

average annual cost of \$841,500. The expected annual benefit upon implementation of the alternative is approximately \$124,500 for a benefit/cost ratio of 0.15. This alternative would not meet the economic feasibility requirements of a Federal project.

SECTION 3.0 PROPOSED ACTION

Alternative one with a minimum 300-foot bench width is the selected plan. It would consist of an overflow channel cut from the east bank of Cowskin Creek between Kellogg Drive and Maple Street (Figure 3.0). The bench layout would vary in width from the channel to accommodate channel bends while maintaining a minimum bench width of 300 feet. It would increase the conveyance capacity of the floodplain and generally decrease flood elevations for a given storm event. The overflow bench would have a one vertical to three horizontal bank slope. The existing hydraulic conditions and availability of space within this reach would allow construction of a channel that could be stabilized by vegetation.

The existing streambed would be retained as a low-flow channel under this alternative. The excavated bench would be located along the east bank of Cowskin Creek and would be planted with a mixture of native and erosion resistant vegetation. During heavy rainfall events, the low flow channel would overflow into the excavated channel. Existing vegetation within the limits of the new channel would be removed during construction. The majority of the excavated area would be through agricultural land (Photo 3.0). Due to relatively low velocities of flow throughout this channel reach, the stream bank slopes would not require stabilization with geotechnical structural material.

The proposed plan would have potential environmental impacts, both adverse and beneficial. Construction would have temporary adverse impacts to the biological resources along portions of the excavated area by removing and disturbing vegetation and habitat and by displacing local fauna. It may require modifying the low water crossing near Station 478+95, which could alter existing aquatic habitat in the channel just upstream. Construction would also temporarily impact water quality but should, in the long term, improve water quality by controlling storm water runoff. The acquisition of private land for this alternative would also have socioeconomic impacts. Land that is available for agriculture or that could possibly be used for future development would be removed from production and/or development.

It would reduce flood levels within the improvement area. It is expected that flood levels both upstream and downstream of the improvement area will remain unchanged.

This plan was selected because it would provide increased flood protection along Cowskin Creek between Kellogg Drive and Maple Street. It would have a favorable benefit/cost ratio of 1.96, which meets the requirement of a Federal interest. The hydraulic performance of the system would be improved with construction of this alternative. The City has several bridge removal and/or replacement projects in various stages of planning and design within the Cowskin Creek drainage basin and expects to complete the projects regardless of any Federal plan. These are: 1) Removal of the railroad bridge over Cowskin Creek south of Kellogg; 2) Replacement of the Kellogg bridge and eastbound and westbound frontage roads over Cowskin Creek; 3) Replacement of 119th Street West bridge over Calfskin Creek; 4) Replacement of the Maple Street bridge over the North Fork of Calfskin Creek; and 5) Replacement of three bridges on 13th Street North over Dry Creek. The proposed plan, together with the bridge replacements, is expected to reduce annual flood-related damages by over 244 million dollars with a 75% probability that this figure would be exceeded by another 180 million dollars. It also would provide more favorable hydrological conditions for the bridge projects being completed by the City of Wichita. The local sponsor supports this plan.

The modified channel would be grass-lined with three horizontal on one vertical side slopes. The bottom elevation of the new channel would vary from about elevation 1308 feet NGVD at the upper end of the project to about elevation 1302 feet NGVD at the lower end. It would follow the existing creek channel but the width of the excavated channel would vary from a minimum of 300 feet to about 400 feet near the confluence of Calfskin Creek. The width of the area required for the side slope would vary dependent upon the elevation of the existing ground along the channel alignment. The U.S. Fish and Wildlife Service and the Kansas Department of Wildlife and Parks



Photo 3.0 Agricultural land adjacent to channel.

expressed concerns over the loss of spotted skunk habitat along the excavated area. The mitigation plan (SECTION 6.0) provides measures developed to alleviate losses.

SECTION 4.0 AFFECTED ENVIRONMENT

4.1 Location

The Cowskin Creek drainage basin is located in Sedgwick County in south central Kansas. Cowskin Creek is a right bank tributary of the Wichita-Valley Center Floodway, entering the floodway between 47th Street South and West 55th Street South. Above the Kansas Highway 42 bridge, the Cowskin Creek drainage basin encompasses approximately 122 square miles.

Included within the basin are the communities of Andale, Colwich, and Goddard, and also portions of Wichita and Maize. The major drainage courses within the basin are Cowskin Creek and its four tributaries: Dry Creek, Calfskin Creek, North Fork Calfskin Creek, and Middle Fork Calfskin Creek. Cowskin Creek generally runs in a north-south direction. These drainages are moderately sinuous, with a fairly low slope gradient. The upper and middle reaches of Cowskin Creek basin are predominantly agricultural, while the lower reaches drain through residential and commercial developments. Much of the floodplain area is under private ownership with minimal public access. Topography in the floodplain is relatively flat. The flat terrain is the principal cause of the problem and results in reduced drainage capability and increased flooding.

4.2 Climate

Wichita's elevation is just over 1,300 feet above sea level. Wichita is located in the Central Great Plains where masses of warm moist air from the Gulf of Mexico collide with cold dry air from the Arctic region. Wichita has a distinct four-season climate and a wide range of weather year round. The climate is mild with brief periods of

extreme temperatures. The average annual daily low is 45 degrees F; the average annual daily high is 67.4 degrees F; and the average annual daily temperature is 56.2 degrees F. The average summer temperature is 78.9 °F, and the average daily maximum is 90.1 °F. The average winter temperature is 33.3 °F, and the average daily minimum is 23 °F.

Wichita averages about 225 days of sunshine annually. Wichita Mid-Continent Airport operates under VFR (Visual Flight Rules) conditions about 91% of the time. The prevailing wind is southerly and averages about 9 miles per hour.

Summers are usually warm and moderated by steady wind and relatively low humidity. Temperatures above 90 degrees occur an average of 63 days per year. Winters are usually mild with short periods of very cold weather. Temperatures below zero occur about 2 days per year. Spring is the most varied season and is the period of heaviest rainfall due to severe thunderstorms and occasional tornadoes. The prevailing winds are from the north in February and from the south the remainder of the year.

Rainfall averages about 29 inches per year, with 70% occurring during the April-September growing season. Snow flurries are common, but snowfall is light, averaging 15 inches per year from December through March. Occurrence of more than 1 inch of snow, ice or sleet happens on average about 5 times per year. Occurrence of more than 3 inches happens about twice per year. Snow seldom covers the ground for a period greater than three days.

Kansas ranks sixth among states in average number of tornados per year (Texas, Oklahoma, and Florida top the list.) Kansas weather is generally benign. The likelihood of experiencing a tornado on a given section of land in Sedgwick County based on area and frequency over the last 40 years is estimated to be once in every 1,460 years. Civil defense systems are in place to ensure adequate warning in case of severe weather.

4.3 Social and Economic Conditions

4.3.1 Study Area

The project alternatives will have the most direct impact on persons living and working in the western portions of the City of Wichita and portions of Sedgwick County, Kansas. This area is considered the social area within which the primary impacts of the proposed project will occur.

4.3.2 Population

The U.S. Bureau of Census estimates that Sedgwick County had a population of 453,400 in 2000, a 12% increase from the 1990 Census count of 404,600. The area surrounding the project is medium density urban area in the City of Wichita and rural estates and pastureland in areas outside the incorporated area.

Wichita is the county seat of Sedgwick County. It is the largest city in Kansas, with a population of 344,284 in the 2000 census. The Kansas Turnpike and Interstate I-35 are the two major highways that link the city with a large trade area that encompasses a population of approximately 1.2 million people within a 100-mile radius. Wichita's population growth has been steady for the past two decades. The majority of recent growth has occurred along the far west/northwest and east/northeast peripheries of the city, and in the unincorporated portions of Sedgwick County.

As of March 1999, the city's total land area was 136.7 square miles. The majority of annexation activity over the last several years is in response to property owner requests associated with new developments and water and sewer service requests in the new growth areas. According to the 2000 Census, the median age of residents in the City of Wichita was 33.4 compared to 35.2 for the State of Kansas. Seven percent of the 2000 population in the state was Hispanic or Latino, the single largest non-white racial group.

Area Population City of Wichita, Sedgwick County, State of Kansas Census 1970-2000				
Area				
	1970	1980	1990	2000
City of Wichita	276,554	279,838	304,001	344,284
Sedgwick County, KS	349,219	368,704	404,613	453,426
State of Kansas	2,247,823	2,369,039	2,481,349	2,691,750

Population Characteristics City of Wichita, Sedgwick County, State of Kansas Census 2000			
	City of Wichita	Sedgwick County	State of Kansas
Population	344,284	452,869	2,688,418
Median Age (years)	33.4	33.6	35.2
Race			
Single-Race classification	333,622	440,166	2,631,922
White	258,900	359,489	2,313,944
Black or African American	39,325	41,367	154,198
Amer. Indian or Native Alaskan	3,986	5,041	24,936
Asian or Pacific Islander	13,845	15,402	48,119
Other	17,566	18,867	90,725
Two or more Races Classified	10,662	12,703	56,496
Hispanic or Latino	33,112	36,397	188,252
Not Hispanic or Latino	311,172	416,472	2,500,166

4.3.3 Employment and Income

Wichita was incorporated in 1870. In 1872, extension of the Santa Fe Railway into Wichita was the original stimulus to the city's economic development. The city's early growth paralleled the expanding agricultural productivity of the Central Plains States, and by 1900, the city was a regional center for the processing of agricultural products and the distribution of farm equipment. The discovery of oil in 1914 broadened the economic base by attracting numerous services, distributive enterprises and metalworking industries. Wichita has been a leading producer of general aviation and commercial aircraft from the earliest days of the aircraft industry. McConnell Air Force Base was activated in 1951 and has remained an important factor in the community.

Wichita's employment includes a broad mix of business types, with a strong base of relatively high paying manufacturing jobs. Wichita's major employers include the Boeing Co., Raytheon Aircraft Co., Cessna Aircraft Co., Coleman Co. Inc., Nations Bank, Bombardier Aerospace Learjet, Via Christi Regional Medical Center, Wesley Medical Center, Koch Industries and Southwestern Bell Telephone. Many small and mid-sized companies also provide a wide variety of goods and services to regional and national markets.

The 2000 per capita income (PCI) for residents in the City of Wichita was \$20,692. Sedgwick County PCI was \$20,907 in the same year. This compares with \$20,506 PCI for the State of Kansas and \$21,587 for the entire United States.

Employment by Industry City of Wichita and Sedgwick County 2000		
	City of Wichita	Sedgwick County
Employed Persons	165,868	219,098
Agriculture, forestry, and fisheries	806	1,732
Construction	9,738	13,113
Manufacturing employment	39,074	53,710
Wholesale trade	5,242	7,105
Retail trade	19,578	25,069
Transportation warehousing & public utilities	6,278	8,579
Information	3,909	4,765
Finance, Insurance and real estate	9,225	11,963
Professional, scientific, management, administrative, and waste mgmt.	12,699	15,842
Educational, health and social svc..	32,571	43,014
Arts, entertainment, recreation, accommodation and food svc.	13,656	16,628
Other services (except public admin.)	7,609	10,307
Public administration	5,483	7,271
US Census Bureau, 2000, Profile of Selected Economic Characteristics.		

In 2000, 25 percent of the 219,000 jobs in Sedgwick County were in manufacturing industries and 20 percent was in educational, health, and social service industries. Manufacturing accounted for 53,700 jobs, while educational, health, and social services contributed 43,000 total jobs.

Wichita's unemployment rate averaged 3.6 percent for the year in 2000, slightly below the U.S. average of 3.7 percent. Wichita's unemployment rate has been lower than the national average since 1995. Recent increases in unemployment from economic impacts to the manufacturing sector have increased area unemployment.

4.3.4 Social Ecology

The social area of Wichita and Sedgwick County is primarily an urban metropolitan area that is the center of regional growth. The economy of Wichita is diverse with many national and international companies and has become a center of commerce within the region.

4.4 Natural Resources

4.4.1 Terrestrial

The Cowskin Creek drainage basin is located in the Wellington-McPherson Lowlands of the Central Great Plains ecoregion. The project lies within the floodplain of the Arkansas River and drains an area that has a flat lowland topography with very little relief. The floodplain in this area is either highly urbanized or has been developed into farmland. About six acres of floodplain vegetation provides habitat along Cowskin Creek (Photo

4.4.1). The general location of the project is within the Arkansas River Lowlands section of the Central Lowland Physiographic Province (Schoewe, 1949).

Loess and river valley deposits support extensive cropland agriculture of winter wheat and grain sorghum. Shale, gypsum and salt that formed from ancient Permian seas underlie the area. Salt is commercially mined from the Hutchinson salt member. The northern area contains the alluvial Equus beds, an important aquifer. Once a grassland, dominated by mixed grass prairie with scattered low trees and shrubs, much of this region is now in cropland, with the eastern boundary of the region marking the eastern limit of the major winter wheat growing area of the United States. Subsurface salt deposits and leaching contribute to the high salinity found in some streams.

Riparian forest occupies a narrow corridor along the project area and comprises only a small percentage of the cover type. Major species include plains cottonwood (*Populus occidentalis*), black willow (*Salix nigra*), common hackberry (*Celtis occidentalis*), American elm (*Ulmus americana*), green ash (*Fraxinus pennsylvanica*), black walnut (*Juglans nigra*), Osage orange (*Maclura pommifera*), and bur oak (*Quercus macrocarpa*). Pecan (*Carya illinoensis*), honey locust (*Gleditsia triacanthos*), red cedar (*Juniperus virginiana*), box elder (*Acer negundo*), and mulberry (*Morus rubra*) are present to a lesser degree.

Woody shrubs or smaller trees in the area include buckbrush (*Symphoricarpos orbiculatus*), green briar (*Smilax spp*), poison ivy (*Rhus radicans*), buttonbush (*Cephalanthus occidentalis*), grape (*Vitis sp.*), sumac (*Rhus sp.*), and Virginia creeper (*Parthenocissus quinquefolia*). Other plant species found along Cowskin Creek include dewberry (*Rubus spp*), giant ragweed (*Ambrosia trifida*), sunflower (*Helianthus sp.*), Illinois bundleflower (*Desmanthus illinoensis*), black-eyed Susan (*Rudbeckia hirta*), Johnson-grass (*Sorghum halepense*), cocklebur (*Xanthium strumarium*), curly dock (*Rumex crispus*), brome (*Bromus spp*), Canada wild rye (*Elymus canadensis*), sedge (Cyperaceae), smartweed (*Polygonum sp*), purpletop (*Tridens sp.*), water primrose (*Jussiaea sp.*), and spike-rush (*Eleocharis sp.*). Other grass species in the project area include Indian grass (*Sorghastrum nutans*), switchgrass (*Panicum virgatum*), Bermuda grass (*Cynodon dactylon*), and fescue (*Festuca sp.*).

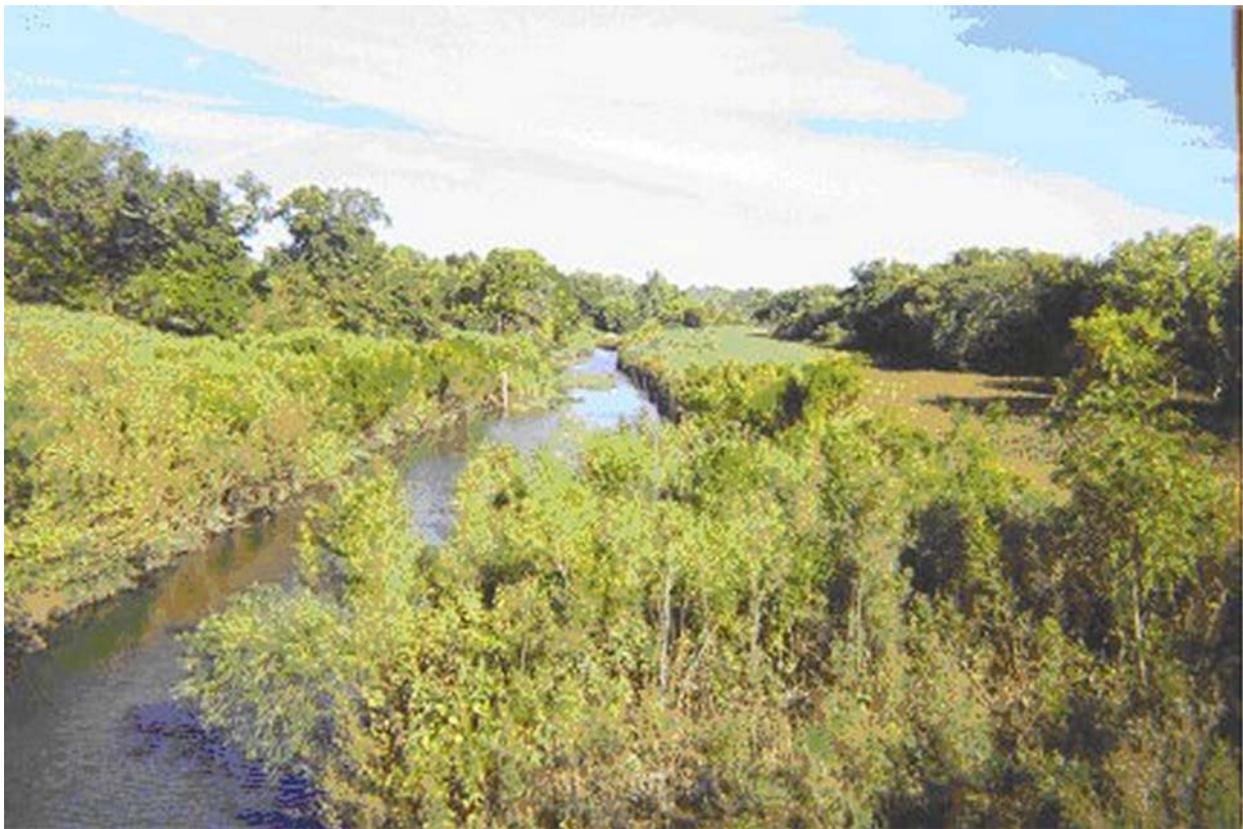


Photo 4.4.1 Habitat along Cowskin Creek.

4.4.2 Soils

Soils in the project area are of the Elandco-Canadian Association. These soils are deep, nearly level, well drained soils that have loamy subsoil (U.S. Natural Resource Conservation Service). Two soils occur along the proposed project. They include Elandco silt loam and Elandco silt loam, occasionally flooded. Both are classified as prime farmland. A significant part of the project is located on agricultural land (Station 484+50 – Station 515+00).

Elandco silt loam is a nearly level, well drained, soil on low terraces. Flooding is rare. Typically the surface layer is dark grayish brown and about 40 inches thick. The underlying material also is dark grayish brown and is about 60 inches thick. The main concern of management of this soil in urban areas is flooding. If protected against flooding, this soil is suitable for building site development. The soil is listed as 'prime farmland' by the US Department of Agriculture and is well suited to trees, shrubs, flowers, and lawn grasses and to all garden and agricultural crops commonly grown in the area.

Elandco silt loam, occasionally flooded is a nearly level, well-drained soil on flood plains. Typically the surface layer is dark grayish brown, very friable silt loam about 40 inches thick. The underlying material to a depth of 60 inches is dark grayish brown silt loam. Natural fertility and organic matter content are high. The main concern of management of this soil is flooding and it has a poor potential for building site development. This soil also is listed as 'prime farmland' by the US Department of Agriculture and is well suited to trees, shrubs, flowers, and grasses and to all garden and agricultural crops commonly grown in the area. The main hazard to agricultural and urban uses in this soil type is occasional flooding.

4.4.3 Prime Farmland

Soil that is prime or unique farmland as defined in the Farmland Protection Policy Act is classified as prime farmland. According to the U.S. Department of Agriculture, it is soil that is best suited for producing food, feed, forage, fiber, and oilseed crops. Both Elandco silt loam and Elandco silt loam, occasionally flooded soils listed above are classified as prime farmland.

4.4.4 Wild and Scenic Rivers

There are no streams within the project area that are classified as wild and scenic pursuant to the Federal Wild and Scenic Rivers Act, Public Law 90-542.

4.4.5 Aquatic and Wetlands

Cowskin Creek is a perennial, warm water stream with a small, relatively shallow channel and low gradient. This section of Cowskin Creek has been modified greatly during the last 50 years. The stream was channelized in the mid-fifties and again during the period between 1961 and 1982. Banks are steep in most areas with a drop of 4 to 6 feet. The creek is essentially a series of pools. The stream bottom predominantly is from the soil type in the area and bottom sediment is primarily silt. The water appearance is muddy and almost stagnant. No wetlands outside the existing channel would be affected by this project although there are wetlands in the project area. These wetlands are the oxbows of the original Cowskin Creek channel that existed prior to channelization. They are on the west side of Cowskin Creek and the current project alignment is along the east side of the creek. Construction would impact only the east side of the creek.

In 1995, the Kansas Natural Resource Council and the Sierra Club filed a complaint against the EPA, compelling it to enforce Section 303(d) of the Clean Water Act by establishing Total Maximum Daily Loads (TMDLs) for specified parameters. Kansas intervened in the litigation, since the state had lead responsibility for identifying the waters requiring TMDLs and establishing the TMDLs. TMDL parameters established for Cowskin Creek include Chlordane, Fecal Coliform Bacteria, and Nutrients/Biochemical Oxygen Demand (BOD). Designated uses for water in Cowskin Creek include: Primary Contact Recreation; Secondary Contact Recreation; Expected Aquatic Life Support; Domestic Water Supply; Food Procurement; Ground Water Recharge; Industrial Water Supply Use; Irrigation Use; and Livestock Watering Use.

A fish tissue monitoring and survey program was implemented by the Kansas Department of Health and Environment (KDHE) to analyze fish tissue samples for chlordane in order to define water body segments impacted by contamination and provide long term monitoring on segments with past or present fish consumption advisories. Bottom feeding fishes are sampled because of their feeding or dwelling preferences near the streambed where chlordane remains in the sediments. Fish tissue samples were collected in 1990-1998. Graphs of the data indicate an increasing trend in the Cowskin Creek watershed. The average concentration of chlordane in the fish tissue samples collected at the Mid-Continent Airport monitoring site during that period was 0.029 mg/kg. The water quality standard for Food Procurement is 0.00048 µg/L (KAR 28-16-28e(c)(4)(A)). Chlordane is a substance that can bioaccumulate in tissue through bioconcentration or biomagnification and is limited in surface waters to concentrations that result in no harm to human consumers. The fish consumption advisory level for chlordane is 0.02 mg/kg.

Fecal Coliform Bacteria loading capacity varies as a function of the flow present in the creek and is not fixed at a single value. Load curves were established for Primary and Secondary Contact Recreation to derive a load duration curve of colonies of bacteria per day. Flow was calculated by using data collected from 1987 to 1999 at the USGS Station (07145700) at Slate Creek. Twenty three percent of samples were over the criteria and standards were exceeded in all three seasons. The percent of samples collected during 2000 that exceeded the bacteria standard was 26% during spring, 16% during summer, and 22% during winter. The water quality standard for Secondary Contact Recreation is 2000 colonies per 100 ml (KAR 28-16-28e(c)(7)(C)).

The nutrient/ oxygen demand impairment was determined by analyzing three main parameters: Macroinvertebrate Biotic Index (MBI); percent Ephemeroptera, Plecoptera, and Trichoptera Taxa Count (%EPT); and Biochemical Oxygen Demand (BOD). The MBI rates the nutrient and oxygen demanding pollution tolerance of large taxonomic groups. Higher values indicate greater pollution tolerances. Fifty percent of the surveys (1980-1999) produced MBI values indicative of impaired aquatic life support. The EPT index is the proportion of aquatic taxa present within a stream belonging to pollution intolerant orders (mayflies, stoneflies, and caddis flies). Higher percentages of total taxa comprising these three groups indicate less pollutant stress and better water quality. When aquatic life is partially impaired, the percentage of EPT ranges from 12-54%. Percent EPT under current conditions (1980-1999) was 43%. Normal background levels for BOD are 3-4 mg/L. The historical average (1980-1999) of BOD in Cowskin is slightly above normal at 4.69 mg/L.

4.4.6 Fish and Wildlife

Most streams with riparian corridors contain a rich diversity of fish and wildlife species because of the abundance of food, vegetative cover, and water found there. The diversity and abundance of wildlife in the Cowskin Creek area is limited by the proximity of the creek to an urban area and by farming operations that utilize all available land to the edge of the creek bank. A small amount of floodplain forest remains within the study reach along Cowskin Creek. The following four subsections provide a listing of fish and wildlife species that could occur in the Cowskin Creek project area.

4.4.6.1 Fish

Habitat quality in the creek is degraded by excessive amounts of silt and nutrients from storm water runoff from streets, parking lots, gardens and lawns, and agricultural areas. The quality of aquatic habitat is further degraded by a lack of substrate diversity and from chemicals generated during agricultural operations in the watershed. In-stream aquatic substrate is primarily silt or silt laden woody debris. The stream forms a series of pools and cover consists primarily of fallen trees, logs, and rocks. Bank vegetation forms a canopy over the stream and provides shade in some areas (Photo 4.4.6.1.).



Photo 4.4.6.1 Bank canopy provides shade.

As is typical of low quality streams, species diversity is low in Cowskin Creek, with many individuals of a few species. Dominant aquatic animals include animals that are able to tolerate the polluted waters such as crayfish, beetles, shiners, minnows, sunfish, yellow and black bullheads, and carp. There are several good pools along this stretch that provide some fishing for sunfish, catfish, and carp.

Several factors are present in this section of Cowskin Creek that limit its quality as fish habitat. A significant percentage of the bottom is silt with a minimal variation of substrate in the channel. Much of the drainage basin is agricultural and nutrient loading was indicated in samples collected upstream of the project by the City of Wichita, Sewage Treatment Division. They found the benthic community lacking in the area sampled and fish species diversity and density low.

The Kansas Department of Health and Environment and the Kansas Department of Wildlife and Parks reports that a fish and wildlife advisory exists for Cowskin Creek within the City of Wichita and downstream to the confluence with the Arkansas River southeast of the City of Belle Plaine (Sedgwick and Sumner Counties). These agencies recommend that consumption of bottom-feeding and bottom-dwelling fish (carp, blue catfish, channel catfish, flathead catfish, freshwater drum, bullhead, sturgeon, buffalo, carpsucker, and other sucker species) from Cowskin Creek be limited. The advisory recommends a limitation of one 5-ounce meal per month, or twelve 5-ounce meals per year, on the consumption of the above fish due to the insecticide chlordane in fish tissue.

4.4.6.2 Amphibians and Reptiles

Numerous species of amphibians and reptiles are found in south central Kansas. Common species of amphibians that could occur in the project area include Woodhouse's toad (*Bufo woodhousei*), Great Plains toad (*Bufo cognatus*), plains leopard frog (*Rana blairi*), western chorus frog (*Pseudacris triseriata*), Blanchard's cricket frog (*Acris crepitans*), and bullfrog (*Rana catesbeiana*). Common species of reptiles that could occur in the project area include the northern water snake (*Nerodia sipedon*), snapping turtle (*Chelydra serpentina*), and western painted turtle (*Chrysemys picta*).

4.4.6.3 Birds

Birds that are most likely to occur in the area include mourning dove, great horned owl, barred owl, red-tailed hawk, wood duck, redheaded woodpecker, hairy woodpecker, downy woodpecker, great blue heron, blue jay, Carolina chickadee, European starling, English sparrow, warblers, flycatchers, native sparrows, red-winged blackbird, brown-headed cowbird, and cardinal. Neotropical migrants utilize the bottomland forests along the creek during spring migration.

4.4.6.4 Mammals

Mammals most likely to occur in the project area include species that are tolerant of urban activity. Typical species include fox squirrel (*Sciurus niger*), pocket gopher (*Geomys bursarius*), raccoon (*Procyon lotor*), opossum (*Didelphis marsupialis*), mink (*Mustela vison*), striped skunk (*Mephitis mephitis*), spotted skunk (*Spilogale putorius*), cottontail rabbit (*Sylvilagus floridanus*), several species of rodents, and several species of bats.

4.5 Threatened and Endangered Species

The U.S. Fish and Wildlife Service reports that there is no record of occurrence of any Federally listed threatened or endangered species based on a review of the proposed project area.

State-listed threatened and endangered species known or likely to occur in the project area includes the state-listed eastern spotted skunk. The Kansas Department of Wildlife and Parks has designated the Cowskin Creek drainage basin as critical habitat for the eastern spotted skunk.

Spotted skunks are smaller and more weasel-like in body shape than the more familiar striped skunk. The spotted skunks' strips are broken in pattern, giving it a 'spotted' appearance. Spotted skunks may occur in suitable habitat anywhere in the state. They seem to prefer forest edges and upland prairie grasslands, especially where rock outcrops and shrub clumps are present. In western counties, it relies heavily on riparian corridors where woody shrubs and woodland edges are present. Woody fencerows, odd areas, and abandoned farm buildings are also important habitat for spotted skunks.

4.6 Cultural Resources

In accordance with Section 106 of the National Historic Preservation Act of 1966 (as amended), in 2001 consultation was initiated with the Kansas State Historic Preservation Office (SHPO) and the Wichita and Affiliated Tribes of Oklahoma (Appendix D). The Wichita and Affiliated Tribes did not provide any comment on the project.

In July 2003, 4G Consulting performed a literature review and field reconnaissance at the request of the Tulsa District. No historic properties were identified. The project methodology is outlined in the 4G Consulting report of investigations (Appendix D). In a September 8, 2003 letter to the Kansas SHPO, Tulsa District established an agency position of "no historic properties affected" for the Cowskin Creek project. The Kansas SHPO agreed in a return letter dated October 3, 2003. Section 106 coordination is therefore complete for the project.

4.7 Air Quality

The U.S. Environmental Protection Agency (EPA) published a Conformity Rule on November 30, 1993, requiring all Federal actions to conform to appropriate State Implementation Plans (SIP's) that were established to improve ambient air quality. At this time, the Conformity Rule only applies to Federal actions in non-attainment areas. A non-attainment area is an area that does not meet one or more of the National Ambient Air Quality Standards for the criteria pollutants designated in the Clean Air Act (CAA).

The project area is within the City of Wichita and is predominately urban. The Wichita-Sedgwick County Health Department monitors air quality in Wichita and the surrounding area for both criteria pollutants and air toxins. National Ambient Air Quality Standards exist for six pollutants: carbon monoxide, ozone, particulate matter smaller than 10µm, sulfur dioxide, nitrogen oxides, and lead. These "criteria pollutants" are the only ones for which

standards have been established. The EPA assigns designations, based on an area's meeting, or "attaining" these standards. The Wichita-Sedgwick County area is designated "In Attainment" for criteria pollutants and air toxins.

A conformity determination based on air emission analysis is required for each proposed Federal action within a non-attainment area. Since this geographical region is in attainment and meets the National Air Quality Standards for the criteria pollutants designated in the CAA, a conformity determination is not required.

4.8 Hazardous, Toxic, and Radiological Waste

HDR Engineering, Inc., was contracted to conduct a Hazardous, Toxic and Radioactive Waste (HTRW) survey for the Cowskin Creek project. They concluded that the potential for discovery and significant problems related to HTRW during project construction or operation is low.

No developments are present within 200-300 feet along either side of the creek, with the exception of three bridges. The land is densely covered with grass, shrubs, and trees. Numerous residential structures are present beyond, on either side of the creek. Neither current nor historic uses appear to present significant environmental concerns. No sites of environmental concern were identified on any of the Federal or state environmental databases searched. A review of historical aerial photographs reveal that the area has remained largely unchanged since 1938, with the exception of residential development, new bridge construction, and roadway improvements. Three sites located within the HTRW search boundaries were identified in the database search: Johnson's General Store, at 10318 Maple Street (Underground Storage Tank (UST)); Universal Quick Mart, 20611 W. Harry (UST); and Millers Cleaners, 323 S. Maize Road (Resource Conservation and Recovery Act (RCRA)). Based on the information provided regarding the nature of listing and regulatory status, as well as their proximity to Cowskin Creek, these three sites do not appear likely to result in a significant environmental impact to any portion of the project area affected by future construction activities. The Wichita-Sedgwick County Health Department provided information on historical activities for the area through record reviews and specialized knowledge from divisions within the department. Records indicate that limited dumping took place on private land during the 1970's and 1980's on the west side of Cowskin Creek, north of Kellogg. During the 1990's, considerable quantities of concrete were dumped on the east side of Cowskin Creek. Both areas appear to have been cleaned up, as HDR Engineering observed no evidence during the site reconnaissance. Given the historic time frames and the nature of the materials, it is unlikely that these past incidents have resulted in a significant environmental impact to the area. A site reconnaissance was conducted on October 8, 9, and 10, 2001. No evidence of dumping was observed, with the exception of some lawn debris such as tree limbs and grass clippings. A 55-gallon drum was washed up on the east bank. None of these materials appeared to represent a threat of significant environmental impact to the site.

SECTION 5.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

A summary of environmental impacts is presented in Table 5.0, Impact Assessment Matrix.

5.1 Social and Economic Impacts

5.1.1 Future Without-Project Conditions

5.1.1.1 Population

Under the without-project conditions, population trends of the past decade will likely continue with higher than average rates of population growth and lower than average ages within the City of Wichita. This trend continues the in-migration of the working age population as the opportunities in the City of Wichita and surrounding metropolitan areas draw from the available labor force in the region. Job opportunities in the City of Wichita and the demand for residential lands will be linked to future population dynamics in the area. In the absence of flood control improvements, slower urban development in the western area of the City of Wichita will experience reduced population growth and urban densities. The flooding along Cowskin Creek will continue to disrupt the lives of those conducting business, going to school and residing in flood prone areas. The health and safety of these individuals will continue to be at risk.