3 AFFECTED ENVIRONMENT

This section describes the existing conditions of the natural and human environment in the study area that could be affected by any of the alternatives presented in the FEIS. Additional detail regarding the resources may be found in the respective technical reports. The data and level of detail are commensurate with the significance and degree of effects. The following environmental resources are evaluated in this chapter:

- Socio-economic and Environmental Justice
- Land Use and Recreation
- Farmland
- Cultural Resources
- Floodplains
- Wetlands and Tributaries
- Groundwater
- Vegetation, Fish and Wildlife
- Threatened and Endangered Species
- Transportation
- Visual Quality
- Traffic Noise
- Air Quality
- Hazardous Materials
- Energy

3.1 Socio-Economic Conditions and Environmental Justice

3.1.1 Regulatory Framework and Policies

Social and economic conditions and environmental justice are governed by the following:

- 23 CFR 771 FHWA Environmental Impact and Related Procedures
- 49 CFR 24; Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended
- Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- USDOT Order to Address Environmental Justice in Minority Populations and Low-Income Populations
- Title VI of the Civil Rights Act of 1964
- Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)

3.1.2 Methodology

Three detailed technical reports were prepared to evaluate socio-economic conditions and effects, highway-induced growth and effects to environmental justice (low-income and minority) populations.

The Community Impact Assessment (HDR 2006) evaluated the demographic characteristics of Latah County as a whole as well as the project corridor. Population, including age, race and Hispanic origin, employment, and income were analyzed. General population trends, land use, potential impacts to residences or private property, community cohesion, visual and traffic noise effects were also evaluated. Community members, local officials, and other stakeholders were interviewed to collect information regarding community resources and potential effects.

The Community Profile-Induced Development report (HDR 2005a) evaluated existing socio-economic conditions, land use and development trends in the project area. A Delphi process, which utilized a panel of local experts, was used to predict highway-related growth. The Delphi process relies on the opinions of a panel of experts to provide their assessment of likely future outcomes by responding to several rounds of questions anonymously. The process is done iteratively with controlled feedback. Anonymity allows participants to focus on the issues, not the personalities of the participants. The repeated rounds with feedback from the moderators allow participants to reconsider their responses in light of new information but prevent lobbying for any point of view. The statistical group response gives the range of opinion as well as the most common response. The local panelists in the Delphi process for this project included:

- Michelle Fuson, Latah County Planning Director
- Gundars Rudzitis, University of Idaho Professor
- Shelley Bennet, Realtor
- Walter Steed, City of Moscow Transportation Commission
- Tom LaPointe, Moscow Valley Transit Executive Director
- Travis Wambeke, Local Engineering Consultant
- Orland Arneberg, North Latah Highway District
- Jack Nelson, County Commissioner
- Andrew Ackermann, City of Moscow Assistant Community Development Director
- BJ Swanson, American West Bank
- Cinthya Barnhart, Latah Economic Development Council Executive Director
- Jeff Martin, CEO Gritman Medical Center

The Environmental Justice Report (HDR 2005b) identified minority and low-income populations in the project area and evaluated the effects of each alternative on Environmental Justice populations.

Updated information for each of the reports was prepared in 2011. The findings of the reports and updates are summarized in this section. See the Community Impact Technical Reports.

EO 12898 directs federal agencies to identify and prevent disproportionately high and adverse human health or environmental effects to minority and low-income populations, as a result of federal activities, regardless of population size.

According to USDOT, minority and low-income populations are any identifiable group of minority or low-income persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons who will be similarly affected (FHWA 2009). Effects are determined to be disproportionately high if the adverse effect is predominantly borne by a minority and/or low-income population and is appreciably more severe than the adverse effect that will be suffered by the remainder of the community.

Minority populations are groups that are Black, Hispanic, Asian American, American Indian and Alaskan Native, Native Hawaiian or other Pacific Islander (FHWA 2009).

Low-income populations are a group of persons whose household income is at or below the Department of Health and Human Services (HHS) poverty guidelines (FHWA 2009). The HHS poverty guidelines were $22,050 for a family of four in both 2009 and 2010 (USDHHS 2010).

Adverse effects are the combination of significant individual or cumulative human health or environmental effects, including interrelated social and economic effects, which may include, but are not limited to: injury or death, residential impacts, air quality, noise impacts, water pollution, soil contamination; diminution of aesthetic values; or disruption of community cohesion. It also includes the denial of, reduction in, or significant delay in the receipt of benefits of programs, policies, or activities (FHWA 1998).

The determination of whether there would be a disproportionately high and adverse human health or environmental effects as a result of the alternatives was based on evaluating two factors:

- The presence of minority or low-income populations that could be affected by the alternatives.
- If low income or minority populations are present, are the effects to those populations disproportionately high or adverse.

3.1.3 Existing Conditions

This section discusses the demographic characteristics of Latah County and the Thorncreek to Moscow corridor. Characteristics of the population including age, race, Hispanic origin, employment, and income are presented in this section. See the Community Profile - Induced Development Technical Report and update for details.

The corridor consists of two areas called census block groups: census tract 54, block group 2[8], and census tract 57, block group 3. Those block groups were larger than the actual corridor boundaries, so the data presented in the profile is more inclusive than the actual demographics found in the corridor. The City of Genesee population is excluded from the data for the corridor because the city is classified by the Census as its own unit of geography. By excluding this population center, the analysis area is more representative of the corridor study area as a whole.

Population

The Thorncreek Road to Moscow project consists of primarily undeveloped land dominated by dryland farming. Public land borders a portion of the eastern edge of the project area. The main population center associated with the project area is the City of Moscow with a population of approximately 23,800 according to the 2010 US Census data. The population of the project corridor has experienced a six percent decrease in population between 2000 and 2010 whereas Latah County experienced an increase of nine percent. See Table 9. Population.

Table 9. Population

Year	Latah County	Corridor
2000	34,935	1,307
2004	35,619	1,217
2010	37,244	1,231
Percent Change	+9%	-6%

Population and household forecasts to 2021 for Latah County were available from the Idaho Department of Labor. Latah County's population is forecast to continue increasing moderately reaching 38,797 by 2021. This is an approximately four percent increase. See Table 10. Latah County Population Forecast.

Table 10. Latah County Population Forecast

Year	Population	Estimated Households[9]
2010	37,244	14,708
2016	38,162	15,025
2021	38,797	15,349

[8] Census Tract 54, Block Group 2 was listed as Census Tract 54, Block Group 6 in the original Community Profile report. The Block Group boundary did not change

[9] A household includes all the people who occupy a housing unit as their usual place of residence

Source: Idaho Department of Labor

Population and household forecasts were not available at the corridor level. Yet, based on historic trends, low to moderate increases can be anticipated.

Age

In 2010, the largest concentration of Latah County's population was in the 15 to 24 and 25 to 44 year old age groups. These two age groups totaled more than one-half of the county's entire population. The 45 to 59 year old age group was the next largest. The median age for Latah County was 28 years old. The population distribution, especially with a concentration of persons in the 15 to 24 year old age bracket, is consistent with that of a university town population.

In the project corridor, the 25 to 44 year old and 45 to 59 year old age groups comprised approximately 49 percent of the population. The next largest age group was the under 15 age group. In 2010 the median age in the corridor study area was 40 years old. The study area's population is more similar to an area with families and children.

Race and Hispanic Origin

In 2010 approximately 92.8 percent of Latah County's total population was white. Hispanic origin and other races each comprised 3.7 percent of the populations. The racial minority and Hispanic origin of Latah County in 2010 was nearly 11 percent of the county's total population. See Table 11. Race and Hispanic Origin and Table 12. Percentage Race and Hispanic Origin.

Table 11. Race and Hispanic Origin

Race or Origin	Latah County 2010	Corridor 2010
White	34,557	1,188
Black	293	5
American Indian	237	16
Asian	781	14
Other Races	1,376	8
Total Populations	37,244	1,231
Hispanic	824	20

Source: U.S. Census Bureau, 2010

Table 12. Percentage Race and Hispanic Origin

Race or Origin	Latah County 2010 (percent)	Corridor 2010 (percent)
White	92.8	96.5
Black	0.8	0.4
American Indian	0.6	1.3
Asian	2.1	1.1
Other Races	3.7	0.6
Hispanic origin	3.7	1.6

Source: U.S. Census Bureau, 2010

In the project corridor, 96.5 percent of the total population was white. The racial minority and Hispanic origin population was five percent.

Housing Units

Housing units refer to the structures in which people live, while households refer to the people living in them. In 2010, Latah County had 15,988 housing units. See Table 13. Housing Characteristics. This is a 15 percent increase in housing since 2000.

Table 13. Housing Characteristics

Housing Variable	Latah County 2010	Corridor 2010
Total Housing Units	15,988	604
Occupied Units	14,708	538
Owner-Occupied	*8,265*	*407*
Renter Occupied	*6,443*	*131*
Vacant Units	1,280	66

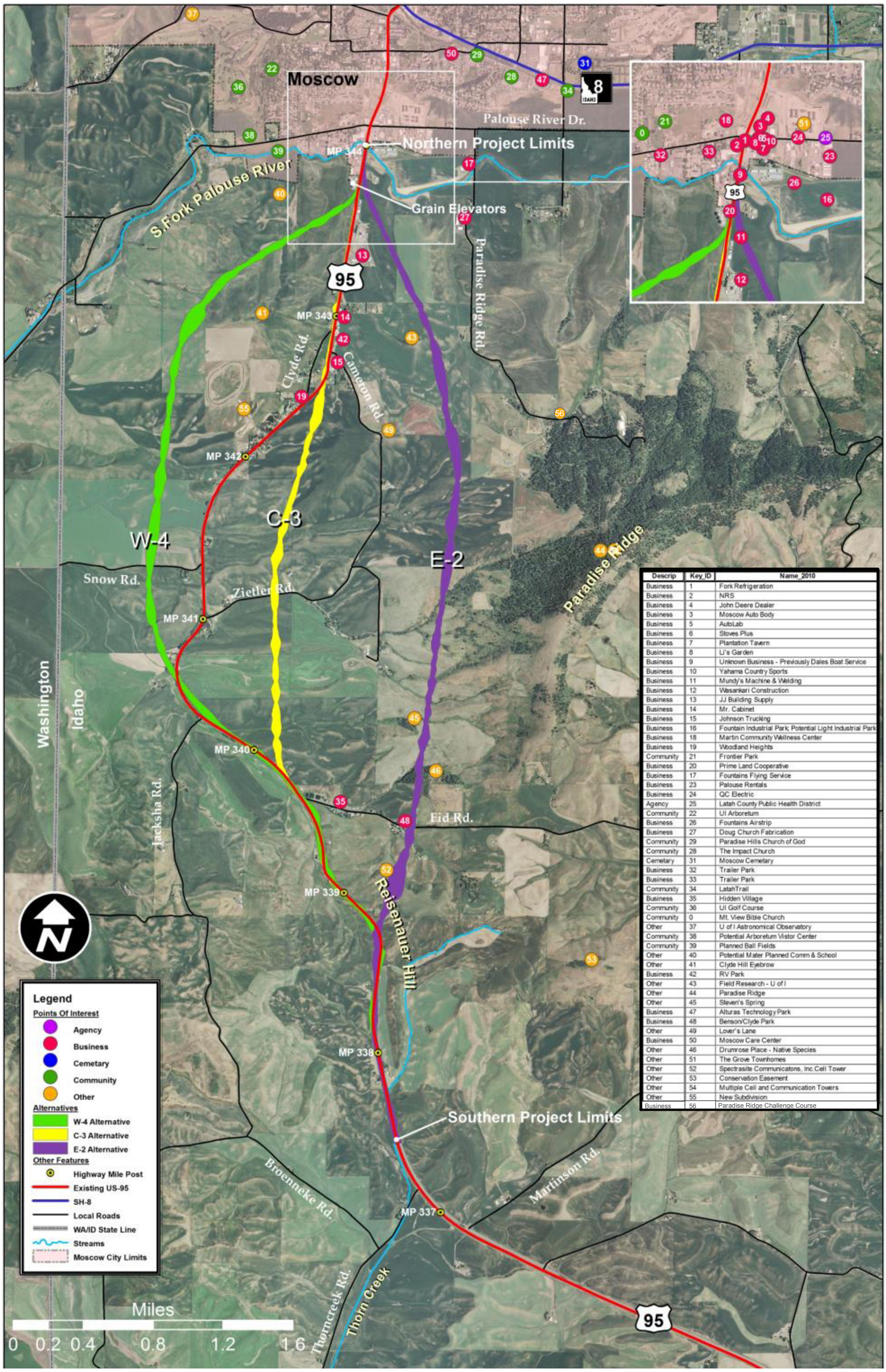
Source: U.S. Census Bureau, 2010

In the project corridor, there was no change in the numbers of housing units between 2000 and 2010. The project corridor has approximately 20 percent more owner occupied homes than Latah County, and has three percent more vacant units compared to the county. See the Community Profile - Induced Development Technical Report and update for more detail.

Community Resources

Exhibit 19. Points of Interest displays the locations of local businesses, landmarks, community resources, environmentally important locations, and recreation sites.

Exhibit 19. Points of Interest



Descrip	Key_ID	Name_2010
Business	1	Fork Refrigeration
Business	2	NRS
Business	4	John Deere Dealer
Business	3	Moscow Auto Body
Business	5	AutoLab
Business	6	Stoves Plus
Business	7	Plantation Tavern
Business	8	Li's Garden
Business	9	Unknown Business - Previously Dales Boat Service
Business	10	Yahama Country Sports
Business	11	Mundy's Machine & Welding
Business	12	Wasankari Construction
Business	13	JJ Building Supply
Business	14	Mr. Cabinet
Business	15	Johnson Trucking
Business	16	Fountain Industrial Park; Potential Light Industrial Park
Business	18	Martin Community Wellness Center
Business	19	Woodland Heights
Community	21	Frontier Park
Business	20	Prime Land Cooperative
Business	17	Fountains Flying Service
Business	23	Palouse Rentals
Business	24	QC Electric
Agency	25	Latah County Public Health District
Community	22	UI Arboretum
Business	26	Fountains Airstrip
Business	27	Doug Church Fabrication
Community	29	Paradise Hills Church of God
Community	28	The Impact Church
Cemetary	31	Moscow Cemetary
Business	32	Trailer Park
Business	33	Trailer Park
Community	34	LatahTrail
Business	35	Hidden Village
Community	36	UI Golf Course
Community	0	Mt. View Bible Church
Other	37	U of I Astronomical Observatory
Community	38	Potential Arboretum Vistor Center
Community	39	Planned Ball Fields
Other	40	Potential Mater Planned Comm & School
Other	41	Clyde Hill Eyebrow
Business	42	RV Park
Other	43	Field Research - U of I
Other	44	Paradise Ridge
Other	45	Steven's Spring
Business	47	Alturas Technology Park
Business	48	Benson/Clyde Park
Other	49	Lover's Lane
Business	50	Moscow Care Center
Other	46	Drumrose Place - Native Species
Other	51	The Grove Townhomes
Other	52	Spectrasite Communicatons, Inc.Cell Tower
Other	53	Conservation Easement
Other	54	Multiple Cell and Communication Towers
Other	55	New Subdivision
Business	56	Paradise Ridge Challenge Course

Employment

Table 14. 2009 Latah County Employment presents the numbers and percentages of the major employment sectors in Latah County. Latah County's unemployment rate was six percent in 2009, compared to eight percent for the State of Idaho.

Table 14. 2009 Latah County Employment

Employment Sector	Employees	Percentage
Farming	1,077	5
Forestry, Fishing	C	-
Mining	C	-
Utilities	20	0.1
Construction	845	4
Manufacturing	437	2
Wholesale Trade	245	1
Retail Trade	2,457	11
Transportation	184	0.01
Information	350	2
Finance and Insurance	460	2
Real Estate	649	3
Services	7,074	33
Government	7,090	33
Other	–	3.89
Total	21,431	100

Source: (U.S. Bureau of Economic Analysis 2009)
C=Confidential information
- No data available

Latah County's full and part-time employment was 21,431 in 2009. The services and government sectors contained the largest number of employees each accounting for about one-third of the county's total employment. Retail trade employment was the third largest employment sector in the county.

The largest employers in Latah County are the University of Idaho and Gritman Medical. Combined, they employ more than 40 percent of the workers in the county (Tacke pers. comm. 2011). Other major government employers include Latah County, the City of Moscow, and School District #281. The major employers in the service sector are Gritman Medical Center and the Good Samaritan Nursing Home. The primary employers in retail trade are Wal-Mart, Winco, and Rosauers Super Markets. Employment data was not available for the forestry, fishing and mining employment sectors. See Table 15. Major Employers in Latah County.

Table 15. Major Employers in Latah County

Employer	Average Number of Employees (Full and Part-time)
University of Idaho	4,000-5,000
Gritman Medical	400-500
Moscow School District	400-500
City Moscow	200-300
University Inn	100-200
Latah County	100-200
Bennett Lumber Products	100-200
Good Samaritan Nursing Home	100-200
Disability Action Center NW	100-200

Source: pers. Comm. Tacke, 2011

Detailed employment data or forecasts were not readily available for the project corridor. However, based on an inventory of the land use, farming, agricultural related services, and general service providers appear to be the primary sources of employment in the corridor.

Latah County's employment projections are based on forecasts prepared for each sector of the county's economy. Latah County's full and part-time employment is forecast to increase by approximately ten percent by 2021. See Table 16. Latah County Employment Forecast. Detailed predictions showed the strongest employment gains are expected in the retail trade, government, and health care trade sectors.

Table 16. Latah County Employment Forecast

Year	Employed Persons
2010	21,012
2016	22,582
2021	23,215

Source: Idaho Department of Labor, 2010

Income

The largest concentration of households in Latah County had incomes below $15,000 in 2009. That income distribution is consistent with an area with a large concentration of university students. The next largest concentration of households in Latah County was in the $50,000 to $75,000 income range. See Table 17. Latah County Households by Income Range.

Table 17. Latah County Households by Income Range

Income Range	Latah County (# of Households)	Corridor (# of Households)
Under $15,000	2,874	147
$15,000 to $25,000	2,405	137
$25,000 to $35,000	1,638	57
$35,000 to $50,000	1,889	118
$50,000 to $75,000	2,705	186
$75,000 to $100,000	1,245	132
$100,000 to $150,00	998	63
$150,000 and More	446	35
Total	**14,200**	**875**

The per capita income in the corridor remained higher ($24,370) than for Latah County ($19,921) in 2010 (HDR 2011a). The higher per capita income in the corridor area compared to the county, generally indicates that the area does not have a higher than average percentage of low-income residents.

3.1.4 Environmental Justice Populations

An Environmental Justice population may include low-income or minority populations. This section provides information regarding the presence of these populations within the study area.

Minority Populations

While minorities are present in the study area, there do not appear to be distinguishable minority populations. Based on the block level analysis, the largest percentage of minorities, 10.6 percent, occurs near the Hidden Village and Benson Mobile Home parks. Approximately 6.6 percent of the populations residing near the Woodland Heights Mobile Home Court are minorities (HDR 2011b).

Low-income Populations

A low-income population for the purpose of environmental justice is based on poverty levels established by Human and Health Services. The poverty level standard in 2009 and 2010 was $22,050 for a family of four (USDHHS 2010). See Table 17. Latah County Households by Income Range and Table 18. Families Living Below Poverty Level. Rental housing can also be used as an indicator of income. Currently, there are no recipients of rental assistance within the corridor (IDHF 2011).

Table 18. Families Living Below Poverty Level

Location	Families (2010)	Families Below Poverty Level (2009)
Latah County	8,268	871 (9.4%)
Census Tract 54, Block Group 2 (previously Block Group 6)	179	5 (3%)
Census Tract 57, Block Group 3	389	6 (2%)

Source: IDHF 2011

Subpopulations of Concern

A windshield survey of the project corridor identified subpopulations that could have low-income populations and a potential source of low-cost housing. These were located at the Woodland Heights Mobile Home Court (previously Valhalla Mobile Home Park), Hidden Village Mobile Home Park and Benson Mobile Home Park. The residences in these facilities included a combination of wood-frame homes, manufactured or mobile homes, trailers and recreational vehicles (RVs). RV's are most commonly temporarily occupied and for the purposes of this description, RVs are distinguished from other types of residences. Income data was not available for the residents and the mobile home park. However, records of need based rental assistance showed that there were no residents in the project area that obtained assistance. Many of the rentals in the corridor study area are located in the general vicinity of mobile home parks.

The Woodland Heights Mobile Home Court is located in the northern portion of the study area on the west side of US-95 approximately two miles south of Moscow (MP 342.5). The park contains 27 spaces for residences and RVs the majority of which are rentals. It currently contains 18 residences and five RVs. Three additional RV spaces are vacant and one additional space for a residence exists. Two additional residences are not managed as part of the facility.

The Hidden Village Mobile Home Park is located on Eid Road on the east side of US-95 approximately five miles south of Moscow (MP 339.6). The park contains 32 residences, only one of which is a rental.

The Benson Mobile Home Park is located on Eid Road just east of the Hidden Village Mobile Home Park. It contains eight residences and two RV spaces all of which are rentals.

3.2 Land Use and Recreation

3.2.1 Regulatory and Policy Framework

Land use and recreation are governed by the following:

- 23 CFR 774-Parks, Recreation Areas, Wildlife and Waterfowl Refuges, and Historic Sites (Section 4(f))
- 1975 Land Use Planning Act of the State of Idaho, Title 67, Chapter 65
- Moscow Comprehensive Plan (City of Moscow 2009)
- Moscow Zoning Ordinance
- Latah County Comprehensive Plan (Latah County 2010)
- Latah County Zoning Map
- Latah County Land Use Ordinance (Latah County 2006)
- Section 6(f) of the Land and Water Conservation Fund (LWCFA)
- 23 USC 138: Preservation of Parklands

NEPA requires that the project action be assessed to determine if it is compatible with existing land use plans. The land use in the project area is regulated through city impact agreements, zoning ordinances and zoning classifications with incorporated areas falling within municipal jurisdiction and un-incorporated areas falling under county jurisdiction.

3.2.2 Methodology

A technical report titled Community Profile - Induced Development (HDR 2005a) was prepared and is summarized in this section. The report evaluated existing socio-economic conditions, land use planning documents and development data in the project area. A Delphi process, involving interviews with a panel of local experts, was used to predict development trends and highway-related growth. It was also used in the evaluation of the alternatives' consistency with land use plans. Reports were prepared in 2011 to provide updated information. See the Community Impact Technical Reports.

Planning documents that govern the land uses in the project area were evaluated to determine if the alternatives would be consistent with city, county and regional land use policies. Existing land uses were verified by comparing geographic information system (GIS) data with the results of field visits in the study area. City and county staff were interviewed and completed questionnaires regarding existing conditions and planned development in 2004 and 2011. A regional analysis and local trends analysis were performed to describe effects related to projected growth within the study area.

3.2.3 Existing Conditions

Land Use

The majority of the corridor is surrounded by agricultural land with associated farmhouses and agricultural buildings. There are clusters of residential development along certain portions of the

corridor (Zeitler Road, Cameron Road, and Clyde Road) and two areas (Woodland Heights Mobile Home Court and Hidden Village /Benson Park) that have a concentration of residences. The northern portion of the corridor is more highly developed with a mix of uses and an emphasis on auto-oriented businesses such as RV parts and service, automotive repair facilities, and trucking services.

Approximately 58 percent of all property in Latah County is privately owned. Nearly 16 percent of the county's land is owned by the federal government with most of that land in the St. Joe and Clearwater National Forest. State held land accounts for five percent of the county and includes the US-95 right-of-way. Most of the state property is endowment land for education. See Table 19. Latah County General Land Ownership.

Table 19. Latah County General Land Ownership

Land Ownership	Acreage	Percentage
Private	404,682	58.7
Forest Industry	126,701	18.4
US Government	108,285	15.7
State	35,577	5.2
University	9,856	1.4
Highway	2,100	0.3
City Owned	1,990	0.3
Railroad	665	0.1
Latah County	493	0.1
School District	296	Less than 0.1

Nearly 96 percent of Latah County is in low intensity land use such as forest land and agriculture. The county contains 3,400 acres of land designated as urban, which accounts for about a half percent of the county's total land. See Community Impact Technical Reports; Community Profile and Induced Development (HDR 2005a).

Low-density residential development is the only type of residential development allowed in unincorporated Latah County. Commercial developments are expected along US-95 at the southern edge of the city limits.

City of Moscow Comprehensive Plan

The City of Moscow adopted a new Comprehensive Plan in 2009. While most of the project area is located outside the City limits, Latah County has adopted the City of Moscow's zoning ordinance and zoning classifications for the area of impact located in the northern end of the project. The land outside the city limits in the Area of City Impact is currently characterized in

the City of Moscow Comprehensive Plan as Auto Urban Industrial. The future planned use includes Auto Urban Commercial, Industrial, Urban Residential and Auto Urban Residential. Zoned by Latah County as Urban Residential, Auto-AF-Agriculture/Forestry with smaller areas of Motor Business Industrial and Commercial along US-95.

The City of Moscow Comprehensive Plan promotes a system of transportation and circulation within and around the city that will make it possible for all people utilizing various modes of transportation to reach their destination as safely and as easily as possible, with the least disturbance possible occurring upon adjacent uses. The plan also states that roads and intersections are to be designed to restrict and control vehicular access along state and federal highways in the Area of City Impact. The area east of US-95 at the southern edge of the city is designated as light industrial use.

The City of Moscow Comprehensive Plan update did not address any of the proposed US-95 alignments but does consider the following potential developments (City of Moscow 2009):

- The City of Moscow plans to develop the Ring Road concept, which is a long range, unfunded improvement. The project is a planned loop around the City of Moscow that would permit through traffic on both US-95 and SH-8 to travel around the perimeter of the City to facilitate circulation in and around Moscow and to reduce congestion from regional through traffic. The Ring Road would be on both sides of US-95 with a crossing just south of the Primeland Silos. The Ring Road Concept has been developed to a point that an alignment is proposed based on topographic conditions, expected design standards, and anticipated use. The concept and alignment have been based upon ITD design standards in the southwest quadrant (US-95 to SH-8) and Minor Arterial Standards in all other quadrants.
- A proposed ball park (parks and open space) was rezoned and annexed into the City. Build-out of the park isn't anticipated for several years but it is included in the Parks and Recreation Master Plan (City of Moscow 2009).
- Future auto-urban commercial land uses are planned along the US-95 corridor entering Moscow.
- Auto-urban residential growth areas have been extended further south of the City.
- The City of Moscow recently worked on a new Master Plan for an Industrial Park that is located north of the South Fork of the Palouse River.

Latah County Comprehensive Plan

Latah County adopted a new Comprehensive Plan and Land Use Zoning (Resolution 2010-32) in December 2010. However, the plan remains relatively unchanged from the previous plan with

the same goals to maintain the largely rural nature of the county. The Comprehensive Plan goals are stated below:

- Preservation of the rural character of Latah County to ensure the protection of the cultural, scenic and natural amenities presently found in the county.
- Preservation of agricultural and forest land uses to ensure the continued viability of an agricultural and forest based economy in rural Latah County.
- Fostering of other land uses which will help achieve a solid broad based and sustainable economic foundation.
- Clustering of commercial and higher density residential uses in and around areas with adequate public services.
- Ensure that land use policies do not unconstitutionally violate private property rights.

The key policies related to transportation and the project in the new Comprehensive Plan includes:

- Limit the number of access points to state and federal highways.
- Ensure that buildings are set back a safe distance from public roads.
- The Ring Road concept is included as a transportation element in the project area (Latah County 2010).

The plans reflect the goals of protecting productive agricultural and forested areas and to identify suitable areas for future residential, commercial, or industrial development.

North Latah County Highway District Transportation Plan

The North Latah County Highway District (NLHD) Transportation Plan was completed in November 2006. This was an update to a previous transportation plan. The plan discusses the potential re-alignment of US-95. It verifies that three alignments are being considered and that once a final alignment is selected, approved, and constructed, the current US-95 roadway will be placed under the jurisdiction of the NLHD (Carscallen pers. comm. 2011). The plan also incorporates the Ring Road concept and alignments.

Other Plans

The Moscow School District is preparing a Long-Range Facilities Plan. The City of Moscow began preparing a transportation plan in 2012 with anticipated completion in 2014.

Recreation

Primary recreational facilities in the project area are shown in Exhibit 19. Points of Interest and include the following:

- Frontier Park
- Paradise Ridge Road (bicycling and hiking)
- University of Idaho Golf Course
- University of Idaho Arboretum
- Planned recreational areas including multi-use ball fields, Latah Trail and an arboretum.
- Planned linear park/pathway along the Southfork of the Palouse River
- Paradise Ridge is privately owned land but is often used recreationally with landowner permission.

The Latah County Comprehensive Plan goals for recreation are to encourage a variety of recreational opportunities in Latah County by implementing policies that:

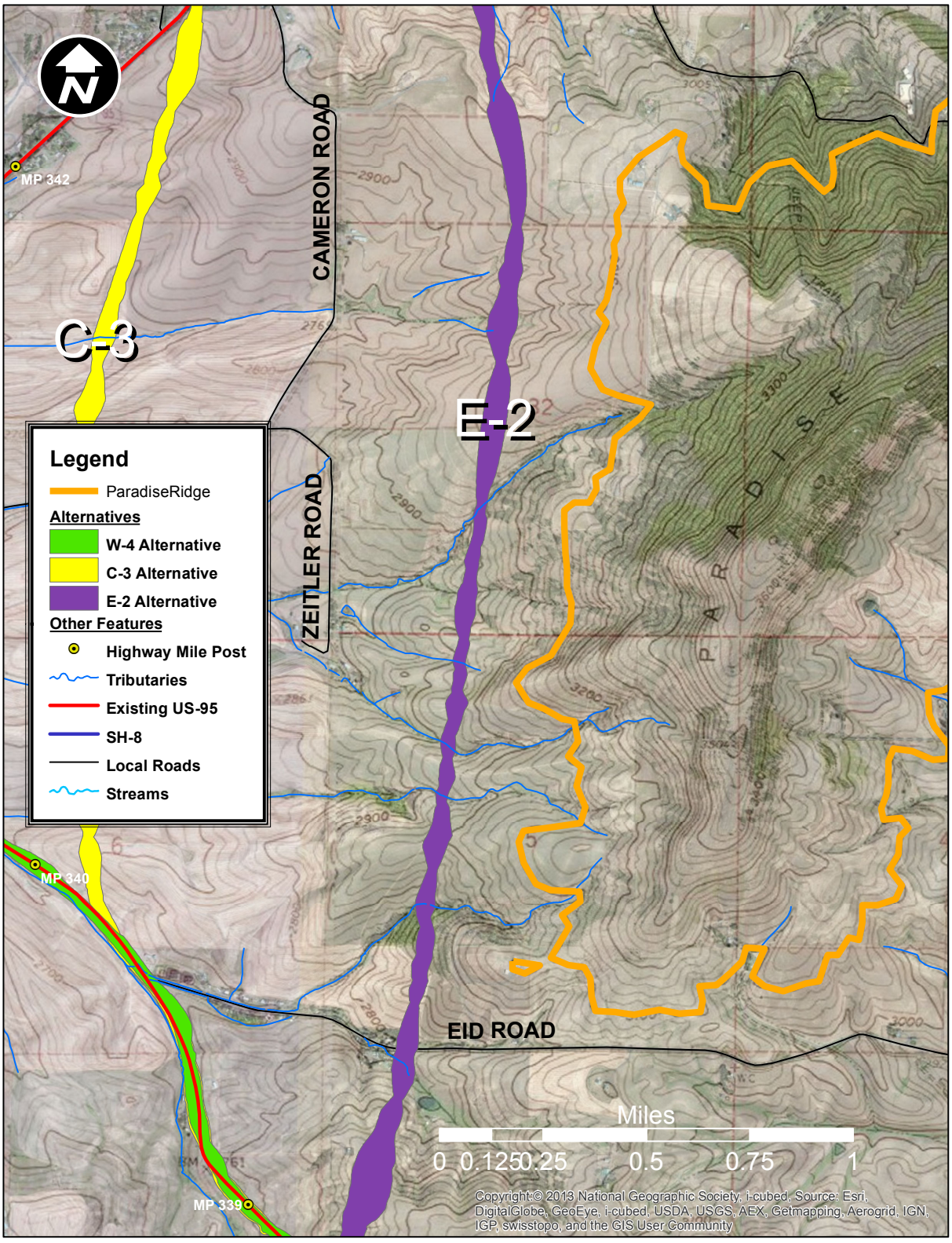
- Encourage the development of suitable land for recreational uses.
- Ensure the compatibility of recreational areas with adjoining land uses.
- Encourage the dedication of land within new developments for recreational use.

3.2.4 Paradise Ridge

Paradise Ridge is a landform located southeast of Moscow. It is a term used by the local community to describe not only the highest elevation of the ridge (3702 ft) but also the area surrounding the ridge. There does not appear to be a defined geographic boundary associated with Paradise Ridge other than the boundary of the South end of Paradise Ridge remnant, which is described in Section 3.8. Therefore, to facilitate the discussion in this FEIS, a boundary for Paradise Ridge was estimated based on topography near the 3100 ft contour. See Exhibit 20. Paradise Ridge.

Paradise Ridge consists of privately owned parcels with primarily rural residential developments, commercial developments, actively farmed land, and Conservation Reserve Program (CRP) land. There are growing rural residential developments on and surrounding Paradise Ridge, which may have roads, driveways, fences, domesticated animals, and other associated human activity but is not considered dense development. It is zoned for one unit per acre. Paradise Ridge has been used recreationally with permission from the private landowners as there is no public access to properties nor are there special protections from development. Paradise Ridge Road is used for biking and walking and local access. It also offers scenic value as described in Section 3.11 and wildlife habitat as described in Section 3.8.

Exhibit 20. Paradise Ridge



3.3 Farmland

3.3.1 Regulatory Framework and Policies

Farmland is governed by the following:

- The Farmland Protection Policy Act (FPPA) of 1981
- Guidelines for Implementing the Final Rule of the Farmland Protection Policy Act for Highway Projects
- State of Idaho Local Land Use Planning Act

The FPPA of 1981 requires that federal projects minimize the conversion of farmland to nonagricultural uses, and that projects consider state and local farmland protection policies to the extent that is practical. Farmland subject to FPPA includes prime and unique farmland and farmland of statewide importance. Farmland considered under FPPA does not have to be currently used for agriculture but cannot be water, urban or developed land (FHWA 1989).

3.3.2 Methodology

A technical report titled Farmland Protection Policy Act (Haagan 2006) was prepared to assess the farmlands in the project area and to determine the relative effects of the alternatives to farmland. The study area was evaluated for prime, unique, and farmland of statewide importance by reviewing farmland soil lists, U.S. Department of Agriculture (USDA) maps and through consultation with Natural Resource Conservation Service (NRCS). A Land Evaluation and Site Assessment were completed in order to rate and rank sites for agricultural importance (Haagen 2006). The information for each alternative was recorded by NRCS staff in the NRCS Form NRCS-CPA-106 in December 3, 2006. See Appendix 1, Key Agency Correspondence and Forms, Farmland Conversion Impact Rating for Corridor Type Projects. The 2006 report was reviewed by the author, Ed Haagen in 2011 and he determined that the crop rotations, farming operations, and leasing arrangements had changed slightly since the original analysis and will continue to change. However, the existing conditions in 2011 do not differ substantially from those in 2006. Site assessment criteria that were considered in the farmland conversion impact rating score for each alternative included:

- Area in non urban use
- Perimeter in non urban use
- Percent of corridor being farmed
- Protection provided by state or local government
- Size of farm unit compared to average
- Creation of non farmable units
- Availability of farm support

- On-farm investments
- Effects of conversion on farm support services
- Compatibility with existing agricultural use

The USDA recommends that alternatives with farmland impact rating scores totaling 160 points or greater be given increasingly high levels of consideration for protection from conversion. See the Farmland Technical Report for more information.

Agricultural lands not considered prime farmlands or prime farmland soils under the USDA definition are also considered under NEPA. The farmland classification system identifies map units as prime farmland, unique farmland, farmland of statewide importance, and farmland of local importance. Further clarification of farmland classifications may be found in the National Soils Survey Handbook (USDA 2007).

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. Examples of these crops include grain, forage, fiber, oilseed, sugar beets, sugarcane, vegetables, tobacco, orchard, vineyard, and bush fruit crops. The land must have the soil quality, growing season and moisture supply needed to economically produce sustained high yields of crops when treated and managed according to acceptable farming methods (USDA 1991). Prime farmland soils currently located in or committed to urban development are not subject to the FPPA.

Unique farmland is land other than prime farmland used for the production of specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods. Examples of such crops include citrus, tree nuts, olives and cranberries.

Farmland of statewide importance is classified by the NRCS as farmland of lesser quality than prime farmland by having the soil, water supply and other characteristics that, with good management, yield productive crops.

Farmland of local importance. In some local areas, there is concern for certain additional farmlands for the production of food, feed, fiber, forage, and oilseed crops even though these lands are not identified as having national or statewide importance.

3.3.3 Existing Conditions

This section discusses general farmland trends, crops and farmland within the study area classified as prime, unique and farmland of statewide importance (Environmental Analysis Bureau 1997).

There are approximately 265,000 acres of cropland in Latah County. Farming operations are generally privately owned family farms but in many cases include leased land. The average farm size in Latah County is 494 acres; however, considering rental property, many producers are farming more than 1,000 acres. The principal crop is winter wheat with an average yield of about 80 bushels per acre. Other primary crops grown in the area include barley, field peas, garbanzo beans and lentils. See Table 20. Latah County Crop Production.

These crops are usually grown in a rotation with winter wheat to prevent disease and control erosion. Spring barley or lentils followed by two or three years of winter wheat would be a normal rotation for the area. Rotations vary depending on the producer's farming operation and the conservation programs in which the farm is enrolled. Table 20. Latah County Crop Production shows the acreages and percentages of crops in Latah County.

Table 20. Latah County Crop Production

Crop	Estimated Acres of Production (2005)	Estimated Percent of Total Production
Wheat	97,068	43
Barley	10,550	5
Peas	21,011	9
Lentils	31,976	14
Garbanzo	10,406	5
Canola	228	Less than 1
Rapeseed	452	Less than 1
Conservation Reserve Program (CRP)	46,410	21
Hay	5,027	2
Pasture	131	Less than 1
Total	223,259	100

There are an estimated 11,000 acres of land designated as crop fields in the project area of which approximately 98 percent is privately owned. The western corridor is considered to have the most productive farmland in the project area. Table 21. Farmland Classifications in Project Corridor shows the farmland types within the project corridor. Farmland classified as Prime and Farmland of Statewide Importance are present in the study area. No farmland classified as Unique occurs in the project area or in Latah County.

Table 21. Farmland Classifications in Project Corridor

Farmland Type	Estimated Land Currently in Production (acres)
Cultivated Crops	9,000
Hay or Pasture	500
Shrub Vegetation	550
Farms, rural residences, commercial areas, forest land, highway right-of-way and water	400
Conservation Reserve Program	1,500

Approximately 1,500 acres of land in the project area is enrolled in the CRP and administered by the Farm Service Agency (FSA). Farmers enrolled in the program agree to remove environmentally sensitive land from agricultural production and plant species that will improve environmental health and quality. The program is voluntary and offers no special protections or long-term protection. Farmers are paid rental rates and enrolled the land for 10-15 years but may cancel enrollment at any time. Offers for CRP contracts are ranked according to the Environmental Benefits Index (EBI) which is based on the relative environmental benefits in comparison to all other offers and selections made from that ranking. The following EBI factors are considered in the CRP lands:

- Wildlife habitat benefits resulting from covers on contract acreage;
- Water quality benefits from reduced erosion, runoff, and leaching;
- On-farm benefits from reduced erosion;
- Benefits that will likely endure beyond the contract period;
- Air quality benefits from reduced wind erosion;
- Cost

The ecological value of CRP program lands as well as its function as matrix habitat is discussed in Section 3.8.

3.4 Cultural Resources

3.4.1 Regulatory Framework and Policies

Cultural resources are governed by the following:

- 16 USC 470-National Historic Preservation Act (NHPA), Section 106 and Implementing Regulations
- 36 CFR 800-Protection of Historic Properties
- 23 CFR 774-Parks, Recreation Areas, Wildlife and Waterfowl Refuges, and Historic Sites (Section 4(f))

- 49 USC 303-Policy on Lands, Wildlife and waterfowl refuges, and historic sites
- 42 USC 1996 and 1996a-American Indian Religious Freedom Act (AIRFA)
- 16 USC 431-433-Antiquities Act
- 25 USC 3001-Native American Graves Protection and Repatriation Act (NAGPRA)
- Idaho Graves Protection Act: Title 27, Idaho Statutes, Cemeteries, and Crematoriums

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. The historic preservation review process mandated by Section 106 is outlined in 36 CFR Part 800.

The NHPA defines the National Register of Historic Places (NRHP) criteria for eligibility (A through D), explains the need for properties to retain enough elements of integrity (location, design, setting, workmanship, materials, feeling and association) to be eligible for the NRHP, and defines the meaning of the different effect determinations.

3.4.2 Methodology

The area of potential effect (APE) established for the project was initially based on approximately 250 feet from the centerlines of the alignments and areas immediately adjacent to these locations for each of the Action Alternatives. In 2011, the cultural resource survey technical report was updated and the evaluation area was expanded to approximately 500 feet from the centerlines of the alternatives. In 2015, ITD Cultural Resources Staff was asked to consider impacts to historic properties as a result of the Modified W-4 Alternative. The footprint of the Modified W-4 Alternative, plus an additional 250 feet from the Modified W-4 Alternative centerline was considered during the evaluation.

The Idaho State Historic Preservation Office (SHPO) along with the Nez Perce Tribe and Nez Perce Tribal Historic Preservation Office (THPO) were consulted throughout the process regarding the APE to identify any culturally important sites that should be considered during the survey and EIS development. Consultation between these parties included discussions regarding all proposed alignments, including the Modified W-4 Alternative.

ITD District 2 has been meeting quarterly with the Nez Perce Tribe to consult on planned projects since 2002. This project has been discussed numerous times during that consultation. The dates of Tribal consultation are listed in Chapter 7, Public Involvement and Agency Coordination. The most recent Tribal consultation letters and the ITD Memorandum of Understanding with the Nez Perce Tribe are included in Appendix 1, Key Agency Correspondence and Forms.

Pre-field research including literature reviews, known historical sites, and ethnographic/ historic background were completed. Field studies were completed in 2004, 2005, 2006 and 2011 to determine cultural resource probability, identify cultural resources, document and record historic building and structures, and complete archaeological survey. In addition to visual survey, subsurface shovel testing was completed in selected locations.

An initial report was prepared during the early project scoping but was not distributed with the DEIS Cultural Resource Technical Report due to the confidentiality of the content. The report is titled *A Cultural Resources Probability Study for Idaho Transportation Department's Proposed US 95 Thorn Creek Road to Moscow, Stage 1 Project, Latah County, Idaho* (Sharley and Gough, 2005). The report focused on the likelihood of encountering prehistoric Native American resources in the 12 square mile project area. It cited ethnographic/historic information about Native Americans including information regarding camas root grounds, hunting areas, travel routes, known and predicted camp locations, and the relationships of camps to landscape features such as Palouse highlands, camas meadows and stream valleys. This information helped to identify where sites were most likely to be located and where further investigation should be focused. This report did not dismiss the possibility of significant tribal resources or sites in the project area. Some of the same ethnographic citations were used in subsequent cultural resource surveys for the project.

The following additional cultural resource survey technical reports were prepared to evaluate if archaeological and historic resources are present and would be affected by the alternatives. The information from the reports is summarized in this section.

- *Historic Resources Survey update to An Historic Buildings/Structures Survey for the Idaho Transportation Department's Proposed US 95, Thorn Creek Road to Moscow, Stage 1 Project, Latah County, Idaho* (November 2011) (Cardno-Entrix 2011)
- *Cultural Resources Surveys of Idaho Transportation Department Proposed US-95, Thorn Creek Road to Moscow, Phase 1, Project Latah County Idaho* (AHS 2006)
- *Historic Buildings/ Structures Survey: US-95, Thorn Creek Road to Moscow, Stage 1* (Sharley 2005)

The technical report titled Cultural Resources Surveys of Idaho Transportation Department Proposed US-95, Thorn Creek Road to Moscow, Phase 1; Project Latah County Idaho (AHS 2006) was submitted to the Idaho SHPO in 2006. SHPO concurred with the suggested NRHP eligibility and determination of effects for the alternatives in January 2, 2007.

An update to the 2006 Cultural Resources Survey Technical Report was prepared in November 2011 and was submitted to SHPO for review. In their responses of January 23, 2012 and March 8, 2012, SHPO determined that one additional resource, the Mountain Mart/Goodman Oil Convenience Store, is eligible for listing on the NRHP.

During the evaluation of the Modified W-4 Alternative in 2015, ITD discussed the APE and the level of effort needed with both the Idaho SHPO and the Nez Perce THPO. All parties agreed that no additional fieldwork would be required at this time. Because the Modified W-4 Alternative footprint is so close to the originally proposed W-4 Alternative, and based on the fact that the previous cultural resource (mainly archaeological investigations) fieldwork has not resulted in the identification of archaeological sites, there is little potential for archaeological resources to be present within the APE for the Modified W-4 Alternative. An Addenndum to the 2006 Cultural Resource Survey Technical Report (ITD 2015c) was prepared and submitted to SHPO for review in April 2015. The addendum evaluated the effects of the Modified W-4 Alternative on historic properties. On June 16, 2015, the SHPO provided a letter of concurrence to ITD stating that there would be No Effect to historic properties as a result of the proposed Modified W-4 Alternative. See Appendix 1, Key Agency Correspondence and Forms for associated documentation.

3.4.3 Existing Conditions

Cultural Resources in the APE

Of the potentially historic sites identified within the project APE, three are eligible for listing in the NRHP; the Arthur Snow Farm (house and garage), the Deesten/Davis Farmstead and the Mountain Mart/Goodman Oil Convenience Store, which was demolished in 2014. See the Cultural Resources Technical Report for additional detail. None would be affected by any of the alternatives and is further discussed in Section 4.4 Cultural Resource Effects and Chapter 5. Section 4(f) Evaluation.

Prehistoric cultural resources are not known in the project APE, and while they are likely present, previous survey of more than 50 percent of the existing US-95 corridor has failed to locate any prehistoric sites (AHS, 2006). Native Americans undoubtedly used and traversed the APE; however, there was more ethnographically documented activity along major stream valleys. The large camas meadow at Moscow north of the APE would have been widely used, but no similar camas meadows are known to have existed within the APE. Exploited camas meadows should have associated camp and camas processing sites.

Stream valleys in the project APE provided water, plant, and animal resources and relatively flat land for campsites. While valleys possess the greatest prehistoric site probability, this probability is moderate and the remaining project APE has low prehistoric site probability. The APE is

outside of the area of aboriginal village locations, and lacks a number of the environmental characteristics typical of the known distribution of Nez Perce camps (Sharley and Gough, 2005). Prehistoric camps or resource exploitation sites may be present in the project APE; however, in lower quantities than elsewhere in the region (Sharley and Gough, 2005).

Arthur Snow Farm House and Garage (IHSI #57-13692)

This residence is situated in a low-density residential area in the rolling Palouse hills two miles south of Moscow. The residence was built in 1919 for Arthur Snow, an Idaho State Legislator. It is a large, well-preserved craftsman style house with a matching detached garage that was constructed in 1921. The buildings were once part of a large farm complex; however, the other structures burned down in 2003. The house and garage are the only remaining structures. Removal of the primary features, including the barn, and the absence of important physical information, renders the historic farm complex as a whole ineligible for listing in the NRHP. However, the house and garage are individually eligible for listing in the NRHP under Criteria B for their association with Arthur Snow and Harold Snow, both Idaho State Legislators and influential community leaders. They are both also eligible for listing under Criteria C as excellent, intact examples of craftsman residential architecture and for their artistic merits.

Deesten/Davis Farmstead, Farmstead (Field #US 95 22)

This farmstead is located immediately west of US-95 and approximately four miles south of Moscow. It consists of eight primary buildings; a farmhouse, garage, barn, granary, chicken house, smoke house, shop, and equipment shed. The property is surrounded by actively cultivated Palouse farmland. See Exhibit 21. Deesten/Davis Farmstead as Viewed from US-95.

Exhibit 21. Deesten/Davis Farmstead as Viewed from US-95

The property also includes two groves of trees planted in the 1930s by the Civilian Conservation Corps, an orchard, cottonwoods, a conifer windbreak and a black walnut tree from Germany. The farm was originally patented to William Plummer in 1882 as a cash entry land claim (BLM 2005) and is remarkably intact. The house, barn and other primary buildings are in good condition with no intrusive modern elements. The property is eligible for NRHP listing under Criterion A, for its association with regional agricultural development. The property is also eligible under Criterion C as an excellent example of early 20th century farmstead architecture and layout.

Mountain Mart/Goodman Oil Convenience Store (HS-02)

The Mountain Mart site, also known as Goodman Oil, is located immediately south of the South Fork Palouse River Bridge on the east side of US-95 and is currently abandoned. The property had several buildings located on the site, including fuel pumps, garages and utility buildings. The Mountain Mart office/shop was built in 1963 and was the only structure determined to be eligible for the NRHP; however, the owner demolished it in 2014. The building was octagonal construction, prefabricated materials, and a modernist vernacular design, which is unusual and unique for a rural community in Idaho. The building had a circular, flat roof. Five of the sides were almost entirely glazed in metal units. Three of these sides were vertical, three were light windows, and the north and west faces had metal entrance doors at their center. The central door had a louvered ventilation window. The building was eligible under Criteria C as an excellent example of mid-century modern architectural design. The octagonal/round form, the large glass

exposure, flat roof, metal components and cinderblock walls were all distinctive characteristics of the type, period and method of construction of the genre. Although a comprehensive survey of gas stations has not yet been conducted in Idaho, this example was a rare survivor of the property type. See Exhibit 22. Mountain Mart/Goodman Oil Convenience Store.

Exhibit 22. Mountain Mart/Goodman Oil Convenience Store

3.5 Floodplains

3.5.1 Regulatory Framework and Policies

Floodplains are governed by the following:

- EO 11988 – Floodplain Management
- 23 CFR 650 Subpart A- Location and Hydraulic Design of Encroachments on Flood Plains
- Latah County Land Use Ordinance #269-Flood Zone Overlay

Presidential EO 11988, Floodplain Management, directs federal agencies to avoid to the extent possible adverse effects associated with floodplains and to avoid support of floodplain development.

3.5.2 Methodology

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) dated August 15, 1980 was reviewed. Two separate meetings with Michelle Fusion, the Director of

Latah County Planning and Zoning and Bill Belknap, the Community Development Director of the City of Moscow were conducted to discuss floodplain requirements, effects of the alternatives and potential risk.

Project-related activities are required to demonstrate that they would not cause more than a one-foot cumulative rise in the base flood elevations and that they would be compliant with the National Flood Insurance Program.

A technical report titled *Hydraulic Study for Affected Floodplains on Alternatives Carried Forward* (ITD 2012b) was completed in compliance with 23 CFR 650 part A (ITD 2012b). A new report which also evaluates the Modified W-4 Alternative, titled *Hydraulic Study for Affected Floodplains on Alternatives Carried Forward* (ITD 2014c) supercedes the previous report and discusses the following:

- Flooding risks
- Impacts on natural and beneficial floodplain values
- Support of probable incompatible floodplain development
- Measures to minimize floodplain impacts
- Measures to restore and preserve the natural and beneficial values

3.5.3 Existing Conditions

The FEMA FIRM show 100-year floodplain (Zone A) associated with the South Fork Palouse River and Thorn Creek. The South Fork Palouse River has a designated floodway in addition to the 100-year floodplain. Four floodplain areas associated with tributaries of the South Fork of the Palouse River are located on the western edge of the study area. See Exhibit 27. Floodplain Effects.

3.6 Wetlands and Tributaries

3.6.1 Regulatory Framework and Policies

Wetlands and tributaries are governed by the following:

- 23 CFR 777 – Mitigation of Impacts to Wetlands and Natural Habitat
- USDOT Order 5660.1A - Preservation of the Nation's Wetlands
- 33 CFR 325 –Processing of Department of Army Permits
- 33 CFR 328 – Definition of Waters of United States
- 33 CFR 332 -Compensatory Mitigation for Losses of Aquatic Resources; Final Rule
- 33 USC –Section 401 and Section 404; Clean Water Act
- 33 USC 403-Rivers and Harbors Act of 1899

- 33 USC 1251 -Clean Water Act (CWA)
- 33 USC 1313(d) Section 303-Water Quality Standards and Implementation Plans
- 40 CFR 230-Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged for Fill Material
- IDAPA 37.03.07-Idaho Department of Water Resources (IDWR) Idaho Stream Channel Protection Act and the Stream Channel Alteration Rules
- U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook
- Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)

Waters of the US as defined by the USACE includes "waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce" [33 CFR 328.3(a)]. This includes all interstate waters, waters from which fish or shellfish could be taken and sold in interstate or foreign commerce, and all tributaries of the waters described above.

Wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas [33 CFR 328.3(b)].

The Clean Water Act (CWA) establishes national goals and policies to restore and maintain chemical, physical and biological integrity of the Waters of the US. Section 401 of the CWA regulates water quality of Waters of the US. Section 402 of the CWA regulates the discharge of pollutants from point and non-point sources (National Pollution Discharge Elimination System (NPDES)). Section 404 of the CWA regulates the discharge of fill or dredged material into Waters of the US and is implemented by the USACE and EPA.

Waters of the US, including wetlands, that are jurisdictional by the USACE and would be affected, would require a permit through the USACE. Lands meeting the definition of wetland, but which are not considered jurisdictional by the USACE are still considered under 23 CFR 777 Mitigation for Wetlands and Aquatic Habitats which requires a no net loss of wetland function and value.

IDEQ is the state agency responsible for implementing the 401 certification process. IDEQ develops and enforces water quality standards that are intended to protect beneficial uses of a

water body. EPA is responsible for ensuring that the standards, which IDEQ adopts, are aligned with the requirements of the CWA.

IDEQ water quality standards consist of three components: 1) an anti-degradation policy to maintain existing water quality independent of designated uses; 2) beneficial uses designated for a specific water body based on plants and animals present and activities taking place in the waterway; and 3) criteria to protect water quality necessary to support the designated beneficial uses (for example, limits on temperature, dissolved oxygen, pH, turbidity, and ammonia). IDEQ considers physical, chemical, and biological characteristics, geographic setting, scenic qualities and economic and public values when designating a water body's beneficial uses.

The IDEQ releases a report listing and describing impaired segments of water bodies. All impaired waterways are required to have a Total Maximum Daily Load (TMDL) prepared for each pollutant listed as impaired. TMDLs are calculations of the maximum amount of a pollutant that a water body can assimilate while still complying with water quality standards.

3.6.2 Methodology

The following wetland technical reports were prepared to evaluate wetlands and tributaries that could be affected by the alternatives:

- *Thorncreek Road to Moscow Determination of Jurisdictional Waters of the United States* (Gilmore 2005) - This report was incorporated into and replaced by Gilmore 2012.
- *Thorncreek Road to Moscow - Wetland Functions and Evaluation* (Gilmore 2006) -This report was incorporated into and replaced by Gilmore 2012.
- *Thorncreek Road to Moscow, Wetland Delineation Report* (Gilmore 2012) - This is the full and current Wetland Technical Report.

In 2012, the earlier wetland delineations and functional assessments (Gilmore 2005 and Gilmore 2006) were reviewed, considering new guidance and the revised methodology *(Regional Supplement to the U.S. Army Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008)). In addition, ITD worked with the USACE to identify tributaries and wetlands that occur in the project area. In 2012, additional function and value ratings were completed for affected wetlands. The results of the wetland delineation and the function and value assessments for the affected wetlands, were updated and compiled into one comprehensive report titled *Thorncreek Road to Moscow, Wetland Delineation Report* (Gilmore 2012) which also contains detailed maps of the tributaries and wetlands in the study area. The wetland and tributary impacts were recalculated based on the revised information in the Gilmore 2012 report and reflected in the DEIS. Those calculations remain unchanged in the FEIS.

Over 150 acres were evaluated for wetlands. One hundred fifteen test sites were evaluated during the 2004 through 2005 field investigations. The findings were displayed on field data sheets in Appendix C of the 2012 report. The project area was revisited on September 15 and 16, October 3, and December 5, 2011 to determine if substantial land use changes had occurred at or near the resource. The original field data sheets were reviewed based on the changes between the USACE delineation manual (Environmental Laboratory 1987) and the 2008 supplement (USACE 2008) and in light of the most recent wetland regulations and guidance.

The functions and values of the affected wetlands were assessed in accordance with the *Washington State Wetland Rating System for Eastern Washington* (Hruby 2004). The project area borders Washington State and the Washington rating system provides a much more comprehensive assessment of wetland functions and values compared to the Montana Department of Transportation method that has also been used by ITD on projects. This rating system assigns wetlands a category between I and IV based on how well they provide water quality, hydrologic, and habitat functions. Each function is scored on how well the wetland is providing that function and its potential to increase that function within a given area. The maximum score for water quality, hydrologic, and habitat functions are 24, 32, and 32 respectively. The higher the score and percentage of the total, the higher that wetland is functioning for the parameter. The total of the scores for the three functions determines the functional category. Category I is considered the highest quality and is the most difficult to replace. Category IV wetlands are typically disturbed and are considered the most easily replaced.

- *Category I* wetlands are those that 1) represent a unique or rare wetland type; or 2) are more sensitive to disturbance than most wetlands; or 3) are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime; or 4) provide a high level of functions.
- *Category II* wetlands are difficult, though not impossible, to replace, and provide high levels of some functions. These wetlands occur more commonly than Category I wetlands, but still need a relatively high level of protection.
- *Category III* wetlands are 1) vernal pools that are isolated, and 2) wetlands with a moderate level of functions. These wetlands generally have been disturbed in some ways, and are often smaller, less diverse than Category II wetlands.
- *Category IV* wetlands have the lowest levels of functions and are often heavily disturbed. These are wetlands that should be replaceable, and in some cases may be improved.

3.6.3 Existing Conditions

Tributaries

The project area is in the Palouse River Watershed, Water Resource Inventory Area (WRIA) 34. The Palouse River Watershed includes the South Fork Palouse River Subbasin and the Cow Creek Subbasin. The upper three quarters of the project area is in the South Fork Palouse River Subbasin. The lower one-quarter of the project area is in the Cow Creek Subbasin.

There are two primary tributaries in the project area; the South Fork Palouse River and Thorn Creek. All other tributaries in the project area are unnamed and drain to one of these tributaries. Most of the tributaries are intermittent or ephemeral. None of the waterways are part of a National Wild and Scenic Rivers System or a river under study for designation to the National Wild and Scenic Rivers System. See Exhibit 28. Tributary Effects for locations of tributary crossings. Maps and additional detail regarding the tributaries are included in the Wetland Delineation Technical Report (Gilmore 2012).

South Fork Palouse River. The South Fork Palouse River is a perennial stream and a primary tributary to the Palouse River. The Palouse River drains to the Snake River, which flows to the Columbia River. The South Fork Palouse River, the Palouse River, the Snake River and the Columbia River are considered by the USACE to be jurisdictional waters of the US.

The South Fork Palouse River has high flows in the spring and early summer and low flows during the late summer and early fall. Most of the wetlands and floodplains in the Palouse have been drained, straightened, cleared of vegetation or otherwise affected by agriculture, urbanization and associated infrastructure. These areas once retained water during high flows and released water during the low flow periods; however, farming and other developments have affected the streams, wetlands and floodplains, resulting in diminished water storage and attenuation capacity. Therefore, peak flows are intensified resulting in channel erosion, deeply incised channels and flooding (IDEQ 2007).

The IDEQ 2002 Integrated Report lists the South Fork Palouse River as a 303(d) listed [33 USC 1313(d) Section 303], impaired waterbody for sediment, nutrients, stream temperature and bacteria (IDEQ 2005b). The Watershed Assessment and TMDL for the South Fork Palouse River Watershed describes the designated beneficial uses for the South Fork Palouse River Subbasin as cold water aquatic life[10] , salmonid spawning, and secondary contact recreation[11] (IDEQ 2007).

[10] Cold water aquatic life is water quality appropriate for the protection and maintenance of a viable aquatic life community for cold-water species

Thorn Creek. Thorn Creek is an interstate intermittent tributary to Cow Creek, which is a primary tributary of the Palouse River. Thorn Creek is considered by the USACE to be a jurisdictional water of the US.

Thorn Creek is typically dry in the summer and has high peak flows following storm events. It has also been affected by agriculture, urbanization and associated infrastructure with similar intensified peak flows, high erosion, incised banks and sedimentation (IDEQ 2005a).

The IDEQ 2002 Integrated Report listed Cow Creek as an impaired water body for nutrients, habitat alteration and stream temperature (IDEQ 2005a). The Watershed Assessment and TMDL for the Cow Creek Subbasin (IDEQ 2005a) described Cow Creek's beneficial uses as secondary contact recreation and cold-water aquatic life.

Wetlands

Forty-six wetlands were identified and delineated in the project area. The seventeen affected wetlands are shown on Exhibit 29. Wetland Effects. No determination regarding jurisdiction has been made by the USACE at this time; however, all of the wetlands are considered by the FHWA under 23 CFR 777, Mitigation of Impacts to Wetlands and Natural Habitat.

Wetlands may be classified by the dominant vegetation types. Two primary wetland vegetation classifications in the project area are: emergent and scrub-shrub wetlands. Emergent wetlands are characterized by low growing, non-woody vegetation such as grasses, sedges and forbs. In the project area, these wetlands are typically used agriculturally. Scrub-shrub wetlands are characterized by shrubs such as roses, hardhack or red-osier dogwood (*Cornus sericea*).

The majority of the wetlands in the project area are Category III Palustrine Emergent (PEM) wetlands associated with agricultural lands and have been altered by human disturbance. The wetlands are either being farmed or farmed to their boundaries reducing the wetland buffer and hydrologic improving capabilities. The wetlands in the northern half of the project primarily drain to the South Fork Palouse River while the wetlands in the southern half of the project primarily drain into Thorn Creek. Both of these water bodies are listed as impaired waters under Section 303(d) of the Clean Water Act [33 USC 1313(d)]. While these wetlands provide some basic functions they have all been impaired and thus their functions degraded. All but a few of

[11] Secondary contact recreation may include fishing, boating, wading, infrequent swimming, and other activities where ingestion of raw water is not likely to occur

these wetlands have only one vegetation class, emergent, which generally consists of crop or introduced species.

Generally, wetlands in the project area scored higher in water quality functions. This is due to the potential for the wetland to improve degraded water quality, as the two main surface waters are both 303(d) listed and surrounded by farming activities. A few wetlands have two predominant vegetation classes, emergent and scrub-shrub. These wetlands, while still impaired, offer higher functions and values to wildlife and greater diversity. These wetlands are still generally surrounded by agriculture.

The wetlands and tributaries in the project area were delineated and are described in detail in the Wetland Delineation Technical Report (Gilmore 2012). Wetlands that would be affected by any of the Action Alternatives are shown in Exhibit 29. Wetland Effects and are described below. Details regarding the other wetlands and tributaries in the project area may be found in the Wetland Delineation Report (Gilmore 2012).

Wetland 9 is a Category III, PEM, drainage way. The southern end of this wetland is being grazed while the western fringe is being farmed. This wetland is dominated by jungle-rice (*Echinochloa colona*) and reed canarygrass (*Phalaris arundinacea*). Wetland 9 scored over 50 percent for water quality functions using the Eastern Washington Wetland Rating System.

The hydrology from Wetland 9 originates near the intersection of Jacksha Road and US-95 and flows in a northerly direction. It continues toward the South Fork Palouse River through a series of wetlands, tributaries and road culverts. Wetland 9 abuts Tributary I, which drains to the South Fork of the Palouse River. The South Fork Palouse River is a tributary of the Palouse River, which is a major tributary to the Snake River.

Wetland 10 is a Category III, PEM, grassed drainage in a gently sloped valley. It receives runoff from the east and west sides of US-95. Wetland 10 is dominated by jungle-rice grass and field horsetail *(Equisetum arvense*) and is surrounded by annual cropland. The lower portion is classified as farmed wetland. This wetland scored over 50 percent for water quality functions.

Wetland 10 borders Tributary I, which drains northwest to the South Fork of the Palouse River. The South Fork Palouse River is a tributary of the Palouse River, which is a major tributary to the Snake River.

Wetland 13 is a Category III, palustrine scrub-shrub (PSS) wetland. It is confined by a steep slope on the north and an area with predominantly higher elevation on the south side. CRP lands are to the north and south of the wetland. There is cropland along the wetland edges with farming

activities up to the grassy borders in the lower reaches. Wetland 13 is dominated by hawthorn (*Crataegus douglasii*), red-osier dogwood, cow parsnip (*Heracleum maximum*), and reed canarygrass. There are also scattered cottonwood trees in the upper portions of the drainage. This wetland scored over 50 percent for water quality functions. Due to its structural diversity, it also provides moderate function for wildlife habitat.

Wetland 13 is contiguous with Tributary W, which flows westerly toward US- 95 through a farmstead and along Zeitler Road. Tributary W continues through Wetland 34 and drains to the South Fork Palouse River through a series of open tributaries and wetlands. The South Fork Palouse River is a tributary of the Palouse River, which is a major tributary to the Snake River.

Wetland 20 is a Category III, PEM wetland in a large drainage way. Farming activities are occurring through the wetland along most of the reach. Vegetation in the wetland is dominated by reed canarygrass and cultivated spring grain. This wetland scored over 50 percent for water quality functions.

The wetland is contiguous with Tributary N, which flows in a westerly direction to the South Fork Palouse River. The South Fork Palouse River is a tributary of the Palouse River, which is a major tributary to the Snake River.

Wetland 23 is a Category IV, PEM wetland consisting of two grassed waterways that drain in an easterly direction toward US-95. The predominant vegetation includes meadow foxtail (*Alopecurus pratensis*) and bromes (*Bromus sp.*). The northern and larger portion of the wetland is being farmed up to its border. The southern portion of the wetland is also being farmed. This wetland did not score over 25 percent for any of the functions.

Wetland 23 does not appear to have a surface connection to other waters and does not appear to be adjacent to Tributary P.

Wetland 24 is a Category III, PEM wetland that includes two north-sloping drainage ways. The western portion drains a relatively steep bowl of pastureland. The predominant vegetation includes reed canarygrass, jungle-rice grass, and grazed pasture grasses. The eastern-most portion includes a small pond and has a more gradual gradient. Both drainage patterns converge near the west side of US-95 into a relatively wide grassy area. This wetland scored over 50 percent for water quality functions.

The wetland is contiguous with Tributary Q, which flows in a northerly direction along the west side of US-95 toward Wetland 9. It then flows through a series of wetlands and open roadside

ditches to the South Fork Palouse River. The South Fork Palouse River is a tributary of the Palouse River, which is a major tributary to the Snake River.

Wetland 25 is a Category III, PEM, grassed drainage, which is surrounded by cropland. This wetland is currently mowed. The predominant vegetation includes meadow foxtail and cultivated grasses for hay. This wetland scored over 50 percent for water quality functions.

The wetland drains in a northerly direction along the west side of US-95 from the toe of the slope to the east toward Clyde Road. The wetland is adjacent to Tributary R which is conveyed through a series of wetlands, open roadside ditches and culverts and to the South Fork Palouse River. The South Fork Palouse River is a tributary of the Palouse River, which is a major tributary to the Snake River.

Wetland 26 is a Category IV, PEM, drainage surrounded by annual cropland. Farming activities are occurring through most of the wetland. A combination of hillside seeps and slow soil permeability within the cropland contribute to prolonged soil saturation into the spring. Predominant vegetation includes quackgrass (*Elymus repens*), jungle-rice grass, spring grain, prickly lettuce (*Lactuca serriola*), mayweed (*Anthemis cotula*), Canada thistle (*Circium arvense*), and field horsetail. This wetland did not score over 25 percent for any of the functions.

The wetland drains in a northerly direction along the west side of US-95 by Tributary R, to Tributary S which is conveyed through a series of wetlands, open roadside ditches and culverts and to the South Fork Palouse River. The South Fork Palouse River is a tributary of the Palouse River, which is a major tributary to the Snake River.

Wetland 27 is a Category III, PEM, forked grassy drainage way that drains the toe slope of annual cropland across a flat area. Predominant vegetation includes wild oats (*Avena fatua*) and jungle ricegrass. A combination of upland runoff and the flat topography of the drainage way contribute to prolonged soil saturation in the spring. This wetland scored 50 percent for water quality functions.

The wetland, adjacent to Tributary T, is drained in a northerly direction along the west side of US- 95 toward the South Fork Palouse River. The runoff is conveyed through a recently created wetland along the South Fork Palouse River banks. The South Fork Palouse River is a tributary of the Palouse River. The Palouse River is a major tributary to the Snake River.

Wetland 28 is a Category III, PEM, grassy forked drainage. This wetland is contained within the lower third of a forked drainage way on the east side of US-95. The upper two-thirds of the drainage way possess wetland and tributary characteristics previously defined as PC (Prior

Converted). This wetland is predominantly reed canarygrass bordered by wheat and brome species. This wetland scored 50 percent for both water quality and habitat functions.

The drainage way conveys overland flow from upper croplands in a southerly direction toward US-95. The runoff is conveyed under the highway by a culvert, connecting the surface flow to Tributary P, on to Wetland 19 and Thorn Creek. Thorn Creek flows to Union Flat Creek, a tributary of the Palouse River. The Palouse River is a major tributary to the Snake River.

Wetland 29 is a large Category III, PEM, multi-forked drainage way that carries overland flow in a westerly direction along Eid Road. The wetland consists mostly of wide grassy ditches that flow into defined narrow channels with upland trees just outside the wetland boundary. Predominant vegetation is reed canarygrass. A relatively large man-made pond exists near the upper portion of the tributary of the most southern fork, identified as AW (Artificial Wetland). This wetland scored over 50 percent for water quality functions.

Surface water is conveyed from the wetland through Tributary U toward US-95, traveling under the highway through a culvert toward Tributary Q, to Wetland 9 and 10, and on down Tributary I to the South Fork Palouse River. The South Fork Palouse River is a tributary of the Palouse River. The Palouse River is a major tributary to the Snake River.

Wetland 31 is a Category IV, PEM, long grassy waterway in the middle of annual cropland. Predominant vegetation includes reed canarygrass and dagger-leaf rush (*Eleocharis lanceolata*). Hydrology for Wetland 31 originates from overland flow in a westerly direction toward US-95. The grassy drainage way is relatively flat and extends into the draw beyond the wetland boundary. This wetland did not score over 50 percent for any of the functions.

Water draining from Wetland 31 is conveyed under the highway, and continues through Wetland 10 and Tributary I toward the South Fork Palouse River. The South Fork Palouse River is a tributary of the Palouse River. The Palouse River is a major tributary to the Snake River.

Wetland 32 is a Category III, PSS wetland with an emergent component and grassed waterway. Predominant vegetation includes reed canarygrass, hawthorn and aspen (*Populus tremuloides*). This wetland originates in the foothills of the west-facing slope of Paradise Ridge. This area was defined by aerial photos as a farmed wetland (FW) and wetland (W) (USDA FSA 1979). A man-made pond is found in the upper most portion of Tributary W and is identified as an AW (Artificial Wetland). This wetland scored over 50 percent for water quality functions. Due to its structural diversity, it also provides moderate function for wildlife habitat.

The wetland has both a brushy draw and a wide grassed waterway that conveys overland flow and hillside seeps in a westerly direction through a channelized tributary that travels through a farmstead and along Zeitler Road toward the highway through Tributary W. Tributary W drains Wetlands 13 and 32 in a westerly direction toward US- 95. It continues through Wetland 34, flows under the highway through a culvert and to the South Fork Palouse River through a series of open tributaries (Tributary I) and wetlands (Wetland 10). The South Fork of the Palouse River is a tributary of the Palouse River; the Palouse River is a major tributary to the Snake River.

Wetland 35 is a Category III, PEM wetland area above a man-made pond in a drainage way that comes off Paradise Ridge. Predominant vegetation includes reed canarygrass. The wetland hydrology appears to come from a hillside seep and overland flow. This wetland scored over 50 percent for water quality functions.

Wetland 35 drains to a pond, which overflows to a roadside wetland and under Cameron Road toward Tributary X. Tributary X also carries overland flow from Wetland 14 and 33. The hydrology continues to flow toward US-95 through annually cropped land, through a culvert under the highway, and through a series of open tributaries until it flows into the South Fork Palouse River. The South Fork of the Palouse River is a tributary of the Palouse River, which is a major tributary to the Snake River.

Wetland 39 is a Category IV, PEM wetland on the edge of an annually cropped field. Predominant vegetation includes reed canarygrass and mayweed. Water appears to pond at this edge near US-95. Hydrology is from a combination of upland and roadside runoff and possibly a high water table. This wetland did not score over 50 percent for any of the functions.

The wetland is adjacent to Tributary Y, which flows along the toe of the highway slope until it crosses under the highway in a westerly direction through a culvert. It then flows through a series of tributaries and wetlands until it drains to the South Fork Palouse River. The South Fork of the Palouse River is a tributary of the Palouse River, which is a major tributary to the Snake River.

Wetland 40 is a Category III, PEM wetland in grassed drainage surrounded by tilled agricultural land. This wetland follows a swale along the east corridor. Predominant vegetation consists of reed canarygrass and mayweed. This wetland scored over 50 percent for water quality functions.

The wetland is contiguous with Tributary AA, a farm field ditch that flows in a northerly direction eventually draining to the South Fork Palouse River. The South Fork of the Palouse River is a tributary of the Palouse River, which is a major tributary to the Snake River.

Wetland 44 is a Category III, PEM, man-made pond and drainage way located just east of Zeitler Road. Predominant vegetation is reed canarygrass. This wetland scored 50 percent or higher for water quality and habitat functions.

While the pond and surrounding area is wetland, no surface water connection to other tributaries or associated wetlands could be determined.

3.7 Groundwater

3.7.1 Regulatory Framework and Policies

Groundwater is governed by the following regulations and policies:

- 33 USC 1251 Clean Water Act (CWA)
- 42 USC 300-Safe Drinking Water Act (SDWA)

3.7.2 Methodology

Wells were identified within the project area by utilizing data obtained from the IDEQ and IDWR. Wells within 300 feet and within the footprint of each Action Alternative were identified in the DEIS.

A Hydrogeologic Analysis of Alternative Alignments of Highway 95 from Thorncreek to Moscow (Ralston 2014) was prepared after the DEIS was published to respond to public comments. This technical report assesses the hydrologic and geologic settings underlying the alternatives and compares the potential impacts. The hydrogeologic analysis describes groundwater systems typical to each geologic environment and data obtained from well driller reports from the project area.

3.7.3 Existing Conditions

Aquifers

Most of the general project area is underlain by granite. Basalt is present near the western and northern boundaries of the project area. An outcrop of metaphoric rocks occurs in the northern portion of the project area (Ralston 2014).

The project area includes two basalt aquifer systems that supply groundwater in the project area; the Grande Ronde and the Wanapum (Priest Rapids) aquifers. The Wanapum Aquifer overlies the Grande Ronde Aquifer. Neither of these aquifers are sole source aquifers.

Municipal drinking water is generally drawn from the deeper Grande Ronde aquifer. As groundwater withdrawals have increased to meet demands, the Grande Ronde aquifer levels have been declining at a rate of one to two feet per year in some areas indicating little recharge (Hashmi 1995).

The shallow Wanapum aquifer is a primary water source for rural residents, particularly in the eastern portion of the basin. The City of Moscow also draws approximately 30 percent of its water supply from the Wanapum aquifer (City of Moscow 2014). The Wanapum aquifer responds to changes in precipitation and pumping and appears to be recharged from the surface (Palouse Water Conservation Network 2005).

Wells

The wells in the study area were evaluated as part of the new hydrogeological study. Wells typically obtain water from any of three water-producing intervals typical of granitic environments. First, some shallow wells obtain water from near the bottom of the weathered zone where weathering has progressed to produce sand-like material rather than the end result of weathering, which is clay. Second, some wells obtain water from weathering along fractured zones. In some areas, weathering occurs along a fracture zone approximately parallel to land surface at a depth of 100 to 200 feet. This zone may be the result of "unloading" of the weight of the material overlying the granite as erosion exposes it at land surface. Deeper wells obtain water from isolated fracture zones with little weathering products, generally at depths greater than about 200 feet (Ralston 2014).

Wells in the upper aquifer in the City of Moscow yield a maximum of 1,000 gpm; however, most of the wells are for domestic purposes and are pumped at rates less than 30 gpm. All of the wells completed in the lower aquifer in the Moscow area are owned either by the City of Moscow or the University of Idaho. The yields of these wells are large, some exceeding 2,500 gpm (Ralston 2014).

Based on the IDWR database 94 wells were listed in the project area and all were listed as domestic uses. The domestic wells in the project area range from 60 to 650 feet in depth with an average depth of 267 feet (Ralston 2014).

3.8 Vegetation, Fish and Wildlife

3.8.1 Regulatory Framework and Policies

Vegetation, fish and wildlife are governed by the following:

- FHWA TA 6640.8A – NEPA Implementation Guidance for Preparing and Processing Environmental and Section 4(f) Documents
- 16 USC 1531-1544 – Endangered Species Act (ESA)
- 16 USC Sections 1600-1614-National Forest Management Act
- 16 USC Sections 661-667e- Fish and Wildlife Coordination Act
- 16 USC Sections 668-668d -Bald Eagle Protection Act
- 16 USC Sections 703-712-Migratory Bird Treaty Act
- 16 USC Sections 1801-1882-Fishery Conservation and Management Act (1976)
- EO 13186-Responsibilities of Federal Agencies to Protect Migratory Birds
- Federal Noxious Weed Act of 1974
- Magnuson-Stevens Fishery Conservation and Management Act (P.L. 104-297)
- 49 USC 303-Policy on Lands, Wildlife and waterfowl refuges, and historic sites
- IDAPA 20.02.01-Idaho 1974 Forest Practices Act
- Idaho Code, Title 22, Chapter 24, Noxious Weeds

3.8.2 Methodology

Several technical reports were conducted by experts to identify vegetation, wildlife and habitat in the study area and to assess the potential effects of the alternatives. The technical reports are listed below:

Vegetation Studies

The following reports were prepared and are included in the Vegetation Technical Report or the Biological Assessment Technical Report.

Vegetation Technical Report

A Scientific Evaluation for Noxious and Invasive Weeds of the Highway 95 Construction Project between the Uniontown Cutoff and Moscow (January 2007). This report describes the potential weeds in the study area. It also describes the potential for the proposed project to spread weeds and discusses mitigation for the potential effects (Lass and Prather 2007).

Memo Documenting Resurvey for Spalding's catchfly in the Project Area (May 2014) was prepared after the DEIS publication. No new plants were found (Lichthardt 2014).

Memo: Effects Analysis of the US Highway 95-Thorncreek Road to Moscow Project for Plant Species and Communities of Conservation Concern was prepared (December 1, 2008). This report prepared by IDFG provides information regarding indirect and cumulative effects to Palouse remnants and to communities of conservation concern. Information from this memo was incorporated into the FEIS.

Biological Assessment Technical Report

Biological Evaluation of Plant Species and Communities of Conservation Concern in the US Highway 95 Thorncreek Road to Moscow Project Area (December 2005). This report discusses the potential occurrence and extent of Palouse remnants and rare plants in the project area. It analyzes the potential effects for the proposed project on plant species of conservation concern and remnant native plant communities that potentially provide habitat for these species (Lichthardt 2005).

Wildlife Studies

Biological Assessment, Thorncreek Road to Moscow Highway Construction Project (December 2007). This study describes the project effects to federally listed and proposed species and designated critical habitat (ITD 2007a). This report was reviewed in November 2011. USFWS provided concurrence that the findings are still valid in December 2011. USFWS provided a clarification to the Spalding's catchfly mitigation in April 2012. See Appendix 1, Key Agency Correspondence and Forms.

General Wildlife Assessment, Thorncreek to Moscow (December 2006). This report is a general assessment of wildlife impacts for the US-95 Thorncreek to Moscow Project. IDFG evaluated alternatives' impacts to a limited number of species that could serve as surrogates for all other wildlife species expected to be present in the project area (IDFG 2006). The initial list of wildlife species was generated from reviewing Idaho state sensitive species lists, primarily the Idaho Comprehensive Wildlife Conservation Strategy (WCS), which summarizes the Species of Greatest Conservation Need (SGCN) information. The Washington State Comprehensive WCS was also reviewed. Of the 229 SGCN, IDFG identified 32 species, including 13 vertebrate and 19 invertebrate species that could reasonably be expected to be present in the project area and, therefore, potentially be impacted by the project.

Of these, various species were expected to be present in the project area for all, some or none of the proposed alternatives. Some species (e.g., Spur throated Grasshoppers, California Myotis) were retained for consideration because there was not sufficient information to remove them from the list and/or IDFG determined they could serve as an appropriate surrogate for other species. The giant Palouse earthworm was considered in the analysis due to high local and academic interest in the species (IDFG 2006).

Habitat associations described in the WCS were compared with available habitat in the project area using maps (IDFG 2006; Lichtart 2005; Lichtart and Mosely 1997), aerial photos provided by ITD and local knowledge was used to determine whether suitable habitat was present in or near the project area. Species were removed from consideration if suitable habitat was not

present, even though the potential exists for some species to occasionally range far from suitable habitat. IDFG suggested protections and mitigations for unavoidable impacts. (IDFG 2006).

Biological Evaluation on the Potential Impacts of Corridor Alternatives from Thorncreek Road to Moscow on Large Ungulates (December 2005). This report evaluates the potential effects of alignments through different corridors (west, central and east) on the habitat and survival of white-tailed deer (*Odocoileus virginianus*), elk (*Cervus elaphus*), and moose (*Alces alces*) in the project area (Melquist 2005a).

Biological Evaluation on the Long-eared myotis and Pygmy nuthatch (December 2005). This report describes the potential effects of the proposed project on the long-eared myotis (*Myotis evotis*) and Pygmy nuthatch (*Sitta pygmaea*) which were classified as Species of Special Concern (SSC) by the IDFG (Melquist 2005b).

Final Review of Wildlife Mitigation for the Thorncreek Road to Moscow Highway Development Project (US-95) (September 2007). This report reviews and summarizes the information in the *Biological Evaluation on Potential Impacts of Corridor Alternatives* (Melquist 2005a) and evaluates the effects of the alternatives to deer, elk and moose and makes mitigation recommendations (Ruediger 2007).

Assessment of Potential Big Game Effects and Mitigation Associated with Highway Alternatives from Thorncreek Road to Moscow (December 2010). This report summarizes the wildlife reports prepared by Melquist and Ruediger and provides ITD with an independent assessment of the project's effects to potential big game. It also discusses mitigation (Sawyer 2010).

ITD commissioned four different wildlife experts to assess impacts and mitigation for large ungulates. The general descriptions of the reports are in the Section 3.8.2 Wildlife Studies. Each of the experts had similar conclusions regarding the quality of available habitat in the study areas and the relative impacts of the alternatives on that habitat which is stated; however, mitigation recommendations differed.

The Sawyer report was intended to evaluate the mitigation recommendations for the project. Sawyer evaluated and summarized ungulate habitat in the corridors and the relative impacts by alternative. The Sawyer report found that the Melquist and Ruediger reports were consistent regarding general habitat quality and the relative alternatives' effects to habitat. The Sawyer report also provided new information that was available since the previous reports were prepared which also supported the conclusions of the reports.

Both Ruediger and Melquist stated that the alternatives would not have population level effects to ungulates and that no mitigation was required for population level effects. Both offered optional recommendations that included wildlife crossing, fencing, habitat preservation and other measures that could benefit individuals and mitigate for animal vehicle collisions; however, these were not required, nor are they likely to be effective without land use control in the surrounding properties (Ruediger 2007).

Melquist acknowledges that there may be impacts to individual ungulates through increased road kills, possible habitat avoidance, and increased risks to motorists and offers seven recommended actions that would benefit deer, elk, moose, and other wildlife should transportation corridors be constructed. These recommendations include one or two possible wildlife crossings near draws, fencing associated with the crossings, habitat preservation near those crossings and other measures. However, he further states that not implementing a recommended action would not jeopardize populations of any of the species.

Animal/vehicle collisions (AVCs) and associated risks to motorists were considered in the AASHTO Safety Analysis and are mitigated for in the proposed alternatives' design. Clearing vegetation from the clear zone (highway right-of-way), widening the roadway and improving the sight distance are all mitigating factors that are expected to significantly reduce the animal vehicle crashes (AVC). On US-20 between MP 369 and 375, similar improvements reduced the AVC by 85 percent (ITD 2012a). To further mitigate for the possible AVCs, if the E-2 Alternative is selected. See Chapter 9, Environmental Commitments for details of this mitigation.

Ruediger did not recommend stand-alone large game crossings nor did he recommend replacement of lost wildlife habitat. However, in recognition of the resource agencies' desire for mitigation, he made three optional recommendations, all of which were considered and included in the DEIS Chapter 9, Environmental Commitments. These were 1) to provide a wildlife/vehicle crossing at county road underpasses of US-95 where wildlife use is expected and where wildlife are welcome on private lands (deer, elk and moose), 2) to provide oversized culverts to allow for small terrestrial movement and 3) to replace water sources on the east side of the highway should water sources be impacted. See Chapter 9, Environmental Commitments for a list of the mitigation measures that will be implemented for each alternative.

3.8.3 Existing Conditions

The project area has an elevation of between 2,600 and 3,000 ft above sea level. The primary habitat in the project area is plowed and cultivated agricultural or CRP fields. Small patches of conifers, brush, and riparian habitat are retained on the edges of fields, in gullies and on rock

knobs. These patches are too small and fragmented to provide useable habitat for most large terrestrial species (Ruediger 2007).

Paradise Ridge is a geologic landform located southeast of Moscow outside of the project area. It has forested components, grassland, Palouse prairie, rural residential and agricultural lands. Paradise Ridge does not have a specific geographic boundary but for the purposes of this study a boundary is approximately the 3100-foot contour line in Exhibit 20. Paradise Ridge.

The Palouse Bioregion

The project area is at the eastern edge of the Palouse Bioregion. The Palouse Bioregion is an area of the Columbia Plateau characterized by rolling hills of moderate to high relief, with deep soils formed from loess.

Vegetation

Historically the land was an Idaho fescue - wheatgrass vegetation zone which is land dominated by Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass (*Pseudoroegneria spicata*) with patches of ponderosa pine (*Pinus ponderosa*), snowberry (*Symphoricarpos albus*), hawthorn (*Crataegus douglasii*), aspen (*Populus tremuloides*) and other associated plant species (Lichthardt 2005). This vegetation zone is also classified by the Idaho Natural Heritage Program as Palouse Grasslands.

Approximately 89 percent of the ponderosa pine communities have been lost in Latah County and approximately 99 percent of the Palouse Grasslands have been converted to cultivated agricultural lands (Noss et al. 1995). Loss of Palouse Grasslands has contributed to a number of plant species associated with the Palouse Bioregion being classified as species of conservation concern (Lichthardt and Moseley 1997). The Palouse Grasslands are considered one of the most endangered ecosystems in the US (Noss et. al. 1995).

Palouse Grassland Remnants

Thirty-two areas with remnant Palouse Bioregion vegetation were identified in the project corridor as a result of a study in 2005 (Lichthardt 2005). These Palouse remnants are referred to differently in different reports and may also be referred to as Palouse Grassland remnants or Palouse Prairie remnants. Palouse remnants may contain both grasslands as well as combinations of shrubs and trees. The Palouse remnants identified in Lichthardt's 2005 report were categorized by quality. About 18.3 acres are A-ranked (highest quality) remnants and 17 acres are B or C-ranked (medium high to medium low quality). About 20 acres of grassland are too dominated by annual grasses to be considered a remnant. If the remnants were too infested by weeds (more than 50 percent) they were not considered Palouse remnants (Lichthardt 2005).

The southern end of Paradise Ridge was designated the "South End Paradise Ridge" Conservation Site by the Idaho Conservation Data Center (ICDC) in 1996. It encompasses 106 acres, a little more than half of which is grassland and is the largest of the grassland remnants in the project area. The site also has areas of open pine woodland, pine forest, hawthorn, and ninebark (*Physocarpus (*sp*)*).

The primary threat to the persistence of Palouse remnants in their present state is colonization by weeds. All remnants identified in the project area are bordered completely or partially by weedy vegetation. Annual grasses tend to dominate moderately moist upper slopes, and smooth brome or tall oatgrass occupy the margins of those areas. Among the perennial weedy grasses, tall oatgrass appears to be the most aggressive. The perennial grasses have most likely moved into the remnants, either by rhizomes or seed, from nearby CRP plantings. See the Biological Evaluation of Plant Species and Communities of Conservation Concern in the US Highway 95 Thorncreek Road to Moscow Project Area (Lichthardt 2005) for additional information.

The project area lies near Paradise Ridge, which is considered a key conservation area for Spalding's catchfly as identified in the Recovery Plan for Spalding's catchfly (USFWS 2007). In 2008 USFWS with IDFG began implementing a four phased pilot project in Latah County that included 1) delineation of areas with high potential to support Palouse Grassland remnant plant species, 2) landowner contact and education, 3) field surveys and assessment of potential remnant restoration areas, and 4) development of a comprehensive conservation strategy.

As part of the pilot project, two additional studies of Palouse remnants were completed in 2011. The studies surveyed for Spalding's catchfly and identified potential sites for re-establishment of Spalding's catchfly and identified potential restoration sites. The potential restoration sites that were identified were selected based their potential to connect the Paradise Ridge with other potential remnant areas. The sites were also selected based on soils, topography, and landowner willingness. Landowner easements and agreements have been obtained to implement a variety of practices through several government programs, including Environmental Quality Incentives Program (EQIP)[12], Landowner Incentive Program (LIP)[13], Grassland Reserve Program (GRP)[14],

[12] The Environmental Quality Incentives Program (EQIP) is a voluntary program administered through the NRCS that provides financial and technical assistance to agricultural producers through contracts up to a maximum term of ten years in length. The program plans and implements practices to assist with natural resource and farm production issues.

[13] The Landowner Incentive Program (LIP) is administered by USFWS and provides grant funds to protect and restore habitats on private lands, to benefit federally listed, proposed or candidate species or other at-risk species.

[14] The Grassland Reserve Program (GRP) is a voluntary program administered by USDA for landowners and operators to protect grazing uses and related conservation values by conserving grassland, including rangeland, pastureland, shrubland, and certain other lands. The program emphasizes support for working grazing operations; enhancement of plant and animal biodiversity; and protection of grassland and land containing shrubs and forbs under threat of conversion.

and Partners for Fish and Wildlife (PFW)[15]. The planned and current restoration practices include farming practices to reduce erosion and sedimentation, native plant establishment, conversion of fields from non-native to native seedings, planting Spalding's catchfly, ecological weed control (such as hand pulling weeds) and other activities. These activities were implemented or are planned to be implemented on portions of the sites, which have landowner agreements or easements. See Exhibit 33. Planned and Current Restoration Projects. The actual restoration activities may occur on only a portion of the land that is under a landowner agreement or easement.

One site with landowner agreements for ecological weed control and Spalding's catchfly establishment is approximately 200 feet from the E-2 alignment footprint. See Exhibit 33. Planned and Current Restoration Projects.

ITD, FHWA and USFWS met on July 25, 2012, September 6, 2012 and May 7, 2014 to discuss current and planned conservation efforts, potential project effects and to collaborate on possible mitigation strategies. Based on coordination with USFWS, Latah County Conservation District and Natural Resource Conservation Service (NRCS) sites closer to Paradise Ridge and furthest from the alignments will be prioritized.

Matrix Habitat

The remaining land outside of remnants is primarily agricultural and CRP lands that function as matrix habitat. These matrix habitats (Daily 1997, Daily et al. 2001, Looney et al. 2009, Looney and Eigenbrode 2011, 2012, Ricketts 2001) may be important for wildlife browsing and movement corridors for ungulates, small mammals, bird species, and other wildlife. Matrix habitat also supports a number of species including earthworms, bumblebees and beetles (Hatten & Looney 2013).

CRP fields are planted to perennial habitat (Fargione et al. 2009), which may not always be native vegetation. These CRP lands and other agricultural lands can provide refuge, food and movement corridors for animals that inhabit remnants (Daily 1997, Daily et al. 2001, Ricketts et al. 2001). Multiple studies show that CRP land benefits wildlife (Herkert 2007, Fargione et al. 2009, Stanley 2010, Grovenburg et al. 2012) including migratory grassland birds, ground-dwelling beetles and bumble bees; however, the composition and structure of vegetation in CRP land does not provide equivalent habitats for some animals such as grassland birds (Bakker and

[15] The Partners for Fish and Wildlife (PFW) Program is administered by USFWS and procures short-term easements for restoration activities.

Higgins 2009). Invasive, rhizomatous invasive plants including tall oatgrass were frequently abundant in the borders of remnants next to CRP fields in the project area (Lichthardt 2005).

Rare Plants

Nine plant species listed by ICDC as Species of Greatest Conservation Need, are associated with the Palouse Bioregion and known to occur in Latah County (Lichthardt 2005). See Table 22. Palouse Bioregion Rare Plant Species. IDFG surveyed the project area for these species in 2005. Four of the nine target species were found in the study area; Palouse milkvetch, broad-fruit mariposa lily, Palouse thistle, and Palouse goldenweed. The area was resurveyed near the project area between 2008 and 2010 as part of the IDFG 2011 study (Hill 2011). The rare plants found in the study area are described below.

Table 22. Palouse Bioregion Rare Plant Species

Common name	Scientific Name	ICDC rank*
Jessica's aster	*Aster jessicae*	G2/S2
Palouse milkvetch	*Astragalus arrectus*	G2/G4 Review
Green-band mariposa lily	*Calochortus macrocarpus var. maculosus*	G5T2/S2
Broad-fruit mariposa lily	*Calochortus nitidus*	G3/S3
Palouse thistle	*Cirsium brevifolium*	G3/S2
Idaho hawksbeard	*Crepis bakeri ssp. idahoensis*	G4T2/S2
Palouse goldenweed	*Haplopappus liatriformis*	G2/S2
Ample monkey-flower	*Mimulus ampliatus*	G1/S1
Spalding's catchfly	*Silene spaldingii*	G2/S1 (Federally listed as threatened)

* These ranks reflect the condition of the species rangewide. G-ranks are rangewide ranks that are assigned by Nature Serve and S-ranks are statewide ranks that are assigned by the ICDC. Rankings are explained in detail in Appendix 4.

Palouse milkvetch. Palouse milkvetch was rated between imperiled and secure globally (G2/G4) but based on updated data is now considered imperiled globally (Nature Serve 2011). Palouse milkvetch was found in two places in the study area; in a grassland remnant and on a road cut (Lichthardt 2005).

Broad fruit mariposa lily. Broad-fruit mariposa lily was considered vulnerable both globally and in Idaho State (G3/S3) but based on updated data is now considered imperiled globally (Nature Serve 2011). Five very small populations were found in the study area, ranging from 1 to 20 individuals. This perennial occurs almost exclusively in Idaho in open habitats (Lichthardt 2005).

Palouse thistle. Palouse thistle is considered globally vulnerable and imperiled in Idaho State (G3/S2) but based on updated data is now considered globally vulnerable (Nature Serve 2011).

More than 20 populations were found in occasional stands of snowberry or ponderosa pine. Palouse thistle spreads by creeping roots; therefore, it is difficult to determine what constitutes an individual. This plant occurs in grasslands and scablands[16] (Lichthardt 2005) ranging from northeast Oregon, Eastern Washington and east to Idaho.

Palouse goldenweed. Palouse goldenweed is considered both globally and state imperiled (G2/S2) but based on updated data is now considered globally vulnerable (Nature Serve 2011). It was found in all but two grassland remnants as well as many patches too small or too weedy to qualify as remnants. Moscow is near the center of the global range of this species. This perennial occurs primarily on the Palouse in rocky soils (Lichthardt 2005).

Invasive Plants

Latah County has about 260 listed non-native, invasive plant species that affect agricultural, rangeland, pastures, and forests. Roadsides were sampled for invasive plants or weeds. Weeds found at most sites included Canada thistle, common mullein, downy brome, and prickly lettuce. Established sites usually had reed canarygrass. Sites with exposed soil always had annual bromes and ventenata.

Invasive plant species that are commonly encountered in and adjacent to the project area have demonstrated their ability to become problems within native grasslands with the ability to produce more than 20 percent foliar cover or to dominate other grasslands. These species are presented in Table 23. Invasive Plants for Prairie Habitats. See Scientific Evaluation for Noxious and Invasive Weeds of the Highway 95 Construction Project between the Uniontown Cutoff and Moscow (Lass and Prather 2007) for additional detail. Latah County has about 260 listed non-native, invasive plant species that affect agricultural, rangeland, pastures, and forests. Roadsides were sampled for invasive plants or weeds. Weeds found at most sites included Canada thistle, common mullein, downy brome, and prickly lettuce. Established sites usually had reed canarygrass. Sites with exposed soil always had annual bromes and ventenata.

Table 23. Invasive Plants for Prairie Habitats

Common Name	Scientific Name
Bachelor's button	*Centaurea cyanus*
Blackgrass	*Alopecurus myosuroides Huds.*
Bur chervil	*Anthriscus caucalis*
Canada thistle	*Cirsium arvense*
Chamomile/pineapple weed complex	*Matricania matricariodes*

[16] Terrain consisting of bare rock surfaces, with little or no soil cover and scanty vegetation, that have been deeply channeled by glacial flood waters.

Common Name	Scientific Name
Cluster tarweed / coastal tarweed	*Madia glomerata*
Downy brome "cheatgrass"	*Bromus tectorum*
Field bindweed	*Convolvulus arvensis L.*
Interrupted windgrass	*Apera interrupta (L.) P. Beauv.*
Japanese brome	*Bromus japonicus*
Jointed goatgrass	*Aegilops cylindrical Host*
Meadow brome	*Bromus biebersteinii Roemer & J.A. Schultes*
Prickly lettuce	*Lactuca serriola L.*
Quackgrass	*Elymus repens (L.) Gould*
Reed canarygrass	*Phalaris arundinacea L.*
Smooth brome	*Bromus inermis Leyss.*
Soft brome	*Bromus hordeaceus L.*
St John's wort	*Hypericum perforatum L.*
Sulfur cinquefoil	*Potentilla recta L.*
Tall oatgrass	*Arrhenatherum elatius (L.) Presl.*
Tumble mustard	*Sisymbium altissimum L.*
Ventenata	*Ventenata dubia [Leers] Gross. & Dur.*
White bryony	*Bryonia alba L.*
Yellow starthistle	*Centaurea solstitialis L.*

Invasive plant species that are commonly encountered in and adjacent to the project area have demonstrated their ability to become problems within native grasslands with the ability to produce more than 20 percent foliar cover or to dominate other grasslands. These species are presented in Table 23. Invasive Plants for Prairie Habitats. See Scientific Evaluation for Noxious and Invasive Weeds of the Highway 95 Construction Project between the Uniontown Cutoff and Moscow (Lass and Prather 2007) for additional detail.

Lichtardt also listed several species that she observed to have already invaded the Palouse remnants and grasslands that she surveyed in the project area. The greatest threat to the prairie is perennial grasses. See Table 24. Invasive Plants in .

Table 24. Invasive Plants in Remnant Grasslands

Common Name	Scientific Name
Cheatgrass	*Bromus tectorum*
Kentucky Bluegrass	*Poa pratensis*
Meadow foxtail	*Alopecuris pratensis*
Common crupina	*Crupina vulgaris*
Grassy tarweed	*Madia gracilis*

Bachelor's button	*Centaurea cyanus*
Bur chervil	*Anthriscus caucalis*
Downy brome "cheatgrass"	*Bromus tectorum*
Japanese brome	*Bromus japonicus*
Smooth brome	*Bromus inermis Leyss.*
Soft brome	*Bromus hordeaceus L.*
St John's wort	*Hypericum perforatum L.*
Tall oatgrass	*Arrhenatherum elatius (L.) Presl.*
Ventenata	*Ventenata dubia [Leers] Gross. & Dur.*
White bryony	*Bryonia alba L.*
Yellow starthistle	*Centaurea solstitialis L.*

Sixty-four noxious weeds are listed in Latah County. Of those, five species of noxious weeds were found in the project area (Lass and Prather 2007). See Table 25. Noxious Weeds in Project Corridor.

Table 25. Noxious Weeds in Project Corridor

Common Name	Scientific Name	Category*
Common crupina	*Crupina vulgaris*	Control
Jointed goatgrass	*Aegilops cylindrical*	Containment
Field bindweed	*Convolvulus arvensis*	Containment
Canada thistle	*Cirsium arvense*	Containment
Yellow starthistle	*Centaurea solstitialis*	Containment

*Control =to prevent plants from seeding. Containment =to limit the area that the weeds spread.

Individual plants or small infestations were noted along the alternatives' alignments; however large infestations of St. John's Wort, burr chervil, and reed canarygrass were found. Invasive plants along the US-95 right-of-way with infestations greater than a half acre include ventenata, field bindweed, reed canarygrass, tall oatgrass, and blackgrass.

Wildlife Species

The study area is highly modified through agriculture, rural residences and commercial development, and nearly all of the native pine stands and grasslands have been converted to other land uses. The remaining habitat supports both indigenous and non-native wildlife species. Many species are habitat generalists, which, while important locally, are mainly species already adaptable to habitat modifications, fragmentation and high levels of human use (Sawyer 2010).

Wildlife Conservation Strategy Species (WCS)

The WCS is the State of Idaho's guiding document for managing and conserving at-risk species. It divides the state into Ecological Sections based on habitat. The US-95 Thorncreek to Moscow project area lies entirely within the Palouse Prairie Ecological Section. The WCS maps the majority of the study area as farmable land and non-native herbaceous. It lists wildlife species expected to reside in or migrate through the Palouse Prairie Ecological Section for each habitat type.

As described in Section 3.8.2, Methodology, IDFG prepared a report, General Wildlife Assessment; Thorncreek Road to Moscow Project (IDFG 2006), that evaluated species that could be affected by the proposed project. Although native habitat and wildlife have been severely altered in the project area, the Palouse remains home to many indigenous and introduced wildlife species – too many, for an inclusive impact analysis (IDFG 2006).

IDFG identified representative wildlife species that would provide an indication of impact for all species, but would also suggest suitable protections and mitigations for unavoidable impacts (IDFG 2006). The rationale for selecting wildlife species to evaluate is described in more detail Section 3.8.2 Methodology and in the General Wildlife Assessment (IDFG 2006). Through a filtering process, IDFG identified 32 species, including13 vertebrate and 19 invertebrate species that could reasonably be expected to be present in the project area and, therefore, potentially be impacted by the project. See Table 26. Representative Wildlife Species.

Table 26. Representative Wildlife Species

Common Name	Scientific Name
Woodhouse's toad	*Bufo woodhousii*
Mountain quail	*Oreortyx pictus*
Peregrine falcon	*Falco peregrines*
Townsend's big-eared bat	*Corynorhinus townsendii*
Nimapuna tigersnail	*Anguispira nimapuna*
Pale jumping-slug	*Hemphilla camelus*
Fir pinwheel	*Radiodiscus abietum*
Salmon coil	*Helicodiscus salmonaceus*
Lyre mantleslug	*Udosarx lyrata*
Oregonian	*Cryptomastix mullani tuckeri*
An Oregonian (Hells Canyon)	*Cryptomastix populi*
Humped coin	*Polygyrella*
Giant Palouse earthworm	*Driloleirus americanus*
Northern alligator lizard	*Elgaria coerulea*

Common Name	Scientific Name
Ring-necked snake	*Diadophis punctatus*
Swainson's hawk	*Buteo swainsoni*
Long-billed curlew	*Numenius americanus*
Short-eared owl	*Asio flammeus*
Grasshopper sparrow	*Ammodramus savannarum*
California myotis	*Myotis californicus*
A stonefly	*Capnia zukeli*
A stonefly	*Soyedina potteri*
A stonefly	*Capnia lineate*
A stonefly	*Perlomyia collaris*
A stonefly	*Taenionema umatilla*
A mayfly	*Paraleptophlebia traverae*
A mayfly	*Parameletus columbiae*
A spur-throat grasshopper	*Melanoplus digitifer*
A spur-throat grasshopper	*Melanoplus payettei*

Other Species Considered

Several other wildlife species were also considered. Federal candidate species are species for which USFWS or National Oceanic and Atmospheric Administration (NOAA) have sufficient information on biological vulnerability and threats to support a proposal to list it as threatened or endangered. However, candidate species are not yet listed, do not have protection under ESA and are precluded due to higher priorities. These federal candidate species are described below. Listed threatened and endangered species and critical habitat are described in Section 3.9, Threatened and Endangered Species.

Additional species that could potentially occur in the project area were of particular interest to agencies or the public included the long-eared myotis (*Myotis evotis*) and pygmy nuthatch (*Sitta pygmaea*). For these reasons a specific study was conducted regarding their occurrences and potential alternatives' impacts. Details regarding the wildlife species considered are described in detail in the Wildlife Technical Reports.

Long-eared myotis. Long-eared myotis is a small commonly occurring forest bat that ranges from British Columbia to Baja. In Idaho it is found in a wide range of habitats including grasslands, shrub-steppe habitat, forestland, forested riparian and wetland areas, and barren land with exposed rock (Gillies 2004). A bat survey conducted on portions of the Palouse Ranger District by the USFS and IDFG suggest that the long-eared myotis is likely to occur in the study area and may utilize pine stands for roosting (Melquist 2005b).

Pygmy nuthatch. Pygmy nuthatch is a tiny bird that ranges from British Columbia to Central Mexico. In Idaho, the pygmy nuthatch is generally limited in its distribution to the southern slope of mountains at elevations up to approximately 3,500 feet. Pygmy nuthatches require mature pine stands and snags for foraging and nesting. They are known to be sedentary and young birds may move an average of 286 meters (m) or 938 ft, but have been observed to move up to 533 m or 1,749 ft from their natal area (Ghalambor 2006). In 2005, pygmy nuthatches were observed in pine stands at the southern end of the study area (Melquist 2005b). Suitable habitat is limited along the project corridor but is available on Paradise Ridge and in other areas in Northern Idaho. Pine stands are described in Section 4.8 under Pine Stands.

Northern alligator lizard. Northern alligator lizard is a reptile that occurs from central California to southern British Columbia and east to Montana. Idaho populations occur in the Panhandle region from Boundary County south to northern Clearwater County; however, it is rarely encountered and poorly documented. It occurs in coniferous forests, often in clearings or along forest edges. Sites typically have a prominent understory with leaf litter, bark, rotting logs or talus. They are thought to consume a variety of arthropods and perhaps mollusks and earthworms. There are no known occurrences of northern alligator lizard in the project area; however the pine stand in the southern end of the study area may be considered suitable habitat (IDFG 2006).

Wolverine. Wolverine was listed as a federal candidate species under the Endangered Species Act in December of 2010. They occur within a wide variety of habitats, primarily boreal forests, tundra, and western mountains throughout Alaska and Canada. However, the southern portion of the range extends into Washington and the northern Rocky Mountains in Idaho, Montana, and Wyoming. Wolverines tend to live in remote and inhospitable places away from human populations. They naturally occur at low densities and are rarely and unpredictably encountered. Female wolverines use birthing dens excavated in deep snow. Persistent, stable snow greater than five feet deep appears to be a requirement for birthing dens, because it provides security for offspring and buffers cold winter temperatures.

Wolverines travel long distances over rough terrain and deep snow. The availability and distribution of food is likely the primary factor in determining wolverine movements and home range size; however, gender, age, and differences in habitat are also factors (USFWS 2010).

There are no documented occurrences of wolverine near the project area. The project area is primarily highly disturbed, cultivated, farmland without a persistent, deep snow pack. Therefore wolverine and its habitat have a low likelihood to be present in the project area.

Yellow-billed cuckoo. The Yellow-billed cuckoo was identified as a federal candidate species in Latah County in 2012 when the DEIS was published but was proposed as threatened in November 2014. However, the species was not proposed as threatened in Latah County nor is there proposed designated critical habitat in Latah County (USFWS 2015). The Yellow-billed cuckoo is also a State of Idaho Species of Special Concern. It prefers treed, riparian corridors with a heavy understory (Anderson and Laymon 1989). Dense understory is important for nest site selection and cottonwood trees are important for foraging habitat. Nesting pairs require large blocks of riparian habitat which do not occur in the project area (IDFG 2006).

Bumble bees. The western bumble bee (*Bombus occidentalis*) was common on the Palouse and throughout the western United States but populations have drastically declined (Cameron et al. 2011) including in the Palouse. A population was discovered in Pacific Northwest bunchgrass grassland, approximately 150 miles south of the project (Kimoto et al. 2012); therefore, it is possible that the Palouse Prairie remnants and forest communities support this species.

Bumble bees are important for plant conservation and biodiversity and their regional or local decline can impact plant communities (Biesmeijer et al. 2006; Vamosi et al. 2006). Native bees may pollenate agricultural crops and non-cultivated plants and forage on pollen to feed developing larvae (Michener 2007). Ten of the 15 species historically recorded from Whitman and Latah Counties, which represented most of the regional historically present species, were detected in a recent study of bumble bees, which included Paradise Ridge. (Hatten and Looney 2013).

Habitat loss and fragmentation, pesticide use and exposure to pathogens contribute to the decline of bees (Goulson et al. 2008; Cameron et al. 2011). Bumblebee community composition has changed and genetic diversity has been lost due to agriculture in tall grass prairie habitat in Illinois (Grixti et al. 2009; Lozier and Cameron 2009), but very little is known about the bumble bee communities associated with small, isolated habitat remnants such the Palouse Prairie. Bee communities in remnant habitats are influenced by numerous factors, including the composition and quality of the surrounding landscape or matrix habitat (Steffan-Dewenter and Tscharntke 1999; Steffan-Dewenter et al. 2002; Hines and Hendrix 2005; Hendrix et al. 2010). Bee diversity is correlated to floral diversity, density and matrix diversity (Steffan-Dewenter et al. 2002; Hines and Hendrix 2005).

Bumblebees can thrive in agricultural fields with flowering crops and nesting sites and some open grassland species are adept at utilizing agricultural lands (Diekotter et al. 2006). However, these likely provides limited resources for bees given its prevalence of non-pollen or nectar producing crops, suggesting that bumble bee persistence is due to weeds and native plants along

roads and crop margins and/or resources available within the remnants. Furthermore, diversity of flora is known to correlate with bumble bee diversity (Hendrix et al. 2010).

The golden northern bumblebee (*Bombus fervidus*), which is associated with agricultural lands, is thought to be the primary pollinator of Spalding's catchfly, a partially self-fertilizing species. However, Spalding's catchfly is also dependent upon pollinators for fruit development and seed set (Lesica 1993; Lesica and Heidel 1996).

Grassland Nesting Birds. The conversion of prairie to cropland has affected communities of birds and other wildlife that rely on grassland habitats. The Breeding Bird Survey, an annual bird count conducted by volunteer birders, has provided data for the past 30 years and shows evidence of declining populations of grassland birds, an important factor being the loss of suitable grassland-nesting habitat (Johnson 2000). The cropland that largely replaced prairie is avoided by many bird species, which cannot find the necessary habitat structure in cultivated fields. Most birds that do nest in cropland suffer reproductive failure because of frequent agricultural operations (Rodenhouse and Best 1983). Likewise, hayfields often are used by grassland birds, but mowing operations can be very detrimental to the birds and their nests (Bollinger et al. 1990, Frawley and Best 1991). Reproduction in both cultivated fields and hayfields are not likely to offset mortality and thereby maintain populations. (Johnson 2000). Grasslands established under the CRP program may mitigate some of the detrimental effects that have occurred to native grassland. Several studies have found CRP fields to be highly attractive to breeding grassland birds. The species that most commonly breed in CRP fields vary geographically (Johnson 2000).

Giant Palouse earthworm. The giant Palouse earthworm (*Driloleirus americanus*) is currently found in eastern Washington and Idaho and is poorly understood. In July 2009, USFWS received a petition requesting that the species be listed as threatened and that critical habitat be designated under the Endangered Species Act. On July 26, 2011, USFWS issued a 12-month finding on a Petition to List the Giant Palouse Earthworm [50 CFR Part 17] in which USFWS found that the listing was not warranted.

Early records by Smith in 1897 state that the worms were very abundant in the area (USFWS 2011). They live in deep, semi-permanent burrows, and move to the surface to feed on fresh plant litter (James 2000). Two earthworm occurrences were found on Paradise Ridge in 2012 and two worms, were found in the large ridge-top prairie on Paradise Ridge in 2010. One earthworm was found at Smoot Hill Ecological Preserve in Whitman County in a Palouse Prairie remnant in 2005. In 1986 or 1987, about five Palouse earthworms were found near Moscow. Around 1978 one Palouse earthworm was found near Moscow, and another at the top of the Lewiston Grade along US 95.

Survey efforts in Washington State in the eastern Cascades and the Palouse found earthworms in 18 of the 54 sites evaluated in 2011 suggesting that the earthworms are more widespread. In 2012, two of the additional 49 sites surveyed found earthworms, totaling 22 sites in Washington. The giant Palouse earthworm has been found in grasslands, Pine stands and Douglas-fir stands suggesting that it may occur in a wider variety of environments and soils than originally thought. The giant Palouse earthworm was not found in recent surveys conducted in agricultural and urban locations in Latah County, Idaho (Johnson-Maynard et al. 2007, Smetak et al. 2007,), and Whitman County, Washington (Fauci and Bezdicek, 2002).

Ungulates

Independent studies of big game or ungulate (i.e., moose, elk, and white-tail deer) effects were conducted by Dr. Wayne Melquist (Melquist 2005a) and Dr. Bill Ruediger (Ruediger 2007). Both studies concluded that the project area does not include critical big game habitat or known migration corridors.

White-tail deer. Compared to elk and moose, white-tail deer are less affected by human disturbances. They thrive in agricultural and forested areas that contain adequate amounts of woody cover and herbaceous forage (Demarais et al. 2000). White-tail deer need some structural cover adjacent to them in order to take full advantage of their foraging opportunities (Compton et al. 1988, Dusek et al. 1989, Vercauteren and Hygnstrom 1998). Because whitetails tend to occupy the lower elevations, unlike elk, they are not often forced to migrate in winter. Instead, they will concentrate in timber where snow is less deep (Melquist 2005a).

Moose. Moose prefer shrubby forests with nearby lakes, wetlands, and bogs. Moose diets consist primarily of woody regrowth (e.g., willow, aspen or fir) that follow disturbances such as fire, floods, and logging (Franzmann 2000). Moose commonly use open areas to feed on grasses, sedges, and forbs, then will retreat to the security of tall shrubs and forests to rest. They migrate primarily along or between riparian areas and wetlands (Crenshaw pers. comm. 2005). While random movements and dispersal by moose likely occur, the timing and direction of such movements are unpredictable (Melquist 2005a).

Elk. Elk rely heavily on forest cover and rugged terrain for avoiding human disturbances (Skovlin et al. 2002) and predators (Creel et al. 2005 and Kauffman et al. 2007). Elk movements in and around the project area are often dictated, in large part, by the location and distribution of agricultural crops. Although elk can thrive in non-forested regions, they rely on mature shrub communities and topography to provide adequate security cover (McCorquodale et al.1986, Sawyer et al. 2007).

Available Ungulate Habitat

Deer, elk and moose habitat should include four basic components: food, cover, water and space. The arrangement of these components in the project area can influence foraging behavior and movement. The categories that were used by Sawyer (Sawyer 2010) to rank the quality of habitat for target big game species are described below:

- Poor – does not provide basic habitat components and does not support big game in large numbers or on a year round basis
- Marginal – provides some basic habitat requirements but is limited in quantity and quality. Area is unable to support measureable numbers year-round or seasonally
- Moderate – provides reasonable habitat and has the potential to support big game on year-around or seasonal basis
- Excellent – provides an abundance of high-quality habitat and supports big game on a year-round or seasonal basis.

Table 27. Quality of Available Ungulate Habitat indicates the overall quality of habitat for each ungulate species in the western, central and eastern corridors. The topography and general habitat components utilized by ungulates are summarized below:

Table 27. Quality of Available Ungulate Habitat

	Habitat Quality		
Corridor	Moose	Elk	White-tail deer
Western	Poor	Poor	Marginal
Central	Poor	Poor	Marginal
Eastern	Marginal	Marginal	Moderate

Source: (Sawyer 2010)

Western Corridor

The western corridor is characterized by gentle to rolling topography. It is primarily cropped agricultural fields with sparse rural residences. It is used for seasonable foraging by ungulates. Small patches of suitable ungulate habitat are located in Washington State outside the project area (Melquist 2005a).

IDFG personnel have occasionally observed moose and elk in the general vicinity but there is no evidence that they utilize the western corridor on a regular basis. White-tail deer are believed to utilize the western corridor on a year-round basis (Sawyer 2010).

Central Corridor

The central corridor is characterized by rolling topography. It is also primarily agricultural fields with sparse rural residences. It has more development, as it is closer to the existing US-95 alignment.

IDFG personnel have observed moose and elk in the general vicinity, but there is no evidence that they utilize the central corridor on a regular basis. White-tail deer are believed to utilize the central corridor on a year-round basis (Sawyer 2010).

Eastern Corridor

The eastern corridor is characterized by rolling topography. It is also primarily agricultural fields but has more CRP enrolled land that may be utilized by ungulates compared to the western and central corridors. It also has several wooded draws and small ponds. Habitat exists near Tomer Butte north of Highway 8, east of the eastern corridor and Paradise Ridge.

IDFG personnel have observed moose and elk on Paradise Ridge, but the extent to which they use the area is unknown. Most big game abundance estimates are derived from aerial surveys, typically flown during the winter months while animals are congregated and more visible.

The project area has not been included in recent moose or deer surveys conducted by IDFG; however, in the past year four moose have been relocated by IDFG from the Moscow area. The area is part of a larger elk unit that is stratified into high, medium, and low-density strata and flown each year. However, survey emphasis is placed on the high and medium-density strata. Since the eastern corridor and Paradise Ridge are part of a low-density stratum (Crenshaw pers. comm. 2005) there is no elk abundance data specific to the eastern corridor.

The number of moose and elk that utilize Paradise Ridge is so low, and use is so unpredictable, that capturing an adequate sample of animals is considered by Sawyer to be infeasible (Sawyer 2010). IDFG has expressed that under suitable conditions it may be possible to survey and develop a population estimate for moose and elk in the project area (Henneky pers. comm. 2015). Nonetheless, the wilidfe technical reports and IDFG agree that moose and elk use is more likely to occur in the eastern corridor compared to the western and central corridors. White-tail deer utilize the eastern corridor on a year-round basis (Sawyer 2010).

Ungulate Movement

Varieties of habitat components are utilized by ungulates and may affect their movement in the project area. Paradise Ridge contains a mixture of tree stands, shrubs, grasslands and agricultural fields. Man-made ponds, patches of suitable habitat and forested draws are also located on the eastern side of the project area near Paradise Ridge. Although big game likely travel along the

wooded draws that extend west from Paradise Ridge, the draws do not connect Paradise Ridge with other patches of higher quality habitat to the west.

Based on the distribution of suitable cover and habitat, elk and moose could travel between Paradise Ridge, northeast towards Tomer Butte or southwest to the small patches of suitable habitat in Washington State. The closest cover in the Paradise Ridge area to the complex of habitat in Washington is a small pine stand located just north of Eid Road. Ungulates would likely utilize the small patches of trees or shrub habitat for cover while grazing in the agricultural fields nearby. Moose are expected to only have occasional random movement through these areas. Deer move in all directions to and from Paradise Ridge and the patches of Washington habitat during all times of the year (Melquist 2005a).

The project area is located in a low priority wildlife linkage area of US-95 identified by IDFG. The number of wildlife collisions in this linkage area was much less than other segments of US-95 or similar type highways (ITD 2013). See Section 3.10 Transportation for additional information regarding wildlife collision data and the Safety Technical Report for details.

Aquatic Species

Table 28. Fish Species Occurring in the South Fork Palouse River lists the fish species known to occur in the South Fork Palouse River. The only salmonid native to the Palouse River is an isolated population of West-slope cutthroat trout; however, it does not occur in the South Fork Palouse River. Idaho State Water Quality Standards do not distinguish between native and introduced salmonids for the designation and protection of salmonid spawning.

Table 28. Fish Species Occurring in the South Fork Palouse River

Common Name	Scientific Name	Status
Longnose dace	*Rhinichthys cataractae*	Native
Speckled dace	*Rhinichthys osculus*	Native
Redside shiner	*Richardsonius balteatus*	Native
Largescale sucker	*Catostomus macrocheilus*	Native
Bridgelip sucker	*Catostomus columbianus*	Native
Brook trout	*Salvelinus fontinalis*	Introduced
Brown trout	*Salmo trutta*	Introduced
Rainbow trout	*Oncorhynchus mykiss*	Introduced
Northern pike minnow	*Ptychocheilus oregonensis*	Introduced

Source: Palouse River Watershed Assessment and TMDLs, February 2007

3.9 Threatened and Endangered Species

3.9.1 Regulatory Framework and Policies

Threatened and endangered species are governed by the following:

- 16 USC 1531-1544-Endangered Species Act
- Magnuson-Stevens Fishery Conservation and Management Act (P.L. 104-297)

The ESA directs federal agencies to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the existence of any threatened or endangered species, or result in the destruction or modification of their critical habitat.

3.9.2 Methodology

A Biological Assessment (BA) was prepared for the proposed project in February 2007. The purpose of the BA was to analyze the potential effects of the proposed project on threatened, endangered, proposed, and candidate species and designated critical habitat. The BA was submitted to USFWS for review. USFWS concurrence was received on March 2007. The BA was reviewed again in November 2011 and resulted in a verification email from USFWS that the original effect determination is valid. A clarification to the proposed conservation measures outlined in the 2007 BA, and associated concurrence letters were provided in an email on April 2012.

In assessing potential effects to listed species, one of the following effects findings is required:

- "No effect" means there will be no effects, positive or negative, to listed or proposed resources. Generally, this means no listed resources will be exposed to the action and its environmental consequences.
- "May affect, but not likely to adversely affect" means that all effects are beneficial, insignificant, or discountable. Beneficial effects have contemporaneous positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact and include those effects that are undetectable, not measurable, or cannot be evaluated. Discountable effects are those extremely unlikely to occur.
- "May affect, and is likely to adversely affect" means that listed resources are likely to be exposed to the action or its environmental consequences and will respond in a negative manner to the exposure.

Since publication of the DEIS, the project area was resurveyed for rare plants including Spalding's catchfly. The survey methods and findings are documented in a memo titled: Memo Documenting Resurvey for Spalding's Catchfly along US-95 Thorncreek to Moscow Project

Area (Lichthardt 2014). The most recent USFWS species list was also reviewed in early 2015 but no new species were listed or proposed in the action area (USFWS 2015).

3.9.3 Existing Conditions

Table 29. Federally Listed Threatened and Endangered Species shows species listed as threatened or endangered and designated critical habitat in Latah County, Idaho according to USFWS and NOAA. Federal candidate species are described in Section 3.8 Vegetation, Fish and Wildlife. If the federal candidate species are listed before construction and the project could result in an effect to the species' the BA will be amended.

Table 29. Federally Listed Threatened and Endangered Species

Common Name	Scientific Name	Federal Status
Canada lynx	*Lynx canadensis*	Listed Threatened
Spalding's catchfly	*Silene spaldingii*	Listed Threatened
Water howellia	*Howellia aquatilis*	Listed Threatened
Steelhead trout	*Oncorhynchus mykiss*	Listed Threatened
Steelhead trout	*Oncorhynchus mykiss*	Designated Critical Habitat

Species descriptions and general habitat requirements are summarized below:

Canada lynx. The Canada lynx habitat occurs in older dense primarily coniferous/boreal forests with downed trees located above elevations of 4,000 feet. The lynx utilize primarily Engelmann spruce, subalpine fir, and lodgepole pine habitats. The lynx's population and distribution is highly dependent on the distribution of its primary food source, the snow shoe hare, and to a lesser degree, other small mammals and birds.

The project area is located on agricultural land less than 3,000 feet in elevation and is located greater than 20 miles from the nearest potential Lynx Analysis Unit (ITD 2005) (USFWS 2009).

Spalding's catchfly. Spalding's catchfly typically occurs in open native grasslands with minor shrub components occasionally with scattered conifers. The majority of the project area is agricultural land; however, there are CRP lands, grasslands, scattered ponderosa pine stands and Palouse remnants that offer potential habitat for Spalding's catchfly. The project area is also included as a key conservation area for Spalding's catchfly recovery and is the focus of numerous restoration projects including Spalding's catchfly establishment. See Section 3.8.3. Non-native annual grasses such as tall oatgrass and smooth brome are the largest threats to Spalding's catchfly populations.

The larger remnant portions of grassland are found along the south end of Paradise Ridge. Smaller remnant populations are scattered across the south end of the project. The project area was surveyed for Spalding's catchfly during the summer of 2005. No Spalding's catchfly plants were found. Two field visits were conducted in 2006, which resulted in the discovery of a Spalding's catchfly population on Clyde Hill between the Modified W-4 and C-3 alignments, but outside of the alignment footprints. The next closest known occurrences of the species are 8 miles from the project area in Genesee and 15 miles west of the project area near Colton, Washington (ITD 2005). USFWS and IDFG completed additional surveys from 2008 to 2010; however no new plants were identified in the project area (Hill 2011). After the DEIS was published, ITD also completed additional survey of the remnants in the project area and no new Spalding's catchfly plants were found (Lichthardt, 2014).

Water howellia. Water howellia occurs in wetlands within forested, channeled, scablands. It is mostly found in partly shaded vernal pools or shallow ponds that hold water into mid-summer but dry out by September. The only area where water howellia could potentially occur in the project area is the floodplain of the South Fork Palouse River. However, the floodplain is actively cultivated and the stream is channelized. It is dominated by reed canarygrass, a non-native invasive weed which does not provide suitable habitat. Therefore it is highly unlikely that water howellia is present (ITD 2005).

Steelhead Trout and Designated Critical Habitat. NOAA designated critical habitat for steelhead on November 30, 2004. Designated critical habitat included areas in Latah County. The nearest occupied habitat is within the Snake River Basin Steelhead Evolutionary Significant Unit. The Palouse Subbasin habitat was specifically excluded from the designated critical habitat in the final rule for the designation of Critical Habitat in the Federal Register [50 CFR Part 226] in 2005 (NOAA 2012).

3.10 Transportation

3.10.1 Regulatory Framework and Policies

Transportation is governed by the following:

- FHWA TA 6640.8A requires analysis of changes to travel patterns and accessibility, effects to highway and traffic safety for bicyclists and pedestrians, and overall public safety (FHWA 1987).

3.10.2 Methodology

Data on existing highway and roadway facilities were obtained from ITD, Latah County, the City of Moscow, and local highway districts. Information regarding transit was obtained by

interviewing the Moscow Valley Transit and Moscow Transportation Commission. Existing access information was gained from field observations, aerial photographs and review of transportation plans. In addition a technical report was developed to evaluate traffic operations and safety within the project corridor. The technical report is titled, US-95 Thorncreek Road to Moscow; AASHTO Highway Safety Manual Analysis for Alternatives Carried Forward (ITD 2012a).

The following reports were prepared or revised since the DEIS was published:

- *US-95 Thorncreek Road to Moscow; AASHTO Highway Safety Manual Analysis on Alternatives Carried Forward* (ITD 2013). The Safety Analysis that was developed for the DEIS was revised to include the predicted crash data on the existing US-95 loop and provided updated data.
- *Addendum 1 US-95 Thorncreek Road to Moscow AASHTO Highway Safety Manual Analysis on Alternatives Carried Forward. (ITD 2015b).* This is an addendum to the previous report (ITD 2013) which evaluates the Modified W-4 Alternative.
- *US-95 Thorncreek Road to Moscow; Mobility and Road User Cost Study on Alternatives Carried Forward* (ITD 2014a). This study was developed to respond to public comments regarding the significance of the difference in lengths, travel times and to evaluate road user costs.
- *Addendum 1 US-95 Thorncreek Road to Moscow; Mobility and Road User Cost Study on Alternatives Carried Forward. (ITD 2014b).* This is an addendum to the previous report which evaluates the Modified W-4 Alternative.
- *Weather Analysis and Climate Study for US Highway 95, Thorncreek Road to Moscow, Four Proposed Alternatives, No-Build, W-4, C-3 And E-2* (Qualls 2014). This report is a compilation and synthesis of several previous reports. It clarifies the methodology, data sets, meteorological principles and patterns, and presents additional information on snow accumulation and snowmelt. On-site measurements and variability across the study area were analyzed. Satellite remote sensing data from 2002 through 2012 documents the spatial distribution of snow. Additional data was provided to address comments on the short sampling duration in the original Weather Analysis. It describes the variability of weather related roadway conditions between the alternatives.

On-site measurements collected include:

- Instantaneous, and 24-hour maximum and minimum air temperature
- Relative humidity
- Average and gust wind speeds/directions
- Incoming shortwave radiation
- Precipitation type, rate and accumulation

- Snow depth
- Visibility distance

Wind speed/direction and incoming solar radiation on a horizontal plane were measured at 33 feet height; air temperature, relative humidity, precipitation, visibility distance, and snow depth were measured at approximately 6.5 feet in height. Wet bulb and dew point temperatures were calculated from the temperature and humidity data.

The original weather analysis included monthly and total precipitation from January through May 2005, reported as liquid water equivalent depths, at the three weather corridors and the PSF. Comparing current year PSF values to the 30-year normal shows that January and February were dry months, March and May were excessively wet months, and April was similar to the climatological norm so that the study period included a good sampling of precipitation across the range of historically observed climatological values.

There was a strong correlation between monthly precipitation at the PSF and at each of the three study corridors, which allowed an estimation of the monthly climatological normal precipitation at each of the three study sites.

It is common practice in scientific field studies to conduct short-term data collection, on the order of a few months, to determine spatial variability of weather characteristics (for example, the First International Satellite Land Surface Climatology Project (ISLSCP) Field Experiment (FIFE), (Hall and Sellers 1995) from which more than 1000 scientific publications were produced.

The five-month data set used in the DEIS Weather Analysis was not the sole source of weather data but is a valid methodology used to establish the relative conditions among the EC, WC and RH weather stations within their respective climate regimes. The smaller five-month data set was used to establish the relative ranking of the short-term data within the larger PSF data set, which is about a mile from the study area. Knowledge of the relative conditions among the three on-site weather stations and the UI weather station allowed estimation of the long-term climate at each of the on-site weather stations through calibration with the long-term UI climate records.

The relative weather conditions at the three stations behaved consistently with established principles of physics and thermodynamics, and compared to similar locations and/or elevation trends documented by scientific literature (Qualls 2014).

3.10.3 Existing Conditions

Within Idaho, US-95 is classified as a principal arterial, providing the only continuous north-south highway connection between the Idaho Panhandle and the rest of the state. It supports multiple local uses, including primary access to agricultural, residential, commercial and industrial land located directly adjacent to the highway. Within the City of Moscow, US-95 connects with SH-8, which is a major east west highway. Both US-95 and SH-8 serve as principal arterials within the local system and Regional Transportation System.

Safety

Crash data between 2003 and 2012 shows that this section of US-95 averages 25.3 crashes per year and would reach 27.4 crashes in the year 2017. Safety issues within the study area relate primarily to the road geometry and accesses onto the roadway. Table 30. Crash Severity Data and Table 31. Crash Data summarize the crash types and severity as well as contributing conditions (ITD 2013).

Table 30. Crash Severity Data

Year	Total	Fatal	Type A	Type B	Type C	PDO
2003	28	1	1	4	5	17
2004	21	0	1	4	3	13
2005	22	0	1	3	4	14
2006	14	1	3	2	1	7
2007	33	0	4	7	7	15
2008	26	0	3	2	5	16
2009	22	0	0	3	2	17
2010	26	1	2	5	6	12
2011	14	2	0	0	1	11
2012	47	0	3	4	10	30
Total	253	5	18	34	44	152

Type A - Incapacitating injury but no fatality such as a spinal injury
Type B - Evident injury that is non-incapacitating such as a minor injury like a broken arm
Type C - Possible injury that is not obvious at the scene
PDO-Property damage only with no injury.

Table 31. Crash Data

Year	Wildlife	Intersection related*	Head-ons	Negotiating a curve	Inclement Weather or Road Conditions
2003	3	4	0	19	18
2004	3	2	0	4	14
2005	4	4	0	5	9
2006	1	1	1	5	6

Year	Wildlife	Intersection related*	Head-ons	Negotiating a curve	Inclement Weather or Road Conditions
2007	3	5	2	13	19
2008	3	2	0	9	14
2009	6	1	1	11	12
2010	4	3	3	12	18
2011	2	0	0	6	13
2012	3	4	1	16	27
Total	32	26	8	100	150

*Crashes occurred either at/in an intersection.

The crashes that have occurred on the existing alignment over the past 10 years appear to be random in nature and include head-on crashes, sideswipes, rear end turning, overturning, run off the road to the ditch and embankment, among other crash types.

Twenty-six crashes occurred due to access issues. These accidents occurred either at an intersection, because of an intersection or at a private access point. Accidents at intersections tend to have a higher severity than accidents outside of intersections. Ten percent of these intersection-related crashes are rated as Type A for severity. Approximately 40 percent of these intersection related crashes occurred at private approaches (ITD 2013).

There were eight head-on collisions, which generally had the highest severity rating of all types of accidents. These types of accidents are generally associated with passing maneuvers. By adding a lane in each direction and separating the direction of travel, the frequency of these accidents will be greatly reduced (ITD 2013).

The National Highway Traffic Safety study on the cost of crashes shows that society generally pays for 75 percent of crash costs. Economic values for crashes in the project area have been calculated by crash severity. Fatal accidents in the project area cost approximately $6,200,000 whereas property damage only crashes cost approximately $6,700 per crash in 2012 (ITD 2013).

Three HALs are located within the project limits based on information presented in the DEIS. See Table 32. High Accident Locations (HALs). These segments have the highest crash rates in ITD District 2 and are in the top 13 highest crash locations in the State of Idaho. The crash rates in these locations and throughout the corridor are expected to increase as traffic volumes increase (ITD 2012a).

Table 32. High Accident Locations (HALs)

Milepost Location on US-95	HAL Ranking in Idaho
337.67 - 338.17	6
338.67 - 339.62	13
340.62 - 341.12	4

Accidents near MP 339.1 and MP 344.0 are primarily caused by failure to negotiate the existing curves. Most of these accidents can be attributed to curves in the project area that have substandard geometry and narrower than standard shoulders. Between 2003 and 2012 approximately 40 percent of the accidents in the project area occurred while a driver was negotiating a curve.

Since the DEIS was published, the crash data was updated and the HALs were recalculated. Two HALs are located within the project limits based on the updated crash data. See Table 33. Updated High Accident Locations (HALs). These segments have the highest crash rates in ITD District 2 and are in the top 50 highest accident locations in the State of Idaho. The crash rates in these locations and throughout the corridor are expected to increase as traffic volumes increase (ITD 2013).

Table 33. Updated High Accident Locations (HALs)

Milepost Location on US-95	HAL Ranking in Idaho
337.67 - 338.17	17
340.62 - 341.12	34

IDFG identified four locations as ungulate crossing areas in Latah County through their Fish and Wildlife Linkage Area Project (Geodata 2008). US-95 Thorncreek to Moscow between MP 340 and 343.3 was identified as a low priority linkage area. The frequency of wild animal crashes in the project area is much less than many other sections of US-95 and many other highways in Idaho (Ruediger and DiGiorgio 2007). See Table 34. Crashes by Ungulate Crossing Areas in Latah Countyfor a comparison between different US-95 segments identified by IDFG as Wildlife Linkage Areas in Latah County between 2003 and the end of 2012.

Table 34. Crashes by Ungulate Crossing Areas in Latah County

Ungulate Crossing Area on US-95	Total Wild Animal * Crashes	Linkage Priority Status
Marsh Hill (MP 367.1 -370.1)	27	Moderate
Crooks Hill (MP 356.0 – 359.0)	19	Low
Steakhouse Hill (MP 349.7-352.7)	47	Moderate
Thorncreek to Moscow (MP 340 -343.3)	17	Low

* Wildlife Crashes and Wild Animal Crashes refer to primarily big game such as elk, moose and deer. Not all wildlife such as birds, amphibians, and small mammals are counted.

Crash data from 2003 thru 2012 indicated that there were 476 wildlife crashes along US-95 in District 2. There have been 32 wild animal crashes on US-95 within the project limits during that period. Seventeen occurred within the identified Thorncreek to Moscow ungulate crossing area. Of these only six were rated as type C (possible injuries). The rest of the crashes involving wildlife were property damage only (ITD 2013). Based on the low severity and randomness of the wildlife crashes, they are not anticipated to be a primary factor in the evaluation of the alternatives (ITD 2013).

Intersection related crashes are mostly multiple vehicle high severity crashes that involve head-on crashes, sideswipes, angle turning, and rear-ending crashes. Of the intersection related crashes reported in the past 10 years between Thorncreek Road and Moscow to characterize existing conditions, 19 total injuries that were a combination of serious injuries (Type A), visible injuries (Type B), and possible injuries (Type C) were reported (ITD 2013). The ITD's Strategic Highway Safety Plan has 11 emphasis areas, one of which is intersection crashes; however, there is no emphasis area for wild animal crashes due to their low severity (ITD 2010). However, ITD is currently working with IDFG and wildlife resource agencies to identify the highest priority wildlife crossing area for statewide prioritization within the State of Idaho.

Highway Capacity and Operations

Capacity, the ability of a road to accommodate traffic volume, is an important component of mobility (ITD 2014a). When traffic volumes increase and the roadways reaches capacity, the LOS may be affected.

With the existing Average ADT of 5,364, the current facility operates at a LOS-C, which is high-density traffic flow. Approximately six percent of the vehicle traffic is commercial and 94 percent is estimated to be passenger vehicles. At LOS C, speed and freedom to maneuver are severely restricted and the driver experiences a generally poor level of comfort and convenience.

Time spent following slower vehicles is noticeably longer and occurs more frequently. With LOS C, there are few gaps in traffic to allow for passing, increasing overall delay.

The existing roadway consists of two 12-foot undivided travel lanes with two-foot shoulders. The clear zone and shoulder width, which are important elements for safety, vary throughout the corridor and do not meet AASHTO standards[17]. This two-lane segment of US-95 is a bottleneck for the four-lane highway segments at the northern and southern ends of the project.

Access

This stretch of US-95 is designated as Statewide Access Control. There are currently 66 at-grade intersections and approaches (public, commercial and field) in this 6.34-mile segment of US-95. Between 2003 and 2012 there were 26 crashes directly associated with private approaches or intersections (ITD 2013).

The north end of the project is the most densely populated area. It has the highest number of access points and the highest number of intersection related crashes. Currently, the many approaches along the existing alignment do not meet the ITD Access Control Policy due to spacing, sight distance, width and grade of approaches, which contribute to intersection related conflicts. The Latah County Comprehensive Plan requires that limits should be placed on the number of access points to state and federal highways (Latah County 2010).

Mobility and User Cost

Mobility refers to the efficiency and speed that motorist travel from one location to another and is defined by the AASHTO Policy on Geometric Design of Highways and Streets as "trip travel time". Capacity is an important component of mobility.

The total travel time for motorists making the entire trip on existing US-95 from Thorncreek Road to Moscow in 2017 would be 380,000 hours with a total cost of travel time, cost of time related vehicle depreciation, and vehicle operating costs of $14,600,000 (ITD 2014a).

Increased mobility reduces road user costs and is expected to improve economic opportunity according to the 2011 ITD Strategic Plan. See the Mobility and Road User Cost Technical Report (2014a) for additional Information.

[17] AASHTO standards are outlined in the Roadside Design Guide 2011 (4th Edition)

Bicyclists and Pedestrians

The existing US-95 travels primarily through an agricultural area and there are no formal bicycle and pedestrian facilities along the highway corridor. Currently bicyclists and pedestrians must use the shoulders, which vary, through the corridor. The shoulders are not striped to accommodate dedicated bicycle or pedestrian paths.

Mass Transit

There is currently no mass transit available in the study area; however, there is mass transit available in the City of Moscow. While service ends approximately a half-mile north of the project limits, consideration of future service extension is possible. Moscow Valley Transit had bus routes between Moscow and Lewiston; however, the service was discontinued in 2010 due to low ridership and lack of funding. The City of Moscow operates a small vanpool between Moscow and Lewiston. Palouse Rideshare, an on-line carpooling match program, is available for commuters travelling the same routes on a regular basis.

Weather Conditions

During meetings held from 2004 to 2006, and during the DEIS public comment period, weather conditions as they affect safety were a major topic of concern. The public expressed concern that the topographic differences between locations of the different alternatives could influence safety differently. A report titled Final Report for Weather Analysis of Proposed Realignments of U.S. Highway 95; Thorncreek Road to Moscow (Qualls 2005) was prepared.

During the DEIS comment period, the public expressed concern about the weather data set, the influence of elevation on temperature, ice, and snow. There were also comments regarding fog, wind, snowdrift and other weather related road conditions. The Weather Analysis was revised after the DEIS hearing and additional information, clarification and additional data was incorporated into this section.

General Climate of the Region. Northern Idaho, including Moscow, Idaho and surrounding areas, has a maritime, dry-summer climate (Abramovich et al, 1998). The existing US-95 alignment from Thorncreek Road to Moscow and all of the proposed alternatives are subject to this climate. There is a lengthy history of climate information available as a reference for the region, such as data from the PSF located approximately one mile from the study area. The PSF has weather data extending back to 1892 (Qualls 2014).

Associated with the general climate of the region, the study area can be expected to experience precipitation, snow, ice, wind and fog. Approximately 60 percent of crashes during the past 10 years occurred during inclement weather where the police reports list snow, rain, or fog as the weather condition during the crash incident.

The weather analyses divided the project area into three distinct weather corridors: a western corridor, eastern corridor and Reisenauer Hill. These do not specifically correspond to the individual alternatives (E-2, C-3, and Modified W-4 alternatives); however, based on the principles of physics and thermodynamics, the Modified W-4 Alternative was most closely represented by the western corridor, and the E-2 and C-3 Alternatives were best represented by the eastern corridor. The southern two fifths of the study area for all the alternatives were best represented by Reisenauer Hill. Wind, snow, precipitation, ice, and fog were evaluated to determine if there were differences in conditions between the corridors as summarized in this section.

Wind. Analysis of the data reported in the weather analysis showed the eastern corridor and western corridor to have wind speeds similar to each other, and Reisenauer Hill to experience faster wind speeds than either of the other two corridors. The predominant airflow in the region is in the east-west direction. Given the extent of Paradise Ridge, the northern two-thirds of the study area was dominated by flow over Paradise Ridge, and the southern third of the study region generally experienced air flow which moved around the southern end of Paradise Ridge.

Fog. Fog or clouds are formed when the temperature of the air decreases enough that atmospheric water vapor reaches the saturation point, causing condensation of vapor into fine liquid water droplets. This can happen because temperature decreases or by increasing atmospheric humidity. Multiple measurements were collected each minute, and these were reported as samples, averages or accumulations, depending on the variable, several times per hour.

Measurements of visibility distances associated with fog at the eastern corridor, the western corridor, and Reisenauer Hill showed Reisenauer Hill to have the poorest visibility conditions, followed by the eastern corridor and then the western corridor. There were fewer hours of dense fog in the lowland areas but the worst fog in the study area was located in the southern project area south of Eid Road.

Precipitation and Snow. Snow accumulation is primarily a function of the amount of precipitation and the air temperature while precipitation is falling. Precipitation, especially as snow, is of significant interest in this project in terms of its impact on driving safety for each of the roadway alignment alternatives. Regionally, precipitation decreases on a gradient from Moscow south to the top of the Lewiston grade. Countering this is the localized topography of Paradise Ridge and the fact that precipitation generally increases with elevation on the upwind side of a slope.

Measurements during the study regularly showed the air temperature in the western corridor as 10 to 15 degrees Fahrenheit less than the air temperature in the eastern corridor. The study showed that the eastern corridor was freezing four percent more than the western corridor; however, it was more common for all the corridors to be freezing at the same time. The data regarding snow accumulations showed that snow melts off most slowly from steep north-facing slopes and most quickly from steep south-facing slopes, with gradual variation between these extremes.

Precipitation studies showed that precipitation in the eastern corridor was the greatest and was approximately 25 percent more than the western corridor and near Reisenauer Hill. Annual precipitation at the eastern corridor and Reisenauer Hill weather stations are similar to the PSF and average 2.5 inches per year lower at the western corridor weather station. Due to the short horizontal distance in the upwind direction from the peak of Paradise Ridge to the valley floor, much of the precipitation lands and accumulates downwind of the ridgeline to the south and east of Reisenauer Hill and Paradise Ridge.

Data from the Revised Weather Analysis shows snow accumulation to be less further north of Reisenauer Hill. Both the on-site weather station measurements and the satellite images in the technical report provide useful information comparing snow accumulation between alternatives. Reisenauer Hill is the most critical location within the study area, including both the north-facing slope on the north end and the region to the south toward Thorncreek Road, due to greater accumulation and retention of snow compared to the rest of the study area.

Exhibit 23. Snow Cover shows an eastward looking view of the eastern corridor from Zeitler Road showing the contrast between either flat or south-facing slopes or slopes with a north-facing aspect. The snow covered slopes face northwest. Since the photographs were taken before 10 a.m., the sun was still to the east, so that northwestern slopes had not yet been exposed to direct solar radiation. Flat and south-facing slopes both in the low-lying foreground and at higher elevations in the background are free of snow.

Exhibit 23. Snow Cover

Ice. Icy road conditions may result from condensation on road surfaces during freezing conditions. Reisenauer Hill had the highest total number of hours with frost conditions, followed closely by the western corridor. The southern portion of the study area has the most severe frost conditions. The eastern corridor would both have less than half the number of hours with frost conditions than Reisenauer Hill and the western corridor. See the Revised Weather Analysis (Qualls 2014) for more detail.

3.11 Visual Quality

3.11.1 Regulatory Framework and Policies

Visual quality is governed by the following:

- 23 USC-131 Control of Outdoor Advertising
- 23 USC-136 Control of Junkyards
- 23 CFR-750-Highway Beautification Act
- FHWA's visual quality assessment methodology
- Context Sensitive Solutions (CSS)
- TA 6640.8A NEPA Implementation-Guidance for Preparing and Processing Environmental and Section 4(f) Documents

3.11.2 Methodology

A technical report titled U.S.-95 Thorncreek Road to Moscow Project Final Visual Resources Report (December 2005) was prepared and documents the methods and findings of the visual quality analysis. The purpose of the visual analysis is to assess the existing visual resources of the project corridor and to identify and describe positive and negative visual effects that may occur for each of the alternatives.

Investigators completed site visits, reviewed aerial photographs and developed a three-dimensional (3-D) virtual model that was used at public meetings. The analysis consisted of two phases: an inventory and an assessment of data. During the inventory, investigators identified key observation viewpoints, assessed project visibility, variety classes and distance zones. See Table 35. Visual Variety Classifications. During the second phase, data was analyzed to determine the potential effects of each alternative to visual resources. See the Visual Resources Technical Report.

Table 35. Visual Variety Classifications

Variety Classification	Description
Class A	These are areas where features of landform, vegetation patterns, and rock formations are outstanding within the study area. These features are typically unique and dominate the landscape.
Class B	These are areas where features contain variety in form, line, color, and texture or combinations of these. These features tend to be common throughout the study area.
Class C	These are typically areas with minimal variety in form, line, color, and texture or areas that have been substantially altered by human presence. These areas are typically associated with urban areas such as the City of Moscow.

Distance zones were established because visual perception of form, texture, color, and other visual criteria change as distance from a viewpoint increases. There are four thresholds:

- Extreme Foreground (0 to 0.25 mile)
- Foreground (0.25 miles to 0.5 mile)
- Middle ground (0.5 to 1 mile)
- Background (1 to 3 miles)

After areas were delineated according to project visibility, variety class, and distance zone, the visual effects from different features of the alignments were evaluated.

Additional visual assessment was completed as part of the DEIS Community Impact Assessment Technical Report (HDR 2006). This report also provides design visualizations towards and from several angles and positions including views from the City of Moscow towards the highway.

3.11.3 Existing Conditions

The rolling hills of the Palouse and small farms characterize much of the landscape. Paradise Ridge, a prominent feature, is located outside of the study area further to the east. Dense urban areas associated with the City of Moscow are located to the north.

Key observation viewpoints where viewers who are most sensitive to visual change or where viewers believed to have a high concern for visual change were most likely to be found, were identified. The two key observation viewpoints for this project were identified as residential and recreation viewpoints.

Residential viewers included urban dwellers found in and around the City of Moscow and rural dwellers associated with outlying areas and farms. Recreation viewpoints are typically associated with parks, golf courses, trails and scenic overlooks. Viewers at these viewpoints are concerned with visual impacts because these impacts influence their perception of the recreation experience. Several parks considered as recreation viewpoints are:

- Frontier Park
- Paradise Ridge Road (bicycling and hiking)
- University of Idaho Golf Course
- University of Idaho Arboretum

See Exhibit 19. Points of Interest. See the Visual Resources Technical Report for additional information.

Information from the photogrammetric review, 3-D virtual model, and site visits were used to delineate areas into three variety classes; A, B, and C as described below:

A. The upper portions of Paradise Ridge were the only areas delineated as Class A. The high diversity in landform, vegetation, and uniqueness to the study area contributed to this classification.
B. The rolling hills of the Palouse farmland and the lower slopes of Paradise Ridge were classified as B. While common to the Palouse country, these areas exhibit variety in color, texture, and landform.
C. The urban areas associated with the City of Moscow were classified as C. These areas are heavily altered, dominated by structures, roads, and other man-made amenities.

3.12 Traffic Noise

3.12.1 Regulatory Framework and Policies

Traffic noise is governed by the following:

- 23 CFR 772-Procedures for Abatement of Highway Traffic Noise and Construction Noise
- ITD Traffic Noise Policy

TA 6640.8A NEPA Implementation-Guidance for Preparing and Processing Environmental and Section 4(f) Documents 23 CFR 772 Procedures for the Abatement of Highway Traffic and Construction Noise outlines the FHWA noise regulations. It contains the criteria used for establishing noise impacts and mitigating those impacts.

FHWA and ITD require a traffic noise analysis of federally funded projects or federal aid highway projects that construct new highways or reconstruct existing highways if the project would significantly change either the horizontal or vertical alignment or increase the number of through-traffic lanes.

The FHWA has established NAC standards for several categories of land use activities. See Table 36. FHWA Noise Abatement Criteria (NAC). A traffic noise impact occurs when the existing or future noise levels approach (1 dBA below the FHWA NAC) or exceed the FHWA Noise Abatement Criteria (NAC) or when the predicted future traffic noise levels substantially exceed the existing noise levels, even if the predicted noise levels may not approach or exceed the FHWA NAC.

Table 36. FHWA Noise Abatement Criteria (NAC)

Activity Category	Leq (dBA) FHWA	Evaluation Location	Description of Activity Category
Category A	57	Exterior	Land on which serenity and quiet are of extraordinary significance and serve an important need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
Category B	67	Exterior	Residential
Category C	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings

Activity Category	Leq (dBA) FHWA	Evaluation Location	Description of Activity Category
Category D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
Category E	72	--	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F
Category F	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
Category G	--	--	Undeveloped lands that are not permitted
Substantial Increase	15	--	A substantial increase of 15 dBA over the existing noise levels

Source: 23 CFR 772 and ITD Traffic Noise Policy

3.12.2 Methodology

Noise is defined as unwanted sound. There are several different ways to measure noise, depending on the source of the noise, the receptor, and the reason for the noise measurement. Noise in these analyses was measured in terms of sound pressure levels expressed in A-weighted decibels (dBA). Noise levels stated in terms of dBA reflect the response of the human ear by filtering out some of the noise in the low and high frequency ranges that the ear does not detect well.

A technical report titled Analysis of Noise and Impacts US-95 Thorncreek Road to Moscow was prepared in 2012 to evaluate the existing noise conditions and to determine if the alternatives, including the No Action Alternative, would result in noise impacts meeting or approaching the FHWA Noise Abatement Impact Criteria (NAC). An addendum to the 2012 Noise Analysis was prepared to evaluate the noise impacts of the Modified W-4 Alternative. Both of these reports were updated in 2015 to reflect revised impacts and potential impacts due to the project right-of-way.

The noise analysis was performed in accordance with 23 CFR 772 and the ITD Traffic Noise Policy dated May 2011. Field measurements were taken and a computer noise analysis was performed using the FHWA Traffic Noise Model (TNM) 2.5. The model was used to predict noise impacts to sensitive receptors in the project area in 2010 and the design year of 2037 for all of the alternatives.

Vehicle speeds were 60 mph for the existing roadway and 65 mph for the No Action and Action Alternatives. The posted speed limits change to 35 mph or 45 mph at the approach to Moscow, depending on the alternative. Traffic volume input that was used in the TNM model was divided into road segments as shown in Table 37. TNM Model Traffic Volume Inputs.

Table 37. TNM Model Traffic Volume Inputs

T horncreek Road to End of New Alignment		
–	2010 ADT	2037 ADT
Cars	4,621 (94.3%)	7,223 (92.5%)
Medium Trucks	83 (1.7%)	164 (2.1%)
Heavy Trucks	196 (4.0%)	422 (5.4%)
–	2010 DHV	2037 DHV
Cars	534 (94.3%)	835 (92.5%)
Medium Trucks	10 (1.7%)	15 (2.1%)
Heavy Trucks	23 (4.0%)	35 (5.4%)
End New Alignment To Eid Road	–	–
–	2010 ADT	2037 ADT
Cars	4,621 (94.3%)	7,235 (92.5%)
Medium Trucks	83 (1.7%)	164 (2.1%)
Heavy Trucks	196 (4.0%)	422 (5.4%)
–	2010 DHV	2037 DHV
Cars	534 (94.3%)	836 (92.5%)
Medium Trucks	10 (1.7%)	15 (2.1%)
Heavy Trucks	23 (4.0%)	35 (5.4%)
Eid Road To Clyde Road	–	–
–	2010 ADT	2037 ADT
Cars	4,998 (94.3%)	7,804 (92.5%)
Medium Trucks	90 (1.7%)	177 (2.1%)
Heavy Trucks	212 (4.0%)	456 (5.4%)
–	2010 DHV	2037 DHV
Cars	576 (94.3%)	900 (92.5%)
Medium Trucks	10 (1.7%)	16 (2.1%)
Heavy Trucks	25 (4.0%)	38 (5.4%)

Clyde Road To Palouse River Road	–	–
–	2010 ADT	2037 ADT
5,640 (91.7%)	6,129 (94.3%)	9,454 (92.5%)
148 (2.4%)	111 (1.7%)	215 (2.1%)
362 (5.9%)	260 (4.0%)	552 (5.4%)
2017 DHV	2010 DHV	2037 DHV
660 (94.3%)	700 (94.3%)	1,083 (92.5%)
12 (1.7%)	12 (1.7%)	20 (2.1%)
28 (4.0%)	30 (4.0%)	46 (5.4%)

Source: Idaho Transportation Department 2012a

3.12.3 Existing Conditions

The results of the FHWA TNM 2.5 computer model analysis for existing conditions are shown in Table 38. Existing Noise Levels. The results of the FHWA TNM 2.5 analysis indicated that currently seven receptors approach or exceed the FHWA NAC, indicated by the bolded receptors in Table 38. Existing Noise Levels. Noise Receptor Locations are shown in Exhibit 24. Noise Receptor Locations. See the Traffic Noise Technical Report for additional detail.

Table 38. Existing Noise Levels

Receptor No.	Receptor Location	NAC Activity Category	Distance to Centerline (feet)	Existing Leq dBA
1	3336 US-95	B	146	59.3
2	3335 US-95	B	227	55.6
3	3379 US-95	B	154	58.9
4	3455 US-95	B	167	57.9
5	3460 US-95	B	235	55.2
6	1010 Eid Rd	B	193	58.9
7	1071 Eid Rd #3	B	2474	37.2
8	1071 Eid Rd, #5	B	2543	37.3
9	1071 Eid Rd, #7	B	2593	37.2
10	1071 Eid Rd, #9	B	2732	37.1
11	1071 Eid Rd, #8	B	2799	36.9
12	1071 Eid Rd, #2	B	2692	36.9
13	1084 Eid Rd	B	2595	36.8
14	3621 US-95	B	5349	58.2
15	3625 US-95	B	273	55.4
16	1005 Zeitler Rd	B	158	58.4
17	Undeveloped	G	5334	34.5

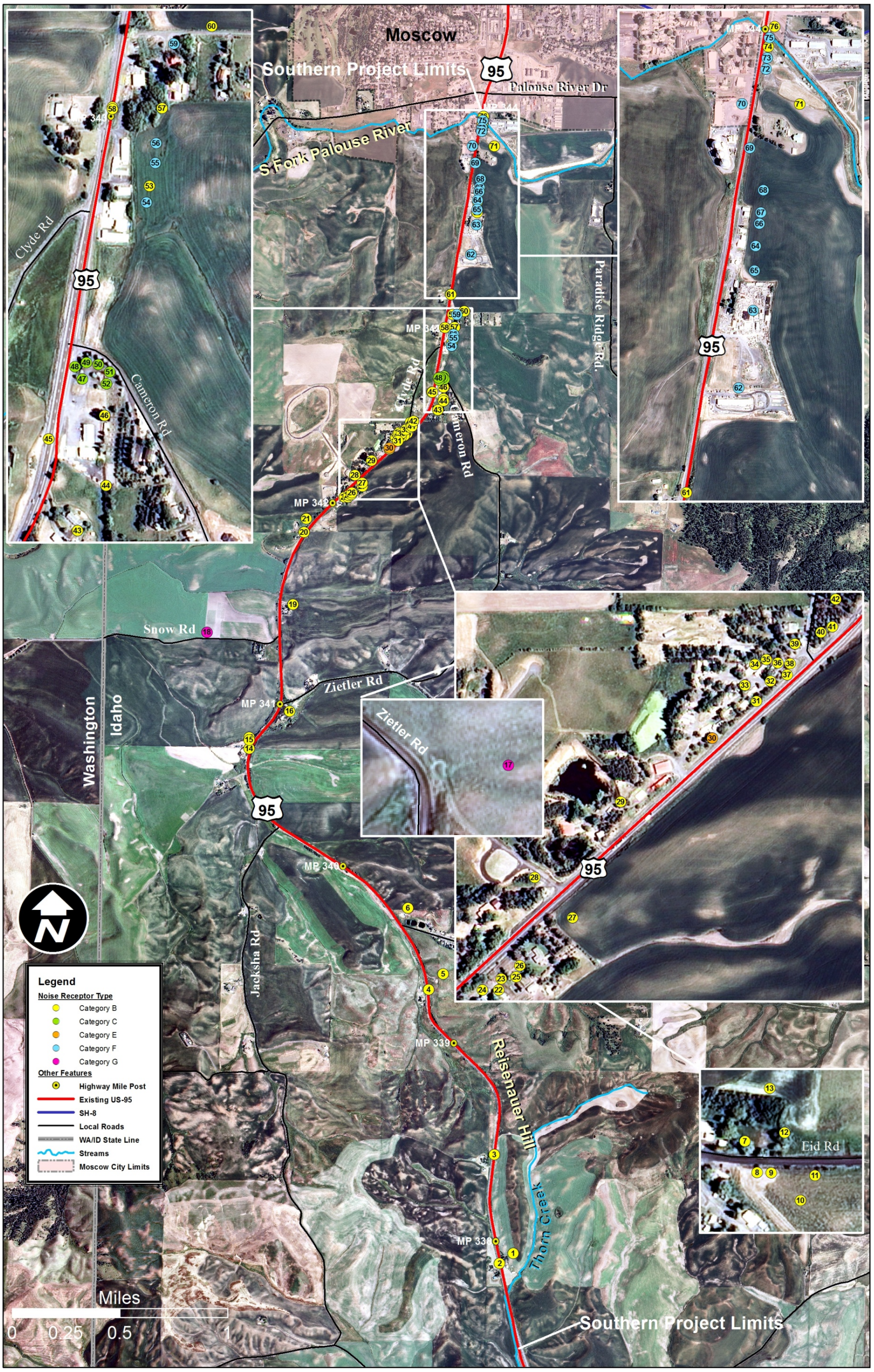
Receptor No.	Receptor Location	NAC Activity Category	Distance to Centerline (feet)	Existing Leq dBA
18	Undeveloped	G	1975	38.9
19	3672 US 95	B	142	60.1
20	3693 US-95	B	114	61.8
21	3125 US-95	B	254	54.5
22	3096 US-95	B	115	61.5
23	3094 US-95	B	90	63.7
24	**3098 US-95**	**B**	**63**	**67.1**
25	3082 US-95	B	127	60.7
26	3080 US-95	B	103	62.5
27	3060 US-95	B	103	62.6
28	3055 US-95	B	161	58.7
29	3045 US-95	B	151	59.4
30	3015 US-95	E	80	65.8
31	**2979 US-95, #22**	**B**	**71**	**66.7**
32	2979 US-95, #23	B	96	63.7
33	2979 US-95, #20	B	165	59.1
34	2979 US-95, #21	B	208	57.1
35	2979 US-95, #24	B	201	57.3
36	2979 US-95, #26	B	148	60.2
37	**2979 US-95, #25**	**B**	**69**	**67.0**
38	2979 US-95, #03	B	99	63.8
39	2979 US-95, #05	B	151	59.8
40	2979 US-95, #02	B	110	62.8
41	2979 US-95, #01	B	106	63.2
42	2949 Clyde Rd	B	177	58.5
43	2946 US-95	B	129	62.3
44	2936 US-95	B	164	59.6
45	2940 US-95	B	177	59.2
46	**2922 US-95**	**B**	**64**	**67.7**
47	**2921 Cameron Rd***	**C**	**68**	**67.1**
48	**2921 Cameron Rd***	**C**	**68**	**67.2**
49	**2921 Cameron Rd***	**C**	**68**	**67.4**
50	2921 Cameron Rd*	C	171	59.2
51	2921 Cameron Rd*	C	171	59.2
52	2921 Cameron Rd*	C	171	59.0
53	2880 US-95	B	79	65.5
54	2880 US-95	F	79	64.4

Receptor No.	Receptor Location	NAC Activity Category	Distance to Centerline (feet)	Existing Leq dBA
55	2860 US-95	F	90	64.4
56	2850 US-95	F	80	65.9
57	2848 US-95	B	80	65.8
58	2845 US-95	B	157	59.8
59	2820 US-95	F	82	65.3
60	2822 US-95	B	145	55.7
61	2805 US-95	B	149	60.4
62	2740 US-95	F	166	59.0
63	2726 US 95	F	179	58.5
64	2720 US 95	F	98	64.0
65	2710 US 95	F	122	61.6
66	2670 US 95	F	95	64.4
67	2650 US 95	F	89	64.8
68	2650 US 95	F	63	66.1
69	2551 US 95	F	121	62.2
70	2555 US 95	F	268	54.8
71	2500 US 95	B	264	54.5
72	2305 US 95	F	105	63.2
73	2205 US 95	F	110	62.8
74	2205 US 95	B	118	61.4
75	2113 US 95	F	122	59.6
76	2113 US 95	B	126	56.2

Note: Bolded numbers indicate that the noise level approaches or exceeds FHWA NACs.

*Green Acres RV Park stalls (Receptors 47-52) are counted as one business.

Exhibit 24. Noise Receptor Locations



3.13 Air Quality

3.13.1 Regulatory Framework and Policies

- 40 CFR 51-Requirements for Preparation, Adoption, and Submittal of Implementation Plans
- 40 CFR 93-EPA Standards; Control of Hazardous Air Pollutants from Mobile Sources
- 42 USC 7401-Clean Air Act (CAA) of 1970 and amendments of 1990
- ITD Air Quality Policy
- FHWA guidance on Mobile Source Air Toxic (MSAT) Analysis in NEPA documents
- IDAPA 58.01.01-Idaho State Administrative Procedures
- FHWA Policies to Reduce Greenhouse Gas Emissions Associated with Freight Movements
- FHWA TA 6640.8A NEPA Implementation-Guidance for Preparing and Processing Environmental and Section 4(f) Documents

CAA amendments of 1990 established air quality goals including those related to land use, travel mode choice, and reduction in vehicle miles traveled. The CAA amendments regulate projects in non-attainment and maintenance of National Ambient Air Quality Standards (NAAQS) requiring conformance with the State Implementation Plan.

Greenhouse gas (GHG), and specifically Carbon dioxide (CO2) emissions, are not currently regulated at the federal or state level. However, FHWA is working nationally with other modal administrations through the USDOT Center for Climate Change and Environmental Forecasting to develop strategies to reduce the transportation sector's contribution to greenhouse gases, particularly CO2 emissions, and to assess the risks to transportation systems and services from climate change.

3.13.2 Methodology

MSAT standards establish stringent controls on gasoline, passenger vehicles, and gasoline containment to further reduce emissions of benzene and other MSATs. While MSAT releases to the environment may cause some level of pollution, scientific techniques, tools, and data analysis has not been developed to accurately estimate actual human health or environmental effects from MSATs from this transportation project (ITD 2007b).

In order to evaluate the projected emissions and MSAT effects, a qualitative analysis was performed. Transportation-related emissions can be related to VMT. This qualitative analysis utilizes existing and projected traffic volumes, vehicle mixes and vehicle miles to calculate vehicle miles travelled (VMT). VMTs are used to estimate the changes and relative differences

in MSATs for the project alternatives. GHG emissions, including CO2, are shown to be directly related to energy consumed.

3.13.3 Existing Conditions

The project is not within a federally designated air quality non-attainment or maintenance area for carbon monoxide (CO) and/or particulate matter (PM10 or PM2.5), nor is it within an IDEQ air quality area of concern. No project level air quality concerns were identified that required evaluation and the project has minimal likelihood of exceeding federal air quality standards. An air quality conformity analysis is not required; however, a qualitative analysis of air quality was conducted. Sensitive receptors in the study area include schools, daycare facilities, hospitals, parks, and retirement facilities.

Greenhouse Gas (GHG)

The transportation sector is the second largest source of total GHGs in the US and is the greatest source of carbon dioxide (CO2) emissions, a predominant GHG. In 2004, the transportation sector was responsible for about 31 percent of US CO2 emissions. The principal human-made source of CO2 emissions is the combustion of fossil fuels, which accounts for approximately 80 percent of human-made emissions of carbon worldwide. Almost all (98 percent) of transportation-sector emissions result from the consumption of petroleum products such as gasoline, diesel fuel, and aviation fuel (FHWA 2011).

Transportation related emissions, including CO2 can be correlated to VMT and fuel consumption, which is discussed in Section 3.15, Energy. The VMT for the existing US-95 is 34,008. VMT was calculated by multiplying the length of the alignment (6.34 miles) by the 2010 traffic volumes. The 2010 data was compiled in 2011.

3.14 Hazardous Materials

3.14.1 Regulatory Framework and Policies

Hazardous materials are governed by the following:

- 40 CFR 1500-1508-CEQ Regulations
- FHWA TA 6640.8A NEPA Implementation-Guidance for Preparing and Processing Environmental and Section 4(f) Documents
- 42 USC 103-Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- 42 USC 6901-6992k -Resource Conservation and Recovery Act (RCRA)
- 33 USC Section 1251-Clean Water Act
- 40 CFR 61(M)-National Emission Standards for Hazardous Air Pollutants (NESHAP)

- 29 USC 651-Occupational Safety and Health Act (OSHA)
- 42 USC 300(f)-Safe Drinking Water Act
- 15 USC 2601-2629-Toxic Substances Control Act (TSCA)
- Idaho Statutes Title 39 Health and Safety
- Hazardous Waste Management Act (Chapter 44)
- Hazardous Substance Emergency Response Act (Chapter 71)
- Land Remediation Act
- Idaho Rules\Regulations\Standards (Chapter 72)
- IDAPA 37.03.09-Well Construction Standards Rules
- Rules and Minimum Standards for the Construction and Use of Injection Wells
- IDAPA 37.03.03 Rules and Minimum Standards for the Construction and Use of Injection Wells
- IDAPA 58.01.05-Rules and Standards for Hazardous Waste
- IDAPA 58.01.07-Rules Regulating UST Systems
- IDAPA 58.01.15-Rules Governing the Cleaning of Septic Tanks
- IDAPA 58.01.18-Land Remediation Rules
- IDAPA 58.01.11-Ground Water Quality Rules
- IDAPA 58.01.02-Water Quality Standards
- IDAPA 17.10.01-General Safety and Health Standards
- IDAPA 17.10.01-Idaho General Safety and Health Standards
- Lead-based Paint Poisoning Prevention Act of 1971
- Residential Lead-based Paint Hazard Reduction Act of 1992

3.14.2 Methodology

A technical report titled Hazardous Material Scan-US-95 Thorncreek Road to Moscow (Northwind 2005) was prepared to identify hazardous material risks in the study area. Federal and state databases were reviewed again in 2011 to identify any changes to known sites within one half-mile of each alternative that could be affected.

A survey for recorded and potentially hazardous materials was performed in 2005 within approximately one-half mile from the project area. Locations within the project area that potentially contained hazardous material were identified and marked on aerial photographs. Databases were reviewed and public safety personnel were interviewed. In addition, a field review of the study area was completed. The following sources were investigated to complete a hazardous materials scan of the study area:

National Response Center Public Report Database

- Latah County Solid Waste Department personnel interviews
- DEQ and ITD Lewiston personnel interviews regarding previous spills or releases
- Aerial photography
- Field survey of the corridor
- Idaho State Police Community and Drug Information.
- DEQ underground storage tank (UST) and leaking underground storage tank (LUST) database
- EPA database for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- Superfund sites and RCRA sites water dischargers, hazardous waste sites, toxic releases and air emissions sites
- Idaho State Police website for Region 2 was accessed to identify known hazardous materials sites, such as methamphetamine (meth) labs or meth production by-products dump sites
- FINDS, ALLSITES databases

3.14.3 Existing Conditions

The predominant hazardous materials observed during the field survey were small propane tanks and aboveground storage tanks (ASTs) for petroleum products. Two sites were identified that have recorded USTs and two sites appear to have USTs but were not recorded in the databases. A fifth site is listed in the EPA database but was closed in 1988. Table 39. Hazardous Material Sites lists the sites identified within and near the project area. Also see Exhibit 43. Hazardous Material Site Effects.

Table 39. Hazardous Material Sites

Site Name	Address	Database/ Listing	Description
Johnson Trucking	4212 Cameron Rd.	FINDS	USTs and ASTs
Widmans Sports Center	1906 S. Main St.	ID Allsites	300 gallon gas UST. Closed 1988.
Moscow MTCE Yard (B21200)	709 W. Palouse River Dr.	ID Allsites	–
Primeland Cooperative/ Latah County Grain Growers	4169 US-95 South	ID UST	5 USTs (diesel & petroleum). Currently in use.
CHS Inc. DBA Primeland Cooperative	2555 US-95 South	ID Tier 2	280,000 pounds diesel fuel.
Private	1451 Thorncreek Rd.	NA	1 200-gallon propane tank.

Site Name	Address	Database/ Listing	Description
Thorncreek Ranch	1461 Thorncreek Rd.	Unlisted	Possible UST (Petroleum) Gas pump on property. Old AST (petroleum) located in equipment storage area.
Private	4347 Wolf Rd.	Unlisted	2 200-gallon ASTs (Petroleum).
Clifford Wolf Farms	1010 Wolf Rd.	–	–
Moscow	Unlisted	1 AST; 3 diesel & 1 gas tank inside barn. (petroleum)	–
Alan Hoffman	1511 Thorncreek Rd. Moscow	Unlisted	Multiple ASTs associated with farm use. Possible UST (old gas pump observed on property). 1 200-gallon propane tank.
Daniel and Dana Carter	1255 Broenneke Rd.	Unlisted	1 200-gallon propane tank.
Weber Land Company	6782 SR 195, Uniontown, WA	Unlisted	1 AST-across road in farmed field.
Private	Residence on Broenneke Rd	Unlisted	2 ASTs; 1 300-gallon tank. (petroleum and propane).
Joyce Frei Family Trust	Residence on Broenneke Rd	Unlisted	2 ASTs and 1 300-gallon tank (petroleum and propane).
Roy and Catherine Reisenauer	3460 US-95	Unlisted	1 200-gallon propane tank.

Four sites were observed or recorded to contain USTs. Two UST sites were recorded on the DEQ UST list; Primeland Cooperative and Johnson's Trucking. Two other sites appeared to have USTs with visible gas pumps that may still be connected to USTs but were not listed by DEQ. Two of these sites were located on Thorncreek Road on the southern end of the study area. The other site was located on US-95 and probably contains one tank used for diesel fuel.

Other fuel storage containers noted in the study area are described below:

- There was an abandoned 1,000-gallon tank observed along Jacksha Road. It currently holds water from a spring. Four locations in the project area had 55-gallon drums on the property with unknown contents.
- Seventeen properties were observed with ASTs and assumed to contain petroleum products such as gasoline, heating oil, or diesel fuel. The majority of the ASTs were approximately 200 to 500 gallons tanks. Thirty-four homes were observed to have an aboveground propane tank on the property. These ranged in size from 200 gallon to 500-gallon tanks.

- Three sites had numerous abandoned cars. One location on US-95 is currently used as an automotive repair shop. These sites have the potential for the presence of petroleum products, stained soils, and leaky car batteries, which could contaminate soils or water. One business within the project area services air conditioners and is anticipated to have Freon and other gases that pose a risk to the environment if not handled correctly. This location also included a stockpile of railroad ties, which are typically a source of leaking creosote.
- There were two locations along US-95 within the study area that had methamphetamine lab related incidences (ISP 2005). Methamphetamine labs contain hazardous materials; therefore, it will be necessary to verify what level of cleanup has been completed prior to any construction activities (Denbleyder, pers. com. 2005).
- Latah County has a solid waste transfer station located on SH-8, approximately five miles east of Moscow, outside the study area.

Lead-based paints and a variety of asbestos containing products were commonly utilized in construction between the 1940s and the mid-1970s. Lead-based paint was determined to be a hazardous material in the early 1970s. The vast majority of homes built before 1950 contained substantial amounts of lead-based paint. Due to the age of many of the existing structures there is the potential risk of lead-based paint and asbestos contained in the structures that would be demolished by each alternative.

3.15 Energy

3.15.1 Regulatory Framework and Policies

Energy is governed by the following:

- 40 CFR 1502-Council on Environmental Quality NEPA Regulation
- FHWA TA 6640.8A NEPA Implementation-Guidance for Preparing and Processing Environmental and Section 4(f) Documents

3.15.2 Methodology

Energy requirements of a highway include the energy required to construct, operate, and maintain the highway. The operational energy consumption has been estimated using the average energy consumption for different vehicle types (heavy trucks and passenger vehicles) and the VMT. VMT is estimated by multiplying the ADT by the length of the highway segment.

Maintenance energy can also be estimated based on the VMT because the amount of roadway that needs to be maintained and the amount of traffic using the roadway relates to the frequency which maintenance would be needed.

3.15.3 Existing Conditions

Operational energy

Table 40. Existing and Projected Fuel Use shows the estimated fuel used for vehicle types travelling on the existing 6.34-mile long highway segment.

Table 40. Existing and Projected Fuel Use

Vehicle type	Average Fuel Consumption (mpg)	Estimated Daily Fuel Use 2010 (gal)	Estimated Daily Fuel Use 2037 (gal)
Passenger Vehicle	22.2	1,445	2,252
Heavy Truck	5.9	329	687
Total Energy Use	–	1,773	2,939

The fuel consumption estimates used in this analysis are based on averages for fuel economy and do not take into account smoothness of traffic flow or average speeds traveled on a specific highway. Highly congested travel conditions with stop-and-start traffic, low speeds, and highly variable speeds all contribute to poor fuel economy (TRB 1995). To help measure the level of congestion or smoothness of traffic flow on a road, LOS standards have been developed. See Exhibit 8. Level of Services (LOS) for a graphic description of LOS.

Total fuel consumption for this segment of US-95 is estimated to be 1,773 gallons per day.

Maintenance energy

The vehicles and equipment used to maintain the highway include trucks, mowers, snow removal machines, tractors, and construction equipment. The frequency at which these vehicles are needed for maintenance activities and the energy needed to produce the material for the road maintenance can be correlated to the VMT for the roadway. VMT would reflect the traffic volumes, the amount of roadway to be maintained and the associated degradation.