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4.0 EXISTING RESOURCE INFORMATION

4.1 Geologic, Hydrologic and Meteorological Conditions

4.1.1 MRPDC

The MRPDC region ranges across the Piedmont Physiographic Province in the southeastern portion of the region to the Blue Ridge and Valley and Ridge Physiographic Provinces to the west. The underlying geology affects the availability and quality of water resources.

Blue Ridge and Piedmont Physiographic Provinces

Both the Blue Ridge and Piedmont areas are primarily underlain by crystalline (igneous and metamorphic) rocks. Regolith, which consists of saprolite, colluvium, alluvium, and soil, overlies the crystalline rock throughout the region. Because of the varied nature of the regolith in thickness, composition, and grain size, its hydraulic properties also vary greatly. However, the regolith is more permeable than the underlying bedrock in which the only effective porosity is through fractures.

Recharge of aquifers is highly variable in the Blue Ridge and Piedmont provinces since it is primarily determined by local precipitation and runoff, which are influenced by both topography and surface infiltration. The western part of the Piedmont Province (spanning from North Carolina to central Virginia) is in the rain shadow of the Blue Ridge Mountains; this area receives less precipitation than other areas of Virginia. Well yields for all types of crystalline rocks are generally small; however, coarse-textured crystalline rocks, such as gneiss and schist generally yield more water than fine-grained metavolcanic rocks. Regardless, water is primarily transported through fracture zones in these types of rocks. The majority of water is stored in the regolith (thick or thin), from which water moves downward and is stored in bedrock fractures (which generally decrease with depth). The thicker the regolith, the greater the volume of water in storage, and the more likely the well can sustain its yield. Conversely, a well drilled in an area of thin regolith overlying crystalline rock is more likely to go dry during the summer months. Fracture traces or lineaments can often be identified using aerial photography to aid in siting higher yield wells.

The Piedmont Physiographic Province contains a diverse geology; therefore, there are wide variations in groundwater quality and yields. In areas with hard crystalline rocks, groundwater occurs in faults and fractures within 300 ft of the surface; well yields in such areas are typically 3 to 20 gpm. The quality of groundwater in areas of crystalline bedrock is generally good, although the groundwater at some localities may be acidic and have a high iron content. The pollution potential with such hydrogeology is moderate to low.

The Blue Ridge Physiographic Province is a relatively narrow, mountainous region underlain by granite, gneiss, and marble. The province is characterized by rapid surface runoff and low aquifer recharge. Groundwater use in the Blue Ridge is generally limited to domestic wells, which produce less than 20 gpm. The groundwater is typically of good quality although it may be locally high in iron, manganese, or sulfate content. The groundwater pollution potential in this area is low.

The crystalline and undifferentiated sedimentary rocks of the Piedmont and Blue Ridge aquifers generally have low dissolved solids contents, water is considered soft. The median hydrogen ion concentration, measured in pH units, is 6.7; therefore, the aquifers tend to be slightly acidic.

Valley and Ridge Physiographic Province

The Valley and Ridge is composed of limestone, dolomite, shale and sandstone. In areas underlain by limestone the groundwater is generally hard and calcium-rich; groundwater in areas underlain by shale is normally sulfurous and iron-bearing; in areas underlain by sandstone groundwater is generally of good quality. Sources of groundwater in the Valley and Ridge are fractured sandstone and cavernous limestone with recharge through precipitation and surface streams. Limestone aquifers may yield up to 3000 gpm, whereas yields from sandstone and shale aquifers are normally 5 to 100 gpm, only sufficient for rural or domestic use. The limestone areas are subject to the development of karst topography including the development of sinkholes, subsidence and cave openings. Surface streams in these areas often flow into underground caverns; therefore, the potential for pollution of groundwater resources is very high. These streams recharge the aquifers and thereby provide direct conduits for pollutants to the subsurface.

4.1.1.1 Bland County

Bland County is located in the Valley and Ridge Physiographic Province. A geologic map of Bland County is included as **Figure 4 (Appendix A)**.

The majority of Bland County is in the Middle New River watershed with a small portion in the southwestern section of the County in the North Fork Holston watershed. A map showing the watersheds for the MRPDC region is included as **Figure 24 (Appendix A)**.

The average annual temperature in Bland County is approximately 52 degrees Fahrenheit (°F). July is typically the warmest month, averaging 71°F, and January is typically the coldest, averaging 33°F. The average annual rainfall is approximately 37.5 inches and the average annual snowfall is approximately 19.8 inches.

4.1.1.2 Carroll County, including the Town of Hillsville and City of Galax

Carroll County is located principally in the Blue Ridge Physiographic Province. A geologic map of Carroll County is included as **Figure 5 (Appendix A)**.

The majority of Carroll County is the Upper New River watershed with a small portion in the southern section of the County in the Upper Yadkin watershed. A map showing the watersheds for the MRPDC region is included as **Figure 24 (Appendix A)**.

Carroll County has a moderate climate with distinct seasonal changes. The average annual rainfall is approximately 41 inches and the average annual snowfall is approximately 20 inches.

The average annual temperature in the City of Galax is approximately 52°F. July is typically the warmest month, averaging 70°F, and January is typically the coldest, averaging 33°F. The average annual rainfall is approximately 41 inches and the average annual snowfall is approximately 23 inches.

4.1.1.3 Grayson County, including the City of Galax and towns of Fries, Independence, and Troutdale

Grayson County is located in the Blue Ridge Physiographic Province. A geologic map of Grayson County is included as **Figure 6 (Appendix A)**.

Grayson County crosses three major watershed areas. They are the Upper New, which drains Virginia, North Carolina, and Tennessee; the Upper Yadkin, which drains North Carolina and Virginia; and the South Fork Holston, which drains Virginia, Tennessee, and North Carolina. The largest drainage system crossing the County is the Upper New. A map showing watersheds in the MRPDC region is included as **Figure 24 (Appendix A)**.

The New River has a median daily discharge of 1,623 cubic feet per second (cfs), and a minimum daily flow of 564 cfs near the City of Galax, which is approximately 6.5 miles upstream from the Town of Fries. A maximum-recorded discharge of 141,000 cfs occurred on Aug. 14, 1940. Other significant rivers and streams in the County include: Fox Creek, Elk Creek, Big Horse Creek, Helton Creek, Wilson Creek, Grassy Creek, Peach Bottom Creek, Brush Creek, Little River, Chestnut Creek, and Fisher River.

Grayson County has a temperate climate with distinct seasonal variations. Frontal air masses affect the climate with rapid and frequent weather changes because of the low- and high-pressure systems that move with the fronts. The general prevailing winds are from the southwest. The average annual precipitation is approximately 42 inches and the annual average snowfall is approximately 20 inches. The January average daily high is 46°F and the average daily low is 24°F. The July average daily high temperature is 82 °F and the average daily low is 64°F.

The average annual temperature in the City of Galax is approximately 52°F. July is typically the warmest month, averaging 70°F, and January is typically the coldest, averaging 33°F. The average annual rainfall is approximately 41 inches and the average annual snowfall is approximately 23 inches.

4.1.1.4 Smyth County, including the towns of Chilhowie, Marion, and Saltville

Smyth County is located principally in the Valley and Ridge Physiographic Province, with the exception of the extreme southern part of the County, which lies in the Blue Ridge Physiographic Province. A geologic map of Smyth County is included as **Figure 7 (Appendix A)**.

The three major streams in Smyth County are the North Fork, the Middle Fork, and the South Fork of the Holston River. The South Fork originates in southeastern Smyth County; the North Fork originates in Bland County; and the Middle Fork originates in Wythe County. Smith

County is located in the North Fork Holston and South Fork Holston watersheds. A map showing watersheds in the region is included as **Figure 24 (Appendix A)**.

Smyth County has a moderate climate. The average annual temperature is approximately 53°F. July is typically the warmest month, averaging 71°F, and January is typically the coldest, averaging 32°F. The average annual rainfall in Smyth County is approximately 46 inches. Average annual snowfall is 18 inches although the higher elevations in the County experience larger average accumulations.

4.1.1.5 Washington County, including the towns of Abingdon, Damascus, and Glade Spring

Washington County is located in the Valley and Ridge Physiographic Province. A geologic map of Washington County is included as **Figure 8 (Appendix A)**.

Washington County is located in the North Fork Holston and South Fork Holston watersheds. A map showing watersheds in the region is included as **Figure 24 (Appendix A)**.

The County is drained by the North, Middle, and South Forks of the Holston River as well as a tributary of the Tennessee River. Walker Mountain is the drainage divide between the North Fork of the Holston River and the Middle and South Forks of the Holston River.

The average annual temperature in Washington County is approximately 52°F. July is typically the warmest month, averaging 73°F, and January is typically the coldest, averaging 31°F. The average annual rainfall is approximately 45 inches and the average annual snowfall is approximately 15 inches.

4.1.1.6 Wythe County, including the towns of Rural Retreat and Wytheville

Wythe County is located in Valley and Ridge and Blue Ridge Physiographic Provinces. A geologic map of Wythe County is included as **Figure 9 (Appendix A)**.

Wythe County is located in the Upper New River watershed. A map showing watershed in the region is included as **Figure 24 (Appendix A)**.

The major sources of surface water in the County are the New River, Reed Creek, Cripple Creek, and their tributaries. A tributary stream of the Holston River flows through a small area of western Wythe County near the Smyth County border. The New River is the major drainage outlet in the County. Reed and Cripple creeks, the major tributaries of the river, drain most of the county. A small area in the western part of the county is drained by the Holston River.

Rural Retreat Lake, in the western portion of Wythe County, is the county's only major impoundment. This 90-acre artificial lake is owned by the Virginia Department of Game and Inland Fisheries (VDGIF).

Wythe County has a moderate climate. The average annual temperature is approximately 53°F. July is typically the warmest month, averaging 83°F and January is typically coldest, averaging 24°F. From 1930 to 2005, the average annual precipitation was approximately 37 inches. The annual average snowfall is approximately 19.8 inches.

4.1.2 Cumberland Plateau PDC

4.1.2.1 Geology

Regionally, the northern part of the planning district is located in the Appalachian Plateaus Physiographic Province. This area is locally referred to as the coalfields and consists of a dissected plateau of generally flat-lying sedimentary rock. The high relief is formed by long term erosion of deep stream valleys. Strata are mainly Mississippian and Pennsylvanian in age. The coalfields encompass Buchanan County, Dickenson County, and small northern portions of Russell and Tazewell counties.

The southern portions of Tazewell and Russell counties are located in the Valley and Ridge Physiographic Province. The rock ages typically range from middle Cambrian through early Mississippian. Limestones, dolomites, and shale predominate in the area. Local areas of Karst topography are found within the planning district. Karst topography is associated with the dissolution of carbonate rocks, and typically is characterized by sinkholes, caves, and underground drainage.

4.1.2.2 Hydrology

The groundwater and surface water uses in the Cumberland Plateau PDC are as follows:

Buchanan County utilizes groundwater wells and surface water intakes. The Buchanan County PSA operates the Kennel Gap WTP which receives water from the Lower Banner coal seam. Luke Prep Plant withdraws water from Well No. 1. The Dismal River is the source of water intakes for Vansant Coke Ovens and Vansant No. 2 Prep Plant. In addition to the Kennel Gap WTP supply, the Buchanan County PSA distributes treated water supplied from the John Flannagan Water Authority in Dickenson County.

Dickenson County utilizes groundwater wells and surface water sources. The John Flannagan Water Authority operates an intake on John Flannagan Reservoir. The Nora Prep Plant withdraws water from a well. Surface water intakes provide water to McClure No. 1 & Prep Plant (Caney Creek), Paramount Deep Mine 26 (Lick Fork), and Paramount Deep Mine 35 (Chaney Creek). Sandy Ridge water system is operated by the Dickenson County PSA and receives water from the Wise County PSA.

Russell County utilizes several groundwater wells and a surface water intake. The Town of Cleveland withdraws water from the Kiser Well and the Tank Hollow Falls Well. The Town of Honaker operates the Davis Well, Putnam Well, Joe Bill Well, and the New Garden Well. The Castlewood Water and Sewer Authority operates the Crystal Well, Seven Springs Wells No. 1 and No. 2, Sargent and White Springs, Seven Springs, and Lower Banner Mine Portal. The Russell County PSA operates Wells 27A and 30C. The Appalachian Detention Center uses Wells No. 1 and No. 2, Wallace Manor uses Strouth Wells No. 1 and No. 2, and Purcell Well. In addition, Mountain View Retirement Home utilizes one groundwater well. The Town of Lebanon receives water from a surface water intake on Big Cedar Creek. The Moss No. 3 Prep Plant receives water from Chaney Creek, and the Clinch River Power Plant receives water from the Clinch River. The Castlewood Water and Sewer Authority purchases water from the Town of St. Paul. Finally, the Russell County PSA purchases water from the Tazewell County PSA.

Tazewell County utilizes groundwater wells and surface water sources. The Tazewell County PSA receives water from Lake Witten and Cox Reservoir. The Tazewell County PSA withdraws from the Clinch River (Greater Tazewell Regional WTP) and from the Little River (Claypool Hill WTP). The PSA also uses Taylor Well and Buskell Well to supply the Claypool Hill WTP. The Town of Bluefield withdraws from the Bluestone River and purchases water from Bluefield,

West Virginia, and the Town of Richlands withdraws from the Clinch River. The Town of Bluefield also uses Dill Springs. The Town of Pocahontas receives water from Big Spring. College Estates maintains a well, Barkay Estates utilizes Well No. 1, and the Porter Farm Subdivision Water Association receives water from Hollyfield Well and Byrd Well. The Coal Creek No. 3 Prep Plant withdraws water from Tiller Mine Well No. 1. Fincastle Country Club and Richwood Golf Club withdraw water from the Bluestone River. Outside water is conveyed by the Bluefield Valley Waterworks. The Tazewell County PSA purchases water from the Town of Richlands and sells to the Russell County PSA near Raven. The Tazewell County PSA also provides water to the Russell County PSA Rosedale/Belfast system from their Claypool Hill WTP.

4.1.2.3 Meteorological

The average daily high temperature is 44.5°F in January and 85.2°F in July. Average daily low temperature is 22.5°F in January and 61.8°F in July. Average rainfall in the Cumberland Plateau region is 43.48 inches per year.

4.1.3 LENOWISCO PDC

4.1.3.1 Geology

Regionally, the northern part of the planning district is located in the Appalachian Plateaus Physiographic Province. This area is locally referred to as the coalfields and consists of a dissected plateau of generally flat-lying sedimentary rock. Surface rocks primarily belong to the Norton and Wise Formations of lower and middle Pennsylvanian age. Bedrock in the coalfields consists of sandstone, siltstone, shale and coal. The coalfields encompass Norton, nearly all of Wise County, and the northern portions of Lee and Scott counties.

South of the St. Paul Fault in Scott County and the Pine Mountain thrust block in Lee County, the southern part of the planning district is located in the Valley and Ridge Physiographic Province. The rock ages typically range from middle Cambrian through early Mississippian. Limestones, dolomites, and shale predominate in the area. Local areas of karst topography are found within the planning district. Karst topography is associated with the dissolution of carbonate rocks, and typically is characterized by sinkholes, caves, and underground drainage.

4.1.3.2 Hydrology

The groundwater and surface water uses in the LENOWISCO PDC are as follows:

Scott County utilizes several groundwater wells and surface water intakes. The Town of Nickelsville currently owns and operates six wells located throughout the Town. Dungannon currently owns and operates two wells and with the Town of Clinchport owning two wells. There are also two private wells, the Lyn Mar Well and Red Hill Subdivision Well, located in Scott County that are considered a public water source. The Scott County PSA owns the Duffield WTP which receives water from the North Fork Clinch River and Spurlock Branch as well as the Moccasin Gap WTP, which receives water from Big Moccasin Creek. Big Moccasin Creek is also the water source for the Town of Gate City WTP. Outside sources of water are provided by the Bloomingdale Utility District and WCSA.

The City of Norton utilizes Benges Branch and Robinette Branch. Benges Branch is the source of water provided from the City of Norton Upper and Lower Reservoirs.

Lee County utilizes several springs, groundwater wells and surface water sources. The Town of Jonesville utilizes water from Wynn Spring. The Lee County PSA currently owns two WTPs which utilize water from the Blue Spring and KVS Quarry Reservoirs, which are considered a groundwater source. Pennington Gap utilizes water from the Powell River. A private well owned by the Harvest Baptist Child Ministries is considered a public source of water. Outside water is also provided from the Arthur-Shawnee Utility District.

Wise County utilizes several wells and surface water sources. The Wise County PSA and the Town of St. Paul currently utilize water from the Clinch River. They also own and operate a public well source (the Dunbar Well) located in the Dunbar section. The Town of Wise currently has two water sources, the Whiteoak Mine and the Wise Reservoir. The Town of Coeburn currently has two sources of water, Jenny Mine and Tom's Creek, which fills the Tom's Creek Reservoir. The Town of Appalachia utilizes water from the Big Cherry Reservoir, which is the head waters of the Powell River. The Town of Pound utilizes water from the Pound Reservoir. There are two wells, the High Knob well and the Hanging Rock well, that are owned and operated by the US Forest Service.

4.1.3.3 Meteorological Summary

Average Temperature is 55.9°F with an average temperature of 42.0°F in January and 74.9°F in July. Average rainfall in the LENOWISCO PDC is 41.24 inches per year.

4.2 Existing Environmental Conditions that Pertain to or May Affect In-Stream Flow, In-Stream Uses, and Sources that Provide the Current Supply

4.2.1 State or Federal Listed Threatened or Endangered Species or Habitats of Concern

4.2.1.1 MRPDC

Information on state or federal listed threatened and endangered species or habitats of concern for the MRPDC Region was collected from the Virginia Fish and Wildlife Information Service (VAFWIS). Species are listed as federal endangered (FE), federal threatened (FT), federal candidate (FC), federal species of concern (FS), state endangered (SE), state threatened (ST), and state special concern (SS). Federal species of concern and state special concern are not legal status and the list is maintained by the USFWS Virginia Field Office. The following tables summarize state and/or federal listed threatened or endangered species in Bland County; Carroll County, including the Town of Hillsville; Grayson County, including the City of Galax and the towns of Fries, Independence, and Troutdale; Smyth County, including the towns of Chilhowie, Marion, and Saltville; Washington County, including the City of Bristol and the towns of Abingdon, Damascus, and Glade Spring; and Wythe County, including the towns of Rural Retreat and Wytheville.

Table 4.2.1.1A: State or Federal Listed Threatened or Endangered Species in Bland County.

BOVA Code	Common Name	Scientific Name	Status
050023	Bat, Indiana	<i>Myotis sodalist</i>	FE, SE
050035	Bat, Virginia big-eared	<i>Corynorhinus</i> (= <i>Plecotus</i>) <i>townsendii virginianus</i>	FE, SE
010430	Dace, Tennessee	<i>Haliaeetus leucocephalus</i>	FT, ST
010199	Darter, candy	<i>Etheostoma osburni</i>	FS, SS
010357	Lamprey, mountain brook	<i>Ichthyomyzon greeleyi</i>	FS
020020	Hellbender, eastern	<i>Cryptobranchus alleganiensis alleganiensis</i>	FS, SS
050024	Myotis, eastern small-footed	<i>Myotis leibii</i>	FS
050081	Woodrat, Allegheny	<i>Neotoma magister</i>	FS
070116	Crayfish, Clinch River	<i>Cambarus angularis</i>	FS
070118	Crayfish	<i>Cambarus veteranus</i>	FS
100154	Butterfly, Persius duskywing	<i>Erynnis persius persius</i>	FS
100155	Skipper, Appalachian grizzled	<i>Pyrgus wyandot</i> (= <i>centaureae</i> Wyandot)	FS, ST
040267	Wren, Bewick's	<i>Thryomanes bewickii</i>	FE, SE

BOVA Code	Common Name	Scientific Name	Status
040292	Shrike, migrant loggerhead	<i>Lanius ludovicianus migrans</i>	FS, ST
040320	Warbler, cerulean	<i>Dendroica cerulean</i>	FS
100248	Fritillary, regal	<i>Speyeria idalia idalia</i>	FS
050106	Cottontail, Appalachian	<i>Sylvilagus obscurus</i>	FS
040293	Shrike, loggerhead	<i>Lanius ludovicianus</i>	ST
040293	Sandpiper, upland	<i>Bartramia longicauda</i>	ST
040129	Moorhen, common	<i>Gallinula chloropus cachinnans</i>	SS
040112	Nuthatch, red-breasted	<i>Sitta canadensis</i>	SS
040262	Creeper, brown	<i>Certhia americana</i>	SS
040264	Wren, sedge	<i>Cistothorus</i>	SS
040270	Flycatcher, alder	<i>Empidonax alnorum</i>	SS
040241	Harrier, northern	<i>Circus cyaneus</i>	SS
040094	Owl, northern saw-whet	<i>Aegolius aradicus</i>	SS
040213	Kinglet, golden-crowned	<i>Regulus satrapa</i>	SS
040285	Thrush, hermit	<i>Catharus guttatus</i>	SS
040278	Warbler, golden-winged	<i>Vermivora chrysoptera</i>	SS
040306	Warbler, magnolia	<i>Dendroica magnolia</i>	SS
040314	Warber, Swainson's	<i>Limnolophus swainsonii</i>	SS
040304	Dickcissel	<i>Spiza americana</i>	SS
040364	Finch, purple	<i>Carpodacus purpureus</i>	SS
040372	Crossbill, red	<i>Loxia curvirostra</i>	SS
050045	Otter, northern river	<i>Lontra canadensis lataxina</i>	SS
040266	Wren, winter	<i>Troglodytes troglodytes</i>	SS

Table 4.2.1.1B: State or Federal Listed Threatened or Endangered Species in Carroll County.

BOVA Code	Common Name	Scientific Name	Status
030061	Turtle, bog (=Muhlenberg)	<i>Clemmys (=Glyptemys) muhlenbergii</i>	FT, SE
040292	Shrike, migrant loggerhead	<i>Lanius ludovicianus migrans</i>	FS, ST
080003	Snaketail, pygmy	<i>Ophiogomphus howei</i>	FS
010363	Darter, Appalachia	<i>Percina gymnocephala</i>	FS
010195	Darter, Kanawha	<i>Etheostoma kanawhae</i>	FS
020020	Hellbender, eastern	<i>Cryptobranchus alleganiensis alleganiensis</i>	FS, SS
050024	Myotis, eastern small-footed	<i>Myotis leibii</i>	FS
050081	Woodrat, Allegheny	<i>Neotoma magister</i>	FS
070118	Crayfish	<i>Cambarus veteranus</i>	FS
010097	Minnow, Kanawha	<i>Phenacobius teretulus</i>	FS
040096	Falcon, peregrine	<i>Falco peregrinus</i>	ST
060081	Floater, green	<i>Lasmigona subviridis</i>	FS, ST
040320	Warbler, cerulean	<i>Dendroica cerulean</i>	FS
100248	Fritillary, regal	<i>Speyeria idalia idalia</i>	FS
040293	Shrike, loggerhead	<i>Lanius ludovicianus</i>	ST
040129	Moorhen, common	<i>Gallinula chloropus cachinnans</i>	SS
040112	Nuthatch, red-breasted	<i>Sitta canadensis</i>	SS
040262	Creeper, brown	<i>Certhia americana</i>	SS
040264	Wren, sedge	<i>Cistothorus</i>	SS
040238	Flycatcher, yellow-bellied	<i>Empidonax flaviventris</i>	SS
040241	Harrier, northern	<i>Circus cyaneus</i>	SS
040204	Owl, barn	<i>Tyto alba pratincola</i>	SS
040213	Kinglet, golden-crowned	<i>Regulus satrapa</i>	SS

BOVA Code	Common Name	Scientific Name	Status
040285	Thrush, hermit	<i>Catharus guttatus</i>	SS
040278	Warbler, golden-winged	<i>Vermivora chrysoptera</i>	SS
040306	Warbler, magnolia	<i>Dendroica magnolia</i>	SS
040314	Warbler, Swainson's	<i>Limnothlypis swainsonii</i>	SS
040304	Dickcissel	<i>Spiza americana</i>	SS
040241	Flycatcher, alder	<i>Empidonax alnorum</i>	SS
050045	Otter, northern river	<i>Lontra canadensis lataxina</i>	SS
040366	Finch, purple	<i>Carpodacus purpureus</i>	SS
040266	Wren, winter	<i>Troglodytes troglodytes</i>	SS

Table 4.2.1.1C: State or Federal Listed Threatened or Endangered Species in Grayson County.

BOVA Code	Common Name	Scientific Name	Status
050068	Squirrel, Virginia northern flying	<i>Glaucomys sabrinus fuscus</i>	FE, SE
030061	Turtle, bog (=Muhlenberg)	<i>Clemmys (=Glyptemys) muhlenbergii</i>	FT, SE
040292	Shrike, migrant loggerhead	<i>Lanius ludovicianus migrans</i>	FS, ST
080003	Snaketail, pygmy	<i>Ophiogomphus howei</i>	FS
010363	Darter, Appalachia	<i>Percina gymnocephala</i>	FS
010195	Darter, Kanawha	<i>Etheostoma kanawhae</i>	FS
020020	Hellbender, eastern	<i>Cryptobranchus alleganiensis alleganiensis</i>	FS, SS
050024	Myotis, eastern small-footed	<i>Myotis leibii</i>	FS
050081	Woodrat, Allegheny	<i>Neotoma magister</i>	FS
070118	Crayfish	<i>Cambarus veteranus</i>	FS
010097	Minnow, Kanawha	<i>Phenacobius teretulus</i>	FS
040096	Falcon, peregrine	<i>Falco peregrinus</i>	ST
060081	Floater, green	<i>Lasmigona subviridis</i>	FS, ST
040320	Warbler, cerulean	<i>Dendroica cerulean</i>	FS
100248	Fritillary, regal	<i>Speyeria idalia idalia</i>	FS
040293	Shrike, loggerhead	<i>Lanius ludovicianus</i>	ST
050106	Cottontail, Appalachian	<i>Sylvilagus obscurus</i>	FS
020078	Salamander, Weller's	<i>Plethodon welleri</i>	FS, SS
040267	Wren, Bewick's	<i>Thryomanes bewickii</i>	FS, SE
070116	Crayfish, Clinch River	<i>Cambarus angularis</i>	FS
020040	Salamander, pygmy	<i>Desmognathus wrighti</i>	SS
040238	Flycatcher, yellow-bellied	<i>Empidonax flaviventris</i>	SS
040241	Harrier, northern	<i>Circus cyaneus</i>	SS
040204	Owl, barn	<i>Tyto alba pratincola</i>	SS
040213	Kinglet, golden-crowned	<i>Regulus satrapa</i>	SS
040285	Thrush, hermit	<i>Catharus guttatus</i>	SS
040278	Warbler, golden-winged	<i>Vermivora chrysoptera</i>	SS
040306	Warbler, magnolia	<i>Dendroica magnolia</i>	SS
040314	Warbler, Swainson's	<i>Limnothlypis swainsonii</i>	SS
040304	Dickcissel	<i>Spiza americana</i>	SS
040241	Flycatcher, alder	<i>Empidonax alnorum</i>	SS
050045	Otter, northern river	<i>Lontra canadensis lataxina</i>	SS
040366	Finch, purple	<i>Carpodacus purpureus</i>	SS
040266	Wren, winter	<i>Troglodytes troglodytes</i>	SS
040129	Moorhen, common	<i>Gallinula chloropus cachinnans</i>	SS
040112	Nuthatch, red-breasted	<i>Sitta canadensis</i>	SS
040262	Creeper, brown	<i>Certhia americana</i>	SS

BOVA Code	Common Name	Scientific Name	Status
020045	Salamander, shovel-nosed	Desmognathus marmoratus	SS
040372	Crossbill, red	Loxia curvirostra	SS
050110	Mole, star-nosed	Condylura cristata parva	SS
040213	Owl, northern saw-whet	Aegolius acadicus	SS

Table 4.2.1.1D: State or Federal Listed Threatened or Endangered Species in Smyth County.

BOVA Code	Common Name	Scientific Name	Status
050068	Squirrel, Virginia northern flying	Glaucomys sabrinus fuscus	FE, SE
060036	Riffleshell, tan	Epioblasma florentina walkeri (=E. walkeri)	FE, SE
040292	Shrike, migrant loggerhead	Lanius ludovicianus migrans	FS, ST
060052	Pigtoe, shiny	Fusconaia cor (=edgariana)	FE, SE
060094	Pearlymussel, little-wing	Pegias fibula	FE, SE
010330	Chub, spotfin (=turquoise shiner)	Cyprinella (=Hybopsis) monacha	FT, ST
020020	Hellbender, eastern	Cryptobranchus alleganiensis alleganiensis	FS, SS
050024	Myotis, eastern small-footed	Myotis leibii	FS
050081	Woodrat, Allegheny	Neotoma magister	FS
070118	Crayfish	Cambarus veteranus	FS
060121	Kidneyshell, fluted	Ptychobranhus subtentum	FC
060139	Lilliput, purple	Toxolasma lividus	FS, SE
040096	Falcon, peregrine	Falco peregrinus	ST
060083	Pearlymussel, slabside	Lexingtonia dolabelliformis	FC, ST
040320	Warbler, cerulean	Dendroica cerulean	FS
100248	Fritillary, regal	Speyeria idalia idalia	FS
040293	Shrike, loggerhead	Lanius ludovicianus	ST
050106	Cottontail, Appalachian	Sylvilagus obscurus	FS
020078	Salamander, Weller's	Plethodon welleri	FS, SS
040267	Wren, Bewick's	Thryomanes bewickii	FS, SE
070116	Crayfish, Clinch River	Cambarus angularis	FS
060146	Bean, rayed	Villosa fabalis	FC
070010	Amphipod, James Cave	Stygobromus abditus	FS
060080	Heelsplitter, Tennessee	Lasmigona holstonia	FS, SE
060112	Clubshell, Tennessee	Pleurobema oviforme	FS
060069	Riversnail, spiny	Io fluviatilis	FS, ST
060050	Pigtoe, Tennessee	Fusconaia barnesiana	FS, SS
060004	Elktoe	Alasmidonta marginata	FS, SS
100001	Fritillary, Diana	Speyeria diana	FS
010075	Shiner, popeye	Notropis ariommus	FS, SS
010197	Darter, wounded	Etheostoma vulneratum	FS
010357	Lamprey, mountain brook	Echthyomyzon greeleyi	FS
010341	Logperch, blotchside	Percina burtoni	FS, SS
010342	Darter, longhead	Percina macrocephala	FS, ST
010430	Dace, Tennessee	Phoxinus tennesseensis	FS, SE
040385	Sparrow, Bachman's	Aimophila aestivalis	FS, ST
060007	Mussel, slippershell	Alasmidonta viridis	SE
010352	Darter, greenfin	Etheostoma chlorobranchium	ST
020040	Salamander, pygmy	Desmognathus wrighti	SS
040238	Flycatcher, yellow-bellied	Empidonax flaviventris	SS
040241	Harrier, northern	Circus cyaneus	SS
040204	Owl, barn	Tyto alba pratincola	SS

BOVA Code	Common Name	Scientific Name	Status
040213	Kinglet, golden-crowned	<i>Regulus satrapa</i>	SS
040285	Thrush, hermit	<i>Catharus guttatus</i>	SS
040278	Warbler, golden-winged	<i>Vermivora chrysoptera</i>	SS
040306	Warbler, magnolia	<i>Dendroica magnolia</i>	SS
040314	Warbler, Swainson's	<i>Limnolophus swainsonii</i>	SS
040241	Flycatcher, alder	<i>Empidonax alnorum</i>	SS
050045	Otter, northern river	<i>Lontra canadensis laticauda</i>	SS
040366	Finch, purple	<i>Carpodacus purpureus</i>	SS
040266	Wren, winter	<i>Troglodytes troglodytes</i>	SS
040129	Moorhen, common	<i>Gallinula chloropus cachinnans</i>	SS
040112	Nuthatch, red-breasted	<i>Sitta canadensis</i>	SS
040262	Creeper, brown	<i>Certhia americana</i>	SS
020045	Salamander, shovel-nosed	<i>Desmognathus marmoratus</i>	SS
040372	Crossbill, red	<i>Loxia curvirostra</i>	SS
050110	Mole, star-nosed	<i>Condylura cristata parva</i>	SS
040213	Owl, northern saw-whet	<i>Aegolius acadicus</i>	SS
010090	Shiner, mirror	<i>Notropis spectrunculus</i>	SS
010126	Stonecat	<i>Noturus flavus</i>	SS
010337	Darter, bluebreast	<i>Etheostoma caeruleum</i>	SS

Table 4.2.1.1E: State or Federal Listed Threatened or Endangered Species in Washington County.

BOVA Code	Common Name	Scientific Name	Status
050021	Bat, gray	<i>Myotis grisescens</i>	FE, SE
060036	Riffleshell, tan	<i>Epioblasma florentina walkeri</i> (=E. walkeri)	FE, SE
040292	Shrike, migrant loggerhead	<i>Lanius ludovicianus migrans</i>	FS, ST
060052	Pigtoe, shiny	<i>Fusconaia cor</i> (=edgariana)	FE, SE
060122	Rabbitsfoot, rough	<i>Quadrula cylindrica strigillata</i>	FE, SE
010330	Chub, spotfin (=turquoise shiner)	<i>Cyprinella</i> (=Hybopsis) <i>monacha</i>	FT, ST
020020	Hellbender, eastern	<i>Cryptobranchus alleganiensis alleganiensis</i>	FS, SS
050024	Myotis, eastern small-footed	<i>Myotis leibii</i>	FS
050081	Woodrat, Allegheny	<i>Neotoma magister</i>	FS
050130	Bat, Rafinesque's big-eared	<i>Corynorhinus rafinesquii rafinesquii</i>	FS
060121	Kidneyshell, fluted	<i>Ptychobranchus subtentum</i>	FC
010344	Darter, sharphead	<i>Etheostoma acuticeps</i>	FS, SE
040096	Falcon, peregrine	<i>Falco peregrinus</i>	ST
010351	Minnow, fatlips	<i>Phenacobius crassilabrum</i>	FS, SS
040320	Warbler, cerulean	<i>Dendroica cerulea</i>	FS
100248	Fritillary, regal	<i>Speyeria idalia idalia</i>	FS
040293	Shrike, loggerhead	<i>Lanius ludovicianus</i>	ST
050106	Cottontail, Appalachian	<i>Sylvilagus obscurus</i>	FS
020078	Salamander, Weller's	<i>Plethodon welleri</i>	FS, SS
040267	Wren, Bewick's	<i>Thryomanes bewickii</i>	FS, SE
070116	Crayfish, Clinch River	<i>Cambarus angularis</i>	FS
060146	Bean, rayed	<i>Villosa fabalis</i>	FC
070010	Amphipod, James Cave	<i>Stygobromus abditus</i>	FS
060086	Sandshell, black	<i>Ligumia recta</i>	ST
060112	Clubshell, Tennessee	<i>Pleurobema oviforme</i>	FS
060069	Riversnail, spiny	<i>Io fluviatilis</i>	FS, ST
060050	Pigtoe, Tennessee	<i>Fusconaia barnesiana</i>	FS, SS

BOVA Code	Common Name	Scientific Name	Status
060004	Elktoe	<i>Alasmidonta marginata</i>	FS, SS
100001	Fritillary, Diana	<i>Speyeria diana</i>	FS
010075	Shiner, popeye	<i>Notropis ariommus</i>	FS, SS
010197	Darter, wounded	<i>Etheostoma vulneratum</i>	FS
010357	Lamprey, mountain brook	<i>Echthyomyzon greeleyi</i>	FS
010341	Logperch, blotchside	<i>Percina burtoni</i>	FS, SS
010342	Darter, longhead	<i>Percina macrocephala</i>	FS, ST
010430	Dace, Tennessee	<i>Phoxinus tennesseensis</i>	FS, SE
060007	Mussel, slippershell	<i>Alasmidonta viridis</i>	SE
010352	Darter, greenfin	<i>Etheostoma chlorobranchium</i>	ST
040210	Owl, long-eared	<i>Asio otus</i>	SS
020040	Salamander, pygmy	<i>Desmognathus wrighti</i>	SS
040238	Flycatcher, yellow-bellied	<i>Empidonax flaviventris</i>	SS
040241	Harrier, northern	<i>Circus cyaneus</i>	SS
040204	Owl, barn	<i>Tyto alba pratincola</i>	SS
040213	Kinglet, golden-crowned	<i>Regulus satrapa</i>	SS
040285	Thrush, hermit	<i>Catharus guttatus</i>	SS
040278	Warbler, golden-winged	<i>Vermivora chrysoptera</i>	SS
040306	Warbler, magnolia	<i>Dendroica magnolia</i>	SS
040314	Warbler, Swainson's	<i>Limnothlypis swainsonii</i>	SS
040241	Flycatcher, alder	<i>Empidonax alnorum</i>	SS
040032	Egret, great	<i>Ardea alba egretta</i>	SS
040366	Finch, purple	<i>Carpodacus purpureus</i>	SS
040266	Wren, winter	<i>Troglodytes troglodytes</i>	SS
040129	Moorhen, common	<i>Gallinula chloropus cachinnans</i>	SS
040112	Nuthatch, red-breasted	<i>Sitta canadensis</i>	SS
040262	Creeper, brown	<i>Certhia americana</i>	SS
020045	Salamander, shovel-nosed	<i>Desmognathus marmoratus</i>	SS
040372	Crossbill, red	<i>Loxia curvirostra</i>	SS
010336	Redhorse, river	<i>Moxostoma carinatum</i>	SS
040213	Owl, northern saw-whet	<i>Aegolius acadicus</i>	SS
010090	Shiner, mirror	<i>Notropis spectrunculus</i>	SS
010126	Stonecat	<i>Noturus flavus</i>	SS
010337	Darter, bluebreast	<i>Etheostoma camurum</i>	SS

Table 4.2.1.1F: State or Federal Listed Threatened or Endangered Species in Wythe County.

BOVA Code	Common Name	Scientific Name	Status
010363	Darter, Appalachia	<i>Percina gymnocephala</i>	FS
010195	Darter, Kanawha	<i>Etheostoma kanawhae</i>	FS
010199	Darter, candy	<i>Etheostoma osburni</i>	FS, SS
010097	Minnow, Kanawha	<i>Phenacobius teretulus</i>	FS
040320	Warbler, cerulean	<i>Dendroica cerulean</i>	FS
100248	Fritillary, regal	<i>Speyeria idalia idalia</i>	FS
020020	Hellbender, eastern	<i>Cryptobranchus alleganiensis alleganiensis</i>	FS, SS
050024	Myotis, eastern small-footed	<i>Myotis leibii</i>	FS
050081	Woodrat, Allegheny	<i>Neotoma magister</i>	FS
070116	Crayfish, Clinch River	<i>Cambarus angularis</i>	FS
070118	Crayfish	<i>Cambarus veteranus</i>	FS
040292	Shrike, migrant loggerhead	<i>Lanius ludovicianus migrans</i>	FS, ST

BOVA Code	Common Name	Scientific Name	Status
100001	Fritillary, Diana	Speyeria diana	FS
050106	Cottontail, Appalachian	Sylvilagus obscurus	FS
070010	Amphipod, James Cave	Stygobromus abditus	FS
060081	Floater, green	Lasmigona subviridis	FS, ST
040096	Falcon, peregrine	Falco peregrinus	ST
040293	Shrike, loggerhead	Lanius ludovicianus	ST
040366	Finch, purple	Carpodacus purpureus	SS
040266	Wren, winter	Troglodytes troglodytes	SS
040129	Moorhen, common	Gallinula chloropus cachinnans	SS
040112	Nuthatch, red-breasted	Sitta canadensis	SS
040262	Creeper, brown	Certhia americana	SS
040241	Harrier, northern	Circus cyaneus	SS
040204	Owl, barn	Tyto alba pratincola	SS
040213	Kinglet, golden-crowned	Regulus satrapa	SS
040285	Thrush, hermit	Catharus guttatus	SS
040278	Warbler, golden-winged	Vermivora chrysoptera	SS
040306	Warbler, magnolia	Dendroica magnolia	SS
040314	Warbler, Swainson's	Limnethlypis swainsonii	SS
040241	Flycatcher, alder	Empidonax alnorum	SS
040213	Owl, northern saw-whet	Aegolius acadicus	SS
010215	Sauger	Stizostedion canadense	SS
050045	Otter, northern river	Lontra canadensis lataxina	SS
050110	Mole, star-nosed	Condylura cristata parva	SS
040372	Crossbill, red	Loxia curvirostra	SS
040364	Dickcissel	Spiza americana	SS

Table 4.2.1.1G: State or Federal Listed Threatened or Endangered Species in the City of Galax.

BOVA Code	Common Name	Scientific Name	Status
030061	Turtle, bog (=Muhlenberg)	Clemmys (=Glyptemys) muhlenbergii	FT, SE
040292	Shrike, migrant loggerhead	Lanius ludovicianus migrans	FS, ST
040320	Warbler, cerulean	Dendroica cerulean	FS
100248	Fritillary, regal	Speyeria idalia idalia	FS
040293	Shrike, loggerhead	Lanius ludovicianus	ST
020020	Hellbender, eastern	Cryptobranchus alleganiensis alleganiensis	FS, SS
050024	Myotis, eastern small-footed	Myotis leibii	FS
050081	Woodrat, Allegheny	Neotoma magister	FS
040096	Falcon, peregrine	Falco peregrinus	ST
040278	Warbler, golden-winged	Vermivora chrysoptera	SS
040364	Dickcissel	Spiza americana	SS
040241	Flycatcher, alder	Empidonax alnorum	SS
040366	Finch, purple	Carpodacus purpureus	SS
040266	Wren, winter	Troglodytes troglodytes	SS
020040	Salamander, pygmy	Desmognathus wrighti	SS
030012	Rattlesnake, timber	Crotalus horridus	CC
040238	Flycatcher, yellow-bellied	Empidonax flaviventris	SS
040241	Harrier, northern	Circus cyaneus	SS
040204	Owl, barn	Tyto alba pratincola	SS
040213	Kinglet, golden-crowned	Regulus satrapa	SS
040129	Moorhen, common	Gallinula chloropus cachinnans	SS

BOVA Code	Common Name	Scientific Name	Status
040112	Nuthatch, red-breasted	<i>Sitta canadensis</i>	SS
040262	Creeper, brown	<i>Certhia americana</i>	SS
040285	Thrush, hermit	<i>Catharus guttatus</i>	SS
050045	Otter, northern river	<i>Lontra canadensis lataxina</i>	SS
040306	Warbler, magnolia	<i>Dendroica magnolia</i>	SS

4.2.1.2 Cumberland Plateau PDC

Cox Reservoir Intake

According to the Virginia Department of Recreation and Conservation (DCR), this intake either overlies or is adjacent to a karst landscape characterized by sinkholes, caves, sinking streams, and large springs. Discharge of runoff to sinkholes or sinking streams, filling of sinkholes, and alteration of cave entrances can lead to surface collapse, flooding, erosion and sedimentation, groundwater contamination, and degradation of subterranean habitat for natural heritage resources.

John Flannagan Reservoir Intake

According to DCR, this intake is located within the Pound River – Russell Fork Stream Conservation Unit (SCU). SCUs identify stream reaches that contain aquatic natural heritage resources, including two miles upstream and one mile downstream of documented occurrences, and all tributaries within this reach. SCUs are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain. The rankings range from 1 to 5, with 1 indicating the greatest biodiversity significance. This SCU has been ranked B4, which represents a site of moderate biodiversity significance.

The natural heritage resources associated with this site are the Green-faced Clubtail, and the Virginia Spiraea. The Virginia Spiraea is classified as threatened by the United States Fish and Wildlife Service (USFWS) and classified as endangered by the Virginia Department of Agriculture and Consumer Services (VDACS).

Big Cedar Creek (Lebanon Intake)

According to DCR, the Hellbender and the Swannanoa Darter have been documented historically in Big Cedar Creek.

In addition, this intake either overlies or is adjacent to a karst landscape characterized by sinkholes, caves, sinking streams, and large springs. Discharge of runoff to sinkholes or sinking streams, filling of sinkholes, and alteration of cave entrances can lead to surface collapse, flooding, erosion and sedimentation, groundwater contamination, and degradation of subterranean habitat for natural heritage resources.

Clinch River Richlands Intake, Cavitts Creek Lake Witten Intake, and Clinch River Greater Tazewell Regional Intake

According to DCR, these intakes are located within the Clinch River – Indian Creek SCU. This SCU has been ranked B2, which represents very high biodiversity significance.

The natural heritage resources of concern are: Slippershell Mussel, Clinch Sculpin, Hellbender, Spectacle Case, Oyster Mussel, Tan Riffleshell, Tennessee Pigtoe, Shiny Pigtoe, Tennessee Heelsplitter, Onyx Rocksnail, Slabside Pearlymussel, Little-winged Pearlymussel, Clinch Dace, Tennessee Clubshell, Fluted Kidney Shell, Rough Rabbits Foot, and Purple Bean.

The Clinch River has been designated by VDGIF as “Threatened and Endangered Species Waters” for 35 listed species.

Little River Claypool Hill Intake

According to DCR, the intake is located within the Little River – Indian Creek SCU. This SCU has been ranked B2, which represents very high biodiversity significance.

The natural heritage resources of concern are: the Swannanoa Darter, Spiny Softshell, Tennessee Clubshell, and Tennessee Pigtoe.

There is potential for the following natural heritage resources to occur in the project areas: Blotchside Logperch, Gray Bats, Allegheny Snake Tail, Appalachian Jewelwing.

4.2.1.3 LENOWISCO

Wise County

Town of Appalachia

According to the DCR, the Spiny Riversnail is existing in the Town's water system. Also, downstream of the Town's waterworks, various mussel, fish, and snails exist that may be affected by water withdrawal. DCR recommends adherence to water withdrawal amounts.

Town of Big Stone Gap

According to DCR, the following species have been historically documented in the project area: Spiny Riversnail, Tennessee Heelsplitter and Northern Map Turtle.

The current activity will not affect documented state-listed plants or insects.

According to DGIF, the federal endangered/state endangered Indiana Bat has been documented in this project area. The Powell River is designated a Threatened and Endangered Species Water. This designation is due to the documented occurrences of the following species: Rough Rabbitsfoot, Cumberland Monkeyface, Dromedary Pearlymussel, and the Appalachian Monkeyface.

Town of St. Paul

According to DCR, the Clinch River-Copper Creek SCU is located within the area. Within these water systems several natural resources are present and include the following: Elktote, Western Sand Darter, Spiny Softshell, Cumberland Combshell, Oyster Mussel, Snuffbox, Bluebreast Darter, Ashy Darter, Golden Darter, Bluespar Darter, Duskytail Darter, Freshwater Mussel, Tennessee Pigtoe, Shiny Pigtoe, Fine-Rayed Pigtoe, Cherokee Clubtail, Northern Map Turtle, Cracking Pearlymussel, Spiny Riversnail, Brook Silverside, Birdwing Pearlymussel, Fragile Papershell, Slabside Pearlymussel, Black Sandshell, River Redhorse, Mudpuppy, Popeye Shiner, Emerald Shiner, Yellowfin Madtom, Stonecat, Tangerine Darter, Blotchside Logperch, Channel Darter, Sheepnose, Tennessee Clubshell, Pyramid Pigtoe, Fluted Monkeyface, Virginia Spiraea, Loggerhead Musk Turtle, Deerote, and Purple Bean. Also the Clinch River has been designated

by the VDGIF as Threatened and Endangered Species Waters. Also according to VDGIF, the Gray Myotis is within the area.

City of Norton

According to VDGIF, the federal endangered/state endangered Indiana Bat has been documented within the vicinity of the project area. Also, the federal species of concern Small Footed Myotis Bat has been documented in the project vicinity.

Lee County

Town of Jonesville

The waterworks is located within a karst landscape areas characterized by sinkholes, caves, sinking streams, and large springs. Within the area, the Lee County Isopod may be impacted with an increase in withdrawal. DCR recommends coordination with any changes in withdrawal amounts due to the potential of surface collapse, flooding, erosion and sedimentation, groundwater contamination, and degradation of subterranean habitat for natural heritage resources.

Lee County PSA – Blue Spring WTP

The waterworks is located within a karst landscape characterized by sinkholes, caves sinking streams, and large springs. Within the area, the Lee County Isopod may be impacted with any increase in withdrawal. DCR recommends strict coordination with any changes in withdrawal amounts due to the potential of surface collapse, flooding, erosion and sedimentation, groundwater contamination, and degradation of subterranean habitat for natural heritage resources.

Harvest Baptist Ministries

The Wallens Creek – Stickleyville SCU is located downstream of the well site. The Tennessee Pigtoe is the only natural heritage resource of concern located within the area.

According to VDGIF, the federal endangered/state endangered Indiana Bat has been documented within the project area.

Town of Pennington Gap

The Powell River – North Fork Powell River SCU is within the intake area. There are several natural heritage resources located within the area and include the Spiny Riversnail, Popeye Shiner, Tennessee Clubshell, Rough Rabbits Foot, and Sauger. Also, the Powell River has been designated by VDGIF as a Threatened and Endangered Species Water.

According to VDGIF, the following federally endangered species have been documented within the area: Gray Bat and Rough Rabbits Foot Mussel. VDGIF also has noted the documentation of the federal species of concern/state threatened Spiny Riversnail within the area. The following species of concern have also been documented in the area: the Small Footed Myotis and the Tennessee Clubshell Mussel. The following state special concern species have been documented in the area: the Bluebreast Darter, Channel Darter, River Redhorse, Sauger, Mirror Shiner, Popeye Shiner, Brook Silverside, and the Tennessee Pigtoe Mussel.

Scott County – Duffield WTP

The North Fork Clinch River – Fraley Branch SCU is located within the area. There are several natural heritage resources located within the area and include: Tennessee Pigtoe, Tennessee Clubshell, and Tennessee Heelsplitter. Also, the North Fork Clinch River has been designated by VDGIF as a Threatened and Endangered Species Water. These resources include the following: Fine-Rayed Pigtoe, Littlewind Pearlymussel, Oyster Mussel, Tan Riffleshell, and the Slippershell Mussel. Also according to VDGIF, the Gray Myotis is within the area.

Scott County – Moccasin WTP

The North Fork – Big Moccasin Creek SCU is located within the area. There are several natural heritage resources located within the area and include: Turquoise Shiner, Bluebreast Darter, Tennessee Pigtoe, Fine-Rayed Pigtoe, Northern Map Turtle, Popeye Shiner, Stonecat, Tangerine Darter, Gilt Darter, Bullhead Minnow, Rough Rabbits Foot, Loggerhead Musk Turtle, and

Cumberland Slider. Also, Big Moccasin Creek, Copper Creek, and the North Holston Fork River have been designated by VDGIF as a Threatened and Endangered Species Water.

Town of Gate City

The North Fork – Big Moccasin Creek SCU is located within the area. There are several natural heritage resources located within the area and include: Turquoise Shiner, Bluebreast Darter, Tennessee Pigtoe, Fine-Rayed Pigtoe, Northern Map Turtle, Popeye Shiner, Stonecat, Tangerine Darter, Gilt Darter, Bullhead Minnow, Rough Rabbits Foot, Loggerhead Musk Turtle, and Cumberland Slider. Also, Big Moccasin Creek, Copper Creek, and the North Holston Fork River have been designated by VDGIF as a Threatened and Endangered Species Water.

4.2.2 River Segments that have Recreational Significance including Scenic River Status

4.2.2.1 MRPDC

Information on river segments with recreation significance, including state scenic river status, was collected from DCR. DCR has established the Virginia Scenic River System. The intent of this program is to identify, designate and help protect rivers and streams that possess outstanding scenic, recreational, historic and natural characteristics of statewide significance for future generations. A focus of the program is to enhance the conservation and wise use of scenic rivers and their attendant corridors. A map showing scenic rivers in the MRPDC Region is included as **Figure 10 (Appendix A)**.

4.2.2.2 Cumberland Plateau PDC

Big Cedar Creek near the Town of Lebanon has been designated as a state scenic river for 5.8 miles upstream from the confluence with the Clinch River. The Clinch River has been designated as a state scenic river between St. Paul and the confluence with the Guest River. This reach forms the boundary between Russell County and Wise County. The portion of the Clinch River in Russell County from the confluence with the Little River to the Route 645-Nash Ford Bridge has also been designated as a state scenic river.

4.2.2.3 LENOWISCO PDC

According to the response from the DCR, there are no river segments of recreational significance within the LENOWISCO PDC.

4.2.3 Site of Historic or Archeological Significance

4.2.3.1 MRPDC

Information on places of historic and archeological significance for the MRPDC Region was collected from the National Park Service (NPS) National Register of Historic Places. The National Register of Historic Places is the Nation's official list of cultural resources and was authorized under the National Historic Preservation Act of 1966. The National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources. Properties listed in the National Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. Information was collected for Bland County; Carroll County, including the Town of Hillsville; Grayson County, including the towns of Fries, Independence, and Troutdale; Washington County, including the towns of Abingdon, Damascus, and Glade Spring; Wythe County, including the towns of Rural Retreat and Wytheville; City of Bristol; and City of Galax.

Table 4.2.3.1: Summary of Historic Sites in Bland County.

Name of Historic Site	Address	City	Date Listed
Mountain Glen	One mile SE of Ceres	Ceres	1/24/1991
Sharon Lutheran Church and Cemetery	West of Ceres on VA 42	Ceres	2/28/1979

Table 4.2.3.2: Summary of Historic Sites in Carroll County.

Name of Historic Site	Address	City	Date Listed
Allen, Sidna, House	North of Fancy Gap on US 52	Fancy Gap	7/15/1974
Carroll County Courthouse	515 Main St.	Hillsville	7/8/1982
Carter Hydraulic Rams	Grayson St. and US 221	Hillsville	11/21/2002
Hillsville Historic District	300-500 Blocks of Main St.	Hillsville	5/16/2002
Snake Creek Farm Historic District	VA 670 South of junction with VA 674	Hillsville	1/11/1991

Table 4.2.3.3: Summary of Historic Sites in Grayson County.

Name of Historic Site	Address	City	Date Listed
Bourne, Stephen G., House	6707 Spring Valley Rd.	Fries	8/26/2004
Brookside Farm and Mill	4161 Wilson Hwy.	Independence	11/16/2005
Grayson County Courthouse	Main St.	Independence	1/26/1978
Snowville Historic District	VA 693	Snowville	1/7/1987
Ripshin	Near junction of VA 603 and 732	Troutdale	9/22/1971

Table 4.2.3.4: Summary of Historic Sites in Smyth County.

Name of Historic Site	Address	City	Date Listed
Old Stone Tavern	US 11	Atkins	7/8/1982
Beatie, A.C., House	249 West Lee Hwy.	Chilhowie	7/5/2001
Bonham, H.L., House	408 White Top Rd.	Chilhowie	5/11/2000
Chilhowie Methodist Episcopal Church	501 Old Stage Rd.	Chilhowie	7/3/1991
Downtown Chilhowie Historic District	Main St., S. Whitetop Rd., and Lee Hwy.	Chilhowie	2/4/2000
Konnarock Training School	Junction of VA 603 and VA 600	Konnarock	6/5/1997
Greer, R. T., and Company	107 Pendleton St.	Marion	5/23/1997
Henderson Building, Southwestern State Hospital	E. Main St.	Marion	12/21/1990
Hotel Lincoln	107 E. Main St.	Marion	7/21/1995
Lincoln Theatre	117 E. Main St.	Marion	12/17/1992
Marion Historic District	Along Main, Cherry, Strother, Lee, North College and College Sts.	Marion	8/2/2000
Marion Male Academy	343 College St.	Marion	11/2/1989
Western Railway Depot	651 N. Main St.	Marion	2/8/1995
Preston House	South of junction of Route 645 and US 11	Marion	11/25/1969
Thomas, Abijah, House	SW of Marion on VA 657	Marion	11/28/1980
Fox Farm Site	Address Restricted	McMullin	6/23/1978
Preston House	VA 107	Saltville	7/30/1976
Saltville Historic District	Main St., 1st Ave., Palmer Ave, Palmer Ln., Stadium Dr., and Henrytown Rd.	Saltville	4/12/2002
Scott-Walker House	VA 635 E side, 2 miles SE of Saltville	Saltville	5/19/1994
Aspenvale Cemetery	Off U.S. 11	Seven Mile Ford	12/5/1980

Table 4.2.3.5: Summary of Historic Sites in Washington County.

Name of Historic Site	Address	City	Date Listed
Abingdon Bank	225 E. Main St.	Abingdon	11/12/1969
Abingdon Historic District	Both sides of Main St. between Cummings and Deadmore Sts.	Abingdon	2/26/1970
Abingdon Historic District (Boundary Increase)	Roughly bounded by Russell Rd. and Jackson St., Whites Mill Rd., E. Main and E. Park and W. Main Sts., and Academy Dr.	Abingdon	9/17/1986
Brook Hall	13160 Byars Ln.	Abingdon	6/5/1997
Mont Calm	West of VA 75	Abingdon	7/18/1974
Pitts, Dr. William H., House	247 E. Main St.	Abingdon	4/1/2002
White's Mill	NW of Abingdon on White Mill Rd.	Abingdon	9/10/1974
Crabtree-Blackwell Farm	One mile South of Blackwell on SR 686	Blackwell	4/1/1975
Grove, The	14071 Lee Hwy	Bristol	5/16/2002
Solar Hill Historic District	Roughly along Johnson, Solar, West, King, Cumberland, and Sycamore Sts.	Bristol	7/5/2001
Walnut Grove	14081 Lee Highway	Bristol	8/11/2004
Emory and Henry College	VA 609	Emory	1/30/1989
Edmondson Hall	Lindell Rd., 0.25 miles North of junction of VA 80 and VA 609	Meadowview	6/11/1998

Table 4.2.3.6: Summary of Historic Sites in Wythe County.

Name of Historic Site	Address	City	Date Listed
Cornett Archeological Site	Address Restricted	Austinville	9/29/1983
Fort Chiswell Site	Address Restricted	Fort Chiswell	8/29/1978
McGavock Family Cemetery	East of Fort Chiswell off I-81	Fort Chiswell	6/22/1979
Graham, Maj. David, House	VA 619 and 626	Fosters Falls	2/14/1985
Martin Site	Address Restricted	Fosters Falls	8/13/1974
Fort Chiswell Mansion	I-81 near junction of US 52 and VA 121	Max Meadows	5/6/1971
Graham's Forge Mill	VA 639	Max Meadows	5/26/2005
Sanders Farm	3908 Fort Chiswell Rd.	Max Meadows	5/22/2003
Shot Tower	West of junction of Route 608 and US 52	Max Meadows	10/1/1969
Kimberling Lutheran Cemetery	NW of Rural Retreat	Rural Retreat	3/26/1980
Zion Evangelical Lutheran Church Cemetery	NW of Speedwell	Speedwell	2/1/1979
Loretto	190 Peppers Ferry Rd.	Wytheville	9/8/1994
Crockett's Cove Presbyterian Church	VA 600 East of junction with VA 603	Wytheville	10/15/1992
Haller-Gibboney Rock House	Monroe and Tazewell Sts.	Wytheville	11/9/1972
St. John's Lutheran Church and Cemetery	NW of Wytheville at junction of US 21/52 and I-81	Wytheville	1/26/1978
Wythe County Poorhouse Farm	VA 2, Peppers Ferry Rd.	Wytheville	5/26/2000
Wytheville Historic District	Roughly bounded by Monroe,	Wytheville	9/30/1994

Table 4.2.3.6: Summary of Historic Sites in Wythe County.			
Name of Historic Site	Address	City	Date Listed
	Eleventh, Jefferson and Twelfth Sts. and W. Railroad Ave.		

Table 4.2.3.7: Summary of Historic Sites in the City of Bristol.			
Name of Historic Site	Address	City	Date Listed
Bristol Commercial Historic District	Roughly along State, Piedmont, Moore, Shelby, Bank, Progress, 5th, 6th, 7th, and 8th Sts.	Bristol	5/22/2003
Grove, The	14071 Lee Hwy	Bristol	5/16/2002
Solar Hill Historic District	Roughly along Johnson, Solar, West, King, Cumberland, and Sycamore Sts.	Bristol	7/5/2001
Walnut Grove	14081 Lee Highway	Bristol	8/11/2004

Table 4.2.3.8: Summary of Historic Sites in the City of Galax.			
Name of Historic Site	Address	City	Date Listed
Galax Commercial Historic District	Roughly Main, Center, Grayson, Carroll and Oldtown Sts.	Galax	5/30/2002
Pless, A.G., Jr. House	942 Glendale Rd.	Galax	5/16/2002
Cox, Dr. Virgil, House	406 West Stuart Dr.	Galax	5/19/2004
Grayson County Courthouse and Clerk's Office, Old	Junction of Greenville and Justice Rds.	Galax	2/21/1997

4.2.3.2 Cumberland Plateau PDC

Refer to the Virginia Department of Historic Resources (VDHR) response attached with maps depicting the archeological and historic architectural resources within the Cumberland Plateau region presented in **Appendix X**.

4.2.3.3 LENOWISCO PDC

Refer to the Virginia Department of Historic Resources responses attached with maps depicting the archeological and historic architectural resources within the LENOWISCO region presented in **Appendix X**.

4.2.4 Wetlands

4.2.4.1 MRPDC

Information on wetlands within the MRPDC Region was collected from the National Wetlands Inventory (NWI), which is part of the USFWS. The NWI produces and provide information on the characteristics, extent, and status of the Nation’s wetlands and deepwater habitats and other wildlife habitats. A map of showing wetlands in Bland County, Carroll County, Grayson County, Smyth County, Washington County, and Wythe County is included as **Figures 11 through 15 (Appendix A)**, respectively.

4.2.4.2 Cumberland Plateau PDC

None known.

4.2.4.3 LENOWISCO PDC

None known.

4.2.5 Riparian Buffers or Conservation Easements

4.2.5.1 MRPDC

Information on conservation lands with the MRPDC Region was collected from DCR. DCR has established the Virginia Natural Heritage Program (VANHP), which represents a comprehensive effort to save Virginia’s native plant and animal life and the ecosystem upon which they depend through inventory, conservation information provision, protection and stewardship. The VANHP has defined Natural Heritage Resources, or “NHRs,” as rare plant and animal species, rare and exemplary natural communities, and significant geologic features. The VANHP established the Virginia Conservation Lands Database, which is the Commonwealth’s first comprehensive, continually maintained GIS data layer for Virginia’s protected conservation lands. The database includes mapped boundaries and attributes for public and certain private lands having various conservation, recreation, and open space roles. Most federal, state, regional, and interstate lands are included, such as water and park authorities, parks and undeveloped or partially-developed lands owned by localities, lands owned as preserves by nonprofit conservation organizations, conservation easements held by the Virginia Outdoors

Foundation, and land trusts. A map showing the major conservation lands in the MRPDC Region is included as **Figure 10 (Appendix A)**.

4.2.5.2 Cumberland Plateau PDC

Conservation easements are reported in Russell County. The holders of the easements include the Nature Conservancy, Virginia Outdoors Foundation, and Wetlands Reserve Program. No conservation easements are adjacent to surface water intakes.

4.2.5.3 LENOWISCO PDC

None known.

4.2.6 Land Use and Land Coverage

4.2.6.1 MRPDC

A map showing land use and land cover information for Bland County, Carroll County, Grayson County, Smyth County, Washington County, and Wythe County is included as Figures 17 through 22 (Appendix A), respectively.

4.2.6.2 Cumberland Plateau PDC

Area land uses within the project area are primarily residential with limited agricultural and commercial activity.

4.2.6.3 LENOWISCO PDC

Area land uses within the project area are primarily residential with limited agricultural and commercial activity.

4.2.7 Presence of Impaired Streams and Type of Impairment

4.2.7.1 MRPDC

Information on impaired streams within the MRPDC Region was collected from the 2006 Water Quality Assessment 305(b)/303(d) Report. This report covers the period from January 1, 2000 through December 31, 2004. The report assesses the overall water quality for Virginia based on whether the condition of the water body being assessed permits citizens to safely enjoy the

designated uses of water as described in the Virginia Water Quality Standards. The report provides an assessment by river basin. The report also includes an integrated list of impaired waters by river basin. A map showing impaired streams in the region by category is included as **Figure 23 (Appendix A)**.

4.2.7.2 Cumberland Plateau PDC

Bluestone River (Bluefield Intake)

Water quality impairments for fish consumption, because of PCBs in edible fish tissue and bacteria were identified in the withdrawal area in the DEQ 2008 Water Quality Assessment, therefore the stream is a 303(d) listed Total Maximum Daily Load (TMDL) segment.

Cox Reservoir (Greater Tazewell Regional Intake)

No surface water quality impairments were identified in the 2008 Water Quality Assessment, therefore no 303(d) listed TMDL segments are affected.

John Flannagan Reservoir (John Flannagan Intakes)

No surface water quality impairments were identified in the 2008 Water Quality Assessment, therefore no 303(d) listed TMDL segments are affected.

Big Cedar Creek (Lebanon Intake)

Big Cedar Creek, immediately downstream of the intake, is classified as Section 2, Class V Stockable Trout Waters. Big Cedar Creek, immediately upstream of the intake, is classified as Section 2i, Class IV Mountainous Zone Waters, PWS in Virginia's Water Quality standards. A water quality impairment for bacteria was identified in the area in the area in the 2008 Water Quality Assessment, therefore the creek is a 303(d) listed TMDL segment.

Clinch River (Richlands Intake, Greater Tazewell Regional Intake)

Water quality impairment for bacteria was identified in the project are in the VDEQ 2008 Water Quality Assessment; therefore, the stream is a 303(d) listed TMDL segment.

Little River (Claypool Hill Intake)

Water quality impairment for bacteria was identified in the project area in the VDEQ 2008 Water Quality Assessment; therefore, the stream is a 303(d) listed TMDL segments are affected.

Lake Witten (Cavitts Creek Intake)

No surface water quality impairments were identified in the VDEQ 2008 Water Quality Assessment; therefore, no 303(d) listed TMDL segments are affected.

4.2.7.3 LENOWISCO PDC

Town of Appalachia (Wise County)

According to the VDEQ 2006 Water Quality Assessment, there are no water quality impairments in the immediate vicinity.

Town of Big Stone Gap (Wise County)

According to VDEQ, the South Fork Powell River is a 303 (d) listed TMDL water segment for bacteria impairment.

Town of Wise (Wise County)

According to the VDEQ 2006 Water Quality Assessment, there are no water quality impairments in the immediate vicinity.

Town of Coeburn (Wise County)

According to the VDEQ 2006 Water Quality Assessment, Tom's Creek is a 303 (d) listed TMDL water segment for bacteria impairment.

Town of Pound (Wise County)

According to VDEQ 2006 Water Quality Assessment, the North Fork Pound River is 303 (d) listed TMDL water segment for bacteria impairment.

Town of St. Paul & Wise County PSA Carfax

According to the VDEQ 2006 Water Quality Assessment, there are no water quality impairments in the immediate vicinity.

City of Norton (Wise County)

According to the VDEQ 2006 Water Quality Assessment, there are no water quality impairments in the immediate vicinity.

Town of Jonesville (Lee County)

According to the VDEQ 2006 Water Quality Assessment, there are no water quality impairments in the immediate vicinity.

Lee County PSA Blue Spring WTP & Harvest Baptist Childcare Ministries Well

According to the VDEQ 2006 Water Quality Assessment, there are no water quality impairments in the immediate vicinity.

Lee County PSA KVS Quarry WTP

According to the VDEQ 2006 Water Quality Assessment, there are no water quality impairments in the immediate vicinity.

Town of Pennington Gap (Lee County)

According to the VDEQ 2006 Water Quality Assessment, there are no water quality impairments in the immediate vicinity.

Scott County PSA Duffield WTP

According to the VDEQ 2006 Water Quality Assessment, there are no water quality impairments in the immediate vicinity.

Town of Gate City & Moccasin Gap WTP (Scott County)

According to VDEQ, the Big Moccasin Creek is a 303 (d) listed TMDL water segment for bacteria impairment in the vicinity of the Moccasin Gap WTP.

4.2.8 Location of Point Source Discharges

4.2.8.1 MRPDC

Information on point source discharges in the MRPDC Region was collected from the USEPA Envirofacts Data Warehouse. The Envirofacts Data Warehouse contains water information from three USEPA databases, the Permit Compliance System (PCS), the Safe Drinking Water Information System (SDWIS), and the National Contaminant Occurrence Database. Information was collected from the PCS database, which provides information on companies which have been issued permits to discharge waste water into rivers. The PCS allows review of information regarding when a permit was issued and expires, how much the facility is permitted to discharge, and the actual monitoring data showing what the facility has discharged. The PCS was queried by county using only PCS facility information to perform the search. Information was collected for Bland County; Carroll County, including the Town of Hillsville; Grayson County, including the towns of Fries, Independence, and Troutdale; Smyth County, including the towns of Chilhowie, Marion, and Saltville; Washington County, including the towns of Abingdon, Damascus, and Glade Spring; and Wythe County, including the towns of Rural Retreat and Wytheville. A copy of the PCS for each county in the MRPDC region listing the companies which have been issued to discharge waste into rivers is included in **Appendix C**.

4.2.8.2 Cumberland Plateau PDC

None known.

4.2.8.3 LENOWISCO PDC

None known.

4.2.9 Anadromous, trout and other significant fisheries.

4.2.9.1 MRPDC

There are no known anadromous, trout and other significant fisheries in the MRPDC Region.

4.2.9.2 Cumberland Plateau PDC

Big Cedar Creek (Lebanon Intake)

According to VDEQ, Big Cedar Creek, immediately downstream of the intake is classified as Section 2, Class V Stackable Trout Waters.

4.2.9.3 LENOWISCO PDC

There are no known anadromous, trout and other significant fisheries in the LENOWISCO Region.

4.2.10 Unusual geologic formations or special soil types.

4.2.10.1 MRPDC

DCR-NHR tracks natural heritage resources by County. The natural heritage resources include rare plant and animal species, rare and exemplary natural communities, and significant geologic features, primarily cave and karst resources. Karst features are found throughout the counties of Bland, Smyth, Washington, and Wythe. Karst features are found within the Valley and Ridge physiographic province where carbonate-rich rocks such as limestone and dolomite reside (primarily in valleys). Physical connections between surface water and groundwater in karst regions make karst aquifers very vulnerable to water pollution.

DCR rates caves throughout the region. A cave designated as “significant” such as those identified in Bland, Smyth, and Washington counties meet special criteria such as exceptional length or depth, the presence of rare species or ecosystems, or an abundance of beautiful mineral formations. Significant caves may be economically important, or have special biologic, geologic, or scenic attributes. DCR currently maintains programs related to the protection of these significant caves and their attributes.

4.2.10.2 Cumberland Plateau PDC

Cox Reservoir (Greater Tazewell Regional Intake)

According to DCR, the water intake either overlies or is adjacent to a karst landscape characterized by sinkholes, caves, sinking streams, and large springs. Discharge of runoff to

sinkholes or sinking streams, filling of sinkholes, and alteration of cave entrances can lead to surface collapse, flooding, erosion and sedimentation, groundwater contamination, and degradation of subterranean habitat for natural heritage resources.

Big Cedar Creek (Lebanon Intake)

According to DCR, the water intake either overlies or is adjacent to a karst landscape characterized by sinkholes, caves, sinking streams, and large springs. Discharge of runoff to sinkholes or sinking streams, filling of sinkholes, and alteration of cave entrances can lead to surface collapse, flooding, erosion and sedimentation, groundwater contamination, and degradation of subterranean habitat for natural heritage resources.

4.2.10.3 LENOWISCO PDC

Town of Big Stone Gap (Wise County)

The waterworks is located within karst landscape areas characterized by sinkholes, caves, sinking streams, and large springs. The Powell River sinks into the Powell River Cave. DCR recommends strict coordination with any changes in withdrawal amounts due to the potential of surface collapse, erosion and sedimentation, groundwater contamination, and degradation of subterranean habitat for natural heritage resources.

Town of St. Paul (Wise County)

The waterworks is located within karst landscape areas characterized by sinkholes, caves, sinking streams, and large springs. The Powell river sinks directly into the Powell River Cave. DCR recommends coordination with any changes in withdrawal amounts due to the potential of surface collapse, erosion and sedimentation, groundwater contamination, and degradation of subterranean habitat for natural heritage resources.

Town of Jonesville (Lee County)

The waterworks is located within karst landscape areas characterized by sinkholes, caves, sinking streams, and large springs. Within the area, the Lee County Isopod may be impacted with any increase in withdrawal. DCR recommends coordination with any changes in withdrawal

amounts due to the potential of surface collapse, erosion and sedimentation, groundwater contamination, and degradation of subterranean habitat for natural heritage resources. According to the NRCS, there are no prime, unique, statewide, or local important farmland within the area.

Lee County PSA – Blue Spring WTP

The waterworks is located within karst landscape areas characterized by sinkholes, caves, sinking streams, and large springs. Within the area, the Lee County Isopod may be impacted with any increase in withdrawal. DCR recommends coordination with any changes in withdrawal amounts due to the potential of surface collapse, erosion and sedimentation, groundwater contamination, and degradation of subterranean habitat for natural heritage resources. According to the NRCS, there are no prime, unique, statewide, or local important farmland within the area.

Lee County PSA – KVS Quarry WTP

The waterworks is located within karst landscape areas characterized by sinkholes, caves, sinking streams, and large springs. Within the area, the Lee County Isopod may be impacted with any increase in withdrawal. DCR recommends coordination with any changes in withdrawal amounts due to the potential of surface collapse, erosion and sedimentation, groundwater contamination, and degradation of subterranean habitat for natural heritage resources. According to the NRCS, there are no prime, unique, statewide, or local important farmland within the area.

Town of Pennington Gap (Lee County)

The waterworks is located within karst landscape areas characterized by sinkholes, caves, sinking streams, and large springs. Within the area, the Lee County Isopod may be impacted with any increase in withdrawal. DCR recommends coordination with any changes in withdrawal amounts due to the potential of surface collapse, erosion and sedimentation, groundwater contamination, and degradation of subterranean habitat for natural heritage resources.

Scott County – Duffield WTP

The waterworks is located within karst landscape areas characterized by sinkholes, caves, sinking streams, and large springs. DCR recommends coordination with any changes in withdrawal amounts due to the potential of surface collapse, erosion and sedimentation,

groundwater contamination, and degradation of subterranean habitat for natural heritage resources.

Scott County – Moccasin WTP

The waterworks is located within karst landscape areas characterized by sinkholes, caves, sinking streams, and large springs. DCR recommends coordination with any changes in withdrawal amounts due to the potential of surface collapse, erosion and sedimentation, groundwater contamination, and degradation of subterranean habitat for natural heritage resources.

Town of Gate City

The waterworks is located within karst landscape areas characterized by sinkholes, caves, sinking streams, and large springs. DCR recommends coordination with any changes in withdrawal amounts due to the potential of surface collapse, erosion and sedimentation, groundwater contamination, and degradation of subterranean habitat for natural heritage resources.

4.2.11 Potential threats to the existing water quantity and quality, other than those above.

4.2.11.1 MRPDC

There are no other known potential threats to the existing water quantity and quality.

4.2.11.2 Cumberland Plateau PDC

The VDEQ does not foresee any long-term adverse impacts to water quality.

4.2.11.3 LENOWISCO PDC

The VDEQ does not foresee any long-term adverse impacts to water quality.