This chapter describes, for each environmental resource evaluated, the environmental consequences, and mitigation measures for direct and indirect impacts that could be expected for the No Action, Preferred Alternatives, and other action alternatives carried forward for analysis in this EIS. Cumulative impacts are analyzed in Section 4.23. Figures in Chapter 3, Affected Environment, and Chapter 4, Environmental Consequences and Mitigation, show limits of disturbance, including the area necessary for permanent impacts and temporary impacts due to construction.

4.1 LAND USE

4.1.1 No Action Alternative

Existing land uses would continue until they are altered or replaced by other land uses in response to market forces and community expansion pressures. Community expansion, particularly in the Grandview area, is likely to result in an increase in commercial development, which may replace existing residences. For example, as of June 2005, at least five new commercial properties have recently been built or are under construction, including two that have replaced three residences.

The No Action Alternative could reduce the viability of fully developing the Grandview area at densities provided in the Grandview Area Plan. As described in detail in Section 3.1.2, Future Land Use Within and Adjacent to the Highway Corridor, the *Grandview Area Plan*, at build out, allows for about 5,500 dwelling units, commercial uses, a hospital, schools and parks. Improvements to US 160 in the Grandview area in 2005 include signalization of the US 160/CR 233 (west) intersection, and widening of US 160 with a center continuous turn lane and an additional US 160 westbound lane. However, in accordance with an Intergovernmental Agreement between CDOT and La Plata County dated July 26, 2005, the county is required to implement improvements that will prohibit traffic from entering the west end of CR 233 once the US 160/CR 233 (west) intersection functions below an LOS D. If no improvements are made to the corridor, this limit on access to US 160 could impact where and when development occurs in Grandview.

4.1.2 Impacts Common to All Action Alternatives

4.1.2.1 Direct Impacts

All action alternatives would impact adjacent land use to varying degrees. Although the specific number of land use parcels impacted varies by alternative, the types of impacts would generally be the same across all highway sections.

Relocation of structures out of the proposed ROW may result in a change in current land use activities. Although such relocations may be individually important for affected property owners, loss of non-replaceable land use would not occur since there is an ample supply of vacant land suitable for relocating displaced land uses.

Although the land use of some individual parcels would be altered under the various combinations of alternatives, the basic character of land uses adjacent to the ROW would not be directly changed and would be consistent with comprehensive development plans. The Grandview section (Alternative G Modified and Alternative F Modified) would continue to exist as a mixed-use area

of residents and various types of businesses, which is consistent with the *Grandview Area Plan* and the *Florida Mesa District Land Use Plan.* For the Florida Mesa and Valley, Dry Creek and Gem Village, and Bayfield sections (from the SH 172/CR 234 intersection with US 160 east to Bayfield), adjacent land uses are likely to remain rural or agricultural, except in Gem Village and Bayfield, consistent with the *Florida Mesa District Land Use Plan* and the *Bayfield District Land Use Plan*. Community expansion forces that could result in urbanization of rural land between the eastern edge of Grandview (the SH 172/CR 234 intersection with US 160) and Gem Village would not be consistent with existing plans. Commercial land uses adjacent to the highway corridor through Bayfield are likely to continue, consistent with the *Bayfield District Land Use Plan*, and the *Town of Bayfield Comprehensive Plan.*

All of the proposed relocations would be compatible with current or proposed planning documents and policies. The *Florida Mesa* and *Bayfield District Land Use Plans* generally call for a continuation of existing land uses along the highway corridor. As discussed above, relocations of residences and businesses would not alter the basic character of the highway corridor.

4.1.2.2 Indirect Impacts

According to the Durango Area Association of Realtors, the Multiple Listing Service (MLS) had ~~1,003~~2,921 residential listings and ~~51~~533 commercial space listings on ~~October 31, 2003~~April 17, 2006. Based on these MLS listings, sufficient replacement residential and commercial property is available for relocating residents and businesses. Even assuming the unlikely "worst case" scenario, whereby all parcels were completely acquired by CDOT for this project, replacement property is available in La Plata County.

There are approximately 10,300 vacant parcels within La Plata County, according to La Plata County Assessor records, ranging from small subdivision lots to large, undeveloped agricultural tracts. Since the amount of commercial and residential square footage typically expands in proportion to increased population, some of the existing vacant tracts will be developed for commercial and residential purposes, providing opportunities to relocate displaced individuals and businesses within La Plata County.

Although improvements to US 160 could induce growth on some specific parcels along the highway corridor between Grandview and Bayfield by making them more accessible, reducing travel times, and improving safety, such improvements are not likely to induce additional county-wide growth beyond the levels forecast by CDS. CDS population forecasts are derived from trends using sophisticated state and regional forecast models, modified as appropriate by relevant local data obtained through discussions with local and county officials. CDS has not specifically modified its 2025 forecast for La Plata County based on the projected completion of proposed highway improvements (CDS, personal communication, 6/30/05). However, CDS typically assumes that necessary improvements to infrastructure, including roads, will keep pace with community development forces to enable growth to occur. According to CDS, failure of roads to keep pace with new development forecasted by its models could act as a constraint on growth. ~~For La Plata County, CDS would expect that the failure of road improvements to keep pace with community development pressures would constrain currently forecasted population levels.~~ Lack of central water and sewer systems in the rural area between Grandview and Bayfield would also constrain growth. However, with additional highway capacity, development in Grandview and Bayfield may occur at a faster rate because they have central water and sewer, and the land use plans allow higher commercial and residential densities (see Section 4.23.6.2,

Present and Future Land Use Cumulative Impacts). ~~If the proposed highway improvements do not occur, growth in the next 10 to 15 years would likely slow below levels currently forecasted and thus, cause the CDS to lower its long-term (2025) forecast or expectations. On a more localized level, the *Grandview Area Plan* recognizes that improvements to the regional highway system (US 160 and US 550) are necessary if the growth envisioned in the plan is to occur. The plan states: "...the Grandview Area Plan assumes highway improvements that were presented to the community by CDOT in 2001..." (p.60). Also: "The City (of Durango) should ensure that...transportation improvements (are) made to support ...specific developments...as well as the long range plan. The City also needs to work closely with CDOT to ensure that the Grandview Area Plan is given proper consideration during project development for US 160 and 550." (p. 53).~~

In summary, it can be concluded that the future baseline condition for population in La Plata County as a whole, as represented by CDS forecasts may not change. However, due to improvements on US 160, this growth is more likely to occur along the US 160 corridor in the areas of Grandview and Bayfield, and the future baseline condition for community development in Grandview, as described in the *Grandview Area Plan*, depend on future improvements to US 160. The implementation of the project described in this EIS would not increase overall population growth in La Plata County, but it could focus growth along the US 160 corridor. ~~rather, the No Action Alternative could constrain population growth. Although the implementation of the project could induce new development on specific parcels, the No Action Alternative could constrain future growth allowed by the *Grandview Area Plan*.~~ With project implementation, development along the corridor could occur at a faster rate, mainly in the areas of Grandview and Bayfield. The conversion of agricultural/rural land to residential/commercial land in Grandview and Bayfield would cause loss of sensitive environmental resources to occur faster than expected. Assuming that the 3,562 acres in Grandview would be fully developed by 2025, this would represent a loss of wildlife habitat that currently is a winter concentration area for mule deer and elk. Wetlands along Wilson Gulch would be lost through the conversion of agricultural land to residential/commercial land.

4.1.3 Grandview Section

4.1.3.1 Alternative G Modified (Preferred Alternative)

There are 147 parcels through which the proposed ROW passes, from which total or partial acquisition would be required. Table 4.1.1, Grandview Section Alternative G Modified (Preferred Alternative) Land Use Impacts, lists the number of parcels grouped by type of existing land use.

Table 4.1.1
Grandview Section
Alternative G Modified (Preferred Alternative) Land Use Impacts

Land Use Type	Number of Parcels
Residential (not including mobile home parks)	78
Mobile home park	6
Industrial	2

Table 4.1.1
Grandview Section
Alternative G Modified (Preferred Alternative) Land Use Impacts

Land Use Type	Number of Parcels
Commercial	27
Church	1
Fire station	2
School	1
Agricultural	6
BLM	1
La Plata County	2
Vacant/undeveloped	21

The BLM parcel is an approximately 29-acre tract of land administered by the BLM. Due to its location and poor access, it is not used for grazing or recreation. Of this, approximately 7.79 acres would be required to expand the ROW beyond the existing 300-foot wide ROW on this BLM parcel. This would require authorization from the BLM, as discussed in Section 4.24, Permits.

Of the 147 total parcels impacted, 39 parcels of land contain one or more structures that may be acquired and their contents and tenants relocated to similar facilities. They are:

- Residential
  - Single-family conventional construction: 11 parcels with 11 structures, some parcels also contain a shed and/or garage
  - Single-family plus mobile home on same parcel: one parcel
  - Multi-family: two parcels, one of which contains eight apartments (next to Sonoco Grandview Station – parcel counted as commercial below) plus one duplex on another parcel
  - Mobile home, not in mobile home park: three parcels containing four mobile homes
  - Mobile home parks: three parcels
  - Cedar Meadows Mobile Home Park: four of 13 structures impacted
  - Mountain Vista Mobile Home Park: four of 22 structures impacted
  - Lille Belle Mobile Home Park: six of 14 structures impacted, including an office/ residence in a conventional structure
- Commercial: 14 businesses on 12 parcels listed below from west to east
  - Southfork Riding Stables: one shed
  - Enterprise Rent-A-Car
  - Budget Truck Rental
  - Sonoco Grandview Station parcel also includes eight-unit apartment building

- Grasshoppers Landscaping and Maintenance
- Eagle Homes: five modular homes for sale within ROW
- Sal's Motor Corral office
- Tile and Carpet Gallery and Showroom
- La Plata Mini Storage: two of five storage structures within ROW
- KOA Campground: seven recreational vehicle (RV) spaces within ROW
- Durango Soda Company: six new mini-storage units are under construction on this parcel as of June 2005

- Structures in ROW include only garages, sheds, or abandoned dilapidated mobile home: seven parcels

4.1.3.2 Alternative F Modified

There are 155 parcels through which the proposed ROW passes, from which total or partial acquisition would be required. Table 4.1.2, Grandview Section Alternative F Modified Land Use Impacts, lists the number of parcels grouped by type of existing land use.

Table 4.1.2
Grandview Section
Alternative F Modified Land Use Impacts

Land Use Type	Number of Parcels
Residential (not including mobile home parks)	84
Mobile home park	6
Commercial	27
Church	1
Fire station	2
School	1
Agricultural	12
BLM	1
La Plata County	1
Vacant/undeveloped	20

As discussed in Section 4.1.3.1, Alternative G Modified (Preferred Alternative), the BLM parcel in the Grandview section is approximately 29 acres in size. This alternative would require approximately 1.21 acres of land to expand the conceptual ROW beyond the existing 300-foot wide ROW on this BLM parcel. This would require authorization from the BLM, as discussed in Section 4.24, Permits.

Of the total 155 parcels that would be impacted, 40 parcels of land contain one or more structures that may be acquired and their contents and tenants relocated to similar facilities. They are:

- Residential
  - Single-family conventional construction: 13 parcels with 13 structures; some parcels also contain a shed and/or garage
  - Single-family plus mobile home on same parcel: one parcel
  - Multi-family: two parcels, one of which contains eight apartments (next to Sonoco Grandview Station – parcel counted as commercial below) plus one duplex on another parcel
  - Mobile home, not in mobile home park: three parcels containing four mobile homes
  - Mobile home parks: three parcels
  - Cedar Meadows Mobile Home Park: four of 13 structures impacted
  - Mountain Vista Mobile Home Park: four of 22 structures impacted
  - Lille Belle Mobile Home Park: six of 14 structures impacted, including an office/residence in a conventional structure
- Commercial: 14 businesses on 12 parcels listed below from west to east
  - Southfork Riding Stables: one shed
  - Enterprise Rent-A-Car
  - Budget Truck Rental
  - Sonoco Grandview Station: parcel also includes eight-unit apartment building
  - Grasshoppers Landscaping and Maintenance
  - Eagle Homes: five modular homes for sale within ROW
  - Sal's Motor Corral office
  - Tile and Carpet Gallery and Showroom
  - La Plata Mini Storage: two of five storage structures within ROW
  - KOA Campground: seven RV spaces within ROW
  - Durango Soda Company: six new mini-storage units are under construction on this parcel as of June 2005
- Structures in ROW include only garages, sheds, or abandoned dilapidated mobile home: six parcels

4.1.4 Florida Mesa and Valley Section

4.1.4.1 Alternative C (Preferred Alternative)

There are 30 parcels through which the proposed ROW passes, from which total or partial acquisition would be required. Table 4.1.3, Florida Mesa and Valley Section Alternative C (Preferred Alternative) Land Use Impacts, lists the number of parcels grouped by type of existing land use.

Table 4.1.3
Florida Mesa and Valley Section
Alternative C (Preferred Alternative) Land Use Impacts

Land Use Type	Number of Parcels
Residential (not including mobile home parks)	18
Commercial	2
Agricultural	10

Of the total 30 parcels that would be impacted, seven parcels of land contain one or more structures that may be acquired and their contents and tenants relocated to similar facilities. They are:

- Residential
  - Single-family conventional construction: four parcels with four residential structures, including one abandoned house; some parcels also contain a barn, shed, or garage
  - Mobile home, not in mobile home park: two parcels with two structures
- Structures in ROW include only garages, sheds, or barns: two parcels

4.1.4.2 Alternative A

There are 29 parcels through which the proposed ROW passes, from which total or partial acquisition would be required. Table 4.1.4, Florida Mesa and Valley Section Alternative A Land Use Impacts, lists the number of parcels grouped by type of existing land use.

Table 4.1.4
Florida Mesa and Valley Section
Alternative A Land Use Impacts

Land Use Type	Number of Parcels
Residential (not including mobile home parks)	18
Commercial	3
Agricultural	8

Of the total 29 parcels that would be impacted, 10 parcels of land contain one or more structures that may be acquired and their contents and tenants relocated to similar facilities. They are:

- Residential
  - Single-family conventional construction: four parcels with four residential structures, including one abandoned house; some parcels also contain a barn, shed, or garage
  - Mobile home, not in mobile home park: three parcels with four structures
- Commercial: RJ Automatic Products
- Structures in ROW include only garages, sheds, or barns: two parcels

4.1.5 Dry Creek and Gem Village Section

4.1.5.1 Alternative H (Preferred Alternative)

There are 61 parcels through which the proposed ROW passes, from which total or partial acquisition would be required. Table 4.1.5, Dry Creek and Gem Village Section Alternative H (Preferred Alternative) Land Use Impacts, lists the number of parcels grouped by type of existing land use.

Table 4.1.5
Dry Creek and Gem Village Section
Alternative H (Preferred Alternative) Land Use Impacts

Land Use Type	Number of Parcels
Residential (not including mobile home parks)	31
Mobile home park	3
Commercial	2
Agricultural	14
Utility	2
BLM	1
Vacant/undeveloped	8

The BLM parcel is a 974-acre tract of public land administered by BLM for multi-use. US 160 bisects this parcel, most of which is on the south side of the highway. The parcel includes a grazing allotment, the Mahan Allotment, which allows the permittee the right to 167 animal unit months (AUMs), a measure of the land's capacity for grazing. ROWs for the highway and several utilities cross this parcel. An existing culvert under the roadway is used to move cattle between the north and south sides. The culvert would be extended as necessary under the widened roadway and designed to allow the movement of cattle between the north and south sides. This alternative would require approximately 10.46 acres of land to expand the conceptual ROW beyond the existing 300-foot wide ROW on this BLM parcel. Expansion of the ROW would require authorization from the BLM, as discussed in Section 4.24, Permits. Work within the expanded highway ROW would remove 5.6 acres of BLM land from production — only 0.6 percent of the total. Most of the affected land consists of piñon-juniper vegetation and sagebrush-rabbitbrush vegetation. The removal of this small amount of land from production would not reduce the number of AUMs allocated to the parcel. During the detailed design phase, exact location of utility rights-of-way would be determined and modified as needed to accommodate an expanded highway ROW.

Of the total 61 parcels that would be impacted, nine parcels of land contain one or more structures that may be acquired and their contents and tenants relocated to similar facilities. They are:

- Residential
  - Single-family conventional construction: three parcels with three residential structures; one parcel also contains a garage in the ROW
  - Mobile home, not in mobile home park: two parcels with two structures

- Narrow Gauge Mobile Home Park: one parcel with three of 62 structures temporarily impacted

- Structures in ROW include only garages, sheds, or barns: three parcels

4.1.5.2 Alternative C

There are 85 parcels through which the proposed ROW passes, from which total or partial acquisition would be required. Table 4.1.6, Dry Creek and Gem Village Section Alternative C Land Use Impacts, lists the number of parcels grouped by type of existing land use.

Table 4.1.6
Dry Creek and Gem Village Section
Alternative C Land Use Impacts

Land Use Type	Number of Parcels
Residential (not including mobile home parks)	41
Mobile Home Park	3
Commercial	12
Agricultural	12
Utility	1
BLM	1
Vacant/undeveloped	15

See Alternative H (Preferred Alternative) above for a detailed description of the BLM parcel, as well as the associated impacts. These impacts would be the same under Alternative C.

Of the total 85 parcels that would be impacted, 28 parcels of land contain one or more structures that may be acquired and their contents and tenants relocated to similar facilities. They are:

- Residential
  - Single-family conventional construction: seven parcels with seven residential structures; some parcels also contain a shed, garage, or barn
  - Mobile home, not in mobile home park: six parcels with six residential structures
  - Narrow Gauge Mobile Home Park: one parcel with three of 62 structures temporarily impacted
- Commercial: nine structures on nine parcels listed below from west to east (all are located in Gem Village)
  - Rock Club
  - Four Corners Framed Art
  - AA Taxidermy
  - MTS Concepts (marble and granite slab)
  - Gem Storage
  - Billy Goat Saloon (mobile home in back not in ROW)
  - Office

- Bayfield Auto Sales (has mobile home in back, counted above)
- Avalanche Engineering

- Structures in ROW, include only garages, sheds, or barns: five parcels

4.1.6 Bayfield Section

4.1.6.1 Alternative B (Preferred Alternative)

There are 56 parcels through which the proposed ROW passes, from which total or partial acquisition would be required. Table 4.1.7, Bayfield Section Alternative B (Preferred Alternative) Land Use Impacts, lists the number of parcels grouped by type of existing land use.

Table 4.1.7
Bayfield Section
Alternative B (Preferred Alternative) Land Use Impacts

Land Use Type	Number of Parcels
Residential (not including mobile home parks)	22
Mobile Home Park	1
Commercial	5
Agricultural	9
Church	1
Vacant/undeveloped	18

Of the total 56 parcels that would be impacted, three parcels of land contain one or more structures that may be acquired and their contents and tenants relocated to similar facilities. They are:

- Residential
  - Single-family conventional construction: one parcel with one structure
  - Duplex: one parcel with two residential units
  - Mobile home, not in mobile home park: one structure

4.1.6.2 Alternative A

There are 55 parcels through which the proposed ROW passes, from which total or partial acquisition would be required. Table 4.1.8, Bayfield Section Alternative A Land Use Impacts, lists the number of parcels grouped by type of existing land use.

Table 4.1.8
Bayfield Section
Alternative A Land Use Impacts

Land Use Type	Number of Parcels
Residential (not including mobile home parks)	21
Mobile Home Park	2
Commercial	5
Agricultural	9
Church	1
Vacant/undeveloped	17

Of the total 55 parcels that would be impacted, three parcels of land contain one or more structures that may be acquired and their contents and tenants relocated to similar facilities. They are:

- Residential
  - Single-family conventional construction: one parcel with one structure
  - Duplex: one parcel with two residential units
- Structures in ROW include only garage: one parcel

4.1.7 Mitigation

CDOT will mitigate the loss of real property and physical relocation. CDOT is required by law to follow specific procedures during real property acquisition and to provide relocation assistance when a real property acquisition includes a residence, business, farm, or non-profit organization. The federal law that mandates acquisition and relocation assistance procedures is the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (PL 91-646), as amended by the Surface Transportation and Uniform Relocation Assistance Act of 1987 (PL 100-17) (Uniform Act). Implementing regulations are found at 49 CFR Part 24. Procedural guidance is provided by the CDOT *Right-of-Way Manual* (CDOT 2001).

The Uniform Act requires that a property owner be notified of CDOT's intent in acquiring his or her property before a real property appraisal is completed. Each property owner shall be given the opportunity to accompany the appraiser during the inspection of his or her property. CDOT must then establish just compensation based on a current appraisal. The owner of real property acquired for ROW will be compensated at fair market value, in accordance with the Uniform Act, federal CFRs, state statutes, and CDOT policies and procedures. No owner shall be required to surrender possession of the real property until paid the agreed purchase price, or until the amount deemed to be just compensation has been deposited with the court for the benefit of the owner.

The Uniform Act requires that CDOT provide information on its relocation program. A CDOT relocation brochure describing the relocation assistance and relocation payments for residential displaced persons and for businesses, farms, and non-profit organizations distributed at public meetings. All relocatees shall be given a minimum of 90 days in which to find replacement housing or business locations, and a relocatee will not be required to move until at least one

comparable, decent, safe, and sanitary housing unit is made available. When applicable, all qualified relocatees shall receive monetary payments, which may include payments for moving expenses, business in lieu payment, rent supplements, down payments, and increased interest payments. CDOT will explain the basis of relocation to the relocatees in detail, and present information as it relates to their financial options.

The real estate market is relatively small in the study area and the available housing units vary according to the time of the year. With a state college in the area, many dwelling units are scarce in the fall. According to a research study of the market, the local rental market is strong but appears to be adequate to provide housing or business locations that are comparable in size and location. Individual projects are anticipated to be limited in scope and length due to shortfalls in highway funding. The size and impact of a project shouldn't exceed the availability of replacement housing or business replacement sites, though limited. In the event that comparable housing is not available or exceeds the limits of the Replacement Housing Payment, Housing of Last Resort will be instituted. More detailed relocation planning is required when a project is identified within the study area and additional efforts will be made to determine how to successfully relocate displaced persons.

Most of the parcels traversed by the proposed ROW do not have structures within the proposed ROW. Depending on CDOT relocation policies and negotiations with individual landowners, the amount of land acquired for highway improvements will be limited only to portions of parcels actually needed for the ROW instead of the entire parcel, thus allowing most landowners to retain a substantial portion of their land.

The study area does not appear to contain any special or unusual neighborhoods or circumstances other than natural gas well heads. Well heads will be avoided because of the cost and effort required to either purchase or relocate them.

US 160 bisects a 974-acre parcel of public land administered by BLM, which contains a grazing allotment. An existing culvert under the roadway is used to move cattle between the north and south sides. If the highway is widened, the extended or replacement culvert will be of sufficient size to allow cattle to continue to have access to both sides of the parcel. CDOT will also ensure that replacement fencing does not allow cattle access to the highway, both during construction and long-term. Potential impacts to the grazing allotment will be coordinated with BLM to assure appropriate notification and modification of existing lease documents.

4.2 FARMLAND

4.2.1 No Action Alternative

Under the No Action Alternative, US 160 would maintain its current configuration, and the proposed highway improvements would not occur. Prime farmland and irrigated statewide important farmland along the existing roadway would not be impacted.

4.2.2 Impacts of the Preferred and Other Action Alternatives

The common impact among all of the action alternatives would be the conversion of farmland to non-agricultural uses. Table 4.2.1, Impacts to Irrigated Farmland, lists the approximate number

of acres of irrigated farmland that would likely be impacted by construction of the various alternatives. Figures 4.2.1 through 4.2.4 identify farmlands within the project corridor.

Table 4.2.1
Impacts to Irrigated Farmland

Highway Section/Alternative	Impacted Acres
Grandview	
Alternative G Modified	23.6
Alternative F Modified	49.4
Florida Mesa and Valley	
Alternative C	55.5
Alternative A	70.6
Dry Creek and Gem Village	
Alternative H	20.7
Alternative C	16.8
Bayfield	
Alternative B	21.4
Alternative A	24.9

Based on the data presented in Table 4.2.1, Impacts to Irrigated Farmland, the US 160 project would have a negligible effect on overall resources of irrigated land in the region.

In the Bayfield section, approximately 1.7 acres of prime farmland would likely be impacted by construction of either Alternative B (Preferred Alternative) or Alternative A. Prime farmland in this area has been subdivided for future development. Thus, the prime farmland would be converted to non-agricultural uses regardless of highway improvements.

4.2.3 Mitigation

Impacts to prime farmland and irrigated farmland will be minimized through the design of the proposed highway corridor, which will emphasize maintaining the existing alignment as much as possible while simultaneously meeting the purpose and need of the project. As part of the ROW acquisition process, CDOT will coordinate with affected landowners on possible impacts to agricultural land. Mitigation may include replacement/relocation of irrigation ditches and/or payment for the lost value of crops.

4.3 SOCIOECONOMICS AND RELOCATIONS

4.3.1 Social Resources

4.3.1.1 No Action Alternative

Without an expanded highway ROW, there would be no need to relocate businesses or acquire residential units and relocate individuals residing in such units, including low-income and minority populations.

Comparisons of the No Action Alternative and project alternatives with respect to community cohesion and social resources are provided in Sections 4.3.1.2 below.

4.3.1.2 Indirect and Direct Impacts Common to All Action Alternatives

As the existing configuration of US 160 acts as a physical and psychological barrier in Grandview, increasing community cohesion would continue to be a challenge. However, with the adoption of the *Grandview Area Plan* by the City of Durango in 2004, and the annexation of the area in the vicinity of the new hospital (under construction as of June 2005), community cohesion in Grandview could improve. Other neighborhood-based facilities, including parks, trails, and schools, are included in the plan. In Gem Village and Bayfield, the existing degree of community cohesion would probably continue without proposed highway improvements, although additional traffic on US 160 could make crossing the highway more dangerous and could reduce the number of face-to-face contacts if perceived safety issues decrease the number of social visits.

Improvements to the US 160 project corridor would directly impact businesses and individuals that own, reside on, or conduct business on parcels that are completely or partially within the new ROW. CDOT would negotiate with owners of such parcels to acquire needed land. For many parcels, a relatively small area would be acquired, which may not require relocation of housing units or businesses. For other parcels, structures that are located within the ROW would be acquired.

Table 4.3.1, Number of Impacted Housing Units, Individuals, and Businesses, summarizes data for parcels where structures must be relocated. This table shows, by highway section and alternative:

- Estimated number of residential units to be acquired
- Estimated number of individuals residing in such units
- Estimated number of businesses to be relocated

Table 4.3.1
Number of Impacted Housing Units, Individuals, and Businesses

Highway Section/Alternative	Number of Residential Units Acquired[1]	Number of Individuals Relocated[2]	Number of Businesses Relocated[3]
Grandview			
Alternative G Modified	41	95	14
Alternative F Modified	43	100	14
Florida Mesa and Valley			
Alternative C	6	14	0
Alternative A	8	19	1
Dry Creek and Gem Village			
Alternative H	8[4]	19	0
Alternative C	15	35	9
Bayfield			
Alternative B	3	7	0
Alternative A	3	7	0

Source: U.S. Census, 2000.

[1] Does not include residential structures that have been abandoned.
[2] Based on 2000 U.S. Census, assume 2.32 persons per household.
[3] Does not include business structures that are vacant or abandoned.
[4] Includes three mobile homes at Narrow Gauge Mobile Home Park that will be temporarily relocated during construction.

Impacts on School Districts, Churches, Police and Fire Protection

Direct impacts to school districts, churches, and fire protection are briefly described by highway section in Sections 4.1.3 through 4.1.6. Direct impacts and indirect impacts to these facilities and services are described in more detail below.

One school – Florida Mesa Elementary, which is within School District 9R –would be directly impacted. The expanded ROW on SH 172, as part of intersection improvements, would result in the acquisition of a small part of the northwestern part of the school parcel. Structures, play areas, and parking areas would not be impacted.

Indirect impacts from the relocation of residences and businesses would have no measurable effect on School District 9R (Durango) and School District 10 JTR (Bayfield). Most residents and businesses located within those districts that would be displaced by highway improvements would probably be relocated within the respective school districts, thus having no effect on overall enrollment or property tax revenue.

Relocations of residences in the Grandview and Florida Mesa and Valley section alternatives could have a minor, temporary, indirect impact on enrollment at Florida Mesa Elementary School and Escalante Middle School. Forty-seven residences would be removed from the ROW in these two sections under the Preferred Alternative and 51 residences would be relocated from the ROW in these sections for the other action alternative. Although some of these residences could be relocated on the same parcel and some residents could be relocated to other dwellings within the respective school service areas, some residents could be relocated outside these service areas, thus reducing enrollment. However, the potential magnitude of reduced school enrollment cannot be determined from readily available data, which does not include the number

of relocated residences with school-age children and the number of such children in each affected residence.

Relocations of residences in the Dry Creek and Gem Village section and the Bayfield section could have a minor, temporary indirect impact on enrollment at Bayfield schools, but much less than the potential impact on Florida Mesa Elementary School and Escalante Middle School discussed above. Only 11 residences would be relocated in these sections for the Preferred Alternative and only 18 would be relocated for the other action alternative. Although some of these residences could be relocated on the same parcel and some residents could be relocated to other dwellings within the school service areas, some residents could be relocated outside these service areas, thus reducing enrollment. However, the potential magnitude of reduced school enrollment cannot be determined from readily available data, which does not include the number of relocated residences with school-age children and the number of such children in each affected residence.

The *Grandview Area Plan* provides sites for three schools – elementary, middle, and high school. These schools will accommodate expected school enrollment increases generated by approximately 5,500 new dwellings provided in the plan at build out. As discussed in Section 4.1.1, No Action Alternatives, maximum projected residential build out is not likely to occur without proposed highway improvements due to traffic congestion, which will probably curtail some projected growth in the Grandview area. Thus, some or all of the schools may not be built or construction could be postponed until other solutions are developed to alleviate projected traffic congestion.

Properties owned by four churches would be directly impacted by proposed highway improvements. They include:

- Florida Baptist Church – The ROW for both Grandview Alternative G Modified and Grandview Alternative F Modified would relocate a mobile home located on the parcel behind the church at 30296 US Highway 160. However, there is sufficient room to relocate the mobile home on the same parcel.
- Durango Baptist Church – The ROW for both Florida Mesa and Valley Alternatives C and A would relocate a house and shed owned by the church at 32067 US highway 160. The office of Buena Vista Builders is located in the residence. However, there is sufficient room to relocate the structures on the same parcel. The church is not located on the parcel.
- Frontier Baptist Church – The ROW for both Florida Mesa and Valley Alternatives C and A would occupy a narrow strip along the western portion of a parcel at 33646 US 160 owned by this church. No structures would be impacted. The church is not located on the parcel.
- Church of Christ – The ROW for both Bayfield Alternatives A and B would occupy a narrow strip along the northern portion of a parcel at 2011 US 160B owned by this church. The church is located on this parcel, but no structures would be impacted.

Indirect impacts, if any, on church membership caused by residential relocations from proposed highway improvements are impossible to evaluate and quantify from data currently available. It is unknown as to which churches, if any, the occupants of residences slated for relocation are members; whether or not future occupants of such residences at time of acquisition will be members of churches; and whether or not relocations will cause church members to join another church or terminate membership.

Two parcels owned by the Durango Fire and Rescue Authority would be directly impacted by the ROW for both Grandview Alternative G Modified and Alternative F Modified alternatives. Animas Volunteer Fire Station No. 7 occupies one of the parcels. The western portion of both of these parcels, located at 204 SH 172, is within the proposed ROW. No structures would be impacted.

Fire and police services would be indirectly impacted by proposed highway improvements. On one hand, response times would generally decrease compared to the No Action Alternative due to less traffic congestion and the ability of emergency vehicles to move faster and safer on a divided four-lane highway. On the other hand, the divided highway with a median will reduce direct access to some properties. Although the highway design would probably provide median crossings at certain locations for emergency vehicles, response times to specific locations could increase if vehicles are forced to double back due to the highway configuration.

4.3.2 Economic Resources

4.3.2.1 No Action Alternative

Without an expanded highway ROW, there would be no loss of assessed value and property taxes. However, market forces and expansion of urban development, particularly in the Grandview area, could result in land use changes and subsequent reevaluation of parcels near US 160. Without improvements to major transportation arteries such as US 160, traffic congestion could reduce La Plata County's attractiveness as a tourist destination. For example, air quality impacts and delays in travel time associated with such congestion could diminish the view shed along the US 160 project corridor and could cause some tourists to choose alternate routes or travel destinations. Comparisons of the No Action Alternative and project alternatives with respect to business impacts and economic resources are provided in Sections 4.3.2.2 through 4.3.2.6 below.

4.3.2.2 Direct and Indirect Impacts Common to All Action Alternatives

Growth and Development Impacts

The US 160 project is expected to stimulate local economic development under all action alternatives. Many businesses along the project corridor would be expected to either grow or be replaced with other more viable and compatible types of businesses. It is unlikely that these properties would become vacant and abandoned due to the reconstructed highway.

Growth and redevelopment is predicted to occur along the portions of US 160 where new access roads are being proposed. These areas along US 160 include Grandview, the SH 172/CR 234 intersection, Gem Village, and Bayfield. The sections between these specific locations would likely remain a mix of agricultural and residential use for a longer time in the future.

La Plata County and the City of Durango are studying innovative land use techniques, including transfer of development rights, to minimize future strip development along rural sections of the highway, particularly between the SH 172/CR 234 intersection with US 160 and the Florida River (Maynard 2005). For the Gem Village section, it would be possible for those businesses to regain property currently occupied by the existing frontage roads after the future construction of

the bypass. This would provide an opportunity to expand and grow areas presently restricted by the highway ROW.

Given the approximately 10,300 vacant parcels in La Plata County, it is likely that most of the impacted structures would be replaced within La Plata County, thus having virtually no impact on the county's assessed valuation or amount of property taxes collected. Similarly, affected businesses have ample opportunity to relocate within the county, thereby having no measurable effect on employment or sales tax revenues.

Business Impacts

The indirect impacts on businesses were ascertained by conducting a business function and location analysis and by interviewing approximately half of the owners or managers of businesses located in the project corridor. However, approximately 80 businesses that would not be relocated may experience impacts due to altered access to these businesses. The highway improvements, while increasing safety and improving the flow of traffic, would eliminate many left turns that currently provide direct access from the highway.

Prior to interviewing business owners, a questionnaire was developed and a field survey was conducted to determine the degree to which a business may be dependent on good visibility/easy access from the highway. As a result of the survey, businesses were tentatively classified into one of three categories:

- Type A Business: Zero to minor dependence on visibility/easy access from highway. The general public rarely visits (e.g., construction companies, other industrial firms, and some offices).
- Type B Business: Minor to moderate dependence on visibility/easy access from highway. Destination for specialists (e.g., contractors) and public, with some impulse-based visits (e.g., lumberyards, auto body shops).
- Type C Business: Moderate to high dependence on visibility/easy access from highway. Sales are often dependent on the public's impulse, quick decision to visit (e.g., gas stations, auto sales, restaurants).

Nearly all of the Type C businesses were interviewed; fewer Type B businesses were interviewed; and even fewer Type A businesses were interviewed. The businesses interviewed are clustered in three general areas along the US 160 project corridor: Grandview, including businesses located on CR 233, which would serve as an access road for both alternatives; Gem Village; and Bayfield.

The perception of business owners and managers in the project corridor as to the impact of highway improvements was somewhat influenced by the extent to which their businesses are dependent on easy access and/or easy visibility from the highway. For businesses with zero to minor dependence (Type A), highway improvements would generally have no impact or a positive impact due to improved safety. Of the 35 businesses contacted, 13 expected no impact or a positive impact. For businesses with a minor to major dependence (Types B and C) on easy access and/or easy visibility from the highway, the perceived impact from highway improvements ranged from minor negative to major negative. Negative impacts would be minor for nine businesses, moderate for nine businesses, and major for four businesses.

4.3.2.3 Grandview Section

Alternative G Modified (Preferred Alternative)

Social and Economic Impacts

In addition to the social and economic impacts addressed above, and the residential and business relocations summarized in Table 4.3.1, Number of Impacted Housing Units, Individuals, and Businesses**,** Alternative G Modified (Preferred Alternative) would relocate structures out of the ROW on the following parcels exclusive to Alternative G Modified that would not be required under Alternative F Modified:

- Three structures, including a modular and two sheds on one parcel would be impacted by the relocated US 550.
- One shed on a single parcel would require relocation outside the proposed ROW.

Business Impacts Common to Grandview Alternatives

Of the 14 businesses located in Grandview that were contacted, three business owners or managers thought the highway improvements would have a positive impact, while one owner felt that improvements would have no impact. These businesses do not depend very much on easy access or visibility. Two are located on the north side of CR 233 and are not visible from US 160. Two are self-storage units and two are in the construction business. All of these owners welcomed safer access provided by the proposed US 160 improvements compared to the existing highway configuration and its continuation under the No Action Alternative.

Five of the owners or managers of Grandview businesses thought the highway improvements would result in a minor negative impact. Most cited short-term disruptions during construction and a period of adjustment as customers learn how to use new access routes. Most of these businesses (auto body, riding stable, lumberyard, fence company) are destination-oriented rather than impulse-based.

Four of the owners or managers of Grandview businesses thought the highway improvements would result in a moderate negative impact (meaning sales would recover). A campground owner, citing conversations with campground owners in other parts of the country, expects to lose half of normal business during the construction period, which would be a major, negative short-term impact. After construction, the loss of direct access would be offset by improved safety, resulting in a minor negative impact in the long term. Other businesses fearing a moderate negative impact include a modular housing sales office, an auto body shop, and a used car dealership. For the used car dealership, the construction period would have a major negative impact, as it would be difficult to keep vehicles on the lot free from dust.

Community Cohesion Impacts Common to Grandview Alternatives

The proposed improvements to US 160 would further isolate the north and south sides of Grandview from each other. Although the existing highway configuration and land use patterns are not conducive to community cohesion, the situation would not be improved with a limited access highway bisecting the community. A center median on US 160 would reduce crossings to only three locations, thereby changing existing access to the highway and travel patterns. Some motorists would have to travel extra distances to access the highway. For example, motorists who seek to travel west on US 160 from the south side of the highway may have to drive east to

the SH 172/CR 234 intersection with US 160. Although this rerouting of traffic may be inconvenient to some people, traffic safety would be greatly improved by limiting access points.

Alternative F Modified

In addition to the socioeconomic impacts addressed above, and the residential and business relocations summarized in Table 4.3.1, Number of Impacted Housing Units, Individuals, and Businesses**,** Alternative F Modified would relocate structures out of the ROW on the following parcels exclusive to Alternative F Modified that would not be impacted by Alternative G Modified:

- A house, garage, and shed on one parcel in the Skyview Subdivision south of the proposed new US 160/US 550 (south) interchange would be impacted.
- Two houses on separate parcels would be impacted.
- A shed on a residential parcel near the US 550/CR 220 intersection would be impacted.

4.3.2.4 Florida Mesa and Valley Section

Alternative C (Preferred Alternative)

There would be no additional social and economic impacts under Alternative C (Preferred Alternative) that are beyond those discussed in Sections 4.3.1.2 and 4.3.2.2, Impacts Common to All Action Alternatives. Residential and business relocations presented in Table 4.3.1, Number of Impacted Housing Units, Individuals, and Businesses, for Alternative C are common to both alternatives within the Florida Mesa and Valley section.

Alternative A

In addition to the social and economic impacts discussed in Sections 4.3.1.2 and 4.3.2.2, Impacts Common to All Action Alternatives, Alternative A would relocate structures out of the ROW on the following three parcels near the US 160/CR 222 intersection that would not impacted by Alternative C:

- Two mobile homes and a barn on one parcel
- A shed on a residential parcel
- A shop (RJ Automatic Products), approximately 25 mini-storage structures, and numerous RVs for rent on one parcel

4.3.2.5 Dry Creek and Gem Village Section

Alternative H (Preferred Alternative)

The social and economic impacts of Alternative H (Preferred Alternative) are discussed in Sections 4.3.1.2 and 4.3.2.2, Impacts Common to All Action Alternatives. The impact of Alternative H relative to businesses, residences, and community cohesion are discussed in the following section. Residential and business relocations are summarized in Table 4.3.1, Number of Impacted Housing Units, Individuals, and Businesses. Relocations of businesses and residences under Alternative H (Preferred Alternative) include a subset of the same properties that are relocated under Alternative C as discussed below. No additional structures would be relocated that are exclusive to Alternative H.

Business Impacts

Of the nine businesses located in Gem Village that were contacted in 2003, two business owners or managers thought that the highway improvements would have a positive impact compared to the No Action Alternative and three owners felt that improvements would have no impact if Alternative H (Preferred Alternative) is selected.

With proper signage at the intersection of the bypass and the existing road plus safety improvements, the business climate could be improved with a bypass. Most of these businesses are destination-oriented, although one receives approximately 30 percent of business from drive-by tourists.

Three of the owners or managers of Gem Village businesses thought the highway improvements would result in a minor negative impact. These businesses are generally not dependent on drive-by customers. Only one business owner (gift shop) anticipates a moderate negative impact, since approximately half of its customers are tourists who may depend on easy visibility.

As of June 2005, two of the nine businesses contacted have closed: The Rose Patch Gift Shop and Village Antiques. The fact that these businesses are no longer open does not necessarily affect the validity of the business survey given that the businesses that chose to participate in the survey were a representative sample of businesses operating at the time of the survey (February 2003). When the highway improvements are actually completed, for either the Preferred Alternative or the other action alternative, it is quite likely that some other businesses that participated in the survey will be out of business, replaced by other enterprises or other types of land uses on the impacted parcels.

Community Cohesion Impacts

At Gem Village, Alternative H (Preferred Alternative), which would bypass the community, would likely result in enhanced community cohesion compared to the No Action Alternative. The existing highway would become a local or county road, greatly reducing the amount of traffic, thus making the community more pedestrian friendly. Alternative H (Preferred Alternative) would improve traffic safety by limiting access to the highway at the west end of Gem Village, which would also slightly alter travel patterns for local traffic.

Alternative C

The social and economic impacts of Alternative C are discussed in Sections 4.3.1.2 and 4.3.2.2, Impacts Common to All Action Alternatives. The impact of Alternative C relative to businesses, residences, and community cohesion are discussed in the following section. In addition to the residential and business relocations summarized in Table 4.3.1, Number of Impacted Housing Units, Individuals, and Businesses**,** Alternative C would relocate structures out of the ROW on the following parcels that would not impacted by Alternative H:

- Two residential houses on two separate parcels
- A house, garage, and shed on one parcel
- One barn located on one parcel
- Two garages located on two parcels
- Three residential mobile home located on three parcels

- Nine commercial properties including mini-storage units, an office, restaurant, and other commercial facilities located on nine separate parcels

Business Impacts

Although Alternative C would still provide easy, visible access to businesses located on the north side of the highway, this alternative would also remove all businesses and residents on the south side and would have a severe negative impact on the Gem Village business community compared to the No Action Alternative and Alternative H.

Community Cohesion Impacts

In contrast to the bypass provided by Alternative H (Preferred Alternative), Alternative C would expand the ROW on the south side, causing the relocation of approximately half the community, thus having a severe negative impact on community cohesion compared to the No Action Alternative. Alternative C would improve traffic safety by limiting access to the highway at the west end of Gem Village, which would also slightly alter travel patterns for local traffic.

4.3.2.6 Bayfield Section

Alternative B (Preferred Alternative)

The social and economic impacts of Alternative B (Preferred Alternative) are discussed in Sections 4.3.1.2 and 4.3.2.2, Impacts Common to All Action Alternatives. Residential and business relocations presented in Table 4.3.1, Number of Impacted Housing Units, Individuals, and Businesses, for Alternative C are common to both alternatives within the Bayfield section. The impact of Alternative B relative to businesses, residences, and community cohesion are discussed below.

Business Impacts

Of the 12 businesses located in Bayfield that were contacted, four business owners or managers thought that the highway improvements would have no impact. Two of these businesses plan to move to the recently constructed business park (Bayfield Center). One business, a motel, is set back from the highway and considers itself to be a destination for travelers who contact it via the Internet. For the other business, virtually all customers are local, and there is minimal dependence on easy access or visibility from the highway.

One of the owners of a Bayfield business (an auto supply store) thought the highway improvements would have a minor negative impact, while four businesses expect a moderate negative impact compared to the No Action Alternative. For the latter, three of the businesses attract most of their customers from the west, who would have to use a more circuitous route by exiting US 160 at the Eight Corners intersection and using a new access road. Customers attempting to access the service station at Eight Corners from the intersection would be prevented from making a left turn into the business from CR 501 south of the intersection.

Three of the Bayfield business owners (restaurant, grocery store, and liquor store; located north of US 160 on Colorado Drive) that were interviewed anticipate a major negative impact from highway improvements. Much of their business comes from drive-by customers from the west, who would have to turn around on B, cross the highway at Eight Corners, and then head east on a new access road. This traffic movement and its impact on these businesses may be alleviated somewhat if the town of Bayfield extends the access road on the north side of the highway to the

proposed US 160/US 160B (east) intersection. This connection would create a roadway parallel to US 160 on the north side, which would connect to Commerce Drive.

Community Cohesion Impacts

Because US 160 already bisects Bayfield, the addition of lanes and intersection improvements is not expected to significantly change community cohesion. Improved safety over the No Action Alternative in crossing from north to south and vice-versa could mitigate a potential decrease in social visits as increased traffic without highway improvements could create a perception of deteriorating safety. For both Bayfield section alternatives the intersection at Mountain View Drive would be closed. Improvements at Eight Corners and at the US160/US 160B (east) intersection would provide two safer means to travel between the north and south parts of Bayfield.

If the proposed trail underpass at Mountain View Drive were to be built, there would be a pedestrian/bicycle link between north and south on the east side of town, providing connections between schools and neighborhoods and between the north side and downtown. Although the proposed limited access highway would be a greater physical and visual barrier than the present highway, this slightly increased barrier would not deter residents from accessing and enjoying the facilities and institutions on both sides of the highway that serve as cohesive community bonds.

Alternative A

There would be no additional social and economic impacts under Alternative A that are beyond those discussed in Sections 4.3.1.2 and 4.3.2.2, Impacts Common to All Action Alternatives. Residential and business relocations presented in Table 4.3.1, Number of Impacted Housing Units, Individuals, and Businesses, for Alternative C are common to both alternatives within the Bayfield section.

4.3.2.7 Mitigation

Relocation impacts will be mitigated by implementation of the Uniform Act. CDOT will provide relocation benefits and assistance. For some of the residences and businesses that would be relocated by one or more alternatives, it may be possible to provide on-site mitigation.

Some parcels are large enough to relocate structures on the same parcel that would be moved out of the proposed ROW. Table 4.3.2, Housing Units and Businesses Potentially Relocated On Site, indicates the number of residences – conventional housing and mobile homes – and the number of businesses that could be moved out of the proposed ROW and relocated on the same parcel.

Table 4.3.2
Housing Units and Businesses Potentially Relocated On Site

Highway Section	Number of Houses Relocated On Site[1]	Number of Mobile Homes Relocated On Site[1]	Number of Businesses Relocated On Site[1]
Grandview			
Alternative G Modified	3	3	3
Alternative F Modified	3	3	3
Florida Mesa and Valley			
Alternative C	2	2	0
Alternative A	2	4	0
Dry Creek and Gem Village			
Alternative H	1	4	0
Alternative C	2	4	0
Bayfield			
Alternative B	1	0	0
Alternative A	1	0	0

[1]See Table 4.3.1, Number of Impacted Housing Units, Individuals, and Businesses, for total number of relocations.

4.3.3 Environmental Justice

Executive Order 12898 requires each federal agency, to the greatest extent practicable and permitted by law, to achieve environmental justice as part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects, including interrelated social and economic effects, of its programs, policies, and activities on minority populations and low-income populations in the United States. It is DOT policy that no person is excluded from participating in, denied the benefits of, or subjected to discrimination by any program or activity of DOT because of race, color, or national origin. The goal is to identify and avoid discrimination and avoid disproportionately high and adverse effects on minority populations and low-income populations.

4.3.3.1 No Action

Under the No Action alternative, minority and low-income populations would continue to experience similar impacts that exist today with additional congestion, safety hazards, and noise that would increase with the travel demand. Relocations for additional highway ROW would be unnecessary and the proximity of the highway and the associated impacts would not change.

4.3.3.2 Project Impacts

Relocations of Households and Businesses

The following assumptions were made to estimate the numbers of relocations of minority and low-income populations that provide a basis for the numbers of environmental justice community relocations:

(1) There is a correlation between income and the ability to pay for housing. Although a renter-occupied mobile home does not prove the household within is low-income, the rent for most mobile homes is less than the county-wide median rent for all rentals, which was $682 per month

according to the 2000 U.S. Census. As indicated in Table 3.3.4, Data for Mobile Home Parks Potentially Impacted by US 160 Improvements, the monthly rent in the four mobile home parks directly impacted by the project ranges from $365 to $850, with the high of $850 for a doublewide mobile home. A telephone survey of other mobile home parks in the Durango – Bayfield area indicated a general monthly rental range from $425 to $850, with a high of $850 for a doublewide mobile home. Thus, based on the assumption described, it can be concluded that households occupying mobile home rental units generally have lower incomes than renters or owners of conventional housing.

(2) Renter-occupied mobile homes outside of mobile home parks earn approximately $20,080 or less per year (50 percent AMI), the CBDG threshold for low-income households. Outside mobile home parks where parcel ownership data did not match with the telephone directory names for a parcel's address, it was assumed that the residence was renter-occupied.

(3) The information provided by secondary sources as discussed in Chapter 3 is representative and accurate.

Table 4.3.1, Number of Impacted Housing Units, Individuals, and Businesses, lists the number of residential and business relocations by alternative. Estimating the number of minority and low-income households that would be relocated by alternative was based on the above assumptions. The estimates include all of the relocations from mobile home parks and other identified minority and low-income residences. Based on the survey methods that included separate questionnaires for minority and low income, households that included both minority and low-income residents would be counted twice resulting in slightly elevated estimates. Relocations within mobile home parks included 11 mobile homes under the preferred and other action alternatives. Of the 14 mobile homes outside mobile home parks that would be directly impacted by the Preferred Alternatives, five were estimated to be renter-occupied. Of the 18 mobile homes outside mobile home parks that would be impacted by the other action alternatives, ten were estimated to be renter-occupied. The estimated minority and low-income renter-occupied mobile homes inside and outside mobile home parks are presented in Table 4.3.1, Number of Impacted Housing Units, Individuals, and Businesses.

One minority business was identified that would be relocated by both the Preferred Alternatives and the other action alternatives. For the Preferred Alternative, one minority business out of 14 total relocated businesses would be impacted. For the other action alternatives, one minority business out of 23 total relocated businesses would be impacted. According to U.S. Census data, there were 502 minority-owned businesses out of 5,919 total businesses in La Plata County in 1997. Some properties did not have income or minority data available to identify populations.

Proximity Impacts

The communities most impacted by any of the alternatives are typically already adjacent to the existing ROW. For most cases the highway would remain near the community or become closer. These communities would experience increased noise, mobile air pollutants, and change in visual character. For this discussion, the communities identified to have minority and low-income residences are discussed. Proximity impacts will be predominantly shared among highway frontage occupants whom generally consist of higher concentrations of mobile home parks. Data are not available for dispersed residences of low-income and minority populations.

All of the communities adjacent to the roadway would experience an increase in noise compared to the existing noise levels. According to the CDOT Noise Abatement Guidelines, the Narrow Gauge and the Cropley mobile home parks would not be impacted by any of the alternatives. The ~~No~~ action alternatives modeled at this location show the loudest noise at 62.9 dBA at receptor R523. Under both the preferred and other action alternatives, the Narrow Gauge and the Cropley mobile home parks may experience a noise increase of almost 4 dBA between the No Action and the action alternatives. There is no difference in the noise levels of the action alternatives. For more detailed information, see Section 4.6, Traffic Noise Analysis, or Appendix B, Traffic Noise Analysis. ~~Under both the preferred and the other alternative, there is no identifiable noise impact between the No Action and the action alternatives at the Narrow Gauge and Cropley mobile home parks.~~

The Cedar Meadows, Mountain Vista, John's Homestead and Lilly Belle mobile home parks would be impacted according to the CDOT Noise Abatement Guidelines by both the preferred and the other alternatives. The Mountain Vista and Lilly Belle mobile home parks would experience a noise impact under the No Action, but Cedar Meadows and John's Homestead mobile home parks would not. The Cedar Meadows and Mountain Vista mobile home parks may experience a noise increase of almost 2 dBA between the No Action and both the action alternatives. ~~There is no difference in the noise levels of the action alternatives.~~ The Lilly Belle Mobile Home Park may experience an increase in noise levels of almost 4 dBA between the No Action and the action alternatives. There is no difference in the noise levels of the action alternatives. The John's Homestead Mobile Home Park may experience an increase in noise between the No Action and the Alternative G Modified (Preferred Alternative) by almost 3 dBA. At this location, the increase in noise level would be ~~as much as 9 or 10~~ 4 dBA with Alternative F Modified.

Noise mitigation was considered for Cedar Meadows, John's Homestead, Lilly Belle and Mountain Vista mobile home parks. As discussed in Section 4.6.2, Mitigation, CDOT has evaluated the use of noise walls to mitigate increases in traffic noise. Ultimately, CDOT has proposed an 8-foot-high, 870-foot-long noise wall to mitigate impacts to 11 residences located in the Mountain Vista Mobile Home Park in Grandview. The average cost for this mitigation is $1,677/~~total~~ dBA reduction with an average of 6.6 dBA reduction. Under CDOT's Noise Abatement Criteria Guidelines, noise mitigation is not justified for Cedar Meadows, John's Homestead and Lilly Belle because the noise reduction and the average cost could not meet the reasonable criteria defined in the guidelines. The noise reduction and average cost for the mitigation with the assumptions of $30 per square foot are as follows: Cedar Meadows $9,640/~~total~~ dBA reduction with an average reduction of 3~~.2~~ dBA; John's Homestead with an average cost of $20,545/~~total~~ dBA reduction with an average reduction of 3.3 dBA; and Lilly Belle with an average cost of $29,520/~~total~~ dBA reduction with an average reduction of 2.1 dBA. Typically, average costs greater than $4,000/~~total~~ dBA reduction, or mitigation that cannot achieve a reduction of 5 dBA for at least one front row receptor, is considered to be not reasonable. However, based on circumstances and consideration that the greatest concentration of highway frontage communities comprise mobile home parks, practicable measures to reduce noise levels within these areas will be further considered during advanced design to mitigate for mobile home noise impacts.

Under all the action alternatives, the entire corridor will experience a change in the visual character of US 160. The highway pavement would have increased pavement surfaces with

some elevated structures at interchanges at SH 172/CR234, CR 233 (west), and potentially US 550 (south). Impacts to visual resources, as discussed in Section 4.16, Visual Resources, also have the potential to affect minority and low-income populations. Generally, potential negative impacts include: locating road alignments closer to residences, introducing cut-and-fill slopes and other built-up features in otherwise natural or pastoral landscapes that are visible from surrounding developments, and removing trees that act as a visual screen for residential areas.

John's Homestead Mobile Home Park in the Grandview section would be visually impacted by both action alternatives that include interchanges at CR 233 (west). In addition to the interchange at CR 233 (west), Alternative G Modified (Preferred Alternative), includes an additional interchange at the junction of US 160/US 550 (south) that would have additional visual impacts due to the raised sections of roadway to make the connections to US 160. This interchange would be located approximately 4,000 feet east of the current Farmington Hill intersection location and closer to the mobile home park. Alternative F Modified would realign the US 160/US 550 (south) interchange closer to the mobile home park to connect with CR 233 (west). The ramps and elevated structures from Alternative F Modified would have greater visual impacts than Alternative G Modified due to being closer, but under this alternative, the Grandview area would require only two interchanges instead of three. Another interchange at SH 172/CR 234 may also be visible from John's Homestead Mobile Home Park.

Visual impacts on Mountain Vista and Lilly Belle mobile home parks would be similar with Alternative G Modified (Preferred Alternative) and Alternative F Modified in that elevated interchanges would impact the visual character of the western and eastern viewshed. Both alternatives propose interchanges with elevated structures at CR 233 (west) and SH 172/CR 234 while Alternative G Modified also includes the additional US 160/US 550 (south) interchange. Visual impacts at Cedar Meadows are similar to Mountain Vista and Lilly Belle except that the interchange at SH 172/CR 234 may not be visible from the mobile home park. The Narrow Gauge and Cropley mobile home parks have an at-grade connection with US 160 for both Alternative H (Preferred Alternative) and Alternative C and would experience minor visual impacts in association with the widened roadway.

Air quality impacts associated with CO, and other criteria pollutants are predicted to decrease under all alternatives compared to the no action based on replacement of older vehicles with newer, less polluting equipment. Under both action alternatives, congestion and stationary idling times that contribute to decreased air quality on a local level will be reduced by improving traffic efficiency resulting in air quality improvements. Construction-related air quality impacts are discussed below.

Impacts Related to Access

Access to US 160 is one of the major purposes driving this study. The access for most residences and communities in the corridor will change. Most of the impacts will be experienced by residences or communities that currently have direct access to US 160. Because the most of the mobile home parks in the corridor that will be affected by the project are adjacent to US 160, they will likely experience a change in their access to US 160 similar to the other residences and communities. Although access modifications will potentially result in out-of-direction travel for residences or communities, this inconvenience will be predominantly shared among highway frontage occupants, which consist of higher concentrations of mobile home parks. Safety

benefits associated with restricted highway access will also be shared equally among highway frontage occupants.

John's Homestead Mobile Home Park currently, and under the No Action Alternative, has direct access to US 160. Under both alternatives G Modified (Preferred Alternative) and F Modified, access would be by an access road that would require approximately 1.7 miles of out-of-direction travel to proceed to Durango. Access to US 160 would be achieved through the interchange at CR 233, 0.75 mile to the east.

Cedar Meadows Mobile Home Park currently, and under the No Action Alternative, has direct access to US 160. Under both alternatives G Modified (Preferred Alternative) and F Modified, access would be directed north (away from US 160) to CR 233 where residents could go east or west and access US 160 via CR 234 or CR 233 (west) respectively.

Mountain Vista Mobile Home Park currently, and under the No Action Alternative, has access to CR 233 and US 160. Under both alternatives G Modified (Preferred Alternative) and F Modified, access to US 160 would be gained through CR 233 (west).

Lilly Belle Mobile Home Park currently, and under the No Action Alternative, has direct access to US 160. Under both alternatives, G Modified (Preferred Alternative) and F Modified, the access would be redirected north to CR 234 where access to US 160 can be gained to the east by CR 234 or by CR 233 (west) to the west.

Narrow Gauge and Cropley mobile home parks currently, and under the No Action Alternative, have access directly to US 160. After working with both mobile home parks, a shared access road with both east and west access to US 160 is included in Alternative H (Preferred Alternative) and Alternative C.

Construction Impacts

As discussed in Section 4.19, Construction, persons living or working in the residences or businesses located near the construction zone would be exposed to elevated noise levels, potential safety concerns, and fugitive dust as a result of construction. Most notably, blasting along the US 550 south realignment in the Grandview section would affect all local residents and businesses alike. These noise and air quality impacts would be temporary and intermittent, lasting only for the duration of the construction phase. Construction impacts, while temporary, would be mitigated by limiting work to daylight hours, requiring contractors to use well maintained equipment (especially with respect to mufflers), through the use of mitigation measures such as temporary noise walls where applicable, and dust control.

Three mobile home households would be temporarily relocated during construction at the Narrow Gauge Mobile Home Park due to the proximity of the ROW and the needed space to construct a retaining wall. No other temporary relocations are required on the project.

Safety issues in the project corridor would be expected to increase during construction due to the presence of construction workers and equipment. In addition, construction in any one of the ten sites listed in Section 4.15, Hazardous Waste Sites, would have the potential to cause a release of hazardous materials into the environment. However, it is not anticipated that these safety issues would be experienced by low-income or minority populations in the project corridor any more than other community members. In addition, once construction is complete, the highway improvements in the US 160 project corridor will increase traffic safety, having a beneficial effect for all.

During construction, detours and traffic delays may discourage local and recreational traffic from using this route, which could affect businesses that rely on US 160 as a source of customers. Twenty-two of 35 local business owners surveyed in 2003 thought that activities in the US 160 project corridor would have more than a negligible impact on their businesses (see Section 4.3.2.2, Impacts Common to All Alternatives). However, 13 business owners noted that the project would have no impact or a beneficial effect on their businesses. Only one minority-owned business of the 35 businesses identified is located in the project corridor.

Access to residential areas and businesses would always be available during construction, so these effects would be insignificant and temporary, lasting only the duration of the construction phase.

Jobs created by the construction activities could have beneficial effects by providing employment opportunities for low-income or minority populations living near the US 160 project corridor. As discussed in Section 4.3.2, Economic Resources, once construction is complete, the new proposed roadway would be expected to have a positive effect on local economic development, which could benefit low-income and minority populations.

4.3.3.3 Avoidance and Minimization of Impacts

Throughout the environmental analysis process, CDOT has worked with residents and the public to avoid and minimize impacts to neighborhoods and mobile home parks wherever possible. For example, public concern was expressed about impacts to that Narrow Gauge and Cropley mobile home parks during the scoping meeting in March 2003. At that meeting, a conceptual design was presented that would have required relocating 14 homes in Narrow Gauge Mobile Home Park and 4 homes in Cropley Mobile Home Park. CDOT refined the design and met with residents of both mobile home parks in May 2003 at the home of a resident in Narrow Gauge Mobile Home Park. Based on input received at the March 2003 public scoping meeting and at the meeting in Narrow Gauge Mobile Home Park, highway access and frontage roads were modified to minimize impacts to the Narrow Gauge and Cropley mobile home parks. These changes:

- Eliminated the frontage road south of US 160 between the west junction of Via Vista Circle and approximately 0.5 mile east of the Narrow Gauge Mobile Home Park access.
- Relocated the Narrow Gauge and Cropley mobile home park accesses to reduce residential relocations and minimize ROW impacts.

The design changes with input from the residents of Cropley and Narrow Gauge mobile home parks minimized impacts by reducing relocations in Narrow Gauge Mobile Home Park from 14 permanent relocations to 3 temporary relocations and reducing impacts in Cropley Mobile Home Park from 4 relocations to 0 relocations.

At the Narrow Gauge Mobile Home Park, relocation impacts could be limited to the construction period when three of 62 mobile homes would be temporarily moved to construct a retaining wall, after which the mobile homes would be moved back to their existing locations. CDOT will provide for appropriate housing during temporary displacement of the residents.

For Alternative G Modified (Preferred Alternative) in the Grandview section, an on-ramp was redesigned to eliminate direct impacts to six mobile homes in the John's Homestead Mobile

Home Park. Also in Grandview, access was redesigned to avoid direct impacts to four mobile homes in the Cedar Meadows Mobile Home Park.

4.3.3.4 Available Areas for Relocations

Households displaced from the four mobile home parks impacted by the project may have difficulty finding vacant pads or mobile home rentals in other mobile home parks in the Durango – Bayfield area.

Based on interviews with nine other parks in the area, there are generally very few pads or rentals available. A new mobile home park opened in 2003 in Bayfield containing 37 mobile home sites. However, most of the mobile home park households that would be displaced by the project are located in Grandview, close to jobs or social services in Durango. Given that 11 households could be permanently displaced from the three mobile home parks impacted by the project (Table 4.3.3, Relocation Summary of Low Income and Minority Populations by Alternative), CDOT will work with residents and local agencies to provide alternative housing. Available options are described in Section 4.3.3.5, Mitigation.

Table 4.3.3
Relocation Summary of Low Income and Minority Populations by Alternative

Alternative	Total Relocations (residential/ business)	Estimated minority and low income relocations within MHP* (residential)	Estimated minority and low income relocations outside of MHP* (residential)	Total estimated minority and low income relocations (residential)
Grandview				
G Modified (Preferred Alternative)	41/14	11	2	13
F Modified	43/14	11	2	13
Florida Mesa and Valley				
C (Preferred Alternative)	6/0	0	2	2
A	8/1	0	4	4
Dry Creek and Gem Village				
H (Preferred Alternative)	8/0	0	1	1
C	15/9	0	4	4
Bayfield				
B (Preferred Alternative)	3/0	0	0	0
A	3/0	0	0	0

* MHP (mobile home park)

Because there are many vacant parcels for relocating mobile homes outside parks, it appears likely that housing needs of some displaced mobile home residents could be accommodated within La Plata County, thus mitigating the impact of highway improvement relocations. However, relocating to a vacant parcel without a pad or service represents a more difficult

challenge than moving to an existing full-service pad. If vacancies continue to be limited in existing mobile home parks during the next several years, or if some of them are replaced by other land uses, the occupants of mobile homes displaced by highway improvements may increase the number of households in search of affordable housing. Available options are described in Section 4.3.3.5, Mitigation.

4.3.3.5 Mitigation

Economic development resulting from the project, both short- and long-term, could have a positive impact on some low-income households within the project corridor, including residents of affected mobile home parks. Additional service sector jobs would likely be created by commercial expansion that could be stimulated by highway improvements. Some low-income individuals could obtain construction-related jobs during the construction phase of highway improvements. ~~CDOT will offer assistance to affected populations to ensure that they receive their proportional share of the anticipated benefits of the project.~~

Enhanced efforts by state and local governments, housing organizations, and private sector housing providers to increase the supply of affordable housing would help to mitigate displacement of low-income residents caused by improvements to US 160. During the ROW acquisition process, CDOT will provide advisory services to the displaced residents to address their housing needs. CDOT treats mobile homes as real property and would offer to purchase the mobile homes and provide relocation benefits in accordance with the Uniform Act. Advanced compensation payments or subsidies toward monthly rents may allow certain residents access to sufficient cash reserves that could be applied toward down payments or security deposits for comparable housing. FHWA and CDOT commit to providing affordable replacement housing for all displaced residents, renters and owners alike, up to and including housing of last resort.

A noise wall will be incorporated into the project design to address noise impacts at the Mountain Vista Mobile Home Park. During advanced design of the project, noise mitigation will be reconsidered for three other mobile home parks in Grandview (Lilly Belle, John's Homestead, and Cedar Meadows) even though initial determinations indicate that noise walls to address noise abatement are not reasonable.

Given that most affected mobile home parks are located in the Grandview area, impacts on low-income households are more likely to be concentrated in Grandview and not evenly distributed throughout the project corridor. Community viewpoints were sought on the DEIS ~~becomes available for public review~~ through notices to the affected mobile home parks announcing public hearings and the opportunity to comment.

Based on the information contained in this section, there will not be disproportionate impacts to minority and low-income populations. As a result of the US 160 project, the severity of the impacts to these populations, including relocations, noise, visual character, air quality, access, and construction, are no more severe than the impacts to other populations. The minority and low-income residential relocations are estimated to be 16 out of 58 total; with one minority business relocation out of 14 total. Taking into account the proposed mitigation, the severity of noise impacts is similar between the 141 mobile homes and the other 203 buildings along the corridor, with predicted noise levels averaging 62.0 dBA and 59.4 dBA, respectively. A 3 dBA difference in decibel level, such as this, is barely perceptible to humans. Some mobile home parks will experience noise impacts, which will be mitigated. Visual and access impacts would

be predominantly shared among occupants adjacent to the highway, whether minority, low-income, or otherwise. Air quality impacts associated with CO and other criteria pollutants are predicted to decrease under all alternatives and have an overall positive impact on residents along the corridor. Construction impacts experienced by those living along and using the roadway would be temporary in nature. Safety issues associated with construction are not expected to affect the minority and low-income population any more than other community members, and long-term traffic safety would improve for all populations. Access to all properties would be maintained during construction, with any potential impacts insignificant and temporary. As part of the public process, CDOT has coordinated with these populations and individuals to mitigate impacts such as those mentioned above and resolve specific problems. These populations have provided input into the process and their concerns have been addressed.

4.4 RECREATION

4.4.1 No Action Alternative

The No Action Alternative would have no effect on recreation resources in the project corridor.

4.4.2 Impacts Common to All Action Alternatives

Although trails are planned in the project corridor, no others currently exist. The *Town of Bayfield Pedestrian and Bicyclist Connections Master Plan* (BRW 1998) proposed a trail within or just outside the US 160 ROW on the north side of the highway, extending from the Los Pinos River east to the US 160/US 160B (east) intersection. As part of recent improvements made by CDOT to the US 160/CR 501 intersection, a trail paved with asphalt has been constructed north and east of the intersection. The plan also calls for a trail connection under the highway at the Los Pinos River bridge to the south side of the highway, running east to Little Pine River Park.

In addition, the plan identifies future trail connections between the north and south sides of the highway at CR 501 and Mountain View Drive. At the latter site, the plan calls for a concrete path under US 160 in a box culvert with appropriate drainage and lighting.

In response to trail advocacy groups, CDOT and highway engineers are coordinating with Smart 160, an organization within Trails 2000, to revise the design of a trail using an abandoned railroad bed that would connect Durango with Grandview. Conceptual design has been completed only for the western portion of the Grandview section, as shown in Figure 4.4.1, Proposed Shared Use Path Alignment. The revisions would incorporate proposed trail alignments adopted in the *Grandview Area Plan*, including connections with Mercy Medical Center, and proposed surrounding development. The trail would eventually continue through Grandview to CR 234, as provided in the plan.

During construction of highway improvements, recreational activities may be diminished because of construction noise, dust, and inconvenient access. Traffic flow could be disrupted, and travel delays to recreation areas could be expected. However, these impacts would be temporary, and normal recreational activities should resume after construction. Overall, the project would result in generally improved access and improved safety conditions for recreationists. These improved conditions are likely to enhance the overall outdoor experience for the majority of recreationists.

4.4.3 Grandview Section

4.4.3.1 Alternative G Modified (Preferred Alternative)

The trail on the abandoned railroad bed from Durango through the proposed greenway and other trail alignments proposed in the *Grandview Area Plan* would eventually connect to CR 234 as the plan is implemented and as land is annexed by the City of Durango.

The Durango East KOA Campground is located in the Grandview section, just west of the SH 172/CR 234 intersection with US 160. Construction activities may temporarily diminish the camping experience and cause a temporary loss of business, but upon completion of construction, the campground would have a much safer access, and the campground would function as it does today.

4.4.3.2 Alternative F Modified

Impacts associated with Alternative F Modified would be the same as those described for Alternative G Modified (Preferred Alternative).

4.4.4 Florida Mesa and Valley Section

4.4.4.1 Alternative C (Preferred Alternative) and Alternative A

The Preferred Alternative and Alternative A would have the same impacts to recreational resources as those discussed in Section 4.4.2, Impacts Common to All Action Alternatives.

4.4.5 Dry Creek and Gem Village Section

4.4.5.1 Alternative H (Preferred Alternative) and Alternative C

The Preferred Alternative and Alternative C would have the same impacts to recreational resources as those discussed in Section 4.4.2, Impacts Common to All Action Alternatives.

4.4.6 Bayfield Section

4.4.6.1 Alternative B (Preferred Alternative)

Alternative B (Preferred Alternative) would not have any permanent impacts to the Little Pine River Park. The proposed improvements do not require any ROW from the park, and access to the park would be maintained. In the vicinity of the park, US 160 would be modified to include a median, which would eliminate left-turn movements into the park from westbound US 160. Alternate access to the park for westbound vehicles would be provided at U-turn locations. During construction of highway improvements, park activities may be diminished because of construction noise, dust, and inconvenient access. However, these impacts would be temporary, and normal park activities should resume after construction.

4.4.6.2 Alternative A

Impacts associated with Alternative A would be the same as those described for Alternative B (Preferred Alternative).

4.4.7 Mitigation

Dust control during construction will reduce impacts to nearby recreation facilities. Access to Little Pine River Park and the Durango East KOA Campground will be signed to direct motorists to the recreation and camping areas.

Delays in access to recreation areas during construction will be minimized by mitigation measures described in Section 4.19, Construction.

The construction of the shared use trail is a beneficial effect that would enhance the recreational opportunities in the project corridor.

4.5 AIR QUALITY

An air quality analysis was prepared for the US 160 project. The analysis was conducted for existing conditions (2001), 2025 No Action Alternative, and the 2025 Preferred Alternatives. Because the corridor is in an attainment area for the NAAQS but ozone has been shown to be increasing, the detailed analysis covers VOCs and NO_x. The two pollutants are typically analyzed as ozone precursors. Because other recent studies have estimated that formaldehyde is increasing in the region, formaldehyde was also analyzed in more detail. The air quality analysis can be found in *Appendix I, Air Quality*. The results of the air quality analysis are shown in Table 4.5.1, Emissions Results.

~~The traffic analysis was conducted using a year 2025 data set. EPA guidance calls for CO "Hot-Spot" analysis to be conducted on any intersection expected to perform at an LOS D or worse. This LOS is not anticipated for any intersections existing or proposed under the action alternatives in this EIS. Additionally,~~ The project is located in an area designated as attainment for CO; therefore, ~~the conformity procedures of 23 CFR 770 do not apply to this project and~~ no "Hot-Spot" modeling was conducted. All of the larger communities in Colorado that have violated the CO standards in the past have come into compliance with the standard, even with much higher levels of daily traffic than that experienced in the project area. The likelihood of any future CO violations in the project area is very small and no hotspot analysis was deemed warranted.

Table 4.5.1
Emissions Results

	Formaldehyde tons/year			VOC tons/year			NO_x tons/year		
	Roadways	Inter-sections	Total	Roadways	Inter-sections	Total	Roadways	Inter-sections	Total
2001 Baseline	0.99	0.02	1.01	71.2	3.5	74.7	278.0	1.2	279.2
2025 No Action	0.84	0.18	1.02	56.4	34.0	90.4	83.6	7.6	91.2
2025 Preferred	0.69	0.01	0.70	45.2	1.6	46.8	89.7	0.4	90.1

4.5.1 No Action Alternative

Under the No Action Alternative, all intersections would maintain current configurations. Continued growth in this area of La Plata County would result in an accompanying increase in traffic volumes and congestion along US 160. ~~, leading to the potential for localized areas of high CO concentrations (hot spots). Although traffic volumes and congestion on US 160 are projected to increase by the year 2025 with or without roadway improvements, motor vehicle emissions would continue to decrease as older vehicles are replaced with newer, less-polluting vehicles. No exceedances of NAAQS would be expected for the No Action Alternative.~~

The increase in traffic volumes and associated VMT leads to decreasing travel speeds and increasing intersection delay in the No Action Alternative. These factors lead to increased formaldehyde and VOC emissions in the No Action Alternative compared to 2001, even though the per-vehicle emissions rates are lower. NO_x emissions are lower in the No Action Alternative because of the larger decline in NO_x emission rates and because the NO_x emission rates are not as sensitive to speed.

4.5.2 Impacts Common to All Action Alternatives

~~Similar to the No Action Alternative, despite increased traffic volumes along US 160, levels of CO and other criteria pollutants would continue to decrease as older vehicles are replaced with newer, less-polluting vehicles.~~ The proposed US 160 road improvements are expected to lead to decreased congestion and decreased idling times. ~~and fewer potential CO hot spots (where CO concentrations are increased). All intersections are expected to operate better than LOS D in 2025. No violations of the CO standard are anticipated.~~Even with the large estimated increase in VMT between 2001 and 2025, the Preferred Alternatives have lower emission than the 2001 baseline and the No Action Alternative for all three pollutants. The Preferred Alternatives represent a 32 percent reduction in formaldehyde emissions, a 37 percent reduction in VOC emissions, and 68 percent reduction in NO_x emissions over 2001 baseline levels. These reductions are due to improvements in vehicle emissions rates from EPA's national control programs, reduction in vehicle idling from the replacement of signalized intersections with interchanges, and for formaldehyde and VOC, improvements in vehicle travel speeds.

The NAAQS for PM_{10} is both an annual standard of 50 $\mu g/m^3$ and a 24-hour standard of 150 $\mu g/m^3$. Increased particulate matter emissions would result from construction activities. However, PM_{10} emissions resulting from construction activities would be temporary and end once construction activities cease. Particulate emissions from construction activities are not expected to violate the annual or 24-hour PM_{10} standard. Particulate matter in the form of re-entrained road dust is likely to increase as VMT increases. Maintenance and management, such as regularly scheduled road sweeping, would assist in reducing levels of re-entrained dust.

During the construction period, local air quality may be affected. Disturbance of soil by earth-moving equipment can result in fugitive dust emissions, and vehicle delays combined with exhaust emissions from construction equipment may cause elevated levels of some pollutants. However, since these emissions would be temporary and intermittent, it is not expected that construction activities would result in any considerable or long-term air quality impacts.

4.5.3 Air Toxics

4.5.3.1 Project Level MSAT Discussion

The analysis of air toxics is an emerging field. The U.S. DOT and EPA are currently working to develop and evaluate the technical tools necessary to perform air toxics analysis, including improvements to emissions models and air quality dispersion models. Limitations with the existing modeling tools preclude performing the same level of analysis that is typically performed for other pollutants, such as carbon monoxide. FHWA's ongoing work in air toxics includes a research program to determine and quantify the contribution of mobile sources to air toxic emissions, the establishment of policies for addressing air toxics in environmental reports, and the assessment of scientific literature on health impacts associated with motor vehicle toxic emissions.

Even though reliable quantitative methods do not exist to accurately estimate the health impacts of MSATs as noted in Chapter 3, Affected Environment, it is possible to ~~qualitatively~~ assess future MSAT emissions under the project alternatives. An analysis of formaldehyde emissions was performed for this project; these trends for the other MSATs and the differences between alternatives are expected to be similar. Therefore, ~~Based on this approach,~~ it is likely that any of the Action Alternatives will result in lower MSAT emissions over the No Action case and that future emissions under ~~both~~ the Action ~~and No Action~~ Alternatives will be lower than present-day emissions.

For each alternative in this EIS, the amount of MSATs emitted would be proportional to the VMT and congestion, assuming that other variables such as fleet mix are the same for each alternative. Because the congestion estimated for the No Action Alternative is higher than for any of the Action Alternatives, increased impacts to regional air quality related to MSATs are not expected from any of the Action Alternatives. In addition, because the estimated VMT and congestion conditions under each of the Action Alternatives are nearly the same, it is expected that there would be no appreciable difference in overall MSAT emissions among the various alternatives. Regardless of the alternatives chosen, emissions will likely be at least 30 percent lower than present levels in the design year. ~~as a result of EPA's national control programs that are projected to reduce MSAT emissions by 67 to 90 percent. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA projected reductions are so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future as well.~~

Because of the specific characteristics of the project under each alternative (i.e., alignment shifts, access roads) there may be localized areas where VMT would increase, and other areas where VMT would decrease. Therefore, it is possible that localized increases and decreases in MSAT emissions may occur. The localized increases in MSAT emissions would likely be most pronounced along realigned roadway sections in Grandview and Gem Village under Alternatives Grandview G Modified and Dry Creek and Gem Village H. In contrast, abandoned highway segments would likely experience localized decreases in MSAT emissions. However, as discussed above, the health effects of ~~magnitude and the duration of~~ these potential increases and decreases ~~are related to health effects and~~ cannot be accurately quantified because research is still being conducted on health effects and modeling techniques. ~~Further, even if these increases~~

~~do occur, they will be substantially reduced in the future due to implementation of EPA's vehicle and fuel regulations.~~

In sum, under all Action Alternatives in the design year, it is expected there would be reduced MSAT emissions in the study area, relative to the No Action Alternatives, due to EPA's MSAT reduction programs and the reduction of congestion. There could be slightly elevated but unquantifiable increases in MSATs to residents and others in a few localized areas where VMT increase, which may be important particularly to any members of sensitive populations. However, there will likely be decreases in MSAT emissions in locations where traffic congestion is reduced. In general, MSAT levels are likely to decrease over time due to nationally mandated cleaner vehicles and fuels.

4.5.3.2 Unavailable Information for Project-Specific MSAT Impact Analysis

The science and modeling of project-specific MSAT impacts has not developed to the point where there is certainty or scientific community acceptance. Accordingly, information on MSAT impacts on any of the alternatives in this EIS is not available, and the means to obtain this information have not been fully developed. When this is the case, 40 CFR 1502.22(b) requires FHWA to address four provisions: 1) A statement that such information is incomplete or unavailable; 2) A statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; 3) A summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and 4) The agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. These provisions are addressed as follows:

1. Project-specific MSAT analysis is an emerging field and the science has not been fully developed and is therefore unavailable. FHWA is aware that MSAT releases to the environment may cause some level of pollution. What is not scientifically definable is an accurate level of human health or environmental impacts that will result from the construction of new transportation facilities or modification of existing facilities. Project-level MSAT risk assessment involves four major steps: emissions modeling, dispersion modeling to estimate ambient concentrations resulting from the estimated emissions, exposure modeling to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is currently encumbered by technical shortcomings that prevent a formal determination of the MSAT impacts of this project. The emissions model (MOBILE6.2) is based on limited data raising concerns over the accuracy of the final estimates. Further, the particulate emissions rates from MOBILE6.2 are not sensitive to vehicle speed, which is an important determinant of emissions rates (this is a shortcoming for diesel particulate matter, but not the remaining priority MSATs) or acceleration. Given uncertainties in the emissions estimation process, subsequent calculated concentrations would be equally uncertain. But beyond this, the available dispersion models have not been successfully validated for estimating ambient concentrations of particulate matter or reactive organic MSATs. Available exposure models are not well designed to simulate roadside environments. Finally, the toxicity value of at least one of the priority MSATs, that of diesel particulate matter, has not been nationally established, which would prevent the determination of health impacts of this pollutant even if the other necessary tools

were available. Thus, current scientific techniques, tools, and data make it impossible to accurately estimate actual human health or environmental impacts from MSATs that would result from a transportation project.

2. Without this project-specific MSATs analysis, it is impossible to quantitatively evaluate the air toxic impacts at the project level. Therefore, this unavailable or incomplete information is very relevant to understanding the "significant adverse impacts on the human environment," since the significance of the likely MSAT levels cannot be assessed.

3. Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with negative health outcomes through epidemiological studies (frequently based on emission levels found in occupational settings) or that animals demonstrate negative health outcomes when exposed to large doses. There have been other studies and papers that suggest MSATs have health impacts. However, noting that unresolved issues still remain, the Health Effects Institute, a non-profit organization jointly funded by EPA and industry, has undertaken a major series of studies to determine whether MSAT hot spots exist and what the health implications are if they do. The final summary of these studies is not expected to be completed for several more years.

   Recent studies have been reported to show that being near to roadways is related to negative health outcomes -- particularly respiratory problems[1]. Yet these studies are often not specific to MSATs. Instead, they have encompassed the full spectrum of both criteria pollutants and other pollutants. Thus, it is impossible to determine whether MSATs are responsible for the health outcomes or the criteria pollutants.

   There is also considerable literature on the uncertainties associated with the emissions modeling process. The most significant of these is an assessment conducted by the National Research Council of the National Academy of Sciences, entitled "Modeling Mobile-Source Emissions" (2000). This review noted numerous problems associated with then-current models, including the predecessor to the current MOBILE 6.2 model. The review found that, "significant resources will be needed to improve mobile source emissions modeling." The improvements cited include model evaluation and validation, and uncertainty analysis to raise confidence in the model's output. Although the release of MOBILE 6.2 represents an improvement over its predecessor, the MSAT emission factors have not been fully validated due to limits on dispersion modeling and monitoring data. The MOBILE 6.2 model is currently being updated and its results will not be evaluated and validated for several years.

4. Even though there is no accepted model or accepted science for determining the impacts of project-specific MSATs, as noted above, EPA predicts that its national control programs will result in meaningful future reductions in MSAT emissions, as measured on both a per vehicle mile and total fleet basis. FHWA believes that these projections are

[1] South Coast Air Quality Management District, Multiple Air Toxic Exposure Study-II (2000); Highway Health Hazards, The Sierra Club (2004) summarizing 24 Studies on the relationship between health and air quality; NEPA's Uncertainty in the Federal Legal Scheme Controlling Air Pollution from Motor Vehicles, Environmental Law Institute, 35 ELR 10273 (2005) with health studies cited therein.

credible, because the control programs are required by statute and regulation. As this project involves new connector roadways and realigned roadway sections, there could be slightly elevated but unquantifiable increases in MSATs to residents and others in a few localized areas where VMT increase, which may be important, particularly to any members of sensitive populations. However, there will likely be decreases in MSAT emissions in locations where existing roadway sections are abandoned. Because MSAT emissions on a per VMT basis are expected to decline due to EPA's control program, and because each of the Action Alternatives would not increase MSATs appreciably relative to the No Action Alternative, FHWA does not believe that there will be significant adverse impacts on the human environment.

4.5.4 Mitigation

Particulate matter or dust emissions will be minimized during construction by implementing techniques to control dust, such as regular watering of construction-disturbed areas. Fugitive dust permits and/or air pollution emission notices for construction activities will be obtained where applicable from CDPHE.

4.6 TRAFFIC NOISE ANALYSIS

The 2025 No Action Alternative, Preferred Alternatives, and other action alternatives were modeled with the validated noise model. Noise abatement strategies are considered when the L(eq) noise levels meet or exceed CDOT's NAC values. The NAC levels are indicated in Table 3.6.1, CDOT Noise Abatement Criteria. The "impact levels" for this study, as stipulated by CDOT, are 66.0 dBA for a NAC B, and 71.0 dBA for a NAC C, and were used as ultimate threshold levels for noise abatement consideration.

Commercial/retail NAC C-type locations were modeled for noise but were not considered for noise abatement since those types of business generally prefer visibility from the highway and normally do not want mitigation, such as noise walls, obstructing the view of the their properties.

Table 4.6.1, Number of Noise Impacts by Alternative, depicts the total number of impacted receptor sites expected under each action alternative. Impacted sites are those with either future noise levels exceeding impact thresholds as described above, or having a noise level increase of at least 10 dBA over existing levels.

Table 4.6.1
Number of Noise Impacts by Alternative

Highway Section/Alternative	No. of Receptor Sites Equal to or Exceeding NAC	No. of Receptor Sites with 10 dBA or More Increase	Total No. of Impacted Receptor Sites
Grandview			
No Action	37	0	37
Alternative G Modified	48	17	52
Alternative F Modified	54	46	82
Florida Mesa and Valley			
No Action	0	0	0
Alternative C	1	0	1
Alternative A	1	0	1

Table 4.6.1
Number of Noise Impacts by Alternative

Highway Section/Alternative	No. of Receptor Sites Equal to or Exceeding NAC	No. of Receptor Sites with 10 dBA or More Increase	Total No. of Impacted Receptor Sites
Dry Creek and Gem Village			
No Action	0	0	0
Alternative H	3	2	4
Alternative C	12	8	13
Bayfield			
No Action	7	0	7
Alternative B	7	0	7
Alternative A	7	0	7

4.6.1 No Action Alternative

Under the No Action Alternative, 44 receptor sites are expected to equal or exceed the NAC threshold, and no sites are expected to have a substantial increase in noise levels.

Preferred Alternative

In the Preferred Alternatives, 59 receptor sites are expected to equal or exceed the NAC threshold, and 19 sites are expected to have a substantial increase in noise levels. Thirteen locations were considered for noise abatement.

Other Action Alternatives

For the other action alternatives, 74 receptor sites are expected to equal or exceed the NAC threshold, and 54 sites are expected to have a substantial increase in noise levels. Twenty-four locations were considered for noise abatement.

4.6.2 Mitigation

Methods to mitigate noise from construction will be considered, where practical, during the construction phase of the project. Examples of possible mitigation measures include ensuring that contractors use properly maintained vehicles with respect to mufflers, and limiting work to daytime hours.

In general, the majority of the corridor is rural, with isolated homes on large acreage lots set far from the road. Nearly all homes access US 160 with a driveway that must be maintained. For noise mitigation to be effective, a cost-effective continuous wall will have to be built. This often cannot be accomplished due to wall openings required for driveways and the great distances between the homes.

Those receptor sites that met the approach NAC, or are expected to experience a substantial increase, are listed in Table 4.6.2, Receiver Locations Analyzed for Noise Mitigation by Alternative. Figures showing the locations of these receptors can be found in Appendix B, Traffic Noise Analysis.

Table 4.6.2
Receiver Locations Analyzed for Noise Mitigation by Alternative

Receiver Number	Receptor Site Represented	Existing	2025 Action	Approach or Exceed NAC Limits?	10 dBA Increase Over Existing
Grandview section Alternative G Modified (Preferred Alternative)					
29	3 mobile homes	56.3	66.5	Yes	Yes
29A	3 mobile homes	60.9	71.6	Yes	Yes
30	2 mobile homes	56.8	66.9	Yes	Yes
34	2 mobile homes	57.6	67.9	Yes	Yes
38	1 house	57.1	66.4	Yes	No
43	1 house	58.4	68.1	Yes	No
52	1 house	58.3	67.0	Yes	No
67	1 house	60.5	67.2	Yes	No
72	3 mobile homes	57.7	66.9	Yes	No
121	1 business	52.4	62.4	No	Yes
122	1 house	51.3	61.5	No	Yes
323	4 mobile homes	59.1	66.5	Yes	No
84	1 house	58.9	66.1	Yes	No
85	2 houses	60.8	68.5	Yes	No
87	1 house	59.7	67.2	Yes	No
88	2 houses	60.4	67.9	Yes	No
92	1 house	62.0	69.6	Yes	No
95	8 mobile homes	60.7	69.3	Yes	No
96	4 mobile homes, 1 house	59.3	67.8	Yes	No
102	2 houses	63.0	68.0	Yes	No
103	1 church, 1 mobile home	57.6	67.7	Yes	Yes
106	2 mobile homes	56.7	66.6	Yes	No
107b	1 mobile home	57.4	67.9	Yes	Yes
112	1 house	45.0	59.2	No	Yes
114	1 house	45.1	64.0	No	Yes
Grandview Section Alternative F Modified					
25	5 mobile homes	50.7	62.3	No	Yes
29	3 mobile homes	56.3	67.5	Yes	Yes
29A	3 mobile homes	60.9	72.3	Yes	Yes
30	2 mobile homes	56.8	67.9	Yes	Yes
34	2 mobile homes	57.6	69.1	Yes	Yes
37	1 house	56.7	67.2	Yes	Yes
38	1 house	57.1	67.6	Yes	Yes
39	1 business	60.7	71.0	Yes	Yes
40	1 business	57.9	68.0	No	Yes
41	1 house	55.9	66.0	Yes	Yes

Table 4.6.2
Receiver Locations Analyzed for Noise Mitigation by Alternative

Receiver Number	Receptor Site Represented	Existing	2025 Action	Approach or Exceed NAC Limits?	10 dBA Increase Over Existing
42	2 houses	55.4	65.8	No	Yes
43	1 house	58.4	69.3	Yes	Yes
44	1 business	64.9	71.1	Yes	No
52	1 house	58.3	68.1	Yes	No
55	1 house	54.7	64.7	No	Yes
63	1 house	54.0	64.1	No	Yes
65	1 house	53.3	65.6	No	Yes
67	1 house	60.5	68.5	Yes	No
72	3 mobile homes	57.7	67.0	Yes	No
119	2 mobile homes	56.6	66.4	Yes	No
121	1 business	52.4	63.2	No	Yes
122	1 house	51.3	62.7	No	Yes
300	1 house	37.7	61.9	No	Yes
301	1 house	37.8	60.7	No	Yes
302	1 house	37.3	57.6	No	Yes
304	1 house	45.2	61.4	No	Yes
305	1 house	44.8	60.2	No	Yes
306	1 house	46.1	62.9	No	Yes
307	1 house	45.5	62.1	No	Yes
309	1 house	48.5	61.5	No	Yes
310	1 mobile home	49.5	60.8	No	Yes
312	1 house	50.4	64.0	No	Yes
315	1 house	51.0	61.6	No	Yes
323	4 mobile homes	59.1	67.7	Yes	No
326	1 business	50.0	61.0	No	Yes
84	1 house	58.9	66.1	Yes	No
85	2 houses	60.8	68.5	Yes	No
87	1 house	59.7	67.2	Yes	No
88	2 houses	60.4	67.9	Yes	No
91	1 business	55.3	65.8	No	Yes
92	1 house	62.0	69.6	Yes	No
95	8 mobile homes	60.7	69.3	Yes	No
96	4 mobile homes, 1 house	59.3	67.8	Yes	No
102	2 houses	63.0	68.0	Yes	No
103	1 church, 1 mobile home	57.6	67.7	Yes	Yes
106	2 mobile homes	56.7	66.6	Yes	No
107b	1 mobile home	57.4	67.9	Yes	Yes

Table 4.6.2
Receiver Locations Analyzed for Noise Mitigation by Alternative

Receiver Number	Receptor Site Represented	Existing	2025 Action	Approach or Exceed NAC Limits?	10 dBA Increase Over Existing
112	1 house	45.0	59.2	No	Yes
114	1 house	45.1	64.0	No	Yes
Florida Mesa and Valley Section Alternative C					
417	1 mobile home	57.8	66.2	Yes	No
Florida Mesa and Valley Section Alternative A					
417	1 mobile home	57.8	66.2	Yes	No
Dry Creek and Gem Village Section Alternative H					
536	1 house	59.5	70.6	Yes	Yes
608	1 house	53.4	64.7	No	Yes
611	2 houses	62.6	68.1	Yes	No
Dry Creek and Gem Village Section Alternative C					
536	1 house	59.5	70.6	Yes	Yes
565	1 house	51.2	61.9	No	Yes
567	1 house	45.6	66.0	Yes	Yes
570	1 house	62.1	66.8	Yes	No
571	1 house	48.1	61.0	No	Yes
582	2 houses	64.4	66.5	Yes	No
594	1 house	63.5	66.0	Yes	No
610	1 house	60.8	69.6	Yes	No
611	2 houses	62.6	74.1	Yes	Yes
617	1 house	60.2	68.8	Yes	No
618	1 house	58.1	75.7	Yes	Yes
619	1 house	56.2	71.9	Yes	Yes
Bayfield Section Alternative A					
735	4 houses	58.8	67.4	Yes	No
737	3 houses	58.6	66.5	Yes	No
Bayfield Section Alternative B					
735	4 houses	58.8	67.4	Yes	No
737	3 houses	58.6	66.5	Yes	No

Commercial receptors were modeled for noise levels and for noise mitigation walls. Commercial sites typically desire highly visible locations and require direct access to the main roadway. The majority of the commercial sites modeled along the corridor for this study either have direct access or have an L(eq) reading that was under the NAC approach threshold of 71 dBA; therefore, they do not qualify for noise mitigation.

Noise walls for the Preferred Alternatives and other action alternatives were analyzed at residential locations to determine the physical feasibility and the economical reasonableness of

the walls. Many of the walls were required for both the Preferred Alternatives and other action alternatives, and were analyzed in both alternative models. The number of walls analyzed by action alternative is depicted in Table 4.6.3, Number of Wall Locations Considered for Mitigation.

Table 4.6.3
Number of Wall Locations Considered for Mitigation

	Alternative							
	Grandview Section		Florida Mesa and Valley Section		Dry Creek and Gem Village Section		Bayfield Section	
	G Modified (Preferred Alternative)	F Modified	C (Preferred Alternative)	A	H (Preferred Alternative)	C	B (Preferred Alternative)	A
Number of Walls	13	24	1	1	3	8	1	1

For the wall locations identified (see Table 4.6.4, Potential Noise Wall Locations Analyzed by Alternative), mitigation considered feasible and reasonable will be incorporated into the project. The noise analysis and abatement guideline worksheets (CDOT Form 1209) were used to investigate the feasibility and reasonableness for each impacted location. To be considered feasible, mitigation measures must achieve a 5 dBA or greater noise reduction for each of the front-row receptors, without engineering difficulties, such as breaks or gaps in the barrier.

The reasonability/cost-effectiveness criteria are specifically defined as a cost per total decibel of noise reduction (<$3,000 – Extremely Reasonable; $3,000-$3,750 – Reasonable; $3,750-$4,000 – Marginally Reasonable; and >$4,000 – Unreasonable). For purposes of calculating cost effectiveness, the analysis assumed a wall cost of $30.00 per square foot.

Using CDOT guidelines, a number of wall heights were modeled to determine the minimum height to reduce noise levels to the NAC level and achieve an average 5 dBA decrease for the receptors to evaluate the cost/benefit (reasonability/cost-effectiveness) of building a wall. The resulting noise levels after modeling the wall are summarized in Table 4.6.4, Potential Noise Wall Locations Analyzed by Alternative.

Noise abatement walls were considered feasible and reasonable and are recommended for the following two locations noted below. The final height and location of the noise walls will be determined during final design. A complete copy of the noise analysis is attached in Appendix B, Traffic Noise Analysis.

Table 4.6.4
Potential Noise Wall Locations Analyzed by Alternative

Receivers Represented by Barrier Location	Barrier No.	No. of Benefited Receptor Sites	Average L(eq) Reduction (dBA)	Total L(eq) Reduction (dBA)	Barrier Height	Barrier Length	Barrier Area (ft^2)	Barrier Cost	Average Cost per Decibel of Reduction	Recommend Wall?	Notes
Grandview Section Alternative G Modified (Preferred Alternative)											
R29, R29A, R30, R34, R37, R38, R42, R43	2/5W1	15	3.3	48.8	12	2785	33,420	$1,002,600	$20,545.08	no	
R119, R56, R57, R118, R58, R322, R323, R320, R67, R66, R318	3/6W1	22	0.7	15	12	935	11,220	$336,600	$22,440.00	no	
R70, R72	3/6W2	9	3	26.7	12	715	8,580	$257,400	$9,640.45	no	
R85, R87, R88, R92	4/7W1	6	3.9	23.2	12	1025	12,300	$369,000	$15,905.17	no	
R94, R95, R96, R97	4/7W2	19	6.6	124.5	8	870	6,960	$208,800	$1,677.11	yes	
R102, R103	4/7W3	4	6.4	25.6	12	650	7,800	$234,000	$9,140.63	no	
R106, R107, R107B	4/7W4	6	2.1	12.5	12	1025	12,300	$369,000	$29,520.00	no	
R52	GG1	1	10	10	10	700	7,000	$210,000	$21,000.00	no	
R83, R84, R86	GG2	3	10	30	10	800	8,000	$240,000	$8,000.00	no	
R112	GG3	1	10	10	10	400	4,000	$120,000	$12,000.00	no	
R114	GG4	1	10	10	10	400	4,000	$120,000	$12,000.00	no	
R122	GG5	1	10	10	10	400	4,000	$120,000	$12,000.00	no	
R121										no	Mitigation not considered for businesses
Grandview Alternative F Modified											
R29, R29A, R30, R34, R37, R38, R42, R43	2/5W1	15	4.3	64.4	12	2785	33,420	$1,002,600	$15,568.32	no	
R119, R56, R57, R118, R58, R322, R323, R320, R67, R66, R318	3/6W1	22	0.6	14	12	935	11,220	$336,600	$24,042.86	no	
R70, R72	3/6W2	9	2.8	25.2	12	715	8,580	$257,400	$10,214.29	no	
R85, R87, R88, R92	4/7W1	6	4.2	25.1	12	1025	12,300	$369,000	$14,701.20	no	
R94, R95, R96, R97	4/7W2	19	8.8	167.9	8	870	6,960	$208,800	$1,243.60	yes	
R102, R103	4/7W3	4	7.5	29.8	12	650	7,800	$234,000	$7,852.35	no	
R106, R107, R107B	4/7W4	6	3	17.7	12	1025	12,300	$369,000	$20,847.46	no	
R25	GF1	5	10	50	10	1000	10,000	$300,000	$6,000.00	no	
R41	GF2	1	10	10	10	400	4,000	$120,000	$12,000.00	no	
R52, R 55	GF3	1	10	10	10	700	7,000	$210,000	$21,000.00	no	

Table 4.6.4
Potential Noise Wall Locations Analyzed by Alternative

Receivers Represented by Barrier Location	Barrier No.	No. of Benefited Receptor Sites	Average L(eq) Reduction (dBA)	Total L(eq) Reduction (dBA)	Barrier Height	Barrier Length	Barrier Area (ft^2)	Barrier Cost	Average Cost per Decibel of Reduction	Recommend Wall?	Notes
R63, R65	GF4	1	10	20	10	600	6,000	$180,000	$9,000.00	no	
R304, R305, R306. R307	GF5	4	10	40	10	800	8,000	$240,000	$6,000.00	no	
R300, R301, R302	GF6	3	10	30	10	800	8,000	$240,000	$8,000.00	no	
R309, R310, R312, R315	GF7	4	10	40	10	800	8,000	$240,000	$6,000.00	no	
R83, R84, R86	GF8	3	10	30	10	800	8,000	$240,000	$8,000.00	no	
R112	GF9	1	10	10	10	400	4,000	$120,000	$12,000.00	no	
R114	GF10	1	10	10	10	400	4,000	$120,000	$12,000.00	no	
R122	GF11	1	10	10	10	400	4,000	$120,000	$12,000.00	no	
R39										no	Mitigation not considered for businesses
R40										no	Mitigation not considered for businesses
R44										no	Mitigation not considered for businesses
R121										no	Mitigation not considered for businesses
R91										no	Mitigation not considered for businesses
R326										no	Mitigation not considered for businesses
Florida Mesa and Valley Alternative C (Preferred Alternative)											
R417	FC1	1	10	10	10	400	4,000	$120,000	$12,000.00	no	
Florida Mesa and Valley Alternative A											
R417	FA1	1	10	10	10	400	4,000	$120,000	$12,000.00	no	
Dry Creek and Gem Village Alternative H (Preferred Alternative)											
R536	DH1	1	10	10	10	400	4,000	$120,000	$12,000.00	no	
R608	DH2	1	10	10	10	400	4,000	$120,000	$12,000.00	no	
R611	DH3	1	10	10	10	600	6,000	$180,000	$18,000.00	no	
Dry Creek and Gem Village Alternative C											
R565, R567, R568, R570, R571	5W1	5	3.9	19.6	10	450	4,500	$135,000	$6,887.76	no	
R536	DC1	1	10	10	10	400	4,000	$120,000	$12,000.00	no	
R610	DC2	1	10	10	10	400	4,000	$120,000	$12,000.00	no	
R611	DC3	1	10	10	10	600	6,000	$180,000	$18,000.00	no	
R617	DC4	1	10	10	10	500	5,000	$150,000	$15,000.00	no	

Table 4.6.4
Potential Noise Wall Locations Analyzed by Alternative

Receivers Represented by Barrier Location	Barrier No.	No. of Benefited Receptor Sites	Average L(eq) Reduction (dBA)	Total L(eq) Reduction (dBA)	Barrier Height	Barrier Length	Barrier Area (ft^2)	Barrier Cost	Average Cost per Decibel of Reduction	Recommend Wall?	Notes
R618, R619	DC5	2	10	20	10	600	6,000	$180,000	$9,000.00	no	
R582										no	Direct access to highway; wall not feasible
R594										no	Direct access to highway; wall not feasible
Bayfield Alternative B (Preferred Alternative)											
R732, R733, R735, R737, R738, R739, R740	1/2W1	16	4.1	65.9	8	805	6,440	$193,200	$2,931.71	yes	
Bayfield Alternative A											
R732, R733, R735, R737, R738, R739, R740	1/2W1	16	4.1	65.9	8	805	6,440	$193,200	$2,931.71	yes	

Mountain Vista Mobile Home Park (Receptors R95 and R96) (Barrier Number 4/7W2)
Grandview Section, Alternative G Modified (Preferred Alternative) and Alternative F Modified

An 8-foot high by 870-foot long noise wall was modeled, without driveway openings, to determine if a 5 dBA reduction in noise could be achieved. The results showed a continuous noise wall will reduce future noise levels by an average 6.6 dBA per benefited site. The average cost ~~total/~~dBA reduction will be $1,677, which falls into the "extremely reasonable" range.

Bayfield (Receptors R735, R737, R740, and R738) (Barrier Number 1/2W1)
Bayfield Section, Alternative B (Preferred Alternative) and Alternative A

This location represents six (first row) homes, and four (second row) homes, for a total of 10 homes. An auto parts store lies between the homes, with four homes to the west and two to the east. A wall measuring 8 feet high by 805 feet long (with no breaks for driveways) was modeled. Using an average 4.1 dBA reduction per benefited site, the resulting average cost ~~total/~~dBA reduction for the 16 homes will be $2,932. This falls into the "extremely reasonable" range.

4.7 WETLANDS

4.7.1 No Action Alternative

Under the No Action Alternative, minor and mostly temporary impacts to wetlands would occur from routine maintenance activities, including winter sanding and maintenance of culverts and roadside ditches. The No Action Alternative would also have minor effects on wetlands due to erosion from unstable highway slopes in some areas. There would be no permanent wetland impacts resulting from the No Action Alternative.

4.7.2 Impacts Common to All Action Alternatives

4.7.2.1 Direct Impacts

Permanent impacts to wetlands were assessed by overlaying the highway construction footprint and the mapped wetland areas. The footprint is based on conceptual design, and there could be some changes with final design to avoid, minimize, and reduce impacts through design options. Most wetlands within the construction footprint of the highway and the berm would be filled and permanently lost. Impacts would occur at bridges from shading. The total area of wetland loss resulting from the Preferred Alternatives (including jurisdictional/non-jurisdictional) would be 20.96 acres. Impacts were analyzed in the following sections for each action alternative and highway section, and are summarized in Table 4.7.1, Summary of Permanent Wetland Impacts by Highway Section. Table C-1, Wetland Impacts for US 160 Project Corridor in Appendix C, Wetlands Analysis, provides the area of impact of the project to each wetland by alternative.

Table 4.7.1
Summary of Permanent Wetland Impacts by Highway Section

Section and Alternative	Jurisdictional Wetlands (Acres)	Non-Jurisdictional Wetlands (Acres)	Total Wetlands (Acres)
Grandview			
Alternative G Modified (Preferred Alternative)	5.58	1.74	7.32
Alternative F Modified	5.52	3.35	8.87
Florida Mesa and Valley			
Alternative C (Preferred Alternative)	0.43	0.84	1.27
Alternative A	0.68	0.84	1.52
Dry Creek and Gem Village			
Alternative H (Preferred Alternative)	7.41	0.76	8.17
Alternative C	6.69	0.62	7.31
Bayfield			
Alternative B (Preferred Alternative)	2.78	1.42	4.20
Alternative A	3.58	1.42	5.00

Appendix C, Wetlands Analysis, Table C-3, Wetland Impacts for US 160 Project Corridor, provides the current wetland functions associated with each affected wetland. Acres of wetlands having moderate or high functions were tallied to provide summaries of affected areas of moderate and high value for each alternative. This summary of impacts by wetland functions is shown in Table 4.7.2, Summary of Impacts to Wetlands with High and Moderate Functions. The acreage for each function is tallied separately, since individual wetlands serve multiple overlapping functions.

Impacts to wetlands were considered during development of the alternatives. Avoidance and minimization of impacts is described below for individual wetlands or groups of wetlands. Wetlands have been avoided and impacts have been minimized in a number of areas. However, many of the impacts would be unavoidable because of design constraints or requirements to minimize impacts to competing resources. Engineering designs will avoid and minimize impacts to wetlands and will be coordinated with USACE and EPA as part of the Section 404 permitting process.

Temporary impacts would occur from short-term activities or minor activities that cause a temporary modification of functions, where the wetlands would be returned to their pre-construction (or better) condition after construction. Temporary impacts may occur as a result of both direct and indirect impacts of the project. Temporary impacts during construction may result from operation of construction equipment within wetlands, from reconstruction and extension of existing culverts, and from installation of silt fencing adjacent to the ROW.

Table 4.7.2
Summary of Impacts to Wetlands with High and Moderate Functions

Alternative	Total Area (acres) Affected	Acres of Impact by Function																			
		Threatened and Endangered Species Habitat		General Wildlife Habitat		General Fish Habitat		Flood Attenuation and Storage		Sediment and Nutrient Retention		Production Export/Food Chain Support		Groundwater Discharge/ Recharge		Uniqueness		Recreation/ Education Potential		Dynamic Water Storage	
		High	Mod + High	High	Mod + High	High	Mod + High	High	Mod + High	High	Mod + High	High	Mod + High	High	Mod + High	High	Mod + High	High	Mod + High	High	Mod + High
Grandview section																					
Alternative G Modified (Preferred Alternative)	7.32	**0**	3.18	**3.10**	4.98	**0**	3.50	**0**	0	**0.06**	6.81	**2.56**	6.19	**4.14**	6.19	**0**	3.63	**0**	0.0	**0**	0.74
Alternative F Modified	8.87	**0**	3.10	**3.05**	6.80	**0**	3.42	**0**	0	**0.01**	6.66	**2.61**	6.14	**4.10**	6.15	**0**	3.58	**0**	0.0	**0**	0.74
Florida Mesa and Valley section																					
Alternative C (Preferred Alternative)	1.27	**0.10**	0.36	**0.10**	0.60	**0.01**	0.05	**0**	0.07	**0**	0.77	**0.02**	0.40	**0.18**	0.44	**0**	0.09	**0.01**	0.09	**0**	0.07
Alternative A	1.52	**0.09**	0.60	**0.32**	0.89	**0.01**	0.05	**0**	0.07	**0**	0.74	**0.01**	0.59	**0.44**	0.68	**0.23**	0.32	**0.01**	0.32	**0**	0.07
Dry Creek and Gem Village section																					
Alternative H (Preferred Alternative)	8.17	**0**	1.06	**0.69**	6.91	**0**	1.62	**0**	0	**0.01**	6.68	**0.59**	5.99	**7.15**	7.34	**0**	5.84	**0**	0.0	**0**	4.37
Alternative C	7.31	**0**	0.69	**0.69**	6.15	**0**	1.34	**0**	0	**0.01**	5.96	**0.59**	5.29	**6.55**	6.55	**0**	5.25	**0**	0.0	**0**	3.95
Bayfield section																					
Alternative B (Preferred Alternative)	4.20	**0.43**	2.36	**0.57**	3.13	**0.15**	0.57	**0**	0	**0**	2.09	**0.2**	2.19	**2.65**	2.93	**0.28**	2.42	**0.15**	0.43	**0**	1.33
Alternative A	5.00	**0.65**	2.42	**0.78**	3.20	**0.15**	0.81	**0**	0	**0**	2.90	**0.2**	3.16	**3.34**	3.94	**0.50**	3.39	**0.15**	0.65	**0**	1.31

Disturbance would be minimized, and temporarily disturbed areas would be restored to their original contours, and no permanent long-term impacts to wetland size or functions are expected in these areas. The areas of temporary disturbance have not been quantified since the exact extent of construction access, erosion control, and other temporary construction features or activities are not known. These constraints will be identified during final design.

Minor and mostly temporary impacts would occur following construction of the highway from routine maintenance activities, including winter sanding and maintenance of culverts and roadside ditches.

4.7.2.2 Indirect Impacts

Indirect permanent impacts to wetlands may include sedimentation, erosion, unplanned hydrologic modifications, noxious weed invasions, and degradation of wildlife habitat quality from decreased diversity, noise, and litter. These impacts are not quantifiable and are briefly discussed below.

Sedimentation and erosion could occur from sanding operations and erosion of the road shoulders and embankments. Sediment from these non-point sources can accumulate in areas adjacent to the roadway, covering the existing vegetation. Long-term impacts from erosion would typically be most pronounced along the roadway edge where there is increased flow frequency, volume, and velocity due to the increase in impermeable surface in the immediate area.

Hydrologic modifications may occur from excavation or placement of fill within a floodplain, or from compaction of soils. Surface and subsurface flows may be modified by the earthwork and result in a new water regime. Depending on the specific site conditions, the new water regime may be detrimental or beneficial to adjacent and downstream wetlands and other water features.

Noxious weeds could degrade the habitat in and adjacent to wetlands. There are few noxious weeds that regularly occur within wetlands in Colorado, but Canada thistle is commonly found along the perimeter of wetlands and can invade well-vegetated areas. Competition of native vegetation with weeds, while unlikely to displace hydrophytic vegetation, can result in decreased diversity of upland species thus reducing habitat value for wildlife. More information about noxious weed impacts is provided in Section 4.10, Noxious Weeds.

Increased proximity of the roadway to wetlands such as 2-1 and 2-2 could result in increased noise, disturbance, and deposition of trash and litter. These effects may reduce wildlife use of these wetlands and adjoining areas, decreasing this wetland function. More information about impacts to wildlife is provided in Section 4.11, Wildlife and Fisheries.

4.7.3 Grandview Section

This section includes the portions of US 550 on Farmington Hill and US 160 in the Wilson Gulch Valley and the western portion of Florida Mesa to the SH 172/CR 234 intersection (Figures 3.7.1 through 3.7.5).

4.7.3.1 Alternative G Modified (Preferred Alternative)

Alternative G Modified (Preferred Alternative) would impact 5.58 acres of jurisdictional wetlands and 7.32 acres of total wetlands. Jurisdictional wetlands with the largest amount of impacts include the following, listed from west to east:

- Wetlands 1-8 (0.62 acre of impact), 1b-2 (0.82 acre of impact), and 1b-1 (0.12 acre of impact) are located along Wilson Gulch at the US 160/US 550 (south) intersection. These wetlands would be affected by widening of the road, replacement of the existing box culvert with a bridge, and construction of check dams on Wilson Gulch above and below the bridge. Four check dams would be installed within wetlands 1b-2 and 1b-1 above the bridge to lower the stream about 30 feet to allow a level crossing under the US 160 bridge. The existing wetlands would be replaced at the same location after construction, and a wall would be constructed along the downslope side of US 160 so highway widening would not require construction within the wetlands and Wilson Gulch. One check dam would be constructed about 150 to 200 feet downstream of the bridge to prevent headcutting, and the existing wetlands in 1b-8 would be replaced after construction of the check dam. The highway would be widened on the north side, and the existing wall between US 160 and wetland 1b-8 would be maintained to minimize impacts to wetlands.
- A total of 0.38 acre of wetlands 2-1, 2-2, 1a-1, and 1b-1 would be affected along about 1,750 feet of Wilson Gulch. This section of Wilson Gulch would be relocated up to 100 feet farther north/northwest to accommodate highway widening. Bridges would cross Wilson Gulch at US 550 and ramps A and E. Greater impacts to wetlands 1a-1 and 1b-1 would be avoided by use of a retaining wall on the downslope side of US 160 below that stream section that would be moved. The relocated stream would be designed to have the same gradient and sinuosity as the existing stream, and the area of wetlands would be replaced or increased. Three bridges (one located at US 550 and two located at on/off ramps) would cross the relocated stream and would have permanent effects from shading under the bridges.
- Wetland 3-1a would be bridged by two on/off ramps associated with the US 160/US 550 (south) interchange and would cause 0.04 acre of impact. Although there would be little or no direct impacts to this wetland from construction, the bridges would affect the existing wetlands by shading. Larger impacts were avoided by use of bridges.
- Wetlands 3-4 (0.42 acre of impact) and G-3 (about 0.32 acre of impact) would be crossed by a new access road to the north of US 160. Wetland G-3 is located along Wilson Gulch and would need to be crossed by a bridge or box culvert, and wetland 3-4 is a large valley wetland that would be filled. The location of this access road is conceptual and based on proposed city of Durango streets, and has not been evaluated for minimization of wetland impacts.
- Wetland 4-5 (0.12 acre of impact) ~~and G-3 (about 0.12 acre of impact)~~ would be crossed by CR 233. This wetland is along tributaries of Wilson Gulch.
- Wetlands 4-3 and 4-4 (total of 1.13 acres of impact) would be filled to accommodate widening of US 160, construction of culverts, and possibly by a water quality detention pond. Most of the impacts would occur from widening the highway to the north. Stream and seepage flows would be piped under the interchange.

- Wetland 5-5 (0.13 acre of impact) is along a tributary of Wilson Gulch that would be eliminated by widening of the highway to the north. Flows from the upstream portions of the tributary would be piped under the highway and interchange.
- Wetlands 7-3 (0.16 acre), 7-8 (0.18 acre), and 7-17 (0.17 acre) are wet floodplain wetlands along West Fork of Cottonwood Creek that would be filled during highway widening, construction of CR 233 on the north side of US 160, and construction of an access road on the south side of US 160.
- Wetlands 8-9 (0.37 acre) and 8-15 (0.24 acre) are associated with the East Fork of Cottonwood Creek and are wide wet floodplain and wet valley wetlands on the north side of US 160. They would be filled by highway widening (wetland 8-9) and by construction of an access road.

Most of the impacts to non-jurisdictional wetlands would occur at wetland 8-8 (1.16 acres of impact). This is a wet valley resulting from discharge of irrigation ditches. A large number of other non-jurisdictional wetlands would also be affected; most of these are irrigation ditches and the combined area of impact would be 0.58 acre.

Alternative G Modified (Preferred Alternative) would affect 4.46 acres of wetlands with one or more high-rated functions. High-rated functions include 3.10 acres of wildlife habitat (wetlands along Wilson Gulch), 0.06 acre of nutrient retention (wetlands 3-1a and 8-11), 2.56 acres of production export (wetland 1b-2, 1b-8, 4-4, and 4-5), and 4.14 acres of groundwater discharge (16 wetlands).

Seven affected wetlands have two or more high-rated functions, including wetlands 1a-1, 1b-2, 1b-8, 3-1a, 4, 4-4, 4-5, and 5-5. Under Alternative G Modified, 2.82 acres of wetlands with two or more high-rated functions would be impacted.

4.7.3.2 Alternative F Modified

Under Alternative F Modified, 5.52 acres of jurisdictional wetlands and 8.87 acres of total wetlands would be impacted. Impacts to jurisdictional wetlands would be very similar to Alternative G Modified (Preferred Alternatives), but Alternative F Modified would affect about 1.6 acres more non-jurisdictional wetlands.

Impacts would be the same for all of the wetlands described above for Alternative G Modified (Preferred Alternatives), except impacts would be reduced by 0.06 acre at wetland 1a-1. In addition, Alternative F Modified would affect two wetlands associated with irrigation ditches on Farmington Hill, G1 and G-2. The presence and size of these wetlands were estimated from aerial photography, and neither wetland has been delineated. The estimated impacts are 1.37 acres at G-1 and 0.39 acre at G-2.

The acres of impacts to wetlands with high- and moderate-rated functions would be similar to the Preferred Alternative. Alternative F Modified would affect 4.39 acres of wetlands with one or more high-rated functions. High-rated functions include 3.05 acres of wildlife habitat (wetlands along Wilson Gulch), 0.01 acre of nutrient retention (wetland 8-11), 2.61 acres of production export (wetland 1b-2, 1b-8, 2-3, 4-4, and 4-5), and 4.10 acres of groundwater discharge (16 wetlands).

Seven affected wetlands have two or more high-rated functions, including wetlands 1a-1, 1b-2, 1b-8, 2-3, 4-4, 4-5, and 5-5. There would be 2.77 acres of impact to wetlands with two or more high-rated functions.

4.7.4 Florida Mesa and Valley Section

This section includes US 160 and various intersections on Florida Mesa and the Florida River Valley (Figures 3.7.5 and 3.7.6).

4.7.4.1 Alternative C (Preferred Alternative)

Alternative C (Preferred Alternative) would affect 0.43 acre of jurisdictional wetlands and 1.28 acres of total wetlands. The largest impacts to jurisdictional wetlands would occur to wetland 10-7 (0.14 acre of impact). This wetland is part of Pine Gulch, and would be affected by widening of US 160 and construction of access roads. Preliminary design calls for placement of Pine Gulch in a box culvert that is also designed for wildlife crossing and pedestrian use. Construction at the Florida River would affect 0.2 acre of wetlands (wetlands 13-1 and 13-2) along the edges of the Florida River, and 183 feet of river channel.

The largest impacts to non-jurisdictional wetlands would be at wetland 9-6 (0.10 acre of impact), 12-2 (0.14 acre of impact) and 12-6 (0.09 acre of impact). There would be small impacts at numerous irrigation ditches.

This alternative would affect 0.27 acre of wetlands with a high rating for wetland functions, including 0.10 acre of threatened or endangered species habitat and wildlife habitat (wetlands 13-1, 13-2, and 13-4), 0.01 acre of fish habitat (wetland 13-1, Florida River), 0.02 acre of production export (wetlands 13-1 and 13-12, Florida River and Long Hollow), 0.18 acre of groundwater discharge (nine wetlands), and 0.01 acre of recreation/educational potential (wetland 13-1, Florida River).

Four affected wetlands have two or more high-rated functions, including wetlands 13-1, 13-2, 13-4, and 13-12. The area of impact to wetlands with two or more high-rated functions would be 0.1 acre.

4.7.4.2 Alternative A

Alternative A would permanently affect 0.68 acre of jurisdictional wetlands and 1.52 acres of total wetlands. Impacts would be about 0.25 acre greater than Alternative C (Preferred Alternative) because construction of an access road would affect 0.25 acre of wetland 12-4, a large hillside seep on the west side of the Florida River Valley. Other impacts would be the same or similar to the Preferred Alternative.

This alternative would have a greater impact to wetlands with high-rated functions (0.52 acre). Impacts to high-rated functions include 0.09 acre of threatened or endangered species habitat (wetlands 13-1, 13-2, and 12-4), 0.32 acre of wildlife habitat (wetlands 12-4, 13-1, 13-2, and 13-4), 0.01 acre of fish habitat (wetland 13-1, Florida River), 0.01 acre of production export (wetland 13-1), 0.44 acre of groundwater discharge (11 wetlands), 0.23 acre of uniqueness (wetland 12-4), and 0.01 acre of recreation/educational potential (wetland 13-1).

Four affected wetlands have two or more high-rated functions, including 12-4, 13-1, 13-2, and 13-4. The area of impact to wetlands with two or more high-rated functions would be 0.32 acre.

4.7.5 Dry Creek and Gem Village Section

The western half of this section (Figures 3.7.6 through 3.7.8) includes Long Hollow and intermittent drainages that are tributary to the Florida River, and the eastern half includes Dry Creek and its tributaries (Figures 3.7.8 through 3.7.11). The principal wetlands are in Upper Dry Creek Valley, where large wetlands occur along the existing highway for approximately 1.5 miles.

4.7.5.1 Alternative H (Preferred Alternative)

Alternative H (Preferred Alternative) would impact 7.41 acres of jurisdictional wetlands and 8.17 acres of total wetlands. The largest affected jurisdictional wetlands (listed west to east) are:

- Wetland 14-2 (0.59 acre, Long Hollow) – Highway widening and construction of access roads would remove marsh and wet meadow wetlands, as well as high-value mixed riparian woodland and shrub along Long Hollow, an active stream.
- Wetlands 14-1 (0.29 acre of impact) and 15-2 (0.10 acre of impact) – These wet floodplain tributaries of Long Hollow would be filled for construction of new access roads.
- Wetland 22-2a (0.17 acre of impact) – Highway widening would encroach on this wetland in Upper Dry Creek Valley. Impacts would be minimized by rerouting the east end of CR 223 to avoid this wetland and other nearby wetlands, and by narrowing the US 160 median.
- Wetland 22-5 (0.24 acre of impact, Dry Creek) – This is a section of Dry Creek with fringing wetlands and seeps on a narrow floodplain in an incised channel. Impacts would occur from widening of US 160 and from realignment of CR 223. The creek crosses the highway diagonally, and approximately 1,200 feet of Dry Creek would need to be relocated out of the ROW. The creek would cross under the highway in a box culvert that may also be used for wildlife, stock, and pedestrian passage.
- Wetlands 22-4 (1.75 acres of impact) and 23-5 (0.51 acre) – Wetland 22-4 is part of the same wetland as wetland 22-2a, which has been bisected by the original highway alignment, and both wetlands 22-4 and 23-5 are valley wetlands in the Upper Dry Creek drainage. Widening of US 160 would affect these wetlands, an impact that appears to be unavoidable. The road alignment is constrained by a steep slope and an irrigation ditch on the north side. The center of the valley has fewer wetlands but has a stream. Although not delineated, the south side of the valley appears similar, with wetlands on the valley floor and an irrigation ditch at the base of the slope. Impacts would be minimized by narrowing the median, using retaining walls, and constructing a guardrail at the exterior shoulders.
- Wetlands 23-6 (0.69 acre of impact) and 24-6b (0.23 acre) – Although these wetlands occur in roadside excavations in upper Dry Creek Valley, the wetlands appear to be natural. Like the valley wetlands in wetlands 22-2a, 22-4, and 23-5, they occur on soils mapped as Bayfield silty clay loam (seeped). Impacts would occur from widening and would be minimized by narrowing the US 160 median, using retaining walls, and constructing a guardrail at the exterior shoulders.
- Wetland 24-2 (0.42 acre of impact) – This is a wet valley on the same soils on the south side of the highway from wetland 23-6, and would be affected by highway widening.

- Wetland 26-1 (0.18 acre of impact) and 26.2 (0.19 acre) – Wetland 26-1 is a shrub wetland with seeps on the slope above Dry Creek, and wetland 26-2 (Dry Creek) is an adjacent stream fringe. These wetlands are on an entrenched meander of Dry Creek and would be filled by construction of the west end of the new alignment around Gem Village. The preliminary design includes filling approximately 450 feet of Dry Creek and all of wetland 26-1. Since Dry Creek is deeply entrenched in this area, rerouting the stream would involve a large amount of excavation.
- Wetlands 27-4a and 27-4b (total 0.8 acre of impact, Dry Creek) – These two crossings of Dry Creek are located on the new alignment south of Gem Village, and would affect 1,524 feet of the Dry Creek channel. Preliminary design includes box culverts that may also be used for passage by wildlife, stock, and pedestrians. Bridges were considered for the crossing of Dry Creek but are not included in the design because of engineering considerations and cost.
- Wetlands 29-1a (0.12 acre) and 29-1b (0.08 acre) – These are sections of roadside ditches east of Gem Village that may be a relocated stream. Wetland 29-1a drains into an unnamed tributary of Dry Creek, and wetland 29-1b drains into wetland 29-1a. Impacts would occur from highway widening.
- Wetland 29-5 (0.66 acre) – This is part of a wet valley wetland east of Gem Village and appears to be supported by groundwater and discharges to an unnamed tributary of Dry Creek. It would be affected by the widening of US 160.

The largest impacts to non-jurisdictional wetlands would be at wetland 27-11 (0.17 acre of impact), a series of irrigation ditches and overflow areas on the new alignment south of Gem Village (listed west to east).

Alternative H (Preferred Alternative) would affect 6.91 acres of wetlands with a high rating for wetland functions, including 0.69 acre of wildlife habitat (wetlands 14-2 and 15-2), 0.01 acre of nutrient retention (wetland 19-1); 0.59 acre of production export (wetland 14-2); and 7.15 acres of groundwater discharge (37 wetlands, including 14-1, 14-2, 15-2, 22-2a, 22-4, 23-5, 23-6, 24-2, and smaller wetlands).

Two affected wetlands (wetlands 14-2 and 15-2) have two or more high-rated functions. The area of impact for wetlands with two or more high-rated functions would be 0.69 acre.

4.7.5.2 Alternative C

Alternative C would impact 6.69 acres of jurisdictional wetlands and 7.31 acres of total wetlands. It would affect about 0.7 acre less jurisdictional wetlands and 0.85 acre less total wetlands than Alternative H (Preferred Alternative). Compared to the Preferred Alternative, impacts would be reduced or eliminated at wetlands 26-1, 26-2, 27-4b, and 27-11. It would affect 727 feet of Dry Creek channel and 0.04 acre of wetland 27-4a on the west side of Gem Village. Other impacts would be mostly the same, including impacts to Long Hollow, wetlands in upper Dry Creek Valley, and wetlands near CR 502.

Alternative C would affect 6.55 acres of wetlands with one or more high-rated functions. Impacts to wetlands with high-rated wildlife habitat, nutrient retention, and production export would the be same as for Alternative H (Preferred Alternative); acres of impact for groundwater discharge would be reduced by about 0.6 acre to 6.55 acres.

Three affected wetlands have two or more high-rated functions, wetlands 14-2, 15-2, and 27-1b. The area of impact for wetlands with two or more high-rated functions would be the same as Alternative H (Preferred Alternative), 0.69 acre.

4.7.6 Bayfield Section

This section includes the Los Pinos River Valley and lands to the east (Figures 3.7.11 through 3.7.13).

4.7.6.1 Alternative B (Preferred Alternative)

Alternative B (Preferred Alternative) would affect 2.78 acres of jurisdictional wetlands and 4.20 acres of total wetlands. The largest areas of jurisdictional impacts (listed west to east) are:

- Wetland 30-2 (1.31 acres) – This large valley wetland would be crossed by the realigned CR 502. The location of the realignment was selected to minimize impacts to this wetland and is located in upland areas where possible.
- Wetland 31-1 (0.15 acre) – The emergent wetland consists of stream fringe and low islands in the Los Pinos River, and would be affected by highway widening. In addition, this alternative would affect 126 feet of the channel of the Los Pinos River.
- Wetland 31-10 (0.28 acre) – This wetland includes natural channels in the Los Pinos River Valley that are used to convey irrigation water and is mostly shrub wetland. Impacts would occur adjacent to the highway from highway widening.
- Wetland 32-12 (0.29 acre) – This is a hillside seep on the east slope of the Los Pinos River Valley that would be crossed by the realignment of CR 501.
- Wetland 32-13 (0.17 acre) – This scrub-shrub and emergent wetland is a roadside depression along US 160B that receives water from both groundwater and ditch flow. It would be impacted by construction of the US 160B/CR 521 intersection.

The largest impacts to non-jurisdictional wetlands include the following:

- Wetland 32-6 (0.15 acre) – A shrub wetland along an irrigation ditch east of Bayfield that would be affected by highway widening.
- Wetland 33-5a (0.19 acre) – This is a roadside excavation near Commerce Drive that would be affected by highway widening.
- Wetland 34-5 (0.18 acre) – This is a wet valley east of Bayfield that appears to be created by irrigation and would be affected by highway widening.

Alternative B (Preferred Alternative) would impact 3.08 acres of wetlands with one or more high-rated functions, including 0.43 acre of threatened and endangered species habitat (wetlands 31-1 and 31-10); 0.57 acre of wildlife habitat (wetlands 31-1, 31-9, 31-10, 31-13, and 34-7b); 0.15 acre of fish habitat (wetland 31-1); 0.2 acre of production export (wetlands 31-1 and 31-9); 2.65 acres of groundwater discharge (wetland 30-2 and 16 smaller wetlands); 0.28 acre of uniqueness (wetland 31-10); and 0.15 acre of recreation potential (wetland 31-1).

Six affected wetlands have two or more high-rated functions, including 31-1, 31-6a, 31-9, 31-10, 31-13, and 34-7b. The area of impact to wetlands with two or more high-rated functions would be 0.57 acre.

4.7.6.2 Alternative A

Alternative A would affect 3.58 acres of jurisdictional wetlands and 5.0 acres of total wetlands. It would affect about 0.8 acre more jurisdictional wetlands and total wetlands than Alternative B (Preferred Alternative). Impacts would be the same or similar to the Preferred Alternative except for impacts resulting from the new interchange in Bayfield. Impacts to wetland 31-10 would increase from 0.28 to 0.5 acre, and impacts to wetland 32-2 would increase from 0.02 to 0.83 acre. Wetland 31-10 consists of shrub wetlands along natural channels, and wetland 32-2 is a wet valley located upgradient from wetland 31-10. Impacts to wetland 32-13 would be decreased from 0.17 acre to no impacts.

Alternative A would impact 3.83 acres of wetlands with one or more high-rated functions, including 0.65 acre of threatened and endangered species habitat (wetlands 31-1 and 31-10); 0.78 acre of wildlife habitat (wetlands 31-1, 31-9, 31-10, 31-13, and 34-7b); 0.15 acre of fish habitat (wetland 31-1); 0.2 acre of production export (wetlands 31-1 and 31-9); 3.34 acres of groundwater discharge (wetlands 30-2, 32-2, 32-12, and 12 smaller wetlands); 0.5 acre of uniqueness (wetland 31-10); and 0.15 acre of recreation potential (wetland 31-1).

Six affected wetlands have two or more high-rated functions, including 31-1, 31-6a, 31-9, 31-10, 31-13, and 34-7b. The area of impact to wetlands with two or more high-rated functions would be 0.78 acre.

4.7.7 Wetland Finding

The following section is the Wetland Finding for US 160 from Durango to Bayfield, La Plata County, Colorado and has been written in compliance with Executive Order 11990, "Protection of Wetlands," and is in accordance with 23 CFR 771.125 (a)(1), 23 CFR 777, and Technical Advisory T6640.8A. This section includes an explanation of why there are no practicable alternatives to the proposed action, and an explanation why the proposed action includes all practicable measures to minimize harm to wetlands. Supporting documentation for the Wetland Finding is included in Section 3.7, Wetlands, and Section 4.7, Wetlands.

The FEIS includes an in depth assessment of project impacts to wetlands for alternatives advanced for detailed analysis. Included in this analysis are the type, function, and quality of impacted wetlands, the basis for these impacts, and alternatives to avoid with measures to reduce these impacts, where possible. The relative importance of impacted wetlands is provided in Table 4.7.2, Summary of Impacts to Wetlands with High and Moderate Functions, along with the severity of impacts provided by function. The relative impact to each function is quantified and provides a measure of functions that are impacted to the greatest degree. Wetland mitigation efforts included in the FEIS will be refined as specific projects are funded and developed. As presented, the conceptual mitigation has been developed to restore, enhance, and create wetlands that compensate for lost functions at similar values to the impacted wetlands. This same approach will be incorporated into detailed wetland mitigation plans as they are developed.

4.7.7.1 No Practicable Alternatives Explanation

Implementation of the *NEPA/404 Merger Process and Agreement for Transportation Projects In Colorado* (December 2004) resulted in early coordination with federal agencies (FHWA, USEPA, USACE, USFWS, BLM) and an opportunity to coordinate on early drafts of Chapters 1 - Purpose and Need, and 2 - Alternatives. Agency input and document revisions resulted in concurrence from USACE on the project purpose and need, and that alternatives advanced for detailed analysis did not exclude the LEDPA. These concurrence points support the determination that there are no practicable alternatives to the proposed action. The final determination of the LEDPA will be made by USACE upon completion of their Section 404(b)(1) evaluation and issuance of the Section 404 permit.

4.7.7.2 Concurrence on Purpose and Need

Concurrence from the USACE on purpose and need was obtained prior to alternative screening development. Concurrence on this point was sought to ensure that the purpose and need included sufficient detail to support criteria used to screen alternatives to provide a reasonable range of alternatives for subsequent analysis. Alternatives that did not meet purpose and need for the project were not considered to be practicable alternatives. Chapter 1 of the FEIS presents project area data that quantitatively and qualitatively support the project need. Traffic data, LOS projections, highway safety deficiencies, and uncontrolled access in mountainous terrain were identified as the basis for highway improvements that address capacity, safety, and access control. The purpose and need screening criteria were applied to Corridor Alternatives and Feasibility Alternatives to refine alternatives carried forward as Preliminary Alternatives. The USACE provided concurrence that the purpose and need allows for the evaluation of a reasonable range of alternatives for purposes of the Section 404(b)(1) evaluation.

4.7.7.3 Concurrence on Alternatives Analyzed in Detail

During the corridor level alternatives screening, alternatives were eliminated and not considered to be practicable if they did not meet the project purpose and need. At the feasibility alternative screening level the corridor alternatives were divided into 12 sections. The majority of the Feasibility Alternatives were eliminated based on purpose and need, with three exceptions (Alternatives 2E, 10F, and 10G). These alternatives were eliminated on the basis of unacceptable environmental or social impacts that included:

- Broad impacts to the undisturbed natural environment
- Aquatic ecosystem impacts double that of other alternatives
- Broad community disruption to residential neighborhoods or community centers (i.e., not practicable due to logistics associated with major relocations)

A discussion of the basis for elimination of alternatives 2E, 10F, and 10G are provided in Sections 2.3.2.2, and 2.3.2.8. In summary, Alternative 2E was not practicable due to its unacceptable impacts to the Mercy Medical Center, the Three Springs Development, and high quality wetlands in Wilson Gulch. Alternatives 10F and 10G were not considered to be practicable because they had unacceptable impacts to the natural environment, including wetlands, based on their alignment outside the existing corridor. Elimination of alternatives during the feasibility level screening on the basis of environmental or social impacts are

consistent with the Section 404(b)(1) Guidelines that require consideration of practicable alternatives "which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences." (40 CFR 230.10(a)).

Alternatives carried forward from the feasibility screening were subject to preliminary screening. At this level the 12 sections were combined into 4 sections. The Preliminary Alternatives were screened on the basis of practicability (logistics and cost) and environmental consequences. The outcome of the preliminary screening was the advancement of two alternatives within each of four sections for detailed analysis of environmental consequences. Alternatives that were eliminated during the preliminary level screening were not considered practicable or had greater environmental consequences to the natural environment than the alternatives advanced for detailed study. A detailed discussion of the preliminary alternative screening is provided in Section 2.4.

In each of the four sections, the preliminary alternative with the least impact to aquatic ecosystems was advanced for detailed study. The USACE provided concurrence that the alternatives carried forward for detailed analysis did not exclude the LEDPA.

4.7.7.4 Summary of Preferred Alternative Screening

Two alternatives within each of four sections were studied in detail to evaluate the environmental consequences of each alternative. In three of the four sections (Grandview, Florida Mesa and Valley, and Bayfield) the Preferred Alternative is the alternative with the least impact to aquatic ecosystems in that section. In the Dry Creek and Gem Village section, Alternative H was selected over Alternative C based on practicability even though Alternative C has fewer impacts to the aquatic ecosystem. The basis for the elimination of Alternative C was the practicability (logistics and cost) associated with the relocation of 15 residences and 9 businesses in Gem Village versus 8 residences and no businesses under Alternative H. Although the actual number of relocations is not relatively large, the social impacts are significantly adverse because Alternative C would have removed approximately 50 percent of the downtown district and reduced the economic viability of Gem Village.

Based on the alternative screening summarized above and presented in detail in Chapter 2, the Preferred Alternative in each section is also considered the LEDPA subject to final concurrence by the USACE. Successive levels of alternative screening using purpose and need, practicability, and environmental consequences criteria, including aquatic ecosystems and other environmental resources, leads to the determination that there are no practicable alternatives to the proposed action that would have fewer environmental and social consequences.

4.7.7.5 Avoidance and Minimization Measures

Under Section 404 of the CWA, impacts to wetlands and other waters of the US must be avoided, minimized, or mitigated, in that order of preference. In addition, it is FHWA and CDOT policy to apply this order of preference to jurisdictional and non-jurisdictional wetlands in accordance with Executive Order 11990. Many wetland impacts have been avoided or minimized during development of project alternatives as described in previous sections. Section 4.7.8, Mitigation, provides conceptual mitigation measures subject to final USACE

approval. These approvals will be requested and obtained during detailed design. The following avoidance or minimization measures have been applied to this project:

- Wetland impacts were avoided or minimized where possible during selection of the alternatives. As described in Chapter 2, the existing alignment included as part of the Preferred Alternative minimizes or avoids impacts compared to off-alignment alternatives. In addition, the alignment of US 160 and county road intersections were located to avoid or minimize wetland impacts. Examples of avoiding wetlands by modifying the roadway alignment include shifting US 160 to the south of the existing alignment between Gem Village and Bayfield to avoid a large wetland complex (30-2) and aligning the bypass south of Gem Village in Alternative H of the Dry Creek and Gem Village section to avoid wetland complex 28-13 (Figure 3.7.11, Wetlands and Waters of the US). Examples of locating intersections to avoid or minimize wetland impacts include the US 160/CR 223 (east) intersection which was moved to avoid two large high quality wetlands in Dry Creek, 22-2a and 22-6 (Figure 3.7.9, Wetlands and Waters of the US), and the US 160/CR 502 intersection which was moved to minimize impacts to wetland 30-2 (Figure 3.7.12, Wetlands and Waters of the US).
- Impacts to wetlands were minimized through the use of medians instead of frontage roads to allow U-turn movements of large trucks. This eliminates the need for a larger footprint required for full frontage road construction. The construction footprint for a divided highway with frontage roads versus a wider median with turnarounds reduced the width of the highway from approximately 300 to 190 feet. In addition, the width of the highway footprint was narrowed by 10 feet between MP 98 and MP 99 to minimize impacts to the high quality wetlands in Dry Creek. Further narrowing of the median in this area would not meet the purpose and need of the project as it would require a median barrier on a curve at the bottom of a hill with an intersection. This would obstruct the vision of vehicles turning onto and off of US 160 from CR 223 (east) and create safety conflicts (see *Appendix G, Public Hearing*, Response to Comment 33A).
- Guardrails and retaining walls will be used to avoid and minimize impacts to wetlands by reducing the footprint that would be required for a typical fill slope. Retaining walls and guardrail are included in the design to minimize and avoid impacts to wetlands 1-8, 1b-1 and 1b-2 in Wilson Gulch, and to minimize and avoid impacts to wetlands 22-4, 23-5, 23-6 and 24-6b in Dry Creek.
- Irrigation drainage flow will be maintained where it crosses the highway to support and maintain non-jurisdictional wetlands.
- Impacts to wetlands and riparian habitat at the Florida River will be avoided by use of a lengthened span bridge. The bridge is larger than necessary for engineering purposes but will provide for wildlife passage and reduce impacts to wetlands.
- Impacts to Wilson Gulch and wetlands associated with Wilson Gulch will be minimized by the use of bridges instead of culverts for all six crossings in Grandview Section Alternative G Modified. Bridges reduce the disturbance area and maintain a natural channel. Additionally, bridge piers in Wilson Gulch will be modified to avoid wetlands by spanning Wilson Gulch.

- Bridges will be used instead of concrete box culverts to avoid and minimize impacts in the Dry Creek area for crossings of US 160 and CR 223 over Dry Creek. These bridges reduce the disturbed area and maintain the natural channel.
- Additional wetland impacts from development along the corridor will be avoided through purchase of access control lines. CDOT will obtain access control lines along the entire corridor during ROW acquisition. Access control lines will restrict the available locations where future development can access the highway. Locations of access points have been identified in the EIS. Refinement of these access points during final design will be based on property rights, safety, and need and will include environmental considerations such as wetlands. An access control line already exists east of the US 160/CR 223 (west) intersection and will serve to protect the wetlands in that area. Access control lines along the corridor will prevent future development access to the highway which would impact additional wetlands.

Additional avoidance and minimization measures will be developed during the final design process for each highway segment, based on current (within 5 years) wetland delineations for that segment. Avoidance and minimization measures that will be evaluated during the final design include slightly shifting the highway alignment, and reducing the limits of construction by installing retaining walls or guardrails with increased side slopes. The avoidance and minimization measures evaluation will also include consideration of safety impacts, feasibility, and conformance to design criteria.

At this time, all practicable measures to minimize harm to wetlands have been incorporated for this level of design. Further reduction in wetland impacts can be accomplished as phases of the design are advanced. However, further reductions in impact cannot be made at this time without compromising the project purpose and need (i.e., safety), or incorporating design variances that would require authorization prior to construction. Based on evolving changes in design standards and construction techniques, avoidance and minimization efforts that require variance determinations will be deferred until the time of detailed design.

4.7.8 Mitigation

~~Under Section 404 of the CWA, impacts to wetlands and other waters of the US must be avoided, minimized, or mitigated, in order of preference. Some wetland impacts have been avoided or minimized during development of project alternatives as described above. The following avoidance or minimization measures have been applied to this project:~~

- ~~Wetland impacts were avoided or minimized where possible during selection of the alternatives, including the county road crossings of wetlands 22-2a and 30-1.~~
- ~~The roadway was designed with retaining walls and guardrails at the exterior shoulders to reduce impacts to adjacent areas in Wilson Gulch (1-8, 1b-2 and 1b-1) and Upper Dry Creek (wetlands 22-4, 23-5, 23-6, and 24-6b).~~
- ~~Bridges instead of culverts will be used for all crossings of Wilson Gulch.~~
- ~~The width of the highway median will be reduced in the Upper Dry Creek Valley. Further narrowing of the median would require the use of a median barrier which would compromise the safety of the design (see *Appendix G, Public Hearing*, Response to Comment 33A).~~

~~- An access control line will be established from the CR 223 (west) intersection to beyond the eastern project limits. This access control line will avoid future wetland impacts as access points are limited to those that currently exist. Access will also be controlled to the west of the US 160/CR 223 (west) intersection to MP 97.5. In the event an access control plan between CDOT and La Plata County is developed, CDOT will make all efforts to avoid and minimize impacts to wetlands and waters of the U.S.~~

~~Additional avoidance and minimization measures will be developed during the final design process for each highway segment, based on a current (within 5 years) wetland delineation for that segment. Avoidance and minimization measures that will be evaluated during the final design include slightly shifting the highway alignment, and reducing the limits of construction by installing retaining walls or guardrails with increased side slopes. The avoidance and minimization measures evaluation will also include consideration of safety impacts, feasibility, and conformance to design criteria.~~

Unavoidable permanent impacts will be mitigated through on-site and/or off-site wetland creation or restoration, in accordance with CDOT policy, current FHWA wetland mitigation policy (23 CFR 777), current USACE mitigation policies, and the conditions of the USACE Section 404 permit. Although the CWA only requires compensatory mitigation for those wetlands and other waters considered jurisdictional by the USACE, it is CDOT policy to mitigate all wetland impacts (jurisdictional and non-jurisdictional) at a minimum 1:1 ratio. The USACE will require compensatory mitigation to replace wetland functions of jurisdictional wetlands that will be permanently impacted, and the acreage may vary depending on the function loss. Based on a functional assessment methodology, CDOT will propose the appropriate level of mitigation for the Section 404 permit. Mitigation sites for replacement of jurisdictional wetland impacts will generally be developed outside the existing CDOT ROW, whenever possible. Properties purchased for mitigation will be acquired as permanent conservation easements and recorded in the local County Clerk and Recorder's Office. CDOT will pursue the purchase of properties on a willing seller basis to provide favorable locations for wetland impact compensation or purchase credits in an existing mitigation bank where available. Mitigation sites may also be developed on remnant parcels that are not required for transportation purposes but are still part of CDOT ROW. These sites will be protected in accordance with the Sacramento District's Mitigation and Monitoring Proposal Guidelines, dated December 30, 2004. Section F, Long-Term Site Management, of these guidelines states that, "The mitigation and monitoring plan must include the identification of a long-term manager/owner (usually a non-profit or a governmental agency), and should include a conservation easement or other documentation of long-term protection and a well-designed long-term management plan." Non-jurisdictional wetland mitigation may be conducted within CDOT ROW without restrictions to replace non-jurisdictional impacts.

Mitigation will be developed considering the functions lost or adversely affected as a result of impacts to aquatic resources, including indirect and temporal impacts, if applicable. Mitigation plans will be developed in coordination with USACE and other appropriate permitting agencies during the final design and the Section 404 permitting process for the individual highway segments. It is CDOT's goal to replace all wetland losses within the corridor in advance or concurrently with the impacts. At a minimum, CDOT will establish mitigation areas concurrent with each phase of construction. Wetland losses will be replaced within the same watershed.

~~Mitigation will be developed considering the functions lost or adversely affected as a result of impacts to aquatic resources, including indirect and temporal impacts, if applicable. Mitigation plans will be developed in coordination with USACE and other appropriate permitting agencies during the final design and Section 404 permitting process for the individual highway segments. All wetland losses will be replaced prior to or concurrently with the impacts. Wetland losses will be replaced within the same watershed.~~

Current FHWA wetland mitigation policy states that using a wetland mitigation bank for compensatory mitigation is preferable (whenever practicable). There are currently no active wetland mitigation banks within the project area watershed, although options for wetland banking are being evaluated by CDOT. The following conceptual mitigation plan identifies on-site areas that appear to be suitable and practicable for wetland mitigation in lieu of mitigation banking. These areas will be further investigated during the final design and permitting process of each highway segment. Final selection of sites and construction methods will depend on various factors, such as the area required, land ownership, hydrology, engineering feasibility, wetland functions that can be achieved, and the surrounding habitats and relative importance in the ecological landscape. CDOT will identify and preserve larger blocks of land for wetland mitigation as early as possible. Early identification, preservation, and construction of mitigation sites will facilitate management and monitoring, increase the probability of success, and enable better long-term protection. CDOT will obtain easements or other legal protection of the mitigation areas.

The overall goals of compensatory mitigation are to replace the acreage of wetlands that will be permanently impacted by the project, to replace the wetland functions that will be lost, and to provide additional functions that the local ecosystem may have previously lost (or partially lost) due to impacts from other projects and activities in the area. In addition, mitigation will follow an ecosystem approach and include a mix of habitats, and where practicable, within the same watershed as the impacted wetlands. Mitigation for non-wetland waters of the US and for riparian habitat also has been incorporated into the wetland mitigation conceptual design.

Detailed wetland mitigation plans will be developed in accordance with USACE Regulatory Guidance Letter 02-2 (USACE 2002) and will include the following:

- Project description
- Baseline information
- Goals and objectives, including factors considered in site selection
- Mitigation work plan, including hydrology, earthwork, planting plan, fencing, erosion control, and schedule
- Performance standards
- Responsible parties
- Site protection (legal means for protecting mitigation area)
- Contingency plan
- Monitoring and long-term management

A number of areas along US 160 offer potential wetland mitigation opportunities. These areas are identified in the following sections for each principal watershed and summarized in Table 4.7.3, Potential Wetland Mitigation Areas. Locations are shown in Figures 3.7.1 through 3.7.13. This list has been developed without consideration of land or water rights ownership. Use of any of these areas for wetland mitigation will be done only on a willing-seller basis. These areas will be reviewed and investigated further, as appropriate, during final design. Additional investigations will be needed to determine feasibility of mitigation at each of these sites, including availability of the land, soil types, depth to groundwater or other hydrology source, and topography.

Table 4.7.3
Potential Wetland Mitigation Areas

Watershed	Potential Mitigation Area	Type of Mitigation	Potential Area (acre)
Wilson Gulch	Realignment of Wilson Gulch at wetlands 1a-1, 2-1 and 2-2 (WG-1)	Wetland, Riparian, Stream	0.8
	Near wetlands 4-3 and 4-4 (WG-2)	Wetland	0.7
	Artesian Valley and Racetrack, near wetlands 3-4 and 3-5 (WG-3)	Wetland	2.0
	Restoration of 1b-8 after construction of check dam (WG-4)	Wetland, Riparian, Stream	0.6
	Restoration of 1b-1 and 1b-2 after installation of check dams (WG-5)	Wetland, Riparian, Stream	0.9
Subtotal			**5.0**
Florida River	Florida River Valley (FV-1)	Wetland, Riparian	8.0
	West side of Florida River Valley (FV-2)	Wetland	0.2
	Long Hollow, wetland 14-2 (FV-3)	Wetland, Riparian	0.6
Subtotal			**8.8**
Dry Creek	Upper Dry Creek Valley, wetland 22-4 (DC-1)	Wetland	2.0
	Upper Dry Creek Valley, wetland 22-2a (DC-2)	Wetland	1.0
	Upper Dry Creek Valley, wetlands 22-1 and 22-5 (DC-3)	Wetland, Riparian, Stream	0.5
	Upper Dry Creek Valley, wetland 23-5 (DC-4)	Wetland	1.0
	Upper Dry Creek Valley, wetland 24-2 (DC-5)	Wetland	0.5
	Upper Dry Creek Valley, wetland 23-6 (DC-6)	Wetland	0.4
	Dry Creek Channel, wetland 22-5 (DC-7)	Wetland, Riparian	1.5
	Dry Creek Channel, wetlands 26-2 and 26-1 (DC-8)	Wetland, Riparian, Stream	0.4
	Peeples Property, wetland 29-5 (DC-9)	Wetland	0.7
	Peeples Property, east of wetland 29-5 (DC-10)	Wetland, Stream	0.4
	Fire Springs Ranch, near wetland 29-11b (DC-11)	Wetland	0.7
	Unnamed Tributary of Dry Creek, wetland 29-2a (DC-12)	Wetland, Riparian	0.3
	Wetland 30-2 (DC-13)	Wetland	1.0
Subtotal			**10.4**
Los Pinos River	Near wetland 31-10 (LP-1)	Wetland, Riparian	3.0
	Wetland 31-15 (LP-2)	Wetland, Riparian	0.2
	Near wetland 31-5 (LP-3)	Wetland, Riparian	2.0
Subtotal			**5.2**
TOTAL			**29.4**

Assuming a 1:1 replacement ratio, the list of potential mitigation areas includes more acreage (total of 29.4 acres) than is likely to be needed (20.96 acres for the Preferred Alternatives) to provide options during site selection. The estimated sizes are approximate but do consider the need for buffer areas and slopes. All of the potential mitigation areas are in upland or primarily upland areas, and wetland mitigation will consist primarily of wetland creation.

Most wetland mitigation areas will be designed to include a mix of emergent and scrub-shrub vegetation, similar to existing wetland conditions. Wetland mitigation areas will include vegetated buffers and will be designed to fit into and enhance the surrounding landscape by expanding existing wetlands or by providing diversity. Riparian trees and shrubs will be planted in buffer areas where wetlands are located along stream corridors. The wetland mitigation areas will not be located in primary stormwater management facilities (e.g., detention basins) and will be protected by stormwater management best management practices (BMPs) as needed. The estimated wetland functions for each of these areas are provided in Appendix C, Table C-4, Estimated Wetland Functions of Mitigation Areas.

CDOT would be responsible for maintenance and monitoring of the wetland mitigation areas during the period when wetland conditions are being established, and would be responsible for meeting approved performance standards. CDOT would also be responsible for providing for long-term maintenance and protection of the mitigation areas, through conservation easements or other means, as approved by the USACE during the Section 404 permitting process.

4.7.8.1 Wilson Gulch Watershed

Wilson Gulch is a tributary of the Animas River, and its watershed covers the western part of the Grandview section in the US 160 project corridor (2.5 miles), from the US 550/CR 220 intersection to the US 160/CR 233 (west) intersection (Figures 3.7.1 through 3.7.4).

The Grandview Alternative G Modified (Preferred Alternative) would result in approximately 4.71 acres of impact to wetlands in this watershed, and Alternative F Modified would result in 6.26 acres of impact. High- and moderate-rated functions to be replaced include general wildlife habitat, general fish habitat, sediment and nutrient retention, production export, groundwater discharge, and uniqueness. The conceptual mitigation sites described below provide about 5.0 acres of compensatory mitigation at sites adjacent to or contiguous with the impacted areas, and will be applicable to both alternatives. As shown in Appendix C, Table C-4, Estimated Wetland Functions of Mitigation Areas, wetland functions for mitigation sites in Wilson Gulch include moderate and high replacement values for the functions lost at wetland impact sites. On-site mitigation is preferred in this area to replace functions associated with Wilson Gulch and its tributaries. The locations of these wetland mitigation areas are shown in Figures 3.7.1 through 3.7.4. Potential areas for mitigation include the following:

- **Realignment of Wilson Gulch at wetlands 1a-1, 2-1, and 2-2 (WG-1).** This section of Wilson Gulch would be relocated up to 100 feet farther north/northwest to accommodate highway widening. The new channel has been designed to provide stream and adjacent riparian and wetland habitat on-site using a combination of earthwork, replacement of the existing sinuosity and gradient, and planting. The grading has been designed to provide low terraces for wetlands along the stream and higher areas for creation/restoration of riparian habitat. Restoration of this stream onsite will maintain habitat continuity along Wilson Gulch. Like other on-site mitigation areas, vegetation in the mitigation wetlands must not

interfere with sight distances along the highway and ramps, and further investigation of elevations will be needed to determine whether shrubs and trees could be planted within the wetland. An estimated 1,750 feet of channel will be restored. With an average width of 20 feet, this will provide approximately 0.8 acre of mitigation.

- **Near wetlands 4-3 and 4-4 (WG-2).** The existing wetland may be able to be expanded by excavating the ground surface to the water table and by redirecting flows from the south tributary (wetlands 4-1 and 5-5) of Wilson Gulch into it. The potential mitigation areas are located within or adjacent to groundwater surface areas. The estimated potential area of impact is approximately 0.7 acre. The elevations and vegetation will need to be designed to not interfere with visibility along the highway and ramps. Shallow wells will need to be installed to monitor the groundwater prior to design to establish the depth of excavation.
- **Artesian Valley and Racetrack, near wetlands 3-4 and 3-5 5WG-3).** This site is located about 600 feet north of the highway. Existing groundwater wetlands may be able to be expanded using surface water and/or groundwater. The abandoned racetrack, in particular, could be restored as a wetland. The existing wetland within the mitigation area (wetland 3-5) is non-jurisdictional. The estimated potential area is 2.0 acres. There may be opportunities to partner with the SUIT Growth Fund, which is developing properties in this area, and restore or create a larger area of wetlands.
- **Restoration of wetland 1b-8 (WG-4).** This wetland is located on Wilson Gulch just downstream of the existing US 160/US 550 (south) intersection. A check dam will be constructed downstream of the bridge to prevent headcutting. The existing wetlands could be replaced after construction of the check dam. Transplanting existing wetland vegetation will help establish and maintain plant species diversity. The replacement area will be the same as the impact area, about 0.6 acre.
- **Restoration of wetlands 1b-1 and 1b-2 (WG-5).** These wetlands are located along Wilson Gulch above the existing US 160/US 550 (south) intersection. Four checkdams will be installed to lower the stream about 30 feet at the upper end of the bridge, so that Wilson Gulch will have a level crossing under the new bridge. The existing wetlands will be replaced at the same location after construction. Transplanting existing wetland vegetation will help establish and maintain plant species diversity. The replacement area will be about the same as the impact area, about 0.9 acre.

4.7.8.2 Florida River Watershed

The Florida River is also a tributary of the Animas River. Its watershed includes the eastern part of Grandview, Florida Mesa and Valley, Dry Creek, and Gem Village (Long Hollow and tributaries) sections, for a total of approximately 6 miles along US 160 (Figures 3.7.3 through 3.7.7).

The Preferred Alternatives would affect approximately 5.12 acres of wetlands in the Florida River watershed, and the other alternatives would affect 5.35 acres. High- and moderate-rated functions of these wetlands primarily include sediment and nutrient retention, production export/food chain support, and groundwater discharge. General wildlife habitat, general fish habitat, and uniqueness are rated high or moderate at less than one-third of the affected wetland area. The conceptual wetland mitigation areas below provide 8.8 acres of compensatory mitigation and apply to both the preferred and other alternatives. Table C-4, Estimated Wetland

Functions for Mitigation Sites in Appendix C includes moderate and high replacement values for the functions lost at wetland impact sites. Potential mitigation areas include the following:

- **Florida River Valley (FV-1)**. Most of the Florida River Valley near US 160 is currently upland, but small wetlands are present in depressions and along the river. It is likely that wetlands and riparian habitat were more extensive in the past but were reduced by water diversions and agriculture, among other factors. New wetlands can be created by excavating the floodplain to the alluvial groundwater table or possibly by using surface water sources. These wetlands will expand existing riparian wildlife habitat on the west side of the Florida River and enhance the functions of the existing habitat by increasing habitat diversity and extent. Assuming that about half the mitigation area will be wetlands and the rest will be maintained or restored as riparian habitat, the estimated wetland mitigation area will be 8.0 acres. A small existing wetland is present within the mitigation area and is not included in the mitigation acreage. The proposed site is located next to US 160, but other locations along the Florida River could also be used. Monitoring wells will be needed to determine the depth of excavation.
- **West Side of Florida River Valley (FV-2)**. Existing wetland 12-6 will be filled. Since its source of water is the highway underdrain, this water can be conveyed to a new location on the valley slope and could potentially be expanded by grading. The estimated on-site mitigation area is 0.2 acre.
- **Long Hollow, wetland 14-2 (FV-3).** Excavating to groundwater along the edges of the existing wetland could expand the existing wetland south of the affected area of wetland 14-2. All of the wetland impacts at wetland 14-2 could be restored at this location. Since this is a natural drainage with diverse habitat structure, the mitigation will include a mix of wetland and riparian areas. The estimated wetland mitigation area is 0.6 acre. Riparian plantings along adjacent portions of Long Hollow may also contribute to mitigation.

4.7.8.3 Dry Creek Watershed

Dry Creek is a tributary of the Los Pinos River, which in turn, is a tributary of the San Juan River. Its watershed includes the east half of the Dry Creek and Gem Village section, Alternatives H and C, respectively, and the west part of the Bayfield section (Figures 3.7.8 through 3.7.11). The Dry Creek Watershed includes Upper Dry Creek, Gem Village, and the valley of the unnamed tributary of Dry Creek east of Gem Village.

The Preferred Alternative would affect approximately 8.65 acres of wetlands in the Dry Creek watershed, and the other action alternatives would affect 7.79 acres. Impacts to high- and moderate-rated functions include general wildlife habitat, sediment and nutrient retention, production export/food chain support, groundwater discharge, and dynamic water storage. The conceptual wetland mitigation areas below provide 10.4 acres of compensatory mitigation and will be applicable to both the preferred and other alternatives. Some of the mitigation areas could be expanded if needed. The primary focus of these conceptual areas is restoring wetland functions with mitigation wetlands close to the impacted area. As shown in Appendix C, Table C-4, Estimated Wetland Functions for Mitigation Sites, includes moderate and high replacement values for the functions lost at wetland impact sites. Potential mitigation areas include the following:

- **Upper Dry Creek Valley (DC-1) wetland 22-4.** The proposed alignment for both alternatives would impact about 1.75 acres of wetland 22-4. The hydrology for this wetland appears to be groundwater flow from the Thompson-Epperson Ditch on the hill on the north side of US 160. The wetland can be moved to the south, between the road and Dry Creek, into an area that is now mesic meadow. Hydrology will be provided by collecting the water from portions of the wetland that would be covered by the road and piping it to the new wetland location 100 to 150 feet farther south. The viability of this method will be further evaluated. Transplanting existing wetland vegetation may help the new wetland establish faster. It is anticipated that only minor amounts of excavation will be needed. About 2.0 acres of wetland will be replaced by this on-site mitigation. Functions should be similar to the original wetland.
- **Upper Dry Creek Valley, wetland 22-2a (DC-2).** The proposed alignment would encroach on the south side of this wetland. Since the US 160/CR 223 (east) intersection is being moved about 1,500 feet to the west, this wetland could be extended east along the north of the highway by excavating the former CR 223 roadbed and adjoining uplands on the northeast side of the existing wetland. This area is below the Thompson-Epperson Ditch on the adjacent hillside and is likely to receive shallow groundwater flow. This on-site wetland mitigation will occupy about 1.0 acre and will have similar functions to the affected wetland.
- **Upper Dry Creek, wetlands 22-1 and 22-5 (DC-3).** Approximately 1,400 feet of the existing Dry Creek channel would be within the footprint of the highway and rerouted CR 223. Approximately 1,400 feet of new channel would be created along the edge of the ROW. The stream channel and its slopes can be contoured and planted to mitigate for wetland and stream impacts. Assuming a channel and wetland averaging 15 feet across, about 0.5 acre of wetland can be created. The new channel can be designed to replace the functions of the impacted wetland and aquatic habitat. The existing channel is incised and also appears to have been straightened. The new channel will have more sinuosity and will have check dams to raise the water table adjacent to the stream.
- **Upper Dry Creek Valley, wetland 23-5 (DC-4).** Similar to wetland 22-4, the non-impacted portions of this wetland can be expanded by collecting and routing shallow groundwater to the new location. The viability of this method will be further evaluated. Some excavation may also be beneficial to reach the groundwater. The estimated mitigation area is 1.0 acre.
- **Upper Dry Creek Valley, wetland 24-2 (DC-5).** Similar to DC-1 and DC-4, wetlands can be moved between the highway and an existing wetland by collecting and routing shallow groundwater to the new location. The viability of this method will be further evaluated. Some excavation may also be needed. The estimated mitigation area is 0.5 acre.
- **Upper Dry Creek Valley, wetland 23-6 (DC-6).** This wetland is located north of the highway and appears to have developed from groundwater and impeded flow. The portion adjacent to the road would be filled during road expansion. The wetland can be extended outward by shallow excavations to groundwater. The estimated mitigation area is 0.4 acre.
- **Dry Creek Channel, wetland 22-5 (DC-7).** The incised channel bed of Dry Creek can be raised with a series of check dams. Currently, the incised stream drains the meadows adjacent to the creek so wetlands do not extend to the creek edge, but are located farther away on each side. Check dams could be used to raise the water table throughout this stretch

and can be combined with planting of woody vegetation. The area is about 3,200 feet long and is mostly outside the project corridor where wetland delineation was done. Assuming the project would affect an average of 20 feet on either side of the stream, an estimated 1.5 acres of wetland could be created. The existing channel is already a wetland and is not included in this area.

- **Dry Creek Channel, wetlands 26-2 and 26-1 (DC-8).** About 450 feet of Dry Creek would be relocated along the edge of the ROW. The stream channel and slope will be contoured and vegetated to mitigate for wetland and stream impacts. The new channel will include meanders to simulate natural conditions. The current channel is deeply incised and has wetlands only along the edge of the channel bed and on one slope where seepage occurs. A wider riparian and wetland area can be developed using terracing and gentler slopes. Trees and shrubs can also be planted to replace the shrub areas lost in wetland 26-1. The estimated mitigation area is 0.4 acre.
- **Peeples property, wetland 29-5 (DC-9).** This wetland is a large groundwater wetland with seeps or springs. Mitigation wetlands can be created between and adjacent to this wetland by excavating to groundwater. Groundwater monitoring will be needed prior to design to confirm that groundwater flows are sufficient to support the additional wetland area. An estimated 0.7 acre of mitigation wetlands can be created. This 35-acre property contains other areas that may also be suitable. The owner has indicated he may be interested in making this property available for wetland mitigation.
- **Peeples property, east of wetland 29-5 (DC-10).** Highway widening would fill the wetland connection between wetland 29-5 and the unnamed tributary of Dry Creek (wetland 29-6). A new channel and/or wetland should be created north of the ROW, both to provide an outlet for wetland 29-5 and to mitigate for wetland impacts. The wetland could be created by excavating a connection between wetland 29-5, simulating a natural stream and wet floodplain. Groundwater monitoring will be needed prior to design to confirm groundwater flows are sufficient to support the additional wetland area. The estimated area is 0.4 acre.
- **Five Springs Ranch property, near wetland 29-11b (DC-11).** Drained and degraded wetlands could be restored using groundwater or surface water from King Ditch. The amount of groundwater is uncertain and may have changed in recent years. An investigation of water availability and extent of historic wetlands will be needed. The estimated mitigation area is 0.7 acre.
- **Unnamed tributary of Dry Creek, wetland 29-2a (DC-12).** The narrow existing wetland along this drainage south of the highway may be able to be enhanced and expanded by excavation or by check dams. Water drained from other nearby wetlands within the ROW could also be used to establish new wetlands. The estimated mitigation area is 0.3 acre.
- **Wetland 30-2 (DC-13).** The center of wetland 30-2 would be impacted by realignment of CR 502. The existing wetland will be expanded by excavating to groundwater. The estimated mitigation area is 1.0 acre.

4.7.8.4 Los Pinos River Watershed

The Los Pinos River is a tributary to the San Juan River. The Los Pinos watershed includes most of the Bayfield section A and B Alternatives (Figures 3.7.12 and 3.7.13), a length of approximately 2 miles along US 160. Alternative B (Preferred Alternative) would impact 2.7 acres of wetlands in this watershed, and Alternative A would affect 3.5 acres of wetlands. The most important functions of impacted wetlands are general wildlife habitat, sediment and nutrient retention, and groundwater discharge. Potential mitigation areas provide 5.25 acres of mitigation. In Appendix C, Table C-4, Estimated Wetland Functions for Mitigation Sites, includes moderate and high replacement values for the functions lost at wetland impact sites. Potential mitigation areas include the following:

- **Near wetland 31-10 (LP-1)**. This area was previously investigated as a potential wetland mitigation site for the US 160/CR 501 intersection improvement project (CDOT Project No. NH1602-075). Two upland meadow sites are nearly surrounded by wetland 31-10 and the US 160 ROW. This is an area with shallow groundwater, where wetlands may be developed by excavation to the alluvial groundwater table. The nearby wetland has the only observations of Southwestern willow flycatcher in the project corridor, and the mitigation design will incorporate habitat features beneficial to this species, including shrub cover and small openings with open water. This mitigation area will contribute to the mosaic of high quality riparian habitat near the Los Pinos and Little Los Pinos rivers. The estimated mitigation area is 3.0 acres. Similar areas are also present on the south side of US 160. In addition, the adjacent existing wetland and Southwestern willow flycatcher habitat will be preserved.
- **Wetland 31-15 (LP-2)**. This wet floodplain along an unnamed stream, which is used to carry irrigation water, can potentially be expanded by excavation. Planting shrubs and trees along the edge of the wetland can also enhance wildlife habitat value. The potential mitigation area is approximately 0.2 acre.
- **Near wetland 31-5 (LP-3).** Similar to LP-1, a wetland could be created at this location by excavating to groundwater. The mitigation area is currently an upland meadow. Wetland mitigation can be combined with riparian mitigation to create high quality habitat. The estimated mitigation area is 2.0 acres.

4.7.8.5 Additional Mitigation Measures

The following measures will be used to minimize adverse impacts to wetlands and other waters of the US during project construction:

- Precautions will be taken when working in areas with shallow groundwater or areas that frequently carry surface water flows to avoid inadvertent hydrologic modifications.
- Unnecessary temporary impacts will be avoided by fencing the limits of disturbance during construction.
- BMPs will be used during all phases of construction to reduce impacts from sedimentation and erosion. BMPs will include the use of berms, brush barriers, checkdams, erosion control blankets, filter strips, sandbag barriers, sediment basins, silt fences, straw-bale barriers, surface roughening, and/or diversion channels.

- Specific permanent BMPs, including infiltration basins, trenches, wet ponds, and other practices will be evaluated during final design.
- No equipment staging or storage of construction materials will occur within 50 feet of wetlands or other waters.
- The use of chemicals, such as soil stabilizers, dust inhibitors, and fertilizers within 50 feet of wetlands and other waters will be prohibited.
- Equipment will be refueled in designated contained areas, at least 50 feet away from wetlands and other waters.
- Where practicable, work will be performed during low flows or dry periods. If flowing water is present, it will be diverted around active construction areas.
- No discharge of effluent into wetlands or other waters will occur.
- Temporary fill material will not be stored within wetlands or other waters.
- All areas of exposed soil will be seeded and/or planted and mulched throughout construction (following the completion of each section). When seeding and/or planting cannot occur due to seasonal constraints, mulch and mulch tackifier will be placed for temporary erosion control. Upland seed mixes will not be used within wetlands.
- During design, wetland hydrology sources will be evaluated and connections to wetlands will be maintained if possible. If it is determined that construction would cut off the hydrological connection to a wetland, the impacts to that wetland will be mitigated.
- Any wetland areas used for construction access will be covered with a layer of geotextile, straw, and soil prior to use to minimize impacts and facilitate reclamation after use. The materials would be removed upon completion of use.
- The new bridges over the Florida and Los Pinos rivers will be designed to not allow any direct discharge of stormwater runoff into wetlands.
- Concrete washout structures will be constructed in designated areas at least 50 feet from wetlands and other waters of the US.
- Clearing and grubbing will include the conditions of the Migratory Bird Treaty Act, Endangered Species Act, Municipal Separate Storm Sewer System (MS4) permit, and Section 404 permit.
- CDOT will obtain access control lines along the entire corridor. Access control lines designate where individual properties can be accessed along highways. An access point cannot be placed across an access control line. In this instance, access control lines would be used to limit impacts to wetlands; however, they are used for many other reasons.

Based upon the above considerations, it is determined that there is no practicable alternative to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use.

4.8 WATER RESOURCES

4.8.1 Floodplains

Impact Assessment/Methodology

Location Hydraulic Study

The purpose of the Location Hydraulic Study as outlined in 23 CFR 650, Subpart A, is to identify areas within natural stream channels that would be encroached upon by the proposed improvements for each of the action alternatives. A floodplain encroachment analysis was performed for portions of Wilson Gulch, Florida River, Dry Creek, and Los Pinos River at the locations where US 160 crosses the floodplain or runs adjacent to the floodplain.

Existing US 160 crosses or lies adjacent to the floodplains previously identified. Roadway improvements to existing US 160 and the improvements identified in each alternative involving horizontal or vertical realignment or widening would result in similar impacts to the adjacent floodplains due to the proximity of US 160. Risks associated with this action are primarily hydraulic related and would be mitigated as a part of preliminary and final design. Proposed mitigation measures for the alternatives are the same or similar to the measures already in place for existing US 160, as discussed in this section for the specific alternative or as discussed elsewhere in the EIS. Specific mitigation measures for floodplain values to be implemented by this action include:

- Rechannelization to convey the floodplain runoff and meet state, local, or federal standards
- Bridge and culvert construction to convey the floodplain runoff and meet state, local, or federal standards
- Retaining wall construction to minimize or eliminate floodplain impacts
- Placement of slope protection and hydraulic structures to prevent adverse impacts to floodplain values, adjacent properties, and roadway facilities
- Wetland replacement/mitigation to restore or preserve floodplain values
- Reseeding/vegetation of disturbed areas and new embankment to restore and preserve floodplain values
- Implementation of best management practices to comply with National Pollutant Discharge Elimination System (NPDES) Phases 1 and 2 requirements to restore and preserve floodplain values

The results of this study supplement the discussion of floodplain impacts in Chapter 3, Affected Environment, and are for planning purposes only. A more comprehensive analysis will be performed as part of preliminary and final roadway design. Evaluation of encroachment on floodplain crossings from one side of the road to the other side (i.e., culvert sizing analysis) was not performed in this study. Floodplain crossing improvements will be addressed as part of preliminary and final design.

In addition to this study, a conceptual hydrology and culvert hydraulic analysis was performed and the results presented in *US 160: Farmington Hill to Bayfield Conceptual Hydrology and Hydraulic Design Report* (URS 2001). Cross-drainage design was evaluated based on CDOT

criteria for rural multilane roadways, which is the 50-year storm event. Smaller tributary channel crossings of US 160 were analyzed as part of this analysis. All future drainage structures will be sized during preliminary and final design to meet the requirements of 23 CFR Part 650, Subpart A, and CDOT drainage design criteria.

CDOT maintenance has not identified any current drainage issues, and flood history forms do not indicate flooding or roadway overtopping within the study area.

There are no FEMA maps defining floodplain boundaries for Wilson Gulch, Florida River, or Dry Creek. These waterways fall within the FEMA Zone D (unstudied).

FIRM Panel 551 of 875 for La Plata County, Colorado (Community Panel Number 080097-0551-8) was published by FEMA on December 15, 1981, for the Los Pinos River. Base flood elevations (BFEs) have been established by FEMA for the Los Pinos River in the vicinity of US 160. US 160 lies within an A3 Zone designation with BFE of 6,887 feet immediately downstream of US 160.

Hydraulic Analysis

The 1.0 percent chance flood event (100-year event) flow rates for Florida River and Los Pinos River were derived using draft USGS Water Resources Investigation Reports as shown in Table 4.8.1, USGS One Percent Chance Flood Event Flow Rates. The USGS report was prepared through a cooperative effort between USGS, CDOT, and the US Bureau of Reclamation. The 100-year event runoff rates for the remainder of the project basin along US 160 were evaluated using the NRCS Synthetic Unit Hydrograph and the rational method for smaller basins. Results are contained in *US 160: Farmington Hill to Bayfield Conceptual Hydrology and Hydraulic Design Report* (URS 2001).

Table 4.8.1
USGS One Percent Chance Flood Event Flow Rates

Natural Major Stream Channel	Sub-Basin I.D. No.	Q100 cubic feet per second (cfs)
Wilson Gulch (north of US 160)	2B	2,420
Wilson Gulch (south of US 160)	23	270
Florida River	N/A	3,920
Dry Creek	93	2,450
Los Pinos River	N/A	7,680

cfs = cubic feet per second

For the Los Pinos River, FEMA has established BFEs and published a FIRM panel. Any impacts to the Los Pinos River in the vicinity of US 160 will require mitigation and the preparation of a Conditional Letter of Map Revision (CLOMR) or a Letter of Map Revision (LOMR) as a part of the design and upon completion of construction, if construction were to change the BFE.

The roadway alignments for each action alternative were reviewed to determine areas where the project improvements would encroach into the major natural stream channels. A single cross-section analysis was performed at all identified encroachment locations. At each cross section, a comparison was made between the existing and action alternative water surface elevations to

determine the impact of project improvements to the natural stream channel floodplain. An analysis of "significant encroachments" based on criteria in 23 CFR 650 was also determined. The results of the cross-section analysis are summarized in Table 4.8.2, US 160 Floodplain Impact Analysis Results.

Locations where the change in the floodplain water surface elevation is less than 1 foot (characterized as minor or no impacts) include three crossings of Wilson Gulch, two crossings of the Dry Creek section (Alternative H), and the crossings of the Florida and Los Pinos rivers. Major impacts (greater than 1 foot) were determined for the Dry Creek section (Dry Creek and Gem Village Alternative C at the US 160/CR 508 intersection). Significant lateral encroachment based on criteria in 23 CFR 650, was determined for one crossing of Wilson Gulch under Alternative G Modified (Preferred Alternative) and Alternative F Modified [1,400 to 2,200 feet east of the existing US 160/US 550 (south) intersection], and two crossings of Dry Creek including Alternative H (Preferred Alternative) at the US 160/CR 223 (east) intersection, and Alternative C at CR 508.

Specific impacts as they relate to sections and alternatives are discussed below.

4.8.1.1 No Action Alternative

The No Action Alternative would have no additional impacts on the Wilson Gulch floodplain, the Florida River floodplain, or the Dry Creek floodplain. The No Action Alternative would result in no new encroachment on the Los Pinos River 100-year floodplain.

4.8.1.2 Impacts Common to All Action Alternatives

Floodplain crossing improvements (from one side of the road to the other side) will be addressed as part of preliminary and final design. All future drainage crossing structures will be sized during preliminary and final design to meet the requirements of 23 CFR Part 650, Subpart A, and CDOT drainage design criteria.

4.8.1.3 Grandview Section

In accordance with 23 CFR 650.113, the Grandview section was evaluated for impacts to the Wilson Gulch drainage basin. Alternatives for the Grandview section ~~were evaluated for~~ have significant impacts ~~including impacts,~~ to the floodplain.

- Due to geographic constraints, all alternatives evaluated in detail ~~must~~ follow the existing US 160 alignment along Wilson Gulch. Wilson Gulch forms a ravine with high mesas on each side and is the only practicable location to place a roadway connecting Durango to the Grandview area. Thus, all alternatives use the Wilson Gulch alignment with location of interchanges being the key difference between alternatives. ~~Both alternatives minimize impacts to Wilson Gulch by using bridges, retaining walls, and design improvements.~~

.

Table 4.8.2
US 160 Floodplain Impact Analysis Results

Section	Alternative	Location	Channel	Water Depth				Floodplain Type[2]	Lateral Encroachment (Yes/No)	Significant Encroachment[3] (Yes/No)
				Existing (feet)	Proposed (feet)	Change (feet)	Impact[1]			
Grandview	Alternative G Modified (Preferred Alternative) and Alternative F Modified	1,400 to 2,200 feet east of the existing US 160/US 550 (south) intersection	Wilson Gulch	2.7	2.7	0	None	Base	Yes	Yes, see Section 4.8.1.3 for mitigation
Grandview	Alternative G Modified (Preferred Alternative)	3,100 feet east of the existing US 160/US 550 (south) intersection	Wilson Gulch	2.4	2.4	0	None	Base	Yes	No
Grandview	Alternative G Modified (Preferred Alternative) and Alternative F Modified	US 160/CR 233 (west) intersection	Wilson Gulch	0.9	0.9	0	None	Base	Yes	No
Dry Creek and Gem Village	Alternative H (Preferred Alternative)	US 160/CR 223 (east) intersection	Dry Creek	3.6	3.6	0	None	Base	Yes	Yes, see Section 4.8.1.5 for mitigation
Dry Creek and Gem Village	Alternative H (Preferred Alternative)	2,100 feet west of the existing US 160/CR 508 intersection	Dry Creek	3.0	3.9	0.9	Minor	Base	Yes	No
Dry Creek and Gem Village	Alternative C	CR 508	Dry Creek	3.2	7.3	4.1	Major	Base	Yes	Yes, see Section 4.8.1.5 for mitigation

[1] "Minor" refers to changes in water depth of less than or equal to one foot, and "major" refers to changes in water depth of greater than one foot. Depths are for preliminary assessment of potential base flood encroachment issues and require verification during final project design.

[2] "Base Floodplain" means the area subjected to flooding by the base flood (flood having a 1.0 percent chance of being exceeded in any given year).

[3] "Significant Encroachment" as defined in 23 CFR 650A means a highway encroachment and any direct support of likely base floodplain development that would involve one or more of the following construction or flood-related impacts:

- A significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community's only evacuation route,
- A significant risk, or
- A significant adverse impact on natural and beneficial floodplain values.

- ~~No practicable alternatives could be developed that did not have impacts to the Wilson Gulch drainage basin.~~Several alternatives, including new corridor length alternatives to the north and south of the existing US 160 alignment, were considered in the Grandview section. These alternatives did not meet purpose and need or were not considered practicable due to impacts to the natural and social environment [see Section 2.2.2.3, Corridor Alignment Alternatives and Section 2.3.2.2, Section 2 – West Project Limit to CR 232 (west)]. For these reasons and those stated above, no practicable alternatives could be developed that did not have impacts to the Wilson Gulch drainage basin.
- The design is in accordance with applicable state and local floodplain protection standards.

Alternative G Modified (Preferred Alternative)

The Wilson Gulch floodplains would be affected by a series of bridges resulting from the reconfigured US 160/US 550 (south) intersection. The US 160 westbound off-ramp and the northbound US 550 to westbound US 160 ramp would cross Wilson Gulch by spanning the floodplain.

Moving downstream, Wilson Gulch would be rechannelized east of the point where it flows underneath US 550, and would remain channelized as it flows under the US 160 eastbound off-ramp and the ramp connecting southbound US 550 to westbound US 160. The rechannelized Wilson Gulch would then reconnect with the existing Wilson Gulch near the access for the gravel quarry. Farther downstream, Wilson Gulch would be protected from impact by a retaining wall.

The current box culvert that Wilson Gulch flows through underneath US 160 is undersized. A bridge would replace this box culvert, and a series of drop structures starting close to 1,200 feet upstream of the bridge would lower the elevation of Wilson Gulch to match the existing downstream portion. The floodplain throughout the project corridor would be affected due to relocation, retaining walls, or piers in the channel.

Alternative F Modified

Alternative F Modified would have the same floodplain impacts to those discussed for Alternative G Modified (Preferred Alternative).

4.8.1.4 Florida Mesa and Valley Section

In accordance with 23 CFR 650.113, the Florida Mesa and Valley section was evaluated for impacts to the Florida River drainage basin. Alternatives C and A do not have significant impacts to the floodplain. ~~for this section were evaluated for impacts, including impacts to the floodplain.~~

~~Alternatives for the Florida Mesa and Valley section included alternative locations for the CR 222/CR 223 (west) intersection. Alternative alignments for US 160 were evaluated in the north-south shift sections. All alignment shifts would be required to cross the Florida River since US 160 is an east to west corridor and the Florida River flows north to south. A bridge is planned for the Florida River crossing for both alternatives to minimize impacts to the Florida River.~~

~~No practicable alternatives could be developed that did not have impacts to the Florida River drainage basin.~~

~~The design is in accordance with applicable state and local floodplain protection standards.~~

Alternative C (Preferred Alternative)

The current alignment of US 160 historically encroaches on the 100-year floodplain on the east side of the Florida River. An existing bridge spans the Florida River. Figure 3.8.2, Florida River 100-Year Floodplain, shows the delineation of the Florida River 100-year floodplain.

The proposed bridge would be approximately 200 feet long and would affect the 100-year floodplain due to the addition of a second bridge. Retaining walls would be used to avoid impacting most of the riparian habitat. The proposed bridge crossing under Alternative C (Preferred Alternative) would maintain the same water surface elevation as the existing bridge; however, it would have a longer span to avoid impacting most of the riparian habitat. Under the Preferred Alternative, the US 160/CR 223 (west) intersection would be realigned to a position approximately 1,300 feet east of the Florida River, outside the floodplain.

Alternative A

The proposed bridge that would cross the Florida River under Alternative A would be the same as Alternative C (Preferred Alternative). Therefore, this alternative would have no additional encroachment into the floodplain.

4.8.1.5 Dry Creek and Gem Village Section

In accordance with 23 CFR 650.113, the Dry Creek and Gem Village section was evaluated for impacts to the Dry Creek drainage basin. Alternatives for this section have significant ~~were evaluated for impacts, including~~ impacts to the floodplain.

- The Dry Creek and Gem Village section ~~contains~~ has significant impacts to one drainage ~~area~~basin, Dry Creek. Just west of Gem Village, Dry Creek crosses US 160 at an angle from the northwest to southeast. All alternatives must cross this section of the creek since the creek generally flows north to south. ~~US 160 impacts would be minimized in this section by reducing the median width to 36 feet and constructing retaining walls along both sides of the highway. CR 222 would be relocated to minimize impacts to wetlands associated with Dry Creek.~~
- ~~Alternative H was developed to reduce impacts to the Gem Village community. However, this alternative has impacts to the floodplain of Dry Creek and its tributaries. These impacts would be minimized by the use of bridges, drainage structures, and retaining walls. The design would not have a major impact to the floodplain. Other alternatives would follow US 160 through Gem Village but have major impacts to the businesses and developments. These alternatives would not impact the Dry Creek watershed since Gem Village has already impacted the tributaries.~~ Several alternatives, including new corridor length alternatives to the north and south of the existing US 160 alignment, were considered in the Dry Creek and Gem Village section. These alternatives did not meet purpose and need or were not considered practicable due to impacts to the natural and social environment (see Section 2.2.2.3, Corridor Alignment Alternatives, Section 2.3.2.8, Section 10 – Gem Village, and Section 2.4.2.6, Dry Creek and Gem Village Section Screening). For these reasons and those stated above, no practicable alternatives could be developed that did not have impacts to the Dry Creek drainage basin.

- The design is in accordance with applicable state and local floodplain protection standards.

Alternative H (Preferred Alternative)

A 100-year floodplain has not been determined for Dry Creek. The current alignment of US 160 crosses Dry Creek in one location – immediately west of the existing US 160/CR 223 (east) intersection. Alternative H (Preferred Alternative) would impact Dry Creek in three locations. At the existing crossing of Dry Creek west of the existing US 160/CR 223 (east) intersection, the double pipes beneath the highway would be replaced with a box culvert with sufficient length to accommodate the proposed four-lane section. The proposed widening of the highway and the junction with the county road would fill approximately 1,400 feet of Dry Creek. A new channel would be created along the edge of the ROW. There would be a major loss in hydraulic capacity of the creek, and a change in historic drainage patterns (see Section 4.8.1, Floodplains).

West of Gem Village, the proposed highway bypass under Alternative H (Preferred Alternative), would fill approximately 450 feet of Dry Creek, which would be rechannelized along the edge of the ROW. This area has also been identified as a potential wetland mitigation site.

At the two proposed crossings of Dry Creek south of Gem Village, box culverts would be used to convey the creek under the road. All Dry Creek crossings will be large enough to accommodate the 100-year storm design.

Alternative C

Alternative C through Gem Village includes an improved US 160/CR 508 intersection. This enlargement of the intersection would require filling of a portion of the Dry Creek floodplain, resulting in a major impact on the water surface flood elevation.

A new channel would be created and box culverts used to convey the creek under the frontage road. The culverts would be large enough to accommodate the 100-year storm design.

4.8.1.6 Bayfield Section

In accordance with 23 CFR 650.113, the Bayfield section was evaluated for impacts to the Los Pinos drainage basin. Alternatives B and A do not have significant impacts to the floodplain.~~for this section were evaluated for impacts, including impacts to the floodplain.~~

~~The Bayfield section crosses the Los Pinos River drainage area. All alternatives must cross the Los Pinos drainage area since the Los Pinos River flows north to south. Impacts to the watershed would be minimized through the use of a bridge structure over the Los Pinos River.~~

~~No practicable alternatives could be developed that would not have impacts to the Los Pinos drainage basin.~~

~~The design is in accordance with applicable state and local floodplain protection standards.~~

Alternative B (Preferred Alternative)

Figure 3.8.3, Los Pinos River 100-Year Floodplain, delineates the Los Pinos River 100-year floodplain near the town of Bayfield. The FEMA FIRM shows a narrow 100-year floodplain associated with the Los Pinos River near US 160. To the east of the river, US 160 is in Zone C, which experiences minimal flooding.

The current alignment of US 160 crosses approximately 1,650 feet of the expanded 100-year floodplain. Widening of US 160 would encroach upon the floodplain with fill slopes. Alternative B (Preferred Alternative) would cross the Los Pinos River floodplain within the existing ROW. This alternative includes a substantially longer bridge than the existing bridge, and thus would cause a decrease in the 100-year floodplain water surface elevation compared to existing conditions. Therefore, implementing the Preferred Alternative would not have negative impacts to the Los Pinos River 100-year floodplain. Natural and beneficial floodplain values would not be affected.

Alternative A

The floodplain impacts for Alternative A would be the same as Alternative B (Preferred Alternative).

4.8.1.7 Mitigation

Floodplain impacts will be avoided or minimized during the selection of the Preferred Alternatives by the use of bridges, retaining walls, and box culverts. The structures will be designed so there will be no loss in hydraulic capacity to the drainages and no adverse effect on floodplain elevations. The rechannelized Wilson Gulch will be replaced with a trapezoidal ditch and revegetated to provide both stream and wetland habitat.

The rechannelized sections of Dry Creek will be an open ditch with the stream channel and slopes contoured and vegetated to mitigate for wetland and stream impacts. The existing channel at the existing crossing of Dry Creek is incised and appears to have been straightened. The new channel will have more sinuosity to approximate more natural conditions.

Local and CDOT criteria will be followed in the design of all hydraulic structures, and the design will meet the requirements of 23 CFR 650.

4.8.2 Water Quality

A number of stream crossings were considered in the water quality analysis. Proposed structures include bridges at four crossings of Wilson Gulch, bridges crossing the Florida and Los Pinos rivers, box culverts at two crossings of Wilson Gulch, three crossings of Dry Creek, two crossings of Hartman Creek, and two crossings at Long Hollow Creek as shown in Figure 4.8.1, Future Water Crossings. Other stream crossings would use corrugated metal pipe. The number of crossings varies by alternative; not all crossings would be required for all the alternatives. Nearly all crossings would be perpendicular to the stream, and there is only one area, Lower Wilson Gulch, where the road closely parallels a stream segment.

4.8.2.1 Driscoll Method Analysis and Results

The Driscoll Method was used to estimate the water quality impacts, in particular annual mass loadings of total copper and total zinc, associated with the construction or reconstruction of the crossings. It was assumed that total copper and total zinc provide an overall picture of the water quality impacts associated with the proposed roadway improvements. Total suspended solids (TSS) is a major pollutant associated with highway runoff, and it was assumed that the relative water quality impact of TSS would be similar to the impact of these two heavy metals. Most other water quality impacts that can occur with highway improvements (e.g., magnesium chloride, oil, and grease) are minor when compared to TSS and heavy metals. Due to the

limitations of the model and the lack of site-specific data, the Driscoll Method was used as a screening tool only to identify potential water quality problems.

The Driscoll Method is a procedure for estimating the impacts of highway runoff on the water quality of receiving waters such as streams, rivers, and lakes. For stream and river analyses, the program estimates mass loading of pollutants during highway runoff events. Details of this procedure are provided in the four volumes of *Pollutant Loadings and Impacts from Highway Stormwater Runoff* (Driscoll et al. 1989, 1990a, 1990b, 1990c).

For calculating loads, inputs to the model include statistics for rainfall, pollutant concentrations in highway runoff, and drainage areas from the roadway crossings (total and impervious). The source for rainfall statistics and pollutant concentrations is the Design Procedure (Driscoll et al. 1990a, 1990b, 1990c).

Rainfall statistics are listed by region in the design procedure. The project corridor (and much of Southwestern Colorado) is located in the relatively arid region that also includes Arizona and southern California.

Pollutant concentrations are the result of a study that included data from 993 runoff events at 31 sites from across the country. These data indicate that there is a difference between water quality in runoff from rural versus urban highways. Runoff from urban highways has considerably higher concentrations than from rural highways, more than twice as high for copper and more than three times greater for zinc. For this analysis, rural highways are defined as having an average daily traffic (ADT) volume less than 30,000, and urban highways are defined as having more than 30,000 ADT. Existing and future conditions were modeled. For the future condition, both No Action and action alternatives were modeled. For the US 160 crossings, the existing and future traffic conditions are all rural except for the six crossings of Wilson Gulch in the future.

The water quality impacts to six water bodies (Wilson Gulch, Florida River, Dry Creek, Hartman Creek, Los Pinos River, and Long Hollow Creek) at six existing crossings and nine proposed crossings were evaluated. These 15 crossings are described above in Section 4.8.2, Water Quality.

The current mass loading in stormwater runoff was estimated for the six existing crossings. The future mass loading in stormwater runoff was estimated for the No Action and action alternatives at all 15 proposed crossings. The results were used to compare water quality in runoff before and after the proposed improvements. Table 4.8.3, Driscoll Method Results – Annual Mass Loading of Copper and Zinc, presents the annual mass loadings generated for total copper and total zinc.

Table 4.8.3
Driscoll Method Results – Annual Mass Loading of Copper and Zinc

	Copper (pounds per year)			Zinc (pounds per year)		
	Existing	No Action	Future	Existing	No Action	Future
Wilson Gulch Crossing #1	NA	NA	0.174	NA	NA	0.894
Wilson Gulch Crossing #2	NA	NA	0.081	NA	NA	0.416
Wilson Gulch Crossing #3	NA	NA	0.648	NA	NA	3.340
Wilson Gulch Crossing #4	NA	NA	0.037	NA	NA	0.190
Wilson Gulch Crossing #5	NA	NA	0.138	NA	NA	0.713
Wilson Gulch Crossing #6	0.022	0.050	0.047	0.081	0.257	0.244
Florida River	0.056	0.056	0.123	0.206	0.206	0.451
Los Pinos River	0.061	0.061	0.183	0.224	0.224	0.668
Dry Creek Crossing #1	0.038	0.038	0.150	0.140	0.140	0.550
Dry Creek Crossing #2	NA	NA	0.678	NA	NA	2.480
Dry Creek Crossing #3	NA	NA	0.291	NA	NA	1.065
Hartman Creek #1	NA	NA	0.423	NA	NA	1.546
Hartman Creek #2	0.196	0.196	0.275	0.717	0.717	1.007
Long Hollow #1	0.037	0.037	0.105	0.134	0.134	0.384
Long Hollow #2	NA	NA	0.015	NA	NA	0.054

The increases from existing to future conditions for Wilson Gulch, Florida River, Los Pinos River, Dry Creek #1, Hartman Creek #2, and Long Hollow #1 crossings are due to increases in areas of ROW and impervious areas. The existing crossing at Wilson Gulch (Wilson Gulch #6) is the only crossing where the increase in loading from the existing to future condition is a result of the change in estimated ADT (from less than 30,000 to more than 30,000).

4.8.2.2 No Action Alternative

The No Action Alternative would have no construction-related impacts to surface water quality. The six existing crossings would have impacts from continued increases in traffic that would result in proportional long-term increases in runoff contaminants. However, based on the estimated future traffic conditions, five of the six existing crossings would continue to have rural conditions (less than 30,000 ADT) in the year 2025; therefore, the estimated mass loadings indicate no difference between the existing and No Action Alternative. Mass loadings from the Wilson Gulch #6 crossing would increase under the No Action Alternative due to the more than 30,000 ADT traffic condition.

The amount of traction sand used would probably remain the same as currently used and would be less than the action alternatives. Existing erosion on steep slopes below the highway along Lower Wilson Gulch would continue. There is a potential for spills of chemicals or hazardous materials in accidents, which would increase with increasing traffic rates, and would be higher than with the action alternatives because of poorer safety conditions with the No Action Alternative.

Table 4.8.5, Annual Mass Loading by Alternative, presents a summary of the estimated annual mass loadings for the No Action and action alternatives.

4.8.2.3 Impacts Common to All Action Alternatives

Construction-related impacts include increased erosion from cleared and excavated areas and transport of sediments to surface waters. This is most likely to occur after heavy rains or snowmelt. There may be increased sediment loading to streams from overland flow at locations where construction takes place near or on a stream bank, or in other areas from stormwater flow away from the construction area in intermittent stream channels or swales.

In all the action alternatives, widening the road would increase the amount of paved impervious roadway and would increase the volume of stormwater runoff once the project is completed. Highway runoff could include heavy metals, sediments, oil, grease, deicing salts, and litter pollutants. The amount of traction sand deposited in winter would increase because of the wider road width. These pollutants could adversely impact water quality on roadways. The improved safety associated with the action alternatives would decrease the likelihood of hazardous material spills resulting from accidents that could adversely affect water quality.

Depending on various factors such as temperature, location, traffic, and equipment availability, several types of solid and liquid chloride and acetate deicers would be used on US 160. Sodium chloride in solid form is used in conjunction with road sand when temperatures fall below effective temperatures for liquid-based deicers. Magnesium chloride has been used as both a deicer in the winter and a chemical that reduces road dust in the summer. The magnesium chloride deicer is generally used in the liquid form. Liquid magnesium chloride deicers generally consist of approximately 30 percent magnesium chloride in water with a corrosion inhibitor to reduce the likelihood of metal corrosion. The corrosion inhibitors in the magnesium chloride deicers vary depending on the brand of deicer used. Acetate-based deicers consist of 50 percent solutions of potassium acetate with a proprietary corrosion inhibitor at approximately 1 percent concentration.

Chemical and corrosion specifications have been developed for deicers by the state of Colorado. The magnesium chloride and acetate deicers used by CDOT are required to meet the Colorado specifications for the maximum allowable trace metal concentrations. Table 4.8.4, Trace Metals Measured in Deicers, shows the concentrations of trace metals in the different brands of deicers used by CDOT along with CDOT maximum concentration specifications.

Table 4.8.4
Trace Metals Measured in Deicers

Trace Metal (mg/l)	Magnesium Chloride (FreezGard Zero w/Shield LS)	Magnesium Chloride (Ice StopCl)	Magnesium Chloride/ Caliber (Caliber M1000)	Sodium Chloride (Ice Slicer)	Potassium Acetate 50% concentration (CF7)	CDOT Maximum Concentration Specification (CDOT Deicing Summary 4/05)
Arsenic	0.001	<0.5	<1	ND	<0.2	3.00
Barium	0.0013	<0.07	0.23	<4.0	<0.2	10.000
Cadmium	0.00001	<0.05	<0.02	ND	<0.2	0.150
Chromium	0.0003	0.13	<0.1	ND	<0.5	0.100
Copper	0.0047	<0.09	<0.1	0.29	<0.1	0.200

Table 4.8.4
Trace Metals Measured in Deicers

Trace Metal (mg/l)	Magnesium Chloride (FreezGard Zero w/Shield LS)	Magnesium Chloride (Ice StopCl)	Magnesium Chloride/ Caliber (Caliber M1000)	Sodium Chloride (Ice Slicer)	Potassium Acetate 50% concentration (CF7)	CDOT Maximum Concentration Specification (CDOT Deicing Summary 4/05)
Lead	0.0009	≤0.3	0.57	≤0.2	≤0.1	1.000
Mercury	≤0.0004	≤0.01	≤0.01	ND	≤0.01	0.050
Selenium	≤0.0008	≤0.5	≤1	ND	≤0.1	0.300
Zinc	0.007	0.34	0.71	10	≤0.5	10.000

Source: Evaluation of Selected Deicers Based on a Review of the Literature Report No. CDOT-DTD-R-2001-15

These chloride and acetate-based deicers have the potential to increase the salinity and trace metal concentrations of groundwater, rivers, streams, and lakes. Where detection limits for analyses are sufficiently low, trace metal concentrations are below drinking water Maximum Contaminant Levels (MCLs) and aquatic toxicity values. The acetate deicers have a relatively high biological oxygen demand (148,000 mg/L) and cyanide concentrations (0.33 mg/L) above the MCL of 0.2 mg/L.

Dilution of deicers from the roadways to nearby streams is estimated to range from 100 to 500-fold, making salinity and other constituent increases likely to occur only in slow-flowing streams and small ponds. The organic corrosion inhibitors present in some chloride and acetate deicers have the potential to cause oxygen depletion of streams near the roadways where the deicers are applied and can result in mortality of fish and other aquatic organisms. However, the 500-fold dilution (Lewis 2000) estimated to occur from the roadways to the streams reduces the likelihood of these effects.

4.8.2.4 Grandview Section

Alternative G Modified (Preferred Alternative)

As part of this alternative, five new stream crossings would be constructed, and one would be reconstructed. Proposed structures include bridges at four crossings of Wilson Gulch, and box culverts at two crossings of Wilson Gulch. Alternative G Modified (Preferred Alternative), like the existing alignment, closely parallels a portion of Lower Wilson Gulch.

The construction of the five new crossings (Wilson Gulch #1 through #5) would introduce pollutant loads to Wilson Gulch. For Wilson Gulch #6, the increase in loading from existing conditions is a consequence of increased traffic only; the impervious area would decrease with the reconstruction of this crossing because the US 160/US 550 intersection would be relocated to the east. The pollutant loads at this location would double from existing to future conditions for copper and triple for zinc due to increased traffic volume.

Table 4.8.5
Annual Mass Loading by Alternative

	Copper (pounds per year)		Zinc (pounds per year)	
	Existing	Future	Existing	Future
Grandview Section				
No Action				
Wilson Gulch Crossing #6	--	0.050	--	0.257
Alternative G Modified (Preferred Alternative)				
Wilson Gulch Crossing #1	NA	0.174	NA	0.894
Wilson Gulch Crossing #2	NA	0.081	NA	0.416
Wilson Gulch Crossing #3	NA	0.648	NA	3.340
Wilson Gulch Crossing #4	NA	0.037	NA	0.190
Wilson Gulch Crossing #5	NA	0.138	NA	0.713
Wilson Gulch Crossing #6	0.022	0.047	0.081	0.244
Alternative G Subtotal	***0.024***	***1.125***	***0.086***	***5.797***
Alternative F Modified				
Wilson Gulch Crossing #6	0.022	0.047	0.081	0.244
Florida Mesa and Valley Section				
No Action				
Florida River	--	0.056	--	0.206
Alternative C (Preferred Alternative)				
Florida River	0.056	0.123	0.206	0.451
Long Hollow Creek #2	NA	0.015	NA	0.054
Alternative C Subtotal	***0.056***	***0.138***	***0.206***	***0.505***
Alternative A				
Florida River	0.056	0.123	0.206	0.451
Dry Creek and Gem Village				
No Action				
Dry Creek Crossing #1	--	0.038	--	0.140
Hartman Creek #2	--	0.196	--	0.717
Long Hollow #1	--	0.037	--	0.134
No Action Subtotal	***--***	***0.271***	***--***	***0.991***
Alternative H (Preferred Alternative)				
Long Hollow #1	0.037	0.105	0.134	0.384
Dry Creek Crossing #1	0.038	0.150	0.140	0.550
Dry Creek Crossing #2	NA	0.678	NA	2.480
Dry Creek Crossing #3	NA	0.291	NA	1.065
Hartman Creek #1	NA	0.423	NA	1.546
Alternative H Subtotal	***0.075***	***1.647***	***0.274***	***6.025***

Table 4.8.5
Annual Mass Loading by Alternative

	Copper (pounds per year)		Zinc (pounds per year)	
	Existing	Future	Existing	Future
Alternative C				
Dry Creek Crossing #1	0.038	0.150	0.140	0.550
Hartman Creek #2	0.196	0.275	0.717	1.007
Long Hollow #1	0.037	0.105	0.134	0.384
Alternative C Subtotal	***0.271***	***0.530***	***0.991***	***1.941***
Bayfield Section				
No Action				
Los Pinos River	--	0.061	--	0.224
Alternative B (Preferred Alternative)				
Los Pinos River	0.061	0.183	0.224	0.668
Alternative A				
Los Pinos River	0.061	0.183	0.224	0.668

Alternative F Modified

As part of this alternative, one crossing of Wilson Gulch would be reconstructed. The proposed structure would be a bridge at Wilson Gulch crossing #6. At this crossing Alternative G Modified and Alternative F Modified are identical, and the pollutant loads at this location would double from existing to future conditions for copper and triple for zinc due to increased traffic volume.

4.8.2.5 Florida Mesa and Valley Section

Alternative C (Preferred Alternative)

As part of this alternative, proposed structures include a reconstructed bridge and associated widening of US 160 crossing the Florida River and a new crossing at Long Hollow Creek. These improvements would increase the amount of impervious surfaces and cause more stormwater runoff to enter the river. As shown in Table 4.8.5, Annual Mass Loading by Alternative, the loading of pollutants would also increase.

Alternative A

Alternative A is the same as Alternative C (Preferred Alternative) for the Florida River, but would not have a new crossing at Long Hollow Creek. The estimated pollutant loads at the Florida River crossing would be the same as those under Alternative C (Preferred Alternative).

4.8.2.6 Dry Creek and Gem Village Section

Alternative H (Preferred Alternative)

As part of this alternative, a number of stream crossings would be constructed or reconstructed. Proposed structures include three box culverts crossing Dry Creek and one new box culvert

crossing Hartman Creek. There is also an existing crossing of Long Hollow Creek that would be reconstructed along US 160. Two of the three Dry Creek crossings would be new, and the third would be reconstructed.

For the reconstructed Dry Creek crossing (#1) and Long Hollow crossing, estimated future mass loads of total copper and total zinc are up to four times higher for the future conditions than for existing conditions. The new crossings of Dry Creek and Hartman Creek would also have water quality impacts.

Alternative C

Alternative C includes one reconstructed crossing of Dry Creek (#1), with estimated impacts identical to those for Alternative H (Preferred Alternative). The reconstruction of the Long Hollow Creek crossing and the Hartman Creek crossing would also increase the pollutant loads to these water bodies.

4.8.2.7 Bayfield Section

Alternative B (Preferred Alternative)

As part of this alternative, proposed structures include a reconstructed bridge crossing the Los Pinos River. The widening of US 160 would increase the amount of impervious surfaces and cause more stormwater runoff and associated pollutants to enter the river. As shown in Table 4.8.5, Annual Mass Loading by Alternative, the loading of pollutants would also increase.

Alternative A

The water quality impacts for Alternative A would be the same as those for Alternative B (Preferred Alternative).

4.8.2.8 Mitigation

Water quality impacts will be mitigated through the implementation of construction and permanent BMPs.

Construction Best Management Practices

Water quality impacts during construction would be controlled through implementation of a construction stormwater management plan, which would identify BMPs to be implemented during construction. These would include erosion control measures such as silt fences, hay bales, and sedimentation basins. Bridge deck designs would be in full compliance with CDOT water quality management requirements.

To comply with NPDES regulations, construction stormwater permit applications describing individual project phases will be provided to CDPHE prior to construction. Development of a Stormwater Management Plan (SWMP) is a required component of all construction activities greater than or equal to 1 acre, as required by the CDPHE General Construction Stormwater Phase II Permit, which requires the implementation of both temporary and permanent BMPs. The SWMP and BMPs will be in compliance with the current CDOT *Erosion Control and Stormwater Quality Guide* (CDOT 2002a), and *Standard Specifications for Road and Bridge Construction* (CDOT 1999). Approved water quality BMPs, such as erosion hay bales, silt fencing, culvert inlet protection, and soil retention blankets, will be used to minimize soil loss during construction. Areas of temporary disturbance will be revegetated in accordance with

NPDES permit requirements. Revegetation will include procedures such as seeding, mulching, sodding, erosion control blankets, and surface roughening. All revegetation activities will be in compliance with the most current *Standard Specifications for Road and Bridge Construction* (CDOT 1999).

Permanent Best Management Practices

Water quality design is driven by water quality standards and classifications, threatened and endangered species, and physical design constraints of the project corridor as outlined in the *MS4 Permit/New Development and Redevelopment Storm Water Program* (CDOT 2004). The US 160 project may affect threatened and endangered species. Consequently, where corridor stormwater runoff directly enters the sensitive habitat and wetlands, the treatment of the runoff will be the highest level of water quality treatment (Tier 1). According to the Tier 1 program criteria, the permanent BMPs will need to contain at least 80 percent of the average annual TSS loading from the average storm event or 100 percent water quality capture volume. Furthermore, the Florida River and the Los Pinos River are Aquatic Life Class 1, Recreation Class 1, and Water Supply (defined in Section 3.8, Water Resources), which also require the highest level of water quality treatment. The presence of threatened and endangered species, Section 303(d) listed waters, and Class 1 water sources, the major drainages intersecting the project (Florida River, Los Pinos River, Dry Creek, and Wilson Gulch) will require these waters to be protected with permanent water quality BMPs.

The Driscoll Method analysis results indicate that the transition from existing to future conditions would produce an increase in loading of copper and zinc for all 15 crossings. Therefore, to mitigate loadings of TSS, metals, and other pollutants from the roadway, permanent water quality BMPs will be included in the final designs for all crossings. For the new crossings, where the impact is especially high, and for some of the reconstructed crossings, the impact is well above 50 percent increase in loads, and combinations of BMPs will be implemented.

For the six existing crossings, the estimated quantity of pollutant removal required for no impact from future conditions (above existing conditions) are listed in Table 4.8.6, Required Removal for No Increase in Mass Loading of Pollutants.

Table 4.8.6
Required Removal for No Increase in Mass Loading of Pollutants

	Copper			Zinc		
	Existing (lbs. per year)	Future (lbs. per year)	Percent Removal Required for Future Load to Equal Existing Load	Existing (lbs. per year)	Future (lbs. per year)	Percent Removal Required for Future Load to Equal Existing Load
Florida River	0.056	0.123	54%	0.206	0.451	54%
Los Pinos River	0.061	0.183	67%	0.224	0.668	66%
Dry Creek Crossing #1	0.038	0.150	75%	0.140	0.550	75%
Hartman Creek #2	0.196	0.275	29%	0.717	1.007	29%
Long Hollow #1	0.037	0.105	65%	0.134	0.384	65%
Wilson Gulch #6	0.022	0.047	53%	0.081	0.257	67%

When properly designed, constructed, and maintained, structural BMPs can be effective in removing pollutants from stormwater runoff by filtering the water (media include vegetation, soils, and sand) and by detaining or retaining the water to allow suspended solids to settle.

BMPs vary in their effectiveness in removing pollutants. Table 4.8.7, BMP Removal Ranges, provides a summary of BMP pollutant removal ranges for total zinc, as reported in the stormwater quality literature. Because of the wide range of values, it is assumed that these values represent reductions in mass loading as well as reduced concentrations. It is also assumed that these ranges are applicable for total copper removal as well as total zinc.

Table 4.8.7
BMP Removal Ranges

BMP	BMP Removal Ranges for Total Zinc (%)	
	Literature Reported Range	Expected Probable Range (UDFCD Volume 3 Best Management Practices)
Grass Buffer	0-10	0-10
Grass Swale	0-40	0-20
Extended Detention Basin	30-60	30-60
Constructed Wetland Basin	29-82	30-60
Retention Pond	0-71	20-60
Sand Filter Extended Detention	10-98	50-80
Constructed Wetland Channel	0-40	20-40

Source: CDOT 2004
UDFCD = Urban Drainage and Flood Control District

A comparison of Table 4.8.6, Required Removal for No Increase in Mass Loading of Pollutants, and Table 4.8.7, BMP Removal Ranges, indicates that individual BMPs will reduce the impact of the increased runoff loads. Combinations of two BMPs in series are known to be more effective than individual BMPs, and would lower future runoff loads even more effectively. However, quantitative data are not available to assess these combinations.

The potential for sand and other runoff pollutants to reach waterbodies would likely decrease by using retaining walls, vegetated roadside ditches, and by altering highway drainage. The vegetative buffer bordering the road in many areas would filter highway runoff along the project corridor.

Project corridor maintenance personnel will coordinate with project designers to determine acceptable operation and maintenance criteria for BMPs, wildlife underpasses, equipment, personnel, training, and scheduling requirements. Traction sand removal by sweeping will be considered based upon location, other mitigation measures in place, and cost/benefit effectiveness.

4.9 VEGETATION

4.9.1 No Action Alternative

The No Action Alternative would result in no impacts to vegetation. Under the No Action Alternative, the currently unvegetated areas will not change.

4.9.2 Impacts Common to All Action Alternatives

The primary impact to vegetation would be removal of existing vegetation during construction. All the action alternatives would affect native vegetation communities including piñon-juniper woodlands, sagebrush shrubland, riparian areas, and wetlands. Impacts to wetlands are discussed in greater detail in Section 4.7, Wetlands. Impacts to native plant communities were assessed by overlaying the highway construction footprint and the mapped vegetation areas. Approximately 50 percent of the construction footprint would be occupied by the new roadway, shoulder, and other permanent facilities, and the other half would be temporarily disturbed and revegetated after construction. Areas of temporary disturbance in upland areas would usually be seeded with grasses for soil stabilization and not restored to the original native vegetation. Therefore, all affected areas of native vegetation within the construction footprint are considered to be permanent impacts. The construction footprint is based on preliminary or conceptual design, and changes could occur during final design.

Wetland areas would be replaced through compensatory mitigation under Section 404 of the CWA, and riparian habitat would generally also be replaced as part of the USACE approach to wetland mitigation and as part of CDOT mitigation policy. In some cases, mitigation may occur at the same location as the original wetland or riparian area, but these areas were tallied as part of the impacts because the original vegetation would be removed. Direct impacts to native vegetation are summarized in Table 4.9.1, Impacts to Native Vegetation Types.

Table 4.9.1
Impacts to Native Vegetation Types

Highway Section/Alternative	Acres of Impact by Vegetation Type				
	Piñon-Juniper	Sagebrush Shrubland	Riparian Woodland and Shrub	Wetlands	Total
Grandview					
Alternative G Modified	56.1	0.0	4.9	7.3	68.3
Alternative F Modified	38.9	0.0	4.9	8.9	52.7
Florida Mesa and Valley					
Alternative C	1.3	1.9	2.4	1.3	6.9
Alternative A	2.5	0.5	2.1	1.5	6.6
Dry Creek and Gem Village					
Alternative H	73.2	58.4	0.5	8.2	140.3
Alternative C	70.6	49.2	2.4	7.3	129.5
Bayfield					
Alternative B	9.9	2.6	1.3	4.2	18.0
Alternative A	10.3	2.6	1.3	5.0	19.2

Impact to native vegetation may also occur from spread of noxious weeds and from erosion and sedimentation. Noxious weeds are likely to invade areas disturbed during construction, and may spread into adjacent native habitats and agricultural lands. Impacts and proposed mitigation measures for noxious weeds are described separately in Section 4.10, Noxious Weeds. Clearing and grading would remove vegetation and soil crusts that stabilize the soil surface, leading to increased erosion within and adjacent to the construction area, and deposition on downstream vegetation. Soil erosion and sedimentation reduces vegetation cover and productivity, and can have long-term effects on vegetation structure and composition in affected areas. Erosion and sedimentation would be controlled by erosion control practices required by CDOT's NPDES permit and SWMP.

The Southern Utes have expressed a concern about impacts to medicinal plants that may be present within the construction corridor. They have agreed to document the plants of specific importance to them and whether they are present in the construction corridor.

4.9.3 Grandview Section

4.9.3.1 Alternative G Modified (Preferred Alternative)

Construction of this alternative would directly affect 56.1 acres of piñon-juniper woodland, 4.9 acres of riparian (cottonwood/willow) habitat, and 7.3 acres of wetlands. Impacts to wetlands are described in Section 4.7, Wetlands.

The riparian impacts would occur along several portions of Wilson Gulch:

- About 0.9 acre of riparian woodland would be removed during construction of check dams in lower Wilson Gulch at wetlands 1b-2 and 1b-1. The habitat would be restored in place following construction.
- About 3.2 acres of mixed riparian woodland and shrubland in the middle of Wilson Gulch would be removed during relocation of Wilson Gulch out of the highway footprint. The relocated section of stream would be replaced with the same sinuosity and gradient, and the side slopes would be contoured to facilitate replacement of wetland and riparian vegetation.
- About 0.8 acre of riparian shrub in upper Wilson Gulch would be removed that would be within the highway footprint.

Loss of piñon-juniper vegetation would occur primarily on Farmington Hill. The relocated US 550 would remove a strip of woodland 200 to 800 feet wide, for almost a mile. About 2,500 feet of the existing US 550 roadbed would be abandoned and revegetated. Widening of US 160 at the foot of Farmington Hill would remove additional piñon-juniper woodland.

4.9.3.2 Alternative F Modified

Construction of this alternative would remove approximately 38.9 acres of piñon-juniper woodland, 4.9 acres of riparian (cottonwood/willow) habitat, and 8.9 acres of wetlands. Impacts would be the same or similar to Alternative G (Preferred Alternative), except for the following. Realignment of US 550 would occur farther east on Farmington Hill in an area where piñon-juniper woodlands alternate with irrigated agricultural lands, and would therefore affect less piñon-juniper woodland. Impacts to wetlands would be greater than the Preferred Alternative

because of the presence of wetlands in some of the irrigated cropland on the realigned portion of US 550.

4.9.4 Florida Mesa and Valley Section

4.9.4.1 Alternative C (Preferred Alternative)

Construction of this alternative would remove approximately 1.3 acres of piñon-juniper woodland, 1.9 acres of sagebrush shrubland, 2.4 acres of riparian habitat, and 1.3 acres of wetlands.

Impacts to piñon-juniper would occur from the widening of US 160 on the west slope of the Florida River Valley. Sagebrush shrubland would be affected by construction of the CR 225 connector on the east side of the Florida River. Riparian woodland would be lost on both sides of US 160 at the Florida River from widening of the highway, and construction of the CR 225 connector across a wooded section of lower Long Hollow. The crossing was selected to minimize impacts to wetlands and riparian vegetation, and crosses at the narrowest point. Wetland impacts would occur at a number of locations associated with streams and irrigation.

4.9.4.2 Alternative A

Construction of this alternative would remove approximately 2.5 acres of piñon-juniper woodland, 0.5 acre of sagebrush shrubland, 2.1 acres of riparian habitat, and 1.5 acres of wetlands. Impacts to piñon-juniper woodland would be higher than the Preferred Alternative, and impacts to sagebrush would be reduced because the location of the CR 222/CR 223 (west) intersection with US 160 would be moved to just west of the edge of the Florida River Valley. Impacts to riparian vegetation would be reduced because lower Long Hollow would not be affected, but impacts to wetlands would be increased because of construction impacts to a wetland on the west slope of the Florida River Valley.

4.9.5 Dry Creek and Gem Village Section

4.9.5.1 Alternative H (Preferred Alternative)

Under Alternative H (Preferred Alternative), direct impacts to vegetation include the loss of 73.2 acres of piñon-juniper woodland, 58.4 acres of sagebrush shrubland, 0.5 acre of riparian woodland, and 8.2 acres of wetlands.

Impacts to piñon-juniper woodland would occur primarily in the 3-mile section of wooded hills between Long Hollow and Dry Creek, and would result from the widening of US 160. More limited impacts would occur in the Dry Creek Valley and Gem Village areas. Impacts to sagebrush shrubland would also occur mostly in the section of US 160 between Long Hollow and Dry Creek, where sagebrush valleys intermingle with piñon-juniper hills. Impacts would also occur west of Gem Village both from the widening of US 160 and from construction of the west end of the Alternative H (Preferred Alternative) realignment around Gem Village.

Impacts of about 0.5 acre of riparian shrubland would occur in two areas along Dry Creek west of Gem Village due to road widening and realignment. The riparian shrub is found on the terraces and slopes along both sides of the creek, and would be removed by construction of a box

culvert. Wetland impacts would occur mostly in upper Dry Creek Valley as a result of widening US 160.

4.9.5.2 Alternative C

Implementation of this alternative in the Dry Creek and Gem Village section would remove 70.6 acres of piñon-juniper woodland, 49.2 acres of sagebrush shrubland, 2.4 acres of riparian woodland, and 7.3 acres of wetlands.

Losses of riparian woodland, sagebrush, and wetlands would be reduced by keeping the current US 160 alignment through Gem Village, rather than using a new alignment. Impacts to riparian vegetation would increase, and would include about 1.8 acres of riparian woodland on the west side of Gem Village, and about an additional 0.1 acre of riparian shrub along Dry Creek.

4.9.6 Bayfield Section

4.9.6.1 Alternative B (Preferred Alternative)

Direct loss of vegetation would include removal of approximately 9.9 acres of piñon-juniper woodland, 2.6 acres of sagebrush-rabbitbrush shrubland, 1.3 acres of riparian woodland, and 4.2 acres of wetlands.

Impacts to piñon-juniper woodland would occur mostly from the realignment of CR 502 through Dunham Gap in Arrowhead Hill. Losses of sagebrush shrubland would result from widening of US 160 at the eastern end of the project, where the highway leaves the agricultural lands around Bayfield. Widening of US 160 would also cause loss of riparian habitat at the Los Pinos and Little Los Pinos rivers, and at an unnamed drainage east of Bayfield. Most of the woodland loss at the Los Pinos and Little Los Pinos rivers would occur in a narrow strip between the highway and a mobile home park to the north, and the town park to the south. Impacts to wetlands would occur in several areas, and would result from the widening of US 160, as well as realignment of CR 502 and CR 501.

4.9.6.2 Alternative A

Implementation of Alternative A would result in the loss of approximately 10.3 acres of piñon-juniper woodland, 2.6 acres of sagebrush shrubland, 1.3 acres of riparian habitat, and 5.0 acres of wetlands.

Impacts to sagebrush shrubland and riparian woodland would be the same as the Preferred Alternative, and impacts to piñon-juniper woodland would be about the same. Wetland impacts would increase mostly from realignment of CR 501.

4.9.7 Mitigation

The following mitigation measures would reduce impacts to all vegetation types:

- Noxious weeds will be controlled during construction and habitat restoration (Section 4.10, Noxious Weeds).
- Silt fencing and other BMPs will be used to prevent degradation of habitats adjacent to the construction area by preventing transport of eroded sediment.

The following mitigation measures would reduce impacts to riparian areas:

- Further efforts to avoid permanent impacts to riparian vegetation will be made during final design.
- Construction impacts will be minimized. The construction ROW will be fenced where it passes through riparian vegetation to prevent temporary disturbance outside the construction limits. Construction staging areas will not be placed in riparian areas.
- All disturbed areas within riparian areas not occupied by permanent facilities will be revegetated with appropriate native species. Riparian areas disturbed during construction will be stabilized as soon as possible.
- Trees removed during construction will be replaced at a 1:1 ratio based on a stem count of all trees with diameter at breast height of 2 inches or greater. Shrubs will be replaced based on their pre-construction aerial coverage. All replacement trees and shrubs will be native species.
- Replacement habitat will be provided for unavoidable impacts through enhancement of existing habitat or restoration of riparian habitat on floodplains.
- Restoration of riparian woodland and shrubland will be included in the design of wetland mitigation areas to provide vegetated buffers and increased habitat diversity and value. A number of the conceptual wetland mitigation areas include riparian habitat restoration, including WG-1, FV-1, FV-5, DC-7, DC-8, LP-1, and LP-2 (Section 4.7, Wetlands).

Impacts to native upland communities (piñon-juniper and sagebrush) will be mitigated, in part, by the following actions:

- The abandoned and reclaimed road and ROW on Farmington Hill will be revegetated with native vegetation.
- Areas of piñon-juniper and sagebrush that will be impacted during construction but that are not needed as part of the permanent facilities (road and shoulder) will be revegetated with an appropriate mixture of native upland forbs, grasses, and low-growing shrubs. Taller vegetation (piñon pines, piñon-junipers, tall shrubs) will also be planted where the road is adjacent to piñon-juniper woodland and where planting of taller vegetation will not interfere with safety (sightlines and animal crossings).

Mitigation measures for wetland impacts are detailed in Section 4.7, Wetlands.

4.10 NOXIOUS WEEDS

4.10.1 No Action Alternative

The No Action Alternative would neither increase nor decrease the distribution and abundance of noxious weeds in the project corridor.

4.10.2 Impacts Common to All Action Alternatives

Various construction activities have the potential to increase the abundance of existing noxious weeds or to introduce new noxious weeds into the project corridor. These activities would

include mobilizing construction vehicles, excavating and moving borrow materials and topsoil, clearing land, and reclaiming disturbed areas. Removing existing vegetation and disturbing soils would encourage germination of seeds and allow the spread of weeds from airborne seeds.

Following construction, noxious weeds could persist or become established on road edges and in reclaimed areas, and vehicle traffic could spread or introduce weeds along road ROW. Noxious weeds that establish in construction areas and along the road ROW could spread into adjacent lands, resulting in degradation of habitat quality in wetlands, riparian areas, and other natural habitats, including those occupied by threatened and endangered species. Significant habitat degradation could occur if noxious weeds heavily compete with or displace desirable native vegetation, which could lead to subsequent food chain impacts. For instance, a reduction in native vegetation may lead to a decreased amount of insects and rodents, which the Southwestern willow flycatcher and bald eagle depend on as food sources. In addition to potential impacts to public lands, private landowners could experience decreased value and increased management costs in agricultural and developed areas.

4.10.3 Grandview Section

4.10.3.1 Alternative G Modified (Preferred Alternative)

Alternative G Modified (Preferred Alternative) would have the same impacts to noxious weeds as those discussed in Section 4.10.2, Impacts Common to All Action Alternatives. Approximately 68 acres of native vegetation would be impacted and become vulnerable to noxious weed introduction under this alternative.

4.10.3.2 Alternative F Modified

Alternative F Modified would have the same impacts to noxious weeds as those discussed in Section 4.10.2, Impacts Common to All Action Alternatives. Approximately 53 acres of native vegetation would be impacted and become vulnerable to noxious weed introduction under this alternative.

4.10.4 Florida Mesa and Valley Section

4.10.4.1 Alternative C (Preferred Alternative)

Alternative C (Preferred Alternative) would have the same impacts to noxious weeds as those discussed in Section 4.10.2, Impacts Common to All Action Alternatives. Approximately 7 acres of native vegetation would be impacted and become vulnerable to noxious weed introduction under this alternative.

4.10.4.2 Alternative A

Alternative A would have the same impacts to noxious weeds as those discussed in Section 4.10.2, Impacts Common to All Action Alternatives. Approximately 7 acres of native vegetation would be impacted and become vulnerable to noxious weed introduction under this alternative.

4.10.5 Dry Creek and Gem Village Section

4.10.5.1 Alternative H (Preferred Alternative)

Alternative H (Preferred Alternative) would have the same impacts to noxious weeds as those discussed in Section 4.10.2, Impacts Common to All Action Alternatives. Approximately 143 acres of native vegetation would be impacted and become vulnerable to noxious weed introduction under this alternative.

4.10.5.2 Alternative C

Alternative C would have the same impacts to noxious weeds as those discussed in Section 4.10.2, Impacts Common to All Action Alternatives. Approximately 132 acres of native vegetation would be impacted and become vulnerable to noxious weed introduction under this alternative.

4.10.6 Bayfield Section

4.10.6.1 Alternative B (Preferred Alternative)

Alternative B (Preferred Alternative) would have the same impacts to noxious weeds as those discussed in Section 4.10.2, Impacts Common to All Action Alternatives. Approximately 18 acres of native vegetation would be impacted and become vulnerable to noxious weed introduction under this alternative.

4.10.6.2 Alternative A

Alternative A would have the same impacts to noxious weeds as those discussed in Section 4.10.2, Impacts Common to All Action Alternatives. Approximately 19 acres of native vegetation would be impacted and become vulnerable to noxious weed introduction under this alternative.

4.10.7 Mitigation

CDOT will develop a project-specific noxious weed management plan that will be implemented during construction. This plan will include the results of a noxious weed inventory, weed management goals and objectives, and preventive and control measures. Preventive measures will include the following:

- Noxious weeds observed in and near the construction area at the start of construction will be treated with herbicides or physically removed to prevent seeds blowing into disturbed areas during construction.
- Contractors' vehicles will be washed before being used for construction to ensure they are free of soil and debris capable of transporting noxious weed seeds or roots.
- Periodic surveys will take place during the construction period to identify and treat noxious weeds that have developed.
- Topsoil used in reclamation will be free of noxious weeds or will be treated prior to use per the Weed Free Forage Act (CRS, Title 35, Article 27.5).

- Disturbed areas will be reclaimed as soon as construction is finished and seeded using temporary cover or a permanent seed mixture of native grasses and forbs, depending on the season.
- Fertilizer will not be used in seeded areas because it could enhance the growth of noxious weeds at the expense of desired vegetation.
- Certified weed-free mulch will be used for reclamation, and weed-free straw bales will be used for sediment barriers per the Weed Free Forage Act (CRS, Title 35, Article 27.5).
- The presence of threatened and endangered species could limit the method of treatment and management of noxious weeds in portions of the project corridor.
- Noxious weeds being treated near wetlands and riparian areas will require the use of aquatic-use only herbicides to prevent the potential leaching of chemicals into the groundwater table, as well as the potential impact to fish and other wildlife.

Weed control will use the principles of integrated pest management to treat target weed species efficiently and effectively by using a combination of two or more management techniques (biological, chemical, mechanical, and/or cultural). Weed control methods will be selected based on the management goal for the species, the nature of the existing environment, and methods recommended by Colorado State University, the La Plata County Weed Supervisor, BLM, and other weed experts. The plan will avoid adverse impacts from herbicides, and management recommendations will be developed based on factors such as high groundwater and presence of riparian vegetation that would preclude the use of certain herbicides.

Monitoring will be used to identify new weed infestations and to evaluate the effectiveness of weed control methods. Monitoring and weed controls will be implemented during construction and continued by CDOT maintenance personnel after the end of construction.

4.11 WILDLIFE AND FISHERIES

4.11.1 No Action Alternative

The No Action Alternative involves no changes to the existing highway alignment and would result in continued direct and indirect impacts to wildlife resources within the project corridor, especially to deer and elk from collisions with vehicles when attempting to cross the highway. Because of their migratory pattern, deer and elk utilize winter concentration areas and severe winter concentration areas in the vicinity and to the south of US 160. To move between summer and winter range, deer and elk must cross US 160.

Existing characteristics of US 160 contribute to the high frequency of wildlife-related accidents, especially in deer and elk migration corridors, resulting in direct impacts to these and other animal species attempting to cross the highway. These characteristics include lack of wildlife-exclusion fencing and wildlife crossings, poor sight distance, and minimal shoulders.

The lack of wildlife crossings in the project corridor prevents wildlife access to north-south habitats divided by the existing highway. Wildlife, including ungulates, birds, and small mammals are impacted by the existing highway condition through habitat fragmentation and road avoidance. With increasing traffic on the existing highway, vehicle collisions with deer, elk, and other animals would likely increase within the project corridor under the No Action Alternative.

Under the No Action Alternative, there would be no change in the existing impacts to the aquatic resources. Aquatic resource conditions would continue as they exist today.

4.11.2 Impacts Common to All Action Alternatives

Roads affect wildlife in numerous ways, from habitat fragmentation, habitat loss, and habitat alienation (i.e., sensory disturbance), to physical obstacles and vehicle collisions (Van der Zee et al. 1992). Implementation of the Preferred Alternatives or any of the other action alternatives would impact wildlife resources, especially deer and elk movement through migration routes.

Short-term, localized impacts to wildlife can be expected during construction of any of the action alternatives. Short-term and direct impacts to wildlife from the removal (and restoration) of vegetation from the highway construction would displace individuals from these areas until construction was complete and vegetation was reestablished.

Vegetation clearing, earth-moving, and other construction activities have the potential to alter breeding behavior and destroy nests of bird species protected under the Migratory Bird Treaty Act (MBTA), including raptors. Destruction or disturbance of nests that results in loss of eggs or young is a violation of the MBTA. Impacts would occur from displacement of wildlife near the project corridor while construction activities are occurring. Noise and disruption associated with construction would result in temporary and possibly permanent displacement of some species of wildlife from important habitats. The distance that animals move to avoid human disturbance is dependent on the species and/or individual, topography, vegetation cover, and intensity of the disturbance. Displacement of migratory songbirds and raptors could result in nest abandonment.

Wildlife would incur adverse impacts from loss of habitat due to expansion of the existing highway to four lanes and the addition of access roads in several sections. In addition to habitat loss, widening and expanding the highway would accommodate higher traffic densities. The direct implications of this to individual animals are increased mortality from vehicle collisions and/or avoidance of the highway. At the population level, this influences gene flow and community structure.

Research suggests traffic speed and volume are positively correlated with vehicle/wildlife collisions (Clevenger and Waltho 1999). Deer and elk do not cross at random locations but are spatially clustered based on habitat type, dispersal areas, and migration corridors (Ruediger 2000). Therefore, animal collision data can be very useful in final highway design to identify locations along US 160 that deer and elk choose to cross. CDOT currently records incidents on wildlife mortality from vehicle collisions along US 160. As discussed in Section 3.11, Wildlife and Fisheries, the data show that the most numerous collisions with deer and elk occur at MPs 88.0 to 89.0 and 90.0 in the Grandview section, MP 94.5 to 98.5 and 99.0 to 100.0 in the Dry Creek and Gem Village section, and in the Bayfield section, MPs 102.0 to 102.5, and 104.0 to 105.0 in the vicinity of the Los Pinos River.

Increasing the width of the highway and erecting concrete medians in some sections would create a much larger physical obstacle for deer and elk, as well as other smaller and medium-sized mammalian, reptilian, and amphibian species to cross. However, the construction of wildlife exclusion fencing and adequate numbers of wildlife crossings would provide animals the opportunity to safely cross under the highway. Although traffic densities and speeds, as well as the width of US 160, would increase as a result of the project, incorporation of wildlife-exclusion fencing and wildlife crossings into the highway design would reduce the potential for conflicts

between wildlife and drivers. Proposed design features of US 160, such as wildlife underpasses, culverts, and fencing, would provide increased opportunity for wildlife to safely access habitats north and south of the highway. This would result in beneficial impacts to wildlife from the implementation of crossing structures and fencing.

Installation of wildlife-exclusion fencing and wildlife-crossing structures may not eliminate impacts to wildlife from roads and vehicle collisions. Smaller-sized animals, such as reptiles, amphibians, and small rodents would still have access to the highway. CDOT plans to erect fencing on both sides of the highway to limit medium and large animals from accessing the highway ROW and to funnel them into the wildlife crossings. If wildlife crossings are not spaced adequately along the US 160 project corridor for animals to use, the fencing and wider highway would further reduce many animals' ability to travel, and thereby fragment habitat and potentially change deer and elk migration patterns. Additionally, crossings must be of sufficient dimensions to promote animals to use them.

~~Dimensions for multi species crossings, which include elk and deer, would be a minimum of 12 feet high by 24 feet wide for a 140 foot long culvert.~~ The openness of a structure is a generally more influential factor than size of the opening for animals choosing to cross through an underpass; for mule deer and elk, the larger the openness of a structure, the more likely an animal is to enter it (Clevenger and Waltho 2000). Openness is defined by a formula: Openness = width * height / length. The *minimum* openness factor for mule deer to use a structure is 2.65 feet or 0.8 meters (Gordon 2003). However, this openness factor should be increased to consider elk. ~~Since crossing structures should be as large as possible to promote animal use, the openness ratio for multi species (deer and elk) use of culverts and bridges should be 2.0 for the US 160 project.~~

Crossing structures should be as large as possible to promote animal use; as the length of the structure increases, the width and height should also increase proportionately. From an animal's perspective, the opening at the far end of an underpass appears smaller as the length increases, and the smaller the aperture of the opening appears, the less likely an animal is to enter it. ~~For multi species crossings, which include elk, minimum dimensions for a box culvert with an openness ration of 2.0 should be 12 feet in height by 24 feet long for a 140 feet long culvert.~~ As the length of the culvert increases, the height and width should also be increased. Additionally, "multi-use" pedestrian/wildlife crossings are proposed along the US 160 project corridor. These consist of a paved pedestrian path on one side of a stream/river channel, and a wildlife crossing area on the opposite side of the channel. Although animals are unlikely to use these crossings during periods of high human activity, they would use the crossings at other times.

Fencing is necessary to guide animals into the wildlife crossing structures and prevent animals from entering the ROW. A fencing plan has been developed as part of the conceptual design in the Grandview and Florida Mesa and Valley sections, though fencing would also be used in portions of roadway in the project area. Wildlife exclusion fencing would be installed from approximately MP 87.75 to MP 89.25, from MP 93.4 (existing CR 223) to MP 100, and from MP 101 to MP 102.5. US 550 would be fenced from the southern end of the project to the intersection with US 160. The conceptual fencing would be located on segments on the north and south sides of US 160 with options such as double cattle guards at intersections. Fencing would break in towns and other developed areas, such as Gem Village and Bayfield. Escape ramps would be incorporated into the highway design to prevent animals from becoming trapped on the highway side of fencing.

4.11.3 Grandview Section

4.11.3.1 Alternative G Modified (Preferred Alternative)

Under Alternative G Modified (Preferred Alternative), approximate direct impacts to wildlife from habitat loss would affect 56.1 acres of piñon-juniper woodland, 4.5 acres of riparian woodland and shrub habitat, and 7.3 acres of wetlands. US 550 would be realigned to the east under the Preferred Alternative; the existing US 550 ROW would be removed and revegetated.

Due to the existing residential and commercial development occurring in the town of Grandview from approximately MP 90.5 to 91.8 (CR 233 to near the SH 172/CR 234 intersection), wildlife would incur few additional impacts from project construction, as most animals avoid the area due to the existing development.

During discussions with CDOW, CDOT identified locations for three wildlife crossings as part of the conceptual road design. The length of US 160 in the Grandview section would be fenced on both sides of the highway (except for where retaining walls would be constructed) to funnel animals under the proposed wildlife crossing where Wilson Gulch crosses US 160 and prevent animals from entering the US 160 ROW. This crossing is located at a proposed bridge structure measuring 22 feet high by 156 feet long. The dimensions of the proposed bridge would be an improvement for wildlife crossings from the existing bridge at Wilson Gulch. The area available for a wildlife crossing would be a 25-30-foot-wide bench on one side of Wilson Gulch under this bridge.

Several wildlife crossings have been identified from the conceptual design for Alternative G Modified (Preferred Alternative); one crossing would be located on US 160 over Wilson Gulch at MP 88.27, and two other structures are box culverts located on US 550 at MPs 15.9 and 16.5. These culverts would allow wildlife entering the Wilson Gulch crossing on US 160 to continue on to the Florida Mesa or to access the north side of US 160 from the mesa.

In addition, retaining walls would be constructed on both sides of US 160 from the Wilson Gulch crossing to the US 160/US 550 (south) intersection. The retaining wall on the north side of US 160 would prevent wildlife from entering the US 160 ROW from the north, and would force them to move parallel to US 160 southwest into the Wilson Gulch bridge crossing, or northeast to other habitats. In addition, exclusion fencing would be located from the western project end to MP 89.25 on US 160, and on US 550. Table 4.11.1, Wildlife Crossings, lists the proposed structures in the Grandview section.

4.11.3.2 Alternative F Modified

Under Alternative F Modified, wildlife would incur direct impacts through loss of approximately 38.9 acres of piñon-juniper woodland, 4.9 acres of riparian woodland and shrub, and 8.9 acres of wetlands in the Grandview section. The majority of the piñon-juniper woodland would be removed where US 550 would be realigned over Florida Mesa, which would bisect mule deer and elk severe winter range (NDIS 2005). However, US 550 would be realigned to the east under Alternative F Modified, and the existing US 550 ROW would be removed and revegetated.

Table 4.11.1
Wildlife Crossings

Section	Alternative	Approximate Location	Approximate Milepost	Conceptual Design Structure Type[1]	Minimum Dimensions (HxWxL) (feet)	Comment	~~Recommendation~~
Grandview	G Modified & F Modified	US 160, west end at Wilson Gulch	88.27	Bridge	22 x 26 x 156	Adequate for ungulate use. Only place to cross for 2.25 miles.	~~None~~
Grandview	G Modified	US 550 (on proposed realignment of US 550)	MP 15.9 (US 550 south)	Arch culvert	12 x 24 x 280	Not of sufficient openness to accommodate large animal use.	~~Increase the height and width to 18 x 36 feet, or change to a bridge structure.~~
Grandview	G Modified	US 550 (on proposed realignment of US 550)	MP 16.5	Bridge	280 feet long		
Grandview	F Modified	US 550 (on proposed realignment of US 550)	TBD	Culvert or bridge	12 x 24 x unknown	No crossing has been included in conceptual design.	~~None~~
Grandview	F Modified	US 550 (on proposed realignment of US 550)	TBD	Culvert or bridge	12 x 24 x unknown	No crossing has been included in conceptual design.	~~None~~
Grandview	G Modified	US 160/US 550(south) interchange ramp; east-west crossing over Wilson Gulch	88.9	Bridge (Ramp)	TBD	Exit-ramp bridge, not specifically designed for wildlife but wildlife could use to follow Wilson Gulch along north side of US 160 under this ramp.	~~None~~
Grandview	G Modified	US 160/US 550 (south) interchange ramp; east-west crossing over Wilson Gulch	89.2	Bridge (Ramp)	20 x unknown x 33	Exit-ramp bridge, not specifically designed for wildlife; adequate for deer and elk movement.	~~None~~
Grandview	G Modified	US 160/US 550 (south) interchange ramp; east-west crossing over Wilson Gulch	89.3	Bridge (Ramp)	20 x 60 x 28	Exit-ramp bridge, not specifically designed for wildlife; adequate for deer and elk movement.	~~None~~
Grandview	G Modified	US 160/US 550 (south) interchange ramp; east-west crossing over Wilson Gulch	88.9	Bridge (Ramp)	TBD	Exit-ramp bridge, not specifically designed for wildlife.	~~None~~
Florida Mesa and Valley	C & A	Florida River	93.70	Bridge	12 x 60 area on west side of Florida River	New bridge would have split median.	~~Proposed bridge dimensions are sufficient for ungulate use; consider raising height to 18 to 24 feet to improve.~~
Dry Creek and Gem Village	H & C	Pioneer Irrigation Ditch	94.65	Bridge	12 x 50 x 240	Critical location. High ungulate use and rate of animal/vehicle collisions. Approx. width across road is 240 feet.	~~None~~

Table 4.11.1
Wildlife Crossings

Section	Alternative	Approximate Location	Approximate Milepost	Conceptual Design Structure Type[1]	Minimum Dimensions (HxWxL) (feet)	Comment	~~Recommendation~~
Dry Creek and Gem Village	H & C	Unnamed drainage	95.77	Arch culvert	14 x 36 x 120	Critical location. High ungulate use and rate of animal/vehicle collisions.	~~None~~
Dry Creek and Gem Village	H & C	Unnamed drainage	97.15	Arch or box culvert	12 x 26 x 120	High numbers of animal/vehicle collisions.	~~None~~
Dry Creek and Gem Village	H & C	Tributary to Dry Creek	97.5	Arch or box culvert	14 x 26 x 130	High numbers of animal/vehicle collisions.	~~Increase height if possible.~~
Dry Creek and Gem Village	H & C	Unnamed drainage (Dry Creek just south of highway)	98.4	Box culvert	16 x 24 x 150	High number of animal/vehicle collisions. Approx. width across road is 150 feet with median.	~~None~~
Dry Creek and Gem Village	H & C	Unnamed drainage (Dry Creek just south of highway)	99.10	Box culvert	16 x 24 x 150	Moderate number of animal/ vehicle collisions. Approx. width across road is 150 feet with median.	~~None~~
Dry Creek and Gem Village	H & C	Unnamed drainage	100	Box culvert	16 x 24 x 150	Moderate number of animal/ vehicle collisions. Approx. width across road is 150 feet with median.	~~None~~
Dry Creek and Gem Village	H	Dry Creek (where new realigned US 160 crosses)	100.20	Bridge	TBD	No data (realigned roadway). Approx. width across road is 320 feet with median.	~~None~~
Dry Creek and Gem Village	H	Dry Creek (where new realigned US 160 crosses)	100.65	Bridge	TBD	No data (realigned roadway) but Dry Creek crossing. Approx. width across road is 140 feet with median.	~~None~~
Dry Creek and Gem Village	H & C	Tributary of Dry Creek	101.32	Box culvert	12 x 24 x 110	Moderate animal/vehicle collisions. Approx. width across road is 110 feet with median.	~~None~~

Table 4.11.1
Wildlife Crossings

Section	Alternative	Approximate Location	Approximate Milepost	Conceptual Design Structure Type[1]	Minimum Dimensions (HxWxL) (feet)	Comment	~~Recommendation~~
Bayfield	B & A	Thompson-Epperson Ditch	101.60	Box culvert	TBD	Moderate number of animal/ vehicle collisions. No wildlife crossings identified in Bayfield section during the conceptual design. Approx. width across road is 100 feet with median.	~~None~~
Bayfield	B & A	Los Pinos River	102.25	Bridge	unknown x 120 x 300	Moderate to high number of animal/vehicle collisions. Allow approximately 20 feet high by 40 feet wide area for wildlife crossing under one or both sides of the river.	~~Allow approximately 20 feet high by 40 feet wide area for wildlife crossing under one or both sides of the river.~~
Bayfield	B & A	Unnamed drainage east of the Little Pine River	102.55	Box culvert or bridge	12 x 24 x 100	Moderate number of animal/ vehicle collisions. Approx. width across road is 100 feet with median.	~~None~~
Bayfield	B & A	Unnamed Tributary of Beaver Creek	103.9	Box culvert or bridge	12 x 24 x 100	Moderate to high number of animal/vehicle collisions. Approximate width across road is 100 feet with median. Sign at south portal stating, "Private property ahead, no access to lands."	~~Sign at south portal stating, "Private property ahead, no access to lands."~~

[1]Additional recommended crossing location, identified based on CDOT roadkill data (CDOT 2005a).

Under Alternative F Modified, three wildlife crossing structures are currently included in the conceptual design. Two of these crossings are located on US 550 from its intersection with CR 220 north to the proposed US 160/US 550 (south) intersection. These crossings are discussed in Table 4.11.1, Wildlife Crossings. However, the lack of natural drainages and other topographic features make installation of crossings along US 550 difficult. Without crossing structures on US 550, the highway would fragment important deer and elk habitat and would prevent animals from accessing habitats north and south of the highway in this section.

The third wildlife crossing is located at MP 88.27 on US 160 where it crosses Wilson Gulch on the western project end. This crossing is located at a proposed bridge structure measuring 22 feet high by 156 feet long. Impacts to wildlife would be beneficial compared to existing conditions with the inclusion of wildlife crossings in the highway design.

No impacts are expected to fisheries resources under this alternative.

4.11.4 Florida Mesa and Valley Section

4.11.4.1 Alternative C (Preferred Alternative)

Implementation of Alternative C (Preferred Alternative) would result in the approximate loss of 1.3 acres of piñon-juniper woodland, 1.9 acres of sagebrush shrubland, 2.4 acres of riparian woodland and shrub, and 1.3 acres of wetlands.

High numbers of roadkilled deer are observed in the vicinity of the Florida River. To prevent vehicle collisions with wildlife, US 160 would be fenced between MPs 93.4 [CR 222/CR 223 (west)] to MP 100 to funnel animals into a wildlife crossing under an approximate 220-foot wide multi-use bridge crossing at the Florida River. This crossing would replace the existing Florida River bridge, which has a smaller width and is inadequate for wildlife to cross under. Wildlife would use a 12 foot high by 60 foot wide area on the west side of the Florida River. Double cattle guards would be installed on CR 222 and CR 223 at the intersections of US 160 to prevent deer and elk from entering the ROW where the fence breaks to allow vehicle passage. Under this alternative, vehicle collisions with deer and elk, as well as other species, would be reduced due to the incorporation of wildlife exclusion fencing and wildlife crossings.

Alternative C (Preferred Alternative) could have temporary impacts to the aquatic resources of the Florida River during construction. These impacts could include short-term interruptions in flow and an increase in sedimentation, TSS, and total dissolved solids. However, once the construction phase is completed, the conditions should return to current levels.

The primary concern for aquatic resources in the Florida River during construction is siltation, which could impact the brown trout fishery. Brown trout spawn in the fall from late September through early November, with the females laying eggs in the stream bottom. Increased sedimentation could suffocate the eggs, decreasing survival of brown trout.

Increasing the turbidity of the stream during construction could provide additional habitat for whirling disease, which is caused by a protozoan associated with tubifex worms found in the sediment (Japhet 2000). Increased turbidity can cause increased sedimentation in downstream areas, thus increasing the potential for whirling disease.

4.11.4.2 Alternative A

Under Alternative A, there would be direct impacts to wildlife from the approximate loss of 2.5 acres of piñon-juniper woodland, 0.5 acre of sagebrush shrubland, 2.1 acres of riparian woodland and shrub, and 1.5 acres of wetland habitat.

Beneficial impacts from the implementation of wildlife crossings would be the same as described for Alternative C (Preferred Alternative). Impacts to fish inhabiting the Florida River under Alternative A would be the same as those described under Alternative C (Preferred Alternative).

4.11.5 Dry Creek and Gem Village Section

4.11.5.1 Alternative H (Preferred Alternative)

Implementation of the Preferred Alternative in the Dry Creek and Gem Village section would remove approximately 73.2 acres of piñon-juniper woodland, approximately 58.4 acres of sagebrush shrubland, approximately 0.5 acre of riparian woodland and shrub, and approximately 8.2 acres of wetlands.

Deer and elk currently incur major impacts from vehicle collisions west of the Florida River and west of the Narrow Gauge Trailer Park at MP 95.0. According to local experts, during a 1-month period in hunting season, it is common for 50 or more deer and elk to be killed from collisions with vehicles when attempting to cross US 160 in this area (MP 94.0 to 96.0) (Harrison 2000; Carron 2000). According to CDOT maintenance records of roadkilled deer and elk, hits are extremely high between approximately MPs 94.5 and 95.5 (CDOT 2005a). Wildlife crossings identified for conceptual design are located at 94.65 and 95.77. With the installation of wildlife crossings, there would be a decrease in impacts to the deer and elk populations from vehicle collisions in this section, especially with the addition of wildlife-exclusion fencing from MP 93.4 to MP 100, which would funnel animals into crossings.

Under Alternative H (Preferred Alternative), US 160 would be realigned south of the existing US 160 alignment, which would become an access road to Gem Village. Because of this realignment, wildlife would be required to cross two roads to access habitats on the north and south of the roadway, increasing chances of vehicle collisions. Several locations for wildlife crossings were identified on the realigned portion of US 160 along Dry Creek in the conceptual design. These crossings are currently proposed near locations where high numbers of deer and elk are killed by vehicles. Table 4.11.1, Wildlife Crossings, discusses these locations in more detail. Fencing would be required on both sides of US 160 for Alternative H (Preferred Alternative) to ensure that wildlife are funneled into those crossings.

No impacts are expected to fisheries resources under this alternative.

4.11.5.2 Alternative C

Under Alternative C, direct impacts to wildlife would result from the approximate loss of 70.6 acres of piñon-juniper woodland, 49.2 acres of sagebrush shrubland, 2.4 acres of riparian woodland and shrub, and 7.3 acres of wetlands.

Impacts to wildlife from mortality from vehicle collisions under Alternative C would be similar to those described for Alternative H (Preferred Alternative), though US 160 would not be realigned south of its existing location through Gem Village. Installing wildlife crossings at

suitable locations along the US 160 alignment would benefit wildlife due to a reduction in potential vehicle collisions.

No impacts are expected to fisheries resources under this alternative.

4.11.6 Bayfield Section

4.11.6.1 Alternative B (Preferred Alternative)

Implementation of Alternative B (Preferred Alternative) would result in the approximate loss of 9.9 acres of piñon-juniper woodland, 2.6 acres of sagebrush shrubland, 1.3 acres of riparian woodland and shrub, and 4.2 acres of wetlands.

High numbers of vehicle collisions with deer and elk occur at MPs 102.0 to 102.5, and 104.0 to 105. MPs 102.0 to 102.5 correspond with riparian habitat at the Los Pinos and Little Pine rivers in this section. In the Bayfield section, a wildlife crossing structure would be located at the Los Pinos River to replace the existing bridge; conceptual design has not been completed for this structure. With the installation of wildlife crossings, there would be a decrease in impacts to the deer and elk populations from vehicle collisions in this section, especially with the addition of wildlife-exclusion fencing from MP 101 to 102.5, which would funnel animals into crossings.

Under Alternative B, temporary impacts to the aquatic resources in the Los Pinos River are expected during construction. These impacts could include short-term interruptions in flow and an increase in sedimentation, TSS, and total dissolved solids. However, once construction is completed, the conditions should return to current levels.

The primary concern for the Los Pinos River during construction is siltation, which could impact the brown trout fishery. Brown trout spawn in the fall from late September through early November, with the females laying eggs in the stream bottom. Increased sedimentation could suffocate the eggs, decreasing survival of brown trout.

Increasing the turbidity of the stream during construction could provide additional habitat for whirling disease, which is caused by a protozoan associated with tubifex worms found in the sediment (Japhet 2000). Increased turbidity can cause increased sedimentation in downstream areas, thus increasing the potential for whirling disease.

4.11.6.2 Alternative A

Direct loss of wildlife habitat would result from removal of approximately 10.3 acres of piñon-juniper woodland, 2.6 acres of sagebrush shrubland, 1.3 acres of riparian woodland and shrub, and 5.0 acres of wetlands.

Impacts to wildlife from vehicle collisions would be the same as described for Alternative B (Preferred Alternative). Impacts to fish inhabiting the Los Pinos River under Alternative A would be the same as those described under Alternative B (Preferred Alternative).

4.11.7 Mitigation

A multi-species approach will be implemented for mitigation on US 160. This approach will help increase habitat connectivity and barrier permeability across the highway for ungulates, carnivores, and small- and medium-sized mammals.

Attempts to increase habitat connectivity and barrier permeability across road structures can be found in many road construction and upgrade projects. Current research is focused on increasing the effectiveness of wildlife crossings of roads and highways. Appropriate size and number of wildlife crossings will promote wildlife use in the project corridor. For example, smaller animals may prefer to use small crossing structures, such as culverts with an opening size of 3 to 5 feet. However, larger-bodied species, such as deer or elk, require significantly larger structures with enough height and width to allow natural vegetation, better sight distance, and natural lighting to reduce a "tunneling" effect that species may avoid (Ruediger 2000).

~~Culverts and single and multi span structures allow crossing for multiple species (ungulates, carnivores, and small- and medium-sized mammals). At riparian crossings, spanning or bridging will most effectively allow wildlife to cross adjacent to flowing water.~~ Because species do not function in isolation, but are dynamically linked to other species on a multiple spatial and temporal scale, a multi-species approach is needed in the mitigation process for wildlife crossings (Ruediger 2000).

~~Recent wildlife mortality studies have found that animals tend to use culverts and underpasses more frequently when the passages are in close proximity (500 to 1,000 feet apart). Furthermore, earthen ramps, berms, vegetation, and fencing have been proven successful in guiding animals to use underpasses (Clevinger and Waltho 1999). Wildlife underpasses should be constructed where data indicate the greatest probability for effective use.~~

~~To ensure that locations of wildlife crossings would be suitable in the future as development occurs and projects are designed and constructed in the project corridor, CDOT will continue to collect data on roadkilled wildlife to identify trends in locations of wildlife-vehicle collisions. Additionally, wildlife crossing locations may need to be reconsidered to account for developments that are ongoing or will occur in the future.~~

~~To reduce habitat fragmentation and impacts to smaller mammals, CDOT will install smaller (3- to 5-feet diameter culverts) every 500 to 1,000 feet. The precise locations of these smaller crossings would be decided prior to final design.~~

Ungulates and Large Mammals

Several types of crossing structures can be utilized to help deer and elk safely cross US 160, such as multi-span bridges, single-span bridges, and box culverts. Multiple factors determine the level of use of a crossing by ungulates, including: level of human activity, openness, and structure width (Clevenger and Waltho 2000). Research on underpasses has shown that ungulates are wary of structures lower than 8 feet high and narrower than 23 feet wide (Clevenger 1998). However, the openness of a structure is a more influential factor than size for an animal's choice to cross through an underpass. Openness is determined by the formula of height multiplied by width, then divided by length ([HxW]/L).

The larger the openness of a structure, the more likely an animal is to enter it. From an animal's perspective, the opening at the far end of an underpass appears smaller as the length increases, and the smaller the aperture of the opening appears, the less likely an animal is to enter it.

Current research on mule deer underpasses suggests that *minimum* dimensions for box culverts should be 8 feet high by 20 feet wide, with an openness factor of 2.65 feet (Gordon 2003). With the minimum dimensions for a box culvert at 8 feet in height by 20 feet wide, the length of the culvert should be no more than 60 feet long to maintain an appropriate openness factor. As the

length of the structure increases, the width and height should also proportionately increase to maintain an openness factor of 2.65 feet. Additionally, the openness factor should be increased to consider elk, which are larger and exhibit different behaviors than mule deer. ~~Since crossing structures should be as large as possible to promote animal use, the openness ratio for multi-species (deer and elk) use of culverts and bridges should be 2.0 for the US 160 project. At this ratio, with minimum dimensions for a box culvert at 12 feet in height by 24 feet wide, the length of the culvert should be no more than 140 feet long. As the length of the structure increases, the width and height should also proportionately increase.~~

The use of mechanically stabilized earth (MSE) walls within wildlife underpasses is not recommended for several reasons. The material properties of MSE cause noise vibrations from automobile traffic, which may deter animals. In addition, if the MSE wall does not continue to the top ceiling of the structure, animals will be wary of potential predators on the ledge created by the MSE wall (Dodd pers. communication 2005).

Fencing will be installed to help guide deer and elk to crossing areas until they adapt to using underpasses (Clevenger and Waltho 2000). Earthen ramps, berms, vegetation, and fencing have been proven successful in guiding animals to use underpasses (Clevenger and Waltho 1999). Fencing should only be used in conjunction with underpasses, and fenced areas will incorporate one-way earthen escape ramps to prevent animals from becoming trapped on the wrong side of the fence. Fencing will be maintained to assure that animals are not bypassing fences and creating hazardous situations inside the ROW. Additionally, crash gates or sections of removable fence will be installed between underpass locations to provide gaps in the fence in the event that an extreme weather event traps animals in areas where they can't access underpass locations. Fencing designed to channel mule deer and elk should be a minimum of 8 feet high.

Nineteen proposed multi-use crossing locations were identified during alternatives development based on the presence of natural drainages or other topographical features in the Grandview, Florida Mesa and Valley, and Dry Creek and Gem Village sections; one wildlife crossing, the Los Pinos River bridge, was identified during conceptual design in the Bayfield section. These crossing locations are shown in Figures 4.11.1 through 4.11.4. Several crossings have been located along the alignment for the conceptual design in the Grandview section under Alternative G Modified (Preferred Alternative); two of these structures are box culverts located on US 550, and the third is a bridge structure on US 160 near the start of the project.

Deer and elk do not cross roads at random locations; large animals tend to cross in clustered locations depending on local topography, vegetation, traffic speeds, and fence locations and types (Clevenger et al. 2002). CDOT roadkill location data were used to determine which of the suggested wildlife crossing locations coincide with existing crossing/mitigation routes along US 160. This information on the conceptual wildlife crossings, their dimensions (if determined), and suitability, are presented in Table 4.11.1, Wildlife Crossings.

To ensure that locations of wildlife crossings will be suitable in the future as development occurs and projects are designed and constructed in the project corridor, CDOT will continue to collect data on roadkilled wildlife to identify trends in locations of wildlife-vehicle collisions. The site-specific locations and type of crossing that will be constructed at each identified crossing location may be modified during the final design to account for new information. Information, such as continued CDOT vehicle collision mortality records, track surveys, and local development trends that affect habitat linkages along the roadside will provide sufficient information to install the

proposed wildlife crossings. ~~Linkage habitat that animals utilize on both sides of the highway can be determined through mapping vegetation, terrain, and drainages. Mapping patterns of human land use and settlement will ensure that commercial and residential planning decisions coincide with potential wildlife underpass locations. Deer and elk migration patterns and associated locations of high crossing frequency may change in response to future growth and development within the US 160 project corridor. Therefore, specific underpass locations will be decided during final design.~~ Once installed, the large multi-use wildlife crossing structures will be monitored for a minimum of 3 years post-construction to evaluate their effectiveness.

Small- to Medium-Sized Mammals and Herpetofauna

Culverts 3 to 5 feet in diameter will be installed to increase habitat connectivity and access across US 160 for small- to medium-sized mammals, such as rodents, lagomorphs, coyote, weasels, and foxes. These culverts will also increase habitat connectivity for herpetofauna (toads, frogs, lizards, etc.). Clevenger and Waltho (1999) found that small- and medium-sized mammals use various sized metal culverts to cross highways. ~~Culverts should range from 3 to 5 feet in diameter, which will accommodate small mammals (rodents and lagomorphs) and facilitate passage of medium-sized mammals, such as coyotes and foxes.~~ Culvert placement should include uplands with herbaceous cover, as well as drainages, and should be spaced every 500 to 1,000 feet in appropriate habitat to promote animal utilization. Recent wildlife mortality studies have found that animals tend to use culverts and underpasses more frequently when the passages are close (500 to 1,000 feet apart). Culverts should be partially buried to accommodate a natural substrate floor. The numbers and site-specific locations of culverts will be determined in consultation with CDOW as part of final design. Additionally, prior to each phase of construction, CDOT will coordinate with CDOW to identify specific areas along the highway that are particularly problematic crossing areas for small- to medium-sized mammals and herpetofauna. Appropriate fencing will be installed in these problem crossing areas to guide small mammals and herpetofauna to the culvert openings.

Raptors

All raptor species are protected under the MBTA, which prohibits removing or disturbing active nests except under permit from USFWS. A raptor nest survey has not been completed for US 160, but two likely active red-tailed hawk nests were observed during the summer of 1999, and other nests are likely to be present. Raptor nest surveys will be completed prior to start of construction to identify active nests and potential areas where seasonal restrictions on construction may be required. If nests are located in the study area, protective buffer zones will be established around active nests during construction to avoid disturbance to individual birds while nesting. CDOW recommended seasonal buffer zones for the species listed in Table 4.11.2, Seasonal Buffer Zones.

Table 4.11.2
Seasonal Buffer Zones

Species	Buffer	Timing
Golden eagle	1/4 mile	January 1 - July 15
Red-tailed hawk	1/3 mile	February 15 - July 15
Prairie falcon	1/2 mile	N/A
Northern goshawk	1/2 mile	March 1 - September 31

Specific buffer zones for Cooper's hawk, sharp-shinned hawk, great horned owl, and American kestrel, which also may nest within the project corridor, will be defined if nests are identified. Individual raptor perch trees and tall snags will be avoided to the extent possible, and raptor perch trees that are removed will be replaced at a 2:1 ratio, or as specified by state and federal wildlife agencies. Perch poles will be placed at a 1:1 ratio for raptor perch trees to mitigate for the temporary loss of perching opportunities until replacement perch trees mature.

Migratory Bird Treaty Act

Vegetation removal activities will be timed to the extent possible to avoid the migratory bird breeding season (April 1 through August 15). Areas that must be scheduled for vegetation removal between April 1 and August 15 shall be surveyed for nests and approved by a qualified biologist prior to the initiation of work. A migratory bird nest depredation permit under the MBTA shall be obtained (if necessary), or appropriate inactive nest removal and hazing/exclusion measures shall be incorporated into the work to avoid the need to disturb active migratory bird nests.

Any demolition or structural work on existing bridge structures (such as the Florida or Los Pinos rivers) may potentially destroy or disturb swallows or other birds nesting on the underside of the bridge. Demolition or structural work on existing bridge structures will be scheduled to the extent possible between August 16 and March 31 to avoid impacts to nesting swallows or other birds. If bridge work must begin after April 1, nest surveys will be conducted prior to April 1 to determine if inactive nests are present. Appropriate hazing/exclusion measures or inactive nest removal will be used prior to the nesting season if nests are present to ensure that no active nests are disturbed during demolition and construction activities.

Fisheries

Several proposed measures would ensure that sedimentation and siltation caused during the construction phase is reduced and water quality impact is limited. Also, several BMPs for sediment control and sediment reduction techniques will be incorporated into the alternatives. These mitigation measures are described in Section 4.8, Water Resources. Additional mitigation measures that should be implemented include:

- Construction equipment will not enter river channels from April 1 though June 30 and September 1 through November 30 to protect spawning fish and reduce the potential for whirling disease. This may not be required for the Florida Mesa and Valley section Alternative C (Preferred Alternative) because it is located farther from the Florida River.
- Any riparian vegetation removed as a part of the project will be replaced with similar vegetation.
- CDOT will delineate sensitive habitat after construction to avoid direct impacts from maintenance operations.
- BMPs will be implemented during project construction.

Under Colorado Senate Bill (SB) 40, CDOT is required to consult with CDOW on any project affecting streams, their banks, or tributaries. Minor projects that have little potential for impacts to fish or wildlife are covered under a programmatic SB 40 certification process that requires CDOW notification but does not require an application for certification.

The US 160 project, including the Preferred Alternatives and other action alternatives, would result in impacts that meet one or more of the criteria for individual (not programmatic) project certification. These criteria include, among others, permanent realignment of streams, impacts to habitat of federally listed endangered or threatened species, creation of new stream crossings, or filling of more than 0.5 acre of wetlands at a single location.

An individual application for SB 40 Wildlife Certification will be required, including detailed plans and specifications for each construction phase affecting streams or their banks. CDOW will review the plans to ensure they are technically adequate to protect and preserve fish and wildlife resources, and will provide recommendations or alternative plans if the planned project will adversely affect a stream.

4.12 THREATENED, ENDANGERED, AND SENSITIVE SPECIES

The potential impacts to threatened, endangered, candidate, and other sensitive species as a result of the US 160 highway improvements project are discussed in this section, as well as proposed mitigation measures.

CDOT requested an updated list of threatened and endangered species for La Plata County in March 2005. Previous species lists were obtained from USFWS on December 17, 1999 and February 7, 2003 (Appendix D, General Correspondence). A Biological Assessment (BA) was submitted to USFWS in conjunction with the US 160/US 550 EIS to comply with Section 7 ESA requirements regarding impacts to federally threatened, endangered, or candidate species in the project corridor. A Biological Opinion (BO) was received from USFWS on February 3, 2006. The BA and BO are included in Appendix H, Biological Assessment, Biological Evaluation, and Biological Opinion.

Species descriptions and biology were determined through literature searches. Appropriate agency representatives, field guides, and on-line World Wide Web sources, such as the Natural Diversity Information System, provided information on distributions and documented occurrences for federally listed species in La Plata County.

4.12.1 No Action Alternative

The No Action Alternative involves no changes to the existing highway alignment. Similar to those impacts described in Section 4.12.2, Impacts Common to All Action Alternatives, the No Action Alternative would have increased traffic density that is predicted with increased development in the region. This would increase the potential for vehicle collisions with deer, elk, and bald eagles that feed on roadkilled animals, and other smaller species of wildlife. Without wildlife underpass and deer fencing improvements, wider roadway shoulders, and improved sight lines, vehicle collisions with wildlife, including bald eagles, would increase under the No Action Alternative.

4.12.2 Impacts Common to All Action Alternatives

Impacts common to all action alternatives are discussed below by species. Only those species that would potentially be impacted by the project are discussed.

Southwestern Willow Flycatcher

Construction of US 160 may affect, and is likely to adversely affect, Southwestern willow flycatchers (state and federally listed as endangered) in the Bayfield section due to loss of breeding habitat and indirect disturbances that may result in nest abandonment. During presence/absence surveys conducted in 1998, 1999, and 2002, one Southwestern willow flycatcher was observed near the Los Pinos River on two occasions in 1998, and again on five separate occasions in 2002.

Bald Eagle

Bald eagles (state and federally listed as threatened) may be attracted to roadkilled wildlife, making them vulnerable to injury or death from vehicle collisions. However, the potential for vehicle collisions with bald eagles would decrease under any of the action alternatives, as wildlife crossings and deer fencing will be included in the highway design, decreasing animal vehicle collisions and the potential for bald eagles to feed on roadside carrion.

The known bald eagle winter roost/perch trees present near the Florida Canal and at the Florida and Los Pinos rivers may be impacted by noise and disturbance from construction activities. These disturbances may affect, but are unlikely to adversely affect, wintering bald eagles and/or individuals present in the project area during construction.

Mexican Spotted Owl

Habitats preferred by the Mexican spotted owl (state and federally listed as threatened), including large, steep canyons with old-growth mixed conifer forests and shady, cool canyons with piñon-juniper and old-growth Douglas fir, do not occur along the US 160 project corridor. Although Mexican spotted owls may use the periphery of the project area for foraging, no effects to this species are anticipated with implementation of any of the US 160 action alternatives.

Yellow-billed Cuckoo

Construction of US 160 may affect, but is unlikely to adversely affect, Yellow-billed cuckoos (a federal candidate species). Suitable habitat is restricted to cottonwood-willow riparian habitat greater than 37 acres in extent and less than 325 feet in width (Laymon and Halterman 1989). Suitable habitat occurs throughout the riparian woodlands of the Florida River and Los Pinos River. Road widening would remove approximately 2.1 acres of potential habitat within approximately 100 feet of the proposed ROW adjacent to the Florida River, and an additional 1.1 acres adjacent to the Los Pinos River. Surveys for the presence or absence of Yellow-billed cuckoo would be necessary to determine presence or absence of the bird in the project corridor prior to construction.

Construction activity occurring during the Yellow-billed cuckoo's breeding season (May 15 through August 31) may adversely impact breeding activities and nesting success by causing nest abandonment. The increased proximity of the road to the habitat may have the same effect in subsequent years following construction.

Western Burrowing Owl

Implementation of any of the US 160 action alternatives may impact burrowing owls (state listed as threatened) by eliminating nesting habitat or disturbing nesting activity if individuals are present in the project corridor during construction. Gunnison's prairie dog towns are considered potential habitat for burrowing owls, and several small prairie dog towns were observed along the entire corridor during site reconnaissance of the US 160 project corridor.

Colorado River Fish and Other Sensitive Fish

Colorado pikeminnow (state listed as threatened; federally listed as endangered) and razorback sucker (state and federally listed as endangered) are not present in habitat near the US 160 project corridor. However, water depletions to the San Juan River Basin, such as from Animas, Florida, or Los Pinos rivers, may adversely affect Colorado pikeminnow and razorback sucker occupying waters downstream.

Construction of the US 160 realignment would utilize approximately 44.42 acre-feet of water annually from the San Juan River Basin for fill compaction, dust suppression, and post-construction landscape establishment. Although any depletion would have some detrimental affect to the Colorado pikeminnow and razorback sucker inhabiting waters downstream in the San Juan River Basin, the 44.42 acre-feet depletion associated with this project fits within the depletion limits established by a 1999 Biological Opinion issued by USFWS. On May 21, 1999, USFWS issued a Biological Opinion determining that depletions of 100 acre-feet or less in the San Juan River Basin would not limit the provision of flows identified for the recovery of the Colorado pikeminnow and razorback sucker and, thus, not be likely to jeopardize the endangered fish species or result in the destruction or adverse modifications of their critical habitat. This Biological Opinion relies heavily on the Recovery Implementation Program (RIP) for Endangered Fish Species in the San Juan River Basin that was initiated in October 1992. The RIP was intended to provide mitigation and be the reasonable and prudent alternative to avoid jeopardy to the endangered fishes by depletions from the San Juan River. Provided that the RIP continues to be implemented and provide the flows identified for recovery in a timely manner, the action alternatives are not anticipated to ~~have an adverse affect on~~ jeopardize populations of Colorado pikeminnow and razorback sucker. FHWA will reinitiate Section 7 consultation with USFWS regarding the effects of the proposed project on the Colorado pikeminnow and razorback sucker if the RIP is no longer implemented.

Impacts to other sensitive fish, including bluehead sucker, Colorado River cutthroat trout, flannelmouth sucker (state listed as a species of special concern), and roundtail chub (state listed as a species of special concern), would be similar to those described above for Colorado pikeminnow and razorback sucker. None of the four sensitive fish species are known to occur directly in the project corridor, but occur in downstream waters.

Knowlton Cactus

The project may affect, but is not likely to adversely affect Knowlton cactus (federally listed as endangered). No populations are known to occur in the US 160 study area, however, suitable habitat for Knowlton cactus exists in the study area. Since construction activities are unlikely to begin for several growing seasons, there is a possibility that construction activities may affect Knowlton cactus.

River Otter

Construction of the US 160 realignment may affect, but is unlikely to adversely affect, river otters (state listed as endangered) that inhabit the vicinity of the Los Pinos River in the Bayfield section, as no alterations to water quality or stream flow are expected. Short-term impacts may occur as a result of disturbance from construction activity, which may displace individual otters from construction areas, but this is expected to be temporary and would not impact otter populations over the long term.

Sensitive Bats

Impacts to five sensitive bats that are associated with piñon-juniper habitat would consist primarily of habitat loss. The removal of piñon-juniper woodland would potentially affect Allen's big-eared bats, big free-tailed bats, Brazilian free-tailed bats, fringed myotis, and Townsend's big-eared bats (state listed as a species of special concern), if present in the project corridor. Yuma myotis may incur impacts from loss of riparian woodland and shrub habitat in the project corridor under any of the action alternatives. Impacts to these species from habitat loss would not affect populations as a whole, although loss of habitat may change distributions of individuals in localized areas where habitat is replaced with impervious surface.

Sensitive Birds

Adverse impacts to peregrine falcon (state listed as a species of special concern) are unlikely under any action alternative. Construction would not occur near aeries and would have minimal effects on prey base and hunting habitat within the project corridor.

Ferruginous hawks (state listed as a species of special concern) are unlikely to incur adverse impacts under any of the action alternatives. Construction of the US 160 alignment would cause only minimal habitat loss resulting in a reduction of potential hunting habitat and prey populations.

Impacts to western snowy plover (state listed as a species of special concern) and white-faced ibis, as a result of construction, are unlikely, as these species are rare migrants in the project corridor.

Sensitive Amphibians

Construction of any of the action alternatives would have minor adverse effects on both sensitive amphibian species, the northern leopard frog and the New Mexico spadefoot toad (both state listed as a species of special concern), if present in the project corridor. Leopard frogs may occur near areas with perennial water throughout the entire highway corridor. Construction activities would eliminate some potential habitat and could cause injury or death to frogs in the construction zone. The reduction in potential habitat and population would be minor compared to the amount of habitat available, and wetland mitigation would replace the lost habitat.

New Mexico spadefoot toads present in the construction zone may incur direct impacts from injury or mortality from crushing by equipment or earth-moving activities. Adverse effects to individuals would be localized and would not affect the overall population size.

Sensitive Plant Species

Implementation of any action alternative may adversely impact sensitive plant species by eliminating individuals and local populations, if they are present within the construction zone. Field surveys concluded there was a potential for occurrence of these species, even though they were not observed. Therefore, additional surveys should be completed during final design and appropriate mitigation should be developed if sensitive plant species are located in the project ROW.

BLM Sensitive Species

Allen's big-eared bats, big-free tailed bats, fringed myotis, Townsend's big-eared bat, and Yuma myotis may be present in the project area but are unlikely to be impacted by project construction due to their nocturnal habits. No roosting habitat for Allen's big-eared bats, big-free tailed bats, Townsend's big-eared bats, or fringed myotis is present in the project area, as these three species

tend to use caves and mines for roosting (Adams 2003). Yuma myotis may roost under bridges or in abandoned cliff swallow or other bird nests; therefore, any bridgework may potentially impact Yuma myotis maternal roosts. The loss of habitat for these bats would be minimal; loss of habitat may impact individuals of these bat species, but is not likely to result in a trend toward federal listing or a loss of viability in the planning area.

Peregrine falcons and ferruginous hawks may occur in the project only during foraging activities. Construction activities may displace individuals from the vicinity of construction. This displacement may indirectly impact individuals of these raptor species but is not likely to result in a trend toward federal listing or a loss of viability in the planning area.

Gray vireo, Lewis' woodpecker, pinyon jay, and Virginia's warbler may occur in the project area during nesting season. Impacts to individuals, eggs, or young may occur from nest disturbance or destruction during construction or from loss of habitat. Impacts from habitat loss are expected to be minimal, as the road will generally follow the existing 300-foot ROW in the BLM land parcels. Therefore, construction may impact individuals of these species but is not likely to result in a trend toward federal listing or a loss of viability in the planning area.

4.12.3 Grandview Section

4.12.3.1 Alternative G Modified (Preferred Alternative)

Southwestern Willow Flycatcher

Based on presence/absence surveys conducted in 2002, five areas of suitable Southwestern willow flycatcher habitat were identified in the Grandview section [Table 4.12.1, Direct Impacts to Suitable Southwestern Willow Flycatcher Habitat from Grandview Alternative G Modified (Preferred Alternative), and the habitat maps in Appendix H, Biological Assessment, Biological Evaluation, and Biological Opinion]. No individuals were observed or heard in these sites during presence/absence surveys, although breeding individuals may use this habitat in future years. Surveys are only valid for one year so breeding pairs not currently present may be present in future years. Removal of portions or all of these patches (in the Grandview section only) may affect, but is unlikely to adversely affect, Southwestern willow flycatchers due to the availability of undisturbed suitable breeding habitat in the area. Brief descriptions of these areas follow.

Table 4.12.1
Direct Impacts to Suitable Southwestern Willow Flycatcher Habitat From Grandview Alternative G Modified (Preferred Alternative)

Survey Area	Acres of Impact
A1	0.06
A2	3.52
A3	1.25
A4	0.21
B1	0.10
Subtotal	5.14

Survey Area A1 consists of one patch approximately 60 feet by 60 feet, which is dominated by sandbar willow (*Salix exigua*). The area is located due south of the existing US 160/US 550 (south) intersection at the base of Farmington Hill. This patch would be permanently removed by construction of Alternative G Modified (Preferred Alternative).

Survey Area A2 is a complex of patches consisting of a series of linear willow patches north of US 160 along Wilson Gulch, from the US 160/US 550 (south) intersection to just west of the US 160/CR 233 (west) intersection east of Grandview. Most of these patches measure up to 30 feet in width and are dominated by an understory of sandbar and other willows, and a cottonwood (*Populus* sp.) overstory. Large portions of this complex of patches would be permanently impacted by construction of Alternative G Modified (Preferred Alternative).

Survey Area A3 is located along a tributary to Wilson Gulch, both east and west of the US 160/CR 233 (west) intersection. The patches are linear and measure up to approximately 150 feet in width. Patches are dominated by sandbar willow with an overstory of cottonwood and Gambel oak (*Quercus gambelii*), which overhangs from adjacent upland areas. These patches would be permanently removed by construction of Alternative G Modified (Preferred Alternative).

Survey Area A4 is located south of US 160, just west of Silverview Lane. The survey area consists of one linear patch measuring approximately 40 feet in width and dominated by sandbar willow and cottonwood. This patch would be removed under Alternative G Modified (Preferred Alternative).

Survey Area B1 is located northeast of the SH 172/CR 234 intersection with US 160. This area consists of a single patch measuring approximately 50 feet by 30 feet and is dominated by sandbar willow. All of this patch would be removed for construction under Alternative G Modified (Preferred Alternative).

4.12.3.2 Alternative F Modified

Southwestern Willow Flycatcher

Impacts to Southwestern willow flycatcher under Alternative F Modified would be similar to the impacts under Alternative G Modified (Preferred Alternative), except that 0.17 acre less willow habitat would be impacted in Survey Area A2.

4.12.4 Florida Mesa and Valley Section

4.12.4.1 Alternative C (Preferred Alternative)

Bald Eagle

Construction of Alternative C (Preferred Alternative) may affect, but is unlikely to adversely affect, bald eagles. No known nests or communal roost sites would be impacted. Some known perch/roost habitat at the Florida River may be eliminated, as 2.1 acres of riparian woodland would be removed. This may change the local distribution of bald eagles, but would not reduce the size or overall distribution of the wintering population.

Southwestern Willow Flycatcher

Based on presence/absence surveys conducted in 2002, five areas of suitable Southwestern willow flycatcher habitat were identified in the Florida Mesa and Valley section [Table 4.12.2,

Direct Impacts to Suitable Southwestern Willow Flycatcher Habitat from Florida Mesa and Valley Alternative C (Preferred Alternative), and habitat maps in Appendix H, Biological Assessment, Biological Evaluation, and Biological Opinion.] Removal of portions or all of these patches (in the Florida Mesa and Valley section only) may affect, but is unlikely to adversely affect, Southwestern willow flycatchers due to the availability of undisturbed suitable breeding habitat in the area. No individuals were observed or heard in these sites during presence/absence surveys, although breeding individuals may use this habitat in future years. Brief descriptions of these areas follow.

Table 4.12.2
Direct Impacts to Suitable Southwestern Willow Flycatcher Habitat from Florida Mesa and Valley Alternative C (Preferred Alternative)

Survey Area	Acres of Impact
B2	0.00
B3	0.15
B4	0.08
B5	0.10
B6	2.12
Subtotal	2.45

Survey Area B2 is located along a fenceline, south of US 160, just west of the US 160 intersection with CR 222/CR 223 (west). This area is a complex of patches dominated by sandbar willow, consisting of several linear patches up to 30 feet in width. None of this complex would be permanently impacted by construction of Alternative C (Preferred Alternative).

Survey Area B3 is located south of US 160 at its intersection with CR 222/CR 223 (west). The area is one patch dominated by sandbar willow and measures approximately 100 feet by 120 feet. A portion of this patch would be removed under Alternative C (Preferred Alternative).

Survey Areas B4 and B5 are linear patches located north (B4) and south (B5) of US 160 along the McClure-Murray Ditch, east of CR 222 and CR 223. Both patches are dominated by sandbar willow and measure up to 30 feet in width. The majority of these patches would be removed under Alternative C (Preferred Alternative).

Survey Area B6 is located north and south of US 160 in the riparian woodland and shrub habitat at the Florida River. The area is dominated by an understory of sandbar and other willows and an overstory of cottonwoods. Portions of these patches would be removed for construction of Alternative C (Preferred Alternative). The habitat within Survey Area B6 conservatively includes all of the riparian habitat at this location, although only portions of it have a willow understory suitable for Southwestern willow flycatcher.

Yellow-billed Cuckoo

Under Alternative C (Preferred Alternative), construction of US 160 may affect, but is unlikely to adversely affect, Yellow-billed cuckoos due to the availability of undisturbed suitable riparian nesting habitat along the Florida River. Suitable habitat is restricted to cottonwood-willow riparian habitat greater than 37 acres in extent and less than 325 feet in width (Laymon and Halterman 1989). Suitable habitat occurs at the Florida River in the Florida Mesa and Valley

section. Road widening would remove approximately 2.1 acres of potential habitat within approximately 100 feet of the proposed ROW at this location. Surveys for the presence or absence of Yellow-billed cuckoo will be necessary to determine presence or absence of the bird in the project corridor prior to construction.

Construction activity occurring during the Yellow-billed cuckoo's breeding season (May 15 through August 31) may adversely impact breeding activities and nesting success by causing nest abandonment. The increased proximity of the road to the habitat may have the same effect in subsequent years following construction.

4.12.4.2 Alternative A

Bald Eagle

Impacts to bald eagles under Alternative A would be the same as under Alternative C (Preferred Alternative).

Yellow-billed Cuckoo

Impacts to Yellow-billed cuckoos under Alternative A would be the same as under Alternative C (Preferred Alternative).

Southwestern Willow Flycatcher

Impacts to Southwestern willow flycatcher under Alternative A would be 0.05 acre less than under the Preferred Alternative in the Florida Mesa and Valley section (see Table 4.12.3, Direct Impacts to Suitable Southwestern Willow Flycatcher Habitat from Florida Mesa and Valley Alternative A).

Table 4.12.3
Direct Impacts to Suitable Southwestern Willow Flycatcher Habitat from Florida Mesa and Valley Alternative A

Survey Area	Acres of Impact
B2	0.00
B3	0.10
B4	0.10
B5	0.10
B6	2.10
Subtotal	2.40

4.12.5 Dry Creek and Gem Village Section

4.12.5.1 Alternative H (Preferred Alternative)

Southwestern Willow Flycatcher

Implementation of Alternative H (Preferred Alternative) in this section would remove portions or entire patches of willows along Dry Creek identified as suitable habitat for breeding Southwestern willow flycatchers during 2002 presence/absence surveys (Sugnet 2002). Suitable habitat is located along an approximate 2-mile segment of Dry Creek, which includes where

US 160 would be realigned south of its existing location at Gem Village, as well as a patch on the eastern end of Gem Village, south of US 160. No individuals were observed or heard in these sites during presence/absence surveys, although breeding individuals may use this habitat in future years.

Based on presence/absence surveys conducted in 2002, seven areas of suitable Southwestern willow flycatcher habitat were identified in the Dry Creek and Gem Village section [Table 4.12.4, Direct Impacts to Suitable Southwestern Willow Flycatcher Habitat from Dry Creek and Gem Village Alternative H (Preferred Alternative) and the habitat maps in Appendix H, Biological Assessment, Biological Evaluation, and Biological Opinion]. Brief descriptions of these areas follow.

Table 4.12.4
Direct Impacts to Suitable Southwestern Willow Flycatcher Habitat from Dry Creek and Gem Village Alternative H (Preferred Alternative)

Survey Area	Acres of Impact
B7	0.43
B8	0.05
B9	0.00
C1	0.50
C2	0.00
D1	0.10
D2	0.12
Subtotal	1.20

Survey Area B7 is located north and south of US 160 at the Long Hollow crossing, east of the Florida River. The area is within a contiguous riparian area from approximately 30 feet to 60 feet wide. The area is dominated by sandbar willow, other willows, and cottonwoods. Portions of these patches would be removed under Alternative C (Preferred Alternative).

Survey Area B8 is located north of US 160 just west of the US 160/CR 223. B8 is a patch complex consisting of several 30 feet by 30 feet patches dominated by sandbar willow and other willow species. A small portion of this patch would be removed under Alternative H (Preferred Alternative).

Survey Area B9 is located north of US 160, just west of its intersection with Fox Fire Road. The area consists of several linear patches dominated by sandbar willow up to 30 feet in width. None of these patches ~~adjacent to the ROW may~~ would be removed under Alternative H (Preferred Alternative).

Survey Area C1 is a patch complex consisting of numerous patches measuring up to 50 feet in width and dominated by sandbar willow. The complex is located south of US 160 and runs along the Dry Creek drainage from Gem Village to approximately 1.3 miles to the west in this section. Portions of this patch complex would be removed for construction of Alternative H (Preferred Alternative).

Survey Area C2 is a single patch located south of US 160, on the eastern side of Gem Village. The patch is dominated by sandbar willow and measures approximately 30 feet by 30 feet. None of this patch would be removed under Alternative H (Preferred Alternative).

Survey Area D1 is located north of US 160, approximately 600 feet northeast of the US 160/US 160B (east) intersection. The area consists of a single patch dominated by sandbar willow and other willow species, and measures approximately 30 feet by 50 feet. A portion of this patch near the ROW would be impacted under the Preferred Alternative and the ROW would be directly adjacent to this patch.

Survey Area D2 is located south of US 160B, just east of the US 160/US 160B (east) intersection. The area is a single linear patch dominated by sandbar willow and measures approximately 30 feet in width. A portion of this patch would be directly impacted by construction of Alternative H (Preferred Alternative).

Due to the loss of suitable undisturbed breeding habitat in the area, construction of the Preferred Alternative in the Dry Creek and Gem Village section may affect, but is not likely to adversely affect, Southwestern willow flycatchers through loss of habitat or disturbance to breeding individuals.

4.12.5.2 Alternative C

Southwestern Willow Flycatcher

Alternative C would have 0.16 acre less impact to Southwestern willow flycatcher habitat than the Preferred Alternative because Alternative C would follow the existing US 160 alignment through Gem Village (Table 4.12.5, Direct Impacts to Southwestern Willow Flycatcher Habitat from Dry Creek and Gem Village Alternative C). The corresponding portion of the Preferred Alternative would remove riparian habitat (willows) along Dry Creek that are suitable breeding habitat for Southwestern willow flycatchers. However, Alternative C would remove portions of willow patches from survey area C2 as well. Implementation of Alternative C in the Dry Creek and Gem Village section may affect, but is unlikely to adversely affect, Southwestern willow flycatchers due to the availability of suitable undisturbed breeding habitat in the area.

Table 4.12.5
Direct Impacts to Suitable Southwestern Willow Flycatcher Habitat from Dry Creek and Gem Village Alternative C

Survey Area	Acres of Impact
B7	0.43
B8	0.05
B9	0.00
C1	0.32
C2	0.04
D1	0.10
D2	0.10
Subtotal	1.04

4.12.6 Bayfield Section

4.12.6.1 Alternative B (Preferred Alternative)

Bald Eagle

Construction of Alternative B (Preferred Alternative) may affect, but is unlikely to adversely affect, bald eagles. No known nests or communal roost sites at the Los Pinos River would be impacted by the project; however, approximately 1.1 acres of riparian woodland that contain suitable perching trees would be removed near the Los Pinos River in the Bayfield section. This may change the local distribution of bald eagles, but would not reduce the size or overall distribution of the wintering population.

River Otter

Alternative B may affect, but is unlikely to adversely affect, river otters that inhabit the vicinity of the Los Pinos River in the Bayfield section, as no alterations to water quality or stream flow are expected. Short-term impacts may occur as a result of disturbance from construction activity, which may displace individual otters from construction areas, but this is expected to be temporary and would not impact otter populations over the long term.

Southwestern Willow Flycatcher

Construction of Alternative B in the Bayfield section may affect, and is likely to adversely affect, Southwestern willow flycatchers due to a loss of breeding habitat and indirect disturbances to individuals that may result in nest abandonment. During presence/absence surveys conducted in 1998, 1999, and 2002, one Southwestern willow flycatcher was observed on two occasions in 1998, and again on five separate occasions in 2002 in survey area D5 as described below [Table 4.12.6, Direct Impacts to Suitable Southwestern Willow Flycatcher Habitat from Bayfield Alternative B (Preferred Alternative), and habitat maps in Appendix H, Biological Assessment, Biological Evaluation, and Biological Opinion].

Table 4.12.6
Direct Impacts to Suitable Southwestern Willow Flycatcher Habitat
From Bayfield Alternative B (Preferred Alternative)

Survey Area	Acres of Impact
D3	0.00
D4	0.61
D5	0.00
D6	0.21
P1	0.29
P2	0.00
P3	0.17
P4	0.00
P5	0.11
Subtotal	1.39

Survey Area D3 is located just west of the US 160/CR 506 intersection. The area consists of two linear patches bisected by CR 506, which may measure up to 30 feet in width if measured as a single unit. The area is dominated by sandbar willow and other willow species, as well as cottonwood. No individuals were observed or heard in these sites during presence/absence surveys, although breeding individuals may use this habitat in future years. These patches would not be impacted by Alternative B (Preferred Alternative).

Survey Area D4 is a complex of patches of various sizes located adjacent to the Los Pinos River northeast of the US 160 bridge over the river. The patches are dominated by willow and cottonwood species. No individuals were observed or heard in these sites during presence/absence surveys, although breeding individuals may use this habitat in future years. A small portion of one of these patches ~~located adjacent to the river~~ would be impacted by bridge construction for Alternative B (Preferred Alternative); however, the majority of these patches would not be disturbed.

Survey Area D5 is located north of US 160 and is approximately 600 feet east of the Los Pinos River. The patch is linear and runs along an unnamed natural stream channel used for irrigation. Patches range in size from 30 feet to 60 feet in width and are dominated by sandbar willow. A single Southwestern willow flycatcher was observed at this survey area in 1998 and multiple times in 2002 surveys, and it is therefore considered occupied habitat (Sugnet 2002).

The riparian willow shrub habitat at this location would not be directly impacted by the project. However, road widening would remove meadow, riparian woodland, and wetlands from within 100 feet of the occupied habitat, which may serve as a screen or buffer for breeding individuals from traffic noise and activity. Therefore, individual Southwestern flycatchers may incur indirect impacts from construction.

Survey Area D6 is located north and south of US 160 where it crosses an unnamed tributary of Beaver Creek in the eastern portion of the Bayfield section. No individuals were observed or heard in these sites during presence/absence surveys, although breeding individuals may use this habitat in future years. Portions of these patches ~~located adjacent to the ROW~~ would be impacted under Alternative B (Preferred Alternative).

A BA will be submitted to USFWS in conjunction with the US 160/US 550 EIS to comply with Section 7 ESA requirements regarding the indirect impacts to Southwestern willow flycatchers in the project corridor.

Four additional patches were identified and discussed in the *Eight Corners BA* (Sugnet 2001). No Southwestern willow flycatchers were observed in these patches, and surveys were not conducted. The *Eight Corners BA* determined that the proposed Eight Corners project "may affect, and is likely to adversely affect, Southwestern willow flycatcher territories" (Sugnet 2001). The four patches considered in the *Eight Corners BA* are as follows:

- Patch 1 is located west of CR 501, north of US 160, and is a complex of willow stands that would ~~not~~ be directly impacted by proposed construction activities. ~~However, riparian habitat would be removed from the north side of US 160, which may serve as a screen or buffer to flycatcher habitat from the traffic noise and activity.~~
- Patch 2 is located north of US 160 and west of the US 160B/CR 501 intersection and measures 80 feet by 7 feet. This patch would not be directly impacted by Alternative B (Preferred Alternative).

- Patch 3 is located directly east of the US 160B/CR 521 intersection. Several of these patches of suitable Southwestern willow flycatcher habitat at the US 160B/CR 521 intersection would be removed under Alternative B (Preferred Alternative).
- Patches 4 and 5 are located directly north of US 160 and east of CR 501. The westernmost willow carr, Patch 4, measures 18 feet by 500 feet. The easternmost willow carr, Patch 5, measures 20 feet by 200 feet. Portions of these patches would be removed under Alternative B (Preferred Alternative).

The proposed US 160 improvements under Alternative B (Preferred Alternative) would not result in direct impacts to the Southwestern willow flycatcher because no habitat would be removed that, as of 2002, was used by breeding individuals. However, the implementation of Alternative B (Preferred Alternative) in the Bayfield section project may affect, and is likely to adversely affect, the species indirectly through loss of suitable breeding habitat that could be used by breeding pairs in the future. During the Southwestern willow flycatcher breeding season, construction activity may indirectly affect breeding activities and nesting success by causing nest abandonment. As a result of road widening, the road would be closer to the occupied habitat or patches that may be used in the future, which may cause disturbance to breeding individuals in subsequent years following construction.

In a May 2001 *Biological Opinion to the Eight Corners BA*, USFWS concurred with the FHWA determination that the Eight Corners project is likely to adversely affect the Southwestern willow flycatcher (Carlson 2001).

Yellow-billed Cuckoo

The riparian woodland habitat adjacent to the Los Pinos River is considered marginally suitable for Yellow-billed cuckoo due to its small size. The loss of 1.1 acres of this habitat adjacent under this alternative represents a loss of habitat, but is unlikely to adversely affect Yellow-billed cuckoos in the project corridor.

4.12.6.2 Alternative A

Bald Eagle

Impacts to bald eagle perch/roost habitat at the Los Pinos River would be the same as described under Alternative B (Preferred Alternative).

River Otter

Impacts to river otters inhabiting the Los Pinos River would be the same as described under Alternative B (Preferred Alternative).

Southwestern Willow Flycatcher

Alternative A would have similar, but 0.29 acre less, impacts to Southwestern willow flycatchers as the Preferred Alternative (Table 4.12.7, Direct Impacts to Suitable Southwestern Willow Flycatcher Habitat from Bayfield Alternative A). However, the location of CR 501 under Alternative A would be west of the Alternative B (Preferred Alternative) alignment and would require additional removal of riparian woodland and shrub habitat that may serve as a buffer to traffic-related noise and activity from suitable Southwestern willow flycatcher habitat. Similar to Alternative B (Preferred Alternative), implementation of Alternative A may affect, and is likely to adversely affect, Southwestern willow flycatchers in the Bayfield section as a result of

loss of habitat and potential disturbance to nesting individuals during and/or following construction.

Table 4.12.7
Direct Impacts to Suitable Southwestern Willow Flycatcher Habitat from Bayfield Alternative A

Survey Area	Acres of Impact
D3	0.00
D4	0.61
D5	0.00
D6	0.21
P1	0.01
P2	0.05
P3	0.00
P4	0.08
P5	0.14
Subtotal	1.10

Yellow-billed Cuckoo

Impacts to Yellow-billed cuckoos from loss of riparian woodland habitat at the Los Pinos River would be the same as described under Alternative B (Preferred Alternative).

4.12.7 Mitigation

The following mitigation actions will be implemented.

Bald Eagle

Raptor nest surveys will be conducted within 0.5 mile of the construction area prior to starting construction of specific highway segments. If an active or inactive nest is identified, a 0.5-mile buffer will be required around the nest, and seasonal restrictions on construction in the area will be implemented. Seasonal restrictions will coincide with the bald eagle breeding season (November 15 to July 31), and no human encroachment will occur within the 0.5-mile radius of the nest between these dates.

Nocturnal roost surveys will be conducted within 0.25 mile of the construction area prior to starting construction on specific highway segments. Construction activity will be restricted within 0.25 mile of active nocturnal roost sites between November 15 and March 15, if bald eagles are present.

Perch and roost trees removed during construction will be replaced at a 2:1 ratio with an appropriate tree species, such as cottonwood.

Southwestern Willow Flycatcher

In its response to the 1998 Southwestern willow flycatcher survey report, USFWS recommended that road widening should not occur any closer to the flycatcher's habitat in the Bayfield section,

and that surveys should be conducted annually prior to construction to determine whether seasonal restrictions on construction activity will need to be applied in that area (Sugnet 1998).

Surveys for presence/absence on Southwestern willow flycatcher will be conducted annually of all potential habitats prior to constructing specific highway segments. Minimum patch size dimensions for willow stands capable of supporting nesting Southwestern willow flycatchers are 30 feet in width and length, and 6 feet in height.

Surveys will be required to determine presence or absence of Southwestern willow flycatchers if habitat will be affected or when construction will occur within 0.25 mile of affected habitat. In addition, since the duration of construction is estimated at or beyond 15 years, surveys will be required for Southwestern willow flycatchers prior to construction of each particular segment of roadway.

Seasonal restrictions will be implemented on construction activities to avoid taking habitat between May 1 and August 15. Buffers will be required around active nest areas or within 0.25 mile of an occupied habitat (Powell 2003). During and after construction, CDOT will delineate sensitive habitats to avoid direct impacts from maintenance activities.

Construction activities that begin in an area prior to May 1 in documented previously unoccupied habitat will not adversely affect Southwestern willow flycatcher nesting location choice. To minimize potential impacts to breeding birds, USFWS requires removal of documented previously unoccupied suitable willow nesting habitats located within proposed disturbance areas outside of the breeding season (between May 1 and August 15).

Direct impacts to occupied Southwestern willow flycatcher habitat will be avoided. If occupied habitat will be impacted, habitat enhancement or other mitigation as determined through consultation with USFWS will be implemented. Additional mitigation requirements will be determined during formal ESA Section 7 consultation.

Yellow-billed Cuckoo

Surveys will be conducted annually for two years prior to each phase of construction to confirm presence or absence of Yellow-billed cuckoos in potential habitats along the Los Pinos and Florida rivers. Surveys for Yellow-billed cuckoo will follow protocol outlined by Arizona Game and Fish (Corman and Magill 2000; Powell 2003).

If surveys determine Yellow-billed cuckoos are present, seasonal restrictions will be implemented on construction activities to avoid removing nesting habitat or disturbing nesting Yellow-billed cuckoos (May 1 to September 15). Buffers will be required around active nest areas or within 0.25 mile of habitat (Powell 2003). CDOT will coordinate with USFWS and CDOW to determine an appropriate buffer distance from an active nest. Construction activities that begin in an area prior to May 1 will not adversely affect Yellow-billed cuckoo nesting location choice.

Western Burrowing Owl

Surveys for burrowing owl will be conducted annually in suitable habitat prior to each construction phase. Seasonal restrictions on construction activities will be implemented to avoid taking occupied nesting habitat from April 15 through July 15. A 225-foot buffer will be required around active nest areas (Craig 2001). If surveys located an active burrowing owl nest but construction will not begin within one year, then additional surveys (in the appropriate survey season) are necessary prior to construction.

Knowlton Cactus

During final design, annual field surveys will be conducted in suitable habitat for Knowlton cactus to document any individuals or populations and to avoid impacts to Knowlton cactus, if present. If documented individuals or populations cannot be avoided, consultation with USFWS will be reopened to address impacts to this species. If construction will not begin within one year of the previous survey for this species, then an additional survey is necessary prior to construction.

BLM Sensitive Species

To mitigate potential impacts to roosting Yuma myotis, surveys should be conducted by a qualified biologist for roosting bats under bridges and in cliff swallow or other bird nests prior to initiation of any bridge work. If roosting Yuma myotis are present, CDOT will coordinate with BLM to develop a mitigation strategy for the species.

The BLM uses the USFWS BCC list to determine the dates that nesting species may be present. However, CDOT date standards to comply with the MBTA will provide sufficient protection for BLM and BCC species.

Vegetation removal activities will be timed to the extent possible to avoid the migratory bird breeding season (April 1 through August 15) in order to protect gray vireo, Lewis' woodpecker, pinyon jay, and Virginia's warbler, if nesting in the project area. Areas that must be scheduled for approved vegetation removal between April 1 and August 15 shall be surveyed for nests and cleared by a qualified biologist prior to the initiation of work. A migratory bird nest depredation permit under the MBTA shall be obtained (if necessary), or appropriate inactive nest removal and hazing/exclusion measures shall be incorporated into the work to avoid the need to disturb active migratory bird nests.

4.12.7.1 Sensitive Animal Species

As discussed in Section 3.7, Wetlands, wetlands will be replaced to mitigate lost northern leopard frog and New Mexico spadefoot toad habitat.

4.12.7.2 Sensitive Plant Species

During final design, field surveys will be conducted in sagebrush shrubland and piñon-juniper habitats for Arboles milkvetch, Aztec milkvetch, Pagosa phlox, and showy collomia to avoid impacts to these species, if present. If a species is present and construction will not begin within one year of the previous survey for these species, then additional surveys are necessary prior to construction.

Surveys for green sedge, Philadelphia fleabane, and wood lily should be combined with any subsequent wetland work completed for the project. If present, impacted individuals of these plant species could be replaced in wetland mitigation areas.

Appropriate mitigation actions should then be taken to avoid or minimize impacts to any sensitive plant populations found in surveys.

4.13 HISTORIC PRESERVATION

4.13.1 No Action Alternative

The No Action Alternative would have no impacts on any historic properties.

4.13.2 Impacts Common to All Action Alternatives

Based on conceptual design (including the proposed limits of construction), direct impacts to historic and archaeological properties were identified for each alternative carried forward. Impacts only to those sites that are eligible or may be eligible (i.e., sites identified as needing additional data) for the NRHP have been identified. Table 4.13.1, Number of Historic Properties Impacted by All Action Alternatives, shows the total number of historic properties or segments of linear sites that would be impacted by all action alternatives.

Table 4.13.1
Number of Historic Properties Impacted by All Action Alternatives

Section	Impacts		
	Historic Resources	Archaeological Resources	Total
Grandview	8	0	8
Florida Mesa and Valley	3	0	3
Dry Creek and Gem Village	3	1	4
Bayfield	7	0	7

Although Table 4.13.1 is useful in showing the overall impacts that all of the alternatives would have on historic properties, it does not provide information on the specific types of resources affected or the degree to which they would be impacted. Table 4.13.2, Specific Impacts to Historic Properties by All Action Alternatives, provides details on the impacts that would occur under all action alternatives.

Table 4.13.2
Specific Impacts to Historic Properties by All Action Alternatives

Section	Subsection	Impacts
Grandview	US 550 -CR 220 to US 160	• 5LP1131.8 – multiple areas of this railroad segment would be impacted; Alternative F Modified would impact about 800 feet, while Alternative G Modified would impact about 2,822 feet. • 5LP5661.X – 1,500 feet of this ditch will be impacted by Alternative F Modified.
	US 160-US 550 (south) to CR 232 (east)	• 5LP1131.8 – about 50 feet of this railroad segment would be impacted by both action alternatives.
	US 160-CR 232 (east) to SH 172/CR 234	• 5LP1131.8 – multiple areas of this railroad segment would be impacted; about 2,030 feet of this railroad segment would be impacted by both action alternatives. • 5LP5661.2 – multiple areas of this ditch segment would be impacted; one impact area was realigned during the 1960s highway construction; about 405 feet of this ditch segment would be impacted by both action alternatives.

Table 4.13.2
Specific Impacts to Historic Properties by All Action Alternatives

Section	Subsection	Impacts
	US 160-SH 172/CR 234 intersection	• No impacts to any known historic properties.
Florida Mesa and Valley	US 160-SH 172/CR 234 to west of CR 222/CR 223 (west)	• 5LP5661.1 – new crossings would be required over this ditch segment adjacent to the existing highway crossing. • 5LP5662 – new crossings would be required over this canal segment adjacent to the existing highway crossing.
	US 160-West of CR 222/CR 223 (west) to east of Florida River	• 5LP5663 – the existing culvert and roadway berm would be extended over this ditch segment adjacent to the highway; about 675 feet of this ditch segment would be impacted by Alternative C, while about 750 feet would be impacted by Alternative A.
Dry Creek and Gem Village	US 160-East of Florida River to Gem Village	• 5LP5664 – new crossings would be required over this ditch segment adjacent to the existing highway crossing.
	US 160-Gem Village	• 5LP5658.3 – impact area of this ditch segment was rebuilt during the 1960s highway construction; about 276 feet would be impacted by Alternative C, while about 463 feet would be impacted by Alternative H. • 5LP5677 – a portion of this archaeological site would be disturbed; about 21 percent of this site would be impacted by Alternative C, while about 60 percent would be impacted by Alternative H.
Bayfield	US 160-Bayfield	• 5LP5658.1 – new crossings would be required over this ditch segment adjacent to the existing highway crossing. • 5LP5658.2 – impact area of this ditch segment was realigned during the 1960s highway construction. • 5LP5659.2 – the 1960s pipe crossing over the existing highway would need to be rebuilt and extended. • 5LP5659.3 – a new crossing over this ditch, adjacent to an existing county road, would be required. • 5LP5659.4 – a new crossing over this ditch, adjacent to an existing county road, would be required. • 5LP5665 – the 1960s box culvert under the highway would need to be rebuilt and extended. • 5LP5666 – the 1960s siphon under the highway would need to be rebuilt and extended.

The abandoned grade of the Denver & Rio Grande Railroad (5LP1132.8) would be impacted by the action alternatives in multiple areas (Figure 5.3.1, Section 4(f) Impacts: Grandview Section). The remnants of this railroad extend for several miles within La Plata County and beyond. The portions of it adjacent to the US 160 project corridor have been subjected to numerous impacts from highway and secondary road construction, residential development, erosion, neglect, and natural deterioration. Segments of this railroad that exist outside the US 160 project corridor are better preserved. Although there would be impacts to small sections of the railroad grade, it is not enough to have a detrimental effect on the overall integrity of this resource, and therefore, would cause no adverse effect. Part of the proposed shared use path would run along the abandoned railroad grade. FHWA, ACHP, and the National Council of State Historic Preservation Officers have agreed that conversion of abandoned railroad corridors to trails is an appropriate reuse of such facilities. This is codified in a Programmatic Agreement among these parties that was signed on May 1, 1997.

All of the ditches have several things in common. They have all been determined eligible for the NRHP under criterion (a), on the basis of their associations with significant events, specifically irrigation's role in promoting agriculture and settlement in the region. They all have been in continuous use and subject to various undocumented upgrades and modifications, as well as the documented changes associated with the construction of the existing highway in the early 1960s. Only open, unlined segments of ditch are crossed, and no features other than those built in association with the highway construction in the 1960s are involved. Only small portions of relatively long linear resources would be affected. The ditches, as they are crossed by the existing highway and other roads throughout their courses, were accepted with these prior impacts by SHPO as being eligible. Therefore, a minor impact to this type of resource is considered an integral part of the natural progression of the use of these resources over time.

Four different types of impacts would occur to the ditches:

1. New or widened crossings in areas where the ditch is currently crossed by the existing highway and where highway construction in the 1960s included substantial realignment of the ditch at that time.
2. New or widened crossings in areas where the ditch is currently crossed by the existing highway and where highway construction in the 1960s did not include realignment of the ditch at that time.
3. Areas where a ditch would be crossed in a completely new location adjacent to a county road.
4. Areas where a ditch parallel to the highway would be impacted by the laying back of slopes below the ditch.

The current ditch crossings by the existing highway were built in the 1960s during construction of the present highway. Therefore, these features should appropriately be considered elements of the highway rather than the ditches. Replacement and/or renovation of these crossings in the same place should have no adverse effect to the historic resource, since the existing crossing has already impacted the historic value of the resource. As long as the new impacts are restricted to the realigned portion of the ditch, the same rationale would apply to those ditches realigned during the highway construction, since the realignment would have already impacted the historic value of the resource in these areas.

Where an existing crossing needs to be widened, or a second crossing added to support additional travel lanes, it is presumed that previously unaffected portions of the ditch would be impacted. However, only a small portion of relatively long linear resources would be impacted in an area adjacent to previous roadway impacts, and this would not adversely affect the historic value of the resource. Any new crossings in areas previously not crossed by roadway, but adjacent to existing county roads or realigned during previous roadway construction, and any impacts to ditch segments parallel to the roadway that were not previously impacted, would also constitute no adverse effects because only small portions of a large resource would be impacted.

One archaeological site (5LP5677) in the Dry Creek and Gem Village section would be impacted by both alternatives. The site could not be evaluated based on the surface materials alone and has been determined as needing additional data to evaluate its NRHP eligibility. It appears that impacts to this site cannot be avoided. Assuming that it is determined to be eligible after it is tested, then data recovery prior to construction would be the required mitigation measure.

According to the Section 106 implementing regulations (36 CFR 800), data recovery is an adverse effect.

It should be noted that a formal concurrence of No Adverse Effect for all the NRHP-eligible sites was provided by SHPO on December 17, 2001 in response to a letter from CDOT dated December 6, 2001 (see Appendix E, Historic Preservation Correspondence), with the exception of Site 5LP6490, which was provided by SHPO on July 29, 2003 in response to a letter from CDOT dated July 25, 2003 (see Appendix E, Historic Preservation Correspondence). Additional surveys performed in the fall of 2005 found no additional properties. A letter concurring with this finding was received from SHPO on November 17, 2005 (see Addendum to Appendix E, Historic Preservation Correspondence).

4.13.3 Grandview Section

4.13.3.1 Alternative G Modified (Preferred Alternative)

In addition to the impacts common to all action alternatives (see Section 4.13.2, Impacts Common to All Action Alternatives), this alternative would impact site 5LP1131.8, an abandoned railroad grade, in six different areas. Approximately 4,902 feet of this site would be impacted, which constitutes about 15.5 percent of its total length in La Plata County. Site 5LP5661, the Florida Farmers' Ditch, would be impacted in two different locations by this alternative. In one of these locations, the ditch was previously realigned during the original construction of US 160 in the 1960s. The other location would be new crossings of this ditch. Approximately 405 feet of this site would be impacted, which constitutes approximately 1.1 percent of its total length.

4.13.3.2 Alternative F Modified

In addition to the impacts common to all action alternatives (see Section 4.13.2, Impacts Common to All Action Alternatives), this alternative would impact site 5LP1131.8, an abandoned railroad grade, in five different areas. Approximately 2,879 feet of this site would be impacted, which constitutes about 9.1 percent of its total length in La Plata County. Site 5LP5661, the Florida Farmers' Ditch, would be impacted in three different locations by this alternative. In one of these locations, the ditch was previously realigned during the original construction of US 160 in the 1960s. The other two locations would include new crossings of this ditch. Approximately 1,905 feet of this site would be impacted, which constitutes approximately 5.2 percent of its total length.

4.13.4 Florida Mesa and Valley Section

4.13.4.1 Alternative C (Preferred Alternative)

In addition to the impacts common to all action alternatives (see Section 4.13.2, Impacts Common to All Action Alternatives), this alternative would impact approximately 675 feet of the McCluer/Murray Ditch (Site 5LP5663) at one location, which constitutes about 5.1 percent of the total length of the ditch.

4.13.4.2 Alternative A

In addition to the impacts common to all action alternatives (see Section 4.13.2, Impacts Common to All Action Alternatives), this alternative would impact approximately 750 feet of the McCluer/Murray Ditch (Site 5LP5663) at one location, which constitutes about 5.7 percent of the total length of the ditch.

4.13.5 Dry Creek and Gem Village Section

4.13.5.1 Alternative H (Preferred Alternative)

In addition to the impacts common to all action alternatives (see Section 4.13.2, Impacts Common to All Action Alternatives), this alternative would impact Site 5LP5658.3, the King Ditch, in two areas. Approximately 463 feet of this ditch would be impacted, which constitutes about 1.2 percent of its total length. Approximately 0.54 acre of archaeological site 5LP5677 would be impacted, which constitutes about 62.5 percent of the total site area.

4.13.5.2 Alternative C

In addition to the impacts common to all action alternatives (see Section 4.13.2, Impacts Common to All Action Alternatives), this alternative would impact Site 5LP5658.3, the King Ditch, in one area. Approximately 277 feet of this ditch would be impacted, which constitutes about 0.7 percent of its total length. Approximately 0.18 acre of archaeological site 5LP5677 would be impacted, which constitutes about 20.8 percent of the total site area.

4.13.6 Bayfield Section

4.13.6.1 Alternative B (Preferred Alternative) and Alternative A

Alternative B (Preferred Alternative) and Alternative A would have the same impacts on cultural resources as those discussed in Section 4.13.2, Impacts Common to All Action Alternatives.

4.13.7 Mitigation

Coordination regarding impacts to historic properties as a result of constructing the Preferred Alternatives or other action alternatives has been conducted by CDOT with the appropriate agencies, including SHPO, BLM, and SUIT. SHPO concurred with CDOT's determination of effects on significant cultural resources in December 2001. Based on consultations with these agencies, the following mitigation measures will be employed to minimize impacts to cultural resources:

- Once the final design is completed, CDOT will ensure that the area not surveyed due to lack of landowner access permission during the initial fieldwork will be subjected to an intensive pedestrian survey prior to construction in that area. If new resources are discovered during this survey, they will be evaluated in consultation with SHPO. If any newly discovered resources are determined eligible for the NRHP, then appropriate mitigation measures will be developed in consultation with SHPO and the tribes, and implemented prior to construction in those areas.
- If during construction new historic sites are identified on BLM lands, they will be evaluated in consultation with BLM, SHPO, and the tribes. If any newly discovered resources are

determined eligible for the NRHP, then appropriate mitigation measures will be developed in consultation with SHPO and BLM if these resources are on lands that they administer, and implemented prior to construction in those areas.

- Coordination between CDOT and representatives of SUIT will continue regarding potential medicinal plant locations and regarding Site 5LP2223. The tribe identified no other areas of cultural concern. Because all alternatives avoid site 5LP2233, a site visit will not be necessary. If conditions change, additional coordination among FHWA, CDOT, and SUIT will commence.
- Although no adverse effects to historic sites are anticipated, some impacts to the ditches that would be crossed by the proposed project would occur. To mitigate these impacts in general, a public information notice is proposed. This will consist of a one-page, tri-fold interpretative brochure that provides background on the role of irrigation in the settlement of the region, a map showing the irrigation ditches crossed by the highway, and a brief history of each ditch.
- Ditch segment 5LP5661.X and part of segment 5LP5661.2 in the Grandview section, part of segment 5LP5658.3 in the Dry Creek and Gem Village section, and segments 5LP5659.3 and 5LP5659.4 in the Bayfield section would be crossed by completely new roadway crossings adjacent to existing roadways. To mitigate these impacts, these ditch segments will be recorded prior to construction so there will be a permanent record of their present appearance and history. Recordation will consist of Colorado SHPO Level II documentation, including black and white photographs and a brief narrative history of the ditches. SHPO will be provided with an opportunity to review design plans for new ditch crossings to ensure that the impact is minimized.
- Data recovery will take place for the impacted areas of any sites that are determined to be eligible as a result of additional testing (see next bulleted item). All data recovery will be subject to a data recovery plan and MOA between FHWA and SHPO.
- The one impacted archaeological site (5LP5677) in the Dry Creek and Gem Village section has been evaluated by SHPO as needing additional data before an official determination of eligibility can be made. Subsurface testing for this site will take place in consultation with SHPO before construction commences. Testing results will be documented and submitted to SHPO for an official determination of eligibility to be made on this site. A stipulation covering the methods for testing and providing for an expedited review by SHPO will be incorporated into the ROD. If this site is evaluated eligible for the NRHP, the impacts will be treated through data recovery upon completion of Section 106 consultation with the tribes, SHPO, and the ACHP.
- Clearing, grubbing, and surface stripping activities in the vicinity of Site 5LP1131.8 in the Grandview section will be monitored to ensure site avoidance and to minimize the potential for impact.
- As requested by BLM, clearing, grubbing, and surface stripping activities within 200 feet of Site 5LP6490, which is not eligible, will be monitored to ensure avoidance of this site.
- As per the CDOT Standard Specifications (CDOT 1999), in the event that cultural deposits are discovered during construction, work will cease in the area of discovery, and a CDOT

archaeologist will be notified. The CDOT archaeologist or a designated representative will evaluate any such discovery, and, in consultation with SHPO and BLM archaeologists (if on BLM lands), complete proper mitigation measures before construction activities resume. Further, the construction contractor will be responsible for informing all persons associated with this project that they will be subject to prosecution for knowingly disturbing any cultural resources or for collecting artifacts.

A formal concurrence on these mitigation measures by SHPO has been received (Appendix E, Historic Preservation Correspondence). Additional discussion on the impacts to, and mitigation measures for, historic properties can be found in Chapter 5, Section 4(f) Evaluation.

4.14 PALEONTOLOGICAL RESOURCES

Of the two paleontological localities described in Section 3.14, Paleontological Resources (west of Grandview and east of the Florida River), only the site east of the Florida River is considered scientifically important.

4.14.1 No Action Alternative

The No Action Alternative would not affect any significant paleontological resources.

4.14.2 Impacts Common to All Action Alternatives

There would be no impacts to paleontological resources that are common to all of the action alternatives.

4.14.3 Grandview Section

Both action alternatives would impact the one paleontological locality identified in this section to the same degree. Since this site is not scientifically important, no further action is required.

4.14.4 Florida Mesa and Valley Section

No paleontological resources were identified in this section.

4.14.5 Dry Creek and Gem Village Section

Both action alternatives would impact the one paleontological locality identified in this section to the same degree.

4.14.6 Bayfield Section

No paleontological resources were identified in this section.

4.14.7 Mitigation

Because it preserves vertebrate fossil remains and plant fossil remains identifiable to a scientifically useful level, the fossil locality in the Dry Creek and Gem Village section is considered to be scientifically significant. Impacts to this locality will be mitigated by excavating a statistically valid representative sample of the contained fossils prior to construction. The fossil locality west of Grandview did not produce, and has not shown the

potential for producing, scientifically important specimens; no further work is recommended at that location.

Upon completion of final design for and prior to construction, ground reconnaissance for paleontological resources will be conducted in areas not previously examined during the fieldwork conducted for this EIS. If any scientifically significant fossil localities are located in any of those previously unexamined portions, mitigation measures will be developed for and implemented at those localities, prior to or during construction, as appropriate.

Excavation during construction could expose new fossils. If fossil materials are exposed during any construction activities, then work will stop in the area of the discovery and a CDOT paleontologist will be notified. The CDOT paleontologist will be given the opportunity to assess the discovery prior to the resumption of construction activities in that area.

4.15 HAZARDOUS WASTE SITES

Site investigations and any required mitigation plans for the nine sites listed in Section 3.15, Hazardous Waste Sites, should be completed prior to construction. The type of potential contamination is discussed in the following paragraphs for each of the nine sites.

4.15.1 No Action Alternative

Under the No Action Alternative, there would be no construction activity or potential release of hazardous materials from fuel and equipment storage during construction. Additionally, the RECs within the study area would not be disturbed because there would be no construction.

4.15.2 Impacts Common to All Action Alternatives

All of the action alternatives have the potential to cause a release of hazardous materials during construction activities. Hazardous materials would be brought into the project corridor and stored or used for construction activities, including bulk fuel storage. There is the potential for accidental release of these materials into the environment during normal construction activities; however, BMPs would be used to offset such events. Equipment staging and bulk fuel storage areas would be compliant with the Colorado Petroleum Storage Tank Regulations (7 Colorado Code of Regulations [CCR] 1101-14) requirements, which include security, secondary containment, pressure relief, and a spill prevention control and countermeasure plan.

Additionally, the project may impact areas with RECs, as described below. Appropriate steps would be taken prior to construction to remediate contamination that is found and ensure that contaminated fill materials are not redeposited at another location as either fill or embankment.

Oil and Gas Wells

Although no observable leaks or odors have been observed from the surface at oil and gas facilities, there is the potential for subsurface releases with no observable indications at the surface. Chronic minor leaks that would not be detected by inventory control can result over time in subsurface releases. Table 4.15.1, Oil and Gas Facilities Potentially Impacted by the Project, presents the oil and gas facilities that have the potential to be impacted by construction activities or staging areas.

Table 4.15.1
Oil and Gas Facilities Potentially Impacted by the Project

Owner	Facility Name	Direction from US 160	Township, Range, Section	Location within Project Area
XTO Energy Inc.	05-067-07935 2-9 WD	North <300 feet	T34N R8W Section 9	Grandview
BP America Production Company	05-067-08677 Federal 2-11 Gas Unit 2	South <300 feet	T34N R8W Section 11	Grandview
BP America Production Company	05-067-07546 Tinker 2-9 Gas Unit 1	South <300 feet	T34N R8W Section 9	Florida Mesa and Valley
BP America Production Company	05-067-08704 Tinker Federal Gas Unit 2	South <300 feet	T34N R8W Section 12	Dry Creek and Gem Village
BP America Production Company	05-067-07927 Gearhart Gas Unit C2	North <300 feet	T34N R7W Section 8	Dry Creek and Gem Village
BP America Production Company	05-067-07927 State Gas Com 'CF' 1	South <300 feet	T34N R7W Section 16	Dry Creek and Gem Village
Unknown	05-067-05646 Sitton Gray 1	South <300 feet	T34N R7W Section 15	Bayfield
BP America Production Company	05-067-08948 Le Platt Gas Unit 2	South <300 feet	T34N R7W Section 11	Bayfield
Unknown	05-067-60013 Ferguson	North <300 feet	T34N R7W Section 12	Bayfield

Underground Storage Tanks

The potential exists for unregistered USTs to be located within the proposed ROW at businesses and residential units. Should USTs exist within the ROW, there is a potential that they would be encountered during construction. An unknown encounter of a UST during construction creates the potential to release hazardous materials into the environment.

Transformers/Polychlorinated Biphenyl Items

Identified transformers that may or may not contain PCBs are assumed to be located within the project corridor. No adverse impacts are expected from the transformers provided they are handled in an appropriate manner by the local utility company prior to highway construction.

Asbestos-Containing Building Materials

Buildings constructed prior to 1980 have the potential to have ACBM. No adverse impacts are expected from such buildings providing that demolition and construction activities impacting buildings are in accordance with NESHAP.

Lead-Based Paint

Light poles, signals, bridge girders, and other structures have the potential to be coated with lead-based paint. No adverse impacts are expected from the demolition or disturbance of these structures provided construction activities use BMPs and dispose of the material as hazardous material/waste, or recycle in accordance with CDOT Standard Specifications for Road and Bridge Construction, which requires a disclosure statement.

Hazardous Material Spills

No impacts are expected from past known fuel spills occurring within or adjacent to the project corridor.

4.15.3 Grandview Section

4.15.3.1 Alternative G Modified (Preferred Alternative)

Wilson Gulch Multi-use Commercial Property

The multi-use commercial property in Wilson Gulch is located on the south side of US 160 and is currently planned for total ROW acquisition. Current acquisition plans by CDOT are based on ROW requirements for each alternative. Based on the historical uses at this property and the presence of the on-site septic system, any ground disturbance associated with construction activities has the potential to cause a release and impact the environment.

AA American Auto Sales

Current acquisition plans for this property include a large percentage or total acquisition of the property. Based on the potential for petroleum fuels, used oil, and solvent contamination at the property, any ground disturbance associated with construction activities has the potential to cause a release and impact the environment.

Grandview Store/Sonoco Service Station

Current acquisition plans for this property include total acquisition of the facility. Two USTs are present at the property, as well as a potential floor drain and associated piping. Any ground disturbance associated with construction activities has the potential to cause a release and impact the environment.

Chuck's Diesel Repair

Current acquisition plans for this property include partial acquisition of the southern portion of the property. Based on the site inspection and investigation findings and conclusions, and lack of knowledge regarding the presence of a septic system or UST, any ground disturbance associated with construction activities has the potential to cause a release and impact the environment.

Fender Menders

Current acquisition plans for Fender Menders include a small percentage take of property for ROW. Based on the site inspection and investigation findings and conclusions, and lack of information regarding UST removal, any ground disturbance associated with construction activities has the potential to cause a release and impact the environment.

Durango East KOA Campground

Current acquisition plans for the Durango East KOA Campground include partial acquisition of the northern portion of the property. Based on the potential presence of a UST at the property and former sewage lagoon, any ground disturbance associated with construction activities has the potential to cause a release and impact the environment.

4.15.3.2 Alternative F Modified

Alternative F Modified would have the same impacts as those discussed for Alternative G Modified (Preferred Alternative).

4.15.4 Florida Mesa and Valley Section

4.15.4.1 Alternative C (Preferred Alternative) and Alternative A

There are no known properties containing hazardous materials or hazardous wastes located within the Florida Mesa and Valley section that are expected to impact construction activities.

4.15.5 Dry Creek and Gem Village Section

4.15.5.1 Alternative H (Preferred Alternative)

No property acquisitions of buildings or structures are anticipated for this alternative; however, new ROW would be acquired. Contamination potentially occurring within the drainages is unknown and has the potential to be impacted by ground disturbance associated with construction activities.

The Auto Salvage/Scrap Metal Operations Property

Current acquisition plans for the Auto Salvage Yard include a partial acquisition of the southwestern portion of the property. The low-lying area adjacent to the highway is most likely where contamination from the property has accumulated. Any ground disturbance associated with construction activities has the potential to cause a release and impact the environment.

4.15.5.2 Alternative C

Alternative C would have the same impacts as those discussed for Alternative H (Preferred Alternative).

4.15.6 Bayfield Section

4.15.6.1 Alternative B (Preferred Alternative)

Utility Stations

One electrical utility substation is located within the conceptual ROW along the Bayfield section. Impacts to this property would be avoided by installing a retaining wall along the ROW edge. Final design would avoid the property; therefore, no impacts are expected to or from the electrical substation.

Phillips 66 (Mini-Merc)

Current acquisition plans for the Phillips 66 (Mini-Merc) include a small partial acquisition at the southern edge of the property. This property is currently under long-term monitoring with the state and any ground disturbance and associated construction activities have the potential to encounter known and unknown environmental conditions, potentially causing a release and impacting the environment.

4.15.6.2 Alternative A

Alternative A would have the same impacts as those discussed for Alternative B (Preferred Alternative).

4.15.7 Mitigation

Potential contamination information for each of the nine sites was provided in Sections 3.15.1 and 3.15.2. The mitigation measures that may be considered for each of these nine sites are provided in Table 4.15.2, US 160 Farmington Hill to Bayfield Mitigation Measures. The following general mitigation measures will be applied, as appropriate:

- Hazardous waste management plans will include safety measures developed for protection of workers and the public while doing this work and during construction if hazardous materials/waste are encountered.
- Potential mitigation measures may include, but are not limited to, excavation and removal, in-situ and ex-situ treatment, and enhanced natural attenuation/bioremediation.
- Disposal of roadway structures potentially coated with lead-based paint will be performed according to CDOT standard specifications.
- Fill materials derived from areas that could be impacted by hazardous materials sites or are suspect of being contaminated will be tested as necessary to ensure that contaminated materials are not redeposited within the project ROW.

Table 4.15.2
US 160 Farmington Hill to Bayfield Mitigation Measures

Site Name	Mitigation Measures
1. Wilson Gulch Multi-use Commercial Property	Based on the sampling results from the site investigation report for Wilson Gulch (Jones Property-Parcel 126), no further mitigation or follow-up work is recommended for this property.
2. AA American Auto Sales	Mitigation measures may include, but are not limited to, collection of surface soil, subsurface soil, and groundwater samples downgradient of the septic system, lagoon, and auto salvage yard.
3. Grandview Store/Sonoco Service Station	Mitigation measures may include, but are not limited to, confirmation of location of current USTs, and collection of subsurface soil and groundwater samples north and south of the gas station building.
4. Chuck's Diesel Repair	Mitigation measures may include, but are not limited to, conducting an electromagnetic survey around the periphery of the building structure, and collection of surface soil, subsurface soil, and groundwater samples around the building.
5. Fender Menders	Mitigation measures may include, but are not limited to, collection of subsurface soil and groundwater samples in and around the UST removal excavation, and behind (south of) the shop building in the area around the capped-off floor drain pipe.

Table 4.15.2
US 160 Farmington Hill to Bayfield Mitigation Measures

Site Name	Mitigation Measures
6. Durango East KOA Campground	Mitigation measures may include, but are not limited to, excavation activities at the suspected location of the UST(s) to determine whether they have been removed. If a tank(s) is encountered, tank removal activities should be performed by the landowner according to procedures and requirements specified in the State Oil Inspection Section guidance. Measures will also include collection of subsurface soil and groundwater samples adjacent to and around the suspected location of the UST(s), and collection of sediment, subsurface soil, and groundwater samples in the drainage features along the east and north sides of the property.
7. Lon's Auto Salvage	Mitigation measures may include, but are not limited to, collection of surface soil, subsurface soil, groundwater, sediment, and surface water samples in the low area and southern drainage, and collection of surface soil samples in vehicle storage and handling areas on the property.
8. Gem Village Bypass ROW	If contamination is detected, the source will be identified and appropriate mitigation measures will then be considered, and may include collection of surface water and sediment samples in both drainages.
9. Phillips 66 (Mini-Merc)	Mitigation measures may include, but are not limited to, follow-up for the monitoring results from CDPHE and, if warranted, collection of surface water and sediment samples in drainages and low areas within the proposed US 160 ROW.

4.16 VISUAL RESOURCES

4.16.1 No Action Alternative

Under the No Action Alternative, the proposed project would not be built, and the highway would maintain its current condition. Visual resources along the project corridor would remain the same, without the potential positive or negative effects associated with either the Preferred Alternative or other action alternatives.

4.16.2 Impacts Common to All Action Alternatives

The degree to which the US 160 highway improvements project would affect scenic resources depends on the amount of visual contrast that is created by project components in relation to the existing landscape character. The amount of contrast or compatibility between the project and the existing landscape features is defined by an analysis of the potential change in the basic visual elements (line, form, color, and texture) and how the project would affect the dominance, scale, diversity, and continuity of the existing landscape features.

A change in the highway location and configuration can affect both the view from the highway and the view of the highway from nearby sensitive viewpoints, such as residential or recreation areas.

Visual impacts associated with highway improvement projects typically include:

- Short-term construction impacts, including dust, noise, and traffic delays, that can affect the visual quality of the surroundings for both travelers on the highway and for nearby viewers who have views of the highway.

- Slope cuts and fills that can change the characteristic landscape along the corridor by disrupting the continuity of natural landforms and vegetation, and by creating areas with a high degree of color and form contrasts.
- Expansion of the width of the paved surfaces and associated median, shoulder, and clear areas. This increases the overall visual scale and dominance of the highway in the viewshed.
- Expansion of the existing highway ROW, which may necessitate the removal of trees and other vegetation that may be providing a positive element to the existing landscape quality.
- Additional design features and structures, such as overpasses, access roads, guardrails, and retaining walls, which add more modifications and potentially more discordant elements to the seen area.
- Road realignment, which can impact previously intact, undisturbed landscapes.

Impacts specific to the alternatives are discussed below by section, as defined in Chapter 2, Alternatives, and as shown in Figures 2.5.3 through 2.5.44. Potential effects of the No Action Alternative apply to all highway sections.

4.16.3 Grandview Section

4.16.3.1 Alternative G Modified (Preferred Alternative)

This alternative would relocate US 550 from the west face of Farmington Hill to the top of Florida Mesa, eventually descending the north side of Farmington Hill approximately 3,200 feet east of the existing intersection. As this alignment crosses CR 220 on Florida Mesa, it passes west of a ranch residence and stays to the west edge of the open pastureland. The scenic integrity of the agricultural land on the mesa would be negatively impacted, introducing a major highway with a substantial amount of traffic to a mostly undisturbed pastoral landscape. Potential visual impacts would be reduced by routing the alignment at a natural visual edge created by the meeting of the open pastureland and conifer woodland. A barn and other outbuildings would also help screen the highway from close foreground views to a nearby ranch residence.

As the alignment descends Farmington Hill, it would require large areas of cut-and-fill on the hillside, as shown in Figure 2.5.4, Grandview Section: Alternative G Modified (Preferred Alternative). This would result in visual contrasts, affecting the line, form, color, and texture of the natural landform and vegetation. The US 160/US 550 (south) interchange would involve an overpass on US 160 and on/off ramps and access road connections that would extend onto open, vacant land north of US 160. These project elements would add to the overall modifications to the area, affecting the views from and of the road. The resulting scenic integrity would be rated as moderately to heavily altered.

Along US 160 the proposed alignment generally follows the existing highway alignment, but due to the expanded width of the highway ROW to accommodate additional travel lanes and on/off ramps, the new roadway would require substantial areas of cut-and-fill as the road curves around Farmington Hill. These disturbed areas would cause visual contrasts, especially in the natural form, color, and texture of the hillside, impacting the natural character of the landscape. Retaining walls would also be built to stabilize slopes. Retaining walls can reduce the area of

required slope cut, and if they incorporate effective artistic design features, can add visual interest to the project.

As the alignment approaches CR 232, the expanded width of the roadway, including the access roads, would bring the road surface and traffic closer to several residences along the corridor. With the effective design and reclamation, the project can maintain the overall moderate scenic quality in this section of roadway. Scenic integrity would be moderately to heavily altered.

Grandview is one of the most densely built-up areas along the project corridor, as shown in Figures 2.5.6 and 2.5.7. Both residential and commercial buildings line the highway, with additional residential development occurring both north and south of the immediate highway corridor.

The proposed US 160 alignment would generally be centered in an expanded ROW alignment. At the US 160/CR 233 (west) intersection, the westbound lanes shift north of the existing alignment to accommodate widening for the US 160/CR 233 (west) interchange. The interchange would be the primary access for development in the area and would include access roads north and south of US 160. The new roadway would visually be larger in scale and tend to dominate the scenery in the immediate area. Many tall shrubs along the existing ROW that currently provide a visual screen between nearby properties and the highway would need to be removed, increasing the visibility of the highway.

Removing the many unrestricted accesses along US 160 in this section, and organizing access with the use of access roads, would create a more pleasant driving experience for travelers on US 160. Although the scenic integrity would remain moderately altered, the redesign of the highway in this area would provide a more organized, cohesive visual environment.

Alternative G Modified (Preferred Alternative) would shift the SH 172/CR 234 intersection with US 160 slightly to the north of the existing alignment to accommodate widening for the SH 172/CR 234 interchange. The overall footprint of the intersection would be expanded to accommodate on/off ramps and access roads, increasing the highway's area of visual influence. Figure 2.5.8, Grandview Section: Alternative G Modified (Preferred Alternative), shows the overall footprint of the realigned highway.

Expanding the ROW to the north, and constructing the new access roads, would require the acquisition of several businesses and some residential units. Removal of the existing developments at the intersection would result in an intersection without the visual encroachment of signs and other visual elements associated with roadside commercial development.

Expanding the US 160 ROW would place the westbound lanes closer to residential developments on the north side of the highway, impacting the aesthetic quality of the landscape surrounding the residences. A retaining wall that would be built on the north side of the highway west of the intersection would help reduce visual impacts to nearby homes. The access roads to be built in the area of the SH 172/CR 234 intersection with US 160 would also bring traffic closer to several homes in the area, but would not result in direct impacts.

The BLM land in this section is classified by the BLM as "disposal" property that may be transferred out of federal ownership. The land has the same general characteristics as those discussed above for the Grandview section, and is in an area that has been visually modified from the natural condition. The visual contrasts that would be created in this area by the

proposed project including new entrance ramps, would be additive to the existing condition and would be within management guidelines for VRM Class III lands.

4.16.3.2 Alternative F Modified

Alternative F Modified differs from Alternative G Modified (Preferred Alternative) in how US 550 is aligned with US 160. In Alternative F, US 550 descends Farmington Hill on the east side of the hill and connects with US 160 in Grandview at the US 160/CR 233 (west) intersection. On top of Farmington Hill, US 550 passes through open irrigated pastureland and areas of mixed forested vegetation. Figures 2.5.9 through 2.5.11, and 2.5.14 show the footprint of US 550 as it descends Farmington Hill and intersects with US 160. This alternative alignment passes through a landscape that appears mostly natural, with scattered rural residences. Building the highway in this area would introduce a major built-up feature that would impact the existing scenery, and would impact the views of many residences on Farmington Hill and developments in Grandview. As shown in Figure 2.5.14, Grandview Section: Alternative F Modified, the highway includes access roads on both sides of the highway for a portion of the alignment, increasing the area of disturbance to the landscape. Scenic integrity would be heavily altered and would impact more local residences than Alternative G. As with Alternative G Modified (Preferred Alternative), visual contrasts created by the proposed project under this alternative would be additive to the existing condition, and would be within BLM management guidelines for VRM Class III lands.

4.16.4 Florida Mesa and Valley Section

4.16.4.1 Alternative C (Preferred Alternative)

This roadway section is located on Florida Mesa and crosses the Florida River Valley. The alignment is generally long and straight, through mostly open, agricultural land with scattered residential development. On Florida Mesa the alignment includes two travel lanes in each direction, a median strip, shoulders, and clear zones, with access roads on both sides of the highway, substantially increasing the total area of disturbance associated with the project. Figure 2.5.17, Florida Mesa and Valley Section: Alternative C, displays the Preferred Alternative alignment with the overall outline of the limits of disturbance. As can be seen in this figure, several residential properties would be much closer to the highway ROW after construction, impacting the aesthetic quality of the immediate surroundings of the property throughout. As is the case in the entire project corridor, the overall scale and dominance of the highway would increase substantially with construction of the new, four-lane highway, resulting in a landscape with moderate scenic integrity.

This alternative would realign CR 222 and CR 223 to intersect US 160 east of the Florida River (Figures 2.5.18 and 2.5.21). This alignment would introduce a new, visible disturbance into what is now a mostly undisturbed, natural-appearing landscape. No residential acquisitions would be required, and the new location of the county roads would not impact the scenic quality of residential areas.

The scenic quality of the Florida River would remain moderate to high. Scenic integrity would remain slightly altered in most locations, but would be moderately altered in the area impacted by the realignment of CR 222 and CR 223.

4.16.4.2 Alternative A

Alternative A differs from the Preferred Alternative in this section primarily in how CR 222 and CR 223 intersect with US 160. As shown in Figure 2.5.21, Florida Mesa and Valley Section: Alternative A, the alternative would realign CR 222 and CR 223 to intersect US 160 west of their current location on Florida Mesa. This would require new ROW, causing a substantial modification to lands that are currently natural appearing. Several residences would also experience visual impacts due to the proximity of the realigned county roads. US 160 would generally remain in its current alignment, but would involve a large area of cut-and-fill as the roadway descends the hill into the Florida River Valley, impacting the natural landform and creating color contrasts on the side slope of the highway fill.

4.16.5 Dry Creek and Gem Village Section

This section includes the east portion of the Florida River Valley, the piñon-juniper hills, the Dry Creek, and Gem Village landscape subtypes. The proposed project would generally remain in the same alignment as the existing US 160 alignment. The major visual contrast that would occur in this area would be the general increase in the overall footprint of the highway ROW. This would result in an increase in the scale and dominance of the highway in the viewshed, and in the substantial amount of cut-and-fill work needed in the piñon-juniper hill section, causing impacts to the natural landform and vegetation.

In the Dry Creek section, the highway would be shifted to the south of its present alignment, impacting agricultural and wetland areas. However, there are good opportunities to re-create the wetlands south of the new alignment, maintaining that positive element of the valley scenery. Scenic quality in this section would remain moderate, and the scenic integrity of the piñon-juniper hills and the Dry Creek Valley would be slightly altered from its current condition. The BLM land in this section is classified as VRM Class II. The proposed activities, including the new intersection with CR 225, would increase the magnitude of the visual contrasts created between US 160 and the surrounding landscape, but would be additive to the existing condition. Proposed modifications to US 160 are within the guidelines for VRM Class II lands and would not change the character of the landscape.

4.16.5.1 Alternative H (Preferred Alternative)

Alternative H (Figures 2.5.23 through 2.5.29) would relocate US 160 south of Gem Village. The ROW would cross irrigated agricultural land, introducing a substantial new modification to the existing natural-appearing landscape. This area generally has high scenic value and provides a scenic backdrop to the town as viewed by travelers on US 160 and to several viewing locations, including residences, within the town. Scenic integrity of the existing agricultural land would become heavily altered, and scenic quality would be moderate.

4.16.5.2 Alternative C

Alternative C (Figures 2.5.30 through 2.5.36) would generally follow the existing alignment through Gem Village, expanding the highway ROW to the south. The expanded highway ROW would require property acquisitions, including residential properties. The existing highway through town creates a corridor that is already a heavily altered landscape, with the existing road corridor and several commercial properties that line the frontage roads. The expanded ROW

would be an added visual impact to the existing condition and would increase the scale and proximity of visual effects.

4.16.6 Bayfield Section

4.16.6.1 Alternative B (Preferred Alternative)

As the project passes through the Bayfield area, US 160 would generally remain on its current alignment as it crosses the Los Pinos River, the town of Bayfield, and continues to the end of the project corridor east of town (Figures 2.5.37 through 2.5.40). West of the Los Pinos River, there would be a substantial area of cut-and-fill on the hillside leading down to the river, creating visual contrasts to the natural line, form, color, and texture of the landform and vegetation.

East of the river, the expanded ROW would result in the removal of several large trees that currently provide a visual screen of the highway for a local recreation area south of the highway and to a residential area on the north side. For the remainder of the highway corridor through town and to the project end east of town, visual effects from US 160 changes would mainly result in an increase in the overall scale of the highway and the closer proximity of disturbed ROW area to properties adjacent to the corridor.

The major changes associated with the project through this section include changes in connections to local access. West of the Los Pinos River, CR 502 would be realigned to the west and combined with CR 506 and the new US 160/US 160B (west). This realignment of CR 502 would create a new visual disturbance on Arrowhead Hill. The new alignment would pass through a gap in the landform, reducing impacts to the skyline from the new roadway, but would require a large area of cut-and-fill, impacting the natural scenic qualities of the characteristic landscape.

The US 160/CR 501 intersection (the Eight Corners intersection) would remain a signalized intersection and would be realigned slightly west of its current location. Due to its location near the existing intersection and its use of existing ROW, the new intersection would have minimal impact on existing scenic quality. On the north side of US 160, CR 501 would be aligned adjacent to, and on the west side of, the existing CR 501. The area is an irrigated field with wetlands that has high scenic value. The realignment of CR 501 is adjacent to the existing CR 501 and would result in a minor visual change to the scenic quality of the site.

South of US 160, CR 501 would be realigned slightly to the west and would include a roundabout at the intersection with B. The realignment would locate the road adjacent to the existing CR 501 and would result in minor visual impacts. The roundabout would change the look of the intersection, but would be mostly located within the existing road ROW and would not have a negative effect on nearby sensitive viewers.

4.16.6.2 Alternative A

Alternative A differs from the Preferred Alternative primarily in the configuration of the US 160/CR 501 intersection. The US 160 intersection would undergo major changes as the intersection would become a diamond interchange (CR 501 would be an underpass), and the intersection would be realigned to the west of its current location.

On the north side of US 160, CR 501 would be relocated in an area that currently is an irrigated pasture and wetland area with high scenic value, causing a substantial alteration to a natural

appearing landscape. South of US 160, CR 501 would be located several hundred feet west of its current alignment, resulting in visual change in the area. Overall, project improvements would increase the level of alteration to the existing landscape.

4.16.7 Mitigation

Mitigation measures to reduce visual resource impacts include the following:

- Construction of cut-and-fill slopes will be minimized, and the cut line will be blended into the existing terrain.
- Revegetation will occur as soon as possible after construction to stabilize soils and reduce visual contrasts.
- Retaining walls and bridge structures will include design features to add to the scenic quality of the built area. Architectural design guidelines will be developed to maintain consistent architectural and aesthetic treatments throughout the corridor.
- Removal of adjacent roadside vegetation will be minimized, where possible. Areas that will lose vegetation that provides important visual screens will be revegetated with taller plant species (trees and shrubs) that can serve the same function. These areas will be determined in final construction plans.
- The original US 550 alignment at Farmington Hill in the Grandview section will be obliterated and revegetated with native species, including shrubs and trees.

4.17 ENERGY CONSUMPTION

4.17.1 No Action Alternative

Periodic rehabilitation and/or reconstruction of the existing ROW would result in temporary energy consumption of petroleum products and electrical energy. Long-term energy savings would not be realized under the No Action Alternative.

4.17.2 Impacts Common to All Action Alternatives

Energy consumption would increase temporarily with the use of heavy equipment (graders, dump trucks, loaders, etc.) during construction for the transport and placement of materials (soil, aggregate, asphalt, concrete, etc.) and installation of appurtenances (structures, traffic control devices, signage, guardrails, etc.). Energy consumption would be primarily in the form of petroleum hydrocarbons such as gasoline and diesel fuel. A small amount of energy consumption would result from electricity usage at field offices for lighting, computers, and heat. The manufacture of asphalt pavement would result in energy consumption in the form of petroleum distillates. Even under the No Action Alternative, the existing highway would require periodic rehabilitation or reconstruction, which would also result in temporary energy consumption of both petroleum products and electrical power.

Long-term energy savings are expected to offset energy consumptive impacts by improving highway conditions. The primary objective of these improvements is to improve safety, but improvements would also reduce energy consumption by reducing congestion and delays resulting from turning movements. Automobile fuel efficiency would be improved by

maintaining a constant speed and reducing idling time (EPA 1994). Often under the existing two-lane condition, through traffic must stop behind vehicles that are waiting for a break in the opposing traffic to make left-turning movements. Through traffic often must slow to accommodate right-turning movements because most of the existing highway is two lanes and few right-turn lanes are present. Following the four-lane improvements, through traffic would not be delayed and idling time would be eliminated at intersections because turning vehicles would have dedicated lanes for deceleration and turning. In addition, by increasing the number of highway lanes from two to four, reducing the number of access points, and eliminating left turns at private driveways and roads, drivers would spend much less time braking and accelerating to accommodate the turning movements of others.

Temporary increases in energy consumption during highway reconstruction would be small compared to the volume of vehicles that would experience energy savings due to the proposed improvements. The number of vehicles directly involved in highway construction during the construction season (typically April through October) may be in the hundreds. However, the daily volume of vehicles traveling the US 160 project corridor between Durango and Bayfield reported for 2001 on the CDOT Web site ranged from 4,500 to 10,000. The higher volumes were located near Durango and the lower volumes were located near Bayfield. Based on traffic volume projections completed as part of the Feasibility Study and subsequent updates, the traffic volumes within the US 160 project corridor from Durango to Bayfield are predicted to more than double by 2025. Based on the current and predicted highway volumes, the energy savings resulting from fewer vehicle delays are expected to compensate for the additional energy consumption experienced during construction activities.

4.17.3 Mitigation

Mitigation implemented to reduce energy consumption during construction activities will include:

- Maximum use of on-site material to reduce haulage requirements
- Adequate vehicle maintenance
- Design of construction access roads and location of construction staging areas to minimize distance traveled

4.18 GEOLOGY AND SOILS

The potential impacts to geology and soils as a result of the US 160 highway improvements project are discussed in this section, along with mitigation measures.

4.18.1 No Action Alternative

The No Action Alternative would have no impacts to the geology or soils within the study area.

4.18.2 Impacts Common to All Action Alternatives

The action alternatives would impact soils to varying degrees depending on the extent of ground disturbance. During construction, the potential for soil erosion would occur until stabilization mechanisms were in place and the area was rehabilitated and revegetated. Construction activities

that damage the soil's ability to perform its function or fulfill its potential would also be considered impacts. Excavations for roadway structures would require special attention in the slope's high water table alluvial lands. For instance, water flowing out of a cut slope reduces the cohesive strength and could cause it to slough or creep.

It is anticipated that most construction and operation activities would occur within the first 10 feet of the surface. At these depths, both soils and surficial geology would be impacted from construction and operation activities. Impacts that should be considered from roadway construction activities include:

- Clearing, excavating, scraping, blasting, leveling, compacting, and release of fuels and oils
- Increased erosion potential from cut-and-fill slopes
- Runoff from the roadway that may include soil particulates and/or chemicals from vehicle emissions and construction materials
- Wind and runoff erosion due to loss of vegetation cover in construction area
- Slope stability in areas where the groundwater table may be shallow

Permanent impacts to surficial geology and soils would result from roadway expansion and placement of impervious surfaces. These surfaces increase runoff rates and reduce the amount of surface area available. Engineering controls should be incorporated into all construction and operation activities to prevent hazardous erosion. Actual amounts of surficial geology disturbance would require a geotechnical investigation in the project corridor. Further mitigation measures are provided below.

4.18.3 Mitigation

Construction and operation activities would impact geologic and soil resources without proper control measures ~~can be implemented~~ in place to lessen these impacts. Prior to commencing ~~roadwork construction~~ highway design activities, a thorough geotechnical investigation and analysis will be completed to optimize the engineering design of the roadway, and to assess the geologic resources that will be encountered during construction and operation activities. A geotechnical investigation and analysis provides estimates for soil/geologic material engineering properties, anticipated amounts of disturbance, and methods of disturbance.

Mitigation of the various geologic and soil impacts can generally be accomplished through implementation of engineering controls. The following mitigation measures will help reduce the amount of impacts to the geologic resources in the project corridor:

- Soils or materials excavated from one area will be used in other areas of the project, if possible, so as to disturb less ground area. Before soils are used as embankment, a detailed geotechnical analysis of the soil will be performed to assess the engineering soil properties. Analysis will include, at a minimum, the soil's maximum slope stability threshold, water content, and compaction requirements.
- Potentially contaminated soils will be tested for hazardous constituents prior to being used as fill or embankment.
- On-site soils of similar or same type will be used to the appropriate depth for fill areas in cropland and wetlands, so native topsoils will be replaced.

- Retaining structures and other engineering controls (e.g., rock fall mesh) will be incorporated to increase slope stability.
- Engineered grading controls will be implemented in fill stockpile and cut-and-fill areas. Proper covering and/or temporary to permanent drainage structures will be used to divert runoff away from wetlands and/or other water resources.
- Expansive soils and bedrock will be mitigated at structure locations by designing deep foundation systems, such as driven H-piles or drilled piers, rather than using shallow foundations. Foundation pads can also be designed to form a raft across any swelling or collapsing materials. Additionally, floating floor slabs can be designed in lieu of slab-on-grade construction.
- Structural retaining walls, such as soil nail walls, ground anchors, MSE walls, cantilever walls, or reinforced soil slopes will be built to stabilize slopes when cut or fill slopes require steep gradients ~~(3 horizontal:1 vertical)~~ when gradients exceed the allowable placement properties of the soil, or where potential slope failures may occur due to the presence of water or loose material.
- A Stormwater Management Plan that prescribes BMPs to minimize potential soil erosion, and includes prescriptions for monitoring conditions before, during, and after the completion of work (and for immediate post-restoration site stabilization), will be prepared and implemented. Measures that will be required are typical of erosion control procedures used in CDOT highway construction ~~projects~~practices, and will be in compliance with CDOT's MS4 wastewater permit. The minimum methods for controlling erosion will be as described in CDOT's, *Standard Specifications of Road and Bridge Construction, Section 208, Erosion Control.*
- The necessary permits will need to be obtained and the requirements of the NPDES process will need to be addressed.

4.19 CONSTRUCTION

4.19.1 No Action Alternative

There would be no construction impacts associated with the No Action Alternative.

4.19.2 Impacts Common to All Action Alternatives

Due to budget constraints, construction of US 160 would occur in phases, as funding becomes available.

Impacts associated with the reconstruction of US 160 would occur periodically throughout the construction period. Construction noise and dust would occur, as well as impacts associated with hauling materials for construction; however, these impacts would be localized and temporary. Detours and traffic delays may discourage local traffic, recreational vehicles, and emergency responders from using this route. This could cause increased traffic on local roadways used as alternate routes, and could reduce traffic for businesses that rely on US 160 as a source of customers. Businesses, residents, and emergency vehicles would retain access to properties at all times during construction; however, access may be judged as inconvenient at times.

Construction delays may also encourage motorists to use alternate routes. Depending on the location of the construction, motorists may use county roads as alternate routes, thereby increasing the normal traffic volumes on the county roads and accelerating roadway deterioration of these alternate routes. Emergency responders may also choose to use alternate routes, which could increase response times.

Exhaust and particulate (dust) emissions would increase during project construction as a result of construction vehicle activity, lower traffic speed, and earth excavation activities associated with construction.

Persons living or working in residences or businesses located close to the construction zone would be exposed to construction noise. The noise generated by construction equipment would last only for the duration of the construction phase. ~~During that time, the magnitude of noise increase could be considerable, but because the increased noise would occur in the short term, the increase would be considered a nuisance rather than a substantial adverse impact.~~

Blasting may be necessary along the proposed US 550 realignment in the Grandview section and would likely cause the greatest temporary noise impacts. ~~Although the noise from blasting would be temporarily unpleasant, it would not be substantial in the long term.~~ Blasting on the realignment would typically require 1-2 shots per day, occurring during phases of several weeks at a time separated by periods of no blasting. The work would likely be done as a single project lasting up to 2-3 years.

Blasting would affect four major target groups: large game mammals, summer and winter tourists, recreationists, and local residents/businesses.

Large quantities of excess material (soil and rock) would be generated at some locations during construction of the project. Project construction would be phased so excess materials generated at one location could be disposed as embankment material at another location during the same project phase. Depending on the location of the embankment site for excess material, impacts that could occur to residents along the corridor include:

- Dirt and debris falling off trucks
- Congestion caused by large trucks
- Noise from trucks
- Air pollution from trucks

Transportation systems also facilitate the spread of invasive species outside their natural range. Invasive species, primarily state-listed noxious weeds, that are likely to harm the environment, human health, and economy would be analyzed and then managed during design and construction.

4.19.3 Mitigation

Mitigation actions that will be implemented during construction include:

- Follow all FHWA and CDOT regulations and guidance regarding worker and public safety in effect at the time of construction.
- Maintain access to businesses and residences at all times.

- Coordinate with emergency service providers to minimize delays and ensure access to properties.
- Use and maintain BMPs to control sediment and erosion during all phases of construction. These practices will include, but not be limited to, use of silt fence, erosion logs, straw bales, and new technologies available during construction. CDOT's *Standard Specifications for Road and Bridge Construction* currently require the construction contractor to have an on-site Erosion Control Supervisor (ECS). The ECS is required to have experience in all aspects of construction, and to have completed CDOT-approved training.
- Implement dust abatement as necessary by using water trucks.
- Perform construction vehicle maintenance and refueling operations at a designated area away from sensitive wildlife habitat, wetlands, and waters of the US.
- Coordinate with public and private entities in a public information effort to minimize inconveniences of highway users as a result of construction.
- Provide temporary signage to business entrances during construction to draw attention to highway access points.
- Ensure emergency vehicle access at all times during construction and minimize travel delays for general tourist traffic, especially during the summer season.
- Provide adequate public notices through newspapers and local signs to warn motorists of future detours and road closures.
- Plan the shortest, most direct detours with adequate signing to limit additional travel to the extent possible.
- Limit any major traffic disruption to the off-peak hours as much as possible to alleviate congestion, reduce capacity impacts, and lessen economic impacts.
- Keep average delay times to a minimum.
- Place flaggers immediately adjacent to work areas to optimize traffic flow during periods of construction activities and to reduce delays.
- Develop a project-specific noxious weed management plan during design and implement it during construction (see Section 4.10, Noxious Weeds). Native plant material will be used and existing native plant material will be protected during the design and construction process.

4.20 IMPACTS TO BLM LAND

As shown in Figure 3.1.1, BLM Parcels, there are two areas where the US 160 project corridor bisects lands managed by the BLM. This section is intended to summarize those impacts identified previously that would occur on the BLM parcels specifically. The BLM parcels fall within the Grandview section and Dry Creek and Gem Village sections of the project corridor, and therefore, the analysis is limited to those impacts that would occur as a result of implementing the alternatives for these sections. Also, some resource areas described previously, such as socioeconomics, transportation, traffic noise, hazardous waste sites, and energy consumption, are not applicable to this BLM-specific analysis, and are therefore not

discussed. Other resources, such as air quality, visual resources, and recreation resources, are discussed qualitatively, as the specific impact on BLM lands are not quantifiable. Quantitative impacts to resources identified previously in the DEIS are briefly described, with references to those sections where the detailed analysis is presented. The impacts that have been quantified represent those impacts that would occur outside of the 300-foot ROW that currently exists on the BLM lands, but within the conceptual ROW. The analysis is presented in Table 4.20.1 Summary of Impacts to BLM Lands.

Table 4.20.1
Summary of Impacts to BLM Lands

Resource Area	Grandview Section Alternative G Modified (Preferred Alternative)	Grandview Section Alternative F Modified	Dry Creek and Gem Village Section Alternative H (Preferred Alternative)	Dry Creek and Gem Village Section Alternative C
Land Use	Approximately 7.79 acres of the BLM parcel near Grandview would be converted to highway ROW.	Approximately 1.21 acres of the BLM parcel in the Grandview section would be converted to highway ROW; however, as noted in Section 4.1.2, Impacts Common to All Action Alternatives, the Grandview section would continue as a mixed-use area of residents and businesses.	Approximately 10.46 acres of the BLM parcel in the Dry Creek and Gem Village section would be converted to highway ROW. As noted in Section 4.1.5.1, Alternative H (Preferred Alternative), the expanded highway ROW in the vicinity of the BLM parcel would remove 5.6 acres of potential grazing area. This acreage is approximately 0.6 percent of the land total in this BLM parcel and would not affect the AUMs permitted under an associated grazing lease. As stated in Section 4.1.2, Impacts Common to All Action Alternatives, land uses adjacent to the Dry Creek and Gem Village section are likely to remain rural or agricultural.	As noted in Section 4.1.5.2, Alternative C, the impacts to the BLM land under this alternative would be the same as those identified for Dry Creek and Gem Village section Alternative H (Preferred Alternative).
Farmland	The alignment of US 160 under this alternative would not affect irrigated farmland within the BLM parcel in the Grandview section.	The alignment of US 160 under this alternative would not affect irrigated farmland within the BLM parcel in the Grandview section.	The alignment of US 160 under this alternative would not affect irrigated farmland within the BLM parcel in the Dry Creek and Gem Village section.	The alignment of US 160 under this alternative would not affect irrigated farmland within the BLM parcel in the Dry Creek and Gem Village section.
Air Quality	As noted in Section 4.5.2, Impacts Common to All Action Alternatives, the proposed US 160 improvements are expected to lead to decreased congestion, decreased idling times, and fewer potential CO hot spots. Although construction may temporarily affect air quality and cause elevated levels of pollution, these impacts would be temporary and intermittent, and are not expected to cause a violation of NAAQS.	As noted in Section 4.5.2, Impacts Common to All Action Alternatives, the impacts under this alternative would be the same as those identified for Grandview section Alternative G Modified (Preferred Alternative).	As noted in Section 4.5.2, Impacts Common to All Action Alternatives, the impacts under this alternative would be the same as those identified for Grandview section Alternative G Modified (Preferred Alternative).	As noted in Section 4.5.2, Impacts Common to All Action Alternatives, the impacts under this alternative would be the same as those identified for Grandview section Alternative G Modified (Preferred Alternative).
Wetlands	There would be no impacts to wetlands on the BLM parcel in the Grandview section under this alternative.	Less than 0.01 acre of the impacts to wetland 2-3 noted in Section 4.7, Wetlands, would occur on the BLM parcel in the Grandview section.	There would be no impacts to wetlands on the BLM parcel in Dry Creek and Gem Village section under this alternative.	There would be no impacts to wetlands on the BLM parcel in Dry Creek and Gem Village section under this alternative.

Table 4.20.1
Summary of Impacts to BLM Lands

Resource Area	Grandview Section Alternative G Modified (Preferred Alternative)	Grandview Section Alternative F Modified	Dry Creek and Gem Village Section Alternative H (Preferred Alternative)	Dry Creek and Gem Village Section Alternative C
Water Resources	Approximately 1.09 acres of the Wilson Gulch floodplain on BLM lands in the Grandview section would be impacted. As described in Section 4.8.2.1, Impacts Assessment/ Methodology, there is the potential for an increase in mass loadings of total copper and total zinc associated with the crossings constructed in the Grandview section (it is assumed that total copper and total zinc provide an overall picture of the water quality impacts associated with the proposed improvements). One of these crossings would occur on BLM land in this section; however, the discussion of the Effectiveness of BMPs in Section 4.8.2.1, Impacts Assessment/Methodology, also indicates that the use of BMPs could possibly lower future runoff loads to existing levels. Finally, Sections 4.8.2.3, Impacts Common to All Action Alternatives, and 4.8.2.4, Alternative G Modified (Preferred Alternative), discuss the potential for increased erosion from cleared and excavated areas, increased stormwater runoff (from increased impervious surfaces associated with the widening of US 160), and the potential for sediments and other runoff pollutants to reach surface waters. However, these sections also discuss BMPs that would be implemented to minimize impacts.	Approximately 0.05 acre of the Wilson Gulch floodplain on BLM lands in the Grandview section would be impacted. As discussed in Section 4.8.2.4, Alternative F Modified, water quality impacts under this alternative would be similar to those discussed under Alternative G Modified (Preferred Alternative). There would be minor differences due to the size of impervious area, the size of the ROW, and differences in traffic volume.	As noted in Table 4.8.2, US 160 Floodplain Impact Analysis Results, and Section 4.8.1.5, Alternative H (Preferred Alternative), the floodplain of Dry Creek at the US 160/CR 223 intersection would be affected. However, none of the floodplain that may occur on BLM lands in the Dry Creek and Gem Village section would be affected. One of the crossings discussed in Section 4.8.2, Water Quality, could occur on BLM land in the Dry Creek and Gem Village section (Dry Creek crossing #1). As discussed in Section 4.8.2.6, Alternative H (Preferred Alternative), this would be a reconstructed crossing that would increase future mass loads of total copper and total zinc. In addition, there is the potential for increased erosion from cleared and excavated areas, increased stormwater runoff, and the potential for sediments and other runoff pollutants to reach intermittent surface waters on BLM land, as discussed in Section 4.8.2.3, Impacts Common to All Action Alternatives.	Impacts to floodplains on BLM land under this alternative would be the same as those discussed for Alternative H (Preferred Alternative). Impacts to water quality on BLM land under this alternative would be the same as those discussed for Dry Creek and Gem Village section Alternative H (Preferred Alternative).

Table 4.20.1
Summary of Impacts to BLM Lands

Resource Area	Grandview Section Alternative G Modified (Preferred Alternative)	Grandview Section Alternative F Modified	Dry Creek and Gem Village Section Alternative H (Preferred Alternative)	Dry Creek and Gem Village Section Alternative C
Vegetation	Under this alternative, approximately 1.27 acres of riparian vegetation, and 3.09 acres of piñon-juniper vegetation on the BLM parcel in the Grandview section would be removed.	Under this alternative, approximately 0.77 acre of riparian vegetation and less than 0.01 acre of wetland vegetation on the BLM parcel in the Grandview section would be removed.	Under this alternative, approximately 3.01 acres of piñon-juniper vegetation, 2.48 acres of sagebrush-rabbitbrush vegetation, and 0.11 acre of riparian vegetation on the BLM parcel in the Dry Creek and Gem Village section would be removed.	Under this alternative, approximately 3.01 acres of piñon-juniper vegetation, 2.48 acres of sagebrush-rabbitbrush vegetation, and 0.11 acre of riparian vegetation on the BLM parcel in the Dry Creek and Gem Village section would be removed.
Noxious Weeds	Approximately 4.36 acres of native vegetation would be impacted and become vulnerable to noxious weed introduction.	Approximately 0.78 acre of native vegetation would be impacted and become vulnerable to noxious weed introduction.	Approximately 5.6 acres of native vegetation would be impacted and become vulnerable to noxious weed introduction.	Approximately 5.6 acres of native vegetation would be impacted and become vulnerable to noxious weed introduction.
Wildlife and Fisheries	The discussion in Section 4.11.2, Impacts Common to All Action Alternatives, describes impacts to wildlife that would occur throughout the US 160 project corridor, including those species that use BLM lands. Such impacts include the potential for altering breeding behavior and destroying nests of birds protected under the MTBA; displacement of individual wildlife species due to construction noise and other disruptions; and increased vehicle/ wildlife accidents due to increased traffic densities and speeds (this will be offset somewhat by providing wildlife-exclusion fences and wildlife crossings). Habitat loss, including approximately 1.27 acres of riparian habitat and 3.09 acres of piñon-juniper habitat, associated with this alternative would have a direct effect on wildlife that use BLM lands as well.	The discussion in Section 4.11.2, Impacts Common to All Action Alternatives, applies to this alternative as well. Habitat loss, including approximately 0.77 acre of riparian habitat and less than 0.01 acre of wetland habitat, associated with this alternative would have a direct effect on wildlife that use BLM lands as well.	The discussion in Section 4.11.2, Impacts Common to All Action Alternatives, applies to this alternative as well. Habitat loss, including approximately 3.01 acres of piñon-juniper habitat, 2.48 acres of sagebrush-rabbitbrush habitat, and 0.11 acre of riparian habitat associated with this alternative would have a direct effect on wildlife that use BLM lands as well.	The discussion in Section 4.11.2, Impacts Common to All Action Alternatives, applies to this alternative as well. Habitat loss, including approximately 3.01 acres of piñon-juniper habitat and 2.48 acres of sagebrush-rabbitbrush habitat, and 0.11 acre of riparian habitat associated with this alternative would have a direct effect on wildlife that use BLM lands as well.

Table 4.20.1
Summary of Impacts to BLM Lands

Resource Area	Grandview Section Alternative G Modified (Preferred Alternative)	Grandview Section Alternative F Modified	Dry Creek and Gem Village Section Alternative H (Preferred Alternative)	Dry Creek and Gem Village Section Alternative C
Threatened, Endangered, and Sensitive Species	As discussed in Section 4.12.2, Impacts Common to All Action Alternatives, generally, the US 160 project would not affect bald eagles, Mexican spotted owls, western burrowing owls, Colorado river fish and other sensitive fish, or sensitive bats, birds, amphibians, and plants. Survey Area A1, discussed in Section 4.12.3.1, Alternative G Modified (Preferred Alternative), is located on BLM land and would be removed.	The impacts under this alternative would be the same as those identified for Grandview section Alternative G Modified (Preferred Alternative).	As discussed in Section 4.12.2, Impacts Common to All Action Alternatives, generally, the US 160 project would not affect bald eagles, Mexican spotted owls, western burrowing owls, Colorado river fish and other sensitive fish, or sensitive bats, birds, amphibians, and plants. Survey Area B8, discussed in Section 4.12.5.1, Alternative H (Preferred Alternative), is located on BLM land and would not be impacted.	The impacts under this alternative would be the same as those identified for Dry Creek and Gem Village section Alternative H (Preferred Alternative).
Historic Preservation	The US 160 project would not affect cultural resources on BLM lands.	The US 160 project would not affect cultural resources on BLM lands.	The US 160 project would not affect cultural resources on BLM lands.	The US 160 project would not affect cultural resources on BLM lands.
Paleontological Resources	The paleontological resources discussed in Section 3.14, Paleontological Resources, do not occur within the BLM parcel in the Grandview section.	The paleontological resources discussed in Section 3.14, Paleontological Resources, do not occur within the BLM parcel in the Grandview section.	The paleontological resources discussed in Section 3.14, Paleontological Resources, do not occur within the BLM parcel in the Dry Creek and Gem Village section.	The paleontological resources discussed in Section 3.14, Paleontological Resources, do not occur within the BLM parcel in the Dry Creek and Gem Village section.
Visual Resources	As noted in Section 4.16.3.1, Alternative G Modified (Preferred Alternative), the BLM land in this section is classified by the BLM as "disposal" property that may be transferred out of federal ownership. Visual contrasts created in this area by the proposed project, including new entrance ramps, would be additive to the existing condition and would be within management guidelines for VRM Class III Lands.	As with Alternative G Modified (Preferred Alternative), visual contrasts created by the proposed project under this alternative would be additive to the existing condition, and would be within BLM management guidelines for VRM Class III lands.	As noted in Section 4.16.5, the BLM land in this section is classified as VRM Class II. The proposed activities, including the new US 160/CR223 (east) intersection, would increase the magnitude of the visual contrasts created between US 160 and the surrounding landscape, but would be additive to the existing condition, and would be within the guidelines for VRM Class II lands.	The impacts under this alternative would be the same as those identified for Dry Creek and Gem Village section Alternative H (Preferred Alternative).
Recreation Resources	Due to the location and relatively poor access, the BLM land in the Grandview section is not generally used for recreation. Therefore, the US 160 project would not affect recreation resources on BLM land in the Grandview section.	Due to the location and relatively poor access, the BLM land in the Grandview section is not generally used for recreation. Therefore, the US 160 project would not affect recreation resources on BLM land in the Grandview section.	The BLM parcel in this section is used primarily for grazing; however, the US 160 project is not expected to affect those recreational opportunities that are available on the BLM land in the Dry Creek and Gem Village section (such as hunting, wood gathering, and hiking).	The BLM parcel in this section is used primarily for grazing; however, the US 160 project is not expected to affect those recreational opportunities that are available on the BLM land in the Dry Creek and Gem Village section (such as hunting, wood gathering, and hiking).

Table 4.20.1
Summary of Impacts to BLM Lands

Resource Area	Grandview Section Alternative G Modified (Preferred Alternative)	Grandview Section Alternative F Modified	Dry Creek and Gem Village Section Alternative H (Preferred Alternative)	Dry Creek and Gem Village Section Alternative C
Geology and Soils	Soils that occur on BLM land in the Grandview section include the Arboles clay, 3 to 12 percent slopes; Falfa clay loam, 3 to 8 percent slopes; Zyme clay loam, 3 to 25 percent impacts; and Zyme-Rock outcrop complex, 12 to 65 percent slopes. As discussed in Section 4.18.2, Impacts Common to All Action Alternatives, impacts from roadway construction activities may include: • Clearing, excavating, scraping, blasting, leveling, compacting, and release of fuels and oils. • Increased erosion potential from cut-and-fill slopes. • Runoff from the roadway that may include soil particulates and/or chemicals from vehicle emissions and construction materials. • Wind and runoff erosion due to loss of vegetation cover in construction area. • Slope stability in areas where the groundwater table may be shallow. Permanent impacts to surficial geology and soils on BLM land in the Grandview section would result from roadway expansion and placement of impervious surfaces.	Impacts to geological resources under this alternative would be the same as those discussed for the Grandview section Alternative G Modified (Preferred Alternative).	Soils that occur on BLM land in the Dry Creek and Gem Village section include the Arboles clay, 3 to 12 percent slopes; Bayfield silty clay loam, seeped, 1 to 3 percent slopes; Bodot clay, 3 to 10 percent slopes; and Zyme-Rock outcrop complex, 12 to 65 percent slopes. The discussion in Section 4.18.2, Impacts Common to All Action Alternatives, applies to BLM land affected under this alternative as well.	Impacts to geological resources under this alternative would be the same as those discussed for the Dry Creek and Gem Village section Alternative H Modified (Preferred Alternative).

4.21 RELATIONSHIP OF LOCAL SHORT-TERM USES VS. LONG-TERM PRODUCTIVITY

Transportation improvements are based on state and local comprehensive planning, which considers the need for present and future traffic requirements within the context of present and future land use development. The local short-term impacts and uses of the resources by the proposed action are consistent with the maintenance and enhancement of long-term productivity for the local area and the region.

4.21.1 No Action Alternative

The No Action Alternative would not reconstruct US 160. Although there would be no short-term impacts through the use of local resources, there also would be no improvements in long-term productivity.

4.21.2 Impacts Common to All Action Alternatives

All action alternatives would have similar short-term impacts, or uses of the environment. Local short-term uses of the environment that would occur include:

- Some loss of soils through erosion
- Disruptions in traffic and economic conditions during construction
- Some increases in turbidity during construction
- Temporary and intermittent air quality degradation
- Vegetation loss due to construction clearing
- Some wetlands filled for construction
- Some wildlife displacement and/or death during construction
- Opportunity for noxious weed growth

Long-term productivity that would be maintained or enhanced by this action include:

- Improved safety
- Improved travel efficiency
- Upgraded roadway deficiencies
- Improved use of energy for vehicular fuel consumption
- Enhancement of traffic capacity
- Improved highway maintenance
- Local economic stimulation
- Replacement of wetland values lost
- Reduced wildlife/vehicle collisions due to construction of wildlife crossings

4.21.3 Mitigation

Short-term and long-term impacts will be mitigated as described in previous sections of this chapter. Mitigation measures are summarized in Section 4.25, Summary of Impacts and Mitigation Measures.

4.22 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Implementation of the proposed action involves a commitment of a range of natural, physical, human, and fiscal resources. Land used in the construction of the proposed facility is considered an irreversible commitment during the time period that the land is used for a highway facility. However, if a greater need arises for use of the land or if the highway facility is no longer needed, the land can be converted to another use. At present, there is no reason to believe that such a conversion will ever be necessary or desirable.

Considerable amounts of fossil fuels, labor, and highway construction materials, such as cement, aggregate, and bituminous material, are expended. Additionally, large amounts of labor and natural resources would be used in the fabrication and preparation of construction materials. These materials are generally not retrievable. However, they are not in short supply and their use would not have an adverse effect upon continued availability of these resources. Any construction would also require a substantial one-time expenditure of both state and federal funds, which are not retrievable.

The commitment of these resources is based on the concept that residents in the immediate area, state, and region will benefit by the improved quality of the transportation system. These benefits would consist of improved accessibility and safety, savings in time, and greater availability of quality services, which are anticipated to outweigh the commitment of these resources.

4.23 CUMULATIVE IMPACTS

Cumulative impacts are defined by the CEQ as:

"…the impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions and regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

A cumulative impact analysis is based on a number of assumptions. CEQ guidance limits the cumulative impact analysis to "important issues of national, regional, or local significance" (CEQ 1997). Therefore, not all issues identified for impact assessment in this EIS are analyzed for cumulative effects at the same level. Because of the wide geographic scope of a cumulative assessment and the variety of activities assessed, cumulative impacts are commonly examined at a more qualitative and less detailed level than are direct impacts caused by the action alternatives. FHWA guidance in the form of "Interim Guidance: Questions and Answers Regarding Indirect and Cumulative Impact Considerations in the NEPA Process" (January 31, 2003) was also considered during preparation of this section.

4.23.1 Methodology

La Plata County is used as the region of influence for this cumulative impacts assessment, and 20 years is the period considered for reasonably foreseeable future actions. La Plata County and the project corridor are shown relative to the Four Corners area in Figure 1.1.1, Project Location. In reviewing past projects and activities, a summary of more than 120 years of growth and change is included, as appropriate. Population growth figures for the past 20 years are presented. The projects and other activities evaluated for cumulative impacts analyses include the Animas-La Plata Water Storage Project, oil and gas development, La Plata County growth and development, the Missionary Ridge fire, the US 550 corridor transportation project, and other transportation projects. These activities and projects are shown relative to the US 160 improvement project in Figure 4.23.1, Cumulative Impacts to Projects in La Plata County.

The methodology used to assess cumulative impacts was as follows:

- A list of past, present, and future projects was developed for consideration of cumulative impacts.
- Projects were then assessed by resource area against the project list for cumulative impacts. While assessing cumulative impacts, it was determined that impacts generally do not vary greatly between the No Action Alternative and action alternatives. However, if impacts from the No Action Alternative substantially vary in some way, it is noted.

The following resources were evaluated for potential cumulative impact:

- Land use
- Wetlands
- Historic/archaeological
- Wildlife habitat
- Vegetation
- Threatened, endangered, and sensitive species
- Water quality
- Air quality
- Social/environmental justice
- Economic
- Visual resources

The resources in the following section were determined not to have substantial cumulative impacts.

4.23.2 Resources Not Evaluated for Cumulative Impacts

4.23.2.1 Soils and Geology

Project-related impacts to soils and geology are limited to areas directly disturbed by construction activities and those areas immediately adjacent to directly disturbed areas. The

past, present, and future projects evaluated are all geographically distinct from the proposed improvements to US 160. Although these other projects would have their own impacts to soils and geology from surface-disturbing activities, the impacts to soils and geology from these projects are geographically distinct from US 160 and are not expected to have any measurable additive cumulative impacts to soils and geology.

4.23.2.2 Prime Farmland

None of the projects evaluated for the cumulative effects analysis predict any significant impact on prime farmlands, as defined by NRCS. In the town of Bayfield, prime farmland would be taken out of production for expanded community development in the area of the US 160/CR 501 intersection, but the overall effect on the resource is minimal. Future development in La Plata County includes a potential large-scale commercial development and continued residential development along the Florida Mesa, which would impact irrigated farmland in the immediate vicinity of the project corridor.

4.23.2.3 Noxious Weeds

In accordance with the Colorado Weed Management Act, CDOT is responsible for managing weeds in the CDOT ROW, and CDOT implements control measures for noxious weeds as necessary. These control measures, plus the construction of weed control measures for the US 160 project, would limit the spread of weeds within the project corridor. Thus, consideration of this project's action alternatives is not expected to contribute to cumulative noxious weed impacts in La Plata County.

4.23.2.4 Paleontology

Impacts to paleontological resources as a result of the proposed US 160 project would be minor and would not contribute measurably to county or regional impacts. Therefore, a cumulative impact assessment has not been completed for paleontological resources.

4.23.2.5 Noise

An increase in noise as a result of increased residential and commercial/industrial development is anticipated. The increase in population and development would result in more traffic on all roadway systems, and thus an increase in noise. Future impacts could be minimized by proper planning of new residential developments.

There would also be short-term construction-related noise impacts associated with continued growth and development, but because of their temporary nature, they are not expected to have a cumulative impact.

4.23.2.6 Hazardous Materials

Facilities along the US 160 project corridor determined to have hazardous waste or materials contamination would either be avoided or remediated prior to highway construction, thus resulting in either no environmental impact or a positive impact. Hazardous waste impacts throughout La Plata County and the US 160 project corridor may increase as development increases over the next 20 years. However, as stated previously, the proposed project would

likely reduce the resulting cumulative impacts by identifying and remediating hazardous waste sites that currently exist along the US 160 project corridor.

4.23.2.7 Construction

There could be short-term cumulative impacts if other construction projects were occurring simultaneously to construction on US 160. However, these impacts could be mitigated by coordinating schedules with the appropriate public and private agencies.

4.23.3 Actions Considered for the Cumulative Impact Analyses

The projects and other activities evaluated for cumulative impacts analyses include La Plata County growth and development, oil and gas development, the Animas-La Plata Water Storage Project, the Missionary Ridge fire of 2002, the US 550 corridor transportation project, and other roadway improvements. The past projects, and present and reasonably foreseeable future projects, are described below.

4.23.4 Past Projects

Growth and Development in La Plata County

The area in and around the city of Durango has been developing since the discovery of mineral resources in the 19th century and the creation of the Southern Ute Indian Reservation. Consequently, land use patterns have been changing continually for more than 120 years, with some decades experiencing more rapid growth and change. An example of a past project that has impacted the land and resources with both its inception and abandonment is the Denver & Rio Grande Railroad. The railroad created Durango, changed the character of the valley, and continues, through the Durango & Silverton Narrow Gauge Railroad, to impact the area. The growth of agricultural land use, and concurrent construction of reservoirs and irrigation ditches, affected a multitude of resources including wildlife, water, wetlands, historic properties, and socioeconomics. The current loss of that land use continues to impact these same resources.

More recently, La Plata County has grown from approximately 27,000 people in 1980 to just under 47,000 people in 2003. This growth has fueled both residential and commercial development within and outside urban areas. The Denver & Rio Grande Railroad abandoned its line south of Durango in the 1960s. This allowed the Colorado Department of Highways to consider the construction of a bypass of the Durango central business district, which was constructed in the mid 1960s (Camino del Rio). Commercial establishments developed south of Durango in the 1970s and 1980s after additional highway and bridge construction and annexation of the area by the City of Durango in the 1980s and 1990s (Watson 2003). Future development and annexation in the project corridor is a continuum of this development of the previous four decades.

Oil and Gas Development

Large-scale development of oil and gas in the San Juan Basin was made possible by the construction of pipeline-gathering systems around 1950. Development has followed "boom and bust" cycles through the 1990s related to the presence of a gas-gathering system infrastructure, the Arab oil embargo, and the Unconventional Fuel Tax Credit. One of these boom cycles took place in the 1980s and 1990s with the development of the coalbed methane wells. According to *Oil and Gas Development on the Southern Ute Indian Reservation Final Environmental Impact*

Statement (US DOI and SUIT 2002), there are more than 26,000 wells in the San Juan Basin and more than 2,000 wells in the Ignacio-Blanco Field, which is almost entirely within the Southern Ute Indian Reservation.

Transportation Projects

Transportation projects within La Plata County have included construction of US 550 and reconstruction of US 160 (formerly SH 3) in the 1950s. As part of the construction, a portion of US 160 was realigned in the Grandview area. Land use in this area has since changed from rural agricultural uses to urbanized residential and commercial developments. The US 160 bypass (current alignment) around Bayfield was built in the 1960s to address safety and capacity issues through town as highway traffic increased. This resulted in an increase in commercial development in the vicinity of the US 160/CR 501 intersection. In addition, other new alignments of US 550 and US 160 were constructed in and south of Durango. These projects have contributed to land use changes and impacts to some resources. More recent highway improvement projects have included an upgrade of the US 160/US 550 (south) intersection, US 160/SH 3 intersection, and the US 160/CR 501 intersection in Bayfield, and improvement of a 3-mile length of US 550 north of the state line.

The Missionary Ridge Fire

The Missionary Ridge fire, which occurred in June of 2002, impacted about 73,000 acres of land in La Plata County. The human-started fire was located on the Missionary Ridge Forest Road, which provides access to the Weminuche Wilderness Area, located approximately 10 miles northeast of Durango. Increased impacts to resources, such as water quality and wildlife habitat, from the fire will continue into the foreseeable future. Impacts from the fire continue to require the use of economic resources within La Plata County to mitigate the impacts.

4.23.5 Present and Reasonably Foreseeable Future Projects

Animas-La Plata Project

The BLM completed *The Animas-La Plata Project Final Supplemental EIS* in July 2002. This Final Supplemental EIS evaluated the potential impacts of assuring long-term water supply to the Southern Ute and Ute Mountain Ute Indian tribes. Main goals of the project are to divert, pump, store, and convey water from the Animas River at Durango to provide water for both Indian and non-Indian municipal and industrial uses in Colorado and New Mexico.

Part of the Animas-La Plata Project is to construct Ridges Basin Reservoir. Approximately 120,000 acre-feet of water would be stored in Ridges Basin Reservoir located approximately 5 miles southwest of Durango and 5 miles west of US 550. Water would be pumped into the reservoir from the Animas River at a rate ranging between 14 cfs to 56 cfs. Water would be returned to the Animas River from the reservoir via a 1,400-foot outlet tunnel.

As of September 2004, the project, including the reservoir, pumping station, and pipelines was approximately 14 percent completed. The entire project is scheduled to be completed in 2010.

Oil and Gas Development

The BLM completed an FEIS for oil and gas development on the Southern Ute Indian Reservation in July 2002. Planned development on SUIT lands includes completing up to 70 injection wells and 636 production wells. According to the EIS, an estimated 1,306 acres of

surface disturbance would result from well pads, access roads, pipelines, and other mineral-related facilities (US DOI and SUIT 2002). Non-tribal development could add another 67 injection wells and 519 coalbed methane wells, and 346 wells north of the Southern Ute Tribal boundary (US DOI and SUIT 2002).

The USFS and BLM completed the *Northern San Juan Basin Coal Bed Methane Project Draft EIS* in June 2004. The Draft EIS proposes to drill approximately 300 coal bed methane wells, along with the support facilities, in the San Juan Basin, north of the Southern Ute Reservation. Completion of the project would address the public's increased demand on natural gas. The wells would be constructed on federal, state or privately owned lands. Currently, there are seven alternatives, including the No Action Alternative for the project. Cumulative impacts potentially expected from the proposed wells could include loss of roadless areas, loss of various types of wildlife habitat, and changes in water and air quality.

Oil and gas development within and outside the Southern Ute Indian Reservation would continue for the foreseeable future. Additional permits would be granted, wells would be drilled, and access roads and pipelines would be constructed.

Growth and Development in La Plata County

Reconstruction of the CR 233/US 160 (west) intersection in Grandview began in early 2004 to serve as the access for the Mercy Medical Center, which also began construction in 2004. This access would also serve as the access for the Three Springs Development which is a mixed-use development proposed to consist of 2,283 dwelling units, as well as commercial space, schools, and a recreational center on 682 acres.

Development in Grandview will accelerate with the construction of the new hospital. Additional residential and commercial development is proposed for the same area. Another project identified for community expansion is the Three Springs Development. The Grandview area west of the SH 172/CR 234 intersection with US 160 most likely will be annexed by Durango. Infrastructure development, including roads, sewer, sidewalks, and water, will follow.

A shared use trail/path is planned from Durango to Bayfield. This project would construct new trails to connect with existing trails, such as the Animas River Trail. Planning, design, and construction of the trail would be conducted by various entities such as CDOT, SMART 160, La Plata County, the City of Durango, or the Three Springs Development.

Continued community expansion and highway improvements are primarily related to population increases in the area. La Plata County contains a blend of agricultural, industrial, residential, and recreational land uses. Population has increased substantially in the past decade and is expected to continue growing in the near future. The growing population creates demand on community facilities, especially housing, water, and roads. US 160 is expected to be upgraded as part of CDOT's statewide plans.

US 550 Corridor Project

CDOT released an EA in July 2005 to the public and federal and state agencies addressing potential impacts resulting from upgrading US 550 from the Colorado state line north to CR 220 (CDOT and FHWA 2005). A FONSI for this corridor was published in December 2005. The EA identifies a Preferred Alternative that widens the existing US 550 highway from two lanes to four lanes from MP 1.0 to 15.4. The project generally follows the existing alignment with an eastern shift at Bondad Hill to reduce the grade from 6.5 percent to 5 percent between MP 4.3

and MP 5.3. Widening of US 550 would increase the width of the roadway section from its current configuration (approximately 28 feet to 68 feet) to approximately 138 feet.

Other Transportation Projects

The *La Plata County Road Master Plan* identified the following roadway/highway improvement projects for the foreseeable future near the project corridor:

- Relocation of the US 160/CR 228 intersection to CR 229
- Expansion of CR 221 from the south
- Expansion and extension of CR 501 from the south to US 160
- Relocation to the west of CR 502 intersection
- Consolidation of the CR 506, CR 502, and US 160B (west) intersections

Continued community expansion and highway improvements are primarily related to population increases in the area. As described in Section 3.1, Land Use, La Plata County contains a blend of agricultural, industrial, residential, and recreational land uses. Population has increased substantially in the past decade and is expected to continue growing in the near future. The growing population creates demand on community facilities, especially housing, water, and transportation.

4.23.6 Land Use

4.23.6.1 Past Land Use Cumulative Impacts

Growth and Development in La Plata County

The population of La Plata County increased from 27,195 people in 1980 to 43,941 people in 2000, an increase of 36.1 percent. During the same period, the population of the city of Durango increased from 11,649 to 13,922 people, an increase of 19.5 percent. The town of Bayfield experienced robust growth from 1980 to 2000, increasing from 724 to 1,549 people, an increase of 114 percent (CDS 2003). The population growth in La Plata County, Durango, and Bayfield has resulted in additional housing units and the establishment of new businesses to serve the increased population. Changes in land use for the three areas of concentrated development in the US 160 project corridor – Grandview, Gem Village and Bayfield – are discussed below.

In 1980, Grandview was an area of mixed-use development as it is today, but there was less commercial development, particularly in the eastern part of Grandview. Most parcels fronting on US 160 are now developed. Gem Village was also an area of mixed-use development in 1980. While some new businesses have opened and others have closed, the basic mix of residential and commercial uses has not changed.

With a population that more than doubled from 1980 to 2000, Bayfield has experienced more land use changes than Grandview and Gem Village. Virtually all of the town's commercial growth has occurred north of US 160, much of it near the intersection of Colorado Drive and US 160. A new business park (Bayfield Center) located near the US 160/CR 501 intersection is a continuation of the trend to develop on the north side of the highway.

Oil and Gas Development

Oil and gas development within the project area has been occurring through time. Land use changes from forest, meadow, range, and agricultural land have been developed with oil and gas facilities over the years. Loss of land value due to visual impacts and from loss of use of the land has resulted from oil and gas development.

Transportation Projects

The US 160 bypass (current alignment) around Bayfield was built in the 1960s to address safety and capacity issues through town as highway traffic increased. This resulted in an increase in commercial development north of the current US 160 highway.

Missionary Ridge Fire

The Missionary Ridge fire burned naturally vegetated areas, houses, campsites, etc. Through time, the burned area is expected to return to its previous land uses.

4.23.6.2 Present and Future Land Use Cumulative Impacts

Animas-La Plata Water Storage Project

According to the *Animas-La Plata Water Storage Project Final Supplemental Environmental Impact Statement* (US DOI 2000), the Preferred Alternative, Refined Alternative 4, would have "less than significant" impacts on land use other than impacts on the immediate area covered by or surrounding the proposed Ridges Basin Reservoir.

Development associated with additional water allocated for municipal and industrial growth could create conflicts with rural atmosphere goals and objectives stated in some of the district land use plans. Additional water may increase development pressure in rural areas near the city of Durango or near water conveyance facilities. However, proposals for new development must be approved by La Plata County or the City of Durango. These entities would face the task of balancing rural atmosphere goals with the need to accommodate new growth and economic development. Cumulative impacts on ~~land use~~ economic development from the Animas-La Plata Water Storage Project are discussed in ~~community expansion cumulative impacts~~ Section 4.23.8.2, Present and Future Economic and Recreation Cumulative Impacts.

Oil and Gas Development

The San Juan Basin, which includes southern La Plata County, is already substantially developed for oil and gas production. As of 2000, there were more than 26,000 wells in the basin, including those in New Mexico (US DOI and SUIT 2000). Production of gas from conventional sand reservoirs was more common until passage of the 1980 Crude Oil Windfall Profit Tax Act, which spurred coalbed methane development. In some highly productive areas where geologic formations overlap, some 640-acre sections contain more than a dozen wells, while in less productive areas, there are only one or two wells per section.

No productive conventional reservoirs have been found north of the Southern Ute Indian Reservation line, so only coalbed methane production with a well density of two to four wells per section exists there.

Loss of surface use and revenue are key land use concerns relating to oil and gas development due to facility locations, wells, compressors, and roads near existing and future residences.

Noise and visual impacts from well construction, operation, and related traffic could adversely affect residents by lowering property values. The construction of each new well disturbs approximately 1 to 3 acres of surface area. When located on grazing land or irrigated agricultural land, wells may result in an actual economic loss of surface use.

According to US DOI and SUIT (2002), no significant impacts on land use are expected. Although most of the acreage in the region of influence (south of the Southern Ute Indian Reservation line) is used for farming and ranching, minimal acreage of agricultural land, including prime farmland, would be replaced by new well construction. Non-tribal development could add another 67 injection wells and 519 coalbed methane wells.

According to the *Draft Environmental Impact Statement Northern San Juan Basin Coalbed Methane Project* (US DOI and BLM 2004), approximately 300 coalbed methane wells, in addition to the existing 346 wells (along with support facilities), are anticipated to be developed in the San Juan Basin, north of the Southern Ute Indian Reservation. At this location, a variety of factors, including geology, steeper topography, existing residential development, and roads, limit the number of appropriate locations for new wells. Thus, land use impacts from future gas development north of the Southern Ute Indian Reservation line are not considered to have substantial large scale changes to growth patterns from the coalbed methane well development. (US DOI and BLM 2004).

Growth and Development in La Plata County

~~According to CDS (2003), the La Plata County population is projected to increase by nearly 25,000 people to more than 68,000 by 2020, and the number of housing units would increase by approximately 12,000. If the robust growth rate (3.6 percent per year) experienced during the 1990s continues, the county's population would exceed 78,000 by 2020. Based on CDS (2005) projections, the aggregate population of the five planning districts in eastern La Plata County that surround the US 160 project corridor is expected to increase to about 33,000, indicating a 90 percent increase from the present population. The number of new housing units would likewise increase by approximately 7,400 units in the eastern part of the county.~~

~~Future commercial development would most likely increase in proportion to additional population and housing units as businesses respond to the demands for goods and services of new year-round and seasonal residents, as well as tourists.~~

Induced Growth and Effects

As described in Section 4.1.2.2, Indirect Impacts, the implementation of the project described in this EIS would not increase overall population growth in La Plata County, but it could focus growth along the US 160 corridor. With project implementation, development along the corridor could occur at a faster rate, mainly in the areas of Grandview and Bayfield. Based on land use plans and expected growth rates, Grandview is expected to have 2,536 new housing units and Bayfield would have 300 housing units by 2025. With additional highway capacity, development would be focused in these areas mainly because Grandview and Bayfield have central water and sewer, and the land use plans allow higher commercial and residential densities. Lack of central water and sewer will continue to limit growth along the rest of the corridor. At maximum buildout, Grandview would have 5,467 new housing units and Bayfield would have 1,880 new housing units. A faster rate of conversion of agricultural/rural land to

residential/commercial land in Grandview and Bayfield is based on the following information and assumptions:

- A continued population growth rate of 3.6 percent per year in La Plata County. According to the CDS (2003), La Plata County is projected to increase by nearly 25,000 people to more than 68,000 people by 2020 and the housing units would increase by approximately 12,000.
- Assuming the current population split between people who live in the city and county would continue at the same rate, 63.3 percent would move to the county and 36.7 percent would move to the city. By 2025, the Grandview area is expected to be fully annexed by the city.
- Most of the population growth along the corridor would be expected to occur in Grandview and Bayfield. These areas have central water and sewer and their land use plans allow for higher residential and commercial densities. The land use plans that cover Grandview and Bayfield assume densities of development of two units per acre (see Figure 4.23.2, US 160 Corridor Land Use). Along the rest of the corridor, the land use plans assume one unit per 10 to 20 acres for agricultural/ rural residential classifications or one unit per 5 acres to 35 acres for perimeter residential classifications (see Figure 4.23.2, US 160 Corridor Land Use). Because the corridor between Grandview and Bayfield does not have central water and sewer, county requirements will not allow developments with higher densities than 1 unit per 3 acres. Densities in this part of the corridor are likely to be even less than 1 unit per 3 acres because developments are also required to be compatible with surrounding land uses. Currently, the majority of land use between Grandview and Bayfield is agricultural with densities of 1 unit per 10 to 20 acres. One resident per 3 to 10 acres appreciably restricts the rate of growth and controls the pattern of growth in these areas.
- The additional highway capacity would encourage people to live along US 160 between Durango and Bayfield who may otherwise choose to live in other parts of the county.

The conversion of agricultural/rural land to residential/commercial land in Grandview and Bayfield would cause loss of sensitive environmental resources to occur faster than expected. Assuming that the 3,562 acres in Grandview would be fully developed by 2025, this would represent a loss of wildlife habitat that currently is a winter concentration area for mule deer and elk. Wetlands along Wilson Gulch would be lost through the conversion of agricultural land to residential/commercial land.

Impacts from the development would be mitigated through existing land use planning and growth management policies. Additional information on potential mitigation for cumulative impacts is described in Section 4.23.17, Mitigation.

US 550 Corridor Project

The US 550 project which involves expanding the current two-lane roadway to a four-lane roadway from the New Mexico state line north to County Road 220, will require relocating individuals and residences. Anticipated land use impacts from the project include 12 residential relocations, 3 commercial relocations, and conversion of approximately 200 acres of residential, commercial, agricultural, vacant and tribal land to roadway use. Although such relocations and changes in land use may affect individual property owners, the general land use patterns in the corridor would not change. Most of the highway corridor is likely to remain rural or agricultural.

Other Transportation Projects

In the *La Plata County Comprehensive Traffic Study 1999* (La Plata County 1999), the La Plata County Planning Department developed a plan for improvements to the county road network. Recommended improvements were based on projected traffic volumes through 2020 on county roads, which were in part determined by projected distribution of future residential and commercial growth throughout the county. In other words, recommended road improvements are largely in response to existing and projected spatial distribution of community expansion. Cumulative impacts on land use from improvements to La Plata County roads are included in growth and development in La Plata County cumulative impacts.

4.23.6.3 Overall Land Use Cumulative Impacts

For the US 160 corridor, acres of residential, commercial, agricultural, BLM, county, and vacant land converted to roadway use could range from 485 to 563 acres. In combination with US 550, the total land use converted to roadway use by US 160/US 550 projects would be approximately 685 to 763 acres. This converted land use for roadway purposes is less than 0.1 percent of the total acres in La Plata County (1,083,085 acres).

According to the Durango Area Association of Realtors, the MLS had ~~1,003~~2,921 residential listings and ~~51~~533 commercial space listings on ~~October 31, 2003~~April 17, 2006. Based on these MLS listings, sufficient replacement residential and commercial property is available for relocating residents and businesses. Even assuming the unlikely "worst case" scenario, whereby all parcels were completely acquired by CDOT for this project, replacement property is available in La Plata County.

There are approximately 10,300 vacant parcels within La Plata County, according to La Plata County Assessor records, ranging from small subdivision lots to large, undeveloped agricultural tracts. Since the amount of commercial and residential square footage typically expands in proportion to increased population, some of the existing vacant tracts will be developed for commercial and residential purposes, providing opportunities to relocate displaced individuals and businesses within La Plata County.

4.23.7 Social/Environmental Justice

4.23.7.1 Past Social/Environmental Justice Cumulative Impacts

As described in Section 4.1, Land Use, past cumulative land use impacts have been influenced by population growth in La Plata County over the past 20 years. This growth has had varying impacts on community cohesion for the three communities along the project highway corridor: Grandview, Gem Village, and Bayfield. Although Grandview was more rural in the 1980s and traffic volumes were less than traffic levels today, US 160 bisected the community as it does now, acting as a deterrent to the formation of a cohesive community. With the opening of new businesses, virtually all of which are vehicular-dependent rather than pedestrian-oriented, and with increased traffic, there is probably less community cohesion in Grandview today than 20 years ago.

A fairly high degree of community cohesion probably existed in Gem Village 20 years ago, as it does today. In Bayfield, a higher percentage of the population and businesses was located on the south side of US 160 where most community facilities and institutions, such as the town hall,

churches, and schools, were also located. Thus, US 160, which bisects the community, was less of an obstacle to community cohesion than it is today, since most growth during the past 20 years has occurred north of the highway. However, the social and political bonds inherent within an incorporated community have and would probably continue to mitigate the potentially divisive influence of a major highway that acts as a physical barrier between the north and south sides of Bayfield.

Oil and gas development and the Missionary Ridge fire did not contribute to social and environmental justice impacts in the past.

4.23.7.2 Present and Future Social/Environmental Justice Cumulative Impacts

Animas-La Plata Water Storage Project

As discussed in the *Animas-La Plata Water Storage Project Final Supplemental EIS* (US DOI 2000), the socioeconomic impacts for the Preferred Alternative (Refined Alternative 4) are more economic than social, and are discussed in Section 4.23.8.2, Present and Future Economic and Recreation Cumulative Impacts.

Oil and Gas Development

The socioeconomic impacts of oil and gas development are primarily economic in nature, pertaining to tax revenue and employment. Impacts of new wells on population distribution within La Plata County are likely to be negligible, although population density of future development in the immediate vicinity of existing or proposed wells could be reduced if buffer areas are established to mitigate noise and visual impacts.

Growth and Development in La Plata County

In April 2001, the US 160 project corridor from the US 160/US 550 (south) intersection to approximately 0.5 mile east of the SH 172/CR 234 intersection with US 160 was included within the Durango Urbanizing Area by the City of Durango. This area is also included in the *Grandview Area Plan* completed in 2004. Thus, much of the corridor will probably be annexed by the city. The area in the vicinity of the new hospital was annexed in 2004.

The current mix of agricultural, rural, suburban, and urban land uses in the Grandview area are likely to become entirely urbanized during the next 20 years. Residential properties closest to the highway corridor, including those that would be affected by proposed improvements to US 160, are likely to be converted to commercial uses.

The decision to relocate Mercy Medical Center to the western end of Grandview and the "new urbanism" plan recently adopted for the hospital vicinity is the beginning of this trend. Economic forces (i.e., commercial land is more valuable than residential land) would likely cause owners of some parcels currently in residential use, particularly mobile home parks, to sell or convert their properties to commercial uses. With the anticipated increase in the number of parcels available for commercial uses, there would be an increased opportunity for existing businesses in the Grandview area to expand or move to more desirable sites within the general area.

If the proposed trail underpass at Mountain View Drive were to be built, there would be a pedestrian/bicycle link between north and south on the east side of Bayfield, providing connections between schools and neighborhoods and between the north side and downtown.

Although the proposed limited access highway would be a greater physical and visual barrier than the present highway, this slightly larger barrier would not deter residents from accessing and enjoying the facilities and institutions on both sides of the highway that serve as cohesive community bonds.

Changes in traffic movement and its impact on some businesses in the town of Bayfield may be offset somewhat if the town extends the access road on the north side of the highway to the proposed US 160B (east) intersection. This connection would create a roadway parallel to US 160 on the north side, which would connect to Commerce Drive.

There is a general shortage of affordable housing in La Plata County. According to Housing Solutions of the Southwest, a social services agency operating in southwest Colorado, as many as 40 percent of La Plata County renter households pay more than 30 percent of their monthly incomes for housing, one criterion used by federal and state housing programs to determine eligibility for housing assistance. As indicated in Section 3.3, Socioeconomics, there are waiting lists for approximately 175 affordable housing units on file with affordable housing facilities in La Plata County within proximity of the project area. A mobile home park in South Durango was recently replaced with a multi-family development, displacing about 25 mobile homes. Although this does not indicate all the potential need for low-income housing, it does indicate a shortfall.

However, several major affordable housing projects are in the planning or conceptual stages. A total of 123 known affordable housing units are planned for construction in the near future to assist with alleviating the shortage of affordable housing. In addition, a housing development project on 70 acres planned for Ignacio is indicated to include a percentage of affordable housing units, and a new mobile home park recently opened in Bayfield containing 37 mobile home sites.

Given the present and likely future dominance of retail trade and service sectors with typical low-wage jobs, providing a sufficient number of affordable housing units during the next 20 years will challenge local and state housing resources and programs.

In the short term, the No Action Alternative would essentially have a positive effect on existing residents and businesses because they would not be disrupted by highway improvements. There would be no change due to highway-related displacements to a few businesses that currently depend on access of the US 160 through lanes. However, in the long term, increasing traffic congestion resulting from the No Action Alternative, particularly in Grandview, would make US 160 more of a safety concern and could adversely affect some businesses and residents. The mix of land use along US 160 would continue to change. The population increase along the corridor may stimulate more commercial development.

Regionally, the No Action Alternative would have no major effect on the projected development and socioeconomic changes in La Plata County. However, as traffic increases, deterioration of the LOS may have an adverse impact on some potential developments.

US 550 Corridor Project

The Preferred Alternative identified in the US 550 EA (CDOT and FHWA, July 2005) would require the relocation of 12 residences and 3 businesses. Travel patterns and accessibility to Fire Station 4 could be affected and an increase in emergency response time could occur during construction of the project. Three homes owned by minorities and two homes considered to be low-income would be relocated as part of the project. A pedestrian bridge or underpass will be

provided between the Old Homestead Mobile Home Park and the Sunnyside Elementary School and a noise wall will be constructed in front of the Old Homestead Mobile Home Park. Because of these measures, the project is not expected to contribute to cumulative impacts to environmental justice populations in La Plata County.

Other Transportation Projects

Other recommended road improvements in La Plata County are largely in response to existing and projected spatial distribution of community expansion. Cumulative socioeconomic impacts from improvements to La Plata County roads are included in Growth and Development in La Plata County cumulative impacts described earlier.

4.23.7.3 Overall Social/Environmental Justice Cumulative Impacts

Social impacts from community expansion are much greater than impacts from other activities evaluated for cumulative impacts (such as Animas-La Plata Project, oil and gas development, and other highway projects). The trend to convert agricultural land to large-lot residential development is anticipated to continue over the next 20 years, displacing some current residents and businesses.

While the expansion of the US 160 project corridor in the Grandview area would displace some residences, their occupants, and businesses, proposed highway improvements would only accelerate relocations that would most likely occur due to the changing land use patterns and economic forces in the project corridor (see Section 4.23.6.2, Present and Future Land Use Cumulative Impacts).

Because there are a large number of vacant parcels within La Plata County (approximately 10,300, including 8,000 in existing subdivisions), the impacts from this project to those residents and businesses that would need to relocate elsewhere in La Plata County, including the City of Durango, would be negligible. While relocations would be disruptive to individual residents and business owners, there is no shortage of available land to accommodate such relocations.

4.23.8 Economic and Recreation Impacts

4.23.8.1 Past Economic and Recreation Cumulative Impacts

According to CDS (2005), total revenue received by La Plata County increased from $11,774,011 in 1985 (the earliest year for which data is available from CDS) to $36,206,324 in 2000. During this period, property tax revenue increased from $2,379,837 to $9,948,011. Much of the property increase was due to development of coalbed methane resources. From 1985 to 2000, sales and use tax revenue increased from $3,555,442 to $9,403,815. Total taxable assessed value increased from $233,233,000 in 1985 to $1,163,142,000 in 2000. Much of the increase in sales tax revenues and taxable assessed value can be attributed to a robust local economy during the 1990s fueled by population growth, tourism, and increased real estate prices.

Oil and Gas Development

Property tax revenues from oil and gas production makeup a significant percentage of total revenues for La Plata County. In 2000, approximately 45 percent of property taxes were paid by the oil and gas industry. Continued and expanded oil and gas operations have had a beneficial economic impact in La Plata County, helping to fund county government services.

Missionary Ridge Fire

The Missionary Ridge fire burned approximately 70,000 acres, and destroyed 56 homes and 27 outbuildings. One firefighter was killed, and 48 other people were injured. The total economic cost of the fire was $74.6 million dollars broken out below:

Cost: $74.6 million (source: FEMA 2005)

- Firefight: $40.4 million (state/local share was $2.6 million, of which FEMA reimbursed $1.9 million)
- Forest rehabilitation: $9.47 million
- Insurance: $17.7 million
- SBA loans: $6.8 million

4.23.8.2 Present and Future Economic and Recreation Cumulative Impacts

Animas-La Plata Water Storage Project

According to the selected alternative (Refined Alternative 4) in US DOI (2000), Refined Alternative 4 would have either beneficial or less than substantial negative economic impacts. Economic impacts affecting La Plata County include:

- Decreased commercial rafting on the Animas River would result in loss of revenue (less than significant). Commercial rafting contributes only about 1.0 percent of total tourism receipts. Lost user days due to pumping from the Animas River would result in a 4.5 percent reduction in revenues to commercial rafters and a 0.01 percent reduction to county tourist receipts.
- Construction of Ridges Basin Reservoir would increase gross sales revenues and create jobs in La Plata County (beneficial). It is estimated that expenditures during the 7-year construction period would provide an annual average gross direct and indirect increase in La Plata County revenue of nearly $23 million, representing an approximately 2.0 percent increase over 1999 county gross sales receipts. Additionally, the creation of approximately 600 jobs would represent a 2.5 percent increase to the current labor force.
- Reservoir-based recreation would generate revenue (beneficial), resulting in a direct and indirect annual benefit of approximately $9.4 million.
- Conversion of fee simple farmland to Indian Trust Land would reduce tax revenue, as these lands would be removed from the tax rules (less than significant). Total annual losses to La Plata County revenues would be only about $41,000 compared to more than $31 million in total revenues received in 1999.
- Sales of water developed by the project could generate revenue for the SUIT and allow for on-reservation development of potable water, new and/or improved housing, and improved health and medical services (beneficial).

Oil and Gas Development

Property tax revenues from oil and gas production make up a significant percentage of total revenues for La Plata County. According to the 2003 La Plata County budget, approximately 61 percent of property taxes are expected to be paid by the oil and gas industry. Continued and

expanded oil and gas operations would have a beneficial economic impact in La Plata County, helping to fund county government services.

Growth and Development in La Plata County

New development, particularly commercial development, would increase property tax and sales tax revenues and employment opportunities, and thus would create positive economic impacts. However, new development also creates a demand for expanded public facilities and services, such as new or improved roads, more school classrooms, and additional police and fire protection. In general, most of the new taxes generated by new development are allocated to pay for expanded facilities and services. In some communities, particularly those that rely heavily on local property taxes, the cost of serving new growth, especially residential development, is greater than the revenues generated by new growth. However, in La Plata County, several factors mitigate the potential financial drain caused by new development:

- Because tourism and outdoor recreation is a major component of the Durango/La Plata County economy, sales taxes account for a higher share of revenues (21 percent of total revenues) than property taxes (13 percent for non-oil and gas property taxes). In effect, tourists – who pay sales and lodging taxes – pay for much of the cost of new growth.
- New commercial development has generally kept pace with new residential development, generating sales taxes as well as property taxes. According to the City of Durango Department of Planning and Community Development, approximately 100,000 square feet of new commercial development has been built within Durango and newly annexed areas of La Plata County during each of several recent years, creating new jobs and expanding the local tax base.
- In Colorado, the assessed valuation in relation to full market value for commercial property is much higher than for residential property. In 2003, commercial property was assessed at 29 percent of market value, while residential property was assessed at only 7.96 percent. This higher rate of assessed valuation combined with new commercial development results in increased tax revenue.
- La Plata County and the City of Durango collect impact fees for new commercial and residential development, thus reducing the potential drain on public services and facilities resulting from new development. Impact fees are a one-time payment, usually collected when a building permit is issued, to partially offset the cost of serving new development with expanded facilities and services.
- Given that the oil and gas industry provides a significant share of La Plata County's revenues (61 percent of property taxes according to the 2003 budget), such revenues help to fund expanded facilities and services associated with new growth.

For the reasons presented above, new development associated with community expansion would probably continue to have a positive economic impact, as long as local tourism thrives and the oil and gas industry remains an important component of the local economy.

US 550 Corridor Project

Construction to improve US 550 would create positive economic impacts for the La Plata County construction industry and labor force. Although there may be commercial development along US 550, it would be more directly related to the population growth in the area. The location of

the commercial development would be influenced somewhat by US 550 ROW preservation and access control. The SUIT may choose to develop certain parcels of their land along the corridor; again, this would be more dependent on the population growth than US 550 construction. Given the importance of a good road network in support of sustained economic growth, particularly tourism, improvements to US 550 would facilitate efficient traffic movement through the county's southern portal. Improvements to the US 550 corridor could increase La Plata County's attractiveness as a tourist destination, thus having a positive impact on tourist-generated revenues to businesses and local governments.

Other Transportation Projects

Although most of the expenditures for improvements to La Plata County roads would be allocated from the county's Road and Bridge Fund, the impact to existing taxpayers would be reduced if the county adopts road impact fees, as recommended in the *La Plata County Comprehensive Traffic Study 1999* (La Plata County 1999), to ensure that new development pays a fair, proportionate share of future road improvements.

4.23.8.3 Overall Economic and Recreation Cumulative Impacts

Negligible adverse impacts on property tax revenues, assuming a worst-case scenario whereby none of the structures displaced by improvements to US 160 are relocated or replaced within La Plata County, would be offset by the cumulative beneficial economic impacts of the Animas-La Plata Water Storage Project and continued oil and gas development. Lost property taxes would be less than one percent of total property taxes. However, it is more likely that most or all of the structures displaced by improvements to US 160 would be relocated in La Plata County, thereby having virtually no adverse impact on property tax revenues.

Given the importance of a good road network in support of sustained economic growth, particularly tourism, improvements to US 160 would facilitate efficient traffic movement through the county's eastern portal. Conversely, lack of such improvements (the No Action Alternative) would result in traffic congestion and could reduce La Plata County's attractiveness as a tourist destination, thus adversely impacting tourist-generated revenues to businesses and local governments.

4.23.9 Air Quality

4.23.9.1 Past Air Quality Cumulative Impacts

Air quality in the region is measured by several monitoring stations. The most complete air quality measurement data available within the project area are from the SUIT monitoring station near Ignacio, Colorado, which has been operational since 1987. Table 4.23.1, Background Air Pollutant Concentrations (Regional) provides a summary of available data.

Table 4.23.1
Background Air Pollutant Concentrations (Regional)

Pollutant	Year	Averaging Time	Maximum Concentration (µg/m³)	Second Maximum Concentration (µg/m³)	Applicable Ambient Air Quality Standard (µg/m³)
Carbon Monoxide		1-hr	2.286(1)	2.286(1)	40.000
		8-hr	2.286(1)	2.286(1)	10.000
Nitrogen Dioxide	1997	Annual	9.4	N/A	100
	1998	Annual	9.4	N/A	100
	1999	Annual	9.4	N/A	100
	2000	Annual	7.5	N/A	100
Ozone	1996	1-hr	164	163	235
	1997	1-hr	149	147	235
	1998	1-hr	157	153	235
	1999	1-hr	153	151	235
	2000	1-hr	151	147	235
	1997-1999	8-hr	137(2)	N/A	157
PM_{10}	1991	24-hr	50	25	150
	1992	Annual	10.2	N/A	50
	1993	Annual	11.3	N/A	50
	1994	Annual	10.8	N/A	50
	1995	Annual	14.1	N/A	50
	1996	Annual	14.6	N/A	50
$PM_{2.5}$	2003	24-hr	26(3)	20(3)	65
		Annual	6(3)	N/A	15
Sulfur Dioxide	1992	3-hr	57	55	700
		24-hr	23	23	365
		Annual	1.8	N/A	80

Source: BLM (2000)
µg/m³ = micrograms per cubic meter
N/A = not applicable
(1) CDPHE-APCD (2001) assumed values
(2) Maximum 4th highest 3-year running average concentration
(3) CDPHE-APCD (2003) data collected in Durango, Colorado

Growth and Development in La Plata County

Increases in the number of tourists and local residents within La Plata County over the years has caused air pollution increases primarily from increased vehicle emissions, travel on unpaved roads, and increased wood burning. However, the increase in paved roads has decreased road dust, and the use of natural gas has reduced the use of wood-burning stoves and fireplaces.

Oil and Gas Development

It is expected that past oil and gas development within La Plata County has contributed to localized short-term increases in CO, NO_2, PM_{10}, and SO_2 concentrations. La Plata County has been in attainment for USEPA criteria pollutants; therefore, it is not expected that the past air pollutant contributions from the oil and gas facilities substantially contributed to air quality degradation.

Transportation Projects

During the construction or modification of county roads, highways, and other roads, air quality is negatively affected by fugitive dust emissions, vehicle delays, and exhaust emissions from construction equipment, which cause elevated levels of some pollutants. However, these emissions are temporary and intermittent, and are not expected to result in any considerable or long-term air quality impacts.

Missionary Ridge Fire

The Missionary Ridge fire had a short-term negative impact on air quality. The air particulates released into the air from the fire were very intense for the duration of the fire and shortly thereafter. Remaining air impacts from the fire should be unnoticeable.

4.23.9.2 Present and Future Air Quality Cumulative Impacts

Animas-La Plata Project

The Animas-La Plata Project is projected to increase fugitive dust and construction equipment exhaust emissions from the construction of the Durango Pumping Plant, Ridges Basin Inlet Conduit, Ridges Basin Dam, and the Navajo Nation Municipal Pipeline. However, there would be no long-term project air quality impacts.

Oil and Gas Development

Based on impacts projected in the Oil and Gas Development EIS on the Southern Ute Indian Reservation, and the NSJB CBM DEIS, no significant, adverse, direct or indirect impacts on air quality are anticipated from implementation of the project in La Plata County. Based on separate assessments predicting potential near-field air quality impacts, localized short-term increases in CO, NO_2, PM_{10}, and SO_2 concentrations will occur, but maximum concentrations will be below applicable state and NAAQS.

Growth and Development in La Plata County

The increased traffic and growth associated with the Grandview area, including Three Springs Development and Mercy Medical Center, will increase traffic and potentially increase air emissions. The exact amount of growth and increase in air particulates can only be speculated at this time.

Continued growth in La Plata County will result in an accompanying increase in traffic volumes and congestion. Although traffic volumes and congestion are projected to increase by the year 2025 with or without roadway improvements, motor vehicle emissions will continue to decrease as older vehicles are replaced with newer, less polluting vehicles. Particulate matter in the form of re-entrained road dust is likely to increase as VMT increases.

No significant cumulative air quality impacts are expected within La Plata County in the foreseeable future. This analysis is based on the following information:

- No major commercial or industrial air pollution sources are anticipated in or near the study area other than the continuing oil, gas, and coalbed methane development discussed in US DOI and SUIT (2002). Substantial air quality impacts in the NSJB would not occur under the Preferred Alternative (US DOI and BLM 2004).
- No emission increases from the Durango & Silverton Narrow Gauge Railroad are anticipated.
- The rate of gravel mining in the area is sufficient to meet current construction needs and is expected to remain essentially constant into the foreseeable future.
- Increases in the number of tourists and local residents would cause air pollution increases primarily from increased vehicle emissions, travel on unpaved roads, and increased wood burning. However, these potential increases in emissions would be moderated by improvements in motor vehicle emission control technology, increases in the amount of paved roads, and the expected increased availability of natural gas as a primary source of heat.

US 550 Corridor Project

Currently, La Plata County is in attainment for all USEPA criteria pollutants. The Preferred Alternative for US 550 is not expected to result in a violation of the NAAQS. Cumulative impacts to air quality from US 550 are expected to be temporal and can be controlled. Long-term cumulative impacts to air quality from US 550 are not expected. In addition, it is expected that there would be reduced MSAT emissions in the study area, relative to the No Action Alternatives, due to EPA's MSAT reduction programs.

Other Transportation Projects

During the construction period of county roads, highways and other road construction or modification, air quality is negatively affected by fugitive dust emissions, and vehicle delays combined with exhaust emissions from construction equipment causing elevated levels of some pollutants. However, these emissions are temporary and intermittent and are not expected to result in any considerable or long-term air quality impacts.

4.23.9.3 Overall Air Quality Cumulative Impacts

Currently, La Plata County is in attainment for all USEPA criteria pollutants. An additional 2,087 tons of nitrogen oxide and 2,100 tons of carbon monoxide are expected to be produced as a result of regional oil and gas development. ~~The Preferred Alternative for US 160 is not expected to result in a violation of the NAAQS. Cumulative impacts to air quality from US 160 are expected to be temporal and can be controlled. Long-term cumulative impacts to air quality from US 160 are not expected.~~ To address these and other air quality issues, state, tribal, and federal agencies recently created the Four Corners Air Quality Task Force. The Task Force will study the region's air quality issues and develop a broad list of mitigation options.

It is expected there would be reduced MSAT emissions in the study area for both US 550 and US 160, relative to the No Action Alternatives, due to reductions in congestion as a result of the project~~EPA's MSAT reduction programs~~. However, overall MSAT emissions due to regional oil

and gas development may increase. There could be slightly elevated but unquantifiable increases in MSATs to residents and others in a few localized areas where VMT increase, which may be important particularly to any members of sensitive populations. However, there will likely be decreases in MSAT emissions in locations where traffic congestion is reduced. In general, MSAT levels are likely to decrease over time due to nationally mandated cleaner vehicles and fuels.

~~Cumulative impacts to air quality are not expected to result in a violation of the NAAQS.~~

Based on the estimated residential, commercial, and industrial development planned for the future, air pollution of all types is likely to increase in La Plata County.

4.23.10 Wetlands

4.23.10.1 Past Wetland Cumulative Impacts

Growth and Development in La Plata County

The distribution of wetlands in the project corridor has been strongly influenced by previous water developments, including diversions for irrigated agriculture beginning in the 1880s and dams on the Florida and Los Pinos rivers. These actions have reduced flood flows in the Florida and Los Pinos rivers compared to pre-settlement conditions, and probably have reduced the area of former floodplain wetlands that were maintained by surface water overflows or seasonal high groundwater.

Irrigated agriculture and transport of water through unlined ditches has created many new wetlands in former upland areas, such as Florida Mesa, and in former intermittent drainages as a result of ditch seepage, irrigation return flows, and irrigation of poorly drained soils. More recently, some areas have gone out of irrigation as land use patterns have changed, resulting in some loss of irrigation-induced wetlands.

Oil and Gas Development

Wetlands have been impacted by the creation and construction of oil and gas facilities. Wetlands are primarily impacted by oil and gas development by displacing small wetlands dispersed throughout La Plata County because the oil and gas resources are broadly distributed according to established spacing patterns.

Missionary Ridge Fire

Approximately 0.2 percent of the vegetation (146 acres) within the 73,000 acre Missionary Ridge fire was wetland vegetation. Of the 0.2 percent classified as wetland vegetation, 0.1 percent (73 acres) was left unharmed by the fire, while the other 0.1 percent (73 acres) was totally consumed (Wilderness Society 2003).

4.23.10.2 Present and Future Wetland Cumulative Impacts

Direct impacts to wetlands (inundation or fill) would occur from several of the following projects discussed below. Jurisdictional wetlands would generally be subject to permitting and mitigation requirements under Section 404 of the Clean Water Act. To compensate for the functional loss of wetlands, mitigation may be in the form of creation, enhancement, restoration, or preservation. Direct impacts are therefore unlikely to result in cumulative area losses of jurisdictional

wetlands, but may result in ~~temporary displacement of~~ filling of some natural wetland areas. Appropriate compensation based on functional replacement requires approval by the USACE. Non-jurisdictional wetlands (irrigation-induced and wetlands isolated from other waters of the US) are not typically addressed in project permitting or mitigation except on FHWA funded projects, and would result in substantial losses of non-jurisdictional wetlands.

Animas-La Plata Water Storage Project

Refined Alternative 4 of the Animas-La Plata Water Storage Project would fill or inundate 121 acres of wetland/riparian habitat at the Ridges Basin Site, would destroy another 13 acres downstream of the dam, and could result in an additional 200 to 300 acres of wetland/riparian impacts from construction of water pipelines (US DOI 2000). Permanent impacts to wetlands would be compensated at a mitigation ratio sufficient to replace or exceed the losses.

Oil and Gas Development

Impacts to wetlands/riparian habitat from oil and gas development on the Southern Ute Indian Reservation could affect as much as 171 acres from surface disturbance and may affect additional areas indirectly from surface water depletion (US DOI and SUIT 2000). Impacts to wetland/riparian habitat from oil and gas development north of the Southern Ute Indian Reservation would impact three future acres of vegetation (US DOI and BLM 2004). Direct impacts would be minimized during planning and permitting for individual wells and ROW and would be mitigated where needed. Future oil and gas development on non-tribal lands would have similar impacts and mitigation requirements.

Growth and Development in La Plata County

Detailed wetland mapping was not available for all of La Plata County. As a result, data from the CNHP was used to estimate wetlands in La Plata County. The CNHP is conducting surveys of all Colorado counties. To date, studies have been conducted in approximately 20 counties, including La Plata County. The surveys identify Potential Conservation Areas (PCA), not only wetlands. In identifying a PCA, the goal of the CNHP is to identify a land area that can provide the habitat and ecological needs upon which a particular element or suite of elements depends for their continued existence. When delineating PCA boundaries, the best available knowledge of each species' life history is used in conjunction with information about topographic, geomorphic, and hydrologic features, and vegetative cover, as well as current and potential land uses (CNHP 2003). Approximately 16,166 acres of PCAs were identified and mapped in La Plata County.

The cumulative impacts analysis for wetlands considered reasonably foreseeable projects. Data from La Plata County were used to develop the list of reasonably foreseeable projects, which are planned developments to property, such as subdivisions and oil and gas development, that have been requested in 2004 and 2005. In La Plata County, there are 49 reasonably foreseeable projects totaling 5,455 acres. Of these, 11 projects are located within PCAs. These projects total 543 acres. If all of these projects are constructed, it would still be a small amount (3.4 percent) of the total wetlands in La Plata County.

To more accurately assess the cumulative impacts of the US 160 project on wetlands near the project corridor, a subset of reasonably foreseeable projects were identified. Within three miles of US 160, there are 21 reasonably foreseeable projects totaling 1,553.7 acres. Table 4.23.2, Reasonably Foreseeable Projects, shows the projects and their size. These projects and the nearby PCAs are shown in Figure 4.23.3, Reasonably Foreseeable Projects. Of these 21 projects,

one is adjacent to US 160 and would access US 160 directly. Two projects are located near US 160 and could require access to US 160. The remaining projects would access US 160 through the existing roadway network, such as SH 172 or CR 501. Of these reasonably foreseeable projects, three are located within a PCA. These three projects total 109 acres.

Table 4.23.2
Reasonably Foreseeable Projects

Project	Description	Size (acres)
Payne D #2 Minor Oil and Gas	Gas well	43.3
Deer Island Preserve Subdivision	Amend building envelope to minimize impacts to large trees	13.5
Mazzone Subdivision	Subdivide into 10-acre parcels	73.6
Cugnini	Owner constructing new building; gas well	75.0
Fox Fire Ridge Subdivision	Subdivide into 20-acre parcels	40.3
Fogleman Subdivision	Subdivide into 15-acre parcels; gas well	35.0
Lewis 2-33 Minor Oil and Gas	Gas well	21.2
Crook #4-26 Minor Oil and Gas	Gas well	63.5
Animas River Bridge (La Plata County)	New bridge between CR 213 (La Posta Road) and US 160/US 550	0.8
Rivera Crossing (La Plata County)	Subdivide into 4 parcels	4.3
Rancho Encantado	15 townhomes on 7 acres; remaining acreage to be open space	36.3
Ludington Meadows	Subdivide into 19 parcels	10.2
Wheeler Subdivision	Revise plat to correct acreage	33.5
Duffy Draw Subdivision	Subdivide into 4 parcels	18.9
Vista Pacifica Subdivision	Subdivide into 18 parcels	39.7
Jeter Subdivision	Subdivide into 2 parcels	12.2
Chastain Lot 1	Subdivide into 3-acre parcel and a more than 35-acre remainder	69.6
Goeglein #2 Minor Oil and Gas	Gas well	884.7
Williams Subdivision	Subdivide into 3 parcels	8.5
Wing Haven Subdivision	Subdivide into 3 parcels	38.9
Deaderick Subdivision	Subdivide into 2 parcels	30.7
Total		**1,553.7**

These estimates provide a worst-case scenario, as they assume that all wetlands within the proposed development would be impacted and not replaced. However, most of these wetlands are protected by Section 404 of the CWA, which requires avoiding and minimizing impacts to wetlands as much as practicable. If impacts cannot be avoided or minimized, it is likely that some portion would be mitigated. Therefore, impacts to wetlands are likely to be less than this estimate. ~~Community expansion may involve construction of houses, roads, and utility lines in wetlands, but would not likely result in substantial wetland losses based onSection 404 permitting requirements.~~ The implementation of temporary and permanent best management

practices for stormwater management as required under Phase II Stormwater Regulations provides a means to limit secondary impacts to wetlands. Increasing residential development and subdividing of farm fields is likely to cause changes in the movement, use, and disposal of irrigation water. Wetlands may diminish in size or be eliminated if their hydrology is substantially affected by these changes. For example, wetlands supported by seepage from canals or ditches may be eliminated if the canals or ditches are abandoned. Wetlands supported by return water flows may be diminished or lost if return water flows are eliminated or routed to other locations, and flow from hillside seeps may diminish where there are reductions of irrigation in adjacent uplands. ~~Although these changes may cause substantial cumulative loss of wetlands, irrigation induced wetlands are generally not jurisdiction under the CWA, and do not have any specific protection under other federal or state laws.~~

Approximately 7.5 acres of offsite wetland mitigation have taken place for impacts to wetlands from the Three Springs Development project in Grandview. The offsite mitigation is occurring at the Animas River wetland mitigation site located north of Durango. A wetland mitigation plan is being implemented for onsite creation, preservation or enhancement of approximately 50 acres of wetland (Sugnet 2004).

US 550 Corridor Project

The US 550 corridor project would permanently impact 2.67 acres of wetlands and 0.28 acres of other waters, including 1.14 acres of jurisdictional wetlands. CDOT's policy is to mitigate all jurisdictional and non-jurisdictional wetlands. Five sites have been identified for compensatory mitigation. All wetland areas and functions of the wetlands will be replaced.

Other Transportation Projects

Impacts to wetlands would primarily be through transportation projects. Jurisdictional wetland losses for county or city road projects would be mitigated as required by the Clean Water Act. Non-jurisdictional wetlands impacted by these projects would likely be lost.

4.23.10.3 Overall Wetland Cumulative Impacts

Of the 16,166 acres of wetlands estimated to exist in La Plata County, it is estimated that approximately ~~700-800~~ 1,250-1,350 acres of wetland would be or have been disturbed from activities occurring within the last 5-10 years and those activities occurring in the next 20 years. Future wetland losses may be greater due to unknown impacts related to future development. The US 160 corridor project would impact approximately 20 to 24 acres of wetlands, depending on the alternative selected. The US 160/US 550 corridor projects jointly could impact 23 to 27 acres of wetlands. CDOT mitigates for both jurisdictional and non-jurisdictional (e.g., irrigation) wetlands and the US 160 project would not contribute to cumulative losses of non-jurisdictional wetlands.

4.23.11 Water Resources

4.23.11.1 Past Water Resources Cumulative Impacts

Growth and Development in La Plata County

Water resources in La Plata County have been affected because of roadway, residential, and business development projects that created impervious surfaces. Over the years, stormwater

runoff, which collected and carried debris and man-made substances into water bodies, adversely affected water quality.

Oil and Gas Development

Oil and gas exploration in La Plata County also contributed to water quality impacts as roads to wells were required to provide access, and added to contaminated stormwater runoff.

Missionary Ridge Fire

Sedimentation from the Missionary Ridge fire in 2002 also contributes cumulatively to water quality impacts. The watersheds that were burned in the wildfire are tributary to the Pine, Florida, and Animas rivers. Water quality in the area of the Missionary Ridge fire will continue to be impacted due to the loss of vegetative cover.

4.23.11.2 Present and Future Water Resources Cumulative Impacts

Animas-La Plata Water Storage Project

Construction of Refined Alternative 4 of the Animas-La Plata Water Storage Project could temporarily increase the suspended sediment loads in the Animas River. Use of sediment control structures and BMPs would reduce, minimize, or eliminate short-term impacts. No significant impacts during operations are anticipated (US DOI 2000).

Operation of the Ridges Basin Reservoir would change the water quality in the Animas River, with changes occurring in nutrients, chemicals, trace elements, and water temperature. "Depending on (1) the flow regime and current water quality of the stream, and (2) the amount and timing of the water conveyed, the impact could degrade or improve water quality of the receiving stream" (US DOI 2000).

Oil and Gas Development

Surface disturbance from oil and gas development on the Southern Ute Indian Reservation is estimated at more than 2,000 acres (US DOI and SUIT 2000). This has the potential to add sediment to the area's rivers and drainages due to changed surface water runoff patterns and increased erosion. Implementation of mitigation and BMPs for the control or containment of surface water runoff during construction and abandonment activities would substantially reduce the potential for surface water quality impacts (US DOI and SUIT 2000). No surface water quality issues with coalbed methane development have been specifically noted except for accidental discharges of produced water that have resulted in small fish kills in the lower Florida River and its tributary (US DOI and BLM 2004). Surface disturbance north of the Southern Ute Indian Reservation is estimated to be 1,016 acres of vegetation (US DOI and BLM 2004). Future oil and gas development on non-tribal lands would have generally similar impacts and mitigation measures.

Growth and Development in La Plata County

Projections for population and housing growth in the five eastern La Plata County planning units project an increase in population of 80 percent between 1997 and 2020 (CDS 2005). Reducing vegetative cover and increasing impermeable surfaces would increase runoff and sedimentation of drainages and streams. Additional commercial development planned and forecast would also increase the runoff to nearby streams.

US 550 Corridor Project

The US 550 corridor project would include a reconstructed bridge over the Animas River. The proposed bridge is composed of two bridges, each being a three-span with dimensions of 372-feet by 45-feet. The proposed US 550 Animas River crossing would be hydraulically improved because it would create less upstream ponding during the 100-year event. This would result in improved upstream channel stability. The hydrology and floodplain of the Animas River would not be impacted by the project.

The US 550 corridor project includes the construction of permanent erosion control BMPs. These permanent BMPs will be designed to remove at least 80 percent of the annual TSS loading, and 100 percent of the required Water Quality Capture Volume. With implementation of these BMPs, there would be no water quality impacts beyond existing conditions.

Other Transportation Projects

Cumulative impacts from sedimentation from city and county transportation projects should be minimized by state and local regulations requiring BMPs and stormwater management controls for construction activities and non-point sources.

4.23.11.3 Overall Water Resource Cumulative Impacts.

US 160 project impacts, ~~when considered with impacts from other projects in the region,~~ considering mitigation by temporary and permanent BMPs, would contribute minimally to cumulative water resources impacts in La Plata County.

BMPs related to water quality mitigation will be implemented during present and foreseeable projects for all federally funded actions. These practices will limit adverse water resource impacts to a minimum. Private developments also will require mitigation practices. Impacts to water quality from the Missionary Ridge fire will continue, resulting in increased sedimentation of the Animas, Florida, and Los Pinos rivers. However, it is anticipated that cumulative water resource impacts in La Plata County will be minor provided proper measures are taken to mitigate impacts.

4.23.12 Vegetation

4.23.12.1 Past Vegetation Cumulative Impacts

Growth and Development in La Plata County

The population of La Plata County is expected to continue to increase. The population of the Florida Mesa planning district is expected to increase by 85 percent, with an additional 2,000 housing units associated with the Three Springs Development. Assuming that 1/3 of these housing units are in natural habitats and that about one acre of vegetation would be removed for construction of roads, utilities, and new housing, the total loss of natural vegetation would be about 667 acres. Most of this loss is expected to occur in moderate to dense piñon-juniper woodland. There may be minor losses of riparian habitat, but the Florida Mesa District land use plan identifies preservation of riparian habitat as a goal and encourages new development to be located outside of the riparian corridors (La Plata County 2003).

Oil and Gas Development

The cumulative impacts of past oil and gas development has recently been evaluated in an EIS that includes the US 160 area. *Oil and Gas Development on the Southern Ute Indian Reservation Final EIS* evaluated impacts within the reservation boundary, including approximately 200,000 acres of tribal land and 221,000 acres of non-Tribal land (DOI and SUIT 2002). The EIS reported cumulative impacts to native vegetation types that would also be affected by US 160. These impacts are shown in Table 4.23.3, Cumulative Vegetation Impacts.

Table 4.23.3
Cumulative Vegetation Impacts

Vegetation Type	Acres of Resource in Study Area	Current Disturbance (acres)	Current Disturbance (%)	Future Disturbance (acres)	Future Disturbance (%)	Cumulative Disturbance (%)
Grassland/ Shrubland	168,018	8,917	5.3	2,558	1.5	6.8
Medium and High Density Piñon-Juniper	136,483	4,389	3.2	2,604	1.9	5.1
Wooded Riparian	8,156	220	2.7	272	3.3	6.0

Missionary Ridge Fire

The Missionary Ridge fire impacted approximately 73,000 acres of land within La Plata County. Vegetation within the fire was diverse due to the variability of elevation and topography within the Missionary Ridge.

The composition of vegetation lost in the fire is displayed in Table 4.23.4 below.

Table 4.23.4
Proportion of Vegetation Types in Burned Area

Vegetation	Percent Vegetation of Burned Area
Ponderosa pine	16.7
Warm-dry mixed conifer	17.7
Mountain grassland	2.5
Piñon-juniper	0.3
Mountain shrubland	3.2
Aspen	21.5
Cool-moist mixed conifer	26.9
Spruce-fir	11
Riparian	0.2

Source: The Wilderness Society, 2003.

4.23.12.2 Present and Future Vegetation Cumulative Impacts

Animas-La Plata Project

The Animas-La Plata Water Storage Project would cause the loss of 514 acres of sagebrush, 221 acres of piñon-juniper, and 121 acres of riparian and wetland habitat at the Bridges Canyon site west of the Animas River (US DOI 2000). This project would have additional impacts from other project facilities and distribution pipelines, but losses cannot be quantified because locations have not been selected.

Other actions potentially affecting vegetation are flood control, which may limit establishment of new cottonwood stands, and grazing, which can eliminate or suppress seedling trees and shrubs. Many noxious weeds are especially adapted to riparian areas and would degrade habitat quality where they become established.

Oil and Gas Development

Future disturbance to vegetation communities from oil and gas development is displayed in Table 4.23.3, Cumulative Vegetation Impacts.

Growth and Development in La Plata County

The ground disturbance from the Three Springs Development is known to be approximately 800 acres of which an unquantified amount was vegetation. A 75-acre park is expected to be constructed within the area and landscaping would be planned for appropriate areas. It is not expected that natural vegetation would occur once the project is complete.

Present and future cumulative impacts from La Plata County Growth are the same as those listed under past cumulative impacts.

US 550 Corridor Project

The US 550 corridor project would cause the loss of 31.5 acres of piñon-juniper, 23.5 acres of sagebrush shrubland, and 2.14 acres of riparian vegetation for a total impact to native vegetation of 57.14 acres. Most of these impacts would be the result of straightening the curve at Bondad Hill, between mileposts 4.5 and 5.5.

Other Transportation Projects

Several highway improvement projects are planned, including improvements to county roads, and other improvements such as park-and-ride facilities. Most of these projects would occur along existing facilities and losses of natural vegetation have not been quantified.

4.23.12.3 Overall Vegetation Cumulative Impact

The US 160 corridor project is expected to cause the loss of approximately 141 acres of piñon-juniper, 63 acres of sage shrubland, 9 acres of riparian vegetation, and 21 acres of wetlands. Cumulative effects of expansion of US 160 as well as US 550, combined with past, present, and reasonably foreseeable future projects would reduce the amount of sagebrush, piñon-juniper, and riparian vegetation in La Plata County, but most of these communities (more than 90 percent) would remain. Most of the impacts would occur from oil and gas development. The US 160 project would contribute less than 1 percent to the cumulative loss.

4.23.13 Wildlife and Fisheries

4.23.13.1 Past Wildlife and Fisheries Cumulative Impacts

Substantial wildlife habitat has been lost as a result of past activities within the study area, such as residential, commercial, and agricultural development; original construction of highways in the area, including US 160 and US 550; and oil and gas related activities. Conversely, agricultural practices have created new habitat for wildlife, such as irrigation ditches, stock ponds, and seeps. However, the majority of land converted to agricultural uses has generally reduced habitat for most of the wildlife that may have historically inhabited the US 550 study area. Farming practices have contributed to fragmented habitat and the avoidance of the area by some species. Other animals that are habitat generalists (i.e., adaptable to a variety of habitats and conditions) are not affected by changing land uses to the extent that a specialized species is affected. Therefore, many species that avoid human presence were displaced from the area long ago.

Growth and Development in La Plata County

Residential and commercial development in the study area and surrounding regions, such as Durango, has also contributed to wildlife habitat loss and fragmentation. The majority of the development in La Plata County has occurred in unincorporated areas, which has converted piñon-juniper woodland and agricultural land into rural residential subdivisions. Some wildlife species such as several birds, coyotes, foxes, and deer have adapted to human manipulated environments to some extent, but may continue to suffer impacts as more land is developed.

Past cumulative effects from human population growth and development on riparian vegetation appear to have caused a narrowing of the riparian corridor along the Florida and Los Pinos rivers. The causes likely include upstream water diversions, reductions in flooding due to upstream dams, historic conversion of floodplain areas into pastures and hay meadows, and livestock grazing. Water diversions may have reduced the alluvial groundwater levels along the Florida River compared to pre-settlement. Reductions in flooding along the Florida and Los Pinos rivers have affected the ecological dynamics of the river valley, including overbank flow and regeneration of cottonwoods. Agricultural development resulted in direct losses of riparian shrubland, and livestock grazing may have prevented regeneration of cottonwoods in some areas.

Oil and Gas Development

The San Juan Basin is the largest producer of coalbed methane in the world. Past oil and gas operation has resulted in habitat loss from construction of wellpads, roads, pipelines, and facilities; habitat degradation; and disturbance to wildlife through noise and traffic due to increased human presence. According to the *Oil and Gas Development on the Southern Ute Indian Reservation Final EIS* (DOI and SUIT 2002), the combined effects from construction and operation of wells impact biological resources directly and indirectly in the region through disruption of normal behavior, habitat loss and fragmentation, and disturbance to deer and elk.

The San Juan Basin is the largest producer of coalbed methane in the world, resulting in a reduction of foraging habitat for deer and elk (due to increased human presence); habitat fragmentation from development of new roads, pipelines, well pads; and reduced water quality for waterfowl and riparian species migration routes (DOI and SUIT 2002).

Transportation Projects

Because most animals avoid roads, the original construction of US 160 and US 550 resulted in lost and fragmented natural habitat, and created a barrier for animals to cross. Habitat connectivity across highways and the ability of animals to move safely across them is important for a species to access food resources or cover and for dispersal. Many species, including mule deer, have large home ranges, depend on specific areas during certain seasons, and travel while foraging; and would inevitably need to cross a road. At the community scale, animal movement is important because traveling animals disperse seeds and spores helping to maintain biodiversity. Finally, animals must be able to mate with different members of their species in order to prevent isolation of populations, which may lead to extinction as well as to prevent inbreeding among individuals (Conrey and Mills 2001, Belisle and St. Clair 2001). Animals exhibit behavioral alterations due to roads and suffer increased mortality from vehicle collisions as they utilize different habitat types and migrate seasonally across US 550 and US 160.

Missionary Ridge Fire

The Missionary Ridge fire, which occurred in June of 2002, impacted approximately 73,000 acres of land within La Plata County. The impact from the fire to wildlife within the area was predominately caused by loss of habitat. The diverse habitat impacted by the fire primarily consisted of Ponderosa pine, warm-dry mixed conifer, mountain grassland, piñon-juniper, mountain shrubland, aspen, cool-moist mixed conifer, spruce-fir, and riparian (Wilderness Society 2003).

Impacts to the Florida River from the Mission Ridge fire include degradation of the river's water quality and channel conditions. Severe water shortages due to drought and diversions have also negatively impacted the aquatic habitat. These combined impacts have recently eliminated Florida River fish populations in some river reaches within the analysis area.

4.23.13.2 Present and Future Wildlife and Fisheries Cumulative Impacts

Animas-La Plata Water Storage Project

The Animas-La Plata Water Storage Project Ridges Dam would be located west of US 550 and the Animas River. Approximately 2,700 – 2,900 acres of wildlife habitat would be impacted by construction and use of this project (US DOI 2000). This project may have an additional 20 to 300 acres of impact from construction of water pipelines, some of which may occur in the US 160 project corridor. Mitigation measures will be implemented to reduce the level of impact.

The Animas-La Plata Water Storage Project may adversely affect game and native fisheries in the Animas River (US DOI 2000). Operation of the Durango Pumping Plant could deplete water flows by up to 56 cfs from the Animas River, which would limit the ability of trout to reproduce in the river. Loss of carrying capacity is estimated to be less than 15 percent; however, rainbow and cutthroat trout would be stocked and seasonal bypass flows would be implemented to mitigate these impacts. Other mitigation for the Animas-La Plata Water Storage Project would include monitoring, stopping pumping activities when flows are less than seasonal standards, and constructing or acquiring a fish hatchery (US DOI 2000).

Oil and Gas Development

Development of new wells and access roads could affect up to 171 acres of riparian habitat, or approximately 2.1 percent of this habitat on the Southern Ute Indian Reservation (US DOI and

SUIT 2000). This habitat will be avoided when possible, but loss of wooded riparian vegetation was identified as the most important unavoidable adverse impact to vegetation. Similar but smaller losses of riparian habitat may occur from oil and gas development on other lands.

Additional oil and gas development is proposed on Southern Ute Indian Reservation lands and is likely to occur on non-tribal lands within and north of the reservation. According to US DOI and SUIT (2002), the Agency and Tribal-Preferred Alternative would involve the construction of 706 new wells and a maximum disturbance of 2,160 acres. Project construction would occur in elk winter range, severe winter range, and winter concentration areas, and in mule deer winter range and severe winter range. The primary development areas would avoid deer and elk migration routes and the majority of the deer winter concentration areas.

The *Northern San Juan Basin Coalbed Methane Project Draft EIS* (US DOI and BLM 2004) indicates the Preferred Alternative would be to drill 300 additional coalbed methane wells in the 125,000-acre area at two per every 320 acres. Existing wells in this area number 346. Future cumulative impacts to wetland/riparian areas from coalbed methane wells are estimated to be 3 acres, with a total vegetation future impact of 1,016 acres (US DOI and BLM 2004).

During production, long-term disturbance effects are expected to result from operations and maintenance activities, and associated noise and human activity. For analysis, disturbance effects were considered to extend 0.25 mile from each well site, road, or compressor station. Disturbance during construction and maintenance would occur on 28 percent of elk winter concentration areas in the SUIT study area and 13 percent in the region, and 8 percent of mule deer winter concentration areas in the SUIT study area and 4 percent in the region. Disturbance would also occur on 8 to 10 percent of mule deer and elk general winter range and severe winter range in the region (US DOI and SUIT 2002). Approximately 316 acres of habitat would be impacted by the Preferred Alternative on the NSJB with only 2 percent of habitat per species (US DOI and BLM 2004). Proposed mitigation to reduce impacts includes restriction of well drilling activities to summer months in winter range and placement of major developments away from migration corridors (US DOI and SUIT 2002).

Growth and Development in La Plata County

The cumulative impacts from population growth and development are expected to cause disruption, destruction, and fragmentation of elk and mule deer winter range and other wildlife habitat, and disruption of migration corridors. Continued community expansion would affect most of the study area to varying degrees.

Land disturbances associated with the Grandview development have and would continue to occur into the reasonably foreseeable future. Wildlife located within previously disturbed areas have most likely dispersed to adjacent areas. However, continued development of the Grandview area would most likely impact wildlife through removal of habitat. However, positive measures have been implemented for riparian species at the Three Springs Development through the creation of 7.5 acres of wetland off site and creation, enhancement, and preservation of 50 acres of wetland on site.

Population growth and development, especially construction of residential subdivisions and commercial property and associated roads, would reduce and further fragment wildlife habitat. The population of La Plata County is steadily expanding, with approximately 3.7 percent population increase annually in the Durango area (US Census 2000). According to the Florida

Mesa Land Use Plan, the population within La Plata County is expected to increase to 68,385 by 2020, requiring the construction of an additional 2,000 housing units associated with the Three Springs Development (La Plata County 1999). The Florida Mesa Land Use Plan also outlines plans to keep development clustered to maintain rural attributes and maintain existing agricultural land use. Although concentrating development into clustered areas would benefit wildlife populations, especially deer and elk, overall, any development would impact wildlife to some extent by reducing and fragmenting habitat.

The increase in broadly spaced, rural residential development is likely to adversely affect wildlife in several ways. It would reduce the amount of habitat by increasing the proportion of land occupied by buildings and roads. Higher levels of human activity are likely to disturb wildlife and reduce and fragment the amount of usable habitat as animals avoid areas with higher levels of activity. Animals may remain in the same area but with higher levels of stress, they may use alternative habitat that is less suitable in providing forage and cover, or they may disappear from the area entirely. Large predators are often the most sensitive species to roads, and loss or reduction of these species affects diversity of local animal communities at all levels.

US 550 Corridor Project

The US 550 project would contribute to permanent displacement of wildlife due to loss and fragmentation of habitat. The US 550 project is expected to impact a total of 60 acres of wildlife habitat. In addition, the increased width of US 550 would create a much larger physical obstacle for wildlife to cross resulting in fragmented habitats and populations due to road avoidance. Four wildlife crossings and fencing along the corridor would help mitigate these impacts and is expected to result in decreased road-killed animals.

Other Transportation Projects

Improved roads and higher traffic volumes would likely result in an increase in vehicle collisions with wildlife and would restrict movement, as well as result in further avoidance or loss of habitat for many species. Land use changes from agriculture and grazing to housing may reduce the availability of forage for elk and deer. Roads, fences, and houses may threaten migration routes. Other species of wildlife, including animals included in the NDIS list of declining species addressed in Section 3.11, Wildlife and Fisheries, also would be affected by human activity and habitat loss, fragmentation, and modification, including increased predation of birds, small mammals, reptiles, and amphibians by medium-sized predators and domestic cats and dogs as larger predators are reduced or disappear.

Both the Bayfield District and Florida Mesa land use plans (La Plata County 1997, 1998) call for concentrating development and maintaining agricultural land uses and wildlife habitat, especially riparian areas and migration routes, to minimize the impacts of development on wildlife and visual resources. However, the land use plans are advisory documents only and are not binding on county commissioners in making land use decisions.

4.23.13.3 Overall Wildlife and Fisheries Cumulative Impacts

The cumulative impacts contribution from the US 160 project to wildlife would be primarily related to north-south movements of deer and elk within winter range and between summer and winter range. The US 160 project would impact approximately 207 acres to 235 acres of wildlife habitat depending on the alternative selected. In addition, the increased width of US 160 would

create a much larger physical obstacle for wildlife to cross resulting in fragmented habitats and populations due to road avoidance. Conversely, wildlife/vehicle collisions are likely to decrease due to fencing and the installation of ~~12 large~~ 19 multi-use animal crossings including wildlife crossings at the major migration corridors along the Florida River and Los Pinos River.

Cumulative effects of expansion of US 160 as well as US 550, combined with past, present, and reasonably foreseeable future projects and actions are likely to have long-term and severe impacts on wildlife species inhabiting the study area and adjacent areas. The long-term cumulative habitat impacts are expected to cause increased stress and mortality for wintering elk and deer. Populations may decline ~~or collapse~~ in the future, or animals may be displaced to other areas due to permanent loss of habitat. For deer and elk, this impact would primarily affect migration routes and loss of habitat. The overall cumulative impact of wildlife habitat loss is estimated at 77,460 acres or greater in La Plata County within the next 20 to 25 years. Increased oil and gas development, as well as increased community development would further fragment and decrease the amount of natural habitat available for wildlife.

Increased impacts to resources, such as wildlife habitat loss from the Missionary Ridge fire, will continue in the foreseeable future. Of the total estimated acreage of habitat impacts, the vast majority (73, 000 acres or 94 percent) consists of habitat loss from the Missionary Ridge fire of 2002. These impacts, while included in the total estimate, are considered to be temporary in nature. As of the writing of this document, much of this area has experienced partial recovery of understory growth and recruitment of seedling trees. New understory growth likely contributes to an increase in forage value providing benefits to certain wildlife, particularly deer and elk.

4.23.14 Threatened, Endangered, and Sensitive Species

4.23.14.1 Past Threatened, Endangered, and Sensitive Species Cumulative Impacts

Growth and Development in La Plata County

Past growth and development within La Plata County has contributed to habitat fragmentation and reduction for threatened, endangered, and sensitive species. The growth in the residential population and related development of commercial operations and roads has decreased habitat for various threatened, endangered, and sensitive species.

Oil and Gas Development

Impacts to threatened, endangered and sensitive species from past oil and gas development include surface disturbances from construction of well pads and ROW (access and pipelines), which may have impacted the species and/or habitat, as well as noise and activity disturbances from project operations. Additionally, impacts to aquatic threatened, endangered or sensitive species, such as fish, may include possible stream depletions from well drilling, hydro-fracture operations, and production of water from the Fruitland Formation; and water quality degradation from accidental spills of petroleum products and produced (saline) water.

The cumulative effects were calculated within the *Oil and Gas Development on the Southern Ute Indian Reservation Final EIS* (including existing oil land gas development and the SUIT Preferred Alternative and existing well pad development) and the *Draft EIS North San Juan Basin Coal Bed Methane Project – Volume 1* of June 2004*;* both are displayed in Table 4.23.5, Habitat Disturbance Associated with Oil and Gas Development. These impacts are negligible when compared to the land mass of La Plata County.

Table 4.23.5
Habitat Disturbance Associated with Oil and Gas Development

Species of Concern	Habitat Disturbed
Bald Eagle	2,989 ac (4.67 sq mi) winter range and 719 ac (1.12 sq mi) winter concentration areas – SUIT 11,553 ac (18.05 sq mi) winter concentration area – no designated winter roost or nesting areas in project area - NSJBCBM
Burrowing Owl	Not calculated – SUIT
Southwestern Willow Flycatcher	484 ac (0.75 sq mi) wooded riparian habitat – SUIT 584 ac (0.9 sq mi) habitat in project area – NSJBCBM

Transportation Projects

Impacts from past transportation projects have contributed to habitat fragmentation and reduction for threatened, endangered, and sensitive species. Expansion and construction of roads has caused an increase in traffic on roads and thereby has caused an increase in wildlife killed on the road, possibly including threatened, endangered, and sensitive species.

Missionary Ridge Fire

Impacts from the Missionary Ridge fire included the loss of approximately 73,000 acres of habitat that could potentially be used for some threatened, endangered, and sensitive species. It is estimated that it will take years for the burned area to return to natural conditions.

4.23.14.2 Present and Future Threatened, Endangered, and Sensitive Species Cumulative Impacts

Cumulative impacts to threatened and endangered species would be similar to those noted for wildlife and vegetation. Federal threatened and endangered species known or with potential to occur in the US 160 study area includes bald eagle, Southwestern willow flycatcher, Colorado pikeminnow, and razorback sucker. These species are protected under the ESA and mitigation is required to reduce or eliminate impacts to these species as a result of any projects occurring in the region. Burrowing owl is listed as threatened by the state of Colorado. State-listed species are provided a lower level of protection than federally listed species. Sensitive species, gray vireo and roundtail chubs, are not given any formal protection and are therefore more likely to incur cumulative effects from widening and realignment of US 160 and other regional projects or land use changes. The following species have the potential to be cumulatively impacted in relation to the US 160 project.

Bald Eagle

Current cumulative impacts to bald eagles are electrocution from power poles, resulting in fatal burns or heart failure; habitat loss, and mortality from vehicle collision while eating roadkill.

The known perch/roost sites in the Florida Mesa and Valley section at the Florida River may be within the construction corridor of this project and may be impacted by noise and disturbance from construction activities. In addition, riparian woodland that contains trees that could be used for perching would be removed near the Los Pinos River in the Bayfield section. Other impacts to nesting sites may occur within La Plata County, the cumulative impact study area.

Bald eagles may be attracted to roadkilled wildlife, making them vulnerable to injury or death from vehicle collisions. However, the potential for vehicle collisions with bald eagles would decrease with implementation of both the US 160 and US 550 corridor projects. The US 550 corridor projects includes 4 wildlife crossings and the US 160 project includes ~~12~~19 wildlife crossings, thus decreasing animal/vehicle collisions and the potential for bald eagles to feed on roadside carrion. In addition, both projects include mitigation requirements for nest surveys, 0.5-mile buffers around active and inactive nests, and seasonal restrictions.

Impacts described in the *Oil and Gas Development on the Southern Ute Indian Reservation Final EIS* combined with other impacts are expected to result in minor adverse effects to bald eagles in the SUIT region (DOI and SUIT 2002). Mitigation measures for US 160 would decrease the likelihood for any adverse effects to bald eagles as a result of project implementation.

Western Burrowing Owl

Burrowing owls are declining in Colorado due to conversion of native grassland to agricultural land or residential/commercial developments. These changing land uses have and continue to occur in the study area, and burrowing owl habitat is scarce. Cumulative impacts from construction of US 160 and other regional present and future projects are expected to be minimal with adherence to suggested mitigation for burrowing owls as outlined in Section 4.12.7, Mitigation.

Southwestern Willow Flycatcher

Past, present, and future cumulative impacts to the Southwestern willow flycatcher in the study area and surrounding region include the following:

- Population depressions or local extinctions of small populations due to habitat fragmentation or loss from community expansion
- Habitat loss from water management activities, which may change vegetative communities
- Habitat loss from land use practices, including bank stabilization, agricultural development, livestock grazing, and urban development
- Detrimental changes to habitat from increased fire and invasive plant species, such as Saltcedar (*Tamarix* sp.)
- Direct effects from cowbird nest parasitism, predation, and environmental toxins (Finch and Stoleson 2000)

The principal activity that has and may result in cumulative effects on the Southwestern willow flycatcher is community expansion, including growth in the residential population and related development of commercial operations and roads. Such developments may result in minor amounts of habitat loss and increased fragmentation of riparian habitat.

The increased number of rural residences would likely lead to an increase in predation on songbirds from larger numbers of house cats. Other nest predators, such as raccoons, magpies, crows, grackles, and rats, may also increase due to urbanization and habitat fragmentation. The potential for nest parasitism by brown-headed cowbirds may increase due to more favorable habitat conditions for cowbirds, which include bird feeders, as well as areas of mowed grass, such as lawns and horse corrals. High rates of brown-headed cowbird parasitism have resulted in

declines of Southwestern willow flycatchers and other bird populations due to nesting failure (Finch and Stoleson 2000).

The only known occurrence of the Southwestern willow flycatcher in the project corridor is in the Bayfield section, near the town of Bayfield, which is also a focal area for current and future residential and commercial development. More than 1,500 new residences are expected in Bayfield and north along CR 501 by the year 2020, resulting in three times as many residences as are currently present. In addition to loss of habitat, increased urbanization in the surrounding area may decrease the suitability of the riparian habitat in this area and increase the potential for nest parasitism by brown-headed cowbirds and predation of the Southwestern willow flycatcher.

Yellow-billed Cuckoo

Suitable habitat for the Yellow-billed cuckoo occurs at the Florida River in the Florida Mesa and Valley section. Road widening would remove areas of potential habitat within approximately 100 feet of the proposed ROW at this location. Marginally suitable habitat also occurs at the Los Pinos River in the Bayfield section.

Construction activity associated with other projects, such as the Animas-La Plata Water Storage Project, oil and gas development, and other highway projects, as well as community expansion, that may occur during the Yellow-billed cuckoo breeding season may adversely affect breeding activities and nesting success by causing nest displacement, aside from usurping habitat. The increased proximity of county roads to the habitat areas may have the same effect in subsequent years following construction.

Peregrine Falcon

Peregrine falcons nest primarily among cliffs and forage over adjacent coniferous and riparian forests, and to a lesser extent, over other habitats (Andrews and Righter 1992). No suitable nesting habitat occurs within the project corridor. However, active aeries (bird nests located on cliffs or mountaintops) are located west of the Animas River near Perins Peak. Since there is adequate habitat and suitable prey base for peregrine falcons, it is likely that they may use the project area for foraging. The project area may also occasionally be used as hunting habitat by migrating peregrine falcons.

Cumulative impacts associated with this project may affect peregrine falcon habitat, most notably due to community expansion and oil and gas exploration activities. However, these impacts would be considered negligible to minor when considered for their effect on La Plata County.

Ferruginous Hawk

Ferruginous hawks may hunt over unpopulated portions of La Plata County in winter or during migration. Cumulative impacts would be related to loss of habitat due to increased population of La Plata County. The present and foreseeable projects that would have the most cumulative influence on habitat loss would be community expansion projects that populate undeveloped areas. However, it is anticipated that the potential effects would be negligible.

Western Snowy Plover

This small shorebird is a rare fall migrant in La Plata County (Andrews and Righter 1992). They utilize alkali flats around reservoirs and sandy shorelines. The bird has been documented to occur in the project area, but its occurrence is rare. Western snowy plover may occur in the

project area during fall migration. Development projects developed near reservoirs and other shorelined waterbodies could potentially decrease habitat; however, impacts near reservoirs and shorelines is not anticipated to be substantial in La Plata County. Therefore, cumulative impacts to this species is anticipated to be negligible.

White-faced Ibis

White-faced ibis may be present in the project area during spring and fall migration in wet meadows and marshy wetland edges; however, the project area is not within known migration corridor or range (Andrews and Righter 1992). Cumulative impacts to this species' habitat in La Plata County is not anticipated to be substantial. The wet meadow and marshy wetland impacts related to induced growth should be minimal, as wetland mitigation actions will be employed.

New Mexico Spadefoot

The New Mexico spadefoot inhabits sagebrush, semi-desert shrublands, and the floodplains of streams in southwestern Colorado. Typically, the spadefoot only enters water (i.e., temporary ponds and muddy pools) during the breeding season and spends most of its time buried in the soil (Hammerson 1999). Cumulative impacts to the New Mexico spadefoot in La Plata County are anticipated to be minor, with the majority of impacts resulting from community expansion projects and oil and gas exploration activities.

Northern Leopard Frog

The northern leopard frog typically inhabits the banks and shallow areas of marshes, ponds, and streams, but may also occur in irrigation ditches and wet meadows. Suitable habitat exists in the project area for this species. Cumulative impacts to northern leopard frog habitat resulting from present and foreseeable projects would be mitigated by wetland replacement programs, and water quality and historic resource mitigation actions proposed in Section 4.25, Summary of Impacts and Mitigation Measures.

River Otter

Cumulative impacts are unlikely to adversely affect river otters occurring in the Los Pinos River, as water quality and stream flow will not be permanently altered. The US 160 project work will not contribute to cumulative impacts to otter populations.

Amphibians

The US 160 project would have minor adverse cumulative effects on the two sensitive amphibian species, the northern leopard frog and the New Mexico spadefoot, if they are present. Leopard frogs may occur near areas with perennial water throughout the entire project corridor. Construction activities would eliminate some potential habitat and could cause injury or death to frogs in the construction zone. The reduction in potential habitat and population throughout La Plata County, in conjunction with other projects, would be minor compared to the amount of habitat available, and wetland mitigation activities would replace the lost habitat in most instances.

New Mexico spadefoot toads in the construction zones of highway projects may be injured or killed during construction. However, adverse effects would be local and would negligibly affect the overall population size.

Colorado River Fish

Water depletions to the San Juan River drainage, such as from Animas, Florida, or Los Pinos rivers, would have adverse effects on Colorado pikeminnow and razorback sucker occupying waters downstream. Construction of the US 160 realignment and other highway projects in the area would require temporary water depletions and utilize water from rivers and streams during construction.

Sensitive Plant Species

As indicated previously, nine sensitive plant species may occur in the project corridor, although their presence is not confirmed. These species were not found in the project corridor during field surveys completed in 1998. Cumulative impacts to the sensitive plant species are not anticipated to be substantial, particularly since their presence in the project area have not been confirmed.

BLM Sensitive Species

The BLM sensitive species depicted in Table 3.12.3, are not anticipated to experience notable cumulative impacts, as the portion of BLM land impacted for this project is not substantial for La Plata County and mitigation actions related to impacts will be employed.

4.23.14.3 Overall Threatened, Endangered, and Sensitive Species Cumulative Impacts

Adverse impacts of the US 160 project to threatened, endangered, and sensitive species are expected to be negligible to minor, depending on the species and area of the project. Loss of habitat in the Bayfield section may impact breeding success of the Southwestern willow flycatcher, and construction activities may impact breeding activities of the yellow-billed cuckoo. However, mitigation measures, including focused surveys prior to construction and construction schedule restrictions, will limit impacts to these and other sensitive species in the project area.

Cumulative effects of expansion of US 160, combined with past, present and reasonably foreseeable future projects are likely to have long-term and moderate impacts on threatened, endangered, and sensitive species inhabiting the study area and adjacent areas. However, with proper implementation of mitigation measures, cumulative impacts can be avoided or mitigated.

4.23.15 Historic and Archaeological Preservation

4.23.15.1 Past Historic and Archaeological Preservation Cumulative Impacts

Past surface disturbance and increased human activity within the region are largely related to oil and gas extraction. Historic property impact assessments have been required in the past for oil and gas development because such development involved federal lands, permits, and/or leases. These assessments helped to mitigate past impacts associated with oil and gas development. However, the mitigation of adverse effects applies only to NRHP-eligible properties and not necessarily to all historic properties. Past private community expansion projects have often been exempted from impact assessment because of a lack of federal involvement. As a result, mitigation of private construction project impacts on historic and archaeological resources have not been as effective.

Ground disturbance, the major impact to archaeological resources during past roadway construction, has, in some cases, affected the archaeological integrity of sites.

The Missionary Ridge fire did not impact any known historic or archaeological resources.

4.23.15.2 Present and Future Historic and Archaeological Preservation Cumulative Impacts

Animas-La Plata Water Project

Impacts caused by ongoing federal projects, such as the Animas-La Plata Water Storage Project, are considered as moderate because these impacts are assessed, surveys are performed, and efforts are made to mitigate any adverse effects.

Oil and Gas Development

Impacts caused by oil and gas development are considered moderate because, as with the Animas-La Plata Water Project, these impacts are assessed, surveys are performed, the regional database is enhanced, and efforts are made to mitigate any adverse effects.

Growth and Development in La Plata County

The higher population levels associated with the expansion of Durango and increased access into remote areas can result in increased vandalism. Development of lands for various reasons may contribute to the permanent and unintentional destruction of segments of the archaeological and historical record.

Impacts to historic properties tied to residential and commercial development cause the greatest harm because there are no requirements to mitigate these impacts. The city of Durango is a certified local government that has a Historic Preservation Board but does not have any local ordinances specific to the preservation of historic properties. La Plata County is not a certified local government and does not have a historic preservation component. Additionally, these properties are not protected by state law. Because there are no local protections, it is likely that these historic sites will not be mitigated and the data would be lost.

However, beneficial results or impacts can also occur from development in general. Valuable data are collected during historic property surveys. Data that otherwise would not be collected until some time in the future, if ever, or lost in the interim, are made available for study. Data recovery also results in the collection and preservation of materials and information that might otherwise be lost. Some of the data that has been and would be collected has provided and would continue to provide opportunities for regional and local archaeological research projects.

US 550 Corridor Project

The US 550 corridor project is expected to impact two sites: the Twin Rocks Community Ditch, and a large prehistoric hamlet. SHPO concurred that the construction of the US 550 project would not have an adverse effect on the Twin Rocks Community Ditch as it was documented as part of a previous highway-widening project and the only planned construction activity in the area is installation of deer fencing. The large prehistoric hamlet would be impacted by the project but SHPO and the SUIT concurred that the importance of the site lies chiefly in what can be learned by data recovery. Mitigation measures for US 550 include monitoring and data recovery excavations. With the proposed monitoring and data recovery excavations, there would be no loss of historical or archaeological resources from the US 550 project and it would not cause additive cumulative impacts to historic and archaeological resources within La Plata County.

Other Transportation Projects

Impacts caused by highway improvements with federal involvement are considered as moderate because these impacts are assessed, surveys are performed, the regional database is enhanced, and efforts are made to mitigate any adverse effects.

4.23.15.3 Overall Historic and Archaeological Preservation Cumulative Impacts

As farms and ranches are abandoned, the historic water rights for irrigation are often converted to domestic uses. Ditches that were used to deliver water to fields may still be used to deliver water to treatment plants, or they may be abandoned. As the ditches are abandoned, they may be converted to other uses, such as bike paths, roadways, and utility corridors, or they may simply be demolished. Currently in La Plata County, conversion has been occurring for some time, while demolition is just beginning. Both of these types of impacts are likely to continue, with the latter at a higher rate and with a greater degree of impact than the former.

The US 160 project may add incrementally to a loss of archaeological sites. The project may also add incrementally to impacts upon historic irrigation ditches by expanding existing crossings and possibly by adding new crossings. However, several mitigation measures, developed in conjunction with SHPO, BLM, and SUIT, will be implemented to minimize impacts.

Additional residential development in the surrounding area may impact historic properties. As discussed above, impacts to historic properties are normally not assessed during residential development. Thus, more sites may be lost without any mitigation measures. However, some local authorities, such as counties, have only recently begun to require impact assessments for historic properties as part of their permitting regulations. In most cases, treatment of eligible sites is confined to those that would be directly impacted, while those that may be indirectly impacted receive little or no consideration unless a direct project-related effect can be established.

4.23.16 Visual Resources

4.23.16.1 Past Cumulative Impacts

Growth and Development in La Plata County

Past community development, including continued residential/subdivision development and a corresponding increase in commercial and industrial development, has been identified (US DOI and SUIT 2000) as the biggest contributor to cumulative visual impacts in the region. The city of Durango continues to grow at an accelerated rate, resulting in housing developments occurring in what was recently ranch/farmland or other undeveloped areas. This has contributed in the past and would continue to contribute to an increase in the level of development and the loss of uninterrupted, natural-appearing scenic vistas in the region. The overall landscape character of the region is still primarily rural and one of moderate to high scenic quality, but will experience a steady erosion of the scenic quality as growth continues, especially in the Durango area.

Oil and Gas Development

Oil and gas development in the past contributed to visual impacts by altering views that individuals were accustomed to. The oil and gas industry has made attempts to mitigate visual

impacts through careful placement of facilities behind natural screens, such as vegetation and topography, and by painting facilities to blend into the background.

Transportation Projects

Visual impacts from past highway improvement projects have impacted visual resources by producing dust, noise, and traffic delays. Slope cuts and fills from past projects have changed the characteristic landscape by disrupting continuity of natural landforms, vegetation, and creating areas with a high degree of color and form contrast. Expansion of roads has necessitated the removal of trees and other vegetation that may be providing a positive element to the existing landscape. Features associated with roads, including guardrails, access roads, and retaining walls, add negative elements to visual resources.

Missionary Ridge Fire

The Missionary Ridge fire in 2002 severely impacted visual resources within the burned area. As the area regenerates and rebuilds, the visual resources would actually improve, contributing to a positive view.

4.23.16.2 Present and Future Visual Cumulative Impacts

Animas-La Plata Water Storage Project

Elements of the proposed Animas-La Plata Water Storage Project are under construction just southwest of Durango. The Durango Pumping Plant is located on the Animas River at the south end of Santa Rita Park, west of US 160/US 550 (south) intersection. The facility will be visible to recreation users in the park, from the river, and to motorists on the nearby highways. Although there are other visual intrusions in the area, including an industrial park, the pumping plant would add another negative influence on the natural scenic character of the area. The water storage reservoir component of the project would alter the natural landscape, although the water feature that would be created would generally be viewed by most viewers, particularly visitors, as a positive landscape feature.

Oil and Gas Development

Oil and gas well development is an ongoing activity in the county and is projected to continue (US DOI and SUIT 2000). Well development activities, which include the well site, access roads, and other ancillary aboveground facilities (such as compressor stations), occur in a broad area throughout the region. Several existing well sites (11 within 0.25 mile of the project ROW) are visible from US 160 along the project corridor. The current spacing requirements for wells prevent a large-scale concentrated intrusion on the natural scenery, but the wells are noticeable where they do exist and decrease the natural appearance of the landscape. Potential exists for future down-spacing of natural gas well site densities, which would allow a greater concentration of wells per section than is currently allowable.

Growth and Development in La Plata County

Community development, including continued residential/subdivision development and a corresponding increase in commercial and industrial development, has been identified (US DOI and SUIT 2000) as the biggest contributor to cumulative impacts in the region. The communities of Durango and Bayfield continue to grow at an accelerated level, resulting in housing developments occurring in what was recently ranch/farmland or other undeveloped areas. This

has contributed in the past and would continue to contribute in the future to an increase in the level of development and the loss of uninterrupted, natural-appearing scenic vistas in the region and along the US 160 project corridor. The overall matrix of the landscape in the region is still primarily rural and one of moderate to high scenic quality, but will experience a steady erosion of the scenic quality as growth continues, especially in the Durango/Bayfield area.

The existing gravel mine in Wilson Gulch north of US 160 is planned for continued operation. Mining activity disrupts the natural landform as the gravel resource is mined, impacting the scenic character of the land. This operation is highly visible from US 160.

US 550 Corridor Project

The US 550 corridor project will cause visual impacts from the additional excavation and cuts and fills in the Bondad Hill area. Mitigation of this visual impact includes blending the cut line into the existing terrain and not disposing of the excess waste material on the downhill slope. Retaining walls will be designed consistent with the current retaining walls just north of the New Mexico state line and colors will be selected so as to reduce color contrast with the surrounding vegetation.

The primary remaining visual effect of the Preferred Alternative would be the substantial change in the visual scale of the highway in the landscape, which would increase from two to four lanes. This would increase the width of the highway and the visual presence of the travel corridor in the viewshed. The required road cut on the west side of Bondad Hill would permanently change the topography, and the continuity of the natural landform.

Other Roadway Improvements

Visual impacts from highway improvement projects will impact visual resources by producing dust, noise, and traffic delays. Slope cuts and fills from past projects will change the characteristic landscape by disrupting continuity of natural landforms, vegetation, and creating areas with a high degree of color and form contrast. Expansion of roads necessitates the removal of trees and other vegetation that may be providing a positive element to the existing landscape. Features associated with roads, including guardrails, access roads, and retaining walls, will add negative elements to visual resources.

4.23.16.3 Overall Visual Cumulative Impacts

Visual resources would be slightly to heavily altered by the US 160 project, depending on the location and alternative. Long-term impacts would include slope cuts and fills, expansion of the highway ROW, additional structures, and road realignment. Visual impacts of the project would be mitigated by incorporating design features that blend with or add to the current viewsheds.

The Animas-La Plata Water Project would have a positive effect on visual resources by creating a recreational resource with a waterbody to view. Moderate to major cumulative visual impacts in La Plata County over the next 20 years will occur. As oil and gas exploration continues, as well as community expansion projects, viewsheds throughout the county will change notably. Where feasible, revegetation projects along new roadways and plantings, and the provision of green spaces and natural landscaped buffer zones along residential and business developments, would mitigate negative impacts associated with these activities if they are incorporated into plans.

4.23.17 Mitigation

Cumulative impacts can often best be mitigated by planning effectively for future growth. By understanding the potential future impacts, local governments can better plan and implement protective and corrective measures. The City of Durango currently employs policies that can mitigate foreseeable environmental consequences of the project. These policies would be limited to areas incorporated by the city. By the year 2025 this will likely include Grandview north and south of US 160 from Durango to the intersection with SH 172/CR 234 (Grandview Area Plan 2004). Policies used by La Plata County that can mitigate foreseeable environmental consequences of the project would mainly be through the county rules and regulations for subdivisions. The following measures could be used by local and state governments to mitigate environmental impacts in the corridor:

- Access controls – If an access control plan is determined necessary for a particular area, CDOT will work with the appropriate local entity to avoid and minimize impacts to wetlands and other sensitive environmental resources.
- Context sensitive designs.
- Local land use plans – The *Grandview Area Plan* will direct where and to what density development should occur in the Grandview area. The Plan recommends many measures that will mitigate for impacts to the environment including transfer development rights, creation of open space buffer zones, and greater pedestrian amenities and bike path improvements to promote alternative modes of transportation. Plans for other areas may be developed in the future.
- Growth management regulation – The City of Durango and La Plata County have established standards that regulate growth and require mitigation for impacts. These include requiring high density developments to provide for areas for open space within the subdivision (La Plata County) and supporting cost-effective habitat conservation strategies such as dedications, targeted acquisition of land or development rights and mandatory clustering of development (City of Durango).
- Resource management and preservation regulations – Through Section 404 of the CWA, the USACE regulates impacts to wetlands and requires mitigation. In addition, BMPs are required for water quality mitigation on federally funded projects under Phase II stormwater regulations. The Four Corners Air Quality Task Force is studying the region's air quality issues and will develop a broad list of mitigation options.
- Land acquisition and conservation easements – The City of Durango has a land conservation program and encourages conservation easements for wetlands and other sensitive environmental resources.
- Development fees and exactions – the City of Durango has a series of fees for parks, schools, roads, sewer, and water.

4.24 PERMITS

The permits and approvals listed below may be required for the US 160 project. Specifically, applicable permits will be identified during final design of each construction segment.

Land Use

- CDOT Construction Access Permits – permitted through appropriate state or local agency, providing uninterrupted access to residential and commercial properties, detours, and lane closures.
- BLM Reservation for ROW – allows CDOT to construct, use, and maintain a highway over BLM-administered public lands. This ROW reservation was issued by the BLM in 1951 for a 300-foot wide area and remains in effect. Any activities associated with the US 160 project outside of the current ROW will require CDOT to apply for an amendment from the BLM.

Water Resources

- Section 401 Water Quality Certification – permitted through CDPHE, Water Quality Control Division, to assure water quality standards are complied with when a Section 404 permit is issued by the USACE.
- Colorado Discharge Permit System – general permit for stormwater discharges associated with construction activities. Permitted through CDPHE for the discharge of stormwater pollutants from construction activities disturbing an area greater than 5 acres.
- Construction Dewatering Permit – permitted through CDPHE for dewatering activities and to ensure that water quality is not impaired.
- NPDES Permit – permitted through CDPHE to ensure procedures such as seeding, mulching, sodding, erosion control blankets, and surface roughening are used in all areas of temporary disturbance.

Air Quality

- Contractors are required to obtain a construction permit and develop a fugitive emissions control plan to be implemented during construction in accordance with the Colorado Air Quality Control Commission Regulation No. 1, Part 3D, and Regulation No. 3, Applicable Permit Requirements.

Wildlife and Fisheries

- Applications for SB 40 Certification –permitted through CDOW, and required because the project would have impacts to streams that meet one or more of the criteria for certification.
- The MBTA (16 USC 703) makes it illegal to take any migratory bird or nest. If any construction activities result in the taking of any migratory birds or nests, a Migratory Bird Permit will be required.
- The ESA (16 USC 1531 et seq.) makes it illegal to take any species federally listed as threatened or endangered. If any species are to be taken during construction activities, an Incidental Take Permit from the USFWS will be required.

Wetlands and Floodplains

- CWA Section 404 Permit – Any construction activities discharging dredged or fill material into a wetland or other water of the U.S. will require a Section 404 permit from the USACE.
- FEMA approval for bridges, culverts, or structures within the 100-year floodplain may require a LOMR process that involves the modification of the FIRM.
- Floodplain Development Permit – permitted by La Plata County – authorizes construction within the 100-year floodplain.

Historic Properties

- Section 106 Approval Process – although not a formal permit, Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties.

Construction Permits

- Easements from USACE to use land during construction, to avoid impacts to riparian areas and wetlands from machinery and staging areas during construction.
- Other permits such as:
  - Utility easements, permitted through appropriate utility company
  - Construction, slope, and grading permits as appropriate

Municipal or County Permits

- La Plata County may require additional permits for construction. These permits will be defined after the Preferred Alternative is adopted and may include:
  - Stormwater
  - Erosion control
  - Environmental permits

4.25 SUMMARY OF IMPACTS AND MITIGATION MEASURES

See Table 4.25.1, Impacts to Resources by Alternative, and Table 4.25.2, Summary of Mitigation Measures, for a summary of impacts and mitigation measures for the US 160 project.

Table 4.25.1
Impacts to Resources by Alternative

Sections, Alternatives, and Impacts		Right of Way	Land Use			Farmland	Socioeconomics and Relocations							Recreation	Air Quality	Traffic Noise	Wetlands			Water Resources		Vegetation	Noxious Weeds
		New Right of Way Required (acres)	Occupied Parcels	Vacant/ Undeveloped Parcels	Total Parcels	Irrigated Farmland (acres)	No. of Housing Units Acquired	No. of Individuals Relocated Off Site	No. of Houses Relocated On Site	No. of Mobile Homes Relocated On Site	No. of Businesses Relocated On Site	Total No. of Businesses Relocated	Environmental Justice			No. of Impacted Receptor Sites	Jurisdictional (acres)	Non-Jurisdictional (acres)	Total (acres)	Floodplains	Water Quality	Area (acres) of Native Vegetation (piñon-juniper, sagebrush shrub, riparian) Impacted (excluding wetlands)	Area Vulnerable to Noxious Weeds (acres)
Grandview Section:																							
	No Action Alternative	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	Overall, emissions decrease with newer vehicles.	37	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts
	Alternative G Modified (Preferred Alternative)	230	184	21	205	23.6	41	95	3	3	3	14	No Disproportionate Impacts	Construction activities may temporarily diminish the camping experience; access to the Durango East KOA Campground would be improved. A trail connecting Durango with CR 234 along an abandoned railroad bed will be revised by CDOT and Smart 160. Shared use path to be located on the north side of US 160 in the Farmington Hill area.	Overall, emissions decrease with newer vehicles. Fewer intersection "hot spots." No violations of CO or PM10 standards. Temporary increases in dust, vehicle emissions during construction.	52	5.58	1.74	7.32	No increase in water depth; significant floodplain encroachment which will be mitigated	Five new crossings of Wilson Gulch will increase loadings of copper and zinc, but multiple BMPs will reduce impacts. Construction impacts also will be reduced with BMPs.	61.0	68
	Alternative F Modified	200	135	20	155	49.4	42	97	3	3	3	13	Same as Alternative G Modified	Same as Alternative G Modified	Same as Grandview Alternative G Modified	82	5.52	3.35	8.87	Same as Grandview Alternative G Modified	Similar to Alternative G Modified	43.8	53
Florida Mesa and Valley Section:																							
	No Action Alternative	No Impacts	No Impacts			No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	Same as Grandview No Action Alternative	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts
	Alternative C (Preferred Alternative)	90	30	0	30	55.5	6	14	2	2	0	0	Same as Alternative G Modified	Activities may be diminished due to construction noise, dust, and inconvenient access to recreational areas. Shared use path to run from SH 172 through Bayfield; also 10-foot wide shoulders for bicycle use. A trail connecting Durango with CR 234 along an abandoned railroad bed will be revised by CDOT and Smart 160.	Same as Grandview Alternative G Modified	1	0.43	0.84	1.27	No increase in water depths; insignificant floodplain encroachment	Loadings of copper and zinc to Florida River will increase, but multiple BMPs will reduce impacts. Construction impacts also will be reduced with BMPs.	5.6	7
	Alternative A	110	29	0	29	70.6	8	19	2	4	0	1	Same as Alternative G Modified	Same as Alternative C	Same as Grandview Alternative G Modified	1	0.68	0.84	1.52	No increase in water depths; insignificant floodplain encroachment	Same as Alternative C	5.1	7
Dry Creek and Gem Village Section:																							
	No Action Alternative	No Impacts	No Impacts			No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	Same as Grandview No Action Alternative	4	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts
	Alternative H (Preferred Alternative)	140	53	8	53	20.7	7	16	1	4	0	0	Same as Alternative G Modified	Same as Florida Mesa and Valley Alternative C	Same as Grandview Alternative G Modified	4	7.41	0.76	8.17	Increased water depth of up to 0.9 ft. in Dry Creek; significant floodplain encroachment which will be mitigated	Three new crossings of Dry Creek and one crossing of Hartman Creek will increase loadings of copper and zinc, but multiple BMPs will reduce impacts. Construction impacts also will be reduced with BMPs.	132.1	143
	Alternative C	120	70	15	85	16.8	15	35	2	4	0	9	Same as Alternative G Modified	Same as Florida Mesa and Valley Alternative C	Same as Grandview Alternative G Modified	13	6.69	0.62	7.31	Increased water depth of up to 4.1 ft. in Dry Creek; significant floodplain encroachment which will be mitigated	Two fewer crossings of Dry Creek result in lower water impacts than Alternative H. Construction impacts similar to Alternative H.	122.2	132
Bayfield Section:																							
	No Action Alternative	No Impacts	No Impacts			No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	Same as Grandview No Action Alternative	7	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts
	Alternative B (Preferred Alternative)	50	38	18	56	21.4 (1.7 prime)	3	7	1	0	0	0	Same as Alternative G Modified	Same as Florida Mesa and Valley Alternative C; also access to Little Pine River Park will be moved to U-turn locations	Same as Grandview Alternative G Modified	7	2.78	1.42	4.20	Decrease in water depth in the Los Pinos River; insignificant floodplain encroachment	Loadings of copper and zinc to Los Pinos River will increase, but multiple BMPs will reduce impacts. Construction impacts also will be reduced with BMPs.	13.8	18
	Alternative A	60	38	17	55	24.9 (1.7 prime)	3	7	1	0	0	0	Same as Alternative G Modified	Same as Bayfield Alternative B	Same as Grandview Alternative G Modified	7	3.58	1.42	5.00	Decrease in water depth in the Los Pinos River; insignificant floodplain encroachment	Same as Alternative B	14.2	19

Table 4.25.1
Impacts to Resources by Alternative

Sections, Alternatives, and Impacts		Wildlife and Fisheries		Threatened, Endangered, and Sensitive Species	Historic Preservation			Paleontological Resources	Hazardous Waste Sites	Visual Resources	Energy Consumption	Geology and Soils	Construction
		Wildlife Impacts	Fisheries Impacts		Historic	Archaeological	Total						
Grandview Section:													
	No Action Alternative	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No long-term energy savings from reduced traffic congestion and delays	No Impacts	No Impacts
	Alternative G Modified (Preferred Alternative)	Loss of native vegetation and restricted wildlife movement between Florida Mesa and Animas Valley. Wildlife crossings of US 160, crossings of US 550, and fencing would reduce collisions and facilitate crossings.	During construction, temporary increases in water turbidity and siltation in Wilson Gulch.	Potential impacts to listed and sensitive birds, fish, bats, amphibians, and plants were considered. BLM sensitive species also were considered. Removal of portions of suitable Southwestern willow flycatcher breeding habitat (5 areas) may affect, but is unlikely to adversely impact breeding.	2 Sites (8 areas)	No Impacts	8 areas	1	Impacts at 7 properties expected; potential impacts to 2 oil and gas wells; unknown USTs, PCBs, buildings with asbestos and lead-based paint.	Moves US 550 from the west face of Farmington Hill to the top of Florida Mesa, then descends the north side of the hill to US 160. US 550 would require large areas of cut and fill. The US 160 expanded ROW would generally be centered on the existing alignment. Scenic integrity would be moderately to heavily impacted, especially at the US 160/US 550 interchange. Actions are within BLM VRM guidelines.	Based on the current and predicted highway volumes, the energy savings resulting from fewer vehicle delays are expected to compensate for the temporary additional energy consumption expected during construction activities.	Depending on the activity in an area, impacts could result from: clearing, excavating, compaction, and blasting; increased erosion potential from cut and fill slopes; wind and runoff erosion due to loss of vegetation cover; poor slope stability in areas of shallow groundwater.	Construction impacts would be periodic, temporary, and localized. Impacts could include traffic delays, noise, exhaust and dust emissions, and dirt and debris on the roadway.
	Alternative F Modified	Same as Alternative G Modified	Same as Alternative G Modified	Same as Alternative G Modified	2 Sites (8 areas)	No Impacts	8 areas	1	Same as Alternative G Modified	US 550 would be rerouted to the east side of Farmington Hill where it descends to US 160. The US 160 alignment would generally be centered in an expanded ROW on the existing alignment. Scenic integrity would be heavily impacted and would impact local residents.	Same as Alternative G Modified	Same as Alternative G Modified	Same as Alternative G Modified
Florida Mesa and Valley Section:													
	No Action Alternative	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	Same as Grandview No Action Alternative	No Impacts	No Impacts
	Alternative C (Preferred Alternative)	Loss of native vegetation and restricted wildlife movement. Wildlife crossing facilitated by the Florida River bridge.	During construction, temporary increases in water turbidity and siltation in the Florida River	Potential impacts to listed and sensitive birds, fish, bats, amphibians, and plants were considered. Bald eagle: no known nests or roosts affected; Southwestern willow flycatcher: loss of breeding habitat (5 areas) unlikely to have impacts; Yellow-billed cuckoo: loss of breeding habitat unlikely to have impacts.	3 Sites (3 areas)	No Impacts	3 areas	No Impacts	Potential impacts to 1 oil and gas well.	Scenic integrity would remain slightly altered in most locations but would be moderately altered in the areas impacted by the realignment of CR 222 and CR 223. Scenic quality of the Florida River would remain moderate to high.	Same as Grandview Alternative G Modified	Same as Grandview Alternative G Modified	Same as Grandview Alternative G Modified
	Alternative A	Same as Alternative C	Same as Alternative C	Same as Alternative C	3 Sites (3 areas)	No Impacts	3 areas	No Impacts	Same as Alternative C	Similar impacts to Alternative C. Construction would involve a large area of cut and fill as the roadway descends into the Florida River valley, impacting natural landforms on the side slope of the highway fill.	Same as Grandview Alternative G Modified	Same as Grandview Alternative G Modified	Same as Grandview Alternative G Modified
Dry Creek and Gem Village Section:													
	No Action Alternative	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	Same as Grandview No Action Alternative	No Impacts	No Impacts
	Alternative H (Preferred Alternative)	Loss of native vegetation and restricted wildlife movement. Due to realignment of US 160 around Gem Village, two roads further restrict wildlife crossings. Eleven preliminary or recommended structures would facilitate wildlife crossing.	During construction, temporary increases in water turbidity and siltation in Dry and Hartman creeks.	Potential impacts to listed and sensitive birds, fish, bats, amphibians, and plants were considered. BLM sensitive species also were considered. Removal of portions of suitable Southwestern willow flycatcher breeding habitat (7 areas) may affect, but is unlikely to adversely impact breeding.	2 Sites (3 areas)	1	4 areas	1	Impacts at 1 property and drainages are expected; potential impacts to 3 oil and gas wells, unknown USTs, PCBs; buildings with asbestos and lead-based paint.	At the western end of this section, scenic quality would remain moderate, and the scenic integrity of the piñon-juniper hills and the Dry Creek valley would be slightly altered from its current condition. For the bypass south of Gem Village, the ROW would cross irrigated agricultural land; the scenic integrity of this land would become heavily altered, and scenic quality would be moderate. Actions are within BLM VRM guidelines.	Same as Grandview Alternative G Modified	Same as Grandview Alternative G Modified	Same as Grandview Alternative G Modified
	Alternative C	Loss of native vegetation and restricted wildlife movement. Nine preliminary or recommended structures would facilitate wildlife crossing.	Similar to Alternative H	Similar to Alternative H	2 Sites (2 areas)	1	3 areas	1	Same as Alternative H	Scenic quality in Dry Creek would remain moderate, and the scenic integrity of the piñon-juniper hills and the Dry Creek valley would be slightly altered from its current condition. In Gem Village, ROW expansion along the current alignment would be an additional visual impact to the existing condition and would increase the scale and proximity of visual effects.	Same as Grandview Alternative G Modified	Same as Grandview Alternative G Modified	Same as Grandview Alternative G Modified
Bayfield Section:													
	No Action Alternative	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	Same as Grandview No Action Alternative	No Impacts	No Impacts
	Alternative B (Preferred Alternative)	Loss of native vegetation and restricted wildlife movement. Wildlife crossing facilitated by the Los Pinos River bridge plus three preliminary or recommended structures to facilitate wildlife crossings.	During construction, temporary increases in water turbidity and siltation in the Los Pinos River	Potential impacts to listed and sensitive birds, fish, bats, amphibians, and plants were considered. Bald eagle: no known nests or roosts affected; River otter: unlikely impacts; Southwestern willow flycatcher: impacts to breeding habitat (8 areas) likely to have adverse impacts; Yellow-billed cuckoo: loss of marginal habitat unlikely to have impacts	7 Sites (7 areas)	No Impacts	7 areas	No Impacts	Impacts at 1 property are expected; potential impacts to 3 oil and gas wells, unknown USTs, PCBs; buildings with asbestos and lead-based paint	US 160 would generally remain in its current alignment across the Los Pinos River, town of Bayfield, and to the end of the project corridor. The major changes would be in connection to local access. Visual effects would mainly be an increase in the overall scale of the highway. The CR 501 realignment would locate the road adjacent to the existing CR 501 and would result in minor visual impacts.	Same as Grandview Alternative G Modified	Same as Grandview Alternative G Modified	Same as Grandview Alternative G Modified
	Alternative A	Same as Alternative B	Same as Alternative B	Same as Alternative B	7 Sites (7 areas)	No Impacts	7 areas	No Impacts	Same as Alternative B	The major change in this alternative is the grade separation of US 160 over CR 501 which would increase the level of alteration to the existing landscape. North of US 160, CR 501 would be relocated to an irrigated pasture and wetland area with high scenic value. Overall, the project would increase the level of alteration to the existing landscape.	Same as Grandview Alternative G Modified	Same as Grandview Alternative G Modified	Same as Grandview Alternative G Modified

Table 4.25.2
Summary of Mitigation Measures

Category	Principal Mitigation Measures
Land Use (Section 4.1)	Measures: • All acquisitions and relocations will conform with Public Law 91-646 and the Uniform Act as implemented in 40 CFR 24. Procedural guidance will be provided by the *CDOT Right-of-Way Manual* (CDOT 2001). • CDOT will mitigate for the loss of real property and physical relocation costs as needed. • To limit land use impacts, the amount of land acquired for highway improvements will be limited to only portions of parcels actually needed for the ROW instead of the entire parcel, depending on CDOT policies and negotiations with landowners. • A livestock culvert between BLM parcels will be of sufficient size when extended/replaced. • Replacement fencing will prevent cattle access to the highway.
Farmland (Section 4.2)	• As part of the ROW acquisition process, CDOT will coordinate with affected landowners on possible impacts to agricultural land. Mitigation may include relocation of irrigation ditches and/or payment for the lost value of crops.
Socioeconomics and Relocations (Section 4.3)	*Social Resources* • In compliance with the Uniform Act, CDOT will mitigate the loss of real property and physical relocation by providing financial and other assistance. • On large parcels, houses, mobile homes, and businesses may be relocated on the same parcel.
	Economic • In compliance with the Uniform Act, CDOT will mitigate the loss of real property and physical relocation by providing financial and other assistance.
	Environmental Justice • In compliance with the Uniform Act, CDOT will mitigate the loss of real property and physical relocation by providing financial and other assistance, including payment of relocation costs. • As a result of discussions with the mobile home park residents, highway access and frontage roads were modified to minimize impacts to the Narrow Gauge, Cropley, and John's Homestead mobile home parks. • FHWA and CDOT commit to providing affordable replacement housing for all displaced residents up to and including housing of last resort. • During advanced design of the project, noise mitigation will be reconsidered for three other mobile home parks in Grandview (Lilly Belle, John's Homestead, and Cedar Meadows).
Recreation (Section 4.4)	• Dust control measures will be implemented. • Permanent signage will be installed to direct motorists to the Little Pine River Park and KOA campground. • Construction-related delays will be mitigated through measures listed under "Construction." • A shared-use trail will be constructed to enhance recreational opportunities.
Air Quality (Section 4.5)	• Dust control techniques such as watering the construction-disturbed areas will be employed to minimize air quality impacts during construction. • Fugitive dust permits and/or air pollution emission notices for construction activities will be obtained where applicable from CDPHE.
Traffic Noise Analysis (Section 4.6)	• Mitigation measures to be considered for construction noise will include requiring the contractor to use well maintained equipment~~, installing temporary noise barriers,~~ and limiting work in some populated areas to daylight hours when feasible. • Based on the 2002 CDOT Noise Analysis and Abatement Guidelines, noise mitigation is recommended at the following locations: – Grandview: Mountain Vista Mobile Home Park – Bayfield: R735, R737, R740, and R738 • The final height and location of noise walls will be determined during final design.

Table 4.25.2
Summary of Mitigation Measures

Category	Principal Mitigation Measures
Wetlands (Section 4.7)	• Mitigation plans will be developed in coordination with the USACE and other appropriate permitting agencies including USEPA where they request an opportunity to comment. • Wetland impacts have been avoided or minimized during conceptual design of roadway elements and selection of the alternatives. Avoidance and minimization of impacts to wetlands will be ongoing during engineering design. • ~~An access control line has~~ Access control lines have been established along portions of the corridor to limit future wetland impacts. • CDOT will obtain access control lines along the entire corridor and, where feasible, restrict access through wetlands and waterways while providing for reasonable access. ~~• Avoidance and minimization of impacts to wetlands will be ongoing during engineering design.~~ • Unavoidable permanent impacts will be mitigated through on-site and/or off-site wetland creation or restoration. All wetlands will be replaced at a minimum 1:1 ratio in accordance with CDOT policy. • Because no mitigation banks are located in the region, mitigation will be on-site and in-kind where possible and will be designed to restore or enhance wetland functions that will be lost. CDOT will preserve larger blocks of land for wetland mitigation as early as possible. • Mitigation for non-wetland waters and riparian habitat is incorporated into the mitigation conceptual design. • Wetland mitigation areas will not be located in primary stormwater management facilities used for water quality mitigation BMPs. • Areas disturbed temporarily by construction will be restored to original contours. • Precautions will be taken when working in areas with shallow groundwater or areas that frequently carry surface water flows to avoid inadvertent hydrologic modifications. During final design, roadway embankments and retaining walls will be designed to maintain existing hydrology of wetlands with documentation provided in project-specific Mitigation and Monitoring Plans. • Unnecessary temporary impacts will be avoided by fencing the limits of disturbance during construction. ~~• BMPs will be used during all phases of construction to reduce impacts from sedimentation and erosion. BMPs may include the use of berms, brush barriers, check dams, erosion control blankets, filter strips, sandbag barriers, sediment basins, silt fences, straw bale barriers, surface roughening, and/or diversion channels.~~ • Specific permanent BMPs, including infiltration basins, trenches, wet ponds, and other practices will be evaluated during final design. ~~• No equipment staging or storage of construction materials will occur within wetlands or other waters.~~ ~~• The use of chemicals, such as soil stabilizers, dust inhibitors, and fertilizers within wetlands and other waters will be prohibited.~~ ~~• Equipment will be refueled in designated contained areas, away from wetlands and other waters.~~ • Where practicable, work will be performed during low flows or dry periods. If flowing water is present, it will be diverted around active construction areas. • No unpermitted discharge of effluent into wetlands or other waters will occur. • Temporary fill material will not be stored within wetlands or other waters unless appropriate measures are taken to protect them from permanent impacts. ~~• All areas of exposed soil will be seeded and/or planted, and mulched throughout construction (following the completion of each section). Mulch and mulch tackifier will be placed for temporary erosion control when seeding and/or planting cannot occur due to seasonal constraints.~~ • Any wetland areas used for construction access will be covered with a layer of geotextile, straw and soil prior to use. • Upland seed mixes will not be used in wetlands. • Detailed Wetland Mitigation and Monitoring Plans will be developed in accordance with USACE Regulatory Guidance Letter 02-2 (USACE 2002).

Table 4.25.2
Summary of Mitigation Measures

Category	Principal Mitigation Measures
Wetlands (Section 4.7) *(continued)*	~~CDOT will obtain access control lines along the entire corridor.~~ • Mitigation sites for replacement of jurisdictional wetland impacts will be developed outside the existing CDOT ROW, whenever possible. Properties purchased for mitigation will be acquired as permanent Conservation Easements, or similar protection as allowed by statute. Mitigation sites may also be developed on remnant parcels that are not required for transportation purposes but are still part of CDOT ROW. These sites will be protected in accordance with the Sacramento District's Mitigation and Monitoring Proposal Guidelines, dated December 30, 2004. • Wetlands that are impacted by channel realignment or installation of drop structures will be replaced or expanded at their same location (i.e. along the stream) following completion of construction in that area. • The use of bridges instead of concrete box culverts will be evaluated during final design for the US 160 and CR 223 crossings of Dry Creek to reduce the disturbed area and maintain the natural channel. • Wetland mitigation will be in advance or at a minimum, concurrent with impacts and within the same watershed. Based on available funding, a wetland mitigation project will be set up in 2007 or 2008 with input from conservation organizations or agencies to locate the best mitigation site(s). • Wetland mitigation areas will include vegetated buffers to enhance, expand, and diversify the surrounding landscape. In riparian areas, trees and shrubs will be planted. • CDOT will be responsible for maintenance, monitoring, and meeting USACE-approved performance standards at wetland mitigation sites. • New bridges will be designed so that stormwater does not discharge directly into wetlands. • The tangent section between MP 98 and 99 (Dry Creek and Gem Village) will be evaluated during final design for possible alignment shifts to avoid high quality wetlands. Minor alignment shifts will be considered to optimize avoidance of higher quality wetlands over lower quality wetlands, and to allow for sufficient areas for upland buffers. Permanent BMPs will be evaluated in lieu of upland buffers to replace this function.
Water Resources (Section 4.8)	*Floodplains* • Local and CDOT criteria will be followed in the design of all hydraulic structures, and the design will meet the requirements of 23 CFR 650. • Impacts on floodplains will be mitigated using bridges, retaining walls, and box culverts. • Channel realignment of creeks or streams (e.g. Wilson Gulch, Dry Creek) will be designed to approximate natural condition gradients and sinuosity.
	Water Quality • A construction stormwater management plan identifying BMPs will be developed and implemented in accordance with CDOT specifications. The plan and BMPs will help mitigate any construction-related impacts to water quality. • Areas of disturbance will be revegetated in accordance with NPDES permit requirements and CDOT specifications. • The use of sedimentation basins and other permanent BMPs will be included in the final design at appropriate locations as outlined in the MS4 Permit/New Development and Redevelopment Stormwater Program (CDOT 2004). • As per the Driscoll Method results, permanent water quality BMPs including multiple BMPs in series will be evaluated during final design for all water crossings. • No equipment staging or storage of construction materials will occur within 50 feet of wetlands or other waters. • The use of chemicals, such as soil stabilizers, dust inhibitors, and fertilizers within 50 feet of wetlands and other waters will be prohibited. • Equipment will be refueled in designated contained areas, at least 50 feet away from wetlands and other waters.

Table 4.25.2
Summary of Mitigation Measures

Category	Principal Mitigation Measures
Water Resources (Section 4.8) *(continued)*	• Concrete washout structures will be located at least 50 feet from wetlands and other waters. • BMPs will be used during all phases of construction to reduce impacts from sedimentation and erosion. BMPs may include the use of berms, brush barriers, check dams, erosion control blankets, filter strips, sandbag barriers, sediment basins, silt fences, straw-bale barriers, surface roughening, and/or diversion channels. • All areas of exposed soil will be seeded and/or planted, and mulched throughout construction (following the completion of each section). Mulch and mulch tackifier will be placed for temporary erosion control when seeding and/or planting cannot occur due to seasonal constraints.
Vegetation (Section 4.9)	• Further efforts to avoid permanent impacts to riparian vegetation will be made during final design. • Construction impacts will be minimized by fencing the ROW where it passes through riparian vegetation to prevent temporary disturbance outside the construction limits. Construction staging areas will not be placed in riparian areas. • All disturbed areas within riparian areas not occupied by permanent facilities will be revegetated with appropriate native species. • Riparian areas disturbed during construction will be stabilized as soon as possible. • Trees removed during construction will be replaced at a 1:1 ratio. Shrubs will be replaced based on their pre-construction aerial coverage. All replacement trees and shrubs will be native species. • Replacement habitat will be provided for unavoidable impacts through enhancement of existing habitat or restoration of riparian habitat on floodplains. • Restoration of riparian woodland and shrub land will be included in design of wetland mitigation areas to provide vegetated buffers and increased habitat diversity and value. • Noxious weeds will be controlled during construction and habitat restoration. • Monitoring during and following construction will be implemented to identify new weed infestations and to evaluate the effectiveness of weed control methods. • Silt fencing and other BMPs will be used to prevent degradation of habitats adjacent to construction area.
Noxious Weeds (Section 4.10)	• Following construction, CDOT maintenance crews will provide for control of noxious weeds within the CDOT ROW on an as needed basis. • CDOT will develop a project-specific noxious weed management plan to be implemented during construction. The plan will include results of a noxious weed inventory, identification of weed management goals and objectives, and preventive and control measures: – Noxious weeds observed in and near the construction area at the start of construction will be treated with herbicide or physically removed. The presence of protected species may limit the method of treatment. – Contractors' vehicles will be washed before they are used for construction to ensure they are free of soil and debris capable of transporting noxious weed seeds or roots. – Periodic surveys will be conducted during construction to identify and treat noxious weeds. – Topsoil used for reclamation will be free of noxious weeds or will be treated prior to use. – Disturbed areas will be reclaimed and seeded as soon as construction of the individual areas is finished. – Fertilizer will not be used in seeded areas. – Certified weed-free mulch will be used for reclamation and weed-free straw bales, where specified, will be used as sediment barriers.

Table 4.25.2
Summary of Mitigation Measures

Category	Principal Mitigation Measures
Wildlife and Fisheries (Section 4.11)	*Wildlife* • To increase habitat connectivity across the highway and decrease animal-vehicle collisions (AVCs), nineteen "multi-use" wildlife underpasses sized appropriately for deer and elk use (see Section 4.11.7, Mitigation), will be installed. Once installed, the multi-use wildlife underpasses will be monitored for a minimum of 3 years post-construction to evaluate their effectiveness. ~~Specific construction and design practices targeted for multiple species will help to increase habitat connectivity and barrier permeability across roadway structures.~~ • Fencing will be installed in association with multi-use wildlife underpasses to help guide deer and elk to crossing areas. Fenced areas will incorporate one-way earthen escape ramps to prevent animals from becoming trapped on the wrong side of the fence. Additionally, crash gates or sections of removable fence will be installed between underpass locations to provide gaps in the fence in the event that an extreme weather event traps animals in areas where they can not access underpass locations. • To ensure that locations of wildlife crossings will be suitable in the future as development occurs and projects are designed and constructed in the project corridor, CDOT will continue to collect data on roadkilled wildlife to identify trends in locations of AVCs. The site-specific locations of the multi-use wildlife underpasses will be determined in consultation with CDOW as part of final design. • Culverts 3 to 5 feet in diameter will be installed every 500 to 1,000 feet to increase habitat connectivity across US 160 for small- to medium-sized mammals. Culverts will be partially buried to accommodate a natural substrate floor. The numbers and site-specific locations of culverts will be determined in consultation with CDOW during final design. • Prior to each phase of construction, CDOT will coordinate with CDOW to identify specific areas along the highway that are particularly problematic crossing areas for small to medium-sized mammals and herpetofauna. Appropriate fencing will be installed in these problem crossing areas to guide small mammals and herpetofauna to the culvert openings. ~~Multi-span and single-span bridges will help to decrease impacts on deer, elk, and other wildlife species.~~ ~~Culverts will be installed in upland areas to reduce impacts to small and medium-sized animal species and increase habitat connectivity.~~ ~~Mortality studies will be conducted to identify the most effective locations and numbers of crossings needed for deer and elk.~~ • Raptor nest surveys will be completed prior to start of construction to identify active nests. If nests are located in the study area, protective buffer zones will be established around active nests during construction to avoid disturbance to individual birds while nesting. • Individual raptor perch trees and tall snags will be avoided to the extent possible, and raptor perch trees that are removed will be replaced at a 2:1 ratio, or as specified by state and federal wildlife agencies. Perch poles will be placed at a 1:1 ratio for raptor perch trees to mitigate for the temporary loss of perching opportunities until replacement perch trees mature. • ~~Nest surveys for raptors and other migratory birds will be done prior to the start of construction to identify active nests and potential areas where seasonal restrictions on construction or buffers may be needed.~~ • ~~If identified perch trees are removed, they will be replaced at a 2:1 ratio.~~ • Vegetation removal activities will be timed to the extent possible to avoid the migratory bird breeding season (April 1 through August 15). Areas that must be scheduled for vegetation removal between April 1 and August 15 shall be surveyed for nests and approved by a qualified biologist prior to the initiation of work. Appropriate inactive nest removal and hazing/exclusion measures shall be incorporated into the work to avoid the need to disturb active migratory bird nests.

Table 4.25.2
Summary of Mitigation Measures

Category	Principal Mitigation Measures
Wildlife and Fisheries (Section 4.11) *(continued)*	• Any demolition or structural work on existing bridge structures will be scheduled to the extent possible between August 16 and March 31 to avoid impacts to nesting swallows. If bridge work must begin after April 1, nest surveys will be conducted prior to April 1 to determine if inactive nests are present. Appropriate hazing/exclusion measures or inactive nest removal will be used prior to the nesting season if nests are present to ensure that no active nests are disturbed during demolition and construction activities. • ~~Bridge demolition or reconstruction will be performed outside the primary swallow nesting season.~~ • ~~Once installed, large multi-use wildlife crossing structures will be monitored for at least 3 years.~~ *Fisheries* • To protect spawning fish and reduce the potential for whirling disease, construction equipment will not enter the river channel from April 1 though June 30, and September 1 through November 30 unless specifically authorized using mitigation measures developed under the required SB 40 Certification from the CDOW. ~~• Construction equipment will not enter the river channel from April 1 though June 30, and September 1 through November 30.~~ • Any riparian vegetation removed as a part of the project will be replaced with similar vegetation. • Water quality BMPs will be implemented during project construction. • CDOT will delineate sensitive habitat after construction to avoid direct impacts from maintenance operations. • Per SB 40, CDOT will be required to consult with CDOW on impacts to streams, as well as preparing an individual application for SB 40 Wildlife Certification.
Threatened, Endangered, and Sensitive Species (Section 4.12)	*Bald Eagles* • Raptor nest surveys will be conducted within 0.5 mile of the construction area prior to starting construction of specific highway segments. If an active or inactive nest is identified, a 0.5-mile buffer will be required around the nest, and seasonal restrictions on construction in the area will be implemented. Seasonal restrictions will coincide with the bald eagle breeding season (November 15 to July 31), and human encroachment will be prohibited within the 0.5-mile radius of the nest between these dates. • Nocturnal roost surveys will be conducted within 0.25 mile of the construction area prior to starting construction on specific highway segments. Construction activity will be restricted within 0.25 mile of active nocturnal roost sites between November 15 and March 15, if bald eagles are present. • Perch and roost trees removed during construction will be replaced at a 2:1 ratio with an appropriate tree species such as cottonwood. *Southwestern Willow Flycatcher* ~~• Surveys of all potential habitats for Southwestern willow flycatcher within 0.25 mile of construction will be conducted prior to construction of specific highway segments to avoid and minimize any impacts.~~ ~~• Seasonal restrictions on construction activities will be implemented to avoid taking Southwestern willow flycatcher habitat from May 1 to August 15. Buffers of 0.25 mile will be required around active nest areas and sensitive habitat during construction.~~ ~~• Willow patches located within project corridor that may support Southwestern willow flycatcher will be removed prior to May 1 or after August 15.~~ • ~~Direct impacts to Southwestern willow flycatcher habitat will be avoided through habitat enhancement or other mitigation to be implemented as determined through additional formal consultation with USFWS.~~

Table 4.25.2
Summary of Mitigation Measures

Category	Principal Mitigation Measures
Threatened, Endangered, and Sensitive Species (Section 4.12) *(continued)*	• Surveys in suitable habitat will be required annually to determine presence or absence of Southwestern willow flycatchers if habitat will be affected or when construction will occur within 0.25 mile of affected habitat. Construction buffers will be required around active nest areas or within 0.25 mile of any occupied habitat. • To minimize potential impacts to breeding Southwestern willow flycatchers, the USFWS requires removal of unoccupied suitable nesting habitats outside of the breeding season (between May 1 and August 15). Construction activities that begin in an area prior to May 1 in documented unoccupied habitat will not adversely affect Southwestern willow flycatcher nesting location choice. • Removal of documented unoccupied suitable nesting habitat will be replaced at a 2:1 ratio. The replaced habitat will be monitored annually for at least three years or until vegetation has been deemed successful by the USFWS (See Appendix H, Biological Assessment, Biological Evaluation, and Biological Opinion). • CDOT will map and flag suitable Southwestern willow flycatcher habitat prior to construction and inform contractors and CDOT employees to avoid direct impacts from construction and maintenance activities. • CDOT will comply with the additional Reasonable and Prudent Measures and non-discretionary Terms and Conditions of the USFWS Biological Opinion for the project dated February 3, 2006 (see Appendix H, Biological Assessment, Biological Evaluation, and Biological Opinion). *Yellow-Billed Cuckoo* • Surveys for presence/absence of Yellow-billed cuckoo shall be conducted annually for two years prior to each construction phase in potential habitats along the Florida and Los Pinos rivers. ~~• Seasonal restrictions will be implemented on construction activities to avoid taking known Yellow-billed cuckoo habitat from May 1 to September 15.~~ • If surveys determine Yellow-billed cuckoos are present, seasonal restrictions will be implemented on construction activities to avoid removing nesting habitat or disturbing nesting Yellow-billed cuckoos (May 1 to September 15). CDOT will coordinate with USFWS and CDOW to determine an appropriate seasonal buffer distance from an active nest. Buffers will be required around active nest areas or within 0.25 mile of habitat. ~~• If an active nest is located within 0.25 mile of project construction, CDOT will coordinate with CDOW and USFWS to determine the appropriate mitigation action.~~ *Knowltons Cactus* • Annual field surveys shall be conducted in suitable habitat to document individuals and populations to avoid impacts. Surveys shall be within one year prior to construction and USFWS consultation is required if impacts cannot be avoided. *Western Burrowing Owl* • Surveys for the presence of burrowing owls will be conducted annually in suitable habitat prior to each construction phase. If nesting burrowing owls are observed, seasonal restrictions will be implemented (April 15 – July 15). A seasonal 225-foot construction buffer zone will be required around any active nest. Surveys shall be within 1 year prior to construction. ~~If a species is present and construction will not begin within one year of the previous survey for the species, then additional surveys (in the appropriate survey season) are necessary prior to construction~~.

Table 4.25.2
Summary of Mitigation Measures

Category	Principal Mitigation Measures
Threatened, Endangered, and Sensitive Species (Section 4.12) *(continued)*	*Sensitive Mammals* • To mitigate potential impacts to roosting Yuma myotis, surveys will be conducted by a qualified biologist for roosting bats under bridges and in cliff swallow nests prior to initiation of any bridge work. If roosting Yuma myotis are present, CDOT will coordinate with BLM to develop a mitigation strategy for the species. *Sensitive Amphibians* • Wetland mitigation will help to mitigate any lost northern leopard frog or New Mexico spadefoot toad habitat. *Sensitive Plant Species* • During final design, field surveys for sensitive plant species will be conducted in sagebrush and piñon-juniper habitats that will be impacted by construction activities. Appropriate mitigation actions will then be taken to avoid any sensitive populations found in surveys. ~~If a species is present and construction will not begin within one year of the previous survey for these species, then additional surveys are necessary prior to construction.~~ • Surveys for green sedge, Philadelphia fleabane, and wood lily will be combined with any subsequent wetland work completed for the project. *Colorado River Fish* • Construction of the US 160 realignment will not utilize water from rivers and streams in excess of 44.6 acre-feet (the estimated project water consumption) without consulting with USFWS. ~~CDOT will consult with USFWS during project design regarding impacts to razorback sucker and Colorado pikeminnow.~~
Historic Preservation (Section 4.13)	• Once final design is complete, CDOT will ensure that all areas not surveyed during the initial fieldwork are subjected to intensive pedestrian surveys prior to construction. If any newly discovered resources are determined eligible for the NRHP, then appropriate mitigation measures will be developed in consultation with SHPO, BLM, and the tribes (if they are on lands that they administer), and implemented prior to construction in those areas. • Coordination between CDOT and representatives of SUIT will continue regarding potential medicinal plant locations and site 5LP2223. • To mitigate impacts to irrigation ditches in general, a public information notice is proposed. • Ditch segments 5LP5659.3 and 5LP5659.4 will likely be crossed by completely new roadway crossings adjacent to existing roadways. To mitigate these impacts, these ditch segments will be recorded prior to construction so there will be a permanent record of their present appearance and history. • Data recovery will take place for the impacted areas of any sites that are determined to be eligible as a result of additional testing (see next bullet). • Additional data will be collected at archaeological site 5LP5677 to assist with an official determination of eligibility. • As per CDOT standard specifications, in the event that cultural deposits are discovered during construction, work will cease in the area of discovery, and the CDOT archaeologist will be notified. • The construction contractor will be responsible for informing all persons associated with a project that they will be subject to prosecution for knowingly disturbing any cultural resources or for collecting artifacts. • Construction activity in the vicinity of site 5LP1131.8 will be monitored by CDOT to ensure site avoidance and to minimize the potential for adverse effect. • As requested by the BLM, clearing, grubbing, and surface stripping activities within 200 feet of Site SLP6490, which is not eligible, will be monitored by CDOT to ensure avoidance of this site.

Table 4.25.2
Summary of Mitigation Measures

Category	Principal Mitigation Measures
Paleontological Resources (Section 4.14)	• Construction impacts to the fossil locality east of the Florida River will be mitigated by excavation of a statistically valid representative sample of the contained fossils prior to construction. • Prior to any construction project, ground reconnaissance for paleontological resources will be conducted in portions of breakout projects not previously examined. If any scientifically significant fossil localities are located in any of those previously unexamined portions, mitigation measures will be developed for and implemented at those localities, prior to or during construction, as appropriate. • If fossil materials are exposed during any construction activities, work will stop in the area of the discovery and the CDOT paleontologist will be notified. The CDOT paleontologist will be given the opportunity to assess the significance of the discovery prior to the resumption of construction activities.
Hazardous Waste Sites (Section 4.15)	• Contractor hazardous waste management plans will include safety measures developed for protection of workers and the public while doing this work and during construction if hazardous materials/waste are encountered. • Potential mitigation measures may include, but are not limited to, excavation and removal, in-situ and ex-situ treatment, and enhanced natural attenuation/bioremediation. • Disposal of roadway structures potentially coated with lead-based paint will be performed according to CDOT standard specifications. • Fill material derived from areas that could be impacted by hazardous materials sites or are suspected of being contaminated will be tested as necessary to ensure that contaminated materials are not redeposited within CDOT ROW.
Visual Resources (Section 4.16)	• ~~Construction~~ Sizes of cut-and-fill slopes will be minimized and the cut line blended into the existing terrain. • Revegetation will occur as soon as possible after construction of the individual area to stabilize soils and reduce visual contrasts. • Retaining walls and bridges will include design features to add to scenic quality of the built area. • Architectural design guidelines for the project will be developed. • Removal of adjacent roadside vegetation will be minimized where possible. Areas that lose vegetation providing important visual screens will be revegetated with plant species (trees and shrubs) that serve the same function. • The original US 550 roadway at Farmington Hill will be removed and revegetated with native species including shrubs and trees.
Energy Consumption (Section 4.17)	• On-site material will be used to the extent possible to reduce haulage requirements. • Vehicles will be maintained to help maintain maximum efficiency. • Design of construction access roads and location of construction staging areas will minimize distances traveled by construction vehicles to the extent allowed by environmental constraints.
Geology and Soils (Section 4.18)	• Excavated soils or materials will be used within the project, if possible, so as to disturb less ground area. • Temporary and permanent retaining structures and other engineering controls (e.g., rock fall mesh, retaining walls) will be incorporated to increase slope stability. • Native topsoil will be replaced with on-site soils of similar or same type to the appropriate depth for fill areas of cropland and wetlands. • Drainage structures will be used to prevent erosion and runoff into sensitive areas and areas outside the ROW. • Necessary permits will be obtained, and requirements of the NPDES process will be addressed. • A stormwater management plan that prescribes BMPs will be prepared and implemented for each project. • Temporary BMPs will be used in all phases of construction to reduce impacts from sedimentation and erosion. • Permanent BMPs will be installed as early in the project as possible. • Potentially contaminated soils will be tested for hazardous constituents prior to being used as fill.

Table 4.25.2
Summary of Mitigation Measures

Category	Principal Mitigation Measures
Construction (Section 4.19)	• Mitigation measures implemented during construction will include: - Follow all FHWA and CDOT regulations and guidance regarding worker and public safety in effect at the time of construction. - Maintain access to businesses and residences at all times. - Use BMPs to reduce impacts from dust emissions, sedimentation, and erosion. - Perform construction vehicle maintenance and refueling operations at a designated area away from sensitive wildlife habitat, wetlands, and waters of the US. - Coordinate with other public and private entities in a public information effort. - Provide adequate public notices through newspapers and local signs to warn motorists of future detours and road closures. - Provide temporary signage to business entrances during construction to draw attention to highway access points. - Ensure emergency vehicle access at all times during construction. - Plan the shortest, most direct detours with adequate signage. - Limit any major disruption of traffic to off-peak hours as much as possible to alleviate congestion, and reduce highway capacity and economic impacts. - Minimize average delay times to the traveling public. - Place flaggers immediately adjacent to work areas to optimize traffic flow.
Cumulative Impacts (Section 4.23)	The following measures could be used by local and state governments to mitigate environmental impacts in the corridor: • Access controls – If an access control plan is determined necessary for a particular area, CDOT will work with the appropriate local entity to avoid and minimize impacts to wetlands and other sensitive environmental resources. • Context sensitive designs. • Local land use plans – The *Grandview Area Plan* will direct where and to what density development should occur in the Grandview area. The Plan recommends many measures that will mitigate for impacts to the environment including transfer development rights, creation of open space buffer zones, and greater pedestrian amenities and bike path improvements to promote alternative modes of transportation. Plans for other areas may be developed in the future. • Growth management regulation – The City of Durango and La Plata County have established standards that regulate growth and require mitigation for impacts. These include requiring high density developments to provide for areas for open space within the subdivision (La Plata County) and supporting cost-effective habitat conservation strategies such as dedications, targeted acquisition of land or development rights and mandatory clustering of development (City of Durango). • Resource management and preservation regulations – Through Section 404 of the CWA, the USACE regulates impacts to wetlands and requires mitigation. In addition, BMPs are required for water quality mitigation on federally funded projects under Phase II stormwater regulations. The Four Corners Air Quality Task Force is studying the region's air quality issues and will develop a broad list of mitigation options. • Land acquisition and conservation easements – The City of Durango has a land conservation program and encourages conservation easements for wetlands and other sensitive environmental resources. • Development fees and exactions – The City of Durango has a series of fees for parks, schools, roads, sewer, and water.