

Appendix F – Streams and Wetlands Assessment

Break Down of Impacts to Identified Streams (in Linear Feet; LF)

Option	Total Stream Impacts by Alignment Option	Total Stream Impacts for Comparable Section of Primary Alignment
Alignment Option 2 Spring Street	1 Eph. Totaling 19 LF 0 Int. Totaling 0 LF 0 Per. Totaling 0 LF SUM: 1 stream; 19 LF	2 Eph. Totaling 124 LF 1 Int. Totaling 318 LF 0 Per. SUM: 3 streams; 442 LF
Alignment Option 7 Pawnee Drive	3 Eph. Totaling 76 LF 1 Int. Totaling 33 LF 0 Per. SUM: 4 streams; 109 LF	2 Eph. Totaling 74 LF 0 Int. 0 Per. SUM: 2 streams; 74 LF
Alignment Option 18 Edison Avenue	0 Eph. 0 Int. 0 Per. SUM: 0 streams; 0 LF	4 Eph. Totaling 552 LF 1 Int. Totaling 166 LF 0 Per. SUM: 5 streams; 718 LF
Alignment Option 12 W. Sardis Road	0 Eph. 0 Int. 1 Per. Totaling 30 LF SUM: 1 stream; 30 LF	0 Eph. 0 Int. 1 Per. Totaling 142 LF SUM: 1 stream; 142 LF
Alignment Option 19 Germania	3 Eph. Totaling 75 LF 5 Int. Totaling 123 LF 0 Per. SUM: 8 streams; 198 LF	7 Eph. Totaling 457 LF 6 Int. Totaling 2,544 LF 0 Per. SUM: 13 streams; 3,001 LF
Alignment Option 20 N. Sardis Road	1 Eph. Totaling 9 LF 2 Int. Totaling 40 LF 0 Per. SUM: 3 streams; 49 LF	0 Eph. 1 Int. Totaling 54 LF 0 Per. SUM: 1 stream; 54 LF
Alignment Option 21 Arch Street	0 Eph. 1 Int. Totaling 28 LF 2 Per. Totaling 108 LF SUM: 3 streams; 136 LF	0 Eph. 0 Int. 1 Per. Totaling 52 LF SUM: 1 stream; 52 LF
Alignment Option 22 Union Station	0 Eph. 0 Int. 0 Per. SUM: 0 streams; 0 LF	0 Eph. 0 Int. 0 Per. SUM: 0 streams; 0 LF
Total for Primary Alignment (no Alignment Options incorporated)	N/A	57 Eph. Totaling 5,193 LF 45 Int. Totaling 7,426 LF 13 Per. Totaling 1,707 LF SUM: 115 streams; 14,326 LF

Eph. - Ephemeral Stream; Int. - Intermittent Stream; Per. - Perennial Stream

Streams and Wetlands Preliminary Technical Report

FAP NO. FLAP-FLAP (16) – SOUTHWEST TRAIL
ARDOT Job 061562



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1.0 Introduction

The purpose of the project is to provide a multi-use trail connecting Hot Springs National Park in Hot Spring, Arkansas to the Arkansas River Trail System in Little Rock, Arkansas (**Figure 1**). The overall project is approximately 62 miles in length, along which the trail will connect to several other parks/trails including the Old River Bridge on the Saline River and the Little Rock Central High School Historic Site. The project includes evaluating several alternative alignments in an Environmental Assessment (EA) as part of complying with the National Environmental Policy Act (NEPA). The project is receiving federal funding and federal permits. Detailed evaluations of the alternative alignments carried forward for review are provided in the EA, which is available upon request.

Figure 1: Site Location Map



2.0 Methodology

The U.S. Fish and Wildlife Service (USFWS) in cooperation with Cowardin, et al. (1979), have identified a classification system that is widely accepted by the U.S. Army Corps of Engineers (USACE) and USFWS in relation to classifying wetland and stream habitats (i.e., Classification of Wetlands and Deepwater Habitats of the United States). Wetlands and streams in the project area have been identified utilizing the



methodology presented in this classification system. Additionally, hydrology determinations were roughly based on the routine approach described in the USACE Wetland Delineation Manual (1987) and the Regional Supplements to the Corps of Engineers Wetland Delineation Manual: Eastern Mountain and Piedmont (Version 2.0) and the Atlantic and Gulf Coastal Plain Region (Version 2.0). However, due to the large-scale of the project, the field survey for wetlands is considered to be a preliminary identification of wetlands and formal wetland data forms were not completed.

Prior to the site visit, preliminary desktop reviews were initially conducted utilizing data from the Natural Resources Conservation Service (NRCS) Web Soil Survey, Federal Emergency Management Agency (FEMA) maps, and the National Wetlands Inventory (NWI), which is produced by the USFWS. Garver also reviewed U.S. Geological Survey (USGS) topographic quadrangle maps for the presence of streams and other water bodies.

Field investigations of the project area were performed by Colby Marshall and Cassie Schmidt of Garver on May 13-16, May 28-31, and June 11-13, 2019. Abnormal weather conditions (higher precipitation than typical) preceded and occurred during the course of the site visits. According to the closest weather station (Memorial Field in Hot Springs) for field work conducted May 13-16, the area received approximately 6.7 inches of rainfall within the two weeks prior to the site visit with 1.9 inches occurring the week prior. Much of the area was saturated from recent rains. For fieldwork conducted May 28-31, the closest weather station (Bill and Hillary Clinton National Airport in Little Rock) reported the area received approximately 1.8 inches of rainfall within the two weeks prior to the site visit with no rainfall between May 22-28. Much of the area was experiencing flooding and backflow from the Arkansas River. Hydrology during the June 11-13 site visit was beginning to return back to normal conditions with much of the flood waters receding. Weather data for the Little Rock area shows a total of 2.9 inches of rainfall within the two weeks prior to the June site visit.

The study area (approximately 450 acres), which includes a 50-foot-wide corridor centered on each of the proposed alignments, was visually inspected to locate areas of potentially jurisdictional wetlands and waterways. A desktop delineation only was conducted for Option 21 (Arch Street) of the SWT due to lack of access from flood events. With the exception of Option 21, all proposed alignments were physically inspected by qualified wetland biologists in order to develop a level of confidence as to the general limits of each wetland to comply with the CWA Section 404(b)(1) avoidance and minimization requirements. When funding is available for final design and ROW acquisition, a detailed wetland delineation will be conducted and submitted to the USACE as part of the Section 404 permitting process.

All aquatic features identified within this corridor were assumed to be impacted by the SWT with the exception of parallel streams and streams within existing culverts at roadway crossings. Parallel streams were considered to be impacted if the stream was less than 10 feet from the proposed SWT centerline. Stream lengths within existing culverts at roadway crossings were not counted in impact calculations as no work within these structures is anticipated. For streams passing through culverts below railbeds (i.e., when the SWT occurred on new alignment along an abandoned railroad), the entire stream within the study area was assumed to be impacted as it is likely a new or larger culvert will be required. Wetland determinations were made using observable vegetation and hydrology. An overview of the aquatic features mapped on the site is included in **Appendix A**. Additionally, shapefiles and/or Google Earth KMZs of all aquatic features have been provided to USACE along with this delineation report. Each



aquatic feature observed within the study area was assigned a numerical identifier, with wetlands and open waters denoted by a "W" and tributariesstreams by an "S". Some numbers within a sequence are skipped; thus, wetland and stream numbering may not be sequential. Representative photographs of the various communities and types of aquatic features encountered are provided in **Appendix B**, soil data is in **Appendix C**, and weather data is in **Appendix D**.

Once a preferred alignment for the SWT is chosen, a detailed delineation will be conducted that will include the collection of wetland and upland data points. The quantity of wetland and stream impacts will be revised at this time and is expected to be less than values presented in this report.

3.0 Results

Due to the project's great length, the project area is surrounded by numerous different topographies and contains different vegetation types at various densities. In fact, of the 32 Level IV ecoregions in Arkansas, 6 different Level IV ecoregions occur within the project extents (Woods et. al. 2004). Additionally, dense urban development is also present in much of the project area, especially the far east and west ends. Overall, seven distinct areas were observed along the route that shared similar geographical, biological, and physical properties. A brief description of the various biotic communities encountered along the project is provided below along with representative photographs in **Appendix B**. The keymap in **Appendix A** shows the location of each of these seven areas.

Hot Springs Urban Area

Streams 1-13 and wetlands 1-6 were observed within the Hot Springs area, which is characterized by light and dense commercial and residential properties with much of the area being impervious surfaces. Several streams (especially S-1 and S-2) have been partially channelized or culverted within the study area. USGS-named streams within the study area include Gulpha Creek (S-3), Middle Branch Gulpha Creek (S-4), Cedar Creek (S-11), and East Branch Gulpha Creek (S-13). Dominant riparian and wetland vegetation included eastern poison ivy (*Toxicodendron radicans*), English ivy (*Hedera helix*), Indian woodoats (*Chasmanthium latifolium*), Japanese honeysuckle (*Lonicera japonica*), roundleaf greenbrier (*Smilax rotundifolia*), rushes (*Juncus* spp.), Virginia creeper (*Parthenocissus quinquefolia*), woolgrass (*Scirpus cyperinus*), American elm (*Ulmus americana*), American sycamore (*Platanus occidentalis*), black willow (*Salix nigra*), box elder (*Acer negundo*), Chinese privet (*Ligustrum sinense*), eastern redcedar (*Juniperus virginiana*), maples (*Acer* spp.), persimmon (*Diospyros virginiana*), possumhaw (*Ilex decidua*), red oaks (*Quercus* spp.), silk tree (*Albizia julibrissin*), slippery elm (*Ulmus rubra*), southern magnolia (*Magnolia grandiflora*), sugarberry (*Celtis laevigata*), and willow oak (*Quercus phellos*).

Ouachita Mountains Area

Streams 14-57 and wetlands 7-18 were observed within the Ouachita Mountains area, which was primarily forestland. Streams, which were numerous compared to other areas, were moderate to high gradient streams and typically observed to be flashy, nestled within deep ravines, and have rocky substrates. Relatively few wetlands were observed in the area and most were small in size compared to other areas. Over 6 miles of the SWT occur within already-cleared ROW alongside Hwy 70 and few aquatic features are located within this segment. USGS-named streams within the study area include South Tenmile Creek (S-28), Tenmile Creek (S-46 and S-51), and Caney Creek (S-52). Dominant riparian and wetland vegetation included American elm, American pokeweed (*Phytolacca americana*), blackberry



(*Rubus* spp.), Japanese honeysuckle, roundleaf greenbrier, rushes, sedges (*Carex* spp.), sericea lespedeza (*Lespedeza cuneata*), soft rush (*Juncus effusus*), American hornbeam (*Carpinus caroliniana*), American sycamore, Chinese privet, eastern redcedar, hazel alder (*Alnus serrulata*), hickory (*Carya* spp.), red maple (*Acer rubrum*), red oaks, sugarberry, sweetgum (*Liquidambar styraciflua*), and white oak (*Quercus alba*).

Saline River Area

Streams 58-69 and wetlands 19-32 were observed within the Saline River area, which had several rural and farming properties. Streams were typically wider/larger, of higher order, and had more silt and sand substrates compared to other regions. USGS-named streams within the study area include Dodson Creek (S-60), Dobbs Creek (S-61), and the Saline River (S-64). Dominant riparian and wetland vegetation included eastern poison ivy, Japanese honeysuckle, nutsedges (*Cyperus* spp.), roundleaf greenbrier, rushes, American sycamore, bald cypress (*Taxodium distichum*), box elder, Chinese privet, dogwood (*Cornus* spp.), eastern redcedar, elms (*Ulmus* spp.), hickory, maples, mulberry (*Morus* spp.), pawpaw (*Asimina triloba*), river birch (*Betula nigra*), red oaks, sugarberry, sweetgum, water oak (*Quercus nigra*), white oak, and willow oak.

Benton Urban and Saline County Suburban Area

Streams 71-119 and wetlands 33-98 were observed within the Benton urban and Saline County suburban area, which included low and high density residential, commercial, municipal, and industrial properties. Additionally, the area contains forestland, mining operations, and a landfill. Streams within the City of Benton and along existing roadways in east Saline County were typically located within culverts below the roadway and were generally ephemeral. More perennial streams were observed along segments of new alignment that followed the abandoned railbed and were generally dominated by silt and sand substrates. Most aquatic features adjacent to the railbed appeared to have altered hydrology due to the raised bed. Landforms of several areas appeared impacted from past mining events (especially near Alcoa property) and new housing development. USGS-named streams within the study area include Depot Creek (S-80), Hurricane Creek (S-89a and S-89b), and Otter Creek (S-102, S-104, and S-109). Dominant riparian and wetland vegetation included blackberry, eastern poison ivy, goldenrod (*Solidago* spp.), Japanese honeysuckle, lizard's tail (*Saururus cernuus*), peppervine (*Ampelopsis arborea*), periwinkle (*Vinca minor*), rushes, sedges, smartweed (*Persicaria* spp.), spikerushes (*Eleocharis* spp.), trumpet creeper (*Campsis radicans*), Virginia creeper, American elm, American sycamore, buttonbush (*Cephalanthus occidentalis*), Chinese privet, dogwood, loblolly pine (*Pinus taeda*), maples, red oaks, sweetgum, water oak, white oak, and willow oak.

Little Fourche Creek Area

Streams 120-133 and 146 and wetlands 99-120 were observed within the Little Fourche Creek area, which primarily contained forestland with some rural residential properties. This segment is almost entirely within the floodplain as the area is generally flat bottomlands. The SWT through this segment is entirely along abandoned railbed. Most aquatic features adjacent to the railbed appeared to have altered hydrology due to the raised bed. The only USGS-named stream within the study area is Little Fourche Creek (S-120, S-127, and S-128). Dominant riparian and wetland vegetation included blackberry, eastern poison ivy, goldenrod, grape (*Vitis* spp.), Japanese honeysuckle, lizard's tail, nutsedges, roundleaf greenbrier, rushes, sedges, sericea lespedeza, smartweed, trumpet creeper, Virginia creeper, American elm, blackgum (*Nyssa sylvatica*), buttonbush, Chinese privet, chinkapin oak (*Quercus muehlenbergii*),



dogwood, hazel alder, loblolly pine, maples, mulberry, red buckeye (*Aesculus pavia*), slippery elm, sugarberry, sumac (*Rhus spp.*), sweetgum, water oak, water tupelo (*Nyssa aquatica*), white oak, and willow oak.

Fourche Bottoms Area

Streams 134 and 144 and wetlands 123-124 and 129-132 were observed within the Fourche Bottoms area, which is primarily forestland. This segment is almost entirely within the floodplain as the area is generally low bottomlands that are frequently flooded by Fourche Creek and overflow from the Arkansas River. During one of the site visits, this area was flooded with approximately 8 feet of water. Trash/debris from floodwaters was observed along much of the alignment. The SWT through this segment is primarily along existing utility easements and a gravel utility access road or along SH-367 (Arch Street). Stream substrates were predominantly silt and sand. The only USGS-named stream within the study area is Fourche Creek (S-134 and S-144). Dominant riparian and wetland vegetation included rushes, swamp dock (*Rumex verticillatus*), American elm, green ash (*Fraxinus pennsylvanica*), bald cypress, black willow, blackgum, cherrybark oak (*Quercus pagoda*), hackberry (*Celtis occidentalis*), red maple, slippery elm, willow oak, and winged elm (*Ulmus alata*).

Little Rock Urban Area

Streams 135-143 and 145 and wetlands 125-127 and 133-134 were observed within the Little Rock urban area, which primarily contains dense residential and commercial properties. Through this area the SWT predominantly follows along the east side of active tracks for the Union Pacific Railroad. Streams were generally low to moderate gradient and had gravel and cobble substrates. Most streams adjacent to the railbed appeared to have altered hydrology due to the presence of the raised railbed. No USGS-named streams occur within this section of the study area. Dominant riparian and wetland vegetation included daisy fleabane (*Erigeron annuus*), perennial ryegrass (*Lolium perenne*), sedges, American elm, American sycamore, black locust (*Robinia pseudoacacia*), black willow, box elder, Chinese privet, eastern redcedar, green ash, hickory, red oak, roses (*Rosa spp.*), silk tree, slippery elm, and sugarberry.

When combining all seven above-described areas for the SWT, a total of 132 wetlands (totaling 32.5 acres) and 135 streams (totaling 14,867 linear feet) were identified within the study area (**Tables 1 and 2**) and presumed to be impacted by the Main Alignment of the SWT or one of the seven Options. This report is to be presented to the USACE for concurrence and determination of appropriate 404 permitting.

Table 1: Wetlands and Open Waters

Wetland (W) Identification No.	Latitude	Latitude	Cowardin Classification	Acreage Impacted (i.e. Within Study Area)
W-1a	34.501304°	-92.988075°	PFO	0.14
W-1b	34.501323°	-92.988056°	PEM	0.05
W-2	34.501392°	-92.985801°	PFO	0.01
W-3	34.500977°	-92.984670°	PFO	0.03
W-4a	34.500861°	-92.984008°	PEM	0.19
W-4b	34.500739°	-92.983082°	PFO	0.02
W-5	34.500826°	-92.982823°	PFO	0.12



Wetland (W) Identification No.	Latitude	Latitude	Cowardin Classification	Acreage Impacted (i.e. Within Study Area)
W-6	34.499283°	-92.975945°	PFO	0.28
W-7	34.512440°	-92.913301°	PEM	0.01
W-8	34.527585°	-92.875973°	PFO	0.01
W-9	34.529933°	-92.856834°	PFO	0.10
W-10	34.534996°	-92.850465°	PFO	0.09
W-11	34.542636°	-92.832274°	PFO	0.21
W-12	34.543754°	-92.824034°	PFO	0.01
W-14	34.545832°	-92.815592°	PEM	0.04
W-15	34.545721°	-92.814600°	PUB	0.01
W-16	34.545600°	-92.812917°	PEM	0.03
W-17	34.548784°	-92.792947°	PEM	0.01
W-18a	34.533720°	-92.679240°	PFO	0.04
W-18b	34.533720°	92.679303°	PFO	0.02
W-19	34.535064°	-92.666413°	Pub	0.02
W-20	34.533759°	-92.640261°	PEM	0.10
W-21	34.538141°	-92.625121°	PFO	0.05
W-22	34.538635°	-92.622924°	PFO	0.05
W-29	34.542148°	-92.606600°	PFO	0.03
W-30	34.542472°	-92.606541°	PFO	0.01
W-31	34.542919°	-92.606221°	PFO	0.002
W-32	34.543098°	-92.605847°	PFO	0.004
W-33	34.549325°	-92.600276°	PFO	0.003
W-46	34.556974°	-92.561656°	PFO	0.01
W-47	34.556948°	-92.561214°	PFO	0.03
W-48	34.557105°	-92.561291°	PFO	0.02
W-51	34.558552°	-92.557863°	PFO	0.03
W-52	34.558865°	-92.556558°	PEM	0.41
W-53	34.559709°	-92.552128°	PFO	0.07
W-54	34.559835°	-92.548692°	PFO	0.04
W-55	34.559788°	-92.546942°	PFO	0.02
W-56	34.558781°	-92.543552°	PFO	0.27
W-57	34.557300°	-92.539117°	PFO	0.19
W-58	34.557373°	-92.539582°	PFO	0.05
W-59	34.556266°	-92.535672°	PFO	0.12
W-60	34.556283°	-92.529595°	PFO	0.01
W-61	34.556005°	-92.529123°	PFO	0.05
W-62	34.555887°	-92.528791°	PFO	0.05



Wetland (W) Identification No.	Latitude	Latitude	Cowardin Classification	Acreage Impacted (i.e. Within Study Area)
W-63	34.560739°	-92.475414°	PFO	0.39
W-64	34.560588°	-92.473606°	PFO	0.30
W-65	34.560394°	-92.471605°	PFO	0.05
W-66	34.560352°	-92.470846°	PFO	0.09
W-67	34.560394°	-92.470416°	PFO	0.05
W-68	34.560279°	-92.470291°	PFO	0.02
W-69	34.560298°	-92.465948°	PFO	0.02
W-70a	34.560886°	-92.460982°	PFO	0.15
W-70b	34.560915°	-92.460539°	PUB	0.17
W-71	34.561033°	-92.459570°	PFO	0.20
W-72	34.564249°	-92.448694°	PFO	0.46
W-73	34.564897°	-92.448344°	PFO	0.06
W-74	34.565373°	-92.448158°	PFO	0.03
W-75	34.565475°	-92.447980°	PFO	0.03
W-76	34.568998°	-92.444883°	PFO	0.05
W-77	34.571247°	-92.440942°	PFO	0.10
W-78	34.573858°	-92.436988°	PFO	0.03
W-79	34.576200°	-92.435685°	PFO	0.02
W-80	34.576748°	-92.435560°	PFO	0.28
W-81	34.578189°	-92.434992°	PFO	0.07
W-82	34.578927°	-92.434581°	PFO	0.01
W-83	34.579695°	-92.433903°	PFO	0.05
W-84	34.581410°	-92.432182°	PFO	0.22
W-85	34.590532°	-92.424219°	PUB	0.01
W-86	34.592696°	-92.422907°	PFO	0.05
W-87	34.601208°	-92.416215°	PFO	0.02
W-88	34.602527°	-92.415094°	PFO	0.17
W-89	34.605640°	-92.411093°	PFO	0.02
W-90	34.613168°	-92.401229°	PFO	0.01
W-91	34.615112°	-92.398580°	PFO	0.03
W-92	34.615718°	-92.397811°	PEM	0.04
W-93	34.615956°	-92.397440°	PEM	0.22
W-94	34.600979°	-92.408687°	PEM	0.01
W-95	34.600948°	-92.406596°	PFO	0.01
W-96	34.607853°	-92.395361°	PEM	0.03
W-97	34.619651°	-92.390551°	PFO	0.02
W-98	34.620542°	-92.389644°	PFO	0.49



Wetland (W) Identification No.	Latitude	Latitude	Cowardin Classification	Acreage Impacted (i.e. Within Study Area)
W-99	34.627505°	-92.382948°	PFO	0.04
W-100	34.629428°	-92.374507°	PFO	0.16
W-101	34.630160°	-92.372514°	PFO	0.04
W-102	34.632401°	-92.368315°	PFO	0.01
W-103	34.633943°	-92.365490°	PFO	0.02
W-104	34.638175°	-92.358088°	PFO	0.10
W-105a	34.640902°	-92.353115°	PFO	1.17
W-105b	34.641007°	-92.352716°	PSS	0.16
W-106	34.643772°	-92.347833°	PFO	0.48
W-107a	34.648485°	-92.338847°	PSS	0.48
W-107b	34.647909°	-92.340092°	PFO	0.05
W-107c	34.650489°	-92.335071°	PFO	0.01
W-108	34.651768°	-92.332888°	PFO	0.11
W-109	34.653375°	-92.329950°	PFO	0.01
W-110a	34.656124°	-92.324966°	PFO	0.22
W-110b	34.656055°	-92.324886°	PSS	0.76
W-111a	34.659058°	-92.317224°	PFO	4.46
W-111b	34.659651°	-92.317101°	PEM	0.11
W-111c	34.663646°	-92.314690°	PEM	0.13
W-111d	34.666976°	-92.312323°	PEM	0.24
W-112a	34.671396°	-92.312061°	PEM	0.75
W-112b	34.670132°	-92.312212°	PFO	0.54
W-112c	34.670471°	-92.312075°	PFO	0.14
W-113a	34.673599°	-92.311859°	PEM	0.05
W-113b	34.673569°	-92.311770°	PFO	0.02
W-114	34.674406°	-92.311740°	PEM	0.06
W-115a	34.674663°	-92.311730°	PEM	0.05
W-115b	34.674640°	-92.311656°	PFO	0.04
W-116a	34.676813°	-92.311313°	PEM	0.08
W-116b	34.676820°	-92.311261°	PFO	0.03
W-116c	34.676830°	-92.311395°	PFO	0.02
W-117	34.680609°	-92.309045°	PFO	4.42
W-118a	34.687650°	-92.303681°	PEM	0.01
W-118b	34.687599°	-92.303631°	PFO	0.01
W-118c	34.687648°	-92.303744°	PFO	0.004
W-119	34.689657°	-92.303294°	PFO	0.04
W-120	34.690354°	-92.303255°	PFO	0.03



Wetland (W) Identification No.	Latitude	Latitude	Cowardin Classification	Acreage Impacted (i.e. Within Study Area)
W-123	34.701020°	-92.299377°	PFO	4.79
W-124a	34.707499°	-92.290045°	PFO	2.00
W-124b	34.707449°	-92.290083°	PEM	1.42
W-125a	34.712604°	-92.287492°	PEM	0.02
W-125b	34.712657°	-92.287559°	PFO	0.02
W-126	34.712058°	-92.289184°	PFO	0.04
W-127a	34.712740°	-92.291703°	PFO	1.41
W-128	34.688823°	-92.301418°	PUB	0.19
W-129	34.700727°	-92.282752°	PFO	0.41
W-130	34.701952°	-92.281111°	PFO	0.06
W-131	34.703040°	-92.280459°	PFO	0.03
W-132	34.706665°	-92.281192°	PFO	0.00
W-133	34.708763°	-92.281193°	PEM	0.004
W-134	34.710238°	-92.281183°	PEM	0.02

Table 2: Other Waters (Streams)

Stream (S) Identification No.	Latitude	Longitude	Stream Classification	Ordinary High Water Mark (width x depth)	Linear Feet Impacted (i.e. Within Study Area)
S-1	34.511132°	-93.040520°	Intermittent	12.3' x 1'	210
S-2	34.511028°	-93.040517°	Intermittent	14.3' x 1.6'	984
S-3 Gulpha Creek	34.511656°	-93.028759°	Perennial	34.25' x 2.75'	134
S-4 Gulpha Creek	34.501972°	-93.010089°	Perennial	48' x 2.75'	50
S-5	34.500968°	-93.006961°	Intermittent	4' x 0.5'	22
S-6	34.501315°	-92.988243°	Ephemeral	2.5' x 0.3'	63
S-7	34.500581°	-92.980708°	Intermittent	7.75' x 0.9'	318
S-8	34.499503°	-92.978390°	Ephemeral	3.5' x 0.2'	61
S-9	34.502666°	-92.978100°	Ephemeral	6' x 1'	19
S-10	34.501577°	-92.971149°	Intermittent	12' x 0.75'	31
S-11 Cedar Creek	34.499459°	-92.962593°	Perennial	18' x 2'	71
S-12	34.501743°	-92.956680°	Ephemeral	2' x 0.5'	26
S-13 East Branch Gulpha Creek	34.501481°	-92.953368°	Perennial	30' x 2'	50
S-14	34.501953°	-92.940957°	Intermittent	7' x 1'	70
S-15	34.503707°	-92.928505°	Ephemeral	1.5' x 0.4'	30
S-16	34.504957°	-92.921860°	Ephemeral	1.5' x 0.5'	30
S-17	34.505487°	-92.920351°	Ephemeral	1' x 0.3'	30



Stream (S) Identification No.	Latitude	Longitude	Stream Classification	Ordinary High Water Mark (width x depth)	Linear Feet Impacted (i.e. Within Study Area)
S-18	34.509180°	-92.916826°	Intermittent	8' x 0.75'	36
S-19	34.519426°	-92.911862°	Ephemeral	2.5' x 0.75'	220
S-20	34.522656°	-92.908243°	Ephemeral	1.5' x 0.5'	31
S-21	34.528313°	-92.896531°	Ephemeral	2.5' x 0.5'	49
S-22	34.529786°	-92.889195°	Ephemeral	2' x 0.3'	29
S-23	34.529673°	-92.887168°	Ephemeral	1' x 0.3'	32
S-24	34.529620°	-92.885312°	Intermittent	4' x 0.4'	39
S-25	34.529569°	-92.881443°	Ephemeral	2.5' x 0.75'	41
S-26	34.529156°	-92.879871°	Ephemeral	2' x 0.3'	29
S-27	34.528666°	-92.878197°	Ephemeral	1.5' x 0.3'	30
S-28 South Tenmile Creek	34.525973°	-92.874023°	Perennial	8' x 1'	30
S-29	34.524653°	-92.869661°	Ephemeral	6' x 0.5'	34
S-30	34.526569°	-92.863282°	Intermittent	4' x 1'	33
S-31	34.529119°	-92.858065°	Ephemeral	2.5' x 0.25'	32
S-32	34.533479°	-92.852392°	Intermittent	7.5' x 1'	30
S-33	34.536067°	-92.849050°	Intermittent	4' x 0.75'	33
S-34	34.537590°	-92.846589°	Ephemeral	2' x 0.3'	26
S-35	34.540155°	-92.842553°	Intermittent	4' x 1'	30
S-36	34.542274°	-92.835970°	Intermittent	4' x 0.5'	30
S-37	34.542636°	-92.832274°	Ephemeral	2' x 0.2'	30
S-38	34.542631°	-92.830858°	Intermittent	6' x 2'	92
S-39	34.543028°	-92.827871°	Intermittent	4.5' x 0.75'	40
S-40	34.543873°	-92.825418°	Ephemeral	2' x 0.1'	31
S-41	34.543886°	-92.822995°	Ephemeral	15' x 1'	31
S-43	34.545421°	-92.819301°	Intermittent	15' x 0.4'	52
S-44	34.545791°	-92.815073°	Ephemeral	6.5' x 0.6'	49
S-45	34.545785°	-92.813843°	Ephemeral	4.5' x 0.5'	50
S-46	34.545071°	-92.807108°	Perennial	40' x 4'	72
S-47	34.545755°	-92.805375°	Intermittent	15' x 1'	27
S-48	34.545549°	-92.803163°	Ephemeral	2.5' x 0.3'	30
S-49	34.545813°	-92.799976°	Ephemeral	5' x 0.5'	30
S-50	34.546279°	-92.796526°	Intermittent	9' x 1.5'	24
S-51 Tenmile Creek	34.545373°	-92.753759°	Perennial	150' x 4'	50
S-52 Caney Creek	34.537865°	-92.740837°	Perennial	31' x 3'	50
S-53	34.534736°	-92.687680°	Ephemeral	4' x 0.25'	32
S-54	34.532982°	-92.687547°	Ephemeral	3' x 0.5'	22
S-55	34.533323°	-92.680026°	Intermittent	10' x 1.25'	33
S-56	34.534755°	-92.682419°	Ephemeral	9' x 0.75'	36
S-57	34.533475°	-92.678999°	Ephemeral	3' x 0.5'	38



Stream (S) Identification No.	Latitude	Longitude	Stream Classification	Ordinary High Water Mark (width x depth)	Linear Feet Impacted (i.e. Within Study Area)
S-58	34.534485°	-92.672159°	Intermittent	20' x 2.5'	35
S-59	34.534505°	-92.662966°	Ephemeral	3' x 0.5'	72
S-60 Dodson Creek	34.536319°	-92.654052°	Intermittent	47' x 1.75'	14
S-61 Dobbs Creek	34.533765°	-92.640020°	Intermittent	22' x 3'	29
S-62	34.536627°	-92.629435°	Ephemeral	1.5' x 0.5'	62
S-63	34.538917°	-92.612957°	Intermittent	29' x 2.5'	37
S-64 Saline River	34.540889°	-92.606934°	Perennial	193' x 12'	50
S-69	34.543159°	-92.605937°	Intermittent	6' x 1'	28
S-71	34.555328°	-92.593616°	Ephemeral	4' x 0.3'	25
S-75	34.555179°	-92.586606°	Ephemeral	2' x 0.2'	27
S-78	34.557482°	-92.584373°	Ephemeral	18' x 0.3'	0
S-79	34.557253°	-92.576292°	Ephemeral	5' x 0.3'	25
S-80 Depot Creek	34.556912°	-92.566119°	Intermittent	47' x 1.25'	30
S-81	34.558496°	-92.558248°	Intermittent	12' x 1'	166
S-82	34.559255°	-92.544783°	Ephemeral	1.5' x 0.25'	85
S-83	34.558605°	-92.542992°	Ephemeral	3' x 0.9'	76
S-84a	34.556366°	-92.536417°	Ephemeral	2' x 0.3'	271
S-84b	34.556325°	-92.534513°	Ephemeral	4' x 0.5'	120
S-86	34.558166°	-92.516683°	Intermittent	8' x 0.75'	30
S-87	34.558641°	-92.502689°	Intermittent	6.5' x 0.75'	25
S-88	34.558574°	-92.500741°	Ephemeral	5' x 0.75'	21
S-89b Hurricane Creek	34.558410°	-92.464388°	Perennial	65' x 3.5'	30
S-89a Hurricane Creek	34.560567°	-92.464355°	Perennial	85' x 4'	142
S-91	34.562130°	-92.452679°	Ephemeral	5' x 0.75'	33
S-92	34.565917°	-92.447845°	Intermittent	6' x 0.9'	50
S-93a	34.568582°	-92.445923°	Intermittent	7' x 2.5'	25
S-93b	34.568360°	-92.445823°	Intermittent	8' x 1.5'	63
S-94	34.570587°	-92.442007°	Intermittent	6' x 1.1'	1,485
S-95	34.570864°	-92.441413°	Ephemeral	5' x 0.5'	21
S-96	34.571705°	-92.439948°	Ephemeral	3.5' x 0.5'	414
S-97	34.573347°	-92.437355°	Ephemeral	4.5' x 0.5'	54
S-98	34.575547°	-92.436014°	Ephemeral	3.5' x 0.3'	214
S-99	34.583706°	-92.429944°	Intermittent	12' x 0.75'	50
S-100	34.586834°	-92.426917°	Ephemeral	3' x 0.75'	56
S-101	34.590481°	-92.424339°	Ephemeral	3' x 0.5'	44
S-102 Otter Creek	34.599658°	-92.417664°	Intermittent	10' x 2.5'	482
S-103	34.599814°	-92.417461°	Ephemeral	4' x 0.25'	35
S-104 Otter Creek	34.610985°	-92.404272°	Perennial	22' x 2'	0
S-105	34.613956°	-92.400232°	Intermittent	8' x 0.5'	54



Stream (S) Identification No.	Latitude	Longitude	Stream Classification	Ordinary High Water Mark (width x depth)	Linear Feet Impacted (i.e. Within Study Area)
S-107	34.576048°	-92.443981°	Ephemeral	5' x 0.3'	23
S-108	34.591420°	-92.440448°	Intermittent	10' x 0.75'	19
S-109 Otter Creek	34.592130°	-92.438843°	Intermittent	3.5' x 0.75'	29
S-110	34.597610°	-92.429011°	Ephemeral	5' x 0.5'	25
S-111	34.601125°	-92.420105°	Ephemeral	3' x 0.2'	27
S-112	34.601148°	-92.417494°	Intermittent	9' x 0.5'	28
S-113	34.600973°	-92.410139°	Intermittent	8' x 0.5'	20
S-114	34.600738°	-92.397851°	Ephemeral	2.5' x 0.2'	9
S-115	34.608461°	-92.395256°	Intermittent	3' x 0.25'	20
S-116	34.617757°	-92.394105°	Intermittent	10' x 1.5'	76
S-117	34.620585°	-92.389539°	Ephemeral	6' x 0.6'	55
S-118	34.623275°	-92.386930°	Intermittent	15' x 1.25'	50
S-119	34.625189°	-92.385251°	Ephemeral	3' x 0.5'	50
S-120 Little Fourche Creek	34.629146°	-92.379351°	Intermittent	25' x 1.5'	50
S-121	34.629145°	-92.375810°	Ephemeral	2' x 0.3'	50
S-122	34.631190°	-92.370750°	Intermittent	5' x 0.75'	50
S-123	34.632514°	-92.368323°	Ephemeral	3' x 0.3'	51
S-124	34.635551°	-92.362568°	Intermittent	18.5' x 1.7'	50
S-125	34.637661°	-92.359039°	Ephemeral	3' x 0.25'	416
S-126	34.638456°	-92.357499°	Ephemeral	4' x 0.6'	989
S-127-Little Fourche Creek	34.647573°	-92.340719°	Perennial	52' x 4.5'	218
S-128-Little Fourche Creek	34.657240°	-92.320639°	Perennial	70' x 6'	736
S-129	34.669129°	-92.312233°	Intermittent	10.5' x 0.5'	53
S-130	34.669639°	-92.312210°	Ephemeral	3' x 0.25'	100
S-131	34.674555°	-92.311708°	Intermittent	5' x 0.75'	51
S-132	34.680233°	-92.311006°	Intermittent	13' x 2.5'	238
S-133	34.687698°	-92.303673°	Ephemeral	2' x 0.5'	52
S-134 Fourche Creek	34.708237°	-92.285422°	Perennial	125' x 8'	54
S-135	34.710906°	-92.283945°	Intermittent	20' x 3.5'	28
S-136	34.722987°	-92.301324°	Ephemeral	8' x 0.6'	0
S-137	34.727675°	-92.302171°	Intermittent	16' x 1'	1,425
S-138	34.727850°	-92.302158°	Ephemeral	5' x 0.9'	44
S-139	34.742425°	-92.302290°	Ephemeral	3' x 0.25'	516
S-140	34.743424°	-92.301775°	Intermittent	40' x 3'	57
S-141	34.745245°	-92.300119°	Ephemeral	8' x 1'	43
S-142	34.746440°	-92.297442°	Intermittent	20' x 2.25'	497
S-143	34.747182°	-92.294740°	Ephemeral	1' x 0.4'	54
S-144 Fourche Creek	34.702882°	-92.280412°	Perennial	88' x 6'	58



Stream (S) Identification No.	Latitude	Longitude	Stream Classification	Ordinary High Water Mark (width x depth)	Linear Feet Impacted (i.e. Within Study Area)
S-145	34.713854°	-92.292891°	Intermittent	3.5' x 0.5'	150
S-146 Little Fourche Creek	34.688757°	-92.301484°	Perennial	95' x 4'	50

4.0 References

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Online.

ESRI Basemaps Website. <http://www.esri.com/data/basemaps>.

Federal Emergency Management Agency (FEMA). 2019. National Flood Hazard Layer. Available Online at <https://msc.fema.gov/portal/home>.

USACE. Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

USACE. 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0, ed. J.F. Berkowitz, J.S. Wakeley, R.W. Lichvar, C.V. Noble. ERDC/EL TR-12-9. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

USACE. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0), ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-20. Vicksburg, MS: U.S. Army Research and Development Center.

USDA, NRCS. 2019. The PLANTS Database (<http://plants.usda.gov>). National Plant Data Team, Greensboro, NC 27401-4901 USA.

USDA, NRCS. 2019. Web Soil Survey. Soil Survey Staff. Available Online at <https://websoilsurvey.sc.egov.usda.gov/>.

U. S. Fish and Wildlife Service (USFWS). 2019. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Available Online at <http://www.fws.gov/wetlands/>.

Weather Underground. 2019. Historical Weather Data. Available Online at <https://www.wunderground.com/history/>.



Woods A.J., Foti, T.L., Chapman, S.S., Omernik, J.M., Wise, J.A., Murray, E.O., Prior, W.L., Pagan, J.B., Jr., Comstock, J.A., and Radford, M., 2004, Ecoregions of Arkansas (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,000,000).



APPENDIX A

Overview of Aquatic Features within Study Area

































































































































































