

Drinking Water Separation and Setback Design Guidance

State of Idaho
Department of Environmental Quality



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Prepared by

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Abbreviations, Acronyms, and Symbols

DEQ	Idaho Department of Environmental Quality
IDAPA	Numbering designation for Idaho administrative rules promulgated according to the Idaho Administrative Procedure Act
BMP	best management practice
psi	pound per square inch
PWS	public water system
LSAS	large soil absorption system

1 Introduction

Drinking water infrastructure separation and setback distances from features of concern are a requirement of the “Idaho Rules for Public Drinking Water Systems” (IDAPA 58.01.08) and are necessary to protect public health and safety. This document provides guidance to public water system (PWS) owners, engineers, contractors, and others needing to comply with separation and setback requirements for drinking water infrastructure.

1.1 How to Use this Guidance

This document includes separation and setback requirements for potable water lines, sources (e.g., wells and spring boxes), and storage reservoirs. This guidance is intended for design, construction, and maintenance of drinking water facilities to ensure separation requirements are met. System owners and engineers are encouraged to consult with the Idaho Department of Environmental Quality (DEQ) engineering staff early in the design process to facilitate compliance. DEQ regional office contacts and additional information, such as design checklists, are found at www.deq.idaho.gov under the *Engineering and Development* web page. IDAPA 58.01.08 can be found on the administrative rules web page <https://adminrules.idaho.gov/rules/current/58/> under the *Idaho Rules for Public Drinking Water Systems*.

1.2 Background

Separation and setback distances required by IDAPA 58.01.08 and further described in this document are generally based on industry specific standards and common engineering practices. Separation and setback distances have generally been established based on constructability, operation and maintenance, and long-term replacement considerations and are intended to reduce the risk of contamination. American Water Works Association, Recommended Standards for Water Works (commonly known as Ten States Standards), and Idaho Standards for Public Works Construction should be consulted for additional background information. In the case of conflict, requirements of IDAPA 58.01.08 will supersede.

2 Potable Water Line Separation

Pipeline failures or unintentional cross connection can result in drinking water contamination, posing risks to public health and safety. Proper separation of potable water lines from potential sources of contamination helps to mitigate these risks. This section addresses the required and recommended separation distances of potable water lines from common sources of contamination.

2.1 Separation from Non-potable Pipelines

Separation requirements between potable pipelines (drinking water lines) and non-potable pipelines (wastewater, stormwater, recycled water, or other non-potable fluids heavier than air) are specified in IDAPA 58.01.08.542.07. Separation requirements are divided into two main categories: (1) *horizontal separation* and (2) *vertical separation*. Within these two categories, separation requirements for pipelines are further divided into either (1) mains (both potable and non-potable) or (2) service lines (both potable and non-potable). Mains generally provide service to multiple customers (service connections), while a service line provides service to a single homeowner or customer. When determining review authority for service lines, DEQ uses the most recent version of the “Memorandum of Understanding with the Plumbing Bureau” which can be viewed at www.deq.idaho.gov found on the [Guidance](#) web page.

2.1.1 Horizontal Pipeline Separation

Horizontal separation distances are unique to the type of pipeline (e.g., mains versus service lines). Table 1 provides specific requirements for each type of pipeline and of the three distinct horizontal separation zones for pipelines. [Figure 1](#) provided in Attachments shows the same information graphically.

Table 1. Horizontal pipeline separation requirements. ^a

Pipeline Type	Separation Zone	Separation Distance	Requirements	
Mains: Potable mains in relation to non-potable mains	Zone 1	Greater than 10 feet	Separate trenches	
			No other special requirements	
	Zone 2	Between 6 and 10 feet	Separate trenches	
			Bottom of potable main above the top of the non-potable main	
			Non-potable main constructed with water class pipe ^b	
	Zone 3	Less than 6 feet	Separate trenches	
			Design engineer must submit documentation to DEQ for approval, showing alternative separation will protect public health and the environment	
	Service Lines: Potable services in relation to non-potable pipelines or Non-potable services in relation to potable pipelines	Zone 1 and 2	Greater than 6 feet	Separate trenches
				No other special requirements
Zone 3		Less than 6 feet	Separate trenches	
			Design engineer must submit documentation to DEQ for approval, showing alternative separation will protect public health and the environment	
Pressurized Non-potable: Pressure non-potable pipelines in relation to any potable pipelines	Zone 1	Greater than 10 feet	Separate trenches	
			No other special requirements	
	Zone 2 and 3	Less than 10 feet	Not allowed ^c	

a. Requirements found in IDAPA 58.01.08.542.07
b. Potable water pipe standards include, but are not limited to, working pressure rating greater than 150 pounds per square inch (psi), or minimum wall thickness ratio of DR 25 or less, unless otherwise approved by DEQ.
c. Section 5 discusses a waiver for engineering design standards.

2.1.2 Vertical Pipeline Separation

Vertical separation distances must be maintained at pipeline crossings and are similar for pipeline types (e.g. mains versus service lines). Table 2 provides specific requirements for each separation zone. Figure 2 provided in Attachments shows the same information graphically.

2.1.3 Raw Water Pipelines

Raw water pipelines are used to convey groundwater, spring water, or surface water prior to treatment that produces potable water. IDAPA 58.01.08.542.07 requires raw water pipelines meet equivalent horizontal and vertical separation distances from both potable and non-potable pipelines as discussed in sections 2.1.1 and 2.1.2.

2.1.4 Alternative Separation Distances

Alternative separation distances may be considered by DEQ on a case-by-case basis according to IDAPA 58.01.08.542.07.a. For consideration of alternative separation distances, the design engineer must submit documentation to DEQ certifying that the proposed installation will protect public health and the environment. PWS owners and design engineers should consult with DEQ engineering staff prior to the design process to establish the type and extent of documentation that will be required if alternative separation distances are sought.

Documentation should include, but may not be limited to, the following:

- Project background and constraints necessitating alternative separation distances (such as existing features of concern or increases in project costs).
- Proposed alternative horizontal and vertical separation distances that will be maintained throughout the installation.
- Physical conditions that support alternative separation distances (such as soil type, groundwater elevations, and topography).
- Design features intended to mitigate public health and environmental risk (such as pipe material, pipe elevations, trench cutoffs, and pipe marking).
- Constructability and long-term operation and maintenance considerations.

Typically, alternative separation distances are considered appropriate for pipeline projects constructed within existing, narrow utility corridors. Greenfield projects, such as new developments, are not typically considered appropriate for alternative separation distances. In addition, alternative separation distances cannot be approved for construction by qualified professional engineer (QLPE) process outlined in IDAPA 58.01.08.504.3.b.

Table 2. Vertical pipeline separation requirements. ^a

Crossing Configuration ^b	Separation Zone	Separation Distance	Requirements
Potable pipeline crosses ABOVE non-potable pipeline	Zone 1	Greater than 18 inches	Potable pipeline joints as far as possible from the non-potable pipeline. (One full length of potable pipe or non-potable pipe centered over the crossing.)
	Zone 2	Less than 18 inches	Potable pipeline joints as far as possible from the non-potable pipeline. (One full length of potable pipe or non-potable centered over the crossing.)
			Non-potable pipeline constructed with potable water pipe and pressure tested for water tightness for a horizontal distance of 10 feet on both sides of the crossing ^c , OR Non-potable pipeline or potable pipeline must be cased in a larger diameter carrier pipe for a horizontal distance of 10 feet on both sides of the crossing. (Use of hydraulic cementitious materials is not allowed as a substitute.)
			Non-potable pressure pipelines cannot be installed in this zone ^d
Potable pipeline crosses BELOW non-potable pipeline	Zone 3	Less than 18 inches	The non-potable pipeline must be supported through the crossing to prevent settling.
			Potable pipeline joints as far as possible from the non-potable pipeline. (One full length of potable pipe or non-potable centered over the crossing.)
			Non-potable pipeline constructed to potable water pipe standards and pressure tested for water tightness for a horizontal distance of 10 feet on both sides of the crossing ^c , OR Non-potable pipeline or potable main must be cased in a larger diameter carrier pipe for a horizontal distance of 10 feet on both sides of the crossing. (Use of hydraulic cementitious materials is not allowed as a substitute.)
			Non-potable pressure pipelines cannot be installed in this zone. ^d
	Zone 4	Greater than 18 inches	The non-potable pipeline must be supported through the crossing to prevent settling.
			Potable pipeline joints as far as possible from the non-potable pipeline. (One full length of potable pipe or non-potable pipe centered over the crossing.)

a. Requirements found in IDAPA 58.01.08.542.07

b. All potable to non-potable pipeline crossings must be perpendicular, unless otherwise approved by DEQ.

c. Water class pipe standards include, but are not limited to, working pressure rating greater than 150 psi, or wall thickness ratio of DR 25 or less, unless otherwise approved by DEQ.

d. Section 5 discusses a waiver for engineering design standards.

2.2 Separation from Storm Water and Surface Water

In addition to traditional storm sewers (non-potable pipelines described in sections 2.1.1 and 2.1.2), various stormwater collection and disposal features should be considered in relation to potable pipelines. IDAPA 58.01.08.542.08 acknowledges the need for guidance when establishing stormwater setback distances. This section provides recommendations for separation distances between stormwater features and potable pipelines. For projects not meeting recommended separation distances, consult DEQ to determine if alternative separation distances are appropriate and what level of documentation will be required.

Table 3 summarizes DEQ's recommended potable pipeline separation from common stormwater and surface water features. This list is not inclusive of all features but represents those most commonly encountered. The best management practice (BMP) reference numbers in Table 3 are found in the *Idaho Catalog of Storm Water Best Management Practices* found at www.deq.idaho.gov.

Table 3. Recommended horizontal separation distances from stormwater features and surface water.

Facility Type	Examples of Facility Type	Recommended Separation Distance
Surface water	Rivers, creeks, canals, irrigation ditches	10 feet
Stormwater filters	BMP 9: Vegetated (biofiltration) swale BMP 10: Bioinfiltration swale BMP 11: Vegetated filter strip Continuous roadside infiltration ditches or perforated drainpipe	5 feet
Stormwater filters	BMP 12: Sand filter BMP 13: Catch-basin insert BMP 14: Media filter	10 feet
Subsurface infiltration facilities	BMP 17: Infiltration trench	25 feet
Subsurface infiltration facilities	BMP 18: Bioretention basin	10 feet
Lined detention facilities	BMP 22: Wet pond Water amenities and constructed wetlands that receive stormwater	10 feet
Unlined intermittent detention facilities	Dry extended detention pond	10 feet
Unlined continuously wet detention facilities	Biodetention pond	25 feet
Stormwater piping, pretreatment, and other structural controls	BMP 15: Oil and water separators BMP 16: Centrifugal or vortex separation structures Catch basins and other control structures	10 feet

2.3 Separation from Wastewater Facilities

IDAPA 58.01.08.542.08 requires that a minimum horizontal distance of 25 feet must be maintained between all potable water pipelines and a septic tank or subsurface wastewater disposal system. DEQ recommends that wastewater features, such as wastewater pump stations, and wastewater treatment plants, maintain 25 feet of separation distance from potable pipelines when practical. Recycled water pipe is considered non-potable pipeline and must meet the separation requirements in sections 2.1.1 and 2.1.2. For additional details, consult the “Recycled Water Rules” (IDAPA 58.01.17.605.01) found at the administrative rules web page, available at <https://adminrules.idaho.gov/rules/current/58/580117.pdf>.

2.4 Separation from Other Features of Concern

Other features of concern to consider when designing and constructing potable pipelines include permanent structures, property lines, rights-of-way, utility corridors, and other features that may impede future access to pipelines. IDAPA 58.01.08.542.11 requires a minimum separation of 5 feet between potable pipelines and buildings, industrial facilities, and other permanent structures. No specific separation requirement is given for property lines or rights-

of-way; however, DEQ recommends maintaining a minimum separation of 10 feet when possible. DEQ recommends a minimum of 5 feet separation from common service utilities (e.g., electric, internet, and gas).

Local jurisdictions, such as county or city codes, may have additional separation requirements. System owners and engineers should exercise foresight when planning, designing, and relocating potable pipelines to ensure proper constructability and long-term maintenance access.

3 Drinking Water Source Setbacks

PWSs rely on groundwater wells, surface water, and spring sources to provide safe and reliable drinking water to the public. Protecting these drinking water sources from contamination is crucial to ensure safe drinking water. Potential sources of contamination, such as wastewater, stormwater, agricultural activities, livestock, urban development, chemicals, or other hazardous materials, can pose a risk to public health and safety. Proper drinking water source setbacks are required to prevent contamination of drinking water sources. This section addresses the required and recommended minimum setback distances of drinking water sources including wells, spring boxes, and storage reservoirs.

3.1 Well Heads

Many PWSs in Idaho utilize groundwater wells to supply potable water needs. Table 4 presents the required setbacks for a well head according to IDAPA 58.01.08.510.02. In addition to the requirements found in Table 3, the Idaho Department of Water Resources oversees the construction of all groundwater wells (including public drinking water wells) through the “[Well Construction Standards Rules](#)” (IDAPA 37.03.09). IDAPA 37.03.09.025 specifies various setback distances for well heads and should be consulted in combination with this guidance. In the case of a conflict, the most stringent well head setback distance for a public water system should be applied.

Table 4. Minimum distance from a PWS well. ^a

Feature of Concern	Separation Distance
Frost free hydrant	5 feet
Any potential source of contamination	50 feet
Property line	50 feet
Livestock	50 feet
Gravity wastewater line	50 feet
Class A recycled water pressure distribution line	50 feet
Canals, streams, ditches, lakes, ponds, and tanks used to store non-potable substances	50 feet
Stormwater facilities disposing stormwater originating off the well lot	50 feet
Pressure wastewater line	100 feet
Individual home septic tank	100 feet
Individual home disposal field	100 feet
Individual home seepage pit	100 feet
Privies	100 feet
Drain field – standard subsurface disposal module	100 feet
Absorption module – large soil absorption system (LSAS) ^b	150–300 feet See IDAPA 58.01.03
Municipal or industrial wastewater treatment plant	500 feet
Recycled water reuse sites ^c	See IDAPA 58.01.17
Biosolids application site	1,000 feet
<p>a. Requirements found in IDAPA 58.01.08.510.02</p> <p>b. Large soil absorption systems (LSAS) have different setback requirements based on the sewage volumes and soil types. Consult IDAPA 58.01.03.013.04 to determine the required setback distance.</p> <p>c. Setback distances from recycled water facilities are based on buffer distance requirements found in IDAPA 58.01.17.604.02 and included in the recycled water permit. Consult DEQ to determine the required setbacks contained in the recycled water permit.</p>	

3.2 Spring Boxes

Spring boxes are permanent structures intended to protect spring water sources from contamination including the exclusion of surface water, animals, and dust. Spring boxes must meet the design requirements of IDAPA 58.01.08.514, which references criteria found in IDAPA 58.01.08.544 for finished water storage reservoirs. For this guidance, spring boxes should meet the criteria outlined for partially buried storage reservoirs listed under IDAPA 58.01.08.544. Specific setback distances are provided in section 4 of this guidance document. In addition, IDAPA 58.01.08.514.05 requires the entire area within a 100-foot radius of the spring box must be owned by the PWS or controlled by a long-term lease.

4 Finished Water Storage Separation

Separation distances also need to be considered in design and construction for drinking water finished water storage structures. Proper separation distances of these facilities prevent contamination and ensure public health and safety. Table 5 presents the required separation distances for storage facilities as found in IDAPA 58.01.08.544.02.

Table 5. Minimum separation distances from finished water storage structures.

Features of Concern	Storage Facility Type			
	Belowground	Partially Buried (or Spring Box)	Ground Level	Aboveground
Non-potable pipelines	50	50	—	—
Non-potable pipelines constructed of water class pipe	20	20	—	—
Standing water	50	50	50	—
Possible sources of contamination	50	50	20	20
Nearest property line	50	50	20	20
Municipal or industrial wastewater treatment plant	500	500	500	500
Land irrigated with recycled water or used for sludge disposal	500	500	500	500

In addition to horizontal separation distances listed in Table 4, the bottom elevation of belowground and partially buried storage facilities must be above the seasonal, high groundwater table. Partially buried storage facilities may not be less than two feet above the normal ground surface.

5 How to Apply for a Waiver

IDAPA 58.01.08.004 provides DEQ with the authority to waive design requirements, including separation and setback distances, if it can be shown to DEQ’s satisfaction that the requirement is not necessary for the (1) protection of public health, (2) protection from contamination, and (3) satisfactory operation and maintenance. System owners and engineers seeking a waiver must consult with DEQ early in the design process to ascertain if a waiver would be supported by DEQ, and if so, to establish the extent of documentation that would be required. The PWS owner must submit an [Engineering Waiver Application Form for Drinking Water and Wastewater](#) located at www.deq.idaho.gov. The waiver form must include documentation certifying that the proposed installation will protect public health and the environment. If a waiver is issued by DEQ, the final design must incorporate the requirements and conditions of the waiver into the final design and construction.

6 Conclusion

Separation and setback distances for drinking water facilities are an effective strategy in reducing the risk of drinking water contamination. The design and construction of new facilities must consider and follow the required distances to maintain the quality of drinking water and the health and safety of the public. In cases where the required distances cannot be reasonably met or are not feasible, coordinating with DEQ is essential to effectively reduce the risk of contamination and protect public health and the environment.

References

- DEQ (Idaho Department of Environmental Quality). 2020. Idaho Catalog of Storm Water Best Management Practices. Boise, ID: DEQ.
- IDAPA. 2024. "Individual/Subsurface Sewage Disposal Rules and Rules for Cleaning of Septic Tanks." Idaho Administrative Code. IDAPA 58.01.03.
- IDAPA. 2024. "Idaho Rules for Public Drinking Water Systems." Idaho Administrative Code. IDAPA 58.01.08.
- IDAPA. 2024 "Wastewater Rules." Idaho Administrative Code. IDAPA 58.01.16.
- IDAPA. 2024 "Recycled Water Rules." Idaho Administrative Code. IDAPA 58.01.17.
- IDAPA. 2023. "Well Construction Standards Rules." Idaho Administrative Code. IDAPA 37.03.09.

Attachments – Pipeline Separation Graphics

Figure 1. Horizontal pipeline separation zones.

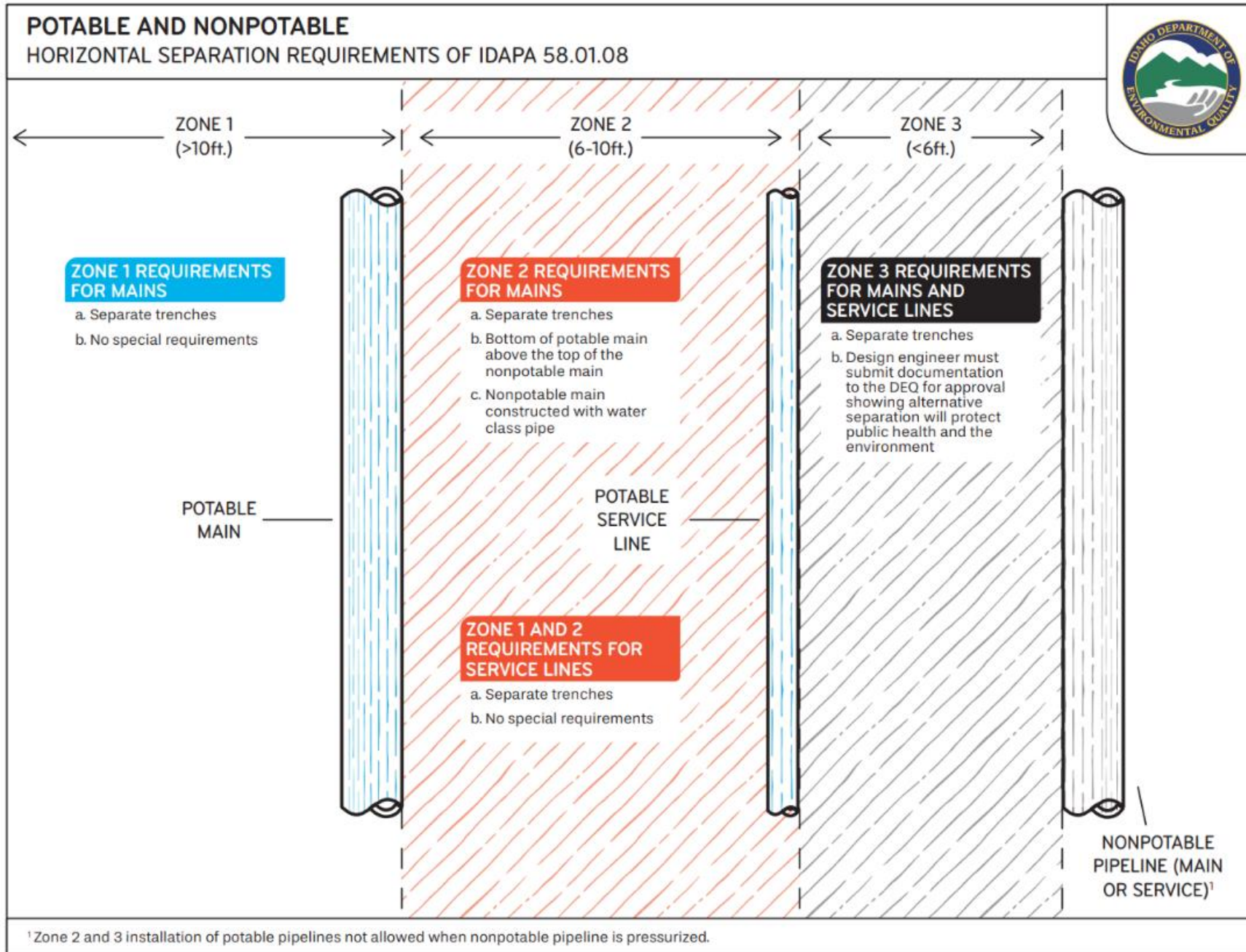


Figure 2. Vertical pipeline separation zones.

