7-6-2000

Augusta River Crossing : Environmental Impact Statement, Chapter Three - Affected Environment, July 6, 2000

Maine Department of Transportation

3.0 AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This Chapter presents baseline information on the existing physical, biological and social environment within the defined study area, focusing on the alternatives retained for further study, A-1, A-2, and B. Limited resource information on Connectors A and B is also provided. Much of the data presented here has been summarized from separate reports compiled by MDOT staff and consultants. These reports include: *Natural Resources Report - Proposed Third River Crossing* (Bostwick et al 1999); *The Augusta River Crossing Study Water Resource Evaluation of Alternatives* (Noel 1999); *The Augusta River Crossing Study Visual Impact Assessment* (Van Dusen 1999); *Phase I Site Assessment for Uncontrolled Oil and Hazardous Waste Along Corridor Alternatives A and B* (Doughty 1999); the *Air Quality Technical Memorandum* and the *Noise Technical Memorandum* (Gannett Fleming 1999).

Copies of these reports are available from MDOT upon request. Information regarding anticipated impacts on these resources is presented in Chapter 4.

3.2 PHYSICAL AND BIOLOGICAL ENVIRONMENT

3.2.1 Soils and Geology

Bedrock geology maps (MGS 1985 (a), Osberg 1968, Edwards 1991) show that the study area is underlain by Ordovician to Silurian-aged Vassalboro Formation (metamorphosed calcareous mudstones), Silurian-aged Waterville Formation (metamorphosed mudstones), a Silurian-aged unnamed sulfidic mudstone and Devonian-aged intrusives. Although fossils were reported found in the Waterville formation in the Waterville area (Osberg, 1968), none are expected here (Churchill-Dickson 1999).

The surficial geology of the area is characterized by deposits of varying thickness. Common components of the overburden consist of till, fine grained glacio-marine deposits (Presumpscot Formation), coarse grained glacio-marine deposits and alluvium. Common landforms in this area include drumlins, glacial outwash deltas and eskers (MGS 1985 (b)).

Soils in the study area are varied, and are classified from poorly drained to excessively well drained (Table 3-1). The general soils association for the study area is described as Buxton-Scio-Scantic Association, which is a common marine and lacustrine soil association found adjacent to the Kennebec River. The west side of the Kennebec River is predominantly well drained and

excessively well drained soils. The east side is predominantly moderately well drained and hydric soils (USDA-SCS 1978). The river bank has Suffield and Hinckley soils which constitute extractable deposits of gravel.

Table 3-1. Study Area Soil Drainage Classifications and Occurrence

Soil Name	Drainage Class	Occurrence in Relation to Kennebec River
Buxton BuB2, BuC2	Moderately Well Drained	East side
Hartland, HfC, HfD	Well Drained	West side
Hinckley, HkB, HkC, HkD	Excessively Well Drained	West side
Hollis HrB, HrC,	Excessively Well Drained	East side
Paxton PeB, PeC	Well Drained	East side
Scantic ScA	Poorly Drained Hydric	East side
Scio SkB,SkB2, SkC	Moderately Well Drained	West side
Suffield SuB, SuC, SuD2	Well Drained	East side
Windsor WmC	Excessively Well Drained	West side East side

Source: USDA-SCS - 1978

Alternative A has predominantly Windsor and Scio soils in the area west of Fisher Brook, and Hartland and Hinckley soils in the area to the east. East of the Kennebec River, Alternative A-1 is predominantly Buxton and Scantic soils, with a large area of Hollis and some Windsor soils along the river bank. Alternative A-2 has Suffield soils beginning at Route 201/100 and extending 2000 feet east, where it becomes Buxton-Scantic soils up to Routes 202/3.

Alternative B is Windsor and Scio soils up to the point where it diverges from the A alternatives. It then becomes predominantly Hartland soils up to the Kennebec River. East of the river, Alternative B is predominantly Buxton soils.

3.2.2 Groundwater

Occurrence

As described in the Soils and Geology section of this chapter, the surficial geology of the project area is dominated by till and glacial marine deposits. Because of the fine grained nature of these deposits, groundwater flow within them is relatively slow. Typically, they can

deliver only enough water to dug wells to supply single family homes and other small uses. Because of the slow groundwater flow rate and mineral composition of these deposits, they have an ability to attenuate (restrict) the migration of some types of contaminants. Where sufficiently thick, these silty deposits act as a buffer, protecting the underlying fractured bedrock and sand and gravel aquifers.

The sand and gravel aquifers within the study area consist of thick glaciofluvial deposits consisting predominantly of sand and gravel. These deposits have the potential to supply large quantities of water to properly installed gravel packed wells. Wells installed in sand and gravel deposits often supply water for industrial, food processing and public water systems. Sand and gravel aquifers have only a moderate ability to attenuate contaminants. Because they are able to supply large quantities of water for human use and also have only a limited ability to attenuate contaminants, sand and gravel aquifers are considered a valued and sensitive natural resource.

A fractured bedrock aquifer underlies the glacial till, glacial marine, and glaciofluvial deposits within the alternatives. In this aquifer, fractures within the metamorphic bedrock transmit groundwater. The amounts of water provided to drilled bedrock wells in central Maine varies greatly over short distances. The quantity of water available to a drilled bedrock well is dependent on the number, openness, spacing, and geometry of water bearing fractures intersected during drilling. Bedrock wells can provide quantities of water suitable for uses from single family homes to amounts suitable for large municipal water systems. Bedrock aquifers have a very limited ability to attenuate contaminants. Areas with thin surficial deposits to protect the bedrock aquifer may be sensitive to impacts from contaminants.

3.2.3 Surface Waters

All the study alternatives include areas that drain directly to the Kennebec River. In addition, the alternatives are located in the minor drainage watersheds for Fisher and Stone brooks on the west side and Riggs Brook on the east side of the Kennebec River. Connectors A and B are located in the minor drainage watershed for Whitney Brook. There are also many unnamed streams and drainage swales that flow into these resources throughout the alternatives. A brief description of the water resources and any State or National Water Quality designations is given in Table 3-2.

The Kennebec River and tributaries have been designated as Habitat of Particular Concern for Atlantic Salmon by the National Marine Fisheries Service. This designation indicates that

all the water resources discussed are sensitive to short-term and long-term sedimentation because Atlantic Salmon spawning areas and habitat and other cold water fisheries habitat can be severely impacted by sedimentation events. Field observations and Maine Department of Inland Fisheries and Wildlife (MDIFW) surveys verify that the streams on the west side of the Kennebec River have better cold water fisheries habitat than on the east side. This indicates the west side water resources have an overall higher sensitivity to sedimentation and thermal pollution.

Table 3-2. Description of Water Resources in Study Area (for location refer to Figure 2-1)

Kennebec River The Kennebec River from the Sidney/Augusta border to the Father Curran Bridge has been upgraded from Class C to Class B ranking by the DEP since the removal of the Edwards Dam. There is an active sport fishery below the former dam site and it is anticipated that fishery habitat will expand with the dam removed (see InfoBox on page 42). The Kennebec River and its tributaries are on a proposed list to be designated by the National Marine Fisheries Service as Habitat of Particular Concern for Atlantic Salmon.
Stone Brook This resource drains to Bond Brook and is also ranked Class B, the third highest classification of fresh surface waters by the DEP. Its watershed includes most of the I-95 connection areas for all proposed alternatives. It is currently experiencing problems with streambank erosion.
Fisher Brook This resource is ranked Class B by the DEP. Field observations by MDOT have verified that fish (unidentified) are in the lower one third to one quarter of the brook between the Kennebec River and Rt. 104. The Fisher Brook watershed area below Rt. 104 within all alternatives is primarily forested land with some large areas of steep slopes (Vollmer 1994). The stream appears to provide good cold-water fish habitat (Woodward 1999).
Riggs Brook This resource is ranked Class B by the DEP. It is considered to be sensitive to additional sedimentation by the National Marine Fisheries Service. It is known to have sporadic populations of brown trout in the upper reaches and appears to be primarily a warm water fishery. The east side of both Alternative A options and Alternative B are located in the watershed of Riggs Brook.
Whitney Brook This resource is ranked Class B by the DEP and has similar fisheries habitat to Riggs Brook (Van Riper 1999). The east sides of Connector A and Connector B are located in the Whitney Brook watershed.
Unnamed Streams By default, these resources have Class B waters as designated by DEP. Each alternative has at least one unnamed stream in the study area.

Confluence of Fisher Brook and the Kennebec River
(looking west)
Source:
MDOT Photo Lab

3.2.4 Vegetation and Cover Type

In general, the study area has a variety of land uses that result in a mosaic of cover types. A cover type is an area where the vegetative structure and composition is similar. On the west side of the Kennebec River, cover types range from approximately 4 to 40 acres (1.5-16 hectares) in size, including scrub-shrub hardwood, softwood, and open field. Current and historic logging activities in the large softwood parcel and haying activities in the open field have disturbed these areas.

The vegetation and cover types found in the study area are common to central Maine. The value of the various cover types as habitat is addressed in the following sections in this chapter and in Chapter 4.

3.2.5 Wildlife

Thestudy area provides a variety of different habitats including open field, forested wetlands, deciduous and coniferous forest drainages, young coniferous forests, upland scrub-shrub, and hayed and farmed areas. Open fields provide habitat for smaller mammals which make them good foraging habitat for birds and also larger mammals such as fox and coyote. Forested habitats are used as breeding and foraging habitat for birds, and as cover, foraging and breeding habitat for animals such as deer, raccoon, hare, and squirrel. For the purposes of this study, mammals and birds were the focus of research and field work on wildlife habitat.

Mammals

Mammal species found in the study area have been identified primarily using MDIFW and other existing data. In addition, winter tracking studies looking for wildlife sign were undertaken by MDOT staff on March 24-25, 1998, along several transects on both sides of the Kennebec River. Data from available Edwards Dam relicensing/removal studies were also reviewed (see InfoBox). Table 3-3 is a list provided by MDIFW of wildlife that occur in study area habitats, with species observed in the winter tracking and/or Edwards Dam studies noted.

InfoBox - Edwards Dam

Edwards Dam Removal (looking south)
Source: MDOT Photo Lab

The Federal Energy Regulatory Commission (FERC), on November 25, 1998, denied the application of Edwards Manufacturing Company and the City of Augusta to relicense the 160-year-old Edwards Dam on the Kennebec River in Augusta. This marks the first time that FERC has ordered the removal of a dam for which the dam owner was seeking a new license.

The removal of the dam allows migrating fish to have access to the longest stretch of migrating fish spawning habitat north of the Hudson River. For the first time since 1837, when the dam was built, Shortnosed sturgeon, Atlantic sturgeon, Striped bass, Rainbow smelt, Atlantic salmon, shad and other species may reach 17 miles of previously inaccessible upstream spawning habitat. Removal of the dam will result in an overall increase in recreational boating and fishing benefits along the Kennebec River.

The first section of the dam was breached on July 1, 1999 (see photo foreground above). Removal was completed in October 1999.

For more information see http://www.state.me.us/spo/edwards/ on the Internet.

Table 3-3. MDIFW Wildlife List

Beaver #	*Castor canadensis*
Bobcat	*Lynx rufus*
Coyote #	*Canis latrans*
Deer mouse	*Peromyscus maniculatus*
Eastern chipmunk #	*Tamias striatus*
Fisher	*Martes pennanti*
Flying squirrel	*Glaucomys sabrinus*
Grey squirrel #	*Sciurus carolinensis*
Little brown myotis	*Myotis lucifugus*
Long tailed weasel	*Mustela frenata*
Masked shrew	*Sorex cinereus*
Meadow vole	*Mycrotis pennsylvanicus*
Mink #	*Mustela vison*
Moose #	*Alces alces*
Muskrat #	*Ondatra zibethicus*
Pigmy shrew	*Microxores hoyi*
Porcupine*	*Erethizon dorsatum*
Raccoon #	*Procyon lotor*
Red Back vole	*Clethrionomys gapperii*
Red squirrel *#	*Tamiasciurus hudsonicus*
Red fox*#	*Vulpes vulpes*
River otter	*Lutra canadensis*
Short tail shrew #	*Blarina brevicauda*
Short tailed weasel (Ermine)	*Mustela erminea*
Smokey shrew	*Sorex fumeus*
Snowshoe hare*#	*Lepus americanus*
Starnose mole	*Condylura cristata*
Striped skunk #	*Mephitis mephitis*
White tail deer *#	*Odocoileus virginianus*
Woodchuck #	*Marmota monax*
Woodland jumping mouse	*Napaeozapus insignis*

* Indicates found during MDOT winter tracking studies

# Indicates listed in Edwards Manufacturing Relicensing Project (Edwards 1991)

Birds

The study area offers a variety of both terrestrial and aquatic habitats for birds. There are mature forests, scrub areas, open fields, and wetl ands, as well as two major streams (Fisher and Riggs brooks) a nd the Kennebec River.

Terrestrial Birds

A breeding bird survey was performed by MDOT staff over a total of four days during the months of May and June, 1998. Various habitats were surveyed by running transects and sampling within different cover types. Species identified are presented in Table 3-4. Of the habitats studied, the mixed deciduous/coniferous forest, and the mixed deciduous/coniferous forest with a coniferous understory had the highest species diversity. The sites having the highest number of individuals were upland/wetland field, Palustrine scrub-shrub wetland, and mixed deciduous/coniferous forest with a coniferous understory.

On a May 11, 1999 field walk, Field sparrow (*Spizella pusilla*), Broadwing hawk (*Buteo platypterus*) and Turkey vulture (*Cathartes aura*) were noted by MDOT staff.

Table 3-4. Terrestrial Breeding Bird Survey Results from MDOT

Alder Flycatcher	*Empidonax alnorum*	Eastern Meadowlark	*Sturnella magna*
American goldfinch	*Carduelis tristis*	Hairy Woodpecker	*Picoides villosus*
American crow	*Corvus brachyrhynchos*	Indigo Bunting	*Passarina cyanea*
American woodcock	*Scolopax minor*	Nashville Warbler	*Vermivora ruficapilla*
American robin	*Turdus migratorius*	Ovenbird	*Seiurus aurocapillus*
Barn Swallow	*Hirundo rustica*	Pine Warbler	*Dendroica pinus*
Blk-throated Green Warbler	*Dendroica virens*	Purple Finch	*Carpodacus purpureus*
Blk & White warbler	*Mniotilta varia*	Red-winged Blackbird	*Agelaius phoeniceus*
Blk capped chickadee	*Parus atricapillus*	Ruby-crowned Kinglet	*Regulus calendula*
Blue jay	*Cyanocitta cristata*	Veery	*Catharus fuscescens*
Bobolink	*Dolichonyx oryzivorus*	White-throated Sparrow	*Zonotrichia albicollis*
Chestnut Sided Warbler	*Dendroica pensylvanica*	Winter Wren	*Troglodytes troglodytes*
Common yellowthroat	*Geothlypis frichas*	Wood Thrush	*Hylocichla mustelina*
Common grackle	*Quiacalus quicsula*	Yellow warbler	*Dendroica petechia*
Downy woodpecker	*Picoides pubescens*	Yellow-rumped Warbler	*Dendroica coronata*
Eastern phoebe	*Sayornis phoebe*		

Woodcocks -- Research for this study included an American woodcock (*Scolopax minor*) courtship survey. These surveys involve looking for visual signs of courtship display along with listening for call notes, vocal chirps, and twittering of the wings. Courtship activity in the Augusta area can be expected to occur until approximately May 15. Surveys were done on May 12, 1998, and May 14, 1998 at two different sites. The first site was an upland field The second site consisted of an upland field and a mostly palustrine emergent wetland, sur-

rounded by a farm field, semi-open shrub area, and two roads. Each site had 5 observation marshes were surveyed for the Edwards Manufacturing Dam relicensing application. Wading bird surveys found Spotted sandpiper, American bittern and Great blue heron. Within the former headpond, surveys for dabbling ducks found one Black duck brood and two Mallard broods, and for diving ducks one Hooded merganser brood. The number of diving ducks found during the survey increased in the fall, with Common merganser, Golden eyes and Buffleheads observed (Edwards 1991). Other aquatic birds observed during the Edwards study were Bald eagle, Ospreys, Double-crested cormorant, Herring, Ring-billed and Great black-backed gulls.

Within the project area, Riggs Brook has a semi-open area on one side and is forested on the other. Small numbers of Wood ducks and Mallards, and occasionally Hooded mergansers, likely use this area as nesting habitat.

3.2.6 Aquatic Habitat

In the study area, lotic (flowing water) habitats are more prevalent than lentic (standing water) habitats. Existing flowing waters are the Kennebec River, Riggs Brook and its tributaries, Fisher Brook and its tributaries, tributaries of Stone Brook, and Bond Brook. With the dam removed, very little standing or ponded water will occur in the area. Alternative A is approximately 8500 feet (2600 meters) upstream of the former Edwards Dam and Alternative B is 3700 feet (1125 meters) upstream.

Fisheries

The Kennebec River has been designated by the New England Fishery Management Council as an Essential Fish Habitat for Atlantic salmon. The designated habitat includes all aquatic habitats in the Kennebec watershed and all tributaries to the extent that they are now or were historically accessible for salmon migration. The removal of the Edwards Dam has expanded potential habitat for salmon and other species. Table 3-5 lists expected habitat in the crossing areas with the dam removed, using data from the Edwards Dam Removal Evaluation report (SWETS 1995).

Tables 3-6 and 3-7 list fish that have been found in the Kennebec River both upstream and downstream of the former dam, according to the Edwards Dam Relicensing Application (Edwards 1991).

Fisher Brook is rated as good in terms of nursery and spawning habitat (SWETS 1995). During a

1998 field walk, water temperatures were cool, and fish were seen by MDOT and MDIFW biologists. The lower 250 feet (75 m) of Fisher Brook (near the confluence with the Kennebec) is 2 - 4 feet (0.6-1.2 m) deep, and further upstream is approximately 1 - 2 feet (0.3-0.6 m) deep. Above the influence of the existing impoundment, the substrate is 75% cobble and 10% gravel with 80% riffle and 20% pool habitat. The upper reach may support smelt or salmonid spawning. Small fish were noted throughout.

Table 3-5. Expected Fishery Habitat After Edwards Dam Removal (SWETS 1995)

Species	Vicinity of Alternatives A and B
Adult Salmon	Large amount of adult habitat within expected channel
Rainbow smelt	Large amount of adult habitat within expected channel
Adult Striped bass	Narrow amount within center of expected channel

It is predicted that with the dam removed, access to Fisher Brook could decrease in value for bass as the stream flow gradient will be greater with the lower water levels. The habitat value could increase for smelt and salmonids as new gravel beds would be exposed (SWETS 1995). According to MDIFW, Fisher Brook has a steep gradient which may play a role in which species can access it from the river (Woodward 1999). Water temperature is cold (near 60º F, 15º C.) in the summer months and may attract cold water species such as salmonids.

In the SWETS report (1995), Riggs Brook is rated as fair in terms of nursery and spawning habitat. There are impassable falls within 600 feet (180 m) of its mouth, and the area contains habitat for warm water species such as Smallmouth bass. According to MDIFW (Woodward 1999), Riggs Brook has been surveyed at spring and summer flows both in the main stem and two tributaries at Routes 202/3 and Church Hill Road. Minnows and warm water fish species were captured (Table 3-8), as well as frogs and crayfish. These studies were done in conjunction with routine stream investigations for all road and stream crossings in Augusta during the summer of 1997 and spring of 1998. Temperatures during both site visits were fairly warm (in excess of 65º F, 18º C).

Table 3-6. Fish Found in the Former Head Pond (Edwards 1991)

Alewife	*Alosa pseudoharengus*
American shad	*Alosa sapidissima*
American eel	*Anguilla rostrata*
Banded killifish	*Fundulus diahanus*
Black crappie	*Pomoxis nigromaculatus*
Blacknose dace	*Rhinichthys atratulus*
Bluegill sunfish	*Lepomis gibbosus*
Brook stickleback	*Eucalia inconstans*
Brook trout	*Salvelinus fontinalis*
Brown bullhead	*Ictalurus nebulosus*
Brown trout	*Salmo trutta*
Chain pickerel	*Esox niger*
Creek chub	*Semotilus atromaculatus*
Fallfish	*Semotilus corporalis*
Fourspine stickleback	*Apeltes quadracus*
Golden shiner	*Notemigonus crysoleucas*
Landlocked Atlantic salmon	*Salmo salar*
Largemouth bass	*Micropterus salmoides*
Pumpkinseed sunfish	*Lepomis gibbosus*
Rainbow smelt	*Osmerus mordax*
Sea lamprey	*Petromyzon marinus*
Silvery minnow	*Hybognathus nuchalis*
Smallmouth bass	*Micropterus dolomieui*
Spottail shiner	*Notropis hudsonius*
Threespine stickleback	*Gasterosteus aculeatus*
White sucker	*Catostomus commersoni*
White perch	*Morone americana*
Yellow perch	*Perca flavescens*

Table 3-7. Anadromous Fish Found Below the Former Dam (Edwards 1991)

Alewife	*Alosa pseudoharengus*	Common carp	*Cyprinus carpio*
American eel	*Anquilla rostrata*	Fourspine stickleback	*Apeltes quadracus*
American shad	*Alosa sapidissima*	Golden shiner	*Notemigonus crysoleucas*
Atlantic salmon	*Salmo salar*	Largemouth bass	*Micropterus salmoides*
Atlantic sturgeon	*Acipenser oxyrynchus*	Ninespine stickleback	*Pungitius pungitius*
Banded killifish	*Fundulus diaphanus*	Pumpkinseed	*Lepomis gibbosus*
Black crappie	*Pomoxis nigromaculatus*	Rainbow smelt	*Osmerus mordax*
Blacknose dace	*Rhinichthys atratulus*	Shortnose sturgeon	*Acipenser brevirostrum*
Blueback herring	*Alosa aestivalis*	Smallmouth bass	*Micropterus dolomieui*
Brook stickleback	*Culea inconstans*	Striped bass	*Morone saxatilis*
Brook trout	*Salvelinus fontinalis*	White perch	*Morone americana*
Brown trout	*Salmo trutta*	White sucker	*Catostomus commersoni*
Chain pickerel	*Esox niger*	Yellow perch	*Perca flavescens*
Common shiner	*Notropis cornutus*		

Table 3-8. Fish Found in Riggs Brook (MDIFW)

Creek chub	*Semotilus atromaculatus*
Ninespine stickleback	*Pungitius pungitius*
Golden shiner	*Notemigonus crysoleucas*
Common shiner	*Notropis cornutus*
White sucker	*Catostomus commersoni*
Pumpkinseed	*Lepomis gibbosus*
American eel	*Anquilla rostrata*
Brown bullhead	*Ictalurus nebulosus*

Invertebrates

Information on invertebrates was obtained during MDOT staff dives along Alternatives A and B and from the SWETS Report (1995). On August 12, 13, and 14, 1998, MDOT and MDIFW divers conducted underwater evaluation of the former Edwards Dam headpond and locations of the proposed bridge crossings on the Kennebec River for Alternatives A and B.

MDOT divers observed 6 species of freshwater mussels (MDIFW 1998) along a transect that parallels the crossing area (Table 3-9).

Table 3-9. Freshwater Mussels Observed (MDIFW 1998)

Alewife floater	Anadonta implicata
Eastern elliptio	Elliptio complanata
Eastern floater	Pyganandon cataracta
Tidewater mucket	Leptodea ochracea*
Triangle floater	Alasmidonta undulata

* State-listed Endangered Species

Sampling for the Edwards Dam EIS was done 900 feet (275 m) (lower impoundment) and 32,500 feet (9900 m) (mid-impoundment) above the existing dam (SWETS 1995). Invertebrates found nearest the proposed crossings were in the lower impoundment 3700 feet (1125 m) above the dam for Alternative B and 8700 feet (2650 m) above the dam for the A alternatives and are listed in Table 3-10.

Table 3-10. Invertebrates Observed Upstream of the Former Edwards Dam (SWETS 1995)

Taxa	Percent Abundance
ANNELIDA	
Oligochaeta	2.4%
ARTHROPODA	
Insecta	
Diptera	
Chironomidae (l)	0.5%
Chironominae (l)	0.2%
Asheum sp.	0.7%
Microtendipes sp.	0.2%
MOLLUSCA	
Gastropoda	
Hydrobiidae (l)	0.2%
Pelecypoda	
Sphaeriidae (l)	95.6%
Substrate Composition	99% sand / 1% gravel

Samples were also taken between the third and fourth rock cribs found 750 feet (225 m) downstream from the Augusta public boat launch. These data are included in Table 3-11 as

the dam removal may allow these taxa to move into the project area.

Table 3-11. Invertebrates Observed Downstream of the Former Edwards Dam (SWETS 1995)

Taxa	Soft Substrate Abundancy (Mucks and Sand)	Soft Substrate Abundancy (Cobble bar)
BRYOZOAN		
Hyalinella sp	not found	0.2 %
ANNELIDA		
Oligochaeta	10.7 %	not found
ARTHROPODA		
Arachoidea		
Hydrachnidae	1.0%	not found
Insecta		
Collembola (I)	Not found	7.7%
Ephemeroptera		
Caenis sp.	2.9%	0.2%
Diptera (I)	5.3%	0.2%
Chironomidae (I)	11.5%	8.6%
Tanyodinae (I)	Not found	0.7%
Orthocladiinae (I)	7.9%	4.7%
Acricotopus sp.	0.2%	0.2%
Cricotopus sp.	Not found	9.4%
Orthocladius sp.	0.5%	37.1%
Chironominae (I)	7.5%	3.1%
Asheum sp.	7.5%	Not found
Cryptochironomus sp.	12.8%	Not found
Demicryptochironomus	0.2%	Not found
Dicrotendipes sp.	4.0%	8.4%
Polypedilum sp.	7.3%	Not found
Pseudochironomus sp.	15.7%	Not found
Tanytarus sp.	Not found	1.2%
Hemerodromia sp.	Not found	0.2%
Homoptera		
Aphididae (I)	0.5%	Not found
MOLLUSCA		
Gastropoda (I)	Not found	8.4%
Physa sp.	Not found	6.2%
Hydrobiidae (I)	0.2%	Not found
Amnicola sp.	0.5%	2.1%
Pelecypoda		
Sphaeriidae (I)	4.0%	1.1%
TOTALS	**100.0%**	**99.9%**

Vernal or Seasonal Pools

The alternatives were surveyed May 27 and 28, 1999, and a total of 4 pooled areas were identified. Along Alternative A-1 there is a deep 3 by 4 foot (0.9 by 1.2 m) pooled area,

possibly an old well, west of Routes 202/3 between the agricultural field and Riggs Brook. No amphibians were observed in this pool, but there was evidence of a recent hatch of mosquitos.

Along the B alternative, a pool is found between Route 201/100 and the Kennebec River. This pool is surrounded by an upland area that had recently been disturbed by logging and soil grubbing, but still contained unidentified tadpoles. A second pool, approximately 32 by 52 feet in size (10 by 16 m), is located within a wetland and is an emergent vegetated pool just east of the crossing of Route 201/100. A third pool is located within an open upland area and has emergent and shrub vegetation along the perimeter. Neither the second or third pools had evidence of amphibians.

Riffle and Pool Complexes

In flowing waterbodies, riffle and pool complexes are identified as Special Aquatic Sites in Section 404 of the Clean Water Act. According to Section 404(b)(1) Guidelines, "Steep gradient sections of streams are sometimes characterized by riffle and pool complexes. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. Pools are characterized by a slower stream velocity, a steaming flow, a smooth surface and a finer substrate."

The three major streams in the study area have some riffle and pool complexes. Fisher Brook has a riffle and pool ratio of 4:1 in the lower reaches. Bond Brook has pools and riffles along its length, with a large pooled area between the Route 8/27 crossing and Bond Brook Road (behind the recreational fields). Riggs Brook is primarily a pooled, slow-moving stream, with an approximately 2000-foot (600 m) segment of riffle water located 1.5 miles (2.4 km) from the mouth.

3.2.7 Wetlands

The majority of the wetlands within the project alternatives fall into three major hydro-geomorphic types: those within low topographical drainage channels, depressional areas, and those that border along surface waterbodies. These wetland types are found in every covertype in the project alternatives.

A preliminary assessment of the study area was done in 1994 (Vollmer 1994) using National Wetland Inventory and published Hydric Soils mapping. More detailed field investigations of wetlands were performed once alternative alignments had been developed. Wetlands were delineated according to the three-parameter routine determination approach (soils, vegeta-

tion, hydrology) of the 1987 Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987). All three parameters had to be present to confirm wetland conditions, except in areas considered to be problematic and/or atypical. Areas within the mapped 1000-foot (300 meter) wide corridor alternatives for Alternatives A-1, A-2 and B were checked for wetlands, flagged and surveyed. In areas where access was denied, wetlands were mapped using visual inspections and 1986 stereo photography. The study area was divided into segments and wetlands were identified by segment.

Fifty-one wetlands and wetland clusters were found during the evaluation. Ten of these were associated with streams. Wetlands associated with Riggs Brook are of special note because of their high value for floodwater control and habitat for bird, terrestrial, and aquatic fauna. Detailed information regarding wetlands can be found in the *Natural Resources Report (Bostwick et al 1999)*.

An federal/state interagency environmental field review of the alternatives was conducted on May 11, 1999. Wetlands were reviewed in the field for jurisdiction and agreement in the field was made as to the flagged boundaries. Wetland mapping was subsequently updated to include these field revisions.

3.2.8 Tidal Wetland Areas

Tidal wetlands in the Augusta area are not typical of tidal areas in Maine because they are freshwater tidal habitat. The average tidal range in Augusta is 4 feet (1.2 m) and maximum is around 5 feet (1.5 m). Tidal fluctuation influence does not extend above the former dam site (VanDenBossche 1999). Existing tidal waters are not expected to be affected by any current project alignments.

3.2.9 Floodplains

The Kennebec River and its tributaries within the study area are subject to frequent, and occasionally major, flooding. Flooding usually occurs in the spring, when heavy rains combine with snowmelt and/or frozen ground conditions. The most recent major flooding event occurred in April 1987, when water levels generally exceeded the 100-year recurrence levels on the Kennebec River (Edwards 1991).

Augusta participates in the National Flood Insurance Program. Flood Insurance Rate Maps (FIRM) and Flood Insurance Studies have been prepared and are available through the Federal Emergency Management Agency (FEMA).

3.2.10 Coastal Zone

Augusta falls within the coastal zone. The Coastal Zone Management Act of 1972 was passed in recognition of the importance of the coastal zone of the United States and the potentially adverse effects on the resource resulting from population growth and economic expansion. Maine's approved Coastal Program, administered by the State Planning Office, requires that federal actions be consistent with the approved program to the maximum extent possible. The core of the Coastal Program consists of state laws which provide state agencies and local officials with directives for carrying out the state's land and water use policies. Projects that fall within the Coastal Zone may be subject to one or more permits. Compatibility with the core laws, including the acquisition of applicable permits, constitutes a determination that the project is consistent with the Coastal Zone Management program. No project can be constructed prior to the receipt of required permits.

3.2.11 Navigation

A U. S. Coast Guard (USCG) permit is required for the construction of bridges that cross "navigable" waters. The main purpose for the USCG involvement in the construction process is to ensure "continued interstate and foreign commerce", and to preserve the right of public navigation. The Kennebec River is a "navigable" water way and once an alternative is selected, the Department will proceed with the established guidelines for this process found in the "Bridge Permit Application Guide", USCG Commandant Publication P16591.3A. Initial contact with the Coast Guard has been made (Appendix A).

3.2.12 Rare, Threatened and Endangered Species

Federally Listed

Shortnose sturgeon (*Acipencer brevinostrum*), a federally listed threatened species, is found approximately six miles (15 km) downstream of the Edwards Dam, in the Gardiner area. A study by Stone and Webster (SWETS 1995) indicated that there was very little habitat for juveniles and non spawning adults upstream of the dam. With the dam removed, spawning adults could use the existing habitat within two miles (3.2 km) upstream of the dam site, but this habitat would be open and easy for predators to locate eggs and juveniles. With the dam removed, an increase in habitat is expected as algae and benthic snails, a food source, increase in population (Dadswell, in FERC 1997). Also, it is expected that increases in water velocities will scour existing substrate into suitable size to be spawning and nursery habitat, resulting in an increase in the sturgeon population by as many as 5,000 fish (FERC 1997).

Bald eagles (*Haliaeetus leucocephalus*) are known to pass through and feed in the area, but

no nesting sites have been identified. In 1999, a pair of bald eagles were observed nesting in Hallowell, south of the project alternatives.

State Listed

There are no identified Essential Habitats (MDIFW 1998) within the study area. However, in addition to Bald eagles, Maine lists as threatened the Grasshopper sparrow, and two species of freshwater mussels known to occur in the Kennebec River within the study area. The Grasshopper sparrow has been documented in the study area near the airport (Corridor C), but not within or adjacent to any retained alternative. In August of 1998, MDIFW and MDOT divers surveyed the Kennebec River for the Yellow lampmussel (*Lampsilis cariosa*) and the Tidewater mucket (*Leptodea ochracea*). It was expected that the river above the dam would have suitable habitat for both species. The A and B Alternative crossings were surveyed, and the Tidewater mucket was found. These populations are deep water species and will not be adversely affected by the removal of the Edwards Dam, and in fact may benefit from an increase in habitat (MDIFW 1998).

In March of 1999, Tall goldenrod, *Solidago altissima*, was added to Maine's list of Rare, Threatened and Endangered Plants as "Possibly Extirpated", which means it is not known to currently exist in Maine (Cameron 1999). This listing is used when a species has not been reported in great amounts for a period of about 20 years, or when it is determined that it is a separate species and not a variation of a common species. During a May 11, 1999 field walk, Tall goldenrod was found by MDOT in several locations within the A and B alternatives, in upland and floodplain wetland habitat. The plant is considered to be ubiquitous to the study area and is not considered a constraint to the alignments by the Maine Natural Areas Program (Cameron 1999).

3.3 ATMOSPHERIC ENVIRONMENT

3.3.1 Air

Microscale analysis of carbon monoxide (CO) is required to evaluate the build alternatives in relation to existing, no-build, and the National Ambient Air Quality Standards (NAAQS). The one-hour NAAQS for CO is 35 parts per million (ppm); the eight-hour NAAQS is 9 ppm. Existing (and proposed) peak hour CO levels were predicted using EPA's CAL3QHC computer model and emission factors generated by the EPA's MOBILE5b computer model. Input used in these models reflect worst-case meteorological (i.e., wind speed, wind direction, stability class, etc.) conditions and traffic data and assumptions from the DEP's Air

Bureau Section. Background concentrations of 4.0 ppm and 2.0 ppm were used for one-hour and eight-hour periods, respectively.

The CAL3QHC model was run for approximately 100 analysis sites within the study area with wind direction varied in five-degree increments. In accordance with guidance provided in the EPA publication titled *Guideline for Modeling Carbon Monoxide from Roadway Intersections*, air quality analysis sites were located either adjacent to a property line or approximately 10 feet (3 m) from the edge of roadway at the corner of each intersection. Sites were along both sides of the roadways at 80 feet (25 m) and 160 feet (50 m) from intersections and at offset distances dictated by either the adjacent property line or the top of cut or bottom of fill slope.

Predictions were performed at sites along Cony Road to represent the existing conditions. The maximum existing one-hour CO concentration of 5.9 ppm was predicted at the southeast corner of the Cony Road intersection with Route 105. Existing one-hour concentrations at this location and at other sites analyzed indicate no violation of the one-hour NAAQS for CO. The highest existing predicted eight-hour CO concentration was 3.4 ppm, indicating no existing violation of the eight-hour NAAQS for CO.

3.3.2 Noise

Eleven Noise Sensitive Areas (NSAs) were identified in the study area. NSAs are defined as existing or future planned residential development likely to be affected by traffic noise from the proposed project. Generally, NSAs are identified and delineated by changes in traffic conditions, roadway configurations, topography, and community boundaries.

Noise measurements were taken within the NSAs along the proposed alternatives from Wednesday, October 7, 1998 to Thursday, October 8, 1998. Ten 20-minute measurements and four 24-hour measurements were taken at locations representative of receptors potentially impacted by noise from the proposed roadway (Table 3-12). The 20-minute measurements were in accordance with FHWA Report Number FHWA-PD-96-046, *Measurement of Highway Related Noise*. Existing measured noise levels ranged from 44 to 69 dBA. Measurements are expressed as A-weighted hourly equivalent noise levels in decibels — Leq(h) dBA. The hourly Leq, or equivalent sound level, is the level of constant sound that in an hour would contain the same acoustic energy as the time-varying sound. In other words, the fluctuating sound levels of traffic noise are represented in terms of a steady-state noise level of the same energy content. Measurements were conducted during a.m. peak, p.m. peak and off-peak periods.

The eleven NSAs identified within the study area are:

- NSA-1 represents an area of low density residential development along Old Belgrade Road just west of Interstate 95 near the proposed I-95/Alternative A, Alternative B interchange. Existing noise levels in NSA-1 are characterized by traffic on I-95 and Old Belgrade Road.
- NSA-2 is comprised of a rural residential area adjacent to Eight Rod Road in the vicinity of the Alternative A/Alternative B alignment, and approximately 1,000 feet (300 meters) to the south of the proposed I-95 interchange. Existing noise levels in NSA-2 consist of rural background noises and the distant noise from traffic on I-95.
- NSA-3 and NSA-4 are the rural residential areas along West River Road near the proposed Alternative B and Alternative A alignments. Traffic on West River Road is the primary source of noise in NSAs 3 and 4.
- NSA-5 represents a medium density mixed residential and commercial area along Route 201/100 in the vicinity of the proposed at grade intersection of Alternative B.
- NSA-6 is along Route 201/100 approximately one mile (1.6 km) to the north of NSA-5 and represents a medium to high density mixed residential and commercial area in the vicinity the proposed Alternative A intersection (Options 1 & 2). Traffic noise from Route 201/100 currently dominates the ambient noise at NSA-5 and NSA-6.
- NSA-7 represents a residential area consisting of mobile homes in the Riverside Mobile Home Village to the east of Route 201/100 and south of the proposed Alternative A-2 alignment. The existing noise levels in this quiet rural community consist of birds, rustling leaves and neighborhood activities.
- NSA-8 represents a low to medium density residential area along Routes 202/3 near the proposed at-grade intersection of Alternative B and Routes 202/3, a residential area on Carlisle Avenue, and the new residential development along Hedgenettle Road. Traffic on Routes 202/3 dominates the existing noise environment.
- NSA-9 represents a low density mixed residential and commercial area along Church Hill Road to the north of Routes 202/3. Background noise consists of traffic on Church Hill Road and distant traffic noise from Routes 202/3.
- NSA-10 represents the rural residential area along Church Hill Road between Routes 202/3 and Route 17. This area is representative of receptors along Church Hill and Cony Roads that will be influenced by the proposed improvements associated with Connector A and the southern portion of Connector B.
- NSA-11 represents the residential area along route 105 between Hicks Road and Church Hill Road. These receptors are in the vicinity of the proposed Connector B interchange and are influenced by traffic noise from Route 105.

Table 3-12. Noise Measurement Data

NSA and Measurement Location	Setback from edge of near roadway (ft)	Date	Time	Measured $L_{eq}(h)$ (dBA)	Total Hourly Traffic During Measurement Period
1) I-95 row fence behind residence along Old Belgrade Road	135	10/7/98	3:02 PM	66	1683
2) Front yard of residence along Eight Rod Road	88	10/7/98	4:06 PM	52	60
3) Front yard of residence on S.R. 104	—		—	52 [1]	—
4) Grassy roadside area near residence at 21 Patrick Road	NA	10/7/98	4:55 PM	46	—[2]
5) Savage Park, Riverside Drive, US Rt. 201	62	10/7/98	11:16 am	62	552
6) Schiavi's Augusta Mobile Home Park	NA	10/7/98	10:31 am	44	360
7) Riverside Mobile Home Village	NA	10/7/98	24 hr	48	—[2]
8) Behind residence at 14 Caswell Street (dead end)	470	10/8/98	11:24 am	48	—[2]
9) Front yard of residence along North Belfast Avenue	80	10/7/98	9:19 am	69	426
10) Front yard of residence at Box 1205, Cony Road	75	10/8/98	6:54 am	59	348
11) 1320 South Belfast Road	40	10/8/98	7:33 am	62	213

[1] Measured results from NSA-2 were used at NSA-3 due to low traffic volume and similar conditions.
[2] Road not visible from measurement site.

3.4 LAND USE, HISTORIC AND SOCIOECONOMIC ENVIRONMENT

3.4.1 Land Use and Zoning

Augusta has in recent decades experienced a decline in its industrial base and an increase in trade and service sectors. This circumstance, combined with the lack of comprehensive planning prior to the 1980's, has led to sprawl and strip development along major routes, and contributed to the traffic and safety problems the city is facing today.

In an effort to stem the sprawl, the City of Augusta developed the *1988 Growth Management Plan* (Augusta Planning Board 1988). This River Crossing Study is consistent with

that plan, which sets forth a policy of concentrating commercial and industrial developments, rather than continuing to allow haphazard development, and expresses the City's interest in "capitalizing on the Kennebec River and opportunities that may be created by a 'third' bridge".

Though most areas along major routes are intensely developed, over 60% of the land within the study area is undeveloped (Table 3-13). During the comprehensive planning process, the area between Route 201/100 and Routes 202/3 was targeted for the expansion of commercial and industrial land uses. Much of this area is currently zoned Planned Development, which requires clustered development whenever land is subdivided or intensely developed. According to Augusta's zoning regulations, "Commercial and industrial uses are intended to be concentrated in single or mixed use centers or parks to ensure the most efficient provision of services and minimize impacts on residential and environmentally sensitive areas, and on the city's and state's roadway systems" (Augusta Planning Board 1994).

Table 3-13. Land Use in the Study Area

	Acres	Hectares	% of total
Industrial	582.3	235.7	4.1%
Cemetery	220.8	89.4	1.5%
Governmental	580.4	234.9	4.0%
Institutional	203.3	82.3	1.4%
Military	38.8	15.7	0.3%
Office	54.8	22.2	0.4%
Parks	579.6	234.6	4.0%
Public Works	24.8	50.5	0.9%
Residential	2,673.7	1,082.0	18.6%
Retail/Business	612.3	247.8	4.3%
Agriculture/Open Land	8,679.6	3,512.6	60.5%
Total:	14,350.6	5,807.7	100%

3.4.2 Prime and Unique Farmland

The Department coordinated with the U. S. Department of Agriculture to determine whether the study will involve the Farmland Protection Policy Act (FPPA) by affecting prime and

unique farmland. On September 4, 1998, the Kennebec County office of the Natural Resource Conservation Service determined that no prime, unique, statewide or local important farmland would be affected by any of the alternate routes proposed in this document and, therefore, the FPPA **does not** apply to the project.

3.4.3 Community Characteristics

The City of Augusta encompasses both sides of the Kennebec River and is the center of employment, commerce, and service for central Maine. Augusta is the seat of county government and the capital of Maine.

Population and Housing

The estimated 1996 population in the City of Augusta is 20,280, a decrease of approximately 7% since 1980 (Augusta 1999). This trend of slow population loss, consistent with other urban centers, is expected to continue in the future.

This slow but steady decrease in population has affected the real estate market within the city limits. The average 1994 selling price ($64,226) in Augusta was down $4000 from the previous year, and was substantially lower than the Kennebec County average ($81,593) or the state average ($104,189)(Augusta 1999). Several factors have likely contributed to the decrease in housing values, including the age of the existing housing stock and migration to outlying towns to escape urban traffic, taxes and confined spaces. Table 3-13. Land Use in the Study Area

Community Facilities and Services

The facilities and services provided by the City of Augusta are typical of those found in most smaller metropolitan areas. A complete list of community resources, current as of 1994, and taken from the Environmental Baseline Report /Augusta Third Bridge Study (Vollmer 1994), can be found in Appendix B. No community resources are located within Alternatives A or B, or either Connector.

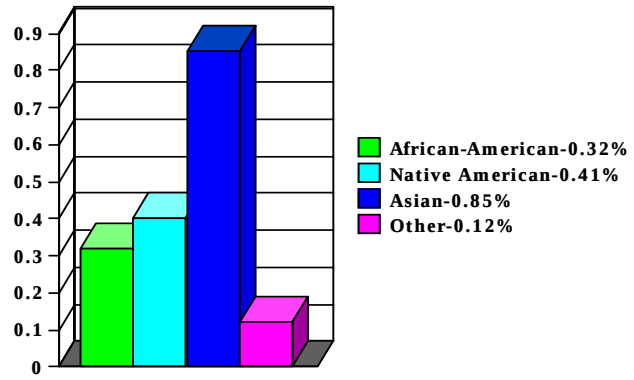
Neighborhood and Community Cohesion

Community cohesion relates to accessibility, whether pedestrian or vehicular, between integral parts of a community or neighborhood. The northern area of Augusta, where the remaining alternatives are located, is characterized by its rural nature with the majority of neighborhood development occurring along local roads and arterial highways. There are several cohesive neighborhoods adjacent to the alternatives, as well as a scattering of residential and commercial properties.

3.4.4 Environmental Justice

Executive Order 12898 and DOT Order 5610.2 set forth policies to ensure that federal actions do not disporportionately affect minority populations in the U.S. This process is referred to as Environmental Justice. Environmental Justice has been defined by the U.S. EPA's Office of Environmental Justice (EPA 1997) as "... The fair and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies." The minority population in the City of Augusta is represented in Figure 3-1. No minorities have been identified as being directly affected by any of the alternatives, nor is there a disproportionate impact to the low income population.

Figure 3-1. Percentages of Minorities by Race
(98.3% of the population is white)



3.4.5 Economic Characteristics - From *Economic Base Analysis* (Augusta 1999)

Employment and Wages

The City of Augusta is a regional employment center and is ranked third in the Maine as a location for employment. With 24,030 jobs and 10,195 resident workers, Augusta has the highest worker to resident worker ratio (2.36:1) in Maine. Employment in the Augusta Labor Market Area (LMA) grew more than 35% between 1981 and 1997. As the Capital City, it is not surprising that government is the dominant employer, at a rate more than double the statewide average (34.6% compared to 16.7%). Manufacturing jobs continue to decline as service sector jobs increase, consistent with the trends seen throughout Maine. The September 1998 unemployment rate for the Augusta and Waterville LMA was 4.3%, compared to 3.4% for Maine as a whole.

The average wage in the Augusta area increased from $13,526 in 1981 to $25,115 in 1995. Although the increase is significant, workers in the Augusta area still earn almost $4000 less per year, on average, than workers statewide.

Retail Sales

The Augusta - Waterville area is the second largest retail sales area in Maine, with sales totaling more than $930 million between July 1996 and June 1997. Sales in Augusta increased by 36.6% from 1990 to 1997, compared to 26.8% statewide. Per capita retail sales in Augusta were 2.56 times the state average in 1997. Expansions planned at the retail complex along I-95 known as the Marketplace at Augusta should "enhance and strengthen the City of Augusta's position as a major retail hub in Maine" (Augusta 1999).

The Marketplace at Augusta (looking northeast)

Source: MDOT Photo Lab

3.4.6 Pedestrian and Bicycle Use

According to the 1990 Census, approximately 571 people who live in Augusta walk to work (T.Y. Lin 1995). This represents approximately 7.7% of Augusta residents who also work in Augusta. A definitive number of employees who bike to work in Augusta is not available, but it is likely a very small percentage.

Within the build alternatives, pedestrian traffic is limited to traversing between houses and recreational walking. There are no sidewalks located on the numbered routes in either Alternative A or B, and transportation in the area is predominantly vehicular dependent.

There are two noteworthy efforts currently in development to encourage Augusta employees to bike to work. The Go Augusta! project is coordinating with city officials to create a map of streets amenable to bicyclists and also to place directional and informational signs along these routes. This program is also working with state government to provide additional bicycle storage facilities at state office buildings.

The second program is the Kennebec River Trail. Funding is approved for the first phase of this project linking Gardiner and Augusta via an off-road trail along the rail right-of-way, and construction is slated to begin summer 2000. This phase will link Gardiner to Farmingdale and Hallowell to Augusta. It is expected that the second phase, which will connect these sections, will be completed in 2-3 years.

3.4.7 Visual Environment

An *Augusta River Crossing Visual Impact Assessment* was completed along Alternatives A and B by the MDOT Landscape Unit. Descriptions of the affected visual environment from that assessment are summarized below. The terms "pleasing" and "displeasing" are subjective terms intended to convey an overall sense of the visual quality of an area rather that reflect the results of a quantitative analysis.

Residential

All of the residential development is adjacent to or accessed from Eight Rod Road, Route 104, Route 201/100, and Routes 202/3. The Eight Rod Road, Route 104, and Routes 202/3 residential development is located on old farmland that is made up of open fields and vegetated fence lines. The area has a distinct agrarian character and is highly valued by those who live there. Visual quality for this area is very pleasing. The Route 201/100 residential development is mixed with retail and commercial establishments where the visual quality of the natural environment of the area is not displeasing.

Agricultural

Agricultural areas are located along Routes 202/3 and Route 104 and are grouped with the residential neighborhoods. There is one working farm within the project viewshed area on Route 104 that maintains open pasture for horses and cattle. Two working agricultural farms are located within the project viewshed on Routes 202/3. Visual quality is pleasing in both of these areas.

Retail and Commercial

All of the retail / commercial establishments are located on Routes 201/100 and Routes 202/3. The Routes 201/100 and Routes 202/3 alternatives are uncluttered, uncongested, and accessible to the public. Visual quality for both areas is not displeasing for a retail neighborhood.

Recreational

Savage Park (Alternative B) and the Kennebec River (Alternatives A & B) are the primary recreational locations. The park area is made up of grassland meadow with a mixed deciduous and evergreen woodland adjacent to the Kennebec River. The park has a series of paths for passive recreational uses. Visual quality is pleasing with viewsheds of the Kennebec River. The Kennebec River basin is visually pleasing from the river with flat topography supporting deciduous woodland along the river banks. Views north are pristine and remote in appearance, views south are aesthetically pleasing with viewsheds of the Augusta skyline.

Travelers

The native landscape is composed of rolling open topography with sparse residential and agricultural development and is pleasing for touring travelers. The Kennebec River valley offers outstanding viewsheds of the natural and cultural environments to the north and south.

3.4.8 Historic Properties and Archaeological Sites

Section 106 of the National Historic Preservation Act of 1966 regulates federal activities that may have an effect on properties that are on or eligible for listing in the National Register of Historic Places (NR). Section 4(f) of the Department of Transportation Act of 1966 also requires that all possible steps are taken to avoid and/or minimize any impact to NR-eligible or NR-listed historic properties and archaeological resources.

One significant historic property, Parker Savage House, has been identified near Alternative B (Table 3-14). It has been determined eligible for NR listing. No significant historic properties were identified in Alternatives A-1 or A-2.

Archaeological resources are evaluated by a three-phase process. Phase I is preliminary identifcation. Phase II is excavation and examination in the field to determine NR eligibility. Phase III involves data recovery. There are **four archaeological sites** located within Alternatives A and B which require Phase II testing before their NR-eligibility status can be determined (Table 3-14).

Table 3-14. Historic and Archaeologic Resources in the Study Area

Alternative/ Resource	A-1	A-2*	B	Conn. A	Conn. B
Historic-Architectural Properties	none	none	Parker Savage House	none	none
Archeology-Prehistoric Sites	2	1	1	none	none
Archeology-Historic Sites	1	1	none	3	3

*The two sites on A-2 are also on A-1.

3.4.9 Parks and Recreational Properties

Section 4(f) of the Department of Transportation Act of 1966 affords special protection to publicly-owned parks and recreational areas that may be impacted by a federally-funded transportation project. Section 6(f) of the Land and Water Conservation (LAWCON) Fund Act of 1965 affords special protection to recreational resources that have been purchased or improved with LAWCON funds.

There is one recreational property near Alternative B, Savage Park, that qualifies for protection under Section 4(f) (Table 3-15). Savage Park is a city-owned public park that is located on Route 201/100 near the proposed at-grade intersection. There are no 6(f) properties in Alternatives A or B. There are no 4(f) or 6(f) properties affected by either Connector.

Table 3-15. Section 4(f) Recreational Properties in the Study Area

Alternatives/ Recreational Properties	A1	A2	B	Con. A	Con. B
Section 4(f) properties	none	none	Savage Park	none	none
Section 6(f) properties	none	none	none	none	none

3.4.10 Uncontrolled Petroleum and Hazardous Wastes

The MDOT Hazardous Waste Unit (HWU) Hydrogeologist completed a Phase I Site Assessment for uncontrolled oil and hazardous materials along Alternatives A and B. Results of that investigation are presented in a separate report (Doughty 1999). The Phase I Site Assessment identifies areas of known or potential waste, soil contamination and groundwater contamination that might influence the development of one proposed alternative over another.

A secondary purpose of the Assessment is to guide future subsurface explorations to specific areas with potential sources of waste or contamination. Subsurface explorations will be used to determine the location and concentration of contaminants that could impact right of way acquisition costs, the final design, construction costs, and worker health and safety.

Summary of Existing Conditions

Based on historic and current land uses there are a number of potential sources of contamination along Alternatives A and B. However, MDOT's HWU found that there are no sites along either alternative that are currently under investigation or cleanup order for soil and groundwater contamination.

There are 24 underground storage tank (UST) registrations within ¼ mile of the centerlines of Alternatives A and B . Many of these have been removed or abandoned in place. Several of the UST sites have documented contamination and have undergone cleanups. There have been 19 spill reports filed on properties within ¼ mile of the centerlines. In each case the DEP response person has been satisfied with the remedial measures taken and has closed the case. Although it is likely that some of these sites have some level of contamination remaining, none are currently under investigation or remediation.

There is one solid waste handling and disposal facility along the project. The Tree-Free Fiber sludge landfill (formerly Statler Tissue) is located between Alternatives A-1 and A-2 near Church Hill Road. The landfill is not currently active but remains licensed to accept various types of demolition debris and special waste. DEP staff indicate that groundwater outside the solid waste boundary has experienced minimal degradation, if any, and should not affect construction of any of the alternatives proposed.

There is one junk yard located near the southeast end of Alternative B. This junk yard is

located behind Fort Western Tire on Routes 202/3. Although there is no documented history of uncontrolled oil or hazardous materials at this location, the site has been a junk yard since the 1950's and field evidence indicates that many types of materials have been salvaged there. Also, it is inferred from the presence of drums, containers, 275 gallon tanks, and staining that liquids, possibly oils and solvents, have been handled within the junk yard. Therefore, it is possible that the junk yard may contain undocumented contaminants. There is a large pile of tires and piles of other material that may represent special wastes.

There are several automobile service stations within a ¼ mile of Alternatives A and B centerlines that may be sources of undocumented contamination. These include: Capitol City Tire on Route 201/100, Wings Garage on Route 201/100, and Fort Western Tire on Routes 202/3.