage and application methods. –In coordination with the University of Idaho Extension and other interested groups, develop seminar and presentation materials for workshops. –Disseminate information to the target audience through mailings, workshops, or other means as appropriate.	Ongoing
Best Management Practices—Program Planning	
Submit a § 319 Clean Water Act grant application to fund implementation of best management practices (BMPs) as outlined in the district's 5-year plan.	As needed
Establish a steering committee of Canyon Soil Conservation District members and staff from IASCD, ISWC, DEQ, ISDA, and NRCS to develop a project plan that will include the following: –Criteria for prioritizing activities in the nitrate priority areas for NMP, IWM, and total maximum daily loads (TMDLs) –Contracting procedures for NMP –Estimating incentives to be offered and methods of distribution –Monitoring and evaluation of BMP effectiveness –Information and education outreach options and methods to be used	As needed

Action Item	Time Frame
Prepare a work plan that includes the following components: –Develop a producer contact list for project information and education. –Prepare a written conservation plan and contract for NMP development and implementation (NMP services to include soil sampling, analysis, and planning for crops with cost share). –Educate landowners on IWM and installation and monitoring of water sensors. –Track load reductions. –Deliver project findings reports to DEQ biannually. –Provide an educational campaign to major producers and other landowners. –Evaluate unregulated manure storage sites to identify risk to ground water supplies. –Develop remediation plans and implement BMPs, including evaluation of agronomic application rates.	As needed
NMP, IWM, and BMP Implementation and Evaluation	
Implement NMPs: –Identify and focus on high-priority or critical areas. –Review water quality monitoring reports and data from other agencies. –Contact critical landowners. –Develop and conduct NMPs. –Follow-up with producers to review and evaluate NMPs. –Compile general (nonproducer-specific) information in report to DEQ.	Ongoing
IWM evaluations: –Identify fields to evaluate. –Install soil moisture equipment. –Analyze data. –Report findings to producers. –Compile general (nonproducer-specific) information in report to DEQ.	Ongoing
Implement BMP effectiveness evaluation program: –Analyze soil sampling data and fertilizer receipts to determine compliance with NMPs –Analyze soil moisture sensor data to evaluate irrigation management recommendations. –Review ground water quality results for samples collected within all nitrate priority areas identified in Canyon County.	As needed
Perform Biannual Reviews and Prepare § 319 Clean Water Act Grant Report for DEQ	
Conduct status review with each participant.	Annually
Prepare report with general information about activities and results conducted and submit to DEQ in a time frame that coincides with the invoice period (as required by DEQ).	As required
Prepare a work plan that includes the following components: –Develop a producer contact list for project information and education. –Prepare a written conservation plan and contract for NMP development and implementation (NMP services to include soil sampling, analysis, and planning for managing the amount, source, placement, form, and timing of the land application of nutrients and soil amendments for plant production).	Implementation schedule to be set after funding is obtained.

Notes: Idaho Association of Soil Conservation Districts (IASCD), Idaho Soil and Water Conservation Commission (ISWC), Idaho Department of Environmental Quality (DEQ), Idaho State Department of Agriculture (ISDA), and Natural Resources Conservation Service (NRCS)

Table 8-4. United States Department of Agriculture, Natural Resources Conservation Service implementation tasks for Canyon County.

Action Item	Time Frame
Public Awareness, Education, and Outreach	
Coordinate with and support the Canyon Soil Conservation District information and education plan.	Ongoing
Provide timely announcements of all Farm Bill sign-ups and other funding opportunities for implementation of best management practices (BMPs) to address resource concerns.	Ongoing
Work with producers involved in Natural Resources Conservation Service (NRCS) programs and provide information on the following: –Water quality resource concerns on their lands –Potential impacts of nitrate contamination to ground water quality –Proper nutrient management –Irrigation water management (IWM) and the benefits of high-level IWM implementation –Use of conservation crop rotation and other practices to mitigate ground water quality impacts	Ongoing
Participate in community activities and meetings, providing technical assistance and information on BMPs to address ground water and surface water quality concerns.	Ongoing
Coordination with Conservation Partners	
Inform all conservation partners of the availability of special Environmental Quality Incentives Program (EQIP) funding (Agricultural Water Enhancing Program and Cooperative Conservation Partnership Initiative) to target specific resource concerns and areas of concern.	Ongoing
Work with the NRCS, State Ground Water Monitoring Technical Committee and the soil and water conservation districts to use ranking and other processes to help target special resource concerns (e.g., nitrate priority areas).	Ongoing
Participate in and coordinate with any special projects (e.g., § 319 Clean Water Act projects) active in the county to help implement BMPs. Assist ISWC and soil and water conservation district, when requested, in evaluating program success through water quality modeling of estimated load reductions.	Depends on active projects
Participate as a member of the Idaho State Department of Agriculture, Agricultural Ground Water Committee and the Idaho Department of Environmental Quality, Ground Water Monitoring Technical Committee to stay abreast of current issues and inform partners of NRCS activities.	Ongoing
Implementation of Conservation Practices	
Use the existing field office work plan to accomplish the following: –Provide information to producers on incentive programs, such as EQIP to implement BMPs. –Develop contracts with producers and assist with the implementing needed conservation practices that address resource concerns. –Use NRCS tools to track progress and results.	Ongoing
Contract with interested producers and provide technical assistance to implement conservation practices that address ground water and surface water quality protection and/or mitigation. Include the following management practices: –Irrigation water management –Nutrient management –Pest management –Conservation crop rotation –Residue management	Ongoing

Action Item	Time Frame
–Prescribed grazing Include the following structural practices and improved technologies: –Upgrade irrigation systems and technologies to improve efficiency. –Filter strips and riparian buffers. –Sediment basins and pump-back systems. –Waste management systems and manure management on animal feeding operations.	

Table 8-5. Idaho State Department of Agriculture implementation tasks for Canyon County.

Action Item	Time Frame
Education and Outreach	
Through the Idaho State Department of Agriculture, Agriculture Ground Water Coordination Committee, complete the following: –Request that University of Idaho fertilizer application guides are reviewed and updated as needed. -Promote education and outreach regarding potential sources of nitrate. –Promote voluntary implementation of best management practices (BMPs).	Ongoing
Work with communities to promote proper fertilizer application in parks, cemeteries, schools, and golf courses.	Ongoing
Work with county commissioners and other local officials to evaluate adequacy of local zoning and land use planning initiatives.	As requested
Water Supply Wells	
Promote assessment to and change homeowner and farmstead activities that have the potential to contaminate drinking water wells.	Ongoing
Livestock Facility Waste Management	
Continue to require nutrient management plans (NMPs) at every licensed dairy and beef cattle feeding operation designated as a confined animal feeding operation (CAFO) (>1,000 head of animals) to help control runoff and infiltration of animal waste.	Ongoing
Identify all beef cattle feeding operations (<1,000 head of animals) that could be considered significant contributors of contaminants to waters of the state and work with the operators to properly manage waste and develop NMPs for their facilities.	Ongoing
Manure Storage and Application	
Continue to aid owners and operators in developing the required manure storage and application procedures in beef and dairy facility NMPs.	Ongoing
Develop information and training for private landowners who accept manure or compost from animal feeding operations for use as fertilizer. Develop the following components: –Identify target audience. –Create informational brochures, flyers, or pamphlets as guidance for proper storage and application methods. –In coordination with the University of Idaho Extension and other interested groups, develop seminar and presentation materials for workshops. –Disseminate information to the target audience through mailings, workshops, or other means, as appropriate.	Ongoing
Monitoring	
Collect samples annually for coliform bacteria and nitrate at licensed dairies.	Ongoing
Every 5 years, monitor dairy wells that have nitrate levels greater than 5 parts per million for nitrogen isotopes.	
Conduct ground water monitoring for pesticides in accordance with the Idaho Pesticide Management Plan and federal Insecticide, Fungicide and Rodenticide Act grant while coordinating with the Idaho Department of Environmental Quality and Idaho Department of Water Resources.	

Table 8-6. Idaho Department of Water Resources implementation tasks for Canyon County.

Action Item	Time Frame
Information and Education	
Work with county commissioners and other local officials to evaluate the adequacy of local zoning and land use planning initiatives if requested.	As requested
Monitoring	
Through the Statewide Ambient Ground Water Quality Monitoring Program, conduct ground water monitoring to better characterize nitrate contamination, determine nitrate concentration trends, and identify the presence of nitrate contamination inside and outside the nitrate priority area boundaries.	Ongoing

Table 8-7. Confined animal feeding operation siting team implementation tasks for Canyon County.

Action Item	Time Frame
The Idaho State Department of Agriculture (as team lead of Idaho's confined animal feeding operation [CAFOs] site advisory team), Idaho Department of Environmental Quality, and Idaho Department of Water Resources will continue to review sites proposed for CAFOs, determine environmental risks, and submit site-suitability determinations to counties.	As requested

Table 8-8. University of Idaho Extension implementation tasks for Canyon County.

Action Item	Time Frame
Information and Education	
Provide education to all fertilizer users through University of Idaho Extension educators, workshops, website, and materials, such as newsletters and factsheets. Information should address proper irrigation and fertilizer application procedures, rates (based on University of Idaho Extension guidance), and timing, with consideration for crop up-take, migration of excess nitrates, and impacts to ground water.	Ongoing
Encourage ongoing outreach and provision of information by the University of Idaho Extension to small acreage operations and part-time agricultural operations (hobby farms).	Ongoing
Distribute University of Idaho Extension publications to homeowners in priority areas through mass mailings or through distribution by local retailers and develop new publications as needed. Educational materials should address fertilizer and pesticide application rates and impacts to ground water.	Ongoing
Promote demonstration projects and disseminate results.	Ongoing

Table 8-9. Municipalities implementation tasks for Canyon County.

Action Item	Time Frame
Ground Water Quality Protection	
"Environmental Quality—Health" (Idaho Code § 39-1) states, "Cities, counties and other political subdivisions of the state shall incorporate the ground water quality protection plan in their programs and are also authorized and encouraged to implement ground water quality protection policies within their respective jurisdictions…" (Idaho Code § 39-126 *https://legislature.idaho.gov/statutesrules/idstat/Title39/T39CH1/SECT39-126/*).	As appropriate
Education and Outreach	
Work with residents, landscape contractors, cemeteries, and schools within jurisdiction to promote proper fertilizer application.	Ongoing
Work with DEQ, ISDA, IDWR, IASCD, ISWC, other agencies, and local governments to gather their input on local zoning, plans, and ordinances.	As needed
Comprehensive Planning	
"Local Land Use Planning" (Idaho Code § 67-65), states "When considering amending, repealing, or adopting a comprehensive plan, the local governing board shall consider the effect the proposed amendment, repeal, or adoption of the comprehensive plan would have on the source, quantity and quality of ground water in the area" (Idaho Code § 67-6537 *https://legislature.idaho.gov/statutesrules/idstat/Title67/T67CH65/*. Review and consider maps of watersheds, aquifer recharge areas, ground water basins, and unique water resource conditions to accurately determine the potential impacts of development on water quality and water resources in areas of interest. Identify existing and potential water pollution sources (landfills; chemical storage sites; abandoned commercial, industrial, and mine properties; and agricultural nonpoint sources) when considering land use changes. Identify appropriate land uses in areas of sensitive water resources.	As appropriate
Ordinance Development	
Develop ordinances that support the comprehensive plan and ground water and drinking water resource protection. Download the Canyon County Comprehensive Plan at *https://www.canyonco.org/elected-officials/commissioners/development-services/growingtogether/*.	As appropriate
Consider a requirement for additional studies to assess impacts to ground water quantity and/or quality due to development activities and changes in land use. View the current Canyon County zoning map at *https://maps.canyonco.org/arcgisportal/apps/webappviewer/index.html?id=9409dd9d0bb3458182165e10609b072f.*	
Planning and Zoning Decisions	
Consider potential impacts to water quality when evaluating land use changes. Use the confined animal feeding operation (CAFO) siting team to review sites proposed for CAFOs and determine environmental risks. Consider the harmful impacts that may occur to ground water resources before approving the following: –Fertilizer manufacturing and/or distribution centers –Commercial endeavors that use large volumes of liquids in aboveground and belowground tanks –Placement and/or expansion of CAFOs or animal feeding operations –Subdivision development; specifically residential densities using individual wells and septic systems	As appropriate

Action Item	Time Frame
Work with the Association of Idaho Cities and Idaho Association of Counties as necessary and appropriate.	Ongoing and as appropriate

Notes: Idaho Department of Environmental Quality (DEQ), Idaho State Department of Agriculture (ISDA), Idaho Department of Water Resources (IDWR), Idaho Association of Soil Conservation Districts (IASCD), and Idaho Soil and Water Conservation Commission (ISWC)

This page intentionally left blank for correct double-sided printing.

9 Drinking Water Source Protection

PWSs can be publicly or privately owned and serve many Idahoans. A PWS is defined as an operation serving at least 25 people or 15 service connections for at least 60 days per year. Many citizens get their drinking water from private wells that are not regulated under the Safe Drinking Water Act. As such, private well owners are responsible for ensuring their water is safe to drink.

Over 95% of Idaho's drinking water comes from ground water. Protecting this resource is largely done through voluntary action where communities develop programs to help prevent drinking water supplies from being contaminated. These programs may involve creating a drinking water protection plan and implementing regulatory and/or nonregulatory management practices. Most human activities at the land surface cause some change in water quality in the aquifer below. Where ground water is the primary source of drinking water, a community should protect the physical area around the wellhead and the areas above which the well pumps water for drinking.

The maps in this section show Canyon County PWSs and their source areas, known as delineations, or the portions of the watershed or subsurface area contributing ground water to wells. Figure 9-1 depicts the delineations for all of Canyon County. Figure 9-2 through Figure 9-5 depict the individual nitrate priority areas in relation to city boundaries and local public water system sources. Figure 9-6 provides a county view of domestic and PWS wellheads. Each well can act as a conduit for ground water contamination. The maps in this section are provided as a reference tool when making land use decisions that may affect ground water and/or drinking water quality in Canyon County.

Preventing ground water contamination requires thoughtful management and cooperation on the part of citizens and the various levels of government. In many cases, land use planning efforts by both city and county governments are the best instruments available for protecting aquifers. If potential contamination sources are prevented from being located over critical recharge areas, the risk of contamination can be greatly reduced.

DEQ sees great potential to protect public health and preserve and protect Idaho's drinking water by providing community leaders a county-wide mapping application that depict drinking water capture zones and delineations. These maps should be considered as land use decisions are made.

For interactive map-based sources of information on ground water quality and for areas where nitrate concentrations potentially degrade drinking water quality, visit *https://mapcase.deq.idaho.gov/gwq/*.

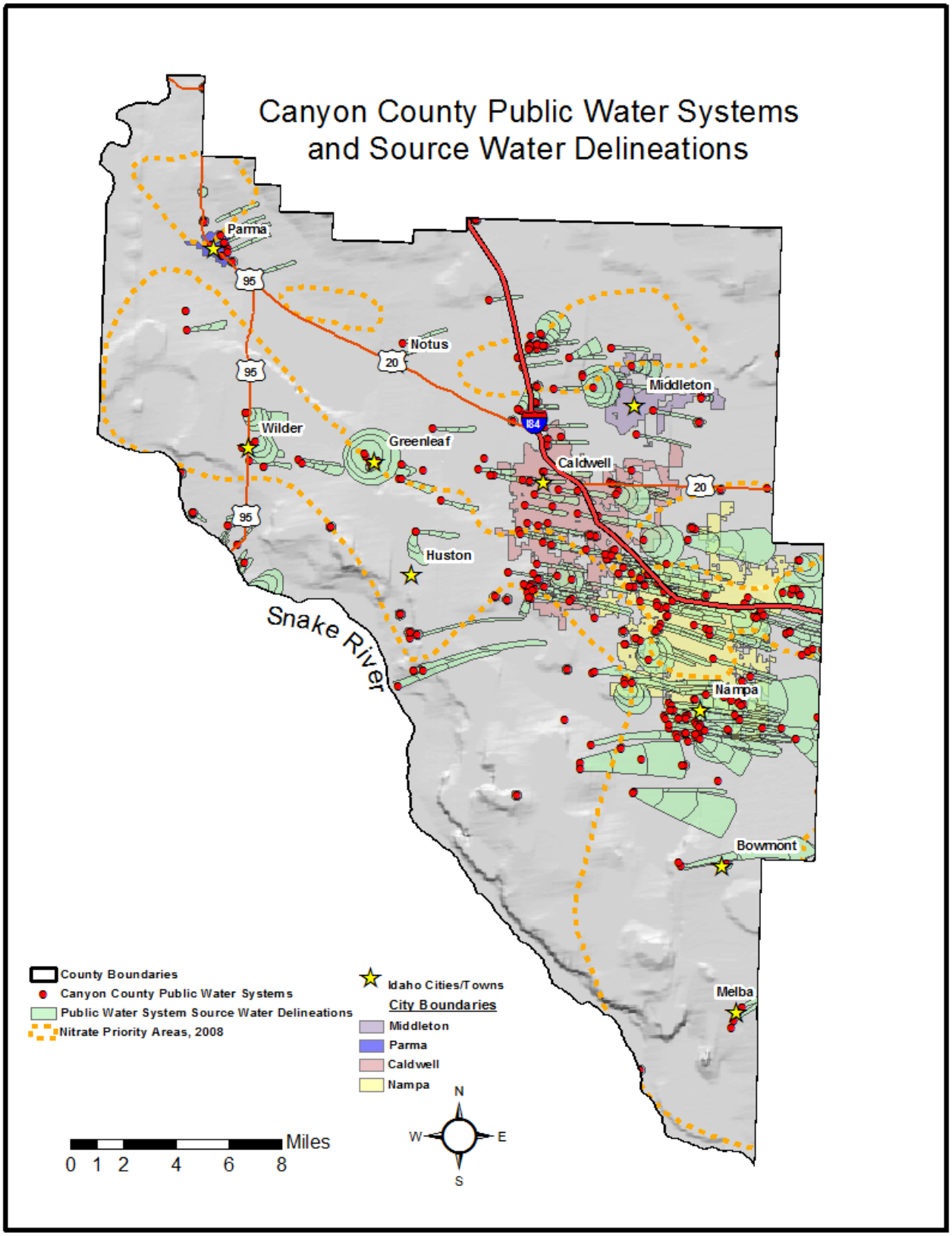


Figure 9-1. Public water system source areas relating to Canyon County.

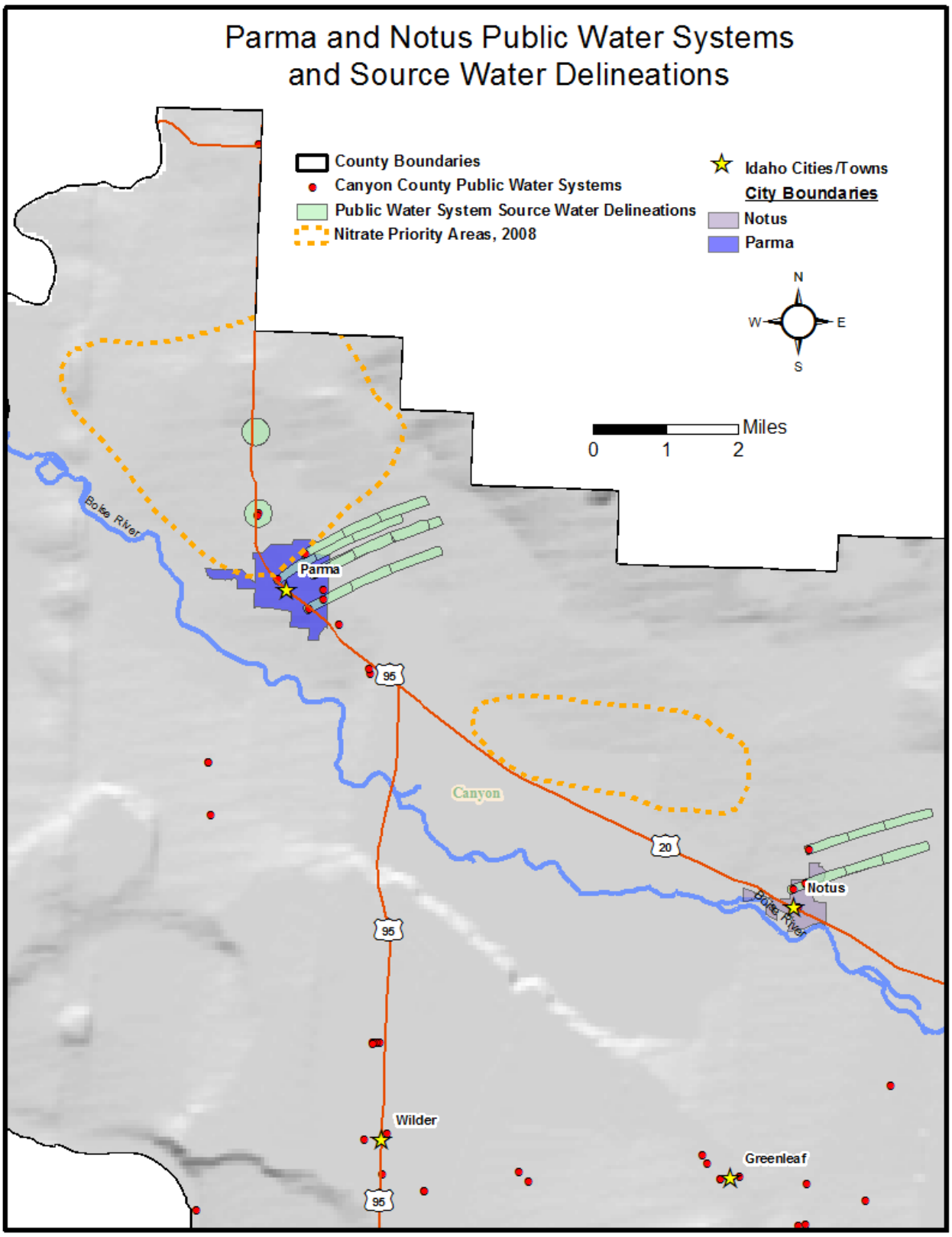


Figure 9-2. Parma and Notus nitrate priority area overlay on public water systems and city boundaries.

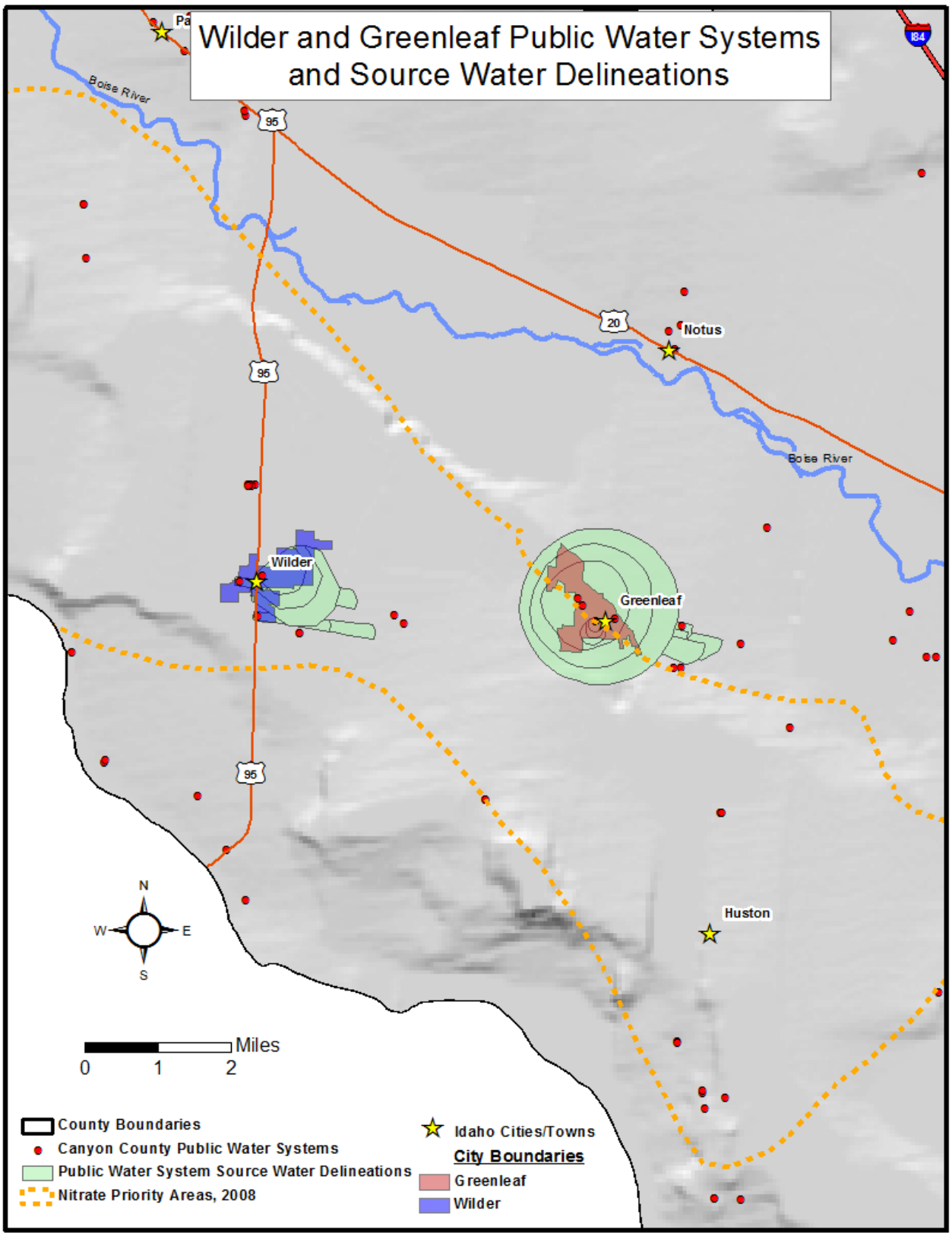


Figure 9-3. Wilder and Greenleaf nitrate priority area overlay on public water systems and city boundaries.

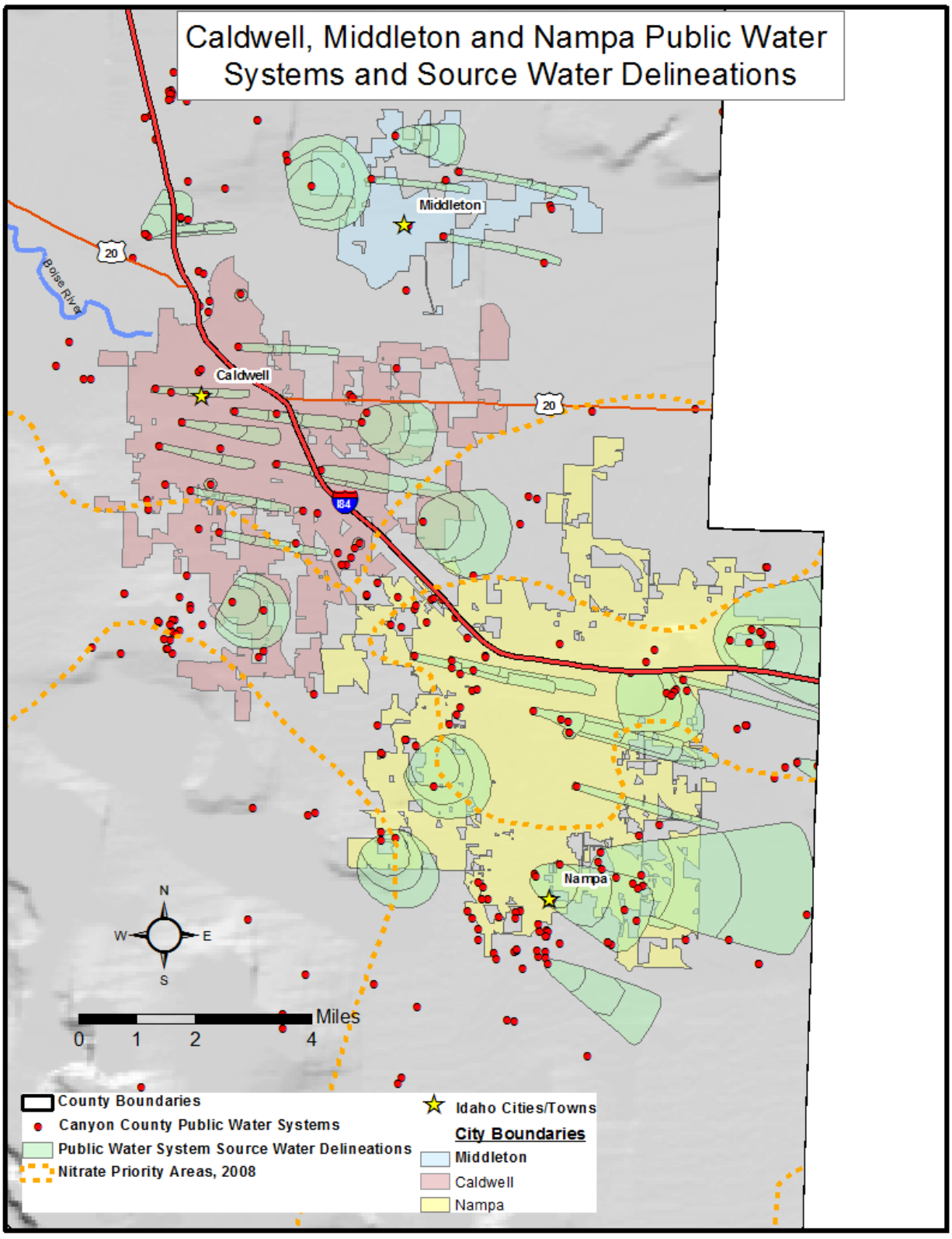


Figure 9-4. Caldwell, Middleton, and Nampa nitrate priority area overlay on public water systems and city boundaries.

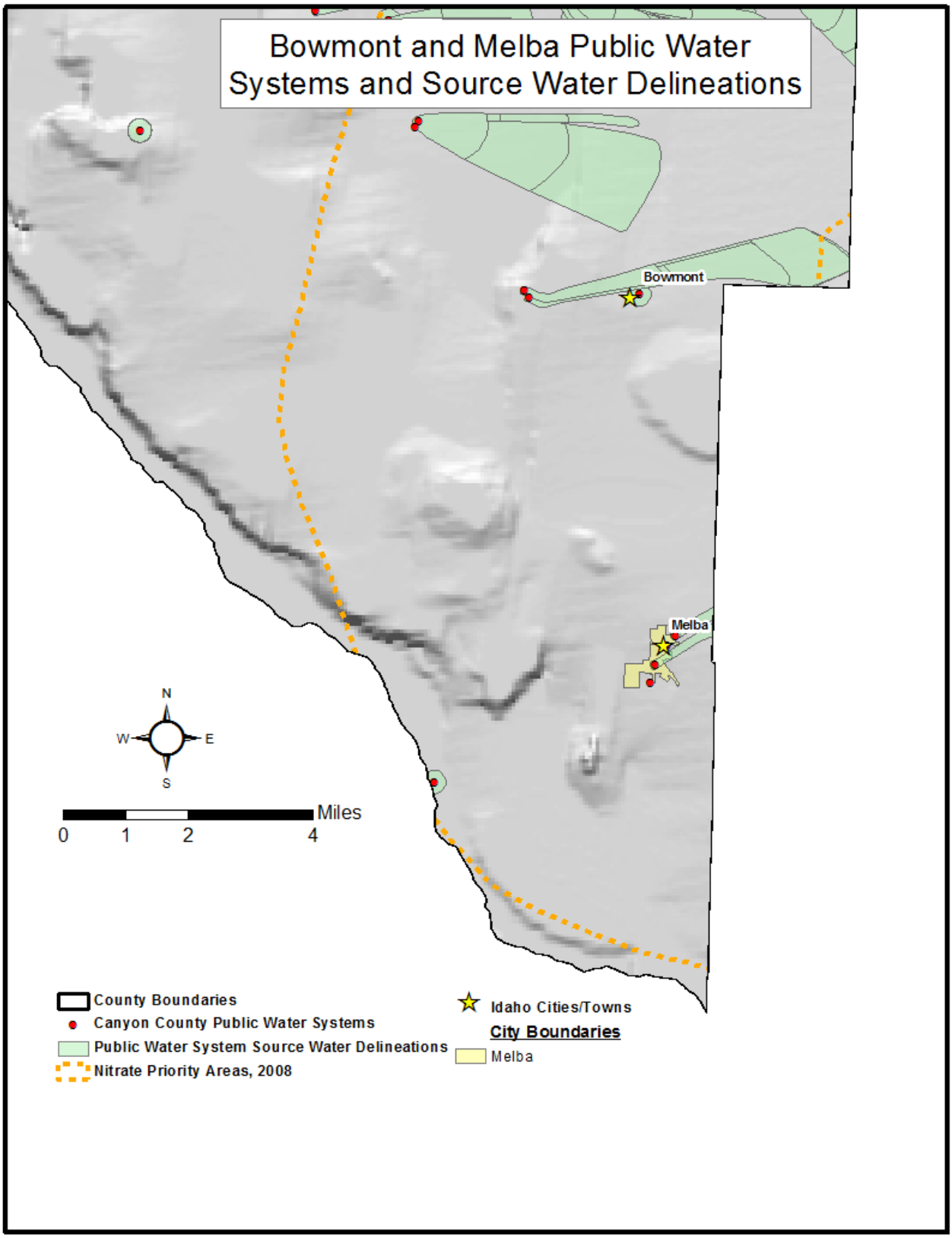


Figure 9-5. Bowmont and Melba nitrate priority area overlay on public water systems and city boundaries.

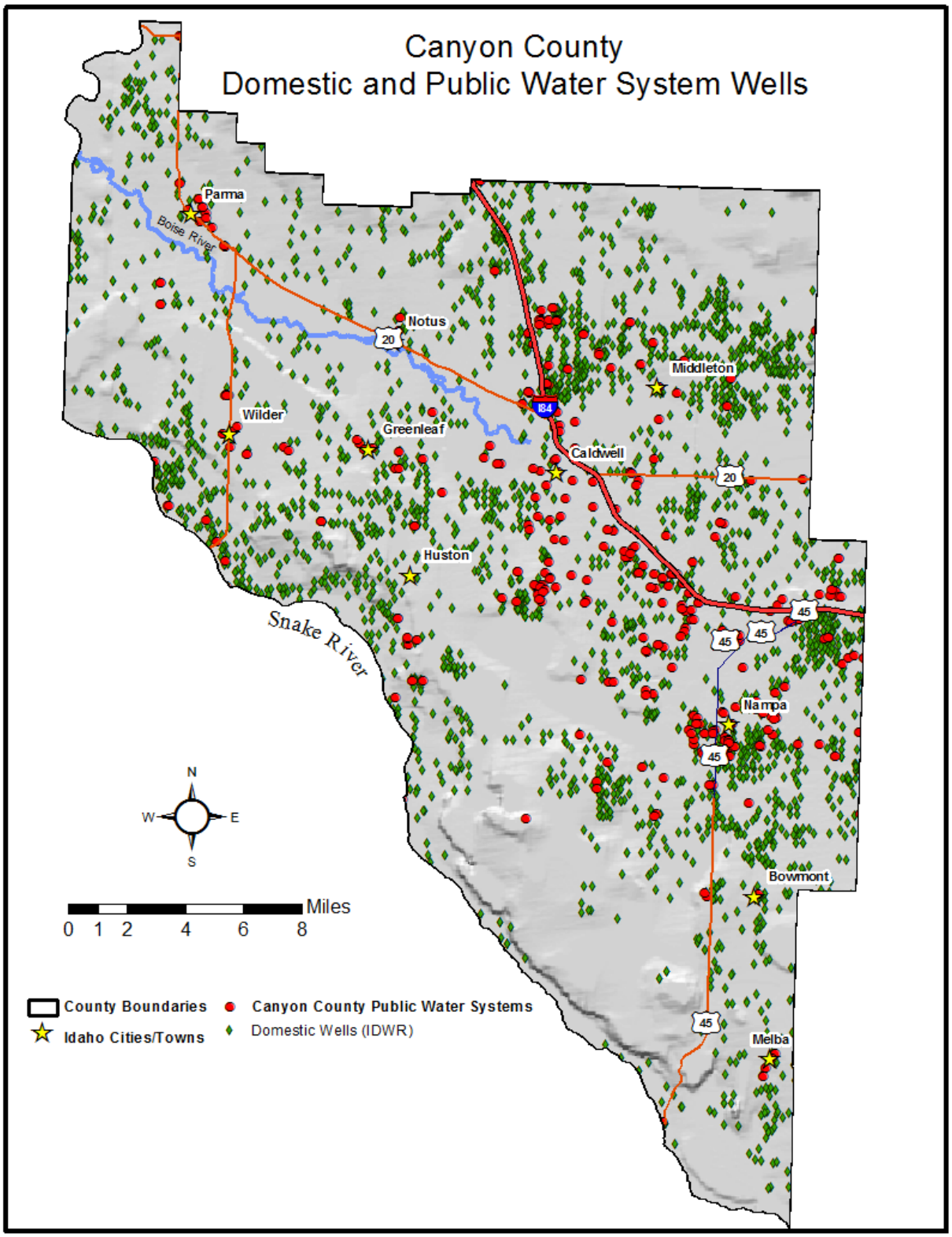


Figure 9-6. Canyon County domestic and public water system wells.

This page intentionally left blank for correct double-sided printing.

10 Surface Water Total Maximum Daily Loads

This section is provided as a resource for making land use decisions to protect surface water quality and to use as supporting documentation for funding requests about projects related to ground water and surface water quality.

Ground water and surface water are interrelated (Figure 10-1). Ground water is surface water (i.e., lakes, rivers, streams, or overland flow) that has percolated into and through the ground to an aquifer (the porous sediment or fractured rock below the water table). Ground water may move back into surface water bodies through seeps, springs, or base flow into a river or lake, depending on the geology of an area.

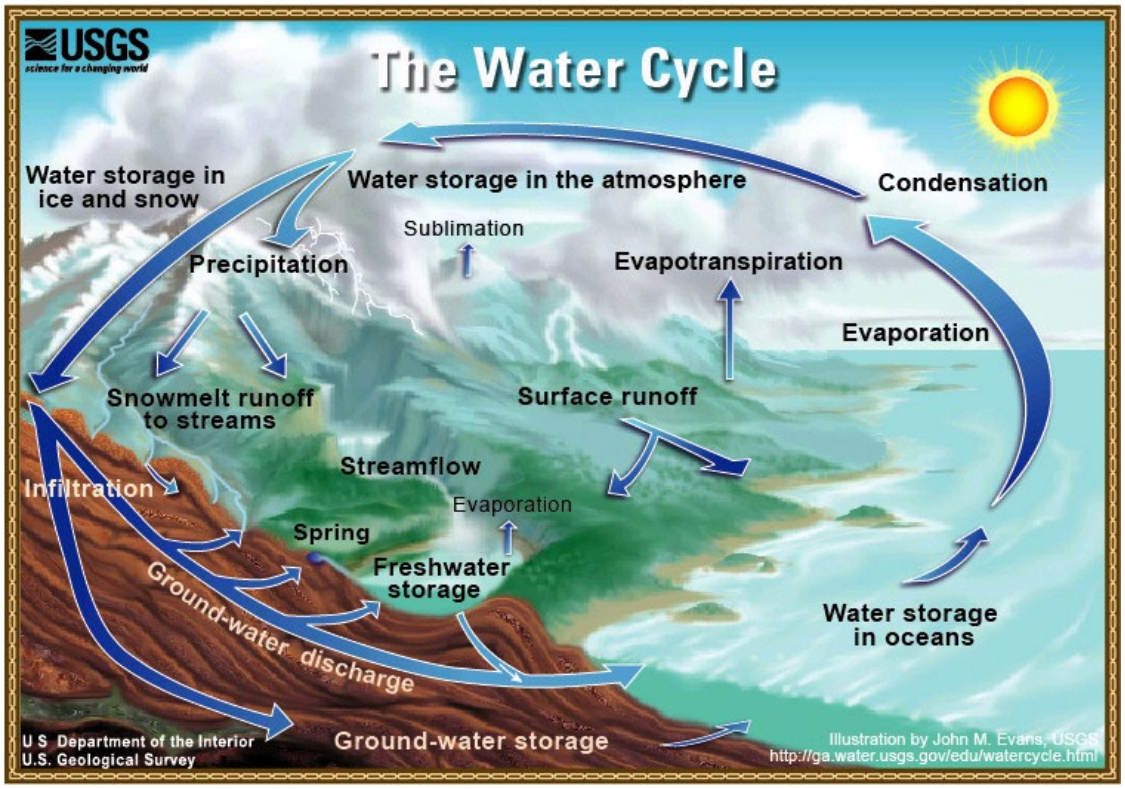


Figure 10-1. Interaction between ground water and surface water.

Many management practices known to protect ground water quality are also used to prevent nonpoint source surface water pollution. Unlike point sources, which are directly related to a specific source or facility, nonpoint sources are generally related to activities taking place at multiple locations throughout a watershed or large-scale activities. Nonpoint source pollution is the cumulative effect of activities such as fertilizer use, pesticide use whether for home or agriculture, oil disposed down storm drains, and various land use practices including urban development, agriculture, mining, and forestry. For these reasons, modifying land use activities can reduce and control nonpoint source pollution. Due to Idaho's rural nature, most water pollution in the state is related to nonpoint sources.

To restore degraded surface waters in the state, Idaho (DEQ specifically) must develop water quality management plans for its various water bodies. These are called subbasin assessments and total maximum daily loads (TMDLs). The TMDL provides a pollution budget written for point and nonpoint sources of pollution for that surface water body. It includes a calculation of the maximum amount of a pollutant a water body can receive from human-caused sources and still meet water quality standards. The pollution budget is expressed in terms of load: the amount of pollutant added to a water body during a given time or per a given volume of water.

There are a number of watersheds (drainage areas) within the county boundary. Each watershed is a basin or subbasin, depending on scale, and each may be subject to a TMDL.

To learn more about the quality of the surface water bodies in Canyon County, Figure 10-2 provides a point of reference.

Information regarding the beneficial use support status and causes of impairment to a surface water can be found using the hydrologic unit code number/name, or water body name.

To see an interactive, map-based source of information on the water quality of lakes, rivers, and streams in Idaho, including the Clean Water Act § 303(d)-listed water bodies, visit *https://mapcase.deq.idaho.gov/wq2020/default.html*.

To see TMDL documents for the impaired waters in Canyon County, visit DEQ's website at *https://www.deq.idaho.gov/water-quality/regional-water-quality-plans-and-reports/*.

An overview of the TMDL process is found at *https://www.deq.idaho.gov/water-quality/surface-water/total-maximum-daily-loads/*.

Written reports for the following TMDLs and subbasins are found on DEQ's website:

Subbasin Name	Hydrologic Unit Code	DEQ Website
Middle Snake	17040115	*Total Maximum Daily Loads* Use the associated subbasin name or number to locate TMDLs, implementation plans and five-year reviews.
Middle Snake Succor	17040103	
Lower Boise	17050114	

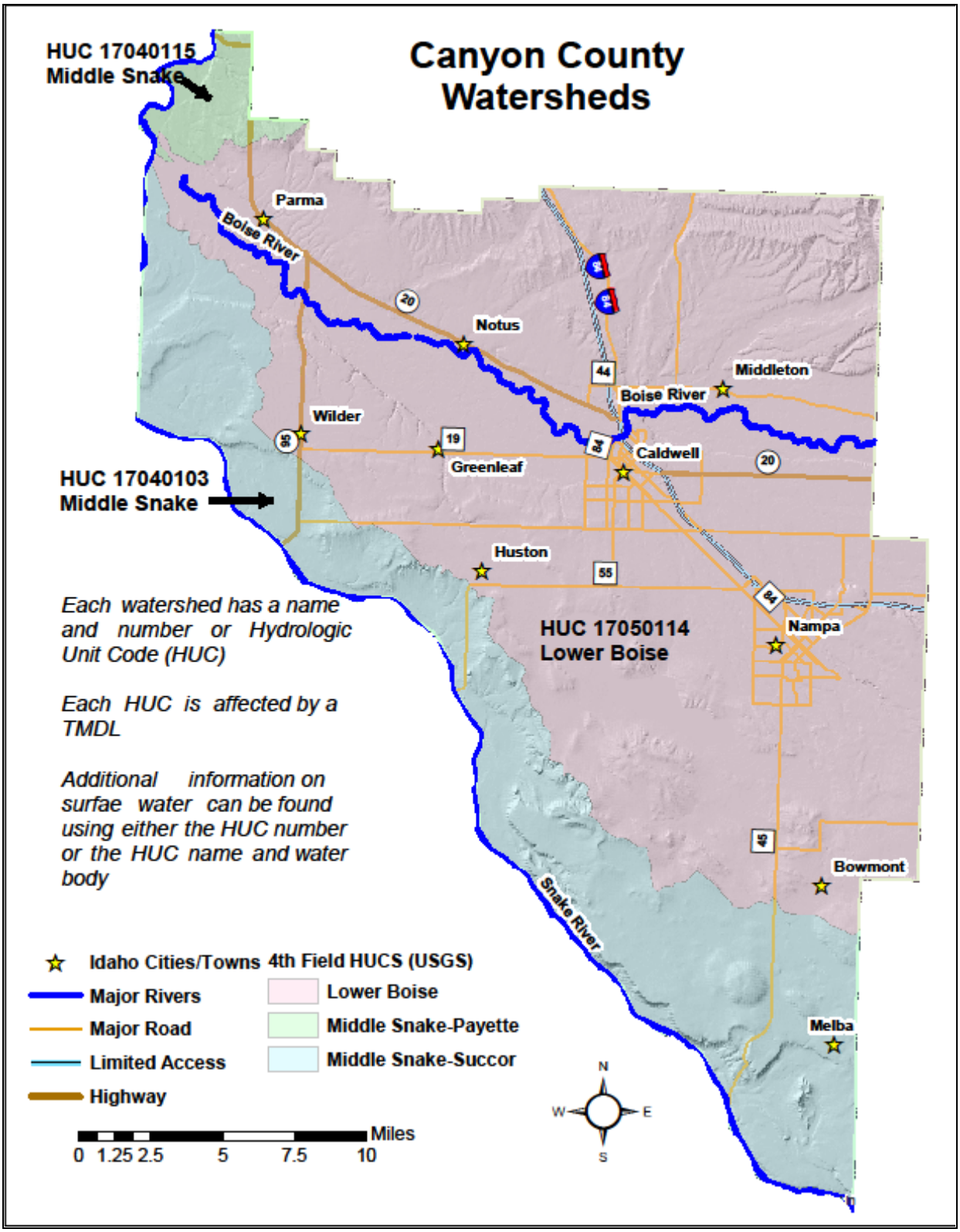


Figure 10-2. Canyon County watersheds.

This page intentionally left blank for correct double-sided printing.

11 Agencies, Directories, and Website Resources

Table 11-1 lists entities that can assist in ground water quality management and/or drinking water protection. Additional information and resources are found in section 11.1.

Table 11-1.Resources and authorities for ground water quality management in Idaho.

Resource	Phone Number and Website
Canyon Soil Conservation District –Nutrient and irrigation water management plans –Grant opportunities –Technical assistance –Restoration and urban conservation	(208) 779-3443 *https://www.canyonsoilconservation.org/*
Idaho Soil and Water Conservation Commission –Technical assistance to owners/operators of private lands for planning, implementing, and evaluating agricultural best management practices –Nutrient and irrigation water management plans	(208) 332-1790 *www.swc.idaho.gov*
Idaho State Department of Agriculture –Beef and dairy animal feeding operations –Confined animal feeding operation (CAFO) siting team –Pesticides	(208) 332-8500 *www.agri.idaho.gov*
Idaho Department of Water Resources –Well construction, permits, underground injection –Water rights –Hydrogeologic studies - CAFO siting team - Environmental Data Management System (EDMS)	(208) 287-4800 *www.idwr.idaho.gov*
Natural Resources Conservation Service Technical assistance to implement conservation practices for erosion control and water quality	(208) 779-3447 *www.id.nrcs.usda.gov/*
Idaho Department of Environmental Quality –Ground water quality –Nutrient-pathogen studies –Public drinking water systems –Source water protection –CAFO siting team –CAFOs for swine, poultry, horses, sheep, mink, and deer –Wastewater permitting, large soil absorption systems, land application	(208) 373-0550 *www.deq.idaho.gov*
Southwest District Health Department –Septic tanks and drainfields –Subdivision sanitary restrictions –Noncommunity drinking water systems –Smaller community drinking water systems –Private well owner assistance with water quality sampling	(208) 455-5400 *https://phd3.idaho.gov/*

Resource	Phone Number and Website
Idaho Water Resources Research Institute Provide research-generated information to water managers, agency research scientists and the public.	(208) 885-2018 *https://www.uidaho.edu/research/entities/iwrri*
Boise Watershed –Project WET partner –Outreach and training materials on water issues for teachers	(208) 608-7300 *https://bee.cityofboise.org/visit/boise-watershed*
University of Idaho Extension—Canyon County –Agricultural research results –Education and outreach for the general public	(208) 459-6003 *http://www.uidaho.edu/extension/canyon*
University of Idaho Department of Animals, Veterinary and Food Sciences Water quality effects on animal health	(208) 885-6345 *https://www.uidaho.edu/cals/animal-veterinary-and-food-sciences*
Idaho Rural Water Training and technical assistance for water and wastewater systems	(208) 343-7001 *https://www.idahoruralwater.com/*
Association of Idaho Cities Ordinance development assistance	(208) 344-8594 *www.idahocities.org*

11.1 Regulatory Directory and Website Resources

The following is not intended as a source of regulatory guidance but is provided to direct readers to proper agencies.

11.1.1 Idaho Department of Environmental Quality

DEQ is responsible for protecting the quality of ground water in Idaho and relies on a combination of programs to protect ground water from pollution, clean up degraded ground water, and monitor and assess ground water quality. DEQ's ground water policy is to maintain and protect the existing high quality of Idaho's ground water and restore degraded ground water, where feasible. DEQ has identified areas, known as NPAs, where ground water quality has been degraded. DEQ conducts *source water assessments* to help PWSs understand potential threats to their public water supplies, and approves and regulates PWSs and wastewater systems. DEQ Ground Water Program staff in the state office can be contacted at (208) 373-0502. Ground Water Program staff in DEQ's Boise Regional Office can be contacted at (208) 373-0550.

See the DEQ web pages listed below for more information:

- *Ground water specific to nitrate contamination*
- *Private, domestic drinking water*
- *Drinking water protection*
- *Source water assessments of public drinking water systems*
- *Source water protection grants* (when available)
- *Operating swine facilities*
- *Nutrient pathogen studies for septic tank effluent evaluations*
- *Design of septic systems*
- *2020 interactive map of § 305(b) Integrated Report*

11.1.2 Idaho State Department of Agriculture

ISDA serves the agriculture industry and consumers through regulatory and service activities. ISDA safeguards the public, plants, animals, and environment through promotion, education, and regulation. ISDA is responsible for dairy and feedlot permitting and monitoring, pesticide management and monitoring, agricultural chemical regulation, and nutrient management. Contact the ISDA staff at (208) 332-8500.

ISDA programs affecting ground water quality are described below:

- The Nutrient Management Program is designed to minimize adverse impacts on surface or ground water. Managing nutrients is a priority to protect agriculture's economic viability and the environment. For more information visit *https://agri.idaho.gov/main/animals/environmental-nutrient-management/*. Reach the ISDA Division of Animal Industries at (208) 332-8540. Additional CAFO information is found at *https://agri.idaho.gov/main/animals/.*
- Authority to regulate siting of CAFOs in Idaho rests with the counties. County ordinances can regulate CAFO zoning and contain environmental protection clauses and rules about waste removal. Counties can request an environmental risk assessment for site suitability. CAFO siting information is available at *https://agri.idaho.gov/main/animals/cattle/cattle-feedlots/*.
- ISDA Dairy & Eggs can be reached at (208) 332-8550. Additional dairy information is found at *https://agri.idaho.gov/main/animals/dairy-bureau/.* Additional egg information is found at *https://agri.idaho.gov/main/animals/avian-species/eggs/.*
- The Agricultural Water Quality Program implements monitoring and protection programs related to pesticides with public and private partners to protect ground and surface water quality. The ISDA Water Quality Program staff can be reached at (208) 332-8597. For more information, visit *https://agri.idaho.gov/main/water-quality-program/.*
- The Division of Agricultural Resources works to promote, direct, and ensure safe agricultural and environmental practices. Through education and enforcement, the division ensures compliance with federal and state rules and laws governing pesticide use in Idaho. Contact the ISDA Agricultural Resources program at (208) 332-8531. For more information, visit *https://agri.idaho.gov/main/56-2/pesticides/.*

11.1.3 Idaho Soil and Water Conservation Commission

ISWC provides support and service to Idaho's 51 soil and water conservation districts, encouraging the wise use and enhancement of soil, water, and related resources. ISWC's responsibilities include the following:

- Administer general funds appropriated by the Idaho Legislature to the districts for implementing resource conservation practices.
- Provide technical assistance personnel to the districts to administer water quality projects.
- Administer the Resource Conservation and Rangeland Development Programs, which provide low interest loans for new conservation projects on private land.

ISWC staff can be contacted at (208) 332-1790. For more information, visit *www.swc.idaho.gov*.

11.1.4 Soil Conservation Districts

Soil conservation districts provide action at the local level to promote the wise and beneficial conservation of natural resources, with emphasis on soil and water. Idaho's soil conservation districts, ISWC, and NRCS have forged a unique local, state, and federal partnership to promote soil conservation. Water quality projects are administered locally by soil and water conservation districts. These projects address nonpoint source water quality problems coming from agricultural activities and encourage voluntary use of BMPs.

Soil conservation district offices and contact information are found at *iascd.org/.*

11.1.5 Southwest District Health

The mission of Idaho's seven Public Health Districts is to prevent disease, disability, and premature death; promote healthy lifestyles; and protect the health and quality of the environment. Central and Southwest District Health Departments are responsible for small public water systems, nonpublic water systems, septic tank and sewage disposal rules for nonmunicipal systems, and approving permits for new and replacement septic systems.

SWDH is responsible for Adams, Canyon, Gem, Payette, Owyhee, and Washington Counties. Additional information is found at *https://phd3.idaho.gov/licensing-permitting/environmental-health-services/.* SWDH's responsibilities are described below:

- SWDH Environmental Health Services regulates subsurface sewage disposal systems in cooperation with DEQ. Developers/homeowners should contact SWDH to discuss applications and permitting requirements for subsurface sewage disposal system. Note that a subsurface sewage permit is usually a prerequisite to obtaining a building permit from the county. Contact SWDH Environmental Health Services at (208) 455-5400. Review the *Septic Systems and Drainfields* brochure for additional information.
- SWDH Environmental Health Services is responsible for maintaining sanitary restrictions in force on all platted subdivisions (*Idaho Code § 50-13*). SWDH may require a nutrient-pathogen study, depending on the location of the subdivision, size of the lots, and density of dwellings. Contact SWDH Environmental Health Services at (208) 455-5400. Additional land development information is found at *https://phd3.idaho.gov/licensing-permitting/septic-land-development/.*
- Owners of private water supplies have the sole responsibility to maintain them and ensure safe potable water. The SWDH's Private Water Program provides education, technical assistance, and water sampling for a nominal fee. Private residents can choose to collect their own water samples as well. SWDH provides guidance on what tests would be beneficial and what the results mean to public health. For more information, contact the SWDH Public Drinking Water Coordinator at (208) 455-5400, or visit *https://healthandwelfare.idaho.gov/Health/EnvironmentalHealth/WellWater/tabid/1128/Default.aspx.*

SWDH has developed the following brochures related to ground water issues:

- *Disinfecting Domestic Wells*
- *Hydrogen Sulfide in Drinking Water*

The Idaho Department of Health and Welfare Environmental Section developed the following brochures related to ground water issues:

- *Nitrate in Your Well Water*
- *Is My Well Water Safe?*
- *Fluoride in Your Well Water*
- *Arsenic in Your Well Water*
- *Iron in Your Well Water*
- *Lead in Your Well Water*
- *Uranium in Your Drinking Water*
- *Pesticides in Your Well Water*

11.1.6 Idaho Department of Water Resources

IDWR serves the people of Idaho by ensuring water is conserved and available to sustain Idaho's economy, ecosystem, and resulting quality of life. IDWR provides a variety of services for the public, such as administering the appropriation and allotment of water resources for the state; licensing drillers and regulating the construction, modification, and abandonment of wells; collecting and serving ground water data; dam safety inspections; and regulating stream channel alterations. Contact the IDWR State Office at (208) 287-4800. The IDWR Western Regional Office, which oversees Canyon County, can be contacted at (208) 334-2190. More information is available on the web pages below.

- Information about the Statewide Groundwater Quality Monitoring Program is found at *https://idwr.idaho.gov/water-data/groundwater-quality/*.
- IDWR administers the Environmental Data Management System (EDMS). Data from EDMS can be viewed on its map viewer (*https://maps.idwr.idaho.gov/agol/groundwaterquality/*) or accessed through a bulk download (*https://data-idwr.opendata.arcgis.com/pages/gis-data#Groundwater*).
- Ground water level data can be viewed at *https://idwr-groundwater-data.idaho.gov/*.
- Information about well construction standards or to apply for a permit for a new well is found at *https://idwr.idaho.gov/wells/*.
- To view a map of wells drilled in Idaho, go to *https://idwr.idaho.gov/wells/find-a-well-map/*.

11.1.7 Natural Resources Conservation Service

NRCS provides technical assistance to farmers, ranchers, and other private landowners, helping them implement conservation practices on their land. Assistance includes providing information on soils, forestry management, pasture and hayland management, erosion control, and water quality. For NRCS field office programs and technical resources, contact (208) 378-5700. NRCS field office contact information by county and conservation district is available at *http://offices.sc.egov.usda.gov/locator/app.*

NRCS programs are generally divided between financial and technical assistance. Access information about NRCS programs at *https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/.* More information on specific programs is given below:

- EQIP is a voluntary conservation program that allows some farmers to receive financial and technical assistance for conservation practices on agricultural land. For more information, visit *https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/.*
- The Conservation Innovation Grants program is voluntary and intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging federal investment in environmental enhancement and protection, in conjunction with agricultural production. For more information, visit *www.id.nrcs.usda.gov/programs/cig/index.html.*
- The Conservation Innovation Grants program is voluntary and intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging federal investment in environmental enhancement and protection, in conjunction with agricultural production. For more information, visit *https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/cig/.*
- The Conservation Reserve Program provides financial and technical assistance to eligible farmers and ranchers to address soil, water, and natural resource concerns. For more information, visit *https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index.*
- The Conservation Technical Assistance Program provides technical assistance supported by science-based technology and tools to help people conserve, maintain, and improve their natural resources. For more information, visit *https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/.*
- Ecological Sciences/Technical Resources for water quality include the following:
  - *Idaho Nutrient Transport Risk Assessment*, a water quality risk assessment tool for conservation planning (2006)
  - *Nitrogen Transport Risk Assessment* (August 2005)
  - Nutrient management
  - *Agronomy*
  - *Idaho soils program technical resources*

11.1.8 University of Idaho Extension

Professionals with the University of Idaho Extension work with Idahoans to address agricultural, natural resource, youth, family, community, and environmental issues. Collaborative relationships with countless agencies, groups, and individuals make a vast array of innovative educational programs available to the state. Extension faculty are joined by several thousand volunteers and dozens of cooperating agencies, organizations, and businesses, both public and private, on local, state, and national levels.

In keeping with the land-grant mission, the University of Idaho Extension, Southern District provides lifelong education and serves the needs of adults and youth in the district. The Southern District encompasses 18 counties of southwestern and south-central Idaho. Agricultural enterprises include farming, ranching, and dairy. Tree fruit, seed, row crops, and forages are the main crops spanning the Boise, Canyon, and Weiser River valleys. Cow-calf operations center in the rangeland areas of Owyhee, Washington, and Adams Counties. Dairies are located primarily in Ada and Canyon Counties. Extension education covers production, management, and marketing of these agricultural commodities, as well as natural resource conservation and

development. Contact the Southern District at (208) 459-6003. A list of extension offices by county is available at *https://www.uidaho.edu/extension/directory/counties*.

Dairy and beef producers can draw on University of Idaho Extension expertise to protect herds and operate more efficiently. The extension provides research-based, local information to help producers protect the environment and manage their animals. More information is found at *https://www.uidaho.edu/cals/animal-veterinary-and-food-sciences.*

The University of Idaho Extension provides timely and local research-based information to help growers control pests, market products, and find new varieties. More information can be obtained at *https://www.extension.uidaho.edu/crops.aspx.*

11.1.9 Project WET at Boise Watershed

As a local partner of Project WET, the Boise Watershed provides educational materials, lesson plans for watershed protection, and teacher workshops to reach children and their parents. More information can be obtained at *https://bee.cityofboise.org/visit/boise-watershed* or *https://www.projectwet.org/*.

11.1.10 General State of Idaho Contacts

For information about other state resources not found in this section, see the state of Idaho's official website at *http://www.accessidaho.org/*.

11.1.11 Idaho Water Resource Research Institute

IWRRI plays an important role in facilitating, participating in, and developing innovative education/outreach programs that provide research-generated information to water managers, agency research scientists, and the public. To learn more about IWRRI, visit *https://www.uidaho.edu/research/entities/iwrri.*

11.1.12 Idaho's Geospatial Data Clearinghouse

Downloadable geographic information systems data allow efficient processing of geospatial data into deliverable data and maps. Idaho's Geospatial Data Clearinghouse is available at *https://gis.idaho.gov/.*

11.1.13 United States Environmental Protection Agency

EPA's MyEnvironment is a search application that allows the user to find environmental data for their area *https://enviro.epa.gov/.*

This page intentionally left blank for correct double-sided printing.

12 Funding Sources

12.1 Funding Integration Tool for Source Water

If you are planning a future Source Water Protection Project, consider using EPA's Funding Integration Tool for Source Water (FITS). FITS is a one-stop-shop explaining how users can integrate various federal funding sources to support activities that protect sources of drinking water. FITS has three sections to help plan your source water protection project.

- ***Source Water Protection Funding*** provides relevant information on major federal funding sources to support activities that protect sources of drinking water. This section includes 11 funding sources/programs, eight from the EPA (e.g., Drinking Water State Revolving Fund, Clean Water State Revolving Fund, Clean Water Act § 319 Nonpoint Source Management Program), and the remainder from other federal agencies (e.g., NRCS, US Forest Service, and Federal Emergency Management Agency).
- ***Planning and Funding Coordination*** covers the steps or components of a source water program. For each step, the tool lays out general information, potential funding sources that may support it, and recommendations for long-term planning and program collaboration. This section identifies planning considerations for future steps of a source water protection program along with tips for users to maximize eligibility for federal funding.
- ***Examples*** provide illustrations of funding sources in action. Examples are geographically diverse and include cross-program collaboration and leveraging multiple funding sources for source water protection goals.

More information is available at *https://www.epa.gov/sourcewaterprotection/fits*.

12.2 Enhancing State and Tribal Programs Initiative

The goal of the Enhancing State and Tribal Programs Initiative is to enhance EPA's delivery of technical and financial support for state and tribal wetlands programs. The overall objective is to accelerate program development on a national scale. More information is available at *https://www.epa.gov/wetlands/what-enhancing-state-and-tribal-programs-initiative*.

12.3 Section 319 (h) Nonpoint Source Grants, United States Environmental Protection Agency/Idaho Department of Environmental Quality

The Nonpoint Source Management program provides financial assistance for implementing BMPs to abate nonpoint source pollution. DEQ manages the nonpoint source program. All projects must demonstrate the applicant's ability to abate nonpoint source pollution through the implementation of BMPs. More information is available on DEQ's *Nonpoint Source Subgrants in Idaho* web page.

12.4 Conservation Technical Assistance, Natural Resources Conservation Service

The NRCS provides conservation technical assistance to private landowners, conservation districts, tribes, and other organizations. Conservation plan preparation and BMP implementation is the main form of technical assistance. Assistance includes interpreting soil, plant, water, and other physical conditions needed to determine the proper BMPs. The Conservation Technical Assistance program provides financial assistance in implementing BMPs described in the conservation plan. More information on NRCS is available at *https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/.*

12.5 Environmental Quality Incentives Program, Natural Resources Conservation Service

EQIP offers technical assistance and cost-share monies to landowners for establishing a 5- to 10-year conservation agreement for activities such as manure management, pest management, and erosion control. The program gives special consideration to contracts in those areas where agricultural improvements will help meet water quality objectives. More information is available at *www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip.*

12.6 Conservation Programs, Natural Resources Conservation Service

NRCS's natural resources conservation programs help people reduce soil erosion, enhance water supplies, improve water quality, increase wildlife habitat, and reduce damage caused by floods and other natural disasters. Public benefits include enhanced natural resources that help sustain agricultural productivity and environmental quality while supporting continued economic development, recreation, and scenic beauty. More information is available at *www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs.*

Programs include but are not limited to the following:

- Conservation Technical Assistance Program and activities
- Environmental Improvement Programs
- Agricultural Management Assistance
- Environmental Quality Incentives Program
- National Water Quality Initiative
- Conservation Innovation Grants
- Wildlife Habitat Incentive Program

More information for programs specific to Idaho is available at *http://www.id.nrcs.usda.gov/programs/.*

12.7 Source Water Protection Grants, Idaho Department of Environmental Quality

DEQ's Source Water Protection Grants provide funding for projects to protect sources of public drinking water. Projects can take either a local or regional approach. Local projects will concentrate on protecting a specific community public water supply system, while regional protection activities will cover multiple systems and communities. Water treatment and water system operations and maintenance are not eligible activities. More information is available on DEQ's *Source Water Protection Grants* web page.

12.8 Resource Conservation and Rangeland Loan Development Program, Idaho Soil and Water Conservation Commission

The Resource Conservation and Rangeland Loan Development Program provides grants for improving rangeland and riparian areas and loans for developing and implementing conservation improvements. More information is available at *https://swc.idaho.gov/conservation-loans-2/*.

12.9 Financial Programs, Idaho Water Resource Board

The Idaho Water Resource Board Financial Program assists local governments, water and homeowner associations, nonprofit water companies, and canal and irrigation companies with funding for water system infrastructure projects. The types of projects that can be funded include public drinking water systems; irrigation systems; drainage or flood control; ground water recharge; and water project engineering, planning, and design. Funds are made available through loans, grants, bonds, and a revolving development account. More information is available at *https://idwr.idaho.gov/IWRB/programs/financial/.*

12.10 Aquifer Protection District, Local Initiative

"Aquifer Protection Districts" (Idaho Code § 39-5) provides a mechanism for counties overlying sensitive resource aquifers to form an aquifer protection district. The purpose of such a district is to protect existing and potential ground water supplies and recharge areas, particularly those areas contributing to public water supplies. An aquifer protection district is created through an election. Once established, the district can raise revenue through fees charged to landowners benefitted by the availability of water from the aquifer protected by the district. This revenue ensures an area can pay for ongoing programs and services needed to protect the aquifer. The revenue can be used as matching funds to receive additional resources. Unfortunately, this legislation would need to be amended to include general resource aquifers before a county could pursue this option.

In 2006, Kootenai County voters approved the formation of the state's first aquifer protection district established to ensure the county can continue to pay for services and programs necessary to prevent the contamination of drinking water. Those services include protecting source water, preventing spills by secondary containment and proper handling of hazardous materials, minimizing septic discharges, managing storm water, monitoring ground water quality, and

conducting education and outreach activities. More information on the Kootenai County Aquifer Protection District is available at *https://www.kcgov.us/336/Aquifer-Protection-Board*.

12.11 Embrace-A-Stream Program, Trout Unlimited

Trout Unlimited provides funding to landowners for small-scale stream restoration projects. These projects have significant involvement from Trout Unlimited volunteers. For more information, see *www.tu.org*.

12.12 Pheasants Forever

Pheasants Forever can provide up to 100% cost-share for projects establishing, maintaining, or enhancing wildlife habitat for pheasant and other upland game. For more information, see *www.pheasantsforever.org.*

13 Planning Tools for Local Governments

The information presented in this section is specific to local government planning for protecting ground water and source water within their jurisdiction.

13.1 Planning Tools

Local governments are encouraged to use the following tools during the planning, zoning, and permitting process to protect and improve ground water and source water in Canyon County.

1. Review *Environmental Planning Tools and Techniques*—This document is useful in protecting ground water by linking land use to water quality.
2. Review *Idaho Land Use Handbook: The Law of Planning, Zoning, and Property Rights in Idaho*—This free handbook is available from Givens Pursley LLP. An email address is required. *https://www.givenspursley.com/assets/publications/handbooks/handbook-landuse.pdf*.
3. Review *Application for Subdivision/Land Development Review* (CDHD)
4. Review *Building Code Adoption Tool Kit 2020* (Association of Idaho Cities)
5. Use the checklists included at the end of this section.
   - The Local Government Checklist for Individual Project Proposals when evaluating land use decisions and approving proposed projects within your jurisdiction.
   - The Local Government Checklist for Addressing Source Water in Comprehensive Plan when reviewing county and municipal comprehensive plans to ensure source water protection has been addressed.
6. Consider using *Compendium of Best Management Practices to Control Polluted Runoff* for projects that may affect ground water.
7. Use American Planning Association (APA) Policy Guides provided at the end of this section.
   - *APA Policy Guide for Water Resources Management*
   - *APA Policy Guide for Solid and Hazardous Waste Management*
   - *Additional APA policy guides*
8. Review the following information and resources provided at the end of this section.
   - *Advice Worth Drinking*
   - *Your Water Your Decision*
9. Use geospatial and interactive mapping tools—There are many sites for downloading and viewing geospatial information. Much of the available and downloadable data about other potential ground water contaminant sources is available through INSIDE Idaho. INSIDE Idaho is the official geospatial data clearinghouse for the state. It serves as a comprehensive geospatial data digital library, providing access to, and a context within which to use, geospatial data and information by, for, and about Idaho.

   INSIDE Idaho and other data providers use a set of services allowing efficient processing of geospatial data into deliverable data and maps.

- These services are based on a number of web service models and protocols including REST, SOAP, KML, and OGC W*S and are broadly supported by a large number of products, including desktop geographic information system.
- These services directly access data and map products without downloading individual data files.

There are a variety of ways to search the available data, but general categories include the following:

- Biota
- Climatology/meteorology/atmosphere
- Elevation
- Farming
- Health
- Inland waters
- Oceans
- Structure
- Boundaries
- Economy
- Environment
- Geoscientific information
- Imagery/base maps/earth cover
- Location
- Society
- Transportation

To get started, visit *www.insideidaho.org/index.html*. This website provides access to DEQ, IDWR, and state agency map products.

Local Government Checklist for Individual Project Proposals

- ☐ Does the project deplete ground water supplies or interfere substantially with ground water recharge so that there would be a net deficit in aquifer volume or a lowering of the local ground water level? For example, would the production rate of preexisting nearby wells drop to a level that would not support existing land uses or planned uses for which permits have been granted?

- ☐ Does the project discharge into the ground water?

- ☐ Does the project discharge any waste material into the ground from septic tanks or other sources, if any (for example: domestic sewage, industrial, agricultural, etc.)?

- ☐ Does the proposed project discharge any waste materials to surface waters?

- ☐ Does the project alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on site or off site?

- ☐ Does the project create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

- ☐ Does the project include measures to reduce or control surface, ground, and runoff water?

This page intentionally left blank for correct double-sided printing.

Local Government Checklist for Addressing Source Water in Comprehensive Plan

Water, General

☐ Make an inventory of water resources

☐ Map watersheds, aquifer recharge areas, ground water basins, unique water resources

☐ Analyze institutional arrangements and responsibilities for water management

☐ Assess adequacy of existing regulations to address water resources

Water Quality

☐ Assess the current and future quality of water resources

- ☐ Perform ground water tests in the vicinity of landfills and hazardous materials dumps, ponds, tanks, and storage areas

☐ Assess the current and future quantity of water resources

- ☐ Analysis of current and future water consumption

☐ Identify existing and potential water pollution sources

- ☐ Inventory hazardous materials dumps, ponds, and storage sites
- ☐ Identify proposed, existing, and abandoned sources of pollution
- ☐ Identify existing nonpoint sources of contaminants
- ☐ Identify existing contaminated sites
- ☐ Identify existing ground water contamination

☐ Assess adequacy of regulations for

- ☐ Use, storage, and disposal of hazardous materials
- ☐ Control of point and nonpoint sources
- ☐ Storm water runoff

Assess Policy Direction Concerning

- ☐ Protection, use, and development of water resources
- ☐ Protection of watersheds and aquifer recharge areas
- ☐ Preservation of wetlands, wild rivers, and watersheds
- ☐ Prevention of contamination
- ☐ Identification of appropriate land uses in areas of sensitive water resources
- ☐ Actions necessary to maintain or improve water quantity and quality to meet projected needs
- ☐ Water conservation (ground and surface) and reuse
- ☐ Drought management and emergency contingency plans
- ☐ Direction for the establishment of local development standards that
    - ☐ Incorporate better site design
    - ☐ Use best management practices for managing impacts on water resources
    - ☐ Address the on-site prevention, retention, and treatment of storm water runoff
- ☐ Financing strategies for needed improvements
- ☐ Private, nongovernment-owned/-operated water systems
- ☐ Implementation of policy direction



Policy Guide on Water Resources Management

Adopted by Chapter Delegate Assembly, April 14, 2002
Ratified by Board of Directors, April 15, 2002
Chicago, IL

Introduction and Findings

Water is a finite resource. Although three-quarters of the earth is covered with water, 97.6 percent our water is salty and 1.9 percent is frozen into the polar ice caps. This means that only about half a percent of our planet's water resources is fresh water. Of these fresh water resources, 0.02 percent is found in rivers, lakes and streams while the rest, 0.48 percent, is ground water. These water resources are used for water supply, ecological, recreational, navigational, and waste disposal purposes and these diverse uses are currently managed under a large number of federal, state and local laws.

The U.S. Geological Survey (USGS) — in its report, *Estimated Use of Water in the United States in 1995* (Circular 1200, 1998) — estimates that the total use of water (both fresh and saline) in the U. S. was around 402,000 mgd in 1995, about 2 percent less than the Survey's 1990 water use estimate and 10 percent less than its 1980 estimate. This decline in water use occurred even though the nation's population increased 16 percent from 1980-95. Much of this water is used for thermoelectric power generation, which had declined from its 1980 peak use of 210,000 mgd to 190,000 mgd in 1995. Industrial water use (29.1 mgd in 1995) also declined 3 percent from 1990-95, a trend the USGS attributes to the more efficient production technologies used by new industries, more industrial water recycling, and changes in pollution laws.

Total irrigation withdrawals (134,000 mgd in 1995) increased from 1965 to 1980, but then gradually declined from 1980 to 1995, dropping two percent from 1990-95. Although the number of irrigated acres (around 58 million) remained fairly constant in the U.S. from 1980-95, irrigated acreage during this period declined in the 19 western states at the same time it increased in the more humid eastern states. On a per-acreage basis, average irrigation water use in 1995 was about 2.1 acre-feet, less than the 2.2 acre-feet average in 1985 and well below the 1975 and 1980 average of 2.5 acre-feet. Irrigation withdrawals vary not only by such factors as the amount of rainfall, energy costs, farm commodity prices, application technologies and conservation practices, but they also vary by region.

The USGS notes that only two water uses showing continual increases from 1950 to 1995 were the "Public Supply" and "Rural Domestic and Livestock" water use categories. Although public supply withdrawals (40.2 mgd in 1995) increased 4 percent from 1990-95, the nation's population increased by 7 percent during this same five year span, so per capita public supply water use actually declined from 184 gpd in 1990 to 179 gpd in 1995 (a trend that the USGS attributes to increased water conservation). The 13 percent increase in rural water use (8.89 mgd in 1995) is attributed to increases in livestock withdrawals; rural (self-supplied) domestic withdrawals were about the same in 1995 as they were in 1990.

It is often difficult to accurately assess and forecast the complex interrelationships between ground and surface water. This means the impacts that development will have on the quantity or quality of one water resource cannot be assessed without also assessing its impacts on all other water resources. For example, increased water demand may force aquifers to be over-pumped, an action that not only leads to the drilling of deeper wells but one that may also impair ground water quality (by increasing dissolved mineral concentrations when water is drawn deeper from the aquifer or by

disrupting ground water flow patterns and inducing saline or polluted surface water or brackish water from another aquifer to flow into the freshwater aquifer). The over-pumping of alluvial or surficial aquifers may also reduce their base flow discharges to surface water bodies, thereby reducing stream flows and also indirectly affecting stream quality (as ambient pollutant concentrations increase).

Both ground and surface water resources can be disrupted by contamination. Pathogens, minerals, and organic and inorganic chemicals polluting the ground water can cause surface water to become polluted and vice versa due to the interconnections between the two. Significant contaminant sources include agricultural chemical use, wastewater discharges from public sewer and on-site wastewater disposal systems, solid and hazardous waste landfills, storage tanks, and industrial materials spills and waste impoundments. Impervious surfaces can not only reduce aquifer recharge but can also increase water pollution and flood hazards by increasing the amount of runoff. Aquifer penetrations — such as injection wells, oil and gas wells, or improperly abandoned wells — may also introduce contaminants directly into an aquifer. Atmospheric deposition of contaminants can also impair water quality. The minimal attenuation and the impracticality of remediation of contaminants in ground water, and the high cost of water treatment make prevention of contamination the only really effective means of protecting aquifers and the most efficient means of protecting surface water resources.

Jurisdictional complexity often makes it difficult to comprehensively manage and protect our water resources. For example, while state and federal environmental protection statutes set water quality standards for surface water and drinking water, other state laws may govern ground and surface water ownership and use, and still other state and local laws might regulate land use activities generating water demand or posing threats to water quality. The needs of non-consumptive instream uses of water — such as the protection of fish and wildlife habitats, the enhancement of recreational activities, the maintenance of navigation, and the need to maintain ambient water quality standards — are more and more coming into direct conflict with the needs of consumptive offstream uses for the same surface water. Large-scale diversions of surface water and excessive pumping of groundwater diminish stream flows, further aggravating intense surface water use conflicts. Greater coordination is clearly needed between the state agencies, between the state and local agencies, and between the local agencies responsible for different aspects of water resources use and management.

Water resources issues need to be integrated better into the comprehensive land use planning process. Urbanization increases runoff from impervious surfaces, causing stormwater flooding and nonpoint source pollution problems. As cities grow larger and water demand starts surpassing the amount of water found locally, people and businesses begin to look further and further from the community to meet their projected water needs — to drill wells in other aquifers, pipe water from large rivers and lakes hundreds of miles to their town, and to augmenting rainfall. As water supplies become even more constrained, even more complicated and expensive schemes to obtain adequate amounts of fresh water may be considered — such as desalination of seawater or brackish aquifers, towing large bladders of fresh water through the ocean to dry port cities, or hauling icebergs to coastal areas. These escalating water supply schemes represent the direct costs to a region of "mining" its water resources at unsustainable rates. But there are also indirect costs, in lost potential for development and in the potential disruption of the existing economic and social order in the receiving areas if they don't have the additional water and in the donating areas from loss of their water resource. Futhermore, dependency upon water resources derived from non-sustainable sources can create long-term economic uncertainty and instability for the dependent communities.

Conservation, each user using less water, is one way to create "new" and perhaps more sustainable sources of water. Water reuse is important. Returning treated effluent to a river where the next town takes out water for its potable supply has been going on for years. Wastewater can be treated and reused for irrigating golf courses, agriculture, parks and gardens, treated and released to surface waters for recreational, navigational, and ecological purposes, or even cleaned to drinking water standards and reused for aquifer recharge or water supply purposes. Similar strategies could also be used to manage stormwater.

Requiring water conservation, as the federal government did when it mandated water-conserving fixtures in the 1992 Energy Policy Act, is one approach to better managing our water resources.

But, other strategies can also be employed — the conjunctive use of both ground and surface water resources, reducing water demand through Smart Growth initiatives and more sustainable land use planning

General Policy

Water should be treated as a collective public resource and managed in a sustainable manner.

1. Water should not be consumed to such an extent so as to:

- interfere with its reasonable use by others;
- impair the ability of a water resource to be naturally replenished;
- impair its ecological, recreational or navigational functions.

2. Water should not be discharged in such a manner so as to:

- interfere with its reasonable use by others;
- create hazardous conditions (e.g., erosion, sedimentation, flooding and subsidence);
- impair its ecological, recreational or navigational functions.

3. Pollution and other manmade threats to water resources should be minimized.

Reason to Support Specific Policy: This general policy is intended to articulate a "Golden Rule" of water resources management. By considering water both a "collective" and " public" resource, APA recognizes that, despite differing state water laws, any private or individual "right" to use water remains only contingent and is therefore always subject to whatever governmental oversight as may be necessary to protect and further the greater general welfare. By requiring that water resources be used "sustainably," APA recognizes that there is a duty to manage water resources in such a way so as not to impair their present and future utility and value. Sound water policy must address the contemporary and long-term needs of humans as well as the ecological community. These management responsibilities, which become an ethical obligation because of the centrality of water to life itself, are expressed in greater detail in the specific policies listed below.

Specific Policies for Water Use

POLICY 1. The American Planning Association and its Chapters support legislation and funding to establish state comprehensive water resource and supply planning (conducted cooperatively with appropriate federal agencies, states, appropriate regional authorities, water utilities, and local governments), based upon watersheds and other natural hydrological boundaries (such as aquifer recharge and discharge areas). Ideally, such water resources planning should be undertaken within the context of comprehensive state planning.

The water resource and supply plans should include at least:

- 20-year projection of water supply needs and service areas based on sound comprehensive planning principles;
- Sources of surface and groundwater supply to meet needs;
- Protection of watershed and evaluation of surface and ground water resource impacts, and actions necessary to maintain or improve water quantity and quality to meet projected needs and to maintain the ecological, recreation, and navigational functions of the water resources;
- Plan for water conservation and reuse, and, as appropriate, drought management and emergency contingency plans;

- A stormwater and flood plain management element addressing the on-site prevention, retention and treatment of stormwater runoff;
- Policies for resource and habitat restoration;
- Environmental impacts and mitigating factors;
- Analysis of existing and required legal and institutional arrangements, and roles and responsibilities of appropriate levels of government in carrying out the plan, including the use of intergovernmental or interstate agreements;
- A land use framework for land located near sensitive water resources; and
- Financing strategies for needed improvements, along with a system for monitoring or evaluating the attainment of plan objectives.

Reason to Support Specific Policy: Responsible water resource use and management requires careful planning. The first policy establishes a planning process that integrates projected water demand and resource characteristics with an impact assessment process, to ensure considerations of longer-term sustainability. This policy sets forth the specific elements of such a planning process that promote a more rigorous governmental consideration of water resource use and interaction. A minimum 20-year planning horizon is proposed to enable capital investments in water-related infrastructure to be recovered through financing mechanisms while ensuring a planning period that would allow for reasonably accurate demographic and other projections affecting water demand. The need for water users to repay bonds for water supply capital improvements or to repay state loans within a time period long enough to stabilize water utility rates suggests the need for longer-range rather than shorter-term water resource management planning. Although some states (e.g., Arizona, under its 1983 Water Use Act) may require that water for urban uses be secured for a century as a pre-condition of assessing water transfers, a 20-year planning horizon allows for more accurate longer-term need projections prior to making infrastructure investments.

POLICY 2. The American Planning Association and its Chapters support legislation to establish requirements for state comprehensive water use permits issued pursuant to policies and criteria set forth in state comprehensive water resources and supply plans. State (and/or regional, in those states where multijurisdictional water districts exist) permit reviews should incorporate thorough environmental and socio-economic review of applications for new or increased use of surface water and ground water resources for consumptive and non-consumptive uses prior to state approval or denial. State (and/or regional) requirements should be made pursuant to a public hearing process that involves all appropriate levels of government and allows public input the decision-making process.

Reason to Support Specific Policy: The withdrawal of waters for public, industrial, agricultural and power generation uses should not be undertaken without a full understanding of the impacts of such withdrawals upon the quantity and quality of ground and surface waters, and without regard to the interests of competing users. This analysis should also address ecological and recreational values of the water resources. State and/or regional overview is essential to the full consideration of the hydrological, ecological and growth impacts of interbasin transfers, downstream quality and quantity impacts of upstream users, and the ground water/surface water interrelationships of withdrawals and diversions. States need to consider comprehensively managing the consumptive use of all of their water resources — ground water as well as surface water withdrawals - through a comprehensive permit system administered at the state or the regional level. The permit process should be designed to maximize public participation to ensure that all interests are represented in water use permit decisions.

POLICY 3. The American Planning Association and Chapters support legislation requiring land use and health regulations for source water protection in order to protect the existing water quality and capacity of aquifers and surface water resources.

Reason to Support Specific Policy: Because of the high costs of water treatment and aquifer remediation, source water protection for drinking water supplies remains a policy priority.

POLICY 4. Water conservation must remain an important water resource and supply plan objective. The American Planning Association and its Chapters support state legislation requiring the metering

and leak detection of all significant private or public community drinking water system service connections as well as all major industrial, commercial or agricultural users to promote and monitor water conservation.

Reason to Support Specific Policy: Water conservation remains an important component of any water supply plan. Metering provides an incentive for users to conserve water and the evaluation of leakage and other unaccounted for flow is essential in promoting and monitoring the success of water conservation efforts. Other measures, such as using reclaimed water or higher-efficiency systems for irrigation or employing drought-resistent or natural landscaping, can also be effective in reducing water use.

POLICY 5. The American Planning Association and its Chapters support appropriate state legislation establishing standards and permits for construction, operation and abandonment of all wells. These standards should be based on the long-term sustainable yield of the water resources.

Reason to Support Specific Policy: Improperly constructed or abandoned wells can provide opportunities for water supply contamination and aquifer interconnection, especially for larger wells (10,000 gpd and larger) used for public water supply, industrial, and irrigation purposes. The impacts of all new major wells and existing wells that are abandoned should be assessed through a permit system requiring preconstruction and post-closure review. Well operation guidelines for major wells, including controls on pumping rates, can also help manage well interference problems and stream baseflow reductions, while backflow valve requirements can protect against ground water contamination by agricultural chemicals. Well permits issued by local permitting officers, boards of health or State environmental agencies should also be required for smaller non-community on-site domestic water supply wells.

POLICY 6. The American Planning Association and its Chapters support legislative action and policy to manage stormwater runoff and its attendant water pollution risks by encouraging appropriate land uses in areas of sensitive water resources, and supporting the establishment of local development standards that incorporate better site design and best management practices for managing impacts on surface- and ground-water resources.

Reason to Support Specific Policy: Approved Nonpoint Source Management Plans establish uniform, state-specific blueprints for the nationwide effort to remediate all nonpoint sources of ground and surface water pollution through state land use-related water quality management programs. Stormwater management remains a priority issue in many urban areas, where runoff and discharges from construction activity, small municipal separate stormwater systems, industrial stormwater systems, and combined sewer overflows threaten surface and ground water quality. Best management practices, many employing land use controls, offer an important strategy for controlling these risks. Stormwater should be considered a water resource instead of a waste product, with natural attenuation, infiltration, and recharge promoted over collection, transport, storage, treatment and discharge. This policy also encourages Smart Growth by promoting land use patterns that minimize the generation of nonpoint source pollution and site planning that utilizes established best management practices to control pollution, especially with respect to stormwater runoff that can be treated on-site.

POLICY 7. The American Planning Association and its Chapters should encourage legislation, with adequate federal funding, to require periodic comprehensive updating of Wastewater Facility Plans, consistent with local comprehensive plans, as a condition for receipt of state revolving loans or grants. APA and its chapters also support proper maintenance and management of individual and community waste water systems. The process for updating facility plans should be coordinated with revisions to community comprehensive plans and the integration of Smart Growth policies to focus new development in those areas served by existing wastewater infrastructure.

Reason to Support Specific Policy: The facility plans in the 1970s are approaching their design years. The current federal rules do not encourage comprehensive updating of these plans, but rather spot changes, often in conjunction with individual development proposals. Local plan consistency should be addressed as a requirement for the receipt of federal funds. Although this policy was initially adopted in APA's earlier Surface Water PIP, this is still an important policy to

promote, especially since some states using revolving loan funds may propose phasing out facility plan requirements in order to reduce their administrative burdens.

POLICY 8. The American Planning Association and its Chapters promote aquatic biodiversity and habitat recovery by supporting programs that reduce hydrological alterations, the deterioration of habitat quality, and the deterioration of water quality. APA and its Chapters should promote regulatory development that emulates the natural hydrologic and ecologic regimes in an increasingly robust fashion, including the restoration of degraded stream reaches and their riparian areas, including associated wetlands.

Reason to Support Specific Policy: Waterways and their riparian areas are critical habitats for a variety of wildlife. Straightening, cementing over and otherwise altering stream channels and wetlands remove the opportunities for biodiversity and also impact important ecological processes that remove pollutants and improve water quality. Health of riparian areas is an important indicator of ecosystem health and consequently of the sustainability of human activities within a watershed.

POLICY 9. The American Planning Association and its Chapters should support federal and state environmental protection agencies in implementing the Total Maximum Daily Load (TMDL) program of the Clean Water Act and the development of baseline, reference TMDLs associated with specific land uses.

Reason to Support Specific Policy: The Total Maximum Daily Load (TMDL) program of the Clean Water Act requires a comprehensive inventory and assessment of impaired waters in order to determine the amounts of pollutants being discharged into a waterway from all potential sources. Without this information, it is impossible to take the next step, which is to devise a plan to allocate the amount of pollutants each source may discharge (through regulations or by market-based mechanisms) and thereby clean up the waterway to the point it meets the fishable and swimmable standard. Watershed plans that support agreements between local entities will be needed in order to achieve regional strategies that truly move towards meeting TMDL compliance.

POLICY 10. The American Planning Association and its Chapters should support legislation to reauthorize and expand federal funding under the Clean Water and Safe Drinking Water Acts for water infrastructure (including funding authorized to support State Revolving Loan Funds) and to reauthorize the Coastal Zone Management Act. These legislative initiatives would provide continuing funding for nationally important water quality, infrastructure and resource protection programs, while addressing the critical issues of controlling nonpoint sources, enhancing coastal resources, and protecting national estuaries and outstanding waters.

Reasons to Support Specific Policy: EPA and the federal government need to maintain and strengthen their partnership with state and local governments in funding water quality improvement and infrastructure programs. State revolving loan funds offer new opportunities to consider state land use and "smart growth" objectives within integrated priority ranking systems by incorporating such considerations into the ranking system in addition to the more traditional public health and environmental criteria. Infrastructure investments can also be tied better to land use by the use of various economic incentives (e.g., lower interest rates or alternative repayment structures) for projects supporting state and regional land use policies. Given the large population growth projected within our coastal areas, supporting the reauthorization of and expanded funding for the Coastal Zone Management Act remains a critical legislative priority for APA and its Chapters.

POLICY 11. The American Planning Association and its Chapters should support legislation establishing interstate or regional compacts to limit drawdowns of shared aquifers and the use of common surface waters. APA and its Chapters and key water policy decision makers should actively encourage states, tribes, and interstate and basin authorities to seek negotiated agreements, ratified by appropriate legislation, to resolve issues regarding water allocations and to develop water resource management systems on an aquifer or watershed basis, to the greatest extent possible.

Reason to Support Specific Policy: Adjudication can be an effective, but complex, lengthy and expensive means of resolving water rights. Adjudications can act to bring parties to the negotiating table, but negotiated settlements are far more likely to result in long-term, constructive

relationships — especially since the U.S. Supreme Court's ruling in *Kansas v. Colorado*, handed down in June 2001, allowed damages to be imposed on a state for violating the Arkansas River compact. In the wake of this decision, federal courts may be more willing to enforce interstate (and, by implication, state/tribal) water agreements and compacts and to both impose and uphold sanctions against entities violating these agreements.

POLICY 12. The American Planning Association and its Chapters support legislation providing opportunities for the integrated management of ground and surface water supplies, and funding for research on strategies for the integrated management, monitoring, and use of surface and groundwater. Whenever possible and appropriate, the planning area of such management programs should be based on natural hydrologic features, such as watersheds and aquifers. APA and its Chapters also support and encourage the development of land use variables within water resource models.

Reasons to Support Specific Policy: There is much we still need to learn about the interrelationships of surface and ground water. Monitoring of these resources is a complex and costly venture, but necessary if we are to assess their status and be alerted to new sources and instances of contamination. APA and its Chapters should support increased funding of federal and state programs that monitor, model, assess, and map our nation's ground and surface water resources.

American Planning Association
Making Great Communities Happen

Policy Guide on Solid and Hazardous Waste Management

Adopted by Chapter Delegate Assembly, April 14, 2002
Ratified by Board of Directors, April 15, 2002
Chicago, IL

Introduction

There will always be waste. The issue is how we manage that waste. Those that cause pollution as a result of improper waste disposal should pay to clean it, but responsible parties often cannot be identified or cannot afford clean-up costs. However, the current waste disposal policy is that the property owner pays. The unintended consequences of this policy are that in some instances it is more expensive to clean up a property than the property is worth, and so it is abandoned. These properties, known as brownfields, with actual or perceived contamination, exist throughout the country. The abandoned or underutilized land is a burden to communities from loss of tax revenue, unused infrastructure and the creation of blight.

Integrated waste management has laid out a hierarchy of techniques with the first one being the most desirable. This hierarchy provides many different strategies for handling waste, including seeing it as a resource. However, in certain cases one or the other may be better. It's important to quantify the options to determine which is best:

- Pollution Prevention
- Reduce/Waste minimization
- Reuse/Use it again
- Recycle/Resource recovery
- Waste to Energy/Incinerate to reduce bulk/sterilize
- Landfill
- Pollution Prevention

Some highly contaminated sites that threaten public health are put on the National Priorities List for clean up by the owner or Environmental Protection Agency, using money from the Superfund for clean up purposes as authorized by the Comprehension Environmental Response Compensation and Liability Act, when the owner or polluter cannot be found.

Siting landfills and other waste handling facilities has become increasingly difficult due to public opposition stemming from real and perceived health risks from waste management facilities such as incinerators, landfills, waste transfer stations, composting yards, or recycling facilities. The "not in my backyard" syndrome arises when efforts are made to designate certain areas for undesirable land use. In addition, some research has shown that to a certain degree, environmental racism exists with hazardous sites being built in close proximity to areas where lower socio-economic classes tend to congregate. The issue of environmental justice becomes an evaluation of who bears the costs of waste disposal and who gets the benefits.

The location of waste management facilities should be part of a comprehensive planning process that includes the opportunity for meaningful public participation and public consensus. The planning process and regulatory process should also address issues of Environmental Justice.

Transporting waste from state to state is protected from state regulation without Congressional authorization under the interstate commerce clause of the constitution. Some states are becoming the dumping grounds for other states because private companies have built large landfills and are actively seeking waste to bring to the sites. Counties that negotiated high royalty fees are making money hosting the sites, which allows them to build new schools and roads, and cut taxes. Local plans and state regulations should govern the siting of waste management facilities. New facilities should be consistent with local land use plans and meet the most rigorous standards to protect the environment. Proposals for large regional facilities should involve all affected communities, evaluate regional impacts, and include regional revenue sharing.

Findings

1. In recent years, financial and environmental costs to dispose of municipal solid waste are beginning to overwhelm North America's local and state governments. Public attitudes about garbage are also changing in response to new information about costs and practices of solid waste disposal. As our disposal sites are filled, new sites become harder to locate and standards for landfill design require modifications in facilities, resulting in disposal becoming more complex, controversial, and expensive.

2. Environmental concerns deal not only in locating new waste management facilities, but also in posing the question of who is at risk of being exposed to the waste.

3. Although federal and state laws distinguish between "non-hazardous" and hazardous waste, the lines between the two categories are sometimes blurred. Household waste may contain hazardous constituents that pose environmental and health impacts if not properly discarded.

4. Medical and nuclear wastes need to be dealt with in a responsible fashion that does not jeopardize human or ecosystem health.

General Policy

The American Planning Association and its Chapters support managing solid wastes (including hazardous and medical wastes) in accordance with the aforementioned hierarchy: reduce, reuse, recycle, waste to energy, incinerate, and landfill.

Reasons to Support Policy: Studies have shown that it is possible to significantly reduce the volumes of both solid and hazardous waste generated by the United States. Likewise, recycling shows promise as a means of reducing the amount of waste that might otherwise have to be disposed of in a landfill. Waste to energy, incineration, and gasification have proven to be effective as part of a larger waste disposal strategy. Land disposal is the least desirable means of managing solid and hazardous waste because the amount of space they require and the dangers associated with them create adverse effects to human and ecosystem health.

Specific Policies

POLICY 1. The American Planning Association and its Chapters support laws requiring: source reduction, the use of biodegradable products and packaging where composting is an established solid waste management method, incentives for the use of reusable products and refillable packaging, and the banning of non-recyclable products and packaging.

Reasons to Support Policy: One way to attack the problem of solid waste is to reduce the amount being thrown away. By requiring the use of refillable or recyclable containers, the amount of waste

being thrown away would be substantially reduced. Product redesign is another approach to fostering waste management/reduction.

POLICY 2. The American Planning Association and its Chapters support laws requiring recycling and reuse of materials in the waste stream through source-separated or co-mingled collection programs, manual or mechanical separation to provide recycling for metals, glass, paper, plastics, and the removal of common hazardous wastes, e.g., batteries, paints, and solvents. Procurement laws that encourage the use of recyclable materials should accompany these laws. In addition to these procurement incentives, there needs to be a re-examination of laws that provide incentives for the utilization of raw, natural materials that may provide a cost savings incentive to the manufacturer making tree cutting for paper fiber use actually cheaper than using collective recyclable paper fibers.

Reasons to Support Policy: We are asking manufacturers and producers to become more responsible for the management of their products at the end of their intended lives. We should expect no less from the consumer, who should be expected to sort waste into aluminum, glass, tin, paper, recyclable plastics, and yard clippings that can be either picked up separately, co-mingled at curbside, or taken to recycling centers in an efficient way to reduce the amount of solid waste going into landfills. Each of these materials can be reused or processed for reuse.

POLICY 3. The American Planning Association and its Chapters support resource recovery programs that produce soil additives, mulch, or compost from yard debris and organic waste.

Reasons to Support Policy: Garden clippings and leaves as well as the organic fraction of household and commercial waste can be composted and used or sold as mulch or soil conditioning humus. Larger branches can be chipped and used as mulch or backyard composting. Both of these actions reduce solid wastes going into landfills.

POLICY 4. The American Planning Association and its Chapters support recycling of contaminated demolition debris, volume reduction by removal of inert or demolition debris containing hazardous material, and use of technologies such as compaction or environmentally safe waste-to-energy.

Reasons to Support Policy: Some material that is put in landfills is bulky and consumes space rapidly, and some material left from construction and demolition sites is considered hazardous. To slow down the filling process, the volume can be reduced by removing the inert debris, compacting the trash first before landfilling or burning it in an incinerator, and the heat used to generate steam for generating electricity or warming buildings. If inert includes asphalt, brick and mortar, concrete and the like, these materials can be ground up and used as aggregate in other applications or as mulch, walkway materials or backfill.

POLICY 5. The American Planning Association and its Chapters support comprehensive education programs on waste minimization, reuse, recycling and resource recovery. Such education programs would involve the media, schools, industry, government, and academia.

Reasons to Support Policy: The saying "out of sight, out of mind" applies to garbage. People are often willing to change their habits if they are shown the consequences of thoughtless acts of improper refuse disposal. Education at all age levels will increase public involvement, so with schools, industry and government interaction as prominent as they are, educational messages can be more easily spread and solutions more clearly defined.

POLICY 6. The American Planning Association and its Chapters recommend that local and state ordinances should be reviewed to increase siting flexibility while ensuring environmental protection and environmental justice. To make siting feasible and predictable, standards by which siting decisions are made should be developed and applied, possibly through a conditional process. New facilities should be consistent with local land use plans based on community consensus and meet the most rigorous standards to protect the environment.

Reasons to Support Policy: As our knowledge increases, local governments will be faced with an increasing array of waste disposal and processing community impacts. Most local plans and

ordinances do not differentiate between types of solid waste management facilities. Because some communities are disproportionately burdened by environmental hazards such as excess air pollution, water pollution, hazardous waste and noise, communities should be empowered to direct their own environmental futures, and states should advocate programs to protect where people live, work, and recreate.

Solutions are increasingly complex and involve private sector time schedules and financing. Siting issues should not be the cause of delays in implementation. See also APA's Policy Guide on Locally Unwanted Land Uses.

POLICY 7. The American Planning Association and its Chapters support interstate and intrastate regional partnerships between governments at all levels to coordinate state, regional, and local planning efforts and to find the best practicable, environmentally safe, and equitable solutions to solid and hazardous waste management problems.

Reasons to Support Policy: Regional approaches can produce cost-effective and consistent plans for managing waste and complying with federal and state laws and regulations. In the absence of multi-jurisdictional alternatives, many communities will be forced to accept waste processing and disposal practices that are expensive and that degrade the environment.

Partnerships are preferred over adversarial relationships. Regional relationships are encouraged from metropolitan areas, as well as interstate areas.

A number of states are beginning to address siting and management issues in statewide solid waste plans that either require or encourage coordination and consistency at each level of government. This type of approach is needed to avoid developer-driven siting decisions without guidance from solid waste planning efforts.

POLICY 8. The American Planning Association and its Chapters support broad public involvement as well as participation by state, regional, and local authorities when siting solid waste management and recycling facilities, and planning for solid waste management. If consensus fails to produce a resolution, then negotiation and arbitration should be used to resolve conflicts.

Reasons to Support Policy: When sitting waste management facilities, involving the public, state, and regional entities can help ensure a timely response. Negotiations will be required if a proper facility is inconsistent with community plans or regulations.

POLICY 9. The American Planning Association and its Chapters support procedures that ensure when landfills are built or expanded in operation, they meet or exceed all existing and, where practical, new standards, and are operated in an environmentally safe way by certified operators.

Reasons to Support Policy: For some materials, such as incinerator ash, there are no other methods of disposal than to landfill it. Landfills need to be constructed in such a manner that they will not cause ground or surface water pollution, air pollution, or create nuisances. A certified operator will ensure that the person in responsible charge is knowledgeable of the laws and regulations concerning waste management.

Federal and state regulations will continue to evolve. Where existing facilities have been in operation for a number of years, they may no longer be "state of the art." While it may not always be practicable, existing facilities should still endeavor to upgrade their air emission control devices, groundwater monitoring programs, and leachate collection systems.

POLICY 10. The American Planning Association and its Chapters support actions that lead to the expansion and stabilization of the economic base for recycling in the local, regional, state, and national economy, including the support for existing and new laws designed to encourage the manufacture and purchase of products made from recycled materials.

Reason to Support Policy: Markets for recycled materials are uneven and tend to be volatile. This should not be interpreted as a restriction on recycling and reuse, but as a challenge to address problems of institutional constraints and artificial barriers such as tax laws that favor use of virgin materials. These barriers should be removed, and economic development planners should aggressively seek out opportunities and companies that can expand the market. For example, economic development incentives can be targeted at companies that use recycled materials in their businesses.

POLICY 11. The American Planning Association and its Chapters encourage the evaluation and use of public/private partnerships where appropriate to manage solid waste.

Reasons to Support Policy: As costs increase and are passed on to the citizens, public sector contracts with the private sector may be more cost-effective and efficient, and some degree of the liability for operations can be shifted with the private sector.

POLICY 12. The American Planning Association and its Chapters support the rapid assessment and cleanup of brownfields with appropriate assurances so that the site may be returned to productive use in the community.

Reasons to Support Policy: Brownfields represent unutilized and underutilized properties that do not make good use of existing infrastructure and location. The sites need to be assessed for the type and severity of contamination and then prepared for reuse by cleaning them to a standard appropriate to their type of reuse. It is important to give owners some type of assurance, either a "no further action" letter or a covenant not to sue, so that the owner starts the use with the knowledge that they may have to cleanup new contamination, but not previous contamination.

POLICY 13. The American Planning Association and its Chapters support the appropriate reuse (parks, open space) of closed landfills after methane gas has been recovered and leachate has been contained or after methane production has subsided, and where public health is not jeopardized by exposure to hazardous materials.

Reasons to Support Policy: While many landfills were built outside of the urban limits, urban development has moved up to and often passed by closed landfills. This area can be put to smart use such as in park or open space development, but the development must not penetrate the landfill cap, so excavation, trees with deep roots, and underground pipes are to be avoided. Landfills continue to produce methane gas as a natural process of decay for about 15 years after a landfill is closed. This gas migrates laterally, and in the right mixture with air, is explosive. Therefore, it is important to either wait until the gas production has subsided before the site is reused, direct ventilation underground, or to actively remove the gas as part of site reuse.

POLICY 14. The American Planning Association and its Chapters urge all agencies siting and reviewing siting of waste management facilities to assess the impact of the facility on the neighborhood and to ensure that waste management facilities are not being disproportionately placed in low income and minority communities. The location of waste management facilities should be part of a comprehensive planning process, which includes the opportunity for meaningful public participation and public consensus.

Reasons to Support Policy: Ethical planners will empower the entire community, including low income and minority populations, to participate in siting waste management facilities and will also look at the total array of waste management facilities and where they are sited when making recommendations for new sites.

APA Planning Advisory Service Reports

- A Guide To Wellhead Protection, No. 457/458 (August 1995)
- Nonpoint Source Pollution: A Handbook for Local Governments, No. 476 (Dec. 1997)
- Green Infrastructure: A Landscape Approach, No. 571 (January 2013)
- Planning and Drought, No. 574 (2013)

Mapping & Data for Land Use Planning

- **National Association of Counties:** Issue brief with case studies, Using GIS Tools to Link Land Use Decisions to Water Resource Protection. cdm16658.contentdm.oclc.org/cdm/ref/collection/p267501ccp2/id/2013
- **USGS Water Resources Maps and Data:** Comprehensive national database of water resource maps and data (GIS) available for download. water.usgs.gov/maps.html
- **General Resources:** EPA Ground Water and Drinking Water: https://www.epa.gov/ground-water-and-drinking-water
- **Case Studies:** Town of Capital Heights Green Streets Master Plan
- **DWMAPS (Drinking Water Mapping Application to Protect Source Waters):** Mapping application for potential sources of contamination to drinking water.
- **EPA WATERS:** EPA mapping application providing access to numerous GIS water datasets water.epa.gov/scitech/datait/tools/waters/services/mapping_services.cfm. EPA WATERS in Google Earth: water.epa.gov/scitech/datait/tools/waters/tools/waters_kmz.cfm.
- **EPA BASINS (Better Assessment Science Integrating Point & Non-point Sources):** GIS-based environmental analysis system that assists in watershed management and TMDL development. water.epa.gov/scitech/datait/models/basins/index.cfm

Who we are

The SOURCE WATER COLLABORATIVE is a coalition of 27 national organizations united to protect the lakes, rivers and aquifers supplying America's drinking water. **www.sourcewatercollaborative.org/about**

Advice Worth Drinking

YOUR WATER. YOUR DECISION.

How today's land-use decisions can protect tomorrow's water supply

A PLANNER'S GUIDE



sourcewater COLLABORATIVE

MAY 2017

Putting drinking water into the planning process

Every day, land use decisions affect future drinking water supplies – either intentionally or inadvertently. You can integrate source water protection into your regular planning activities, from visioning to zoning, to provide sustainable sources of drinking water. This guide reviews options localities are using to protect drinking water.

STRATEGIC POINT OF INTERVENTION	A SAMPLING OF OPTIONS TO PROTECT YOUR DRINKING WATER SUPPLY
LONG RANGE VISIONING Goal-setting exercises (> 20-year outlook)	• Include ground and surface water experts and water utilities in visioning exercises. • Include Source Water Assessments and water budget data in all build-out or alternative scenario analysis. • Link source water protection objectives to other long-range goals, such as land conservation, forest management, habitat protection, compact development, stormwater and watershed management, water/waste water utility planning, and nonpoint source pollution reduction.
PLAN MAKING (a) Comprehensive (master or general) plans, (b) Sub-area plans (neighborhood plans, corridor plans, downtown plans, etc.), (c) Functional plans (stormwater plans, waste water management, water plans, open space plans, etc.)	• Include a critical and sensitive areas element with a strong source water component in the comprehensive plan (using up-to-date data about point and nonpoint threats). • Include maps and narrative describing the physical properties of aquifer and wellhead protection areas (ground water contour, cones of depression, surface water contributors) as well as surface water resources important for current and future drinking water sources. Contact your water utility to get information on your Source Water Protection Area. • Preserve natural features and land-use elements that protect surface and ground water. • Develop stormwater management plans that keep pollutants out of drinking water sources. • Consider including source water impacts in open space planning. * SEE CASE STUDIES ON INSERT
REGULATIONS/INCENTIVES Carrots and sticks to implement plans (zoning ordinances, subdivision regulations, urban area boundaries, transfer of development rights, other incentives)	• Adopt ordinances and regulations such as wellhead protection overlay zones, riparian buffers, stormwater management ordinances, underground storage tank safety regulations, land-use controls in flood plains, and nitrate loading regulations. • Encourage compact settlement patterns by allowing increased density and in-fill around existing urban areas, allowing or requiring cluster development, and adopting programs for transfer of development rights. • Use non-regulatory tools to spur smart growth such as permit streamlining, tax incentives, developer incentives, density bonuses, technical assistance, and the use of public-private partnerships for implementing best stormwater management practices. * SEE CASE STUDIES ON INSERT
DEVELOPMENT PROJECT REVIEW Review and approval of all aspects of the built environment being proposed (residential subdivisions, mixed use developments, commercial and industrial developments, transportation facilities, utilities, etc.)	• Require applicants for development projects to submit appropriate information on drinking water sources as part of their initial application submission. • Refer submitted plans to source water experts as part of the plan review process and include these experts in technical review committees. • Require source water protection measures to be incorporated into plans by private developers as a condition of approval. • Promote Low Impact Development practices that minimize impervious surfaces and runoff, and increase on-site recharge.
PUBLIC INVESTMENT Capital projects undertaken by towns, cities, counties, states, and the federal government	• Make sure that public investments in a capital improvements program adopted by a town, city, or county do not include measures that threaten source water supplies. • Be sure that the design and location of public investments such as roads, transit, buildings, and other public structures and facilities are sensitive to source water issues. • Pass bond issues to acquire fee and less-than-fee interest in land conservation and green infrastructure impacting drinking water. Green infrastructure can lower the cost of treating drinking water for your community (learn more at www.wri.org/publication/natural-infrastructure). • Use land acquisition, stormwater retrofits, and other restoration projects to protect source water. Water suppliers, land trusts, and others can help you implement these measures.

Where To Find Out More

Get information about protecting sources of drinking water and link to influential organizations. Source Water Collaborative, **www.sourcewatercollaborative.org**

A Planner's Guide: How today's land-use decisions can protect tomorrow's water supply. Source Water Collaborative, **www.sourcewatercollaborative.org/guide-for-land-use-planners/**

Resource for source water assessments and other protection tools. Source Water Collaborative, **www.sourcewatercollaborative.org/assess-protect-drinking-water-sources/**

Information on low impact development techniques and strategic planning, **www.lowimpactdevelopment.org**

GIS Tools for land use decisions: **http://cdm16658.contentdm.oclc.org/cdm/ref/collection/p267501ccp2/id/2013**

Information for local officials on land use and natural resource protection: Nonpoint Education for Municipal Officials (NEMO), **www.nemo.uconn.edu**

A Source Water Protection Tool for Municipal Officials. New England Interstate Water Pollution Control Commission, **www.neiwpcc.org/sourcewateroutreach**

Assistance on planning for and financing land conservation. The Trust for Public Land, **www.tpl.org/conservation-finance-handbook**

sourcewater COLLABORATIVE

American Planning Association • American Water Works Association • Association of Clean Water Administrators • Association of Metropolitan Water Agencies • Association of State and Territorial Health Officials • Association of State Drinking Water Administrators • Clean Water Action • Environmental Finance Center Network • Groundwater Foundation • Ground Water Protection Council • National Association of Conservation Districts • National Association of Counties • National Environmental Services Center • National Ground Water Association • National Rural Water Association • North American Lake Management Society • River Network • Rural Community Assistance Partnership • Smart Growth America • The Trust for Public Land • U.S. Department of Agriculture/ Farm Service Agency • U.S. Department of Agriculture/ Forest Service, Northeastern Area • U.S. Department of Agriculture/ Natural Resources Conservation Service • U.S. Environmental Protection Agency • U.S. Geological Survey • Water Systems Council

March 2016

Your Water. Your Decision.



A quick guide for community leaders committed to safe drinking water.

www.SourceWaterCollaborative.org

March 2016

Your water. **Your decision.**

How you govern can determine what you drink. Consider your community's efforts in these key areas: development patterns, pricing options, and stewardship. Then get the details you need for action from the SWC website.



Development Patterns

Planning land use at the watershed level protects sources of drinking water by conserving and protecting land where development would harm source water. Consider promoting development in already developed areas or in less environmentally sensitive areas. Consider:

More green space. Preserving open space helps protect drinking water sources, especially contiguous areas such as stream corridors, wetlands and recharge areas. Redevelopment and compact development can help preserve critical open space.

More natural vegetation. Preserving natural vegetation - especially within green space areas and along rivers and lakes - lowers pollution. Planting new trees and vegetation also reduces runoff.

Less pavement. Reducing impervious surfaces, such as pavement and concrete, through pervious paving materials, narrower streets, and parking decks, decreases runoff and recharges the ground water supply. Development guidelines or incentives to promote green infrastructure can help.

Up-to-date local policies. Comprehensive plans, open space plans, low-impact development requirements, building permits and zoning tools can encourage development that protects drinking water supplies.

March 2016

Budget & Pricing

A community can help avoid over-use of valuable water resources and pollution by setting water, sewer, and septic utility rates to reflect the true costs of safe drinking water. Such full-cost pricing can consider lifecycle costs, environmental protection, and future investments to put safe and clean water policies on a more sustainable long term footing. Here's how it can happen:

Budget your water. Forecast the quantity and quality of drinking water you will be needing in a generation or more, and then budget the costs of protecting and treating the water sources you will be tapping and plan for how this limited resource might be protected and extended.

Recover your costs. When setting water, sewer, and septic utility rates, localities can think beyond the costs of pipes and chemical processes to include such expenses as securing and protecting future sources of tap water and system maintenence.

Determine lifecycle costs. Consider all the costs of water and wastewater treatment (including the delivery and collection systems, operation, and management), not just the initial investment. This will help you gauge the true cost of development.

Stewardship

A local government's own actions can set the tone for source water protection. Here are steps some communities have taken:

Efficient infrastructure. Roads, water and sewer systems, and other public infrastructure can be designed and maintained to reduce runoff, pollution, and water loss.

Think regionally. Drinking water sources don't stop at political boundaries. Partnering with neighboring communities can help ensure your water sources stay clean and abundant.

Expand monitoring. Checking stream and ground water quality can give communities meaningful information about the state of their drinking water supply.

Behavior change. Some communities adjust services and reach out to citizens to influence individual behaviors that collectively have an impact on water use.

Be a role model. Local governments can demonstrate commitment to source water protection through actions such as recycling vehicle wash water, using alternative road treatments that reduce pollution, and supporting community household hazardous waste collection.

March 2016

14 Public Information and Outreach Materials

The brochures listed below and provided in this section involve ground water quality and are designed for the general public. The developing agency for each brochure is included, along with the website address for the brochure, if available.

- *Arsenic in Your Well Water* (Idaho Department of Health and Welfare)
- *Bacteria in Your Well Water* (CDHD)
- *Basic Information: Fluoride in Drinking Water* (DEQ)
- *Disinfecting Your Well* (SWDH)
- *Fertilizer and Pesticide Use at Home* (DEQ)
- *Homeowner's Guide to Septic Systems* (DEQ)
- *Homeowner's Guide to Septic Systems (*EPA*)*
- *Hydrogen Sulfide in Drinking Water* (SWDH)
- *Is My Well Water Safe?* (Idaho Department of Health and Welfare)
- *Idaho Private Well Owner Brochure* (Idaho Department of Health and Welfare)
- *Iron in Your Well Water* (Idaho Department of Health and Welfare)
- *It will Never be this Obvious* (Idaho Department of Health and Welfare)
- *Laboratories certified for drinking water analyses* (Idaho Department of Health and Welfare)
- *Lead in Your Drinking Water* (CDHD*)*
- *Manganese in Drinking Water* (Idaho Department of Health and Welfare)
- *Nitrate in Idaho's Ground Water* (DEQ)
- *Nitrate in Your Well Water* (Idaho Department of Health and Welfare)
- *Pesticides in Your Well Water* (CDHD)
- *How Your Septic System Works* (EPA)
- *Septic Systems and Drainfields: What You Need to Know* (DEQ)
- *Septic and Land Development (SWDH)*
- *Subsurface Sewage Disposal Application* (SWDH)
- *Uranium in Your Well Water* (CDHD)
- *Well Maintenance Log* (Idaho Department of Health and Welfare)

This page intentionally left blank for correct double-sided printing.

HEALTH DISTRICT CONTACT INFORMATION

Panhandle Health District
208-415-5200
www.phd1.idaho.gov
(serving Benewah, Bonner, Boundary, Kootenai and Shoshone counties)

Public Health - North Central District
208-799-3100
www.idahopublichealth.com
(serving Clearwater, Idaho, Latah, Lewis, and Nez Perce counties)

Southwest District Health
208-455-5400
www.swdh.org
(serving Adams, Canyon, Gem, Owyhee, Payette and Washington counties)

Central District Health Department
208-375-5211
www.cdhd.idaho.gov
(serving Ada, Boise, Elmore and Valley counties)

South Central Public Health District
208-737-5900
www.phd5.idaho.gov
(serving Blaine, Camas, Cassia, Gooding, Jerome, Lincoln, Minidoka, and Twin Falls counties)

Southeastern Idaho Public Health
208-233-9080
www.siphidaho.org
(serving Bannock, Bear Lake, Bingham, Butte, Caribou, Franklin, Oneida, and Power counties)

Eastern Idaho Public Health District
208-522-0310
www.eiph.idaho.gov
(serving Bonneville, Clark, Custer, Fremont, Jefferson, Lemhi, Madison, and Teton counties)

IDAHO DEPARTMENT OF WATER RESOURCES

Licensed Well Drillers
research.idwr.idaho.gov/apps/wellconstruction/Licwelldrillers/

Ground Water Protection Section
Boise: 208-287-4800
www.idwr.idaho.gov

Northern Region, Coeur d'Alene: 208-762-2800
Eastern Region, Idaho Falls: 208-525-7161
Southern Region, Twin Falls: 208-736-3033
Western Region, Boise: 208-334-2190

IDAHO DEPARTMENT OF AGRICULTURE

Water Program
Boise Office 208-332-8597
www.agri.state.id.us

IDAHO DEPARTMENT OF HEALTH & WELFARE

Bureau of Community and Environmental Health
1-800-445-8647
environmentalhealth.dhw.idaho.gov
bceh@dhw.idaho.gov

Idaho Bureau of Laboratories
208-334-2235
www.statelab.idaho.gov
statelab@dhw.idaho.gov

IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

208-373-0502
www.deq.idaho.gov

NSF INTERNATIONAL

Consumer Hotline 1-800-673-8010
www.nsf.org

This publication was supported by the Grant or Cooperative Agreement Number, 1 NU61TS000286-01-00, funded by the Centers for Disease Control and Prevention. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention or the Department of Health and Human Services.

March 2018

ARSENIC IN YOUR WELL WATER

Tips to Protect Your Well Water



IDAHO DEPARTMENT OF HEALTH & WELFARE
DIVISION OF PUBLIC HEALTH

Private wells can provide a clean, safe source of water if they are properly located, built, and maintained. However, naturally occurring contaminants such as arsenic, fluoride, and uranium in the rocks and soil near your well can contaminate the well water. As a private well owner, it is your responsibility to make sure that your water is safe to use by testing for contaminants. This brochure provides information on arsenic and helps you understand the possible health effects of drinking arsenic contaminated water.

WHAT IS ARSENIC?

Arsenic is a naturally-occurring semimetal found in the environment. You can't taste or smell arsenic. It can enter well water from natural deposits or from agricultural and industrial sources.

Arsenic in water may be in two forms: arsenic 3 or arsenic 5. Arsenic 3 is more toxic and is more difficult to remove from water.

WHAT ARE THE HEALTH CONCERNS?

Arsenic is known to cause cancer. Drinking water with high levels of arsenic over a long period of time may cause lung cancer, bladder cancer, skin cancer, and liver cancer.

People can also experience non-cancer health effects from drinking water with arsenic. The possible health effects of arsenic vary depending on the person, level of exposure, and amount of time exposed. Health effects may include:

- Upset stomach.
- A feeling of 'pins and needles' in the hands and feet.
- Darkening of the skin and the appearance of corns or warts on the body.

HOW CAN I REMOVE ARSENIC FROM MY WATER?

Arsenic levels at 0.01 milligrams per liter of water (mg/L) or higher should be removed from your water as soon as possible. If your total arsenic test result is higher than 0.01 mg/L, ask the lab to determine the level of arsenic 3.The amount and type of arsenic in your water will determine the type of treatment you should use.

NSF International certified treatment devices such as reverse osmosis, distillation, and carbon block filters can be used for removing arsenic. To decide the best method of removing arsenic from your water call the NSF International Consumer Hotline at 1-800-673-8010. Until you can install a treatment device, the EPA recommends using another source of water, such as bottled water, for drinking and cooking.

Note: Boiling water will not remove arsenic.

TESTING FREQUENCY AND TREATMENT

Contaminant	When to Test	When to Treat
Arsenic	Once every 3 to 5 years	If 0.01 mg/L or higher

WHAT CAN I DO TO MAINTAIN MY WATER SYSTEM?

If you install a treatment device, follow the manufacturer's suggested maintenance schedule to be sure your water is safe. Also, your well should be maintained to keep it in good working order. To help keep track of well maintenance, it is recommended that you create and maintain a "system maintenance log." The log should include the location of the well, construction and contractor details, as well as results of any water tests. A copy of a log is available online at environmentalhealth.dhw.idaho.gov. For questions about your well water, contact your local public health district.

SUGGESTED TESTING SCHEDULE

Contaminants	How often should I test?
Arsenic Uranium Fluoride	Once every 3 to 5 years
Bacteria Nitrates	Once a Year

HEALTH DISTRICT CONTACT INFORMATION

Panhandle Health District
208-415-5200
www.phd1.idaho.gov
(serving Benewah, Bonner, Boundary, Kootenai, and Shoshone counties)

North Central Health District
208-799-3100
www.idahopublichealth.com
(serving Clearwater, Idaho, Latah, Lewis, and Nez Perce counties)

Southwest District Health
208-455-5400
www.publichealthidaho.com
(serving Adams, Canyon, Gem, Owyhee, Payette, and Washington counties)

Central District Health
208-375-5211
www.cdhd.idaho.gov
(serving Ada, Boise, Elmore and Valley counties)

South Central Public Health District
208-737-5900
www.phd5.idaho.gov
(serving Blaine, Camas, Cassia, Gooding, Jerome, Lincoln, Minidoka, and Twin Falls counties)

Southeastern District Health
208-233-9080
www.sdhdidaho.org
(serving Bannock, Bear Lake, Bingham, Butte, Caribou, Franklin, Oneida, and Power counties)

Eastern Idaho Public Health District
208-522-0310
www2.state.id.us/phd7
(serving Bonneville, Clark, Custer, Fremont, Jefferson, Lemhi, Madison, and Teton counties)

IDAHO DEPARTMENT OF HEALTH AND WELFARE

Bureau of Community and Environmental Health
1-866-240-3553
bceh@dhw.idaho.gov

Idaho Bureau of Laboratories
208-334-2235
statelab@dhw.idaho.gov
www.statelab.idaho.gov

NSF INTERNATIONAL

Consumer Hotline 1-800-673-8010
www.nsf.org

SUGGESTED TESTING SCHEDULE

The table below shows how often you should test your well for contaminants.

Contaminants	How often should I test?
Bacteria Nitrate	Once a year
Arsenic Uranium Fluoride	Once every 3 to 5 years

BACTERIA

IN YOUR WELL WATER



IDAHO DEPARTMENT OF HEALTH & WELFARE

Private wells can provide a clean, safe source of water if they are properly located, built, and maintained. As a private well owner, it is your responsibility to make sure that your water is safe to use by testing for contaminants. This brochure provides information on bacteria and helps you understand the possible health effects of drinking water that has bacteria.

How Can Bacteria Get Into My Well?

Bacteria are microscopic organisms that are found almost everywhere. One type of bacteria, coliform bacteria, are commonly found in soil, surface water, on plants and in the intestines of humans and other warm-blooded animals. Coliform bacteria that are washed into the ground by rain are usually filtered out as the water passes through the soil into the groundwater. However, poorly-constructed or unsealed wells, fractured rock or cracked cisterns can provide a path for coliform bacteria to enter groundwater and private wells.

How Do I Know If My Well Has Bacteria?

Just because water is clear and smells okay does not mean the water is safe. Testing the water is the only way to know if there is a bacterial problem. Since it is not practical to test your well water for every type of bacteria, a lab test will look for coliform bacteria. If coliforms are found or present, then it is possible that harmful bacteria are in the well water. For information on how to test your well, contact your local public health district (numbers are located on the back of this brochure).

It is best to test for coliform bacteria in the spring during wet weather. This is when bacteria are most likely to be found because runoff and excess soil moisture can carry contaminants into shallow groundwater sources or through well defects.

Testing Frequency and When to Disinfect

Contaminant	When to Test	When to Disinfect Well
Bacteria	Once every year	After coliforms are found

What Are The Health Concerns?

Most coliform bacteria do not cause disease, but they can indicate that contamination has gotten into the water which means that harmful bacteria may be present. Some types of bacteria, such as *Escherichia coli* (*E. coli*) can cause nausea, vomiting, fever, and diarrhea. *E. coli* can be especially dangerous for children under the age of five years, the elderly, and people with weakened immune systems.



What Can I Do If Bacteria Is In My Water?

If your test results show that coliform bacteria are present, the water should be boiled before drinking, and the well should be disinfected. You should boil your water at least one minute before using it for drinking or for the preparation of baby formula or other foods that will not be cooked. Your local public health district can provide you with information on how to disinfect your well. The source of the bacteria needs to be determined and the problem corrected.

Note: Boiling water will not remove other types of contaminants such as uranium, nitrates, arsenic, and fluoride.

What Can I Do To Maintain My Water System?

If you install a treatment device, make sure it is certified by NSF International and follow the manufacturer's suggested maintenance schedule to be sure your water is safe.

Also, your well should be maintained to keep it in good working order. To help keep track of well maintenance, it is recommended that you create and maintain a "system maintenance log." The log should include the location of the well, construction and contractor details, as well as results of any water tests. A copy of a log is available by calling the Idaho Department of Health and Welfare at 1-866-240-3553.

For questions about your well water, contact your local public health district.

What is fluoride?

Fluoride is a naturally occurring compound derived from fluorine, the 13th most abundant element on Earth. It is found in many rocks and minerals in the soil and enters drinking water as water passes through these soils.

Fluoride is present naturally in almost all foods and beverages including water, but levels can vary widely. As fluoride can prevent tooth decay, it is sometimes added to drinking water in a process known as fluoridation. However, in Idaho, fluoridation is not common.

This brochure provides answers to some commonly asked questions about fluoride. For more information about fluoride, visit DEQ's website and other web resources listed inside this brochure.



For More Information

Idaho Department of Health and Welfare
Bureau of Community and Environmental Health
450 West State Street
Boise, ID 83720
(208) 334-5927

Public Health Districts

Panhandle Health District
8500 N. Atlas Road
Hayden, ID 83835
(208) 415-5100

North Central District Health
215 10th Street
Lewiston, ID 83501
(208) 799-3100

Central District Health
707 North Armstrong Place
Boise, ID 83704
(208) 375-5211

South Central District Health
1020 Washington Street N.
Twin Falls, ID 83301
(208) 734-5900

Southeastern District Health
1901 Alvin Ricken Drive
Pocatello, ID 83201
(208) 233-9080

Eastern Idaho Public Health District
1250 Hollipark Drive
Idaho Falls, ID 83401
(208) 522-0310

Southwest District Health
13307 Miami Lane
Caldwell, ID 83607
(208) 455-5300

Idaho Department of Environmental Quality

Boise
1445 N. Orchard
Boise, ID 83706
(208) 373-0550
toll-free: (888) 800-3480

Coeur d'Alene
2110 Ironwood Parkway
Coeur d'Alene, ID 83814
(208) 769-1422
toll-free: (877) 370-0017

Idaho Falls
900 N. Skyline, Suite B
Idaho Falls, ID 83402
(208) 528-2650
toll-free: (800) 232-4635

Lewiston
1118 F Street
Lewiston, ID 83501
(208) 799-4370
toll-free: (877) 541-3304

Pocatello
444 Hospital Way #300
Pocatello, ID 83201
(208) 236-6160
toll-free: (888) 655-6160

Twin Falls
650 Addison Ave. W, Suite 110
Twin Falls, ID 83301
(208) 736-2190
toll-free: (800) 270-1663

Printed on recycled paper, DEQ, September 2014, PID 0205, CA 30060. Costs associated with this publication are available from the State of Idaho Department of Environmental Quality in accordance with Section 60-202, Idaho Code.

Drinking Water in Idaho

Basic Information: Fluoride in Your Drinking Water



Idaho Department of Environmental Quality
www.deq.idaho.gov

Why is fluoride in drinking water regulated?

Fluoride has been shown to prevent tooth decay, but too much fluoride at an early age, while the teeth are forming, can cause discoloration and pitting of the teeth. This condition is known as dental fluorosis. Overexposure to fluoride over a lifetime can lead to certain types of bone disease.

How do I know how much fluoride is in my water?

There are several ways to determine the general fluoride concentrations in your area. If your water comes from a public water system, ask your water provider. If you have a private well, you will need to have your water tested by a qualified lab to determine your fluoride concentrations.

Visit the *Fluoride in Drinking Water* program page on DEQ's website (see Web Resources at right) to link to an online listing of the latest test results in your area.

What if I have too much fluoride in my drinking water?

If you have been advised by a professional that the concentration of fluoride in your drinking water is too high, it may be necessary to drink only bottled or properly treated water. (See DEQ's fluoride webpage for treatment options.)

Does bottled water contain fluoride?



Bottled water is regulated by the U.S. Food and Drug Administration and must meet federal drinking water standards for regulated contaminants.

Some bottled water contains natural levels of fluoride from the location where it was collected. Some companies add fluoride to their bottled water, and must say so on the label. Consumers who purchase bottled water should carefully read the label or contact the bottler to understand what they are buying, such as the source of water, the method of treatment, and the fluoride level.

How do I test my drinking water?

Your local health department can assist you in testing your drinking water (see office locations on back). Generally, you will need to follow some simple instructions and take a sample of water to a qualified lab for testing. Discuss any concerns you have regarding the results with your dentist, physician, or health department.

For a list of certified labs in your area, visit the Bureau of Laboratories website at *www.healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx*.

Who can I contact for more information?

For questions about regulated contaminants in public water systems, contact DEQ (see office locations on back).

For oral health questions, your dentist or physician is an excellent place to start. These medical professionals can help you decide what your fluoride needs are. Children and adults have very different fluoride needs, so be sure to discuss the needs of all family members. Your local health department and the Idaho Department of Health and Welfare can also help you decide what steps, if any, you need to take.

Web Resources

Fluoride in Drinking Water
DEQ Website: *www.deq.idaho.gov/fluoride*

Idaho Department of Health and Welfare Oral Health Program
www.healthandwelfare.idaho.gov/Health/OralHealth/tabid/106/Default.aspx

List of Idaho Health Districts and their Websites
www.healthandwelfare.idaho.gov/Health/HealthDistrict/tabid/97/default.aspx

Center for Disease Control and Prevention
www.cdc.gov/fluoridation/

American Dental Association Fluoride and Fluoridation Information
www.ada.org/fluoride.aspx

American Dental Association Bottled Water Information
www.ada.org/3048.aspx?currentTab=1

wellcare® information for you about

Disinfecting Your Well

Chlorination disinfects your well by destroying unhealthy bacteria and microorganisms and removing dissolved iron, manganese, and hydrogen sulfide. It can be managed easily at home with common household bleach and food grade white vinegar.

Chlorination uses concentrations of chlorine that are 100 to 400 times the amount found in municipal water supplies. The highly chlorinated water is held in the pipes of your well system before it is flushed out and the system is ready again for use.

It is very important to read all cautions and instructions before proceeding with the chlorination procedure.

When to Disinfect Your Well

You should test your water for bacteria each year, usually in the spring, or if there is any change in the taste, color or odor of your drinking water. Any positive test result requires disinfection.

Other well maintenance activities can also threaten your water supply. Disinfect your well when:

- The well is new. Chlorinate before using.
- The well has been repaired, reconstructed, or new pump or pipes have been added to the water system.
- The well has been flooded or exposed to bacterial contamination in another manner, such as a crack in well cap.

How to Disinfect Your Well

Liquid chlorine in the form of household bleach and food grade white vinegar can be used to disinfect your well. When chlorine is added to water the pH level will rise. Food grade white vinegar is used to lower the water's pH level so the chlorine will work effectively. Make sure to use a new bottle of unscented bleach, as it can lose potency over time. Don't use stabilized swimming pool chlorine products or non-chlorinated "pool shock" products, as they are not effective enough to clean drinking water.

Before You Begin

Be careful when handling chlorine solutions. Wear rubber gloves, goggles, and a protective apron. If chlorine accidentally gets on your skin, flush immediately with clean water.

Caution: Bleach added to water with a pH below 5.0 will release chlorine gas which is toxic. This procedure should be done in a well-ventilated area. Do not mix vinegar and chlorine together above ground.

Determine the amount of water in your well known as Standing Well Volume (SWV). This is accomplished by knowing the total depth of the well and subtracting the depth to water multiplied by the gallons per foot the well can hold. Refer to your well log, use the following table and equation to find the SWV. If you need assistance contact your water well professional for assistance.

SWV = depth of well – depth to water x gallons per foot in well

Well Casing Diameter (inches)	Water Volume Per Foot of Water Depth
4	0.65
6	1.4
8	2.6
10	4.1
12	6

Once you know your SWV, follow the steps below:

Step 1 Consider the general water quality of your well. High levels of iron, sulfur, or hard water will influence the effectiveness of the disinfection process. Using Table 1 or 2 below, calculate how much liquid chlorine bleach and vinegar you will need.

Table 1: Disinfection Quantities for Average Well Water Quality

no sulfur, low to moderate bacteria and hardness

Standing Well Volume (gallons)	pH Control (white vinegar) Food Grade	Chlorine Required 5.25% (Sodium Hypochlorite)
50	1 ½ cups	1 cup
100	3 cups	2 cups
150	1 quart	2 ½ cups
200	5 ½ cups	3 ½ cups
250	6 ½ cups	1 quart
300	8 cups	5 cups
350	½ gal + 1 cup	6 cups
400	½ gal + 2 ½ cups	7 cups

Source: Moravec Water Wells – www.moravecwaterwells.com

Table 2: Disinfection Quantities for Difficult Well Water Quality

high bacteria, iron, hardness, and sulfur

Standing Well Volume (gallons)	pH Control (white vinegar) Food Grade	Chlorine Required 5.25% (Sodium Hypochlorite)
50	5 ½ cups	3 ½ cups
100	½ gal + 2 1/2 cups	6 ½ cups
150	1 gallon	½ gal + 2 cups
200	1 gal + 5 cups	½ gal + 5 ½ cups
250	1 ½ gal + 2 cups	1 gal + 1 cup
300	2 gallons	1 gal + 1 quart
350	2 gal + 5 cups	1 ½ gallons
400	2 ½ gal + 2 ½ cups	1 ½ gal + 3 cups

Source: Moravec Water Wells – www.moravecwaterwells.com

Step 2 Turn the power to the pump OFF. Place any water treatment equipment in to the bypass mode. Failure to do so could result in a breakdown of the treatment media.

Step 3 Remove the cap on the top of the well. Pour the required amount of vinegar followed by the required amount of chlorine into the well in one rapid, continuous flow, avoiding all electrical connections.

Step 4 Turn the power back ON.

Step 5 Attach a clean hose to a nearby faucet and place the other end into the top of the well. Open the faucet and recirculate the chlorinated water for one hour, washing down the entire inside of the well casing and pump piping to remove any excess chlorine residue. Turn off the hose and recap the well.

Step 6 Open each indoor faucet one by one and let the water run until a strong odor of chlorine is detected. Shut off faucet.

Step 7 Allow the chlorine solution to remain in the well and plumbing system for 8 hours, or overnight.

Step 8 Flush the entire system until you can no longer smell chlorine. First, run the chlorinated water outdoors, but be careful to avoid areas that drain into lakes or streams because it can kill fish and other aquatic life. The solution can, likewise, kill grass and shrubs, as well as disrupt septic systems. A good choice may be a backyard ditch (make sure the ditch is not connected to a lake or stream) or side area that will partially contain the solution while it is absorbed by the soil.

Step 9 After the chlorine is out of the system, turn off the outside faucets and turn on the remaining indoor faucets to flush them. Rusty water may come from the faucets, so flush until the water is clear. This should only take a few minutes.

Step 10 After the entire system has been flushed out, shut down all faucets. Change any water treatment filters and clean water treatment devices separately per the manufacturer's or your water treatment professional's instructions. Once cleaned, put water treatment into service. Chlorination of the water well system is now complete.

Retest your water supply for bacteria at least 2 days after disinfection. If chlorination has not eliminated the bacteria problem, you may need a continuous disinfection system or there may be a problem with the well construction or its location. Contact a water well professional for guidance.

wellcare® information on Disinfecting Your Well **Page 4**

FOR MORE INFORMATION to help you maintain your well and protect your water supply

wellcare® is a program of the **Water Systems Council (WSC)**. **WSC** is the only national organization solely focused on protecting the health and water supply of the 43 million people nationwide who depend on household wells for their water supply.

This publication is one in a series of **wellcare®** information sheets. There are more than 90 information sheets available FREE at www.watersystemscouncil.org.

Well owners and others with questions about wells or groundwater can also contact the FREE wellcare® Hotline at 1-888-395-1033 or visit www.wellcarehotline.org.

JOIN THE WELLCARE® WELL OWNERS NETWORK!

By joining the FREE **wellcare®** Well Owners Network, you will receive regular information on how to maintain your well and protect your well water.

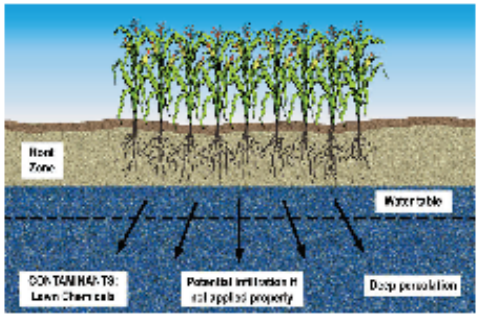
Contact us at 1-888-395-1033 or visit www.watersystemscouncil.org or www.wellcarehotline.org.

WELL WATER – NATURALLY BETTER®

Why does it matter how much fertilizer and pesticide I add to my lawn? How much effect can one home have on the environment?

Your lawn probably covers a small piece of land. Combined with other homeowners, however, the environmental contamination can present a major problem.

Because the majority of Idaho's drinking water supply comes from ground water, over-application of fertilizers and pesticides can move hazardous chemicals through the soil and into drinking water, adversely affecting human health. Over-application of fertilizers and pesticides can also harm surface waters if chemicals run off into lakes and streams and can damage your lawn as well.



Properly using home lawn chemicals can make a difference and set an example for homeowners around you. This list of tips and facts will help you attain a beautiful *and* environmentally friendly lawn.

For More Information

Idaho Department of Environmental Quality

State Office
Water Quality Division
1410 N. Hilton
Boise, ID 83706
(208) 373-0502

Regional Offices

Boise
1445 N. Orchard
Boise, ID 83706
(208) 373-0550
toll-free: (888) 800-3480

Lewiston
1118 F Street
Lewiston, ID 83501
(208) 799-4370
toll-free: (877) 541-3304

Coeur d'Alene
2110 Ironwood Parkway
Coeur d'Alene, ID 83814
(208) 769-1422
toll-free: (877) 370-0017

Pocatello
444 Hospital Way #300
Pocatello, ID 83201
(208) 236-6160
toll-free: (888) 655-6160

Idaho Falls
900 N. Skyline, Suite B
Idaho Falls, ID 83402
(208) 528-2650
toll-free: (800) 232-4635

Twin Falls
650 Addison Ave. W,
Suite 110
Twin Falls, ID 83301
(208) 736-2190
toll-free: (800) 270-1663

Web Resources

Idaho Department of Environmental Quality
Pollution Prevention for Citizens
www.deq.idaho.gov/pollution-prevention-for-citizens

U.S. Environmental Protection Agency
Beneficial Landscaping
www.epa.gov/greenkit/landscap.htm

University of Idaho Extension Service
Homes and Garden
www.extension.uidaho.edu/homegard.asp

Idaho Association of Soil Conservation Districts
www.iascd.org

Printed on recycled paper, DEQ July 2013. PID 0205, CA 30060. Costs associated with this publication are available from the State of Idaho Department of Environmental Quality in accordance with Section 60-202, Idaho Code.

Water in Idaho

Fertilizer & Pesticide Use at Home

How to have a beautiful lawn *and* protect the environment

Idaho Department of Environmental Quality
www.deq.idaho.gov

Fertilizer Use

Fertilizer provides nutrients—usually nitrogen, phosphorus, and potassium—to lawns and gardens. In the proper quantity and proportion, these nutrients can help produce a healthy lawn and plants. If fertilizer is over-applied or the wrong combination of nutrients is added, plants may not fully absorb all of the nutrients. These excess nutrients can build up in the soil or filter into ground and surface waters, adversely impacting water quality.



Here's how you can help

- ***Fertilize your lawn...not your driveway.*** Apply fertilizer so that it lands on your lawn or garden, not on adjacent pavement. Fertilizer that lands on paved surfaces wastes money and can end up in Idaho's waterways. If fertilizer lands on the pavement, sweep it onto the lawn.
- ***Pick a product with appropriate proportions of the nutrients*** your lawn needs. Fertilizers are labeled according to the percentage of each nutrient.
- ***Minimize nitrogen use.*** Excess nitrogen can contaminate ground water and harm animals and humans, particularly small children.
- ***Choose slow-release fertilizers*** to minimize chemical loss through the soil and promote uptake by the plant.
- ***Look on the back of the bag*** for terms such as controlled-release, slow-release, slowly available, or water-insoluble nitrogen.
- ***Ask about proper fertilizer application methods.*** Make sure your investment is used efficiently. Don't over-apply so that your lawn is not harmed.
- ***Plant native grasses and plants*** that tend to be adapted to the local environment and may not need supplemental nutrients.
- ***Test your lawn's soil.*** By determining the characteristics of the soil, you can tell which nutrients are lacking and apply fertilizer more efficiently.

Remember, proper fertilization not only protects Idaho's water, but can reduce money spent on lawn care products and time devoted to lawn care.

A Healthy Lawn

Maintaining a healthy carpet of grass may involve use of fertilizers and pesticides. With proper care, you can maximize the benefits of these products while minimizing their adverse effects on the environment.

Disposal

Proper waste disposal is a critical final measure toward protecting Idaho's water from lawn care products. To minimize impact from extra product and waste containers:

- ✓ Buy ***the least amount*** of product needed.
- ✓ ***Rinse containers*** and use the rinsate as you would the product.
- ✓ ***Properly dispose of the container.*** Do not use it to store another liquid. Contact your local landfill, waste hauler, or public works department for disposal and recycling options in your area.



Pesticide Use

A pesticide is any substance or mixture of substances intended to prevent, repel, mitigate, or kill any pest. Pests can be insects, mice and other animals, unwanted plants (weeds), fungi, or microorganisms like bacteria and viruses.

Here's how to use pesticides wisely

- ***Identify the problem.*** Different pests require different controls. Using the wrong pesticide could damage the plant or surrounding garden without solving the problem.
- ***Try non-toxic controls first.*** Many common pests can be cured with non-toxic alternatives. Beer can be used to capture slugs, for example, and soapy water can eliminate many garden pests. Some pests can simply be removed by hand. Refer to an organic gardening book for suggestions.
- If pesticides must be used, ***limit application*** to the rates specified on the label to prevent over-application.
- Apply ***only to the affected part*** of the plant.
- ***Apply when pests are most vulnerable.*** Depending on the pest, applications at night, early morning, or after watering may be most effective.
- ***Make a habit of inspecting your lawn for pests.*** Catching a problem early reduces the amount of pesticide needed and prevents storage and disposal problems.
- If using a pest control service, ensure it follows ***best management practices.***
- ***Read product label and follow instructions.*** The label tells you how to use the product safely and effectively. Use of any pesticide in any way that is not consistent with label directions and precautions is illegal. It can also be ineffective, harmful to the environment, and potentially dangerous.

A Homeowner's Guide to Septic Systems



Idaho Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706

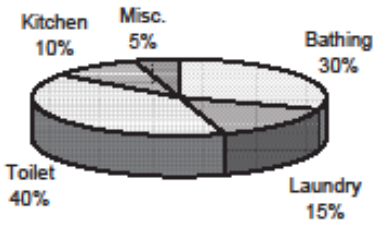
January 2001

Do you have a home septic system? As an Idaho resident, there is a good chance you do—thirty-six percent of Idaho's homes, or about 210,000 residences, use septic systems to treat their sewage. These systems discharge more than 53 million gallons of wastewater into Idaho's soils annually, and this figure grows each year. In 1999, Idaho's seven health districts issued over 6,100 permits for new septic systems.

Septic systems dispose of household sewage, or wastewater, generated from toilet use, bathing, laundry, and kitchen and cleaning activities. Because septic systems are underground and seldom require daily care, many homeowners rarely think about routine operations and maintenance. However, if a septic system is not properly designed, located, constructed, and maintained, groundwater may become contaminated.

Household Wastewater

Households that are not served by public sewers depend on septic tank systems to treat and dispose of wastewater. Household wastewater carries with it all wastes that go down the drains in our homes, including human waste, dirt, food, toilet paper, soap, detergents, and cleaning products. It contains dissolved nutrients, household chemicals, grease, oil, microorganisms (including some that cause disease), and solid particles. If not properly treated by your septic system, chemicals and microorganisms in wastewater can travel through the soil to groundwater and pose a health hazard.



The average person uses between 50 and 75 gallons of water per day; mostly in the bathroom. Reducing your water use will help your septic system to work more efficiently.

Your Septic System

A conventional septic system has three working parts: a septic tank, a drainfield, and surrounding soil.

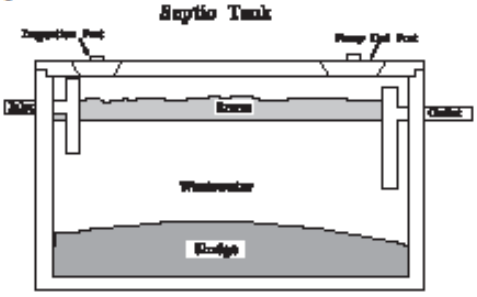
Septic Tank

Septic tanks can be made of concrete, fiberglass, or plastic and must be approved by the state. Minimum sizes of tanks have been established for residences based on the number of bedrooms in the dwelling. In Idaho, a 1,000-gallon septic tank is required for homes with three or four bedrooms. Larger tanks are required for larger homes. Local district health departments issue permits for septic systems and specify the minimum size tank. Some systems installed before the current rules and regulations may have smaller septic tanks.

A septic tank has three main functions:

- to remove as many solids as possible from household wastewater before sending the liquid, called "effluent," to a drainfield;
- to decompose solids in the tank; and
- to store solids that do not decompose.

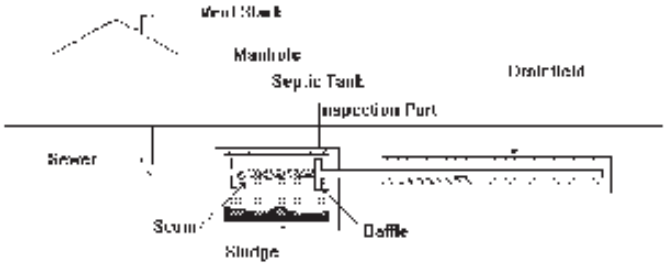
When raw wastewater enters the tank, heavy solids sink to the bottom of the tank as sludge. Light solids, such as grease and paper, float to the surface as scum. During the wastewater storage period, bacteria digest organic material in the wastewater. During this process, the solid material is reduced in volume and composition. Solids that do not decompose accumulate in the tank and eventually must be pumped out.



Tees, or baffles, are provided at the tank's inlet and outlet pipes. The inlet tee slows the incoming wastes and reduces disturbance of the settled sludge. The outlet tee keeps the solids and scum in the tank. As new wastewater enters the tank through the inlet tee, an equal amount of wastewater is pushed out of the tank through the outlet tee. The effluent that leaves the tank has been partially treated but still contains disease-causing bacteria and other pollutants.

Drainfield

Each time raw wastewater enters the tank it forces an equal amount of effluent into a drainfield. A standard drainfield is composed of a series of perforated pipes buried in gravel-filled trenches in the soil. The effluent seeps out of the perforated pipes and percolates through the gravel to the soil.



Soil

The soil below the drainfield provides the final treatment and disposal of the septic tank effluent. After the effluent has passed into the soil, most of it percolates downward and outward, eventually entering the groundwater. Soils are critical to the treatment of septic tank wastewater.

A system that is not functioning properly will release nutrient-rich and bacterial-laden wastewater into the groundwater and/or surface water. These contaminated waters pose a significant public health threat to people that come into contact with them. Wastewater that moves with groundwater can transport bacteria considerable distances. This can result in a threat to public health and adversely affect the quality of ground and surface waters.

Caring for Your Septic System

Installing Your System

In order to have a septic system installed on your property, you must first obtain a permit. Permit applications are available from your local district health department. Next, you must have a site evaluation performed. Make arrangements for this with your district health department and with a licensed septic system installer. Note that not all property is suitable for septic systems, so some permits may be denied. It is recommended that you have a site evaluation performed before you purchase property. Finally, have your system installed by a licensed installer and inspected by your local health district. Provide regular, preventative, maintenance to keep your system running smoothly.

Inspecting Your System

When too much sludge and scum are allowed to accumulate in your tank, the incoming sewage will not have enough time in the septic tank for solids to settle. Solids may flow to the drainfield and clog the pipes, causing the sewage to overflow to the ground surface, where it exposes humans and animals to disease-causing organisms. To prevent this from happening, it is very important to inspect your tank regularly and have it serviced when needed. All tanks have accessible manholes for inspecting and pumping. Some excavation work may be needed to uncover the manhole.

Properly designed tanks should have enough capacity for three to eight years of use before needing service. This is dependent upon the amount of wastewater generated. It is recommended that an average family of four have its septic tank pumped out every three to five years. Don't wait for signs of system failure to have your tank pumped. Your tank should be checked annually to measure sludge and scum levels. A licensed septic tank pumper can provide a septic tank inspection and recommend when the tank should be pumped. A tank inspection should include measuring the depth of scum and sludge and inspecting the tees in the septic tank.

If you do the inspection yourself, it is important to understand that septic tanks always appear full because both the inlet and the outlet are at the top of the tank. What you will need to know is how much of the tank's volume is being taken up by scum and sludge. When sludge and scum take up more than 35 percent of the tank volume, these solids need to be removed by pumping. A pole wrapped in a course weave cloth can be used to check the sludge depth. An extension on the pole can be used to measure the scum depth. Record these measurements as part of your pumping records. To check the tees, uncover the inspection ports.

Never allow anyone to enter your septic tank. Dangerous gases and the lack of oxygen can kill in minutes.

While it is impractical to inspect the pipes in your drainfield, it is important to watch for drainfield failure or overuse. See "Warning Signs of System Failure" in this booklet for information.

Maintaining Your System

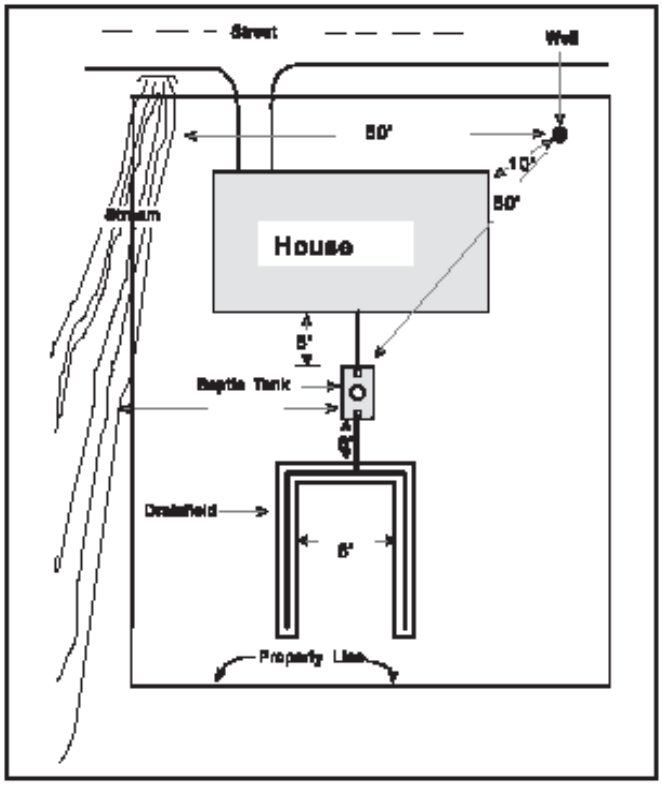
Pumping your septic tank every three years (or as determined by your inspections) will remove accumulations of solids, help keep the drainfield from becoming clogged, and help prevent you from experiencing sewage backups or septic system failure. An accumulation of sludge exceeding 35% of the total water depth in the septic tank could cause solids to enter the drainfield and clog the system. Hire a licensed septic tank pumper to pump your tank for you.

Mapping Your System

In order to take proper care of your septic system, you must know the location of the septic tank and drainfield. The location of your septic tank can be determined from plot plans, septic system inspection records, architectural or landscape drawings, or from observations of the house plumbing. If you do not have access to drawings, find where the sewer pipe leaves your house. Some installers mark the location where the waste pipe comes out of the house with an "S" on the foundation. You may want to do this as well. Probe in the ground 10 to 15 feet directly out from the location where the pipe leaves your house to find your tank.

Once the septic tank has been located, make several plot plan diagrams (with measurements) that include a rough sketch of your house, septic tank cover, drainfield area, well, and any other permanent reference points (such as trees or large rocks) and place them with your important papers. You'll find a sample system diagram on the next page, and a place to draw your own inside the front cover of this booklet. You may also want to hang a diagram in your garage and provide one to your local district health office.

Maintain a permanent record of any septic system maintenance, repair, sludge and scum levels, pumping, drainfield condition, household backups, and operations notes.



Create a septic system diagram, similar to this one, for your system.

Warning Signs of System Failure

While proper use, inspections, and maintenance should prevent most septic tank problems, it is still important to be aware of changes in your septic system and to act immediately if you suspect a system failure. There are many signs of septic system failure:

- surfacing sewage or wet spots in the drainfield area;
- plumbing or septic tank backups;
- slow draining fixtures;
- gurgling sounds in the plumbing system;
- sewage odors in the house or yard (note that the house plumbing vent on the roof will emit sewage odors and this is normal); and
- tests showing the presence of bacteria in well water.

If you notice any of these signs, or if you suspect your septic tank system may be having problems, contact a licensed septic system professional or your local district health agency for assistance.

Septic System Dos and Don'ts

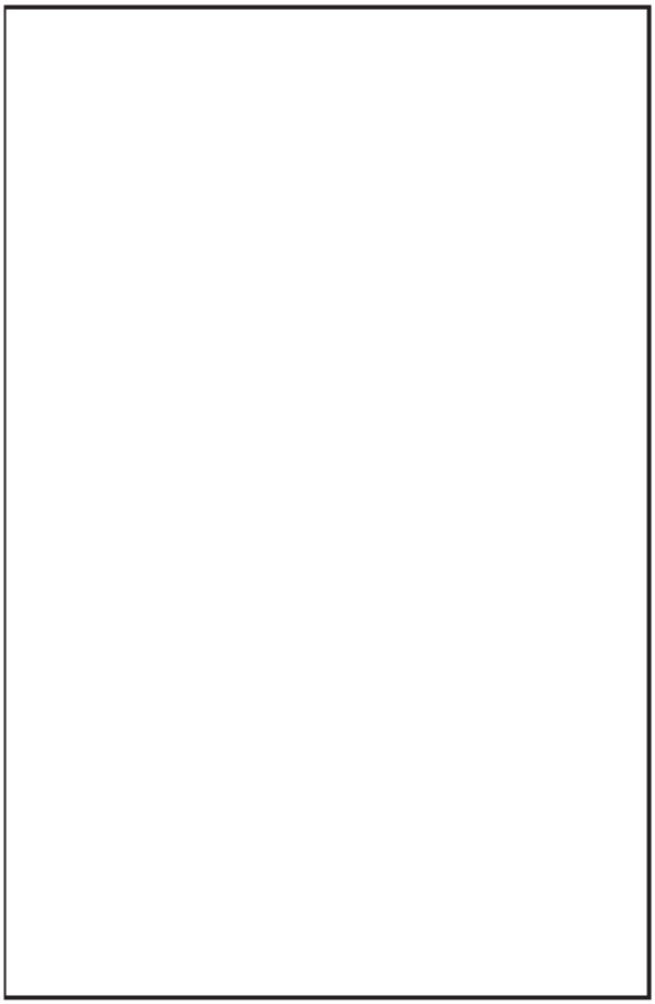
Proper operation of a septic system can prevent costly repairs or replacement. Observing the following guidelines will help to keep your system running efficiently.

Do

- …practice water conservation. The more wastewater you produce, the more wastewater your system must treat and dispose. By reducing and balancing your use, you can extend the life of your system and avoid costly repairs.
    - Use water saving devices such as low flow showerheads.
    - Repair leaky faucets and plumbing fixtures immediately.
    - Reduce toilet reservoir volume or flow.
    - Take short showers.
    - Take baths with a partially filled tub.
    - Wash only full loads of dishes and laundry.
    - Shut off the water while shaving or brushing your teeth.
    - Balance your water use (e.g., avoid washing several loads of laundry in one day).
- …keep accurate records. Know where your septic tank is, keep a diagram of its location using the space provided in this booklet, and keep a record of system maintenance.
- …inspect your system annually. Check the sludge and scum levels inside the tank and periodically check the drainfield for odors, wet spots, or surfacing sewage.
- …pump your system routinely. Pumping your septic tank is probably the single most important thing you can do to protect your system.
- …keep all runoff away from your system. Water from roofs and driveways should be diverted away from the septic tank and drainfield area. Soil over your system should be mounded slightly to encourage runoff.
- …protect your system from damage. Keep vehicles and livestock off your drainfield. The pressure can compact the soil or damage the pipes. Before you dig for any reason, check the location of your system and drainfield area.
- …landscape your system properly. Plant grass over the drainfield area. Don't plant trees or shrubs or place impermeable materials, such as concrete or plastic, over the drainfield.
- …use cleaning chemicals in moderation and only according to manufacturer's directions.

Don't

- …flood irrigate over your system or drainfield area. The best way to irrigate these areas is with sprinklers.
- …use caustic drain openers for clogged drains. Use boiling water or a drain snake to clean out clogs.
- …enter a septic tank. Poisonous gases or a lack of oxygen can be fatal.
- …use septic tank additives. They are not necessary for the proper functioning of your tank and they do not reduce the need for pumping. In fact, some additives can even harm your system.
- …flush harmful materials into your tank. Grease, cooking oil, coffee grounds, sanitary napkins, and cigarettes do not easily decompose in septic tanks. Chemicals, such as solvents, oils, paints, and pesticides, are harmful to your systems operation and may pollute groundwater.
- …use a garbage disposal. Using a garbage disposal will increase the amount of solids entering the septic tank and will result in the need for more frequent pumping.



Map your septic system here

For More Information

If you need to obtain a permit for a new or replacement septic system, or if you have questions about septic systems and their operation and maintenance, please contact your local health district.

Panhandle District Health Department
8500 N. Atlas Road
Hayden, ID 83835
208-415-5100

North Central District Health Department
215 10th Street
Lewiston, ID 83501
208-799-0353

Southwest District Health Department
920 Main Street
Caldwell, ID 83605
208-455-5400

Central District Health Department
707 N. Armstrong Place
Boise, ID 83704
208-327-7499

South Central District Health Department
1020 Washington Street North
Twin Falls, ID 83303
208-734-5900

Southeastern District Health Department
1901 Alvin Ricken Drive
Pocatello, ID 83201
208-239-5270

District 7 Health Department
254 "E" Street
Idaho Falls, ID 83402
208-523-5382

This page intentionally left blank for correct double-sided printing.

The chlorine will then need to be flushed out of the system. If you have a septic system, flush out the water through the outside taps. Running the water through the inside taps could flood the septic drainfield. If this happens, sewage may surface on the ground or back up into the house. Once most of the chlorine is flushed outside, the inside taps can be turned on to remove any lingering chlorine. The amount of bleach used varies with the depth and width of the well. On average, most wells should use 1 quart to 1 gallon of regular household bleach.

Please refer to "Disinfecting Your Well" on our website at www.phd3.idaho.gov for full instructions.

Testing for Hydrogen Sulfide

Hydrogen sulfide in water is very obvious due to the smell. Testing is generally only done if the level in the water needs to be determined. Sampling needs to be done in a specific manner to ensure the gas does not escape from the water prior to testing. Please call Southwest District Health at (208) 455-5400 and ask for information on water testing.

For more information contact SWDH Environmental Health Services at 208-455-5400 or www.swdh.org

SOUTHWEST DISTRICT HEALTH

13307 Miami Lane, Caldwell, ID 83607

Revised April 2019

In-house brochure created December 2006
Division of Environmental Health

HYDROGEN SULFIDE IN DRINKING WATER

"The Rotten Egg Smell"

Hydrogen Sulfide

Hydrogen sulfide is a gas that easily dissolves in water. There are no well documented health effects associated with the levels of hydrogen sulfide found in groundwater. It is easily identified by a "rotten egg" odor. It can corrode plumbing metals such as iron, steel, copper, and brass. When iron and steel are corroded by hydrogen sulfide, a black precipitate can stain laundry and bathroom fixtures.

Hydrogen sulfide is formed by sulfur– and sulfate-reducing bacteria found naturally in water. They can be found in both shallow and deep wells, generally in shale or sandstone.

What if the Odor Only Comes From the Hot Water?

Before you invest in an expensive treatment unit for your home, do a simple test. Turn on your cold water and see if the smell is still noticeable. If the odor is only in the hot water, then the problem is likely with the hot water heater.

If the water thermostat has been reduced to save energy or prevent scalding, it is possible that odor-causing bacteria has formed in the water heater. The problem can be resolved by returning the thermostat to the recommended temperature (typically 140 degrees F) for 8 hours. **Caution:** The pressure relief valve should be in good working order prior to raising the temperature. There is a danger of scalding if the pressure relief valve is not operating correctly.

If increasing the temperature on the thermostat does not alleviate the odor another possible problem may be the metal rod used in electric water heaters.

Electric water heaters frequently use a magnesium rod to protect from corrosion. As magnesium is slowly released into the water, hydrogen is also released. The hydrogen can then combine with sulfur in the water and form hydrogen sulfide.

This problem can usually be corrected by replacing the magnesium rod with an aluminum or zinc rod. The rod could also be removed, however, consult the manufacturers first.

Treatment for Hydrogen Sulfide

Carbon Filters: Trace amounts of hydrogen sulfide can be removed with activated carbon filters. Carbon filters can be placed at a faucet, under a sink, or as it enters the home. Keep in mind, the more water that runs through the filter the faster the filter will need to be replaced. Activated carbon will not normally be able to remove hydrogen sulfide levels over 0.3 mg/L.

Aeration: This (adding air to water) allows oxygen to react with the hydrogen sulfide and convert it to sulfate which is odorless. There are two types of aerated treatment. One type injects compressed air into a retention tank under pressure. The air must be vented from the tank in order to avoid "knocking" in the water pipes. The other type sprays water into a non-pressurized tank. A second pump will be required to re-pressurize the water system.

Manganese Greensand Filters: These filters can generally remove hydrogen sulfide levels up to 10 mg/L. It is normally used for iron and manganese removal. The filters must be recharged with a potassium permanganate solution. The process is similar to that of a water softener. A water pH less than 6.7 would require extra treatment.

Chlorine: Is a common chemical added to water that will convert hydrogen sulfide into a tasteless form. It is also used to reduce iron and manganese. Chlorine (specifically sodium hypochlorite) is pumped into the pipe going into the house. Generally some type of storage tank or pressure tank will be needed. Occasionally taste issues will be a problem and an activated charcoal filter is added.

Chlorine should not be regularly added to the well itself. Chlorine is very corrosive and can damage the pump and well casing if used frequently. The well should only be chlorinated when disinfection is required. If the "rotten egg" smell only started recently and is in both the hot and cold water, sulfur-reducing bacteria may be growing in the plumbing system. Shock chlorination should then be recommended to disinfect the system. A single high dose of chlorine (typically common household bleach) is poured down the well. The taps are turned on to pull the chlorinated water into the pipes. The taps are then turned off and the chlorine is allowed to sit in the pipes to kill bacteria for at least 12 hours.

HEALTH DISTRICT CONTACT INFORMATION

Panhandle Health District
208-415-5200
www.phd1.idaho.gov
(serving Benewah, Bonner, Boundary, Kootenai and Shoshone counties)

Public Health - North Central District
208-799-3100
www.idahopublichealth.com
(serving Clearwater, Idaho, Latah, Lewis, and Nez Perce counties)

Southwest District Health
208-455-5400
www.swdh.org
(serving Adams, Canyon, Gem, Owyhee, Payette and Washington counties)

Central District Health Department
208-375-5211
www.cdhd.idaho.gov
(serving Ada, Boise, Elmore and Valley counties)

South Central Public Health District
208-737-5900
www.phd5.idaho.gov
(serving Blaine, Camas, Cassia, Gooding, Jerome, Lincoln, Minidoka, and Twin Falls counties)

Southeastern Idaho Public Health
208-233-9080
www.siphidaho.org
(serving Bannock, Bear Lake, Bingham, Butte, Caribou, Franklin, Oneida, and Power counties)

Eastern Idaho Public Health District
208-522-0310
www.eiph.idaho.gov
(serving Bonneville, Clark, Custer, Fremont, Jefferson, Lemhi, Madison, and Teton counties)

IDAHO DEPARTMENT OF WATER RESOURCES

Licensed Well Drillers
research.idwr.idaho.gov/apps/wellconstruction/Licwelldrillers/

Ground Water Protection Section
Boise: 208-287-4800
www.idwr.idaho.gov

Northern Region, Coeur d'Alene: 208-762-2800
Eastern Region, Idaho Falls: 208-525-7161
Southern Region, Twin Falls: 208-736-3033
Western Region, Boise: 208-334-2190

IDAHO DEPARTMENT OF AGRICULTURE

Water Program
Boise Office 208-332-8597
www.agri.state.id.us

IDAHO DEPARTMENT OF HEALTH & WELFARE

Bureau of Community and Environmental Health
1-800-445-8647
environmentalhealth.dhw.idaho.gov
bceh@dhw.idaho.gov

Idaho Bureau of Laboratories
208-334-2235
www.statelab.idaho.gov
statelab@dhw.idaho.gov

IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

208-373-0502
www.deq.idaho.gov

NSF INTERNATIONAL

Consumer Hotline 1-800-673-8010
www.nsf.org

This publication was supported by the Grant or Cooperative Agreement Number, 1 NU61TS000286-01-00, funded by the Centers for Disease Control and Prevention. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention or the Department of Health and Human Services.

March 2018

IS MY WELL WATER SAFE?

Tips to Protect Your Well Water



IDAHO DEPARTMENT OF HEALTH & WELFARE
DIVISION OF PUBLIC HEALTH

IS MY WELL PROPERLY BUILT?

Private wells can provide a clean, safe source of water if they are properly located, built, and maintained. Use a licensed well driller and follow the Idaho Department of Water Resources (IDWR) requirements for drilling a well (numbers are on back). To protect your well from contamination, you should follow inspection tips on the "system maintenance log" found online at environmentalhealth.dhw.idaho.gov.

WHY SHOULD I TEST MY WELL?

It is your responsibility as a private well owner to ensure that the water is safe. Sources such as septic systems, farm animals, farm chemicals, and naturally occurring chemicals can contaminate your well water. High levels of contamination can put you and your family's health at risk. Make sure your well water is safe by testing it.

HOW DO I TEST MY WELL WATER?

A certified lab or your local health district may be able to test your well water for contaminants. Staff will tell you how to collect your water sample and costs for the tests. Contact your local health district for information on testing your well (numbers are on the back of this brochure).

WHAT CONTAMINANTS SHOULD I TEST FOR?

Idaho well water may contain several harmful contaminants. The table shows typical contaminants, how often you should test your well water for them, and treatment levels. If you live in an agricultural area and/or you have underground tanks with petroleum, it is recommended that you also test your well water for pesticides and/or petroleum. If your well is damaged or flooded, or if you notice significant changes in taste, smell, or color, get your well re-tested for contaminants.

Type of contaminant	When to test	When To Treat
Bacteria	Once a year	Treat any amount
Nitrate	Once a year	If 10 mg/L or higher
Nitrite	Once a year	If 1 mg/L or higher
Arsenic	Once every 3 to 5 years	If 0.01 mg/L or higher
Uranium	Once every 3 to 5 years	If 30 µg/L or higher
Fluoride	Once every 3 to 5 years	If 4 mg/L or higher

mg/L = milligrams per liter of water
µg/L = micrograms per liter of water

WHAT DO THE TEST RESULTS MEAN?

Typically, the lab results will tell you the level of a contaminant in your water. The table shows what levels are considered safe. If you have contaminant levels higher than those in the table, you should fix the problem. If you have pesticides or petroleum in your water please call the Idaho Department of Health and Welfare (IDHW, number on back of brochure) for information on what test results mean.

HOW CAN I FIX A PROBLEM?

If you have a problem, you may need to disinfect your well, repair your system, find an alternative drinking water source, and/or install a water treatment device to remove contaminants. When installing a treatment system look for NSF International certified treatment devices. Your local public health district can help you determine the best method to fix the problem.

HOW DO I KEEP MY WELL WATER SAFE?

Well maintenance is very important to keep your water safe. It is recommended that once a year you check your well covering, casing, and well cap for cracks and look for other areas where pollutants could enter your water. For treatment devices, follow the manufacturers' suggested maintenance schedules. A "system maintenance log" can help you keep track of any water test results, as well as any construction and contractor details. A copy of a log is available online at environmentalhealth.dhw.idaho.gov.

For a copy of the Home*A*Syst packet, call the Idaho Association of Soil Conservation Districts at 208-338-5900 or download a packet at the following website: www.idahoag.us/gw/homeasyst.htm.

Additional Resources

You can find additional information about private wells at the following links:

The EPA publication, *Drinking Water from Household Wells,* answers questions about drinking water from household wells, lists activities that may affect your water supply, describes problems to look for, and provides maintenance recommendations; www.epa.gov/safewater/privatewells/pdfs/household_wells.pdf.

Wellowner.org provides consumer information about ground water and private wells at www.wellowner.org.

NSF International, a not-for-profit organization that develops standards, product testing procedures, and certification services for products including water treatment devices. Call 1-877-867-3435 or visit its web site at www.nsfconsumer.org.

Contact Information

Idaho District health offices

District 1 Coeur d'Alene office, 208- 667-3481
www2.state.id.us/phd1/
(serving Benewah, Bonner, Boundary, Kootenai and Shoshone counties)
District 2 Lewiston office, 208-799-3100
www2.state.id.us/phd2/
(serving Clearwater, Idaho, Latah, Lewis and Nez Perce counties)
District 3 Caldwell office, 208- 455-5300,
www.publichealthidaho.com
(serving Adams, Canyon, Gem, Owyhee, Payette and Washington counties)
District 4 Boise office, 208-375-5211
www.phd4.state.id.us/
(serving Ada, Boise, Elmore and Valley counties)
District 5 Twin Falls office, 208-734-5900
www.state.id.us/phd5/
(serving Blaine, Camas, Cassia, Gooding, Jerome, Lincoln, Minidoka and Twin Falls counties)
District 6 Pocatello office, 208-233-9080
www2.state.id.us/phd6/
(serving Bannock, Bear Lake, Bingham, Caribou, Franklin, Oneida and Power counties)
District 7 Idaho Falls office, 208-522-0310
www2.state.id.us/phd7/
(serving Bonneville, Butte, Clark, Custer, Fremont, Jefferson, Lemhi, Madison and Teton counties)

Idaho Department of Environmental Quality offices

State office, Boise, 208-373-0502, www.deq.state.id.us/

Coeur d'Alene regional office, 208-769-1422
(serving Benewah, Bonner, Boundary, Kootenai and Shoshone counties)
Lewiston regional office, 208-799-4370 or toll free, 1-877-541-3304
(serving Clearwater, Idaho, Latah, Lewis and Nez Perce counties)
Boise regional office, 208-373-0550
(serving Ada, Adams, Boise, Canyon, Elmore, Gem, Owyhee, Payette, Valley and Washington counties)
Twin Falls regional office, 208-736-2190
(serving Blaine, Camas, Cassia, Gooding, Jerome, Lincoln, Minidoka and Twin Falls counties)
Pocatello regional office, 208-236-6160
(serving Bannock, Bear Lake, Bingham, Caribou, Franklin, Oneida and Power counties)
Idaho Falls regional office, 208-528-2650
(serving Bonneville, Butte, Clark, Custer, Fremont, Jefferson, Lemhi, Madison and Teton counties)

Idaho Department of Water Resources

Ground water Protection Section, Boise office: 208-327-7900
www.idwr.state.id.us/

Northern Region, Coeur d'Alene office: 208-769-1450
Eastern Region, Idaho Falls office: 208-525-7161
Southern Region, Twin Falls office: 208-736-3033
Western Region, Boise office: 208-334-2190

Idaho State Department of Agriculture

Water Program, Boise office: 208-332-8500
www.agri.state.id.us/

Idaho Department of Health and Welfare

Bureau of Community and Environmental Health, 1-208-334-6584, Toll Free 1-866-240-3553

September 2003

IDAHO DEPARTMENT OF HEALTH & WELFARE

Environmental Health Education and Assessment Program
Bureau of Community and Environmental Health
Division of Health

Idaho Private Well Owner Brochure

What are the responsibilities of owning a private well?



Your drinking water is delivered to your faucet either through a public water system or from a private well or spring. Both public and private water systems tap into ground water and surface water sources through wells, springs, and intakes from streams or rivers.

In order to protect their consumers, public water suppliers are required by law to test their drinking water regularly and make these tests results available to the public. Unlike public water supplies, these drinking water regulations do not apply to private wells. As a private well owner, it is your responsibility alone to make sure that your water is safe to drink.

Private wells can provide a clean, safe source of drinking water if they are properly located, constructed and maintained. However, natural and man-made contaminants can get into ground water and into your drinking water. At high enough levels, these contaminants can put your family and animals' health at risk.

If you own your own well, you should periodically test your water, make sure your well system is in good working order, and know how to protect your wellhead. By following the advice in this brochure, you can help insure that your well remains a safe source of drinking water for you and your family.



This brochure contains information to help you find answers to questions about drinking water testing, well construction and maintenance, and basic wellhead protection.

What drinking water contaminants should I be concerned about?



If you find a contaminant in your drinking water, it does not always mean that your water is unhealthy to drink. Some contaminants can occur at low levels and not cause health problems. However, the higher the concentration of a contaminant in your water, the greater the chance it may make you sick.

The Environmental Protection Agency (EPA) has set drinking water regulations for public water supplies to protect public health. Although these regulations do not apply to private wells, they can be used as guides to help you determine if your water is safe to drink.

For a list of drinking water contaminants, potential health effects, and sources of drinking water contaminants contact the EPA safe drinking water hotline toll-free at 1-800-426-4791, or visit www.epa.gov/safewater/mcl.html#mcls.

What are some contaminants found in Idaho ground water?

Idaho ground water may contain infectious microorganisms (such as

harmful bacteria and viruses), nitrates, arsenic, lead, fluoride and organic compounds including oil products, solvents and pesticides. Depending on where your well is located, the depth and condition of your well, and possible contaminant sources, you may want to test for one, some or all of these contaminants.

It is important to realize that the shallower the well, the more vulnerable it may be to contaminants from septic systems, agriculture, industry and other human activities.

Before testing your drinking water, find out what types of contaminants are a concern in your area for your water system.

You can find out about arsenic and nitrates in Idaho ground water and view county ground water reports online at the Idaho Department of Environmental Quality (IDEQ) website, www.deq.state.id.us/water/water1.htm, or call your regional IDEQ office listed on the back page of this brochure.

If you have water quality questions regarding pesticides, fertilizers, animal waste and other potential agricultural contaminants, contact the Idaho State Department of Agriculture (ISDA) Water Quality Program at 208-332-8500 or visit their website at www.idahoag.us/gw/.



When should I test my drinking water?

It is generally a good idea to test well water annually, before purchasing a home, or after installing a new well. You may also want to test if your water is cloudy, has a strange color, odor, taste, or appearance, or if you have recently repaired or had a problem with your home's plumbing, connections, or treatment system.

The Idaho Department of Health and Welfare's Bureau of Community and Environmental Health (BCEH) also can provide you with a private well water testing schedule and a guide for troubleshooting well water problems. Contact BCEH at 866-240-3553.

If your water has a funny taste, appearance or smell, you can identify the cause by using the interactive database, "Diagnose Your Drinking Water" at the Water Quality Association's website, www.wqa.org *(click on "Diagnose Your Drinking Water" listed under "Consumer's Corner" on the site's front page).*



This database will help you narrow down causes of drinking water problems by choosing from a list of water symptoms. Once narrowed down, you can also find potential treatments and solutions. To request more information, contact the association by phone, 630-505-0160, or by email, info@wqa.org.

How do I get my drinking water tested?

Once you have decided to test your drinking water, talk to an environmental health specialist at your local health district. These professionals can help you figure out what tests you may want to have done. They can also instruct you on how, when and where to collect your water sample and where to get the appropriate sample bottles.

You should have your water tested at a certified analytical lab. Lab staff can also answer questions about how to collect your water sample.

For a list of certified drinking water analyses labs in your area contact your regional IDEQ office. You can also find a list of labs at: www.deq.state.id.us/water/dw/water_analyses_labs.htm.

What should I do if a test result comes back positive?

As mentioned before, the presence of a contaminant is not always a sign of a health hazard. However, if your well water tests positive for a contaminant, discuss your test results with an environmental health specialist at your local health district. These professionals can help you determine if you and your family's health is at risk.

If your drinking water tests positive for a contaminant at levels that may harm your health, fix the problem as soon as possible. You may need to disinfect your well, repair your system, find an alternative drinking water source, or install a water treatment device to remove contaminants.

There are many different treatment devices available. Different types remove different contaminants. There is no one device that does it all. It is important to research possible treatment devices carefully to find the best solution for your problem. You must also maintain your water treatment device once it is installed so that it works properly to keep your drinking water safe.

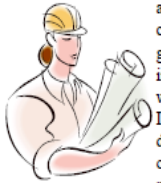
For additional information about drinking water contaminants, testing, and treatment systems contact the National Sanitation Foundation (NSF) Consumer Affairs Office. Call NSF toll-free at 1-877-867-3435 or visit www.nsfconsumer.org/water/drinking_water.asp. You can also search treatment device product listings online at: www.nsf.org/certified/dwtu/.

The Water Systems Council provides information sheets on drinking water testing, treatment, and maintenance for private wells online at www.wellcarehotline.org/wellcare/infosheets.cfm, or you can speak with a technician by calling the well care hotline toll-free at 1-888-395-1033.



To request a free pamphlet about home water treatment units, contact the EPA safe drinking water hotline at 1-800-426-4791.

What do I need to know about well construction and maintenance?



Proper well design, construction and maintenance can reduce the chance that contaminants will get into your well water. To insure proper well construction when installing a well, current Idaho law requires all well drillers to be licensed. Some older wells drilled prior to this ruling may not be constructed to current standards and may need to be updated.

Annual well maintenance is also essential to keep your drinking water safe. Well owners are encouraged to perform an annual water test, periodically check to make sure their well is functioning properly, and repair their system as needed.

For information on well construction, to request a list of licensed well drillers, or to contact a well drilling specialist call the Idaho Department of Water Resources (IDWR) at 208-327-7900 or visit their website at www.idwr.state.id.us/water/well/default.htm.

You can also search for information (including well location, ownership, construction details and underlying strata) about a preexisting well on the IDWR well information search page, www.idwr.state.id.us/water/well/search.htm. Information on older wells may not be available online. However, many older reports are maintained in microfilm files. If you cannot find a well report online, contact your regional IDWR office listed on the back page of this brochure.

The Idaho Home*A*Syst project provides in-depth information on proper well location, Construction, and maintenance and can help you identify homestead activities that may affect your drinking water.

HEALTH DISTRICT CONTACT INFORMATION

Panhandle Health District
208-415-5200
www.phd1.idaho.gov
(serving Benewah, Bonner, Boundary, Kootenai and Shoshone counties)

Public Health - North Central District
208-799-3100
www.idahopublichealth.com
(serving Clearwater, Idaho, Latah, Lewis, and Nez Perce counties)

Southwest District Health
208-455-5400
www.swdh.org
(serving Adams, Canyon, Gem, Owyhee, Payette and Washington counties)

Central District Health Department
208-375-5211
www.cdhd.idaho.gov
(serving Ada, Boise, Elmore and Valley counties)

South Central Public Health District
208-737-5900
www.phd5.idaho.gov
(serving Blaine, Camas, Cassia, Gooding, Jerome, Lincoln, Minidoka, and Twin Falls counties)

Southeastern Idaho Public Health
208-233-9080
www.siphidaho.org
(serving Bannock, Bear Lake, Bingham, Butte, Caribou, Franklin, Oneida, and Power counties)

Eastern Idaho Public Health District
208-522-0310
www.eiph.idaho.gov
(serving Bonneville, Clark, Custer, Fremont, Jefferson, Lemhi, Madison, and Teton counties)

IDAHO DEPARTMENT OF WATER RESOURCES

Licensed Well Drillers
research.idwr.idaho.gov/apps/wellconstruction/Licwelldrillers/

Ground Water Protection Section
Boise: 208-287-4800
www.idwr.idaho.gov

Northern Region, Coeur d'Alene: 208-762-2800
Eastern Region, Idaho Falls: 208-525-7161
Southern Region, Twin Falls: 208-736-3033
Western Region, Boise: 208-334-2190

IDAHO DEPARTMENT OF AGRICULTURE

Water Program
Boise Office 208-332-8597
www.agri.state.id.us

IDAHO DEPARTMENT OF HEALTH & WELFARE

Bureau of Community and Environmental Health
1-800-445-8647
environmentalhealth.dhw.idaho.gov
bceh@dhw.idaho.gov

Idaho Bureau of Laboratories
208-334-2235
www.statelab.idaho.gov
statelab@dhw.idaho.gov

IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

208-373-0502
www.deq.idaho.gov

NSF INTERNATIONAL

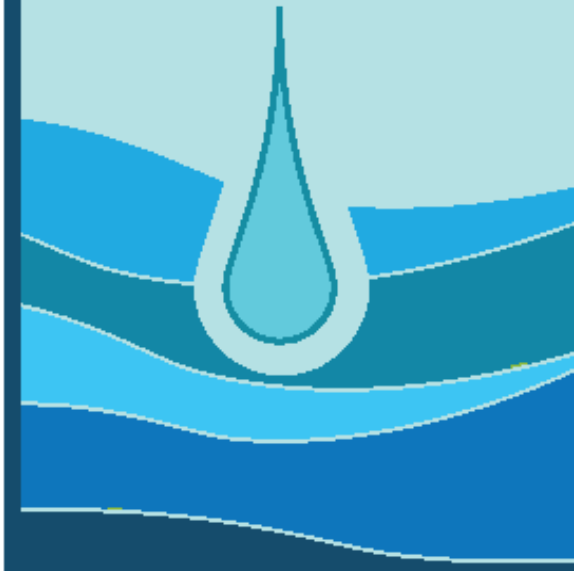
Consumer Hotline 1-800-673-8010
www.nsf.org

This publication was supported by the Grant or Cooperative Agreement Number, 1 NU61TS000286-01-00, funded by the Centers for Disease Control and Prevention. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention or the Department of Health and Human Services.

March 2018

IRON IN YOUR WELL WATER

Tips to Protect Your Well Water



IDAHO DEPARTMENT OF HEALTH & WELFARE
DIVISION OF PUBLIC HEALTH

Private wells can provide a clean, safe source of water if they are properly located, built, and maintained. As a private well owner, it is your responsibility to make sure that your water is safe to use by testing for contaminants. This brochure provides information on iron and helps you understand the possible problems you may encounter with high levels of iron in your drinking water.

WHAT IS IRON?

Iron is a mineral that is naturally-occurring. Our bodies need iron for many bodily functions. For example iron is needed in blood to carry oxygen from our lungs to the rest of the body.

WHAT ARE THE HEALTH CONCERNS?

Iron in well water is usually not a health concern. However, iron can cause other problems such as leaving stains on laundry and dishes. Iron can also give water a metallic taste or a bad smell.

WHAT ARE THE FORMS OF IRON?

The forms of iron are soluble, insoluble, and organic. Soluble iron, also known as "clear water," causes reddish brown particles that will settle at the bottom of a glass of water. Insoluble iron, also known as "red water," gives water a rusty, red or yellow color. Organic iron is formed from organic acid and iron and is typically yellow or brown in color, but it can be clear.

HOW MUCH IRON CAUSES A PROBLEM?

The Environmental Protection Agency (EPA) set a secondary maximum contaminant level (SMCL) for iron at 0.3 milligrams per liter of water (mg/L). The SMCL is used as a guideline to assist the public in determining the level that may cause problems such as a rusty color and/or metallic taste in water, or reddish or orange staining.

WHAT CAN I DO TO REMOVE IRON FROM MY WATER?

The form of iron you have will determine the type of treatment that you use. Currently, there are no NSF International certified treatment devices for iron; however, there are methods than can be used to reduce the amount of iron in your water. Soluble and organic iron can be treated with methods such as a water softener, ozonation or various types of filtration. Methods such as oxidation and filtration can be used to remove insoluble iron from water. To determine the best method for removing iron from your well, call the NSF International Consumer Hotline at 1-800-673-8010.

WHAT CAN I DO TO MAINTAIN MY WATER SYSTEM?

If you install a treatment device, follow the manufacturer's suggested maintenance schedule to be sure your water is safe. Also, your well should be maintained to keep it in good working order. To help keep track of well maintenance, it is recommended that you create and maintain a "system maintenance log." The log should include the location of the well, construction and contractor details, as well as results of any water tests. A copy of a log is available online at environmentalhealth.dhw.idaho.gov. For questions about your well water, contact your local public health district.

SUGGESTED TESTING SCHEDULE

Contaminants	How often should I test?
Arsenic Uranium Fluoride	Once every 3 to 5 years
Bacteria Nitrate	Once a Year

Health Department Contact Information

Coeur d'Alene 415-5200
www2.state.id.us/phd1
(serving Benewah, Bonner, Boundary, Kootenai and Shoshone counties)

Lewiston 799-3100
www.ncdhd.us/
(serving Clearwater, Idaho, Latah, Lewis, and Nez Perce counties)

Caldwell 459-0744
www.publichealthidaho.com/
(serving Adams, Canyon, Gem, Owyhee, Payette and Washington counties)

Boise 375-5211
www.cdhd.idaho.gov/
(serving Ada, Boise, Elmore and Valley counties)

Twin Falls 734-5900
www.phd5.idaho.gov/
(serving Blaine, Camas, Cassia, Gooding, Jerome, Lincoln, Minidoka, and Twin Falls counties)

Pocatello 233-9080
www.sdhdidaho.org/
(serving Bannock, Bear Lake, Bingham, Caribou, Franklin, Oneida, and Power counties)

Idaho Falls 522-0310
www.idaho.gov/phd7
(serving Bonneville, Butte, Clark, Custer, Fremont, Jefferson, Lemhi, Madison, and Teton counties)

Idaho Department of Health and Welfare

Bureau of Community and Environmental Health
1-866-240-3553
bceh@dhw.idaho.gov

IDAHO DEPARTMENT OF HEALTH & WELFARE

Idaho Department of Environmental Quality offices

State office, Boise, 373-0502, www.deq.idaho.gov/

Coeur d'Alene regional office, 769-1422
(serving Benewah, Bonner, Boundary, Kootenai, and Shoshone counties)

Lewiston regional office, 799-4370
(serving Clearwater, Idaho, Latah, Lewis, and Nez Perce counties)

Boise regional office, 373-0550
(serving Ada, Adams, Boise, Canyon, Elmore, Gem, Owyhee, Payette, Valley, and Washington counties)

Twin Falls regional office, 736-2190
(serving Blaine, Camas, Cassia, Gooding, Jerome, Lincoln, Minidoka, and Twin Falls counties)

Pocatello regional office, 236-6160
(serving Bannock, Bear Lake, Bingham, Caribou, Franklin, Oneida, and Power counties)

Idaho Falls regional office, 528-2650
(serving Bonneville, Butte, Clark, Custer, Fremont, Jefferson, Lemhi, Madison and Teton counties)

Idaho Department of Water Resources

Ground Water Protection Section, Boise: 287-4800
www.idwr.idaho.gov

Northern Region, Coeur d'Alene: 769-1450
Eastern Region, Idaho Falls: 525-7161
Southern Region, Twin Falls: 736-3033
Western Region, Boise: 334-2190

Idaho Department of Agriculture

Water Program
Boise Office 332-8597
www.agri.idaho.gov

Some text supplied by the U.S. Environmental Protection Agency Web site.

It will never be this obvious



Four Steps to Well Water Safety

Private wells can provide a clean, safe source of water if they are properly located, built, and maintained. The location and installation of a well is crucial to protecting water from contamination. Because many factors determine the best place to locate a well, it is recommended that a certified well water driller perform the job.

To find certified local water-well contractors in your area, call the national Ground Water Association at 800-551-7379 or visit their website at www.ngwa.org.

1 Have Your Water Tested

As a private well owner, it is your responsibility to make sure that your water is safe to use. Pollution from sources such as septic systems, farm animals, farm chemicals and naturally occurring chemicals can contaminate your well. At high levels, pollution in your well water can put your family's and animals' health at risk. If you have any question about the safety of your well water, you should have your well water tested.

You can have your well water tested at a certified lab. Lab staff will tell you when and how to collect your water sample. For a list of labs, contact your regional Idaho Department of Environmental Quality office (numbers are on back of this brochure).

2 Understand the Results of the Testing

Once you have had your well water tested and received the results, you will need to understand the results. Many times the lab that does the testing will explain if your well water poses any health concerns. If you still have questions after speaking to the lab, you can contact your local health department who should be able to help you interpret well testing results and assist you with any additional questions you may have (local health department numbers are on back of this brochure).

3 Fix Any Problems

If you learn your well water is polluted, fix the problem as soon as possible. You may need to disinfect your water, have a new well drilled, replumb or repair your system. Consult a certified well water driller for help. You might consider installing a water treatment device to remove pollutants. There are many home water treatment devices. Different types remove different pollutants. No one device does it all. Get a copy of the Environmental Protection Agency's "Home Water Treatment Units" pamphlet by calling (800) 426-4791.

4 Maintain Your Well

Annual well maintenance is essential to keep your water safe. Well owners are encouraged to perform an annual water test, periodically check to make sure their well is functioning properly, and repair their system as soon as a problem is discovered. Proper well maintenance should include checking the well covering, casing, and well cap for cracks and other entry points for potential pollutants. Every 10 years have the pump, storage tank, pipes and valves, and water flow inspected by a certified well water driller. When the well is no longer in use, make sure to properly close the old well to help prevent the contamination of the water table.

To help keep track of maintenance, it is recommended that you create and maintain a "well maintenance log." The log should include the location of the well, construction and contractor details, as well as results of any water tests.



HEALTH DISTRICT CONTACT INFORMATION

Panhandle Health District
208-415-5200
www.phd1.idaho.gov
(serving Benewah, Bonner, Boundary, Kootenai and Shoshone counties)

Public Health - North Central District
208-799-3100
www.idahopublichealth.com
(serving Clearwater, Idaho, Latah, Lewis, and Nez Perce counties)

Southwest District Health
208-455-5400
www.swdh.org
(serving Adams, Canyon, Gem, Owyhee, Payette and Washington counties)

Central District Health Department
208-375-5211
www.cdhd.idaho.gov
(serving Ada, Boise, Elmore and Valley counties)

South Central Public Health District
208-737-5900
www.phd5.idaho.gov
(serving Blaine, Camas, Cassia, Gooding, Jerome, Lincoln, Minidoka, and Twin Falls counties)

Southeastern Idaho Public Health
208-233-9080
www.siphidaho.org
(serving Bannock, Bear Lake, Bingham, Butte, Caribou, Franklin, Oneida, and Power counties)

Eastern Idaho Public Health District
208-522-0310
www.eiph.idaho.gov
(serving Bonneville, Clark, Custer, Fremont, Jefferson, Lemhi, Madison, and Teton counties)

IDAHO DEPARTMENT OF WATER RESOURCES

Licensed Well Drillers
research.idwr.idaho.gov/apps/wellconstruction/Licwelldrillers/

Ground Water Protection Section
Boise: 208-287-4800
www.idwr.idaho.gov

Northern Region, Coeur d'Alene: 208-762-2800
Eastern Region, Idaho Falls: 208-525-7161
Southern Region, Twin Falls: 208-736-3033
Western Region, Boise: 208-334-2190

IDAHO DEPARTMENT OF HEALTH & WELFARE

Bureau of Community and Environmental Health
1-800-445-8647
environmentalhealth.dhw.idaho.gov
bceh@dhw.idaho.gov

Idaho Bureau of Laboratories
208-334-2235
www.statelab.idaho.gov
statelab@dhw.idaho.gov

IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

208-373-0502
www.deq.idaho.gov

NSF INTERNATIONAL

Consumer Hotline 1-800-673-8010
www.nsf.org

ADDITIONAL INFORMATION

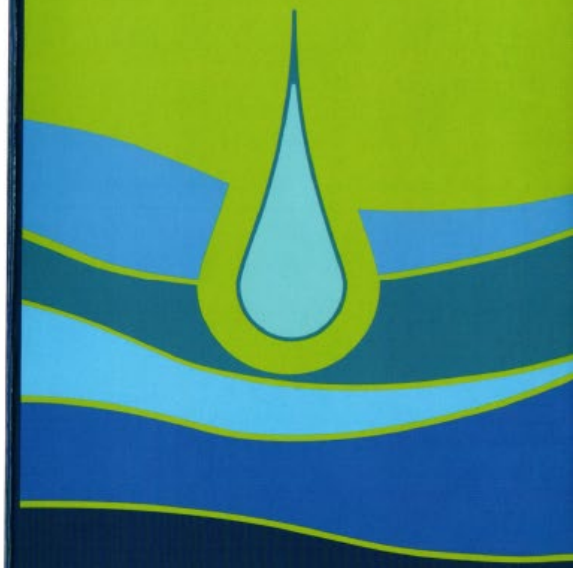
More information about lead in drinking water can be found on the EPA website at www.epa.gov/lead or by calling 1-800-426-4791. You can also visit the CDC website at www.cdc.gov/nceh/lead/tips/water.htm.

This publication was supported by the Grant or Cooperative Agreement Number, 1 NU61TS000286-01-00, funded by the Centers for Disease Control and Prevention. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention or the Department of Health and Human Services.

March 2018

LEAD IN YOUR DRINKING WATER

Tips to Protect Yourself



IDAHO DEPARTMENT OF HEALTH & WELFARE
DIVISION OF PUBLIC HEALTH

Lead in drinking water can come from several sources. One way lead can get into your drinking water is through your plumbing. Even if your water comes from a public water supply, lead contamination can occur after the water has left the treatment plant, as it sits in pipes and plumbing fixtures. Plumbing systems installed prior to 1986 can contain high levels of lead and systems installed after 1986 can have brass plumbing with lead. If your home has plumbing materials with lead, the lead can contaminate your water and may cause health problems.

WHAT IS LEAD?

Lead is a naturally-occurring metal. It is used in many commercial products including, batteries (such as those in automobiles), bullets, and fishing weights. Lead can also be found in some plumbing materials, as well as some house paints manufactured before 1978. People can be exposed to lead through drinking water.

WHAT ARE THE HEALTH CONCERNS?

Children exposed to lead can be affected by learning disabilities, headaches, slowed growth, and hearing problems. Adults can suffer from decreased kidney function, reproductive issues and cardiovascular effects.

HOW DO I KNOW IF A PERSON HAS BEEN EXPOSED TO LEAD?

Even people who appear healthy can have dangerous levels of lead in their bodies. If you think you or your child may have been exposed to lead, talk with your doctor about a blood lead test. A blood test is the only way to know if a child or adult has been exposed to lead.

HOW DO I TEST MY WATER FOR LEAD?

Contact a certified lab or your local public health department to get information on how to test your water for lead (numbers are on the back of this brochure). The lab or health department will have their own instructions to follow. The Environmental Protection Agency (EPA) suggests removing lead from your water if it is 15 parts per billion (0.015 milligrams per liter of water (mg/L)) or higher.

SUGGESTED TESTING SCHEDULE

You should test your drinking water for lead at least once. If you make any repairs to or change any of the plumbing materials in your house, it is suggested that you retest your water for lead.

WHAT SHOULD I DO IF MY WATER HAS LEAD IN IT?

- Run your water for about one to two minutes or until you notice the temperature drop before using it for drinking or cooking.
- Use cold water for drinking, cooking, and making baby formula. Hot water is more likely to have lead from the plumbing materials.
- Check the plumbing in your house for lead-based pipes, faucets, and solder (a plumber can help inspect).
- When buying new plumbing materials or making plumbing repairs, buy and use lead-free materials.

HOW CAN I REMOVE LEAD?

NSF International certified treatment devices such as reverse osmosis, distillation, and filtration can be used for lead. Typically, these methods are used to treat water at only one faucet. To decide the best method of removing lead from your water call the NSF International Consumer Hotline.

LEAD-BASED PAINT

If your home or apartment was built before 1978, it could have lead-based paint. Lead-based paint is responsible for the majority of lead exposures in children For more information visit the EPA website at www.epa.gov/lead.

NITRATE IN YOUR WELL WATER

Tips to Protect Your Well Water



Private wells can provide a clean, safe source of water if they are properly located, built, and maintained. As a private well owner, it is your responsibility to make sure that your water is safe to use by testing for contaminants. This brochure provides information on nitrate and helps you understand the possible health effects of drinking water with high levels of nitrate.

WHAT ARE THE HEALTH CONCERNS?

Nitrate can be converted to nitrite in the human body where it lessens the ability of blood to carry oxygen. This is of greatest concern for infants, pregnant, and nursing women. In infants less than 6 months old, nitrate levels above 10 mg/L in drinking water can reduce the amount of oxygen in the child's blood and cause blue baby syndrome. This is a very dangerous condition with symptoms including shortness of breath and a bluish tint to the skin indicating the baby is not getting enough oxygen.

WHAT CAN I DO TO REMOVE NITRATE FROM MY WATER?

NSF International certified treatment devices such as reverse osmosis, distillation, and ion exchange systems can be used to remove nitrate from water. To determine the best method of removing nitrate from your well, call the NSF International Consumer Hotline at 1-800-673-8010.

If your test level is above 10 mg/L, do not use the water to make baby formula and do not drink the water if you are pregnant or nursing. Note: Boiling water will not remove nitrate.

WHAT IS NITRATE?

Nitrate is a compound that can be found in private well water. High levels of nitrate in drinking water are often caused by groundwater contamination from animal waste run-off at dairies and feedlots, excessive use of fertilizers, or seepage of human sewage from private septic systems.

POSSIBLE HEALTH RISKS BY LEVEL OF NITRATE

Nitrate Level	Interpretation
0-10 mg/L	Safe for humans and livestock. However, concentrations of more than 5 mg/L are an indicator of possible pollution sources and could cause environmental problems.
11-20 mg/L	Not safe for infants, can cause blue baby syndrome. Generally safe for adults and livestock.
21-40 mg/L	Should not be used as a drinking water source except for short-term use for adults and livestock.
41-100 mg/L	Risky for adults and young livestock. Probably acceptable for mature livestock if feed is low in nitrate.
Over 100	Should not be used by humans and livestock.

Table adapted from Utah State University Extension

mg/L = milligrams per liter of water

HEALTH DISTRICT CONTACT INFORMATION

Panhandle Health District
208-415-5200
www.phd1.idaho.gov
(serving Benewah, Bonner, Boundary, Kootenai and Shoshone counties)

North Central Health District
208-799-3100
www.idahopublichealth.com
(serving Clearwater, Idaho, Latah, Lewis, and Nez Perce counties)

Southwest District Health
208-455-5400
www.publichealthidaho.com
(serving Adams, Canyon, Gem, Owyhee, Payette and Washington counties)

Central District Health
208-375-5211
www.cdhd.idaho.gov
(serving Ada, Boise, Elmore and Valley counties)

South Central Public Health District
208-737-5900
www.phd5.idaho.gov
(serving Blaine, Camas, Cassia, Gooding, Jerome, Lincoln, Minidoka, and Twin Falls counties)

Southeastern Idaho Public Health
208-233-9080
www.sdhdidaho.org
(serving Bannock, Bear Lake, Bingham, Butte, Caribou, Franklin, Oneida, and Power counties)

Eastern Idaho Public Health District
208-522-0310
www.phd7.idaho.gov
(serving Bonneville, Clark, Custer, Fremont, Jefferson, Lemhi, Madison, and Teton counties)

IDAHO DEPARTMENT OF WATER RESOURCES

Licensed Well Drillers
www.idwr.idaho.gov/apps/well/licensedwelldrillers/

Ground Water Protection Section
Boise: 208-287-4800
www.idwr.idaho.gov

Northern Region, Coeur d'Alene: 208-769-1450

Eastern Region, Idaho Falls: 208-525-7161

Southern Region, Twin Falls: 208-736-3033

Western Region, Boise: 208-334-2190

IDAHO DEPARTMENT OF AGRICULTURE

Water Program
Boise Office 208-332-8597
www.agri.state.id.us

IDAHO DEPARTMENT OF HEALTH AND WELFARE

Bureau of Community and Environmental Health
1-866-240-3553
www.healthandwelfare.idaho.gov
bceh@dhw.idaho.gov

Idaho Bureau of Laboratories
208-334-2235
www.statelab.idaho.gov
statelab@dhw.idaho.gov

NSF INTERNATIONAL

Consumer Hotline 1-800-673-8010
www.nsf.org

WHAT CAN I DO TO MAINTAIN MY WATER SYSTEM?

If you install a treatment device, follow the manufacturer's suggested maintenance schedule to be sure your water is safe. Also, your well should be maintained to keep it in good working order. To help keep track of well maintenance, it is recommended that you create and maintain a "system maintenance log." The log should include the location of the well, construction and contractor details, as well as results of any water tests. A copy of a log is available by calling the Idaho Department of Health and Welfare at 1-866-240-3553. For questions about your well water, contact your local public health district.

SUGGESTED TESTING SCHEDULE

The table below shows how often you should test your well for contaminants.

Contaminants	How often should I test?
Arsenic Uranium Fluoride	Once every 3 to 5 years
Bacteria Nitrate	Once a Year

Contact Information

Idaho Public Health Districts

Panhandle Health District
8500 N. Atlas Road
Hayden, ID 83835
(208) 415-5100
www.phd1.idaho.gov

North Central Health District
215 10th Street
Lewiston, ID 83501
(208) 799-3100
idahopublichealth.com

Southwest District Health
13307 Miami Lane
Caldwell, ID 83607
(208) 454-7722
www.publichealthidaho.com

Central District Health Department
707 North Armstrong Place
Boise, ID 83704
(208) 375-5211
www.cdhd.idaho.gov

South Central Public Health District
1020 Washington Street North
Twin Falls, ID 83301
(208) 734-5900
www.phd5.idaho.gov

Southeastern Idaho Public Health
1901 Alvin Ricken Drive
Pocatello, ID 83201
(208) 233-9080
www.sdhdidaho.org

Eastern Idaho Public Health District
1250 Hollipark Drive
Idaho Falls, ID 83401
(208) 522-0310
www.phd7.idaho.gov

Idaho Department of Health and Welfare

Bureau of Community and Environmental Health
1-800-926-2588
www.healthandwelfare.idaho.gov

Idaho Department of Agriculture

State Office - (208) 332-8500
www.agri.idaho.gov

Contact Information

Idaho Department of Environmental Quality

State Office, Boise
(208) 373-0502
www.deq.idaho.gov

Coeur d'Alene Regional Office
(208) 769-1422 or toll-free: (877) 370-0017
(serving Benewah, Bonner, Boundary, Kootenai, and Shoshone counties)

Lewiston Regional Office
(208) 799-4370 or toll-free: (877) 541-3304
(serving Clearwater, Idaho, Latah, Lewis, and Nez Perce counties)

Boise Regional Office
(208) 373-0550 or toll-free: (888) 800-3480
(serving Ada, Adams, Boise, Canyon, Elmore, Gem, Owyhee, Payette, Valley, and Washington counties)

Twin Falls Regional Office
(208) 736-2190 or toll-free: (800) 270-1663
(serving Blaine, Camas, Cassia, Gooding, Jerome, Lincoln, Minidoka, and Twin Falls counties)

Pocatello Regional Office
(208) 236-6160 or toll-free: (888) 655-6160
(serving Bannock, Bear Lake, Bingham, Butte, Caribou, Franklin, Oneida, and Power counties)

Idaho Falls Regional Office
(208) 528-2650 or toll-free: (800) 232-4635
(serving Bonneville, Clark, Custer, Fremont, Jefferson, Lemhi, Madison, and Teton counties)

Idaho Department of Water Resources

State Office, Boise
(208) 287-4800
www.idwr.idaho.gov

Northern Region, Coeur d'Alene
(208) 762-2800

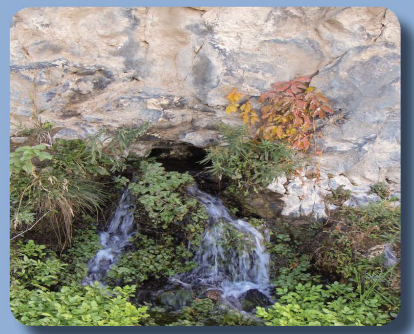
Western Region, Boise
(208) 334-2190

Southern Region, Twin Falls
(208) 736-3033

Eastern Region, Idaho Falls
(208) 525-7177

Printed on recycled paper, DEQ April 2013. PID 0205, CA 30060. Costs associated with this publication are available from the State of Idaho Department of Environmental Quality in accordance with Section 60-202, Idaho Code.

Nitrate in Idaho's Ground Water



Information on how to protect your family and Idaho's drinking water

Idaho Department of Environmental Quality
www.deq.idaho.gov

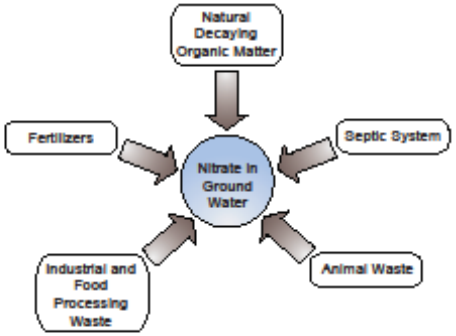
What Is Nitrate?



Nitrate is a form of nitrogen that is essential for plant growth. It is widely used throughout Idaho, mostly as a fertilizer to promote plant growth. If too much fertilizer is applied, the excess that is not used up by crops, lawns, plants, and trees can be washed down through the soils by irrigation or precipitation and eventually reach ground water.

Where Does Nitrate Come From?

Nitrate is the most widespread contaminant in Idaho's ground water, and also the most preventable. **In addition to fertilizers, other sources of nitrate include septic systems, animal waste, and industrial and food processing waste.**



Improperly **abandoned wells or older wells** not meeting current well construction standards can act as a direct pathway for contaminants at the land surface to reach ground water. This is a concern because ground water supplies most of Idaho's drinking water.

Nitrate and Your Health

The U.S. Environmental Protection Agency safe drinking water standard and the Idaho Ground Water Quality Standard for nitrate is 10 milligrams per liter (mg/L). The standards are set to ensure that drinking water is safe for human consumption.

In the human digestive system, nitrate is converted to nitrite, which can interfere with the ability of red blood cells to carry oxygen to tissues in the body. The resulting oxygen deficiency can cause illness in infants under six months of age and under extremely rare instances, possibly death.

How Do I Know if My Water Is Safe for My Family?



Public water systems are required to test water for contaminants and remove them with a treatment process before the water is delivered to customers. Private well owners however, are not required to test or treat water to remove contaminants.

It is extremely important to have private well water tested, particularly if infants, pregnant or nursing mothers, or adults with chronic health problems will be drinking the water.

Your local district health department can provide you with sampling instructions, sample bottles, and assistance in locating a certified laboratory in your area. District health departments are listed on the back of this brochure.

Information for private well owners:
www.wellowner.org
Information on water treatment:
www.nsf.org
www.wqa.org

What if Nitrate Is Found in My Water?

If test results show nitrate at a level greater than 10 mg/L (the safe drinking water standard), do not give the water to infants under six months old, either directly or mixed in formula. Use commercially bottled water.



Boiling will not remove nitrate, and in fact will concentrate the nitrate through evaporation. Contact your local district health department or the Idaho Department of Environmental Quality for information about treatment options to remove nitrate from your well water.

You Can Protect Idaho's Ground Water

Ground water supplies drinking water to 95% of Idaho's population, so it must be protected from contamination. Nitrate contamination is preventable.

Here are several simple things you can do:

- Inspect the area near your wellhead and remove any waste or debris.
- Contact your district health department for information on septic system maintenance.
- Use only the recommended amounts of fertilizer and water in your yard or garden.
- Contact an Idaho well drilling professional to inspect your well seal to see if it meets new safety standards.
- Share your knowledge with your neighbors, friends, and family to prevent further contamination.
- Contact DEQ to find out about ground water protection and improvement efforts in your area.

Questions to Ask When Planning a Septic System

If you are planning a home that will use a septic system, now is the perfect time to ask questions that can head off costly modifications and repairs later:

- **Is the system appropriately sized?** The tank should be large enough to hold at least two days of waste flow—at least 1,000 gallons for a three-bedroom with four occupants.
- **Is the lot appropriate for a septic system?** Sufficient room should be available for a septic tank, drainfield, and one replacement drainfield area. Evaluate the site for the following:
  - Topography—properties with ridges, knolls, and numerous slopes may not be suitable.
  - Soils—soil must have the capacity to accept and treat the volume of wastes anticipated.
  - Ground water—areas with high ground water may not be suitable.
- **What will it cost to add a second drainfield?** State regulations require a reserve area for a future drainfield when the first drainfield reaches the end of its useful life. Adding a replacement drainfield during initial construction may only cost a fraction of installing one later. Plus, having the capability to switch the drainfields annually ensures that the resting drainfield is dry and ready to receive wastewater.

For More Information

Idaho Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706
(208) 373-0502
http://www.deq.idaho.gov/septic_systems
http://www.deq.idaho.gov/technical-guidance-manual

US Environmental Protection Agency
http://water.epa.gov/infrastructure/septic/septicsmart.cfm
http://www.epa.gov/owm/septic/pubs/homeowner_guide_long.pdf

Idaho Public Health Districts

Panhandle Health District
8500 N. Atlas Road
Hayden, ID 83835
(208) 415-5100
www.phd1.idaho.gov

North Central Health District
215 10th Street
Lewiston, ID 83501
(208) 799-3100
idahopublichealth.com

Southwest District Health
13307 Miami Lane
Caldwell, ID 83607
(208) 454-7722
www.publichealthidaho.com

Central District Health Department
707 North Armstrong Place
Boise, ID 83704
(208) 375-5211
www.cdhd.idaho.gov

South Central Public Health District
1020 Washington Street North
Twin Falls, ID 83301
(208) 734-5900
www.phd5.idaho.gov

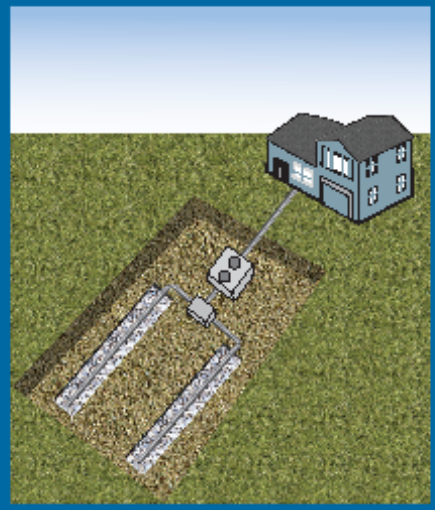
Southeastern Idaho Public Health
1901 Alvin Ricken Drive
Pocatello, ID 83201
(208) 233-9080
www.sdhdidaho.org

Eastern Idaho Public Health District
1250 Hollipark Drive
Idaho Falls, ID 83401
(208) 522-0310
www.phd7.idaho.gov

Printed on recycled paper, DEQ April 2013.
PID 0205, CA 30060. Costs associated with this publication are available from the State of Idaho Department of Environmental Quality in accordance with Section 60-202, Idaho Code.

Septic Systems and Drainfields:

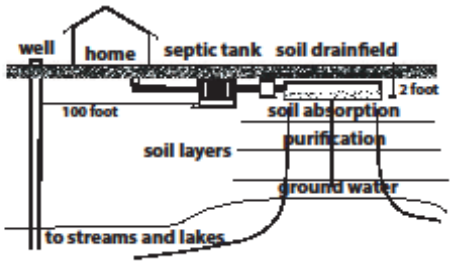
What You Need to Know



For homeowners, real estate professionals, and developers

Idaho Department of Environmental Quality
www.deq.idaho.gov

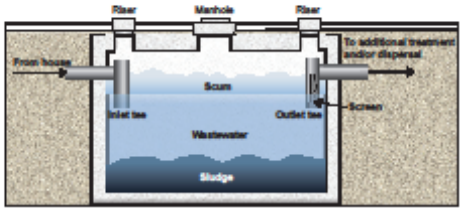
What is a Septic System?



Source: Michael P. Vogel, Montana State University

A septic system is a form of wastewater treatment commonly used in areas where connection to a municipal wastewater system is not practical. The system consists of piping, a septic tank, a drainfield, and the soil.

The septic tank holds the wastewater long enough for solids to settle into a sludge at the bottom of the tank, while oils and greases float to the top, forming a scum. Bacteria in the tank consume a small amount of waste as nutrients.

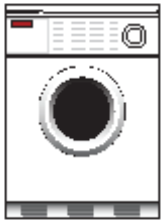


Tank effluent flows to a drainfield where pipes below the surface distribute the wastewater throughout the drainfield. The wastewater then percolates through the soil. As the wastewater moves through the soil, some waste products adsorb to soil particles, while microorganisms in the soil ingest other waste products, providing final treatment of the wastewater.

Caring for Your Septic System

Properly designed and constructed, your septic system can greatly reduce the environmental impacts of household wastewater, but proper system operation requires some routine maintenance and care:

- **Have your septic system inspected** by a qualified professional at least every 3 years—every year if your system has electrical components—and have the tank pumped when necessary.
- **Pump a septic tank** at least every 3–5 years (recommended) depending on use and sludge depth within the septic tank.
- **Use water efficiently.** Excessive flows can overload the septic system, causing wastewater to back up into the house or yard.
  - Use the proper load size when washing clothes, and avoid doing all the laundry in one day.
  - Do not empty your hot tub into the septic system.
  - Consider replacing older toilets and inefficient showerheads with more efficient models.



- **Do not flush materials** that can clog your septic system, such as diapers, cat litter, cigarette filters, coffee grounds, feminine hygiene products, cotton swabs, dental floss, and paper towels.
- **Do not pour toxic chemicals down the drain.** Household chemicals, paints, gasoline, and pesticides can harm or kill the bacteria that digest and treat waste.
- **Minimize using (or eliminate) your garbage disposal.** Kitchen scraps significantly increase sludge and scum in your septic tank, requiring more frequent pumping. Compost these wastes instead.
- **Dispose of old medicines,** such as antibiotics in the trash; medicines may kill the bacteria in your septic tank if flushed and result in ground water contamination.

Giving Your Septic System More Life

The typical functioning life of a septic system is 20 years. To enhance the life of your system,

- **Add an effluent filter.** An effluent filter, placed in the septic tank outlet baffle or tee, prevents excess solids from flowing to and clogging the drainfield.
- **Protect your system's drainfield.** Plant only grass on top, never drive or park vehicles on the drainfield, and direct roof drains, basement sump pump flows, and other drainage systems away from the drainfield.
- **Add a washing machine filter.** Washing machine filters trap lint and fibers that may accumulate in the septic tank and drainfield. If these fibers discharge to the drainfield, they will cause premature failure.

Idaho Deparment of Environmental Quality
www.deq.idaho.gov

Septic Systems and Drainfields: *What You Need to Know*



For homeowners, real estate professionals, and developers.

What is a Septic System?

A septic system is a form of wastewater treatment commonly used in areas where connection to a municipal wastewater system is not practical. The system consists of piping, a septic tank, a drainfield, and the soil.

The septic tank holds the wastewater long enough for solids to settle into a sludge at the bottom of the tank, while oils and greases float to the top, forming a scum. Bacteria in the tank consume a small amount of waste as nutrients.

Tank effluent flows to a drainfield where pipes below the surface distribute the wastewater throughout the drainfield. The wastewater then percolates through the soil. As the wastewater moves through the soil, some waste products adsorb to soil particles, while microorganisms in the soil ingest other waste products, providing final treatment of the wastewater.



Questions to Ask When Planning a Septic System

If you are planning a home that will use a septic system, now is the perfect time to ask questions that can head off costly modifications and repairs later:

- **Is the system appropriately sized?** The tank should be large enough to hold at least two days of waste flow—at least 1,000 gallons for a three-bedroom with four occupants.
- **Is the lot appropriate for a septic system?** Sufficient room should be available for a septic tank, drainfield, and one replacement drainfield area. Evaluate the site for the following:
  - Topography—properties with ridges, knolls, and numerous slopes may not be suitable.
  - Soils—soil must have the capacity to accept and treat the volume of wastes anticipated.
  - Ground water—areas with high ground water may not be suitable.
- **What will it cost to add a second drainfield?** State regulations require a reserve area for a future drainfield when the first drainfield reaches the end of its useful life. Adding a replacement drainfield during initial construction may only cost a fraction of installing one later. Plus, having the capability to switch the drainfields annually ensures that the resting drainfield is dry and ready to receive wastewater.

Caring for Your Septic System

Properly designed and constructed, your septic system can greatly reduce the environmental impacts of household wastewater, but proper system operation requires some routine maintenance and care:

- **Have your septic system inspected** by a qualified professional at least every 3 years—every year if your system has electrical components—and have the tank pumped when necessary.
- **Pump a septic tank** at least every 3–5 years (recommended) depending on use and sludge depth within the septic tank.
- **Use water efficiently.** Excessive flows can overload the septic system, causing wastewater to back up into the house or yard.
  - Use the proper load size when washing clothes, and avoid doing all the laundry in one day.
  - Do not empty your hot tub into the septic system.
  - Consider replacing older toilets and inefficient showerheads with more efficient models.
- **Do not flush materials** that can clog your septic system, such as diapers, cat litter, cigarette filters, coffee grounds, feminine hygiene products, cotton swabs, dental floss, and paper towels.
- **Do not pour toxic chemicals down the drain.** Household chemicals, paints, gasoline, and pesticides can harm or kill the bacteria that digest and treat waste.
- **Minimize using (or eliminate) your garbage disposal.** Kitchen scraps significantly increase sludge and scum in your septic tank, requiring more frequent pumping. Compost these wastes instead.
- **Dispose of old medicines**, such as antibiotics in the trash; medicines may kill the bacteria in your septic tank if flushed and result in ground water contamination.









For More Information

https://www.deq.idaho.gov/water-quality/wastewater/septic-and-septage/
https://www.epa.gov/septic/how-your-septic-system-works
https://phd3.idaho.gov/licensing-permitting/septic-land-development/

4/5/2021

15 Idaho Environmental Guide: A Resource for Local Governments

The *Idaho Environmental Guide* is a resource for local government officials to assist in managing a community's environmental responsibilities. Local government officials should consult this guide before approving projects to understand and consider impacts to air, water, and/or land potentially affecting the health, welfare, and sustainability of communities within their jurisdiction. The *Idaho Environmental Guide* is informational and should be used in strategic planning for environmental issues. This guide is not an all-encompassing summary of state and federal rules and regulations.

This page intentionally left blank for correct double-sided printing.

16 References

Cohen, B. and R. Wiles. 1996. *Nitrate Contamination of Drinking Water*. Environmental Working Group. *https://www.ewg.org/agmag/1996/02/nitrate-contamination-drinking-water*

DEQ (Idaho Department of Environmental Quality). 2001. *Nitrates in Ground Water: A Continuing Issue for Idaho Citizens*. Boise, ID: DEQ. Ground Water Quality Information Series No. 1.

DEQ (Idaho Department of Environmental Quality). 2008. *Idaho Ground Water Protection Interagency Cooperative Agreement*. Boise, ID: DEQ.

DEQ (Idaho Department of Environmental Quality). 2020. *Idaho Ground Water Protection Interagency Cooperative Agreement*. Boise, ID: DEQ. *https://www2.deq.idaho.gov/admin/LEIA/api/document/download/15310*

Digital Atlas of Idaho. 2002. *Geologic Maps of Idaho*. Canyon County. *http://imnh.isu.edu/digitalatlas/counties/geomaps/geomap.htm*

Ground Water Quality Council. 1996. *Idaho Ground Water Quality Plan*. Boise, ID. *https://www2.deq.idaho.gov/admin/LEIA/api/document/download/14925*

Idaho Department of Water Resources, Idaho Environmental Data Management System. *https://data-idwr.opendata.arcgis.com/pages/popular-maps*

Jensen, S. 2002. Quotes and information taken from a presentation given to the Scott Creek/Mann Creek Ground Water Committee on April 10, 2002. Boise, ID: Adams County Cooperative Extension Service.

Mahler, R.L., A. Colter, and R. Hirnyck. 2007. *Nitrate and Groundwater*. Moscow, ID: University of Idaho Extension, Idaho Agricultural Experiment Station, College of Agriculture and Life Sciences. Current Information Series (CIS) 872.

Pitt, R., K. Parmer, S. Clark, and R. Field. 1994. *Potential Groundwater Contamination from Intentional and Nonintentional Stormwater Infiltration-1993 Research Project*. Cooperative Agreement No. CR 819573 EPA/600/SR-94/051. Storm and Combined Sewer Pollution Control Program US. EPA. Cincinnati, OH. Avail. from NTIS (703) 487-0650.

Scalf, M., W. Dunlap, and J. Kreissl. 1977. *Environmental Effects Of Septic Tank Systems*. US Environmental Protection Agency, Washington, D.C. EPA/600/3-77/096 (NTIS PB272702).

Wood S.H. 2005. *Lower Boise/Canyon County Ground Water Quality Management Plan.*