Section 3 – Affected Environment

In accordance with NEPA regulations codified in 40 CFR 1502.15, the Affected Environment section discusses the existing conditions of the human and natural environment that could be impacted, beneficially or adversely, by the proposed alternatives. Baseline data were collected by reviewing existing documentation, consulting with various individuals and agencies, and conducting field inventories for some of the resources.

3.1 Land Use

The study area is located approximately 16 miles south of the center of Salt Lake City in Salt Lake County. It encompasses portions of the cities of Draper, Riverton, Sandy, and South Jordan. All land within the study area is incorporated into one of the four cities. The area is considered suburban to Salt Lake City, with many residents commuting north to Salt Lake City or south into Utah County to reach their employment destinations.

Figure 3-1a shows the study area in 1987 and Figure 3-1b shows the same area in 2003. Figure 3-1c shows existing land use (current zoning) as well as future planned development in the study area. Comparing Figures 3-1a and 3-1b shows that, in just 16 years, the study area developed significantly from what was once a predominantly rural/agricultural area, to a predominantly residential/commercial community. Figure 3-1c shows the continued development trend planned by the study area cities. As discussed in Section 1, total population in the four study area cities is expected to increase by 90 percent between 2000 and 2030; employment is expected to increase by 126 percent in that same time period.

3.1.1 Draper

The Draper portion of the study area extends south from 11400 South between the Jordan River and 700 East. This area is characterized by some undeveloped and agricultural land, along with business and residential areas. Draper has seen recent growth, mainly south and east of the study area. There is an interchange with I-15 at 12300 South. Much of the commercial development in this area is retail-oriented business.

A new commercial/mixed use area is currently being developed as part of the Draper City Northern Gateway Plan. The Northern Gateway extends from 11400 South to 11800 South between the railroad tracks (approximately 400 West), west of I-15, and State Street, east of I-15. Lone Peak Parkway extends north-south through the Northern Gateway area.

The land adjacent to the Jordan River is zoned as River-Sensitive. Draper officials have indicated that the Jordan River area will be preserved as open space in the future.

One of the two Jordan River crossings in the study area is on 12300 South at the Draper/Riverton City border. The zoning along 12300 South within the study area is mostly commercial and ranges from Interchange Commercial, adjacent to I-15, to Community-Neighborhood Commercial. There is some Low-Density Residential and Agricultural land zoned between 600 West and the Jordan River 500-year floodplain area, which is zoned as River-Sensitive.

There are numerous retail and food service businesses on 12300 South east of the I-15/12300 South Interchange. There is also a large retail development (VF Factory Outlet) at 12100 South and State Street, as well as several businesses west of I-15 at 12300 South.

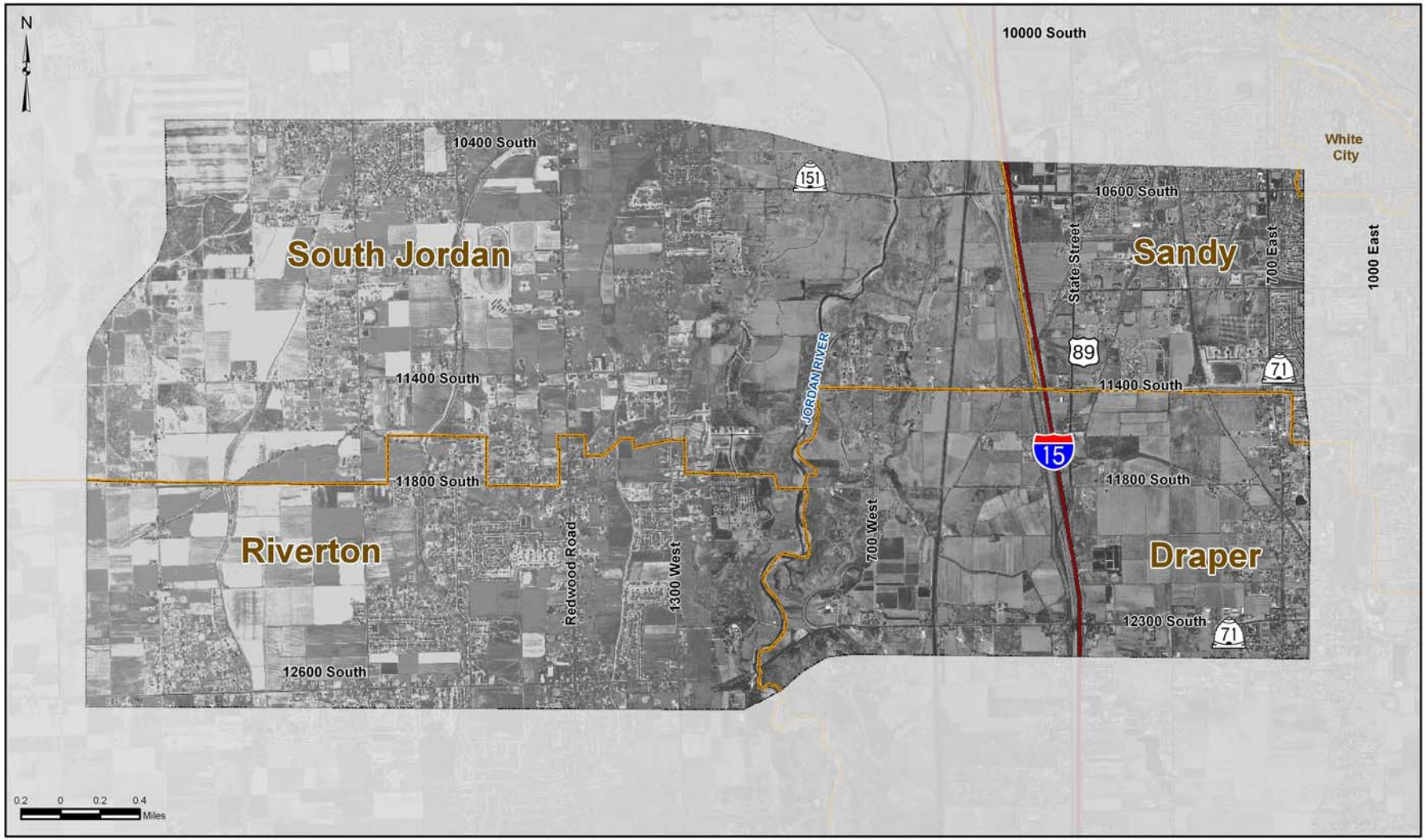

Figure 3-1a. Study Area Land Use in 1987

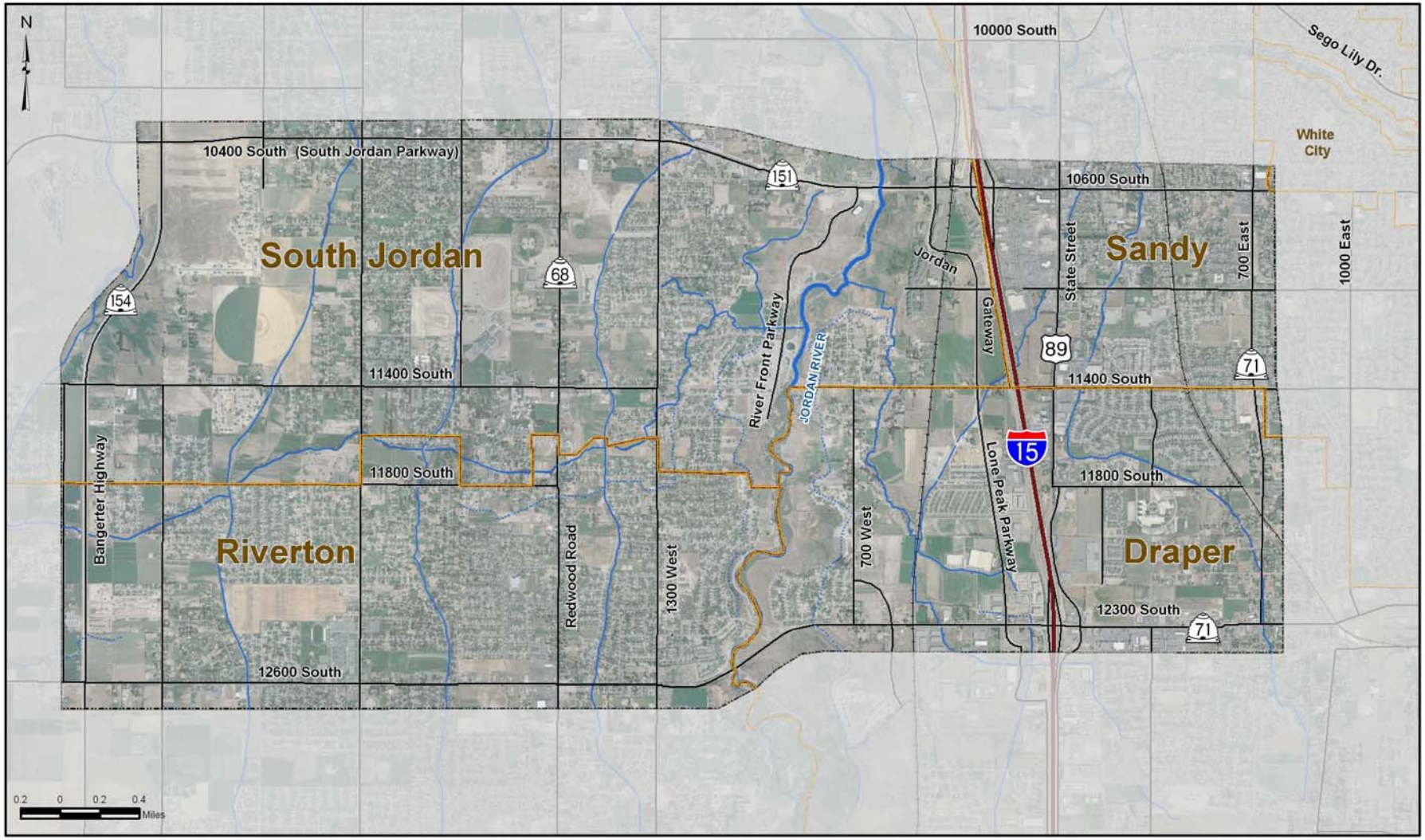

Figure 3-1b. Study Area Land Use in 2003

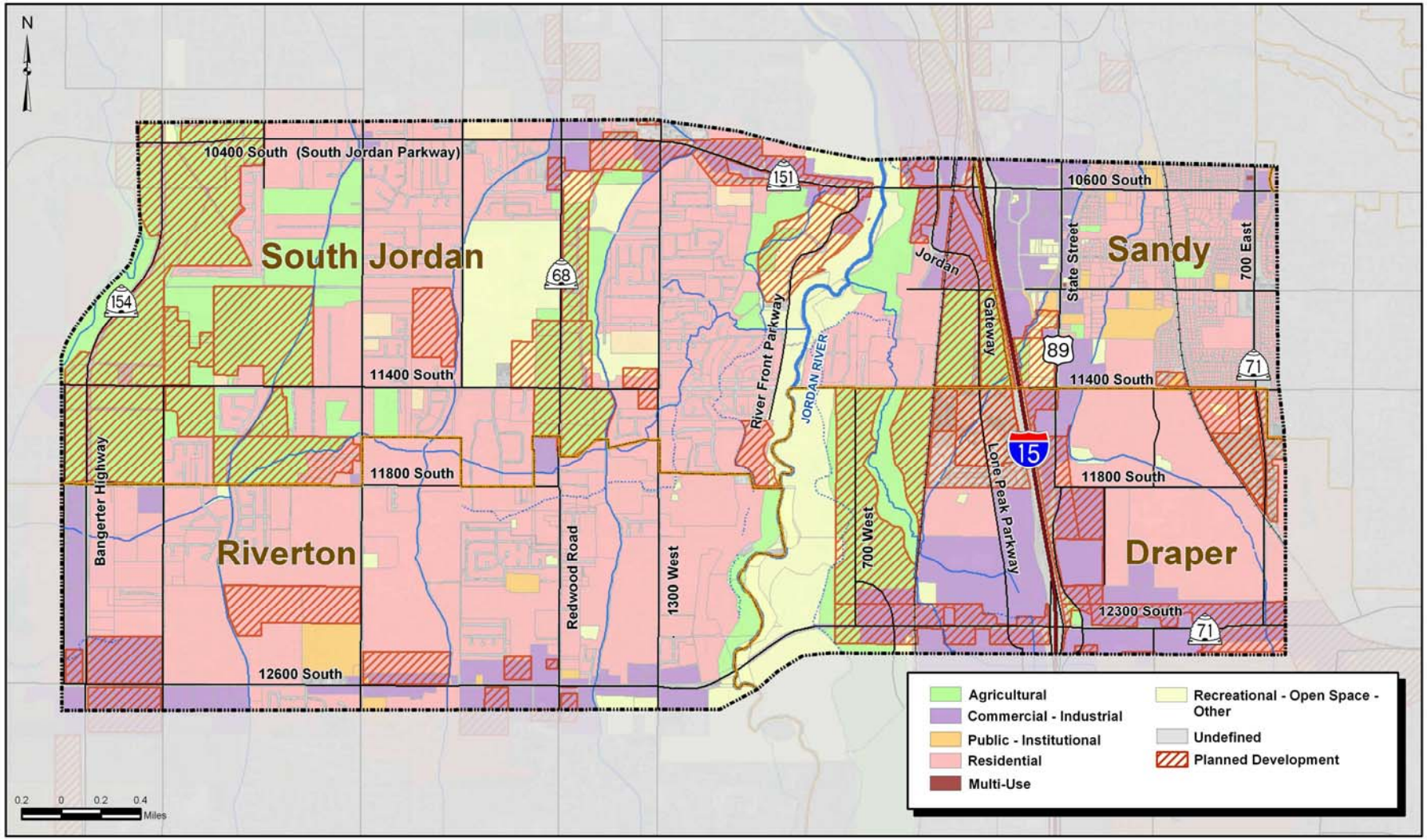

Figure 3-1c. Existing Land Use (Current Zoning) and Planned Development

Draper has plans to reclassify its Land Use Map, including establishment of a new category called Office Residential. This classification will allow for small business development in residential areas, as depicted in Figure 3-1c. Through conversations with city Economic Development representatives, it is expected that the land between 700 and 500 West along 11400 South will become Office Residential. Other foreseeable plans include possible rapid commercial development in areas close to I-15. It is also expected that development along Lone Peak Parkway, 11400 South, and State Street will accelerate as more residents move into the city. Figure 3-1 shows this by indicating that some agricultural lands in the Lone Peak Gateway vicinity are expected to be developed in the future.

3.1.2 Riverton

The Riverton portion of the study area extends west of the Jordan River and south of the South Jordan City boundary at approximately 11800 South. This area has the most rural character of the study area; however, it is rapidly being developed.

The current Land Use Plan of the Riverton City General Plan shows most of the land within the study area zoned as Low-Density Residential. The land located along Bangerter Highway and along 12600 South is mostly Commercial and includes Commercial Office, Community Commercial, and Regional Commercial classifications. The land immediately adjacent to the Jordan River is zoned as Preservation Area, and the land just west of the river is zoned Agricultural.

Riverton's future plans include commercial build-up of the area around Bangerter Highway and along 12600 South. More residential development is planned to occur north and south of 12600 South.

3.1.3 Sandy

The Sandy City portion of the study area lies north of 11400 South and east of I-15. This area contains some undeveloped land in the vicinity of 11400 South and I-15, but the rest of the area is mostly developed. Sandy has recently seen residential growth outside of the study area and commercial development within the study area. Currently, the areas adjacent to I-15 are commercial, while the remainder of the area is residential. An interchange with I-15 exists at 10600 South.

The current Land Use Map of Sandy City shows most of the land within the study area as Residential.

Sandy's Central Business and Retail District portion of the Sandy City Downtown Master Plan is located just north of 10600 South between State Street and I-15. This area consists of a large mall and associated retail developments, as well as the retail establishments north of 10600 South along the east side of State Street. A large auto mall and other retail developments are located south of 10600 South. Other development includes a large number of residences east of this area and businesses located along State Street.

Sandy's future plans include developing the commercial land that fronts 11400 South and extends to I-15 from 100 East.

3.1.4 South Jordan

The South Jordan portion of the study area extends west of I-15 and north from the Riverton City border at approximately 11800 South. Most of this area is developed; however, there are large undeveloped tracts of land located along Bangerter Highway, Jordan Gateway, Redwood Road, and River Front Parkway. There is an interchange with I-15 at 10600 South. One of the two Jordan River crossings on the study area is located at 10600 South in South Jordan.

The current Land Use Plan Map for South Jordan City shows areas along Bangerter Highway, Redwood Road, and 10600 South between Redwood Road and I-15 zoned Commercial. The areas immediately adjacent to the Jordan River are zoned as either Preservation or Recreation/Open Space. The area between Redwood Road and the South Jordan Canal and 10600 South and approximately 11800 South is zoned as High-Density Residential. Land just south of 10600 South and west of the Jordan River and Open Space land is zoned as Office Space.

The Bangerter Highway/10400 South intersection and the I-15 interchange at 10600 South result in heavy traffic use of 10400/10600 South. The existing and new residential developments to the west and the business centers around Bangerter Highway, Redwood Road, and I-15 are contributors to this traffic.

A large-scale master-planned community (Daybreak) is located west of the project area (see Section 1). A new car dealership has been approved between I-15 and Jordan Gateway between 11400 South and 11200 South. Commercial development is planned between the UPRR tracks and I-15, with more residential development planned between the railroad tracks and Redwood Road. Additional residential development is planned between Redwood Road and Bangerter Highway, with commercial development planned around Bangerter Highway. Wal-Mart owns the land located north of 11400 South and west of Jordan Gateway and has submitted plans to South Jordan City to build a Super Wal-Mart there. Wal-Mart has indicated that they will also build a Sam's Club at this location if a new freeway interchange is constructed at 11400 South.

3.2 Prime and Unique Farmland, and Farmland of Local Importance

A few areas zoned as Agricultural exist within the project study area, mainly between the UPRR tracks and Willow Creek, and between 11400 South and 12300 South (see Figure 3-1). Some of this area has already been developed as residential. Another area zoned as Agricultural lies on the west side of the Jordan River from about 11800 South to 12300 South. Most of these areas are planned to be developed by the cities with jurisdiction.

According to the local U.S. Natural Resource Conservation Service (NRCS) field office supervisor, the entire 11400 South FEIS study area is exempt from the Farmland Protection Policy Act because the entire area is within incorporated city limits, and because the area is designated for urban uses (NRCS 2004). Section 658.2 of the Farmland Protection Policy Act states that "farmland" does not include land already in or committed to urban development or water storage.

3.3 Social Conditions, Including Environmental Justice

3.3.1 Social Conditions

To assess the current social characteristics of the study area, two different studies were undertaken, a telephone survey and a written questionnaire.

A random telephone survey of 1,000 of the approximately 18,000 households of the study area was completed in December 2003. The purpose of the survey was to gain a preliminary understanding of community social conditions and concerns, and to help guide the planning of subsequent public involvement activities. A summary of survey results is included in Appendix B.

Of the respondents, 75 percent stated they live west of I-15 and 78 percent rated the quality of life in their community as being either somewhat better or much better compared to other parts of Salt Lake County. Satisfaction with community quality of life was uniformly high in all four of the municipalities that comprise the project study area. When asked to specify what they liked most about their communities, survey respondents most often identified the qualities of people, their neighbors and their neighborhoods (20 percent of all responses), the relatively "rural" or "small town" character of their communities (17 percent of all responses), the quiet and peaceful nature of community life (9 percent of responses), and a sense of safety and security associated with low levels of crime (9 percent of responses).

Despite high levels of overall satisfaction with community quality of life, study area residents also identified several areas of concern regarding community conditions. When asked to indicate what they liked least about their community, survey respondents most frequently volunteered comments highlighting the effects of population growth and development, traffic congestion, and road conditions/road construction.

While open space was important to respondents, they also either strongly or somewhat favored efforts by their communities to pursue more economic growth and development. Area residents' views and preferences regarding community conditions reflect an underlying tension between the high value placed on the preservation of "small town" characteristics involving peaceful, secure, and friendly neighborhoods and maintenance of open space and the desire for continued economic growth and development.

According to the telephone survey, many residents form non-religious social affiliations through their various interests without much regard for geographic location. Horse ownership/riding, bicycle riding, and wildlife enthusiasts are some examples of social affiliations to which residents belong. These types of affiliations draw members from a large land area and encompass the entire study area and areas beyond the study area.

Also according to the telephone survey, there are pockets of tighter community cohesion that exist in the study area. The residential area centered around 10400 South and 2700 West is one such community, as is the residential area located in the vicinity of 700 West and 11400 South. Areas where residents express a tighter sense of affiliation among themselves are characterized by having similar life situations, in that they either have been long-time residents of the same area, or they have moved into the area in roughly the same period of time.

In addition to the telephone survey, a more in-depth community social assessment was performed in early 2004. The assessment surveyed every available household adjacent to the major transportation corridors affected by one or more of the alternatives (10400/10600 South, 11400 South, and 12300/12600 South, excluding households already scheduled for removal in the 10400/10600 and the 12300/12600 South corridors) and also surveyed a randomly selected sample of households from neighborhoods within the surrounding study area encompassing the affected transportation corridors. The assessment was designed to provide descriptive information on the social and demographic characteristics of populations in the project area, and to measure key dimensions of community social organization such as neighborhood-based social interaction and activity patterns, social integration, community cohesion, and other key quality of life dimensions. Response rates for households along the corridors were approximately 82 percent and for households in the larger project area were approximately 78 percent. A copy of the community social assessment report (Krannich 2004) is included in Appendix B.

The survey asked residents to indicate how long they had lived in their current home in the study area, which reflects a general tendency reported in sociological research for longer-term residents to exhibit higher levels of social attachment and integration into neighborhood and community life than is the case among shorter-term residents. The proportion of residents who have lived in their current home for more than 10 years is highest among those living in the 10400/10600 South corridor (49 percent), somewhat lower in the 12300/12600 South corridor (43 percent), lower still in the 11400 South corridor (37 percent), and lowest in non-corridor portions of the overall project area (31 percent). Conversely, a much higher proportion of respondents living in the 11400 South corridor have lived in their home for 2 years or less (31 percent) than is true for the 12300/12600 corridor (19 percent), the 10400/10600 South corridor (17 percent), or the remainder of the project area (22 percent). These variations are a reflection of the presence of substantial numbers of newly constructed homes and neighborhoods in the 11400 South corridor and many other portions of the project area, and fewer new homes within the 10400/10600 South and the 12300/12600 South corridors.

Levels of familiarity with neighbors are substantially lower among residents of the 12300/12600 South corridor (29 percent of survey respondents indicated first-name familiarity with 10 or more neighbors in nearby homes) than in the 11400 South corridor (53 percent), 57 percent in the 10400/10600 South corridor (57 percent), or and 50 percent in the remaining non-corridor portions of the study area (50 percent).

Respondents were asked how many of their closest personal friends live in their neighborhood or in nearby areas of the community within a 10 to 15 minute walk from their home. For this indicator, there is some evidence of higher localized social integration in certain portions of the project area, such as the 11400 South and 10400/10600 South corridors. Those living in the 12300/12600 South corridor were substantially more likely than those in other locations to indicate that none of their closest personal friends live nearby (48 percent).

When asked if they would be pleased or sorry to leave their community, about 25 percent of respondents living in the 12300/12600 South corridor indicated that they would be “very sorry” to leave their neighborhood, compared to 62 percent in the 11400 South corridor, 57 percent in the 10400/10600 South corridor, and 49 percent for remaining non-corridor portions of the overall study area.

Finally, respondents were asked how often they visit or get together with any of their neighbors for informal social activities like playing cards, cookouts, or going to dinner. The percentage of respondents indicating that they “never” engage in these types of neighboring activities was highest in the 12300/12600 South corridor (48 percent), and substantially lower in the 11400 South corridor (23 percent), the 10400/10600 South corridor (26 percent), and the remaining non-corridor portions of the overall study area (24 percent). At the same time, for all of the specified areas, roughly 30 percent of respondents indicated that they participate in these types of interaction with neighbors no less than once every month or two.

3.3.2 Environmental Justice

Per Executive Order 12898: Federal Actions to Address Environmental Justice to Minority Populations and Low-Income Populations (1994), federal agencies must achieve environmental justice by identifying and addressing disproportionately high and adverse effects on minority and/or low-income populations. FHWA issued a guidance document that establishes policies and procedures for complying with this Executive Order in relation to federally funded transportation projects (FHWA 1998). This

guidance defines a “disproportionately high and adverse effect” as one that is predominately borne by, suffered by, or that is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or the non-low-income population. The FHWA guidance also requires comprehensive efforts to identify environmental justice populations and opportunities for public involvement. Section 6 addresses public involvement activities for this FEIS in more detail.

An assessment of minority and low-income populations present in the study area was conducted through U.S. Census Bureau data and discussions with city and school district officials. The percentage of minorities, median household income, house values and rent, and percentage of senior citizens was determined by compiling U.S. Census Bureau, Census 2000 information from census blocks and block groups located in the study area (U.S. Census Bureau 2003).

The U.S. Census Bureau defines a block group as “a subdivision of a census tract. A block group consists of all the blocks within a census tract with the same beginning number.” As shown in Figure 3-2, some block groups extend outside of the study area, since census block groups are not shaped or sized uniformly. This figure shows information for each block group that is located within the study area, even if it extends outside of the study area.

Figure 3-2 shows two block groups with a higher percentage of minorities than the average value for the study area. The block group located between State Street and the Jordan River, extending south from 11400 South to 14600 South shows a 14 to 26 percent minority population. The block group located between State Street and the existing railroad, extending north from 11400 South to 10600 South, shows a 10 to 13 percent minority population.

In the 14 to 26 percent block group, residential developments are located at approximately 11800 South and 500 West. The primary access to these residences is Lone Peak Parkway. There are some single-family residences located at 700 West, south of 11400 South, between Willow Creek and 700 West, with a primary access of 700 West. The remainder of this block is either undeveloped or commercial.

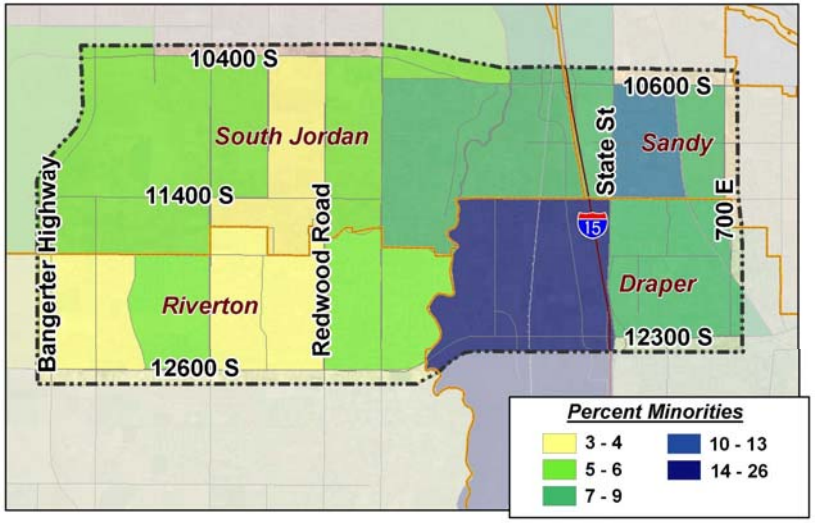

Figure 3-2. Minority Population of Study Area Census Block Groups

The 10 to 13 percent block group is located east of State Street between 11400 and 10600 South. Much of this area is commercial, especially along State Street. One residential development exists at 11400 South, east of State Street, and others are scattered in the northern and eastern portions of the block group. There are no residences located adjacent to any of the areas proposed for improvements. The remaining study area

block groups show minority percentages similar to the study area average.

Table 3-1 presents the percentage of minorities and the median household income in the study area, state of Utah, Salt Lake County, Draper City, Riverton City, Sandy City, and South Jordan City. The percentage of minorities in the study area is less than that of any of the reference areas presented in the table, with the exception of Riverton, which is one percent less than the study area.

Table 3-1.
2000 Demographics

	Total Population	Percent Minority	Median Household Income (1999 Dollars)
Study Area	28,967	7	$66,517
State of Utah	2,233,169	16	$45,726
Salt Lake County	898,387	20	$48,373
Draper City	25,220	11	$72,341
Riverton City	25,011	6	$63,980
Sandy City	88,418	10	$66,458
South Jordan City	29,437	8	$75,433

Source : U.S. Census Bureau, 2000 Census data

Table 3-1 also shows the median household income for the study area, state of Utah, Salt Lake County, Draper City, Riverton City, Sandy City, and South Jordan City. The median household income in the study area, according to Census Bureau data, is $66,517. Each of the study area block groups has a median household income that is above the poverty threshold, which ranges from $8,501 to $37,076. The U.S. Census Bureau sets poverty thresholds according to size of family unit and number of children under the age of 18 years. The average poverty threshold level for a family of four, with two children under the age of 18 (which is considered an average family size), is $16,895. The median household income for the study area as a whole is not below that of the state of Utah or Salt Lake County and is consistent with the median household income of Draper, Riverton, Sandy, and South Jordan.

The U.S. Census Bureau data show the average value of an owner-occupied home in the study area is $207,582, and the average monthly rent paid in the study area is $691 per month. Comparatively, across the state of Utah, the average owner-occupied house value is $142,000, and the average monthly rent is $534. For Salt Lake County, the average owner-occupied house value is $153,500, while the average monthly rent is $578. For the cities of Draper, Riverton, Sandy, and South Jordan, the average owner-occupied house values are: $241,600, $173,300, $180,700, and $222,700, respectively. The respective average monthly rent amounts for the same four cities are $685, $632, $692, and $940. The average owner-occupied house value and the average rent paid in the study area are greater than the values and rents in Utah and in Salt Lake County, but are more consistent with the values and rents of the four cities in the study area.

For this study, a senior citizen is defined as someone 60 years or older. On average, the population of the study area includes 7 percent senior citizens. Comparatively, there are 11 percent senior citizens in the state of Utah and in Salt Lake County, 6 percent senior citizens in Draper and Riverton, 8 percent senior citizens in Sandy, and 7 percent senior citizens in South Jordan. The population of senior citizens in the study area is consistent with that of the four cities in the study area and less than the percentage for the state of Utah and Salt Lake County.

The Salt Lake Area Chamber of Commerce 1999 publication, "Minority- and Woman-Owned Business Directory" lists one minority- or woman-owned business in the study area. It is an agricultural-oriented business located at approximately 10800 South and 1000 West. Discussions with city officials resulted in no additional identification of minority- or woman-owned businesses.

Discussions with Draper, Riverton, Sandy, and South Jordan city officials indicate there are no significant concentrations of minority populations or communities in the study area.

The State of Utah manages a subsidized housing program in which qualified individuals are able to allocate program funds toward their housing costs, such as rent. This program permits participants to live in any location. As such, there are no housing units dedicated to low-income individuals or families, except for various shelters that are operated in conjunction with other assistance programs, such as abuse victim assistance, corrections programs, and/or medical/psychological programs. Discussions with Draper, Riverton, Sandy, and South Jordan city officials indicate there are no low-income or subsidized housing communities within any of the cities' boundaries.

Discussions with Jordan School District representatives indicated that approximately 94 percent of students enrolled in schools located within the study area boundaries are Caucasian and 6 percent are non-Caucasian. These figures compare with district-wide averages of 92 percent Caucasian and 8 percent non-Caucasian. Jordan School District participates in state-assisted lunch programs. Of all students enrolled in study area schools, approximately 6 percent participated in these free or reduced-fee lunch programs, while district-wide, approximately 11 percent participated in these programs.

The random telephone survey provided information useful in identifying percentages of low-income and minority populations. Of the respondents to the survey, 3 percent indicated a household income of less than $20,000, while 18 percent indicated they earn $100,000 or more annually, and 44 percent stated annual earnings between $40,000 and $80,000. Of the respondents, 3 percent indicated they are of a minority ethnicity, 95 percent indicated they are of white/Caucasian/ Anglo ethnicity, and 2 percent preferred not to answer questions of ethnicity. Eighty-nine percent stated that English is the only language spoken within their homes. Sixty-five percent of respondents stated their age was between 36 and 65 years.

The community social assessment provided a more complete review of environmental justice populations in specific areas within the study area. Regarding the total number of people living in their households, the percentage of one- or two-person households is higher in the 12300/12600 South corridor (38 percent) than in the 11400 South corridor (27 percent), the 10400/10600 South corridor (25 percent), or the remainder of the project area (24 percent). Respondents were also asked to indicate how many people living in their households are 65 years of age or older. The percentage of households with one or more persons in this age bracket is higher for the 11400 South corridor (20 percent), the 12300/12600 South corridor (20 percent) and the 10400/10600 South corridor (23 percent) than for the remainder of the project area (12 percent).

Similarly, respondents were asked how many of the people living in their households are under the age of 18. The proportion of households reporting no children living in their homes is highest in the 10400/10600 South corridor (50 percent) and the 12300/12600 South corridor (46 percent), somewhat lower in the 11400 South corridor (39 percent), and lowest in the remainder of the project area (34 percent).

The percentage of households in which either the respondent or other household members are non-white or of Hispanic origin is slightly higher in the 10400/10600 South (9 percent of survey

respondents, 11 percent other household members) and the 12300/12600 South corridors (8 percent of respondents, 10 percent other household members) than in the 11400 South corridor (3.5 percent of respondents, 6 percent other household members) or in the non-corridor portions of the project area (4 percent of respondents, 8 percent other household members). Households in which persons of Hispanic origin are present comprise the largest proportion of minority-occupied homes in each of the corridors and in the overall project area. The percentage of households in which either the respondent (7 percent) or other household members (11 percent) are of Hispanic origin is highest in the 10400/10600 South corridor.

Examination of street addresses for households in which one or more person was identified as being a member of a racial or ethnic minority group indicated no obvious spatial clustering. In the 10400/10600 South corridor, six households were identified as having one or more minority members present; all were located west of 2200 West. In the 11400 South corridor, 10 households were identified as having one or more minority members present; these were scattered fairly evenly east to west across the full length of the corridor. In the 12300/12600 South corridor, seven households with a minority member or members were identified; one of these was located east of 700 West, one was located between 1300 West and Redwood Road, and five were located west of 2200 West.

Respondents were asked to report their total household income from all sources (before taxes) in 2003 by checking one of 16 income categories. The lowest eight of those categories were structured to reflect the U.S. Department of Health and Human Services (HHS) 2003 household poverty thresholds for family units of one to eight persons. In the 11400 South corridor, 88% of those responding indicated that their 2003 household incomes were above $30,960; 71 percent reported incomes of $50,000 or more, and 27 percent were $100,000 or higher. In the 12300/12600 South corridor, 76 percent of responding households reported incomes higher than $30,961; 48 percent reported incomes of $50,000 or more. In the 10400/10600 South corridor, 76 percent of household incomes were above $30,960, with 59 percent exceeding $50,000. For the non-corridor segments of the study area, 94 percent of households reported incomes above $30,960; 79 percent had incomes of $50,000 or more, with nearly 25 percent falling in the highest ($100,000 or higher) category. Household income levels tend to be lower in the 10400/10600 and the 12300/12600 South corridors than in either the 11400 South corridor or in the overall study area.

Conjoint analysis of income levels and household size identified only eight households out of 439 for which reported household income fell below official HHS poverty thresholds. For the 11400 South corridor, 3 percent were below the poverty threshold; two of these are located east of 700 West, with the third located between 1300 West and Redwood Road. In the 12300/12600 South corridor, 4 percent were below the poverty threshold; both are located between 2200 and 2700 West. In the 10400/10600 South corridor, one household, 3 percent, fell below the poverty threshold; that household is located between 2200 and 2700 West. Finally, for non-corridor portions of the overall study area 1 percent were below the poverty threshold. While there is not an extremely high concentration of households falling below official poverty thresholds in any of the potentially affected road corridors, the proportions of poverty-level households within these corridors are 2 to 3 percentage points higher than in the overall project area.

In combination, the responses to these questions about household composition and characteristics indicate that there is a higher concentration of older residents in households immediately adjacent to the three road corridor areas than in the overall project

area. In addition, there is a higher concentration of lower-income households, and of households in which racial and ethnic minorities are present, in the 10400/10600 and 12300/12600 South corridors than is the case in the 11400 South corridor or in the study area as a whole. The populations of the three road corridors do not have extremely high concentrations of elderly or minority residents or of economically disadvantaged households. However, the proportionate representation of these potentially vulnerable population groups is higher in the corridor-adjacent neighborhoods, particularly those adjoining 10400/10600 and 12300/12600 South, than is true for the overall study area.

3.4 Economic Conditions

The study area is in the southern end of the Salt Lake Valley and in the heart of the Wasatch Front – the population center and economic driver of the Utah economy. All of the cities are fast-growing, suburban cities. Of the four, Sandy is the most maturely developed. As such, it has firmly established regional retail and employment centers within its boundaries. The other three cities are in the midst of aggressive growth periods that include new housing, retail, and employment centers. In the past, these communities served as bedroom communities to Salt Lake City; in recent years, the development has assumed more of an "edge city" character, with suburban employment and retail centers often out-performing the more established Salt Lake City Center Business District.

This section discusses the current and historical data for economic factors that will be applied in the impacts analysis for each alternative under consideration. It is the baseline against which alternative transportation scenarios will be evaluated. Existing economic development policies of each city were reviewed to establish existing goals and objectives for economic development. Base economic information, such as employment, wages, income, and sales, was collected for the period 1990-2004 wherever possible. Each city's Economic Development department was interviewed to identify current development activities, and the municipal budgets for each community were analyzed to determine the main funding sources for each city.

The term "economic development" can be defined a number of ways. In this analysis, the term refers to activities that occur within or are initiated by a local community that will increase the revenues of that community. Local government revenues are generally comprised of property taxes, sales taxes, franchise taxes (utilities), fees, and licenses/permits. Revenue sources are described in more detail in Table 3-2.

Municipal governments typically provide the following services (either directly or through contracts with other agencies): police, fire, planning and zoning, public works (roadways and utilities), parks and recreation, garbage pick-up, and other general government services. The revenue sources are generally limited to those discussed above. Municipalities have experienced an increasing reliance on sales tax revenues since the passage of the "Truth in Taxation Act" in 1985 that forbids increased property tax revenues on the basis of inflation or appreciation – effectively capping property tax revenues for mature communities at the time of the act, absent demonstrable new growth. Property tax as a percentage of local government revenues has declined from about 40 percent in 1968 to roughly 16 percent in 1999. Correspondingly, sales tax revenues have increased as a percentage of total revenues from 19 to 32 percent. Therefore, while economic development initiatives aimed at revenue sources other than sales taxes are still undertaken, the biggest gain for municipal budgets is found in retail development that yields both property and sales tax revenues.

Table 3-2.
Revenue Source Descriptions

Revenue Type	Economic Development Activities that Increase Revenues
Property tax	New development, redevelopment
Sales tax	Increased number of retail outlets; increased sales at existing outlets
Franchise tax	New development or redevelopment that results in increased numbers of businesses and households or increased utility usage
Fees	Revenue neutral, as state law requires that fees are directly offset by costs
Licenses/Permits	Revenue neutral, as state law requires that fees are directly offset by costs

Sandy serves approximately 88,000 residents; South Jordan has a population of roughly 29,000, while Draper and Riverton each contain about 25,000 people. Sandy, with a population roughly three times the size of each of the other cities, has a budget of approximately $44 million. This is three to four times higher than the other cities' budgets (South Jordan's budget is about $15 million, Riverton's is about $10 million and Draper's is roughly $12 million).

Retail Sales

The southern third of Salt Lake County contains nearly half of the total retail space in the Salt Lake Valley. Existing figures indicate Sandy currently experiences the greatest portion of the study area's retail revenues. Total 2002 sales in Sandy were nearly three times that of sales in the other three cities combined. Sandy contains South Town Mall, one of four regional malls located in the Salt Lake Valley. Sandy has also actively recruited automobile dealerships, and automotive sales have increased from 9 percent of total sales in Sandy in 1994 to 20 percent of total sales in 2002. Manufacturing contributes 9 percent of total sales in Draper, more than in any of the other cities. Retail food sales are the largest category of retail sales in each of the cities.

Gross retail sales in the four cities have grown at an average annual rate of 7.88 percent since 1995. This growth has not been constant or consistent over the 7-year time frame. Table 3-3 summarizes the average annual growth rates for the period 1995 through 2002 for each of the cities under study. Overall, South Jordan has experienced the highest growth rate in retail sales over the past 7 years. As Sandy is the most maturely developed city of the four, the other three cities of the study area are currently experiencing higher retail sales growth rates than Sandy.

Table 3-3.
Average Growth Rate of Gross Retail Sales

City	1995-2002
Riverton	8.09%
Draper	10.51%
South Jordan	11.80%
Sandy	7.13%
Total	7.88%

An issue raised in early public meetings is that potential retail development at 11400 South and I-15 would suppress retail opportunities in other areas. To address this issue, an analysis of the relative retail potential of a number of sites within the study area for both 2004 and 2030 was conducted. Potential major retail locations were identified as Bangerter Highway and 3800 West; 11400 South and 1-15; 12300 South and I-15; 10600 South and I-15; Bangerter Highway and 11800 South; 12600 South and Redwood Road; 10400 South and Redwood Road; and Bangerter

Highway and I-15. These sites were selected because each offers regional access (or the potential for regional access under an alternative scenario).

Table 3-4 depicts the population base in a 3-mile radius for each of the potential retail development areas. The sites are listed in descending order for the 3-mile radius population in 2004. Currently, 10600 South and I-15 has the largest population base in a 3-mile radius. In 2030, the 3-mile radius with the largest population base will be that surrounding Bangerter and 11800 South. This indicates a shift in population to the now undeveloped westernmost lands.

Table 3-4.
Current and Projected 3-mile Radius Population Base at Potential Major Retail Locations

Location	3-mile radius		
	2004	2030	AAGR*
10600 South and I-15	81,649	115,954	1.4%
11400 South and I-15	70,308	105,221	1.6%
12300 South and I-15	66,888	100,786	1.6%
10400 South and Redwood Road	66,738	108,162	1.9%
12600 South and Redwood Road	51,663	101,496	2.6%
Bangerter Hwy and I-15	44,484	84,962	2.5%
Bangerter Hwy and 11800 South	41,392	121,023	4.2%
Bangerter Hwy and 3800 West	39,871	107,237	3.9%

* AAGR: Average Annual Growth Rate

The 1-mile radius figures, presented in Table 3-5, provide information about the viability of a neighborhood-scale retail center. Typically, there needs to be approximately 5,000 to 6,000 persons residing within the smaller trade area to support a grocery store with some small associated retail. The data indicate that all the locations listed in the table have sufficient population base to support a neighborhood retail center.

Table 3-5.
Current and Projected 1-mile Radius Population Base at Potential Major Retail Locations

Location	1-mile radius		
	2004	2030	AAGR*
10600 South and I-15	5,224	7,160	1.2%
11400 South and I-15	7,133	10,421	1.5%
12300 South and I-15	3,914	6,393	1.9%
10400 South and Redwood Road	7,321	13,296	2.3%
12600 South and Redwood Road	12,925	18,496	1.4%
Bangerter Hwy and I-15	4,881	7,519	1.7%
Bangerter Hwy and 11800 South	5,423	15,922	4.2%
Bangerter Hwy and 3800 West	3,612	10,469	4.2%

* AAGR: Average Annual Growth Rate

Land Use and Taxable Value

According to information from the Salt Lake County Assessor's Office, the four cities range in size from 7,145 acres in Riverton to 13,608 acres in Draper. Sandy is the most developed city with approximately 65 percent of the total land area in private development (residential, commercial, or industrial). With a fair amount of Draper lying within the Utah State Prison grounds, Draper has the lowest proportion of privately developed land (30 percent). South Jordan and Riverton have 33 percent and 46 percent of privately developed land, respectively. Table 3-6 presents the percentage of total land area by taxing designation for each city.

Table 3-6.
Approximate Percentage of Acres by Taxing Designation of Land Use (2004)

	Draper	Sandy	Riverton	South Jordan
Residential	23%	52%	44%	30%
Commercial	3%	11%	2%	2%
Industrial	3%	2%	0%	0%
Agricultural	9%	1%	18%	42%
Government and Nonprofit	38%	22%	16%	14%
Vacant	23%	12%	20%	11%
Total	100%	100%	100%	100%

Source: Salt Lake County Assessors Office

Taxable value is based on 100 percent of market value for nonresidential uses, 55 percent of market value for primary residences and a fraction of market value for land in active agricultural production. Property tax value received from nonresidential development is much greater (by 45 percent, dollar for dollar) than other property types. Table 3-7 provides a breakdown of taxable value by land use type for each city.

Pending and future developments were discussed with local economic development officials. Many of the cities' General Plans anticipate a freeway interchange at 11400 South, with the land use projected for the area surrounding the potential interchange zoned as Regional-Commercial in nature. More specific land use information is found in Section 3.1, Land Use.

Table 3-7.
Approximate 2004 Taxable Value by Land Use Type

	Draper	Sandy	Riverton	South Jordan
Residential	64%	71%	83%	75%
Commercial	18%	23%	10%	14%
Industrial	5%	1%	0%	1%
Agricultural	0%	0%	0%	1%
Government and Non-Profit	0%	0%	0%	0%
Vacant	13%	4%	7%	10%
Total	100%	100%	100%	100%

Source: Salt Lake County Assessors Office

3.5 Recreational Resources

This section discusses recreational resources in the study area, including city parks, schools, and trails. These resources are listed in Table 3-8 and shown on Figure 3-3.

Table 3-8.
Recreational Resources

Name	Address
City Park	11000 South Redwood Road, South Jordan
Crescent Park	230 East 11000 South, Sandy
Honeybee Park	100 East Honeyberry Ct., Draper
Inauguration Park	300 West Inauguration Rd., Draper
Jordan River Parkway Trail	9800 South to 11400 South and 12000 South to Bangerter Highway at the Jordan River
Lone Peak Park	10140 South 700 East, Sandy
Marv Jensen Rec. Center	10300 South Redwood Road, South Jordan

Table 3-8. (cont.)
Recreational Resources

Name	Address
Mulligan's Golf Course	692 West 10600 South, South Jordan
Willow Creek Park (planned)	540 West 11400 South, Draper
Olive Berry Park	11600 South 300 East, Draper
Peggy Green Park	12150 South 1700 West, Riverton
River Front Park	Approx. 10800 South to 11400 South & Jordan River, South Jordan
Galena Hills Community Park (planned)	Approx. 12300 South 400 West, Draper
Jordan River Rotary Park	12300 South at Jordan River, Draper
Riverpark Trail Head	12300 South 1000 West, Draper
Riverton Chase Park	12410 South 1560 West, Riverton
Riverton City Skate Park	1450 West 12600 South, Riverton
Salt Lake County Equestrian Park	2051 West 11400 South, South Jordan
South Jordan Community Center	10778 Redwood Rd., South Jordan
Stonebridge Park	150 East Stonebridge Dr, Draper
Summerhill Park	11660 South 1275 West, Draper
Sunrise Station Park	11830 South Inauguration Rd., Draper
West Field Downs	12075 South 2700 West, Riverton
Bingham High School	2160 West 10400 South, South Jordan
Altara Elementary	800 East 11000 South, Sandy
Crescent Elementary	11100 South 230 East, Sandy
Crescent View Middle School	11150 South 300 East, Sandy

Table 3-8. (cont.)
Recreational Resources

Name	Address
Monte Vista Elementary	11121 South 2700 West, South Jordan
Oquirrh Hills Middle School	12949 South 2700 West, Riverton
Rosamond Elementary	12195 South 1975 West, Riverton
South Jordan Elementary	1350 West 10400 South, South Jordan
South Jordan Middle School	10245 South 2700 West, South Jordan
Southland Elementary	12675 South 2700 West, Riverton

The recreational resources from Table 3-8 that are located along corridors affected by any Build Alternative are discussed below.

Jordan River Parkway and Trail

The Jordan River flows north approximately 44 miles from Utah Lake to the Great Salt Lake, passing trough 15 different municipalities. The river is on average 40 feet wide and serves as home for birds and wildlife. Through a cooperative effort, a nearly continuous corridor on each side of the river has been preserved as open space known as the Jordan River Parkway. The vision of the Jordan River Parkway Trail is to connect the Great Salt Lake and Utah Lake with a series of educational, recreational, and scenic opportunities.

The Utah State Division of Parks and Recreation coordinates Parkway facilities and trail grants. The Division's jurisdiction along the Jordan River generally extends 150 feet from the riverbank on each side of the river. Where there is State ownership beyond the 150-feet boundary, the Division's jurisdiction extends to the property boundaries. In some areas, the Division has jurisdiction but does not have ownership of the Parkway property. While development of the Parkway trail system and any parks and

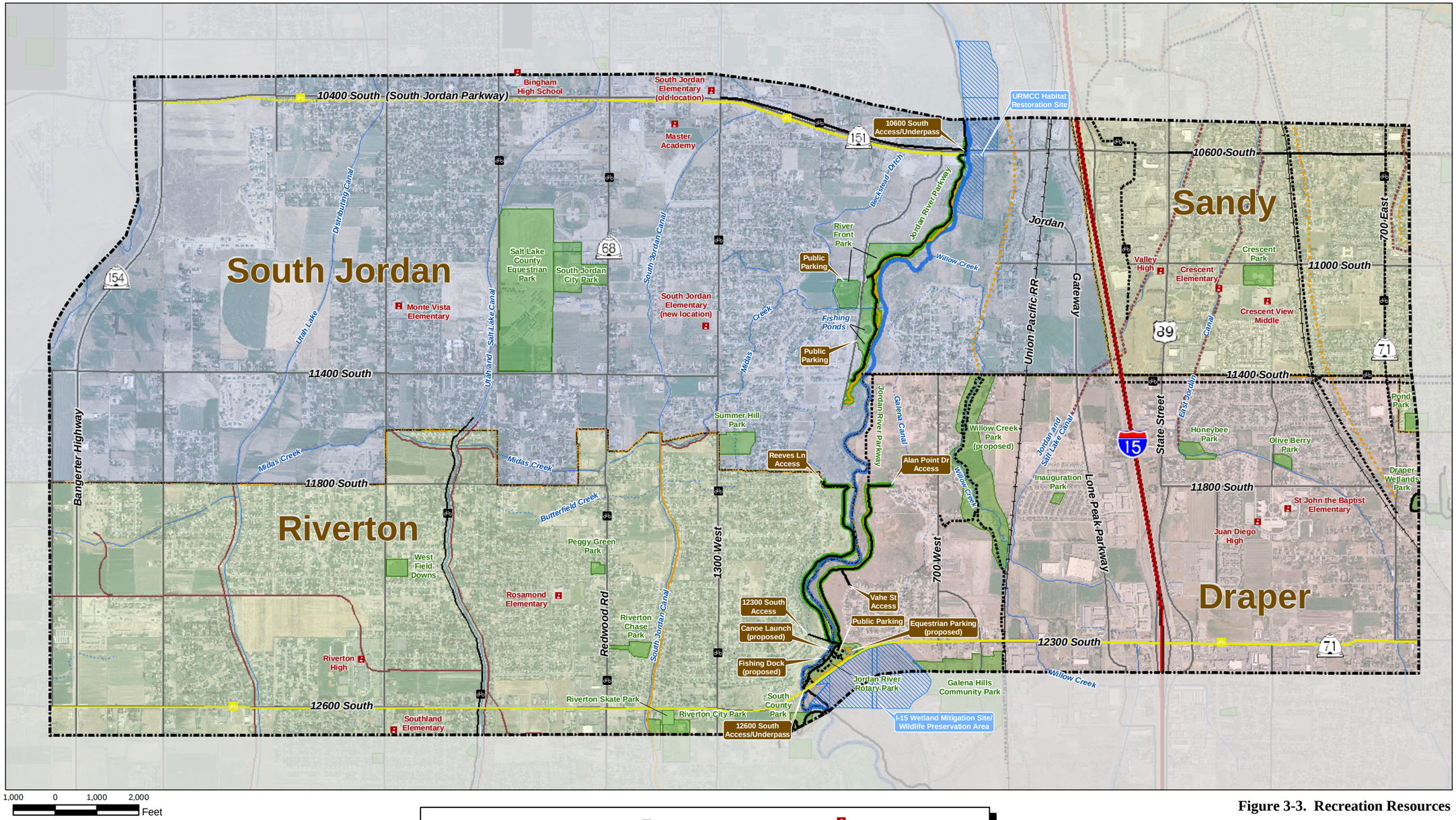

Figure 3-3. Recreation Resources

recreational facilities along the river is coordinated by and under the jurisdiction of the Division, each municipality also has jurisdiction over trail segments and recreation facilities within its boundaries.

The Jordan River Parkway Trail, located within the Parkway corridor, is one of the primary pedestrian/bicycle facilities in the Salt Lake Valley. Some portions contain a separate equestrian trail. The Parkway Trail will eventually extend from Utah Lake in Utah County to the Great Salt Lake, northwest of Salt Lake City, a distance of 44 miles. The Jordan River Parkway Trail is also planned to eventually connect to the Bonneville Shoreline Trail, a regional hiking/biking trail. The trail winds through areas of wetlands, which consist of associated vegetation and wildlife. Within the study area, the Parkway Trail is finished from 10600 to 11400 South, and from approximately 11800 to 12300 South.

In South Jordan, there are two fishing ponds located at 920 West 11200 South, which are part of approximately 22 acres of natural habitat on the west side of the Jordan River along the Parkway. These ponds are stocked by the Utah Division of Wildlife Resources (UDWR) with rainbow trout and catfish. Draper City has an established trailhead at 12300 South on the east side of the Jordan River associated with the Jordan River Rotary Park. The trail extends north from the trailhead on the east side of the river to approximately 11800 South. The only developed section of the Jordan River Parkway trail in Riverton begins at the pedestrian bridge north of 12600 South, which connects the Riverton and Draper trails, and continues north to approximately 11800 South. Riverton and Draper are both looking into improvements in the Parkway area.

The Jordan River is currently used on a limited basis by recreational boaters. Use is sporadic due to limited access points and navigational hazards, dams, and diversions. A Jordan River Navigational Hazard Assessment and Recreational Boating Plan is being prepared by Great Salt Lake Audubon in cooperation with local resource agencies to address these issues and improve the quality of the outdoor experience along the river.

Salt Lake County Equestrian Park

Another important recreational resource is the 120-acre Salt Lake County Equestrian Center, located at 2051 West 11400 South in South Jordan. The Equestrian Center is a racing, training, and show facility and has a 0.75-mile track, 200 stalls for year-round boarding, 300 stalls for show boarding, five outdoor arenas, and a polo field bordered by mature trees.

Bingham High School

Bingham High School is located at 2160 West 10400 South. The school property includes 4.2 acres of public open space available to the public for recreational purposes. There are four tennis courts, a baseball diamond, a soccer/football field, and a ¼ mile running track on the premises.

South Jordan Elementary School

South Jordan Elementary School is located at 1350 West 10400 South. The school property includes 11.2 acres of public open space available to the public for recreational purposes. There is an informal baseball diamond and three basketball courts on the premises.

Willow Creek Park

Willow Creek Park is planned for future construction by Draper City on approximately 70 acres just west of 540 West 11400 South (south side of the road). Planning for the park was conducted jointly with UDOT, in anticipation of the possible widening of 11400 South. UDOT deeded 3.86 acres to Draper City with the understanding that a detention basin would be

constructed on the land to hold runoff water and groundwater associated with any possible improvements to 11400 South. Draper City agreed that part of the property would be deeded back to UDOT if 11400 South were widened (see Appendix D – March 5, 2004 letter from Draper City). The remainder of the property, along with additional adjacent property acquired by Draper, is planned as a linear parkway with a non-motorized trail.

Galena Hills Community Park

Galena Hills Community Park is planned for future construction by Draper City beginning in 2005. The 60-acre park, owned by Draper City, will be located directly west of the UPRR tracks on the south side of 12300 South from approximately 450 West to 550 West. The park will include baseball and softball diamonds, basketball courts, volleyball courts, tennis courts, soccer/football fields, playgrounds, and picnic areas.

Jordan River Rotary Park

The Jordan River Rotary Park is a 10.3 acre park owned by Draper City and located along the Jordan River and 12300 South. The park currently consists of a trail head, parking lot, and restroom. The trail/trail head was developed in part with State funds under the provision that it would not be converted to other than public motorized and/or non-motorized recreational trail use unless another trail of comparable value, in the same general location, is provided. An irrigation system has been installed and trees planted. Future plans for the park include a playground, volleyball courts, basketball courts, picnic facilities, a fishing dock, a canoe launch, and equestrian parking facilities.

Riverton City Skate Park

This park is currently under construction, and planned to be completed by August 2004. The park is located at 1450 West 12600 South in Riverton City. It will be 0.69 acres in size with berms, ramps, and other skateboarding amenities.

Recreational Trails

Following is a discussion of recreational trails and bicycle paths existing or planned within the study area in each of the four cities:

Draper

A portion of the Jordan River Parkway Trail in Draper has been completed, from 12000 South to 12300 South (east side of the Jordan River). According to Draper's Parks, Trails and Recreation Master Plan (Draper 2000), Draper plans to construct a segment of the Jordan River Parkway Trail on the east side of the Jordan River from 11400 South to the existing segment of the trail at approximately 12000 South. The trail may be constructed in 2004.

The Willow Creek West Trail is planned to follow the Willow Creek channel from 12300 South at approximately 400 West to the north boundary of the city (11400 South).

Future bicycle lanes are planned for 300 East, Lone Peak Parkway, 700 West, 700 East, and all major collector roads in Draper. A Class 2 bike lane (signed and striped) is currently being constructed along both sides of 12300/12600 South from 700 East to Bangerter Highway in conjunction with the roadway construction project in that area.

Riverton

Riverton's Parks, Trails, Recreation and Leisure Services Master Plan (Riverton 2003) shows future plans for separated bike trails on 1300 West from 11400 to 12600 South, and Redwood Road from 11400 to 12600 South. A Class 2 bike lane (signed and striped) is currently being constructed along both sides of 12300/12600 South from 700 East to Bangertrer Highway in conjunction with the roadway construction project in that area.

Future pedestrian/bike trails are also shown paralleling the South Jordan Canal, Utah and Salt Lake Canal, and Utah Lake Distributing Canal, all running north/south through the study area.

Sandy

Existing trails within the study area include an 8-foot-wide multiuse trail on 10600 South from 700 East to State Street.

Sandy's Parks and Trails Master Plan, dated May 2 1996, shows the planned Light Rail Trail (a continuation of the Porter Rockwell Trail in Draper), providing a major north-south corridor, as well as multimodal access to UTA light rail. The trail will extend from the Draper/Sandy City border at 11400 South northerly to the existing light rail station at 10000 South. The trail will be fenced from the track. Pedestrian trails are planned for the East Jordan Canal and the Jordan and Salt Lake City Canal.

Bicycle lanes are planned for 700 East (north-south), Auto Mall Drive (north-south), and 11400 South (east-west).

South Jordan

According to South Jordan City's Master Transportation Plan (South Jordan 2000), existing trails in the study area in South Jordan include the Jordan River Parkway Trail and the separated bike path on 10600 South from 1300 West to the Jordan River Parkway trail. Striped and signed bicycle lanes on each side of 10400/10600 South have been constructed from Redwood Road to I-15 and a Class 2 (signed and striped) bike lane is planned on 10400 South from Redwood Road to Bangerter Highway.

3.6 Air Quality

The Clean Air Act (CAA) requires that the U.S. Environmental Protection Agency (EPA) set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. These same standards are used to determine project level air quality impacts as part of the NEPA process. The current standards for criteria pollutants, including carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), lead (Pb), particulate matter smaller than 10 microns (PM_{10}), particulate matter smaller than 2.5 microns ($PM_{2.5}$) and sulfur dioxide (SO_2), are shown in Table 3-9. Primary standards protect public health, including the health of sensitive populations such as children, asthmatics, and the elderly. Secondary standards protect public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation, and buildings.

The state of Utah has adopted measures necessary for attaining and maintaining the NAAQS. These measures are enforced through the Utah Air Conservation Rules (Utah Administrative Code [UAC] Title R307) and the State Implementation Plan (SIP) (UAC R307-110). The measures for attaining and maintaining compliance with NAAQS are detailed in the SIP. Areas not meeting a NAAQS are said to be in "nonattainment status" for that pollutant. Maintenance areas are areas that have been in nonattainment within the last 10 years, but are currently meeting the NAAQS.

The FEIS study area is located in Salt Lake County. The county's compliance status with the NAAQS, as determined by EPA, is also indicated in Table 3-9. The study area's compliance status matches that of Salt Lake County's compliance status, since the study area is located wholly within Salt Lake County. Table 3-9 shows that southern Salt Lake County has attainment status for CO, NO_2, and Pb; maintenance status for the 1-hour average of O_3; and non-attainment status for PM_{10} and SO_2.

The Transportation Equity Act and the CAA require transportation projects located within nonattainment or maintenance areas for one or more transportation related pollutants (CO, PM, and O_3) demonstrate conformity between transportation plans and state air quality plans, or SIPs. A conforming transportation plan is one that has been analyzed for emissions of controlled air pollutants and found to satisfy the emission level limits established in the SIP.

Table 3-9.
National Ambient Air Quality Standards and Salt Lake County Compliance

Pollutant	Standard Value	Standard Type	Salt Lake County Compliance Status
Carbon Monoxide			
1-hour Average	35 ppm (40 mg/m^3)	Primary	Attainment Area (except for Salt Lake City, which is a Maintenance Area)
8-hour Average	9 ppm (10 mg/m^3)	Primary	
Nitrogen Dioxide			
Annual Arithmetic Mean	0.053 ppm (100 μg/m^3)	Primary and Secondary	Attainment Area
Ozone			
1-hour Average	0.12 ppm (235 μg/m^3)	Primary and Secondary (both)	Maintenance Area for 1-hour
8-hour Average	0.08 ppm (157 μg/m^3)		Maintenance Area for 8-hour
Lead			
Quarterly Average	1.5 μg/m^3	Primary and Secondary	Attainment Area
PM_{10}			
Annual Arithmetic Mean	50 μg/m^3	Primary and Secondary (both)	Nonattainment Area
24-hour Average	150 μg/m^3		
$PM_{2.5}$			
Annual Arithmetic Mean	15 μg/m^3	Primary and Secondary (both)	Not yet regulated
24-hour Average	65 μg/m^3		
Sulfur Dioxide			
Annual Arithmetic Mean	0.03 ppm (80 μg/m^3)	Primary	Nonattainment Area
24-hour Average	0.14 ppm (365 μg/m^3)	Primary	
3-hour Average	0.50 ppm (1300 μg/m^3)	Secondary	

Source: OAQPS, 2002
ppm = parts per million
Primary Standards protect public health.
Secondary Standards protect public welfare.
mg/m^3 = milligrams per cubic meter
μg/m^3 = micrograms per cubic meter

The projects located within the study area and included in the Wasatch Front Urban Area Long Range Transportation Plan are outlined in Section 2 under the No Build Alternative discussion. In addition, the WFRC Long Range Plan also includes an interchange at 11400 South and I-15, and widening of 11400 South to four lanes from State Street to Bangerter Highway. FHWA made a conformity finding of the 2004-2030 Long Range Plan and the 2004-2008 Transportation Improvement Plan (TIP) on January 20, 2004, determining that both plans and all projects within the plans conform to the SIP.

Mobile Source Air Toxics

In addition to the National Ambient Air Quality Standards (NAAQS), EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g. dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. See document No. EPA420-R-00-023 (December 2000).

EPA is the lead Federal Agency for administering the Clean Air Act and is concerned with the health effects of MSATs. See document No. EPA400-F-92-004 (August 1994). More recently EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act, and the rule's preamble provides the following summary information regarding the effects and control of MSATs:

Today's action addresses emissions of hazardous air pollutants (HAPs) from motor vehicles and their fuels. Hazardous air pollutants refer to a range of compounds that are known or suspected to have serious health or environmental impacts. Motor vehicles are significant contributors to national emissions of several hazardous air pollutants, notably benzene, formaldehyde, 1,3-butadiene, acetaldehyde, and diesel particulate matter and diesel exhaust organic gases.

In today's action, we list 21 compounds emitted from motor vehicles that are known or suspected to cause cancer or other serious health effects. Our Mobile Source Air Toxics (MSAT) list includes various volatile organic compounds (VOCs) and metals, as well as diesel particulate matter and diesel exhaust organic gases (collectively DPM + DEOG). The selection methodology we used to develop this MSAT list, which may be used to add compounds to or remove compounds from the list in the future as new information becomes available, is also described. In today's action we also examine the mobile source contribution to national inventories of these emissions and the impacts of existing and newly promulgated mobile source control programs, including our reformulated gasoline (RFG) program, our national low emission vehicle (NLEV) standards, our Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and our proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 1990 and 2020, we project these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 67 to 76 percent, and will reduce on-highway diesel PM emissions by 90 percent.

In the 2001 rulemaking, EPA identified six priority MSATs: acetaldehyde, benzene, formaldehyde, diesel exhaust, acrolein, and 1, 3 butadiene (66 FR 17230). EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database *Weight of Evidence Characterization* summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- Under the proposed revised Carcinogen Risk Assessment Guidelines (U.S. EPA, 1996), **benzene** is characterized as a known human carcinogen.
- Under the Draft Revised Guidelines for Carcinogen Risk Assessment (U.S. EPA, 1999), the potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- Under EPA's 1999 Guidelines for Carcinogen Risk Assessment (U.S. EPA, 1999), **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.
- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- Using U.S. EPA's revised draft 1999 Guidelines for Carcinogen Risk Assessment (U.S. EPA, 1999), **diesel exhaust** (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.

As noted, EPA is the lead Federal government agency responsible for the establishment of national air quality standards, national guidance and guidelines for the uniform and scientifically reliable study of air pollutants. To date, neither National Ambient Air Quality Standards for MSATs, nor national project level guidelines or guidance to study MSATs under various climatic and geographic situations have been developed. Such limitations make the study of MSAT concentrations, exposures, and health impacts difficult and uncertain. Thus, accurate and reliable estimates of actual human health or environmental impacts from transportation projects and mobile source air toxics are not scientifically possible at this time.

EPA has also not established toxicity factors for diesel particulate matter, although one study asserts that this pollutant accounts for a large portion of MSAT health risk in certain situations, using a toxicity factor that is unique to California.

3.7 Noise

Traffic noise has the potential of impacting daily activities and the quality of life for people living near streets and highways. Traffic noise levels depend on traffic volume, traffic speed, and the type of traffic. Vehicle noise is produced by the engine, exhaust, and tires. Factors such as vegetation, terrain, and obstacles can also affect the level of traffic noise. Typically, traffic noise is not a

problem for people living more than 500 feet from heavily traveled freeways or more than 100 to 200 feet from lightly traveled roads (FHWA 2003).

All sound level measurements and estimates in this document are reported as hourly equivalent sound level [Leq(h)] in units of decibel (dB) and are A-weighted (dBA). The equivalent sound level (Leq) describes the receiver's average noise exposure from all events over a given period of time. Leq(h) is the hourly value of Leq. The "A" indicates that the sound has been filtered to reduce the strength of very low and very high frequency sounds, much as the human ear would hear. On average, each A-weighted sound level increase of 10 dB corresponds to an approximate doubling of subjective loudness.

An example of typical ambient noise levels in the environment is shown in Figure 3-4. The unit of measurement, night sound level (Ldn), represents the A-weighted Leq for a 24-hour period with an added 10-dB penalty for noise that occurs between 10 p.m. and 7 a.m.

UDOT considers noise impacts based on FHWA Noise Abatement Criteria (NAC) (23 CFR 772). FHWA requires all states to define at what value a predicted noise level approaches the NAC defined in 23 CFR 772, and thus, results in a noise impact (FHWA 1995). UDOT has defined "approach" as 2 dBA less than the FHWA NAC for use in identifying traffic noise impacts in traffic noise analyses. The UDOT NAC are shown in Table 3-10.

Two types of noise levels occurring at sensitive land use areas are considered impacts under the UDOT criteria (UDOT 2004):

(1) The design level is greater than or equal to the UDOT NAC shown in Table 3-10 for the respective activity category.

(2) The design level is greater than or equal to an increase of 10 dBA over the existing noise level, regardless of the existing noise value.

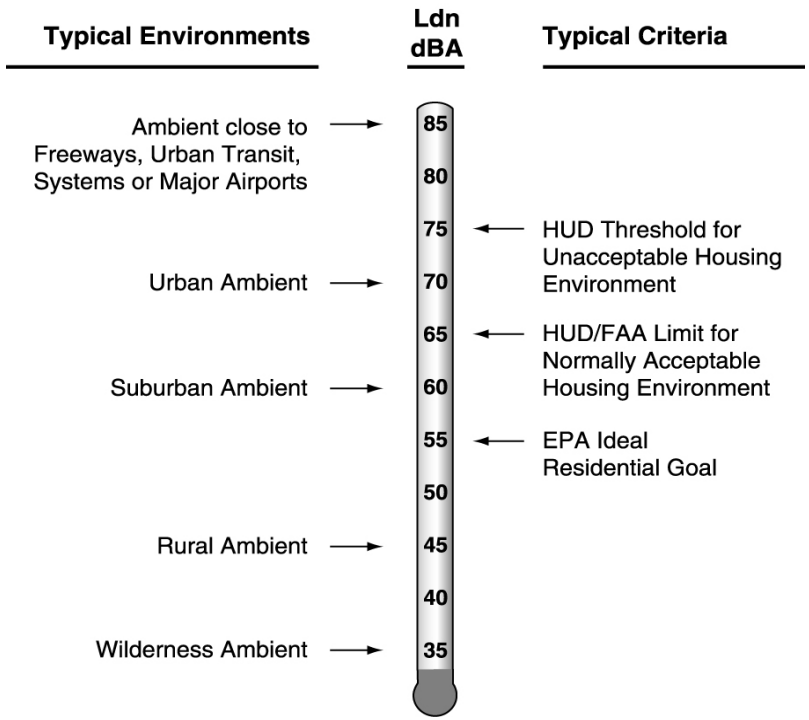

Figure 3-4. Examples of Typical Outdoor Noise Exposure

Reference: HMMH, 1995
HUD = U.S. Department of Housing and Urban Development
FAA = Federal Aviation Administration
EPA = U.S. Environmental Protection Agency

Therefore, if a project predicts a noise level equal to the values shown in the following table, or a noise level greater than 10 dBA over existing levels, some sort of abatement must be considered for the project in the appropriate locations. Some locations, however, may not be feasible or reasonable for abatement.

UDOT considers a severe traffic noise impact to be an increase of 30 dBA or more over existing residential noise levels, or a predicted absolute noise level of 80 dBA or more (UDOT 2004).

The majority of the study area includes residential and commercial land uses. As shown in Table 3-10, residential areas, as well as parks, recreation areas, churches, hotels, motels, hospitals, and libraries are all included in category B land uses. No hospitals or libraries (excluding school libraries) are located within the study area. One county library branch is located at 10300 South Beckstead Lane, which is north of the study area and east of Redwood Road.

Existing ambient noise levels along the affected routes were determined by direct measurements at various locations in residential or commercial areas. Short-term measurements were taken at the selected sites near a building (or a proposed building development) to represent areas of frequent human activity.

Fourteen measurements were taken along the affected routes. The measurements were recorded on mild, calm weekdays using a Quest Technologies 2900 integrating and logging sound level meter. Prior to measurements, the meter was calibrated using a Quest Technologies QC-10 sound calibrator. Relevant data, such as traffic volumes, vehicle types, and traffic speeds, were collected for verification of FHWA's Traffic Noise Model (TNM). The existing noise measurements are shown in Table 3-11. The existing noise measurements were used to assess impacts associated with the alternatives of this FEIS, and are presented in Section 4.7. A full Noise Analysis report, showing existing noise countours, is included in Appendix H.

Table 3-10.
UDOT Noise Abatement Criteria

Activity Category	Leq(h), dBA*	Description of Activity Category
A	55 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	65 (exterior)	Picnic areas, recreational areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	70 (exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	None	Undeveloped lands.
E	50 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: UDOT, 2004
*Hourly A-weighted sound level, reflecting a 2 dBA approach value below 23 CFR 772
Leq(h) = hourly average noise
dBA = A-weighted decibel level

Table 3-11.
Existing Ambient Noise Measurements

Address	Leq(h), dBA*
580 West 11400 South	67.7
11700 South Lone Peak Parkway	56.5
3000 West 11400 South	62.4
2103 West 11400 South	64.8
1570 West 11400 South	64.1
11400 South River Front Parkway	54.4
10431 S Gladys Drive (1925 West)	56.1
2450 West 10400 South	63.4
0.25 mile east of Bangerter Highway on 10400 South	61.2
2840 West 10386 South	58.6
2565 West 12640 South	55.1
Jordan River Parkway at 12300 South	51.0
1132 West Chapel Ridge Drive	54.9
Jordan River Parkway Trail at 11400 South	50.8

* dBA = A-weighted decibel level

3.8 Water Resources

This section describes the water resources that exist within the 11400 South study area. Water resources include surface water bodies such as rivers, streams, lakes, ponds, canals, retention/ detention basins, and underground water bodies such as aquifers. Floodplains associated with the major streams in the study area are discussed in Section 3.9. Figure 3-5 illustrates the surface water resources and floodplains in the study area.

3.8.1 Surface Water

The Utah Department of Environmental Quality, Division of Water Quality (UDEQ, DWQ) groups surface water in classes according to beneficial use in order to protect the water from controllable pollution ("Standards of Quality for Water of the State," UAC R317-2-13.5). These classes are defined below :

- 1C – Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water.
- 2A – Protected for primary contact recreation such as swimming.
- 2B – Protected for secondary contact recreation such as boating or wading.
- 3A – Protected for cold water species of game fish and other cold water aquatic life.
- 3B – Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.
- 3C – Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.
- 3D – Protected for waterfowl, shore birds, and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.
- 4 – Protected for agricultural uses including irrigation and stock watering.

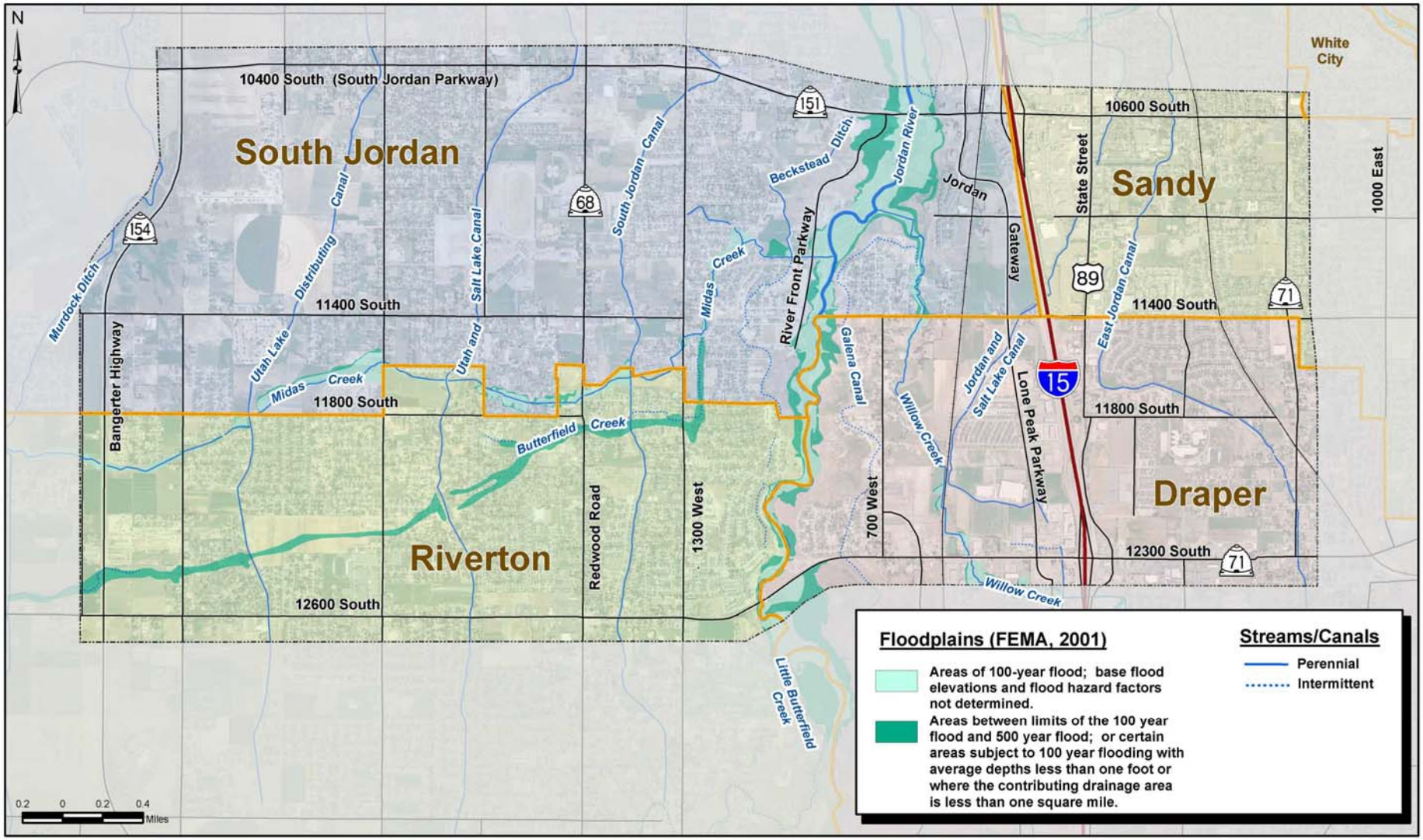

Figure 3-5. Surface Water Resources and Floodplains

Section 303(d) of the Clean Water Act (CWA) requires each state to identify water bodies (i.e., lakes, reservoirs, rivers, and streams) that do not achieve or are not expected to achieve the state water quality standards (based on classification). These water bodies are referred to as “water quality limited” or “impaired waters” and are listed in Utah’s 303(d) List of Waters (Utah DWQ 2004). None of the water bodies are “water quality limited” or “impaired waters” within the study area (Utah DWQ 2004). However, several stretches of the Jordan River outside the study area are considered impaired for the following reasons:

- From Farmington Bay upstream 6.1 miles and from 6.3 miles upstream to North Temple, the Jordan River is in violation of dissolved oxygen standards;
- From Farmington Bay upstream 6.1 miles, the Jordan River is in violation of total dissolved solids standards; and
- From Bluffdale to Jordan Narrows, the Jordan River is violation of temperature standards for aquatic life.

Urban storm water runoff is considered a significant source of organic loading that creates a large oxygen demand in the lower parts of the Jordan River

The following surface water bodies are present within the project study area.

Rivers and Streams

The most important hydrologic feature in the study area is the Jordan River, which flows north-south through the study area between about 700 West and 1300 West. The main tributaries to the Jordan River in this area are Midas Creek from the west and Willow Creek from the east/southeast.

Jordan River

The 11400 South study area is located within the Jordan River Basin, which is the lower portion of the larger Utah Lake-Jordan River Watershed. Within the study area, the Jordan River is classified as 2B, 3A, and 4.

The Jordan River is a perennial stream and provides the outflow from Utah Lake, flowing northward for approximately 50 river miles to terminate in the Great Salt Lake. The stream pattern is generally meandering, developing from a more confined canyon setting with a steeper slope (27 feet per mile [ft/mile]) in southern Salt Lake County to a flat open floodplain with lower slopes (2 ft/mile) and lower sinuosity in Salt Lake City (CH2M HILL 1992).

Numerous streams feed the Jordan River as it flows north to the Great Salt Lake. Its seven major tributaries (Little Cottonwood Creek, Big Cottonwood Creek, Mill Creek, Parley’s Creek, Emigration Creek, Red Butte Creek, and City Creek) and 13 smaller tributaries originate in the Wasatch Mountains and flow westward to the Jordan River. These provide more than 97 percent of the surface water supply in the Salt Lake Valley. Less than 3 percent of the surface water supply originates in the Oquirrh Mountains and flows through six intermittent streams eastward to the Jordan River.

In the study area, the Jordan River traverses the city of South Jordan and forms the boundary between Draper and Riverton. In this reach, the Jordan River has a meandering low flow channel within a braided high-flow channel (CH2M HILL 1992). The annual mean stream flow of the Jordan River at the 9000 South monitoring station, just north of the study area, ranged between 274 and 1661 cubic feet per second (cfs) from 1980 to 1989, with an average flow of 693 cfs (Utah Geological Survey [UGS] 2002a). The maximum peak stream flow for this monitoring station was 2,790 cfs on June 10, 1984 (UGS 2002b).

According to the UGS, the primary consumptive water uses for surface and groundwater withdrawn from the Jordan River in 1990 were public supply, domestic supply, industrial supply, and irrigation use. The UGS also notes that wastewater treatment returns water to the Jordan River, and in 1990, the amount returned by wastewater treatment was slightly less than domestic supply, industrial supply, and irrigation use.

Over the last 100 years, the Jordan River has undergone significant changes. River straightening and channelization, stream flow diversions, bridge construction, and floodplain development have considerably altered the natural equilibrium of the river.

Within the study area, two roadway bridges, two pedestrian bridges (one located just north of 12300/12600 South and one located just south of 12300/12600 South), and approximately three utility crossings currently cross the Jordan River. Concerns with development along the river were detailed in the Jordan River Natural Conservation Corridor Report (NAS 2000). According to this report, bridges crossing the river restrict the pre-settlement meander pattern. Since bridges are sized for the 100-year flood and not the meander pattern, the channel is fixed at the bridge locations, and the river can only (potentially) meander in the stretches between the bridges, which get shorter as more bridges are constructed. Less meandering increases the flow gradient, leading to downcutting and entrenching of the streambed, which in turn causes the water table to drain and drop. This has two main results: the floodplain may dry out, impacting wetland vegetation and the wildlife that rely on wetlands; and erosion and sediment loads may increase from riverbanks into the river. It was recommended in a study commissioned by Salt Lake County (CH2M HILL 1992) that management within the Jordan River Meander Corridor (a zone within which the river channel may be expected to migrate within the next 100 years) should consist of nonstructural measures. The Salt Lake County Jordan River Flood Channel Management Ordinance was developed in 1994 based on this study, setting limits on the type of development and land uses within the designated corridor (NAS 2000). Development proposed within the Jordan River Meander Corridor must undergo additional investigations, with assurances that development will not be threatened by changes in the meander.

Midas Creek/Butterfield Creek

Midas Creek originates in the Oquirrh Mountains and flows generally eastward to the Jordan River. Its flow is intermittent in the upper reaches and perennial near the confluence with the Jordan River due to groundwater and subsurface irrigation return flows. Butterfield Creek originates in Butterfield Canyon in the Oquirrh Mountains. Over the years, the flows from the canyon have been diverted and the channel farmed over. Between about 6000 West and 1700 West, the Butterfield Creek channel is nonexistent. A possible remnant channel starts at about 1700 West and connects to Midas Creek. Salt Lake County is in the process of constructing a connection between Butterfield Creek and Midas Creek at about 6000 West, which will carry flood flows from Butterfield Canyon to Midas Creek (Salt Lake County correspondence, November 30, 2004).

The Butterfield/Midas Creek Watershed area is about 52 square miles. Neither creek is gauged. Midas Creek is not specifically classified, but is included within an area classified as 2B, 3D, and 4 (UDWQ 2002).

Willow Creek

Willow Creek originates in the form of Big and Little Willow Creek in the Wasatch Mountains south of Little Cottonwood Canyon. All the flow from both Big and Little Willow Creek previously flowed into irrigation ditches in Draper at the base of the Wasatch

Foothills. Recently, the historical channel of Willow Creek (below the confluence of Big and Little Willow Creek at about 1700 East) has been restored, and Willow Creek is currently again considered a natural flowing stream, with its lower reach containing perennial flow. It flows in a west-southwesterly direction from its headwaters to about 300 East, then flows in north–northwesterly direction to the confluence with the Jordan River at about 11000 South. Bear Canyon is a tributary to Willow Creek. The drainage area for Willow Creek is approximately 18.5 square miles. Within the study area, Willow Creek is not classified, but as a tributary of the Jordan River, it would have the same classification as the Jordan River (2B, 3A, and 4).

Lakes and Ponds

The study area contains seven small ponds that are all located on the Jordan River Floodplain. The small ponds present within the study area are not specifically classified by UDEQ, DWQ.

Irrigation Canals

There are seven canal systems in the study area; they are listed below in order from west to east. All seven canals transect the study area in a north-south direction. The seven canals are:

- Utah Lake Distribution Canal;
- Utah and Salt Lake Canal;
- South Jordan Canal;
- Beckstead Ditch;
- Galena Canal;
- Jordan and Salt Lake Canal; and
- East Jordan Canal.

Irrigation canals are not regulated by UDEQ; however, typical water quality recommendations for irrigation canals are the same as for Class 4 water bodies (protected for agricultural uses).

The Utah Lake Distribution Canal passes through the study area between Bangerter Highway and 2700 West. This canal is owned and operated by the Utah Lake Distributing Canal Company and is used for irrigation and flood control. It flows from April 15 to October 15, with a flow of 73 cfs at the head works. The canal is approximately 11 miles long. The canal company maintains an easement 33 feet from the middle of the canal to the east, and 18 feet from the middle of the canal to the west.

The Utah and Salt Lake Canal passes through the study area between 2700 West and Redwood Road. This canal is owned and operated by the Utah and Salt Lake Canal Company. The channel is approximately 7 to 9 feet deep through the study area and 25 to 30 feet wide. The canal was constructed in the late 1800s and was later expanded by Kennecott in the early 1900s. It is approximately 27 miles long and conveys water diverted from the Jordan River between April 15 and October 15. Canal water is used for irrigating farmland and also as secondary water for watering lawns. It also serves as a storm drain for flood control. Kennecott Utah Copper, under a contract with the canal company, uses 30 cfs of water from the canal for industrial activities. The maximum flow rate allowed in the canal is 172 cfs.

The South Jordan Canal passes through the study area between Redwood Road and 1300 West. This canal is owned and operated by the South Jordan Canal Company. The channel is approximately 5 to 6 feet deep through the study area and 15 to 20 feet wide. The canal is about 26 miles long and conveys water from Utah Lake between April 15 and October 15. Canal water is used for irrigating farmland and also as secondary water for watering lawns. It also serves as a storm drain for flood control.

The Beckstead Ditch passes through the study area between 1300 West and the Jordan River. The ditch begins just north of 12300 South and terminates just north of 10600 South at

Mulligan's Golf Course. It is owned and operated by the Beckstead Irrigation Company and conveys water from the Jordan River and Midas Creek. The ditch was constructed in 1857 by the Beckstead family and was both an irrigation ditch and a millrace (for the family's grain mill). Historically, the ditch diverted water from the Jordan River just north of 12400 South, however, that diversion was lost during the flood of 1980. A new diversion was constructed at approximately 11000 South. Currently, the canal is piped along 50 to 60 percent of its length and is an open, 8-foot-wide, unlined ditch for the rest. Ditch water is used primarily for irrigation with the main users being South Jordan City and Mulligan's Golf Course. It also serves as a storm drain for flood control.

The Galena Canal historically passed through the study area between the Jordan River and 700 West. It was an unlined canal. However, the head works for the canal no longer exist, and much of the canal within the study area appears to have been removed and replaced by residential construction. What remains of the canal is now dry most of the year and is only fed through groundwater seepage.

The Jordan and Salt Lake Canal passes through the study area to the east of 700 West, crossing beneath I-15, Lone Peak Parkway, and State Street. The canal is about 28 miles long, with an 18.5-foot-wide bottom and a 1:1.5 side slope. Canal water is used for irrigating farmland and also as secondary water for watering lawns.

The East Jordan Canal passes through the study area to the east of State Street between 10600 South and 12100 South. The canal is 17 miles long, is unlined, has a maximum flow of approximately 150 cfs, and is owned and operated by the East Jordan Irrigation Company. Canal water is used for agricultural irrigation and also serves as a storm drain for flood control.

3.8.2 Detention/Retention Basins

The detention basins present within the study area are primarily intended to control the flow of storm water runoff entering the respective receiving water. However, another major function of detention basins is to remove contaminants associated with sediments and suspended solids from storm water runoff by providing time for these particles to settle out of the water column. This function is facilitated by the fact that detention basins often become vegetated, further enhancing the filtration of pollutant-loaded sediments.

Detention basins are designed to detain storm water runoff on site for a specific period of time and to release storm water off site at a specified flow. In doing so, they not only reduce the outflow rates from storm events, but also remove contaminants associated with sediments and suspended solids from the runoff (FHWA 1996).

Retention basins also provide contaminant removal, but are designed to retain storm water runoff and to have water present year round. Water is only released from a retention basin when a specified overflow level is exceeded. There are no retention basins utilized as part of the existing drainage for any of the alternatives.

Storm water drainage within the study area is currently either discharged directly to the receiving water or is routed through detention basins as described below and shown on the alternatives figures in Section 2. Each alternative involves road improvements to one or more of the following corridors:

- 10600/10400 South;
- 11400 South;
- 12600/12300 South;
- Jordan Gateway/Lone Peak Parkway; and

- State Street.

Along the10600/10400 South corridor, there are currently two detention basins: one located at 10700 South adjacent to Beckstead Lane that discharges into the South Jordan Canal, and one located at 10600 South and 1000 West that discharges into the Jordan River.

Along the 11400 South corridor, there is one existing detention basin. Existing runoff is collected in pipes, culverts, ditches and/or the detention basin before reaching Midas Creek, Jordan River, or Willow Creek. There is one temporary detention basin located along the south side of 11400 South between State Street and I-15 that regulates flow to Willow Creek from the construction of the 12300 South roadway project, which includes modifications to State Street.

Along the 12600/12300 South corridor, there are currently four detention basins: one located at 3310 West and 12600 South, one at 2390 West and 12600 South, one at 1585 West and 12600 South, and one on the east side of the Jordan River at 12300 South. The first two detention basins listed above discharge into the third, and then ultimately into the Jordan River from the west through an oil/water separator. The last detention basin listed above discharges into the Jordan River from the east.

Along the Jordan Gateway/Lone Peak Parkway corridor, there is currently one detention basin that is part of the Sterling Village apartment complex and is located at approximately 11050 South and 750 West. It discharges into the Jordan River through an abandoned irrigation ditch. All other runoff is collected in existing pipes, culverts, or ditches before ultimately reaching the receiving water.

Along the State Street corridor, there is currently one detention basin that is being constructed as part of the 12300 South roadway project, which includes modifications to State Street. It is located at 12100 South on the west side of I-15. It will ultimately discharge into Willow Creek through a series of culverts and grassy channels.

3.8.3 Groundwater

The following groundwater resources are present within the study area.

Aquifers

The 11400 South study area is underlain by both shallow and deep aquifers. Drinking water is obtained from the deep aquifer. The 1997 Utah State Water Plan for the Jordan River Basin indicates that within the study area, the susceptibility of groundwater to contamination is ranked as “intermediate” to “least,” meaning that the possibility of the deep primary aquifer being contaminated from surface activities is low. Along the Jordan River, depth to groundwater in the shallow, surface aquifer can be quite close to the ground surface, and in some areas this groundwater surfaces when the earth is disturbed.

Groundwater in Salt Lake Valley generally moves from recharge areas at high altitudes, along the foothills of the mountains, to discharge areas at lower altitudes, mainly the Jordan River. A groundwater divide formed by the Jordan River separates the Salt Lake Valley into two different groundwater regimes. Groundwater originating along the eastern benches flows generally west towards the Jordan River, while groundwater originating along the western benches flows generally east towards the Jordan River. According to the topographic map of the study area, the inferred direction of groundwater flow is to the northeast on the west side of the Jordan River and to the northwest on the east side of the Jordan River.

Wells/Water Rights

According to the Utah Division of Water Rights, there are 999 diversion points for surface water and groundwater rights within the study area. The following information was available in the Utah Division of Water Rights database for these water rights:

- 958 are underground rights, indicating wells;
- 32 are surface rights, which includes springs, streams, rivers, creeks, and any water above ground;
- 5 are drain rights, indicating a surface or underground drain that diverts water;
- 3 are rediversion rights, indicating water diverted from a canal; and
- 1 is point-to-point right, typically indicating stock watering rights along a section of a water body.

The majority of these water rights are used for various combinations of irrigation, domestic, and stock watering purposes (Utah Division of Water Rights 2002).

3.8.4 Floodplains

Floodplains in the study area are located along the Jordan River and along Midas Creek and Willow Creek, as shown in Figure 3-5. The Jordan River is a naturally meandering river flowing through an approximately 1,000- to 1,500-foot-wide floodplain where it crosses the study area. Historically, the incised floodplain was about 2,000 to 2,500 feet wide, as can be seen by the lower elevation of the current active floodplain compared to the surrounding terraces. These riverine terraces were formed during falling Lake Bonneville levels over the last 10,000 to 100,000 years. This can be seen when traveling along 10400/10600 South, 12300/12600 South, or when observed at 11400 South and about 800 West. The current 100- and 500-year floodplains extend about 500 to 700 feet on either side of the river. The 100-year floodplains are also located around Midas Creek. Willow Creek has wide 100- and 500-year floodplains in the low elevation areas near 12300 South and I-15, where the (historical) floodplain of Willow Creek is significantly wider.

The Federal Emergency Management Agency (FEMA) regulations are found at 44 CFR 9 and Executive Order 11988. Under the flood insurance portions of 44 CFR, in order to participate in the flood insurance program, communities must develop ordinances for the management of developments in “special flood hazard areas”. Each city is responsible to insure that development within their city is in conformance with FEMA regulations.

The Salt Lake County Floodplain Ordinance for the Jordan River requires a Flood Control Permit be issued for any discharges to or modifications of any countywide flood control facilities. Salt Lake County Ordinance also requires development within the meaner corridor of the Jordan River to obtain a permit from the County showing that development will be protected from movement of the river. According to the county ordinance, any changes to bridge structures along the Jordan River must not increase the 100-year flood event more than 1 vertical foot. The ordinance also includes location-specific requirements for freeboard from the surface of the 100-year flood to the bottom cord of a bridge structure.

3.9 Wetlands

3.9.1 Introduction

Wetlands are important biological resources that perform many functions including groundwater recharge, flood flow attenuation, erosion control, and water quality improvement. They also provide habitat for multiple plants and animals, including special status species.

Wetlands are defined by the Corps and EPA based on the presence of wetland vegetation, wetland hydrology, and hydric soils. Many wetlands (and other aquatic features, including intermittent and perennial streams) are considered "waters of the United States" by the Corps and these "jurisdictional" areas are protected under Section 404 of the Clean Water Act (CWA). The CWA requires that the Corps issue a permit for any discharge of dredged or fill material into such waters. Additionally, it should be noted that the CWA only "protects" those wetlands and other waters considered jurisdictional by the Corps, whereas it is UDOT policy to consider all wetlands and mitigate for all impacts to jurisdictional and non-jurisdictional wetlands at a 1:1 ratio.

Numerous wetlands and other waters were identified within the study area, as shown in Figure 3-6. The wetlands can be placed into two groups: natural and irrigation/stormwater-related, and the other waters can be divided into creeks/rivers, ponds, and irrigation canals/ditches. The following sections describe these wetlands and other waters, and states whether the feature is considered jurisdictional or non-jurisdictional.

3.9.2 Methods

The study area generally extends across the Jordan River from 700 East to Bangerter Highway and extends along the Jordan River from 10400/10600 South to 12300/12600 South. The entire study area was walked and/or driven in May 2003 to identify wetlands and other waters. Wetlands were identified based on the presence of wetland vegetation and wetland hydrology, assuming the presence of hydric soils. Other waters were identified based on standing water, evidence of scour, or presence of a defined bed and banks.

All wetlands and other waters were mapped on 1 inch equals 200 feet color aerial photographs and the data were digitized using ArcView computer software.

Wetland functions were assessed for each wetland group (natural and irrigation/stormwater-related) using a modified version of the Montana Method (Berglund 1999). This method provides ratings for twelve functions and values.

During the preparation of this document, the Corps and other agencies (as applicable) were contacted to discuss the following:

- Project history and alternatives, including bridge design;
- Selection of the Preferred Alternative;
- Functional assessment methods and results;
- Jurisdictional status of the wetlands and other waters;
- Possible Section 404 permitting scenarios; and
- Possible approaches to compensatory wetland mitigation.

3.9.3 Natural Wetlands

Natural wetlands include those that are associated with creeks, rivers and seeps/springs. Most of the natural wetlands within the study area are associated with the Jordan River, Midas Creek, Willow Creek, and one hillside seep. These wetlands receive their water from natural flows in these creeks and from natural groundwater discharge. Most of these wetlands are classified according to Cowardin et al. (1979) as palustrine emergent with pockets of palustrine scrub/shrub. The dominant vegetation observed in the natural wetlands is listed in Table 3-12.

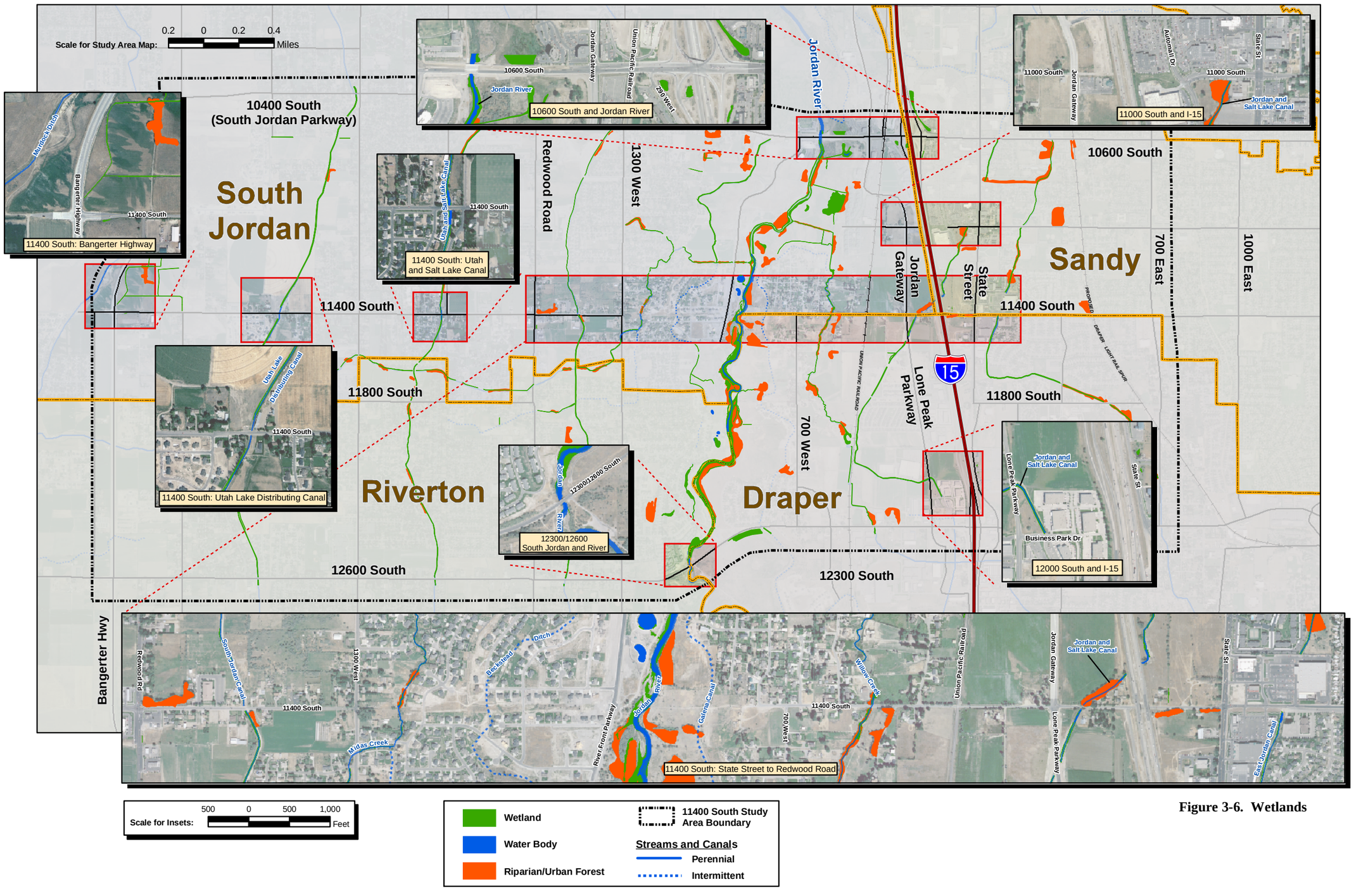

Figure 3-6. Wetlands

Table 3-12.
Dominant Wetland Vegetation by Wetland Group

Common Name	Scientific Name	Indicator Status	Natural Wetlands	Irrigation-Related Wetlands
Creeping bentgrass	*Agrostis stolonifera*	FACW	✓	
Water parsnip	*Berula erecta*	OBL	✓	
Beggar's tick	*Bidens cernua*	OBL	✓	
Woolly sedge	*Carex lanuginosa*	OBL	✓	
Black creeper sedge	*Carex praegracilis*	FACW		✓
Poison hemlock	*Conium maculatum*	FACW	✓	
Teasel	*Dipsacus sylvestris*	NL	✓	
Saltgrass	*Distichlis spicata*	FAC+	✓	✓
Barnyard grass	*Echinochloa crusgalli*	FACW	✓	✓
Creeping spikerush	*Eleocharis palustris*	OBL	✓	
Quackgrass	*Elymus repens*	FACU	✓	✓
Willowherb	*Epilobium ciliatum*	FAC	✓	✓
Goldentop	*Euthamia occidentalis*	OBL	✓	✓
Foxtail barley	*Hordeum jubatum*	FAC	✓	
Wiregrass	*Juncus balticus*	FACW	✓	
Torrey's rush	*Juncus torreyi*	FACW	✓	
Duckweed	*Lemna minor*	OBL	✓	
Purple loosestrife	*Lythrum salicaria*	OBL	✓	
Field mint	*Mentha arvensis*	FACW		✓
Alkali muhly	*Muhlenbergia asperfolia*	FACW+	✓	✓

Table 3-12. (cont.)
Dominant Wetland Vegetation by Wetland Group

Common Name	Scientific Name	Indicator Status	Natural Wetlands	Irrigation-Related Wetlands
Watercress	*Nasturtium officinale*	OBL	✓	
Reed canarygrass	*Phalaris arundinacea*	OBL	✓	✓
Common reed	*Phragmites australis*	FACW+	✓	
Kentucky bluegrass	*Poa pratensis*	FACU	✓	✓
Willow-weed	*Polygonum lapathifolium*	OBL	✓	✓
Rabbitfoot grass	*Polypogon monspeliensis*	FACW+	✓	
Marsh buttercup	*Ranunculus cymbalaria*	OBL	✓	
Curly dock	*Rumex crispus*	FACW	✓	✓
Sandbar willow	*Salix exigua*	OBL	✓	✓
Alkali bulrush	*Scirpus maritimus*	NL	✓	
Three-square	*Scirpus pungens*	OBL	✓	
Soft-stem bulrush	*Scirpus validus*	OBL	✓	✓
Saltcedar	*Tamarix ramosissima*	FACW	✓	
Maritime arrowgrass	*Triglochin maritima*	OBL	✓	

Source: URS, 2003
[1]Indicator status based on national indicators for Region 8 developed by Reed (1988). OBL = obligate wetland species, >99% probability of occurring in a wetland; FACW = facultative wetland species, 67-99% probability of occurring in a wetland; FAC = facultative species, 34-66% probability of occurring in a wetland; FACU = facultative upland species, <33% probability of occurring in a wetland. If the species is not included in Reed (1988) then the designation NL, Not Listed, is shown. If insufficient data were available to determine the indicator status of a species, then NI, No Indicator, is shown. A positive (+) indicates a frequency of occurrence toward the higher end of the category (more frequently found in wetlands) and a negative (-) indicates a frequency of occurrence toward the lower end of the category (less frequently found in wetlands).

The natural wetlands are generally the most ecologically functional wetlands in the study area, and based on a modified version of the Montana Method (Berglund 1999), can provide the following functions and values:

- General wildlife habitat, due to the diverse vegetation communities;
- Flood attenuation and storage, due to the proximity to flowing channels (except for the seep);
- Sediment/nutrient/toxicant retention and removal, due to the proximity to the flowing channels;
- Sediment/shoreline stabilization, due to the proximity to the flowing channels and the high percentage of vegetative cover; and
- Recreation/education potential, due to the proximity to parks and preserves.

All of the natural wetlands in the study area that would be affected by project facilities are considered jurisdictional by the Corps.

3.9.4 Irrigation and Stormwater-Related Wetlands

The irrigation and stormwater-related wetlands include those associated with irrigation canals/ditches, irrigation over and return flows, and stormwater runoff and collection. Most of these wetlands are small and are classified according to Cowardin et al. (1979) as palustrine emergent with some very small pockets of palustrine scrub/shrub. The dominant plant species observed in these wetlands are listed in Table 3-12.

Irrigation/stormwater-related wetlands are generally less functional than the natural wetlands but based on a modified version of the Montana Method (Berglund 1999), can still provide general wildlife habitat, due to the diverse vegetation communities.

All of the irrigation-related and most of the stormwater-related wetlands in the study area are considered non-jurisdictional by the Corps.

3.9.5 Other Waters

A total of 16 other waters were identified within the study area, including six canals and ditches, four creeks/rivers, and six small ponds. These were discussed in Section 3.8. All of the canals and ditches are considered non-jurisdictional by the Corps.

3.9.6 Creeks and Rivers

Three creeks and one river were identified in the study area. These are listed below and briefly discussed in the following paragraphs.

- Midas Creek;
- Butterfield Creek;
- Willow Creek; and
- Jordan River.

Midas Creek (see Figure 3-5) appears to be intermittent in the western portion of the study area (i.e., west of the Utah Lake Distribution Canal). As the creek approaches the Jordan River, the flows appear to be perennial and the quantity of wetlands present along the channel is markedly higher. The intermittent portion of the creek has a poorly defined channel, 2 to 4 feet wide, and no flows were observed. The perennial portion has a well-defined channel approximately 3 to 8 feet wide and was flowing with water 4 to 12 inches deep in most areas. The western portion of the creek is surrounded by rural residential areas, and the easternmost portion is surrounded by more urban residential areas. All portions of Midas Creek (and its wetlands) is considered jurisdictional by the Corps.

The remnants of Butterfield Creek are located approximately 1,000 feet south of Midas Creek, near Redwood Road (see Figure 3-5). Here, the creek is likely intermittent, has a channel 2 to 4 feet wide, and was flowing with water 4 to 8 inches deep. Most adjacent areas are rural residential, with more urban residential further west (higher in the watershed). Butterfield Creek (and its wetlands) would not be affected by any of the alternatives. It would likely be considered non-jurisdictional unless a connection to another jurisdictional water of the United States (e.g., the Jordan River) can be demonstrated.

Willow Creek (see Figure 3-5) appears to be perennial and has a channel 4 to 8 feet wide in most areas. Flowing water 6 to 18 inches deep was observed in most areas, and several wetlands were observed along the creek. The creek is generally surrounded by rural residential and agricultural lands. Approximately 1,500 feet north of 12300 South, about 1,000 feet of the creek is currently being relocated in order to construct a railroad bridge over 12300 South. Willow Creek (and its wetlands) is considered jurisdictional by the Corps.

The Jordan River and its floodplain dominate the center of the study area (see Figure 3-5). It has a channel 20 to 50 feet wide, with water 1 to 4 feet deep. The Jordan River system provides the majority of undeveloped habitat (including large wetlands) within the study area and is the largest fresh water feature in the area. Most of the area adjacent to the floodplain is residential with some open space, parks, and wildlife preserves. All portions of the Jordan River (and its wetlands) is considered jurisdictional by the Corps.

3.9.7 Ponds

The study area contains six small ponds and all are located on the Jordan River Floodplain (see Figure 3-5). Two of the ponds (Midas Creek Ponds) are associated with the River Front Park on the west side of the river. The other four are on private land and appear to function as livestock ponds. The ponds vary in size and depth, and most have some wetlands around their perimeter.

The ponds that are connected to jurisdictional waters of the United States (e.g., the Jordan River) would likely be considered jurisdictional. This includes the two northernmost ponds in the Jordan River Park.

3.10 Wildlife and Special Status Species, Including Threatened or Endangered Species

The majority of the study area was walked or driven in May 2003 to identify wildlife habitat and to record any observed wildlife. During the preparation of this document the U. S. Fish and Wildlife Service (USFWS) and the Utah Division of Wildlife Resources (UDWR) (and other entities as applicable) were contacted to discuss:

- Project history and alternatives, including bridge design;
- Sensitive resources and important wildlife issues in the study area;
- Possible occurrences of threatened, endangered, candidate, proposed, and sensitive species;
- Wetland functional assessment methods and results;
- Impacts to waterfowl from stormwater ponds; and
- Compensatory mitigation for the loss of wetland and riparian habitat.

The study area contains limited wildlife habitat due to residential and commercial development and lack of undisturbed areas. This development has fragmented habitat and reduced or eliminated movement between areas for many wildlife species. However,

many riparian corridors within the study area provide some connectivity between various habitat patches throughout the study area.

The Jordan River corridor provides the most undisturbed habitat in the study area and is where the most diverse and abundant wildlife occurs. Wildlife utilize and migrate through the corridor relatively undisturbed within the urban areas surrounding the Jordan River. Tributaries of the Jordan River in the study area are also important wildlife corridors for movement and dispersal between habitats.

3.10.1 Wildlife Habitat

Three main wildlife habitat types occur within the study area: disturbed/agricultural, riparian/urban forest, and wetlands. Each of these habitat types is discussed briefly below.

Disturbed and Agricultural Habitat

The disturbed and agricultural habitat encompasses most of the study area and includes farm and ranch land; residential, commercial, and industrial development; roads; landscaped areas; and other areas altered by humans. Although many fragmented patches of undeveloped areas that still support wildlife species more tolerant of human disturbance are present, at the time of the site visit, many of these areas were proposed for future commercial or residential developments.

Agricultural lands within the study area often provide tree groves and relatively open spaces for wildlife habitation. Tree groves provide suitable nesting habitat for birds and raptors and irrigation ditches or canals are often found in association with shrub stands, which may provide cover and shelter for wildlife in areas relatively undisturbed by human activity.

Riparian/Urban Woodland Habitat

Riparian habitats and other areas of urban woodland occur along Midas Creek, Willow Creek, the Jordan River, and in other isolated pockets within the study area. This habitat type provides the most vegetative diversity and general wildlife habitat in the study area and generally consists of grasses, weedy forbs, and weedy trees. Table 3-13 contains a list of the most common plant species found in the riparian/urban woodland.

Table 3-13.
Common Vegetation in the Riparian/Urban Woodland Habitat

Common Name	Scientific Name
Trees and Shrubs	
Russian olive	*Elaeagnus angustifolia*
Box-elder	*Acer negundo*
Lanceleaf cottonwood	*Populus acuminata*
White poplar	*Populus alba*
Fremont's cottonwood	*Populus fremontii*
American plum	*Prunus americana*
Golden currant	*Ribes aureum*
Wood's rose	*Rosa woodsii*
Sandbar willow	*Salix exigua*
Crack willow	*Salix fragilis*
European bittersweet	*Solanum dulcamara*
Snowberry	*Symphoricarpos albus*
Saltcedar	*Tamarix ramosissima*
Siberian elm	*Ulmus pumila*

Table 3-13. (cont.)
Common Vegetation in the Riparian/Urban Woodland Habitat

Common Name	Scientific Name
Forbs and Graminoids	
Western wheatgrass	*Agropyron smithii*
Amaranth	*Amaranthus retroflexus*
Ragweed	*Ambrosia artemisiifolia*
Dogbane	*Apocynum cannabinum*
Common burdock	*Arcticum minus*
Showy milkweed	*Asclepias speciosa*
Smooth brome	*Bromus inermis*
Cheatgrass	*Bromus tectorum*
Whitetop	*Cardaria draba*
Musk thistle	*Carduus nutans*
Goosefoot	*Chenopodium album*
Canada thistle	*Cirsium arvense*
Bull thistle	*Cirsium vulgare*
Field bindweed	*Convolvulus arvensis*
Orchard grass	*Dactylis glomerata*
Tansymustard	*Descurainia pinnata*
Teasel	*Dipsacus sylvestris*
Saltgrass	*Distichlis spicata*
Tall wheatgrass	*Elymus elongatus*
Slender wheatgrass	*Elymus trachycaulus*

Table 3-13. (cont.)
Common Vegetation in the Riparian/Urban Woodland Habitat

Common Name	Scientific Name
Goldentop	*Euthamia occidentalis*
Wild licorice	*Glychorriza lepidota*
Curlycup gumweed	*Grindelia squarrosa*
Marshelder	*Iva xanthifolia*
Kochia	*Kochia scoparia*
Prickly lettuce	*Lactuca serriola*
Perennial pepperweed	*Lepidium latifolium*
Clasping pepperweed	*Lepidium perfoliatum*
Dalmatian toadflax	*Linaria dalmatica*
Cheeseweed	*Malva neglecta*
Yellow sweetclover	*Melilotus officinale*
Field mint	*Mentha arvensis*
Scotch thistle	*Onopordum acanthium*
Common plantain	*Plantago major*
Kentucky bluegrass	*Poa pratensis*
Prostrate knotweed	*Polygonum aviculare*
Russian thistle	*Salsola pestifer*
Field sowthistle	*Sonchus arvensis*
Field pennycress	*Thlaspi arvense*

Midas Creek flows east through the study area and is a tributary of the Jordan River. At the time of the site visit, the majority of Midas Creek was heavily disturbed with non-native vegetation and crossed by roads in multiple locations.

Willow Creek is a tributary of the Jordan River, with the confluence occurring in the northern portion of the study area. Generally, the riparian woodland associated with the creek is very narrow and is mostly comprised of non-native vegetation with many different land uses encroaching to the edges of the creek.

The Jordan River flows north from Utah Lake to the Great Salt Lake and is located near the center of the study area. The Jordan River corridor is a mosaic of riparian grassland, shrub land, and woodland; and contains the highest diversity of wildlife in the study area. The floodplain contains large stands of salt cedar and Russian olive, with interspersed wetlands. As part of a floodplain restoration effort, many of the largest stands of Russian olive near 10600 South have been recently cleared and planted with native trees and shrubs. Although most of the habitat along the Jordan River in the study area has been substantially altered by human activity, it still provides an important movement corridor for wildlife. A recreational trail, fishing ponds, and picnic areas are located along the Jordan River in the study area.

Two habitat enhancement projects occur within the study area at the Jordan River. The Utah Reclamation Mitigation and Conservation Commission (URMCC), in conjunction with the Great Salt Lake Audubon Society and Tree Utah, manages the Migratory Bird Habitat Restoration Project that extends from 9800 South to 11100 South along the east side of the Jordan River. This project was designed to restore migratory bird habitat and protect existing wildlife resources in the area.

In addition, the URMCC manages the 81-acre I-15 Wetland Mitigation Site/Wildlife Preservation Area located south of 12300 South, on the east side of the Jordan River. This property was used, in part, for wetland mitigation for the expansion of the I-15 corridor through Salt Lake County. URMCC manages this site as a wildlife preserve to enhance avian and terrestrial wildlife use of the area.

Wetland Habitat

Numerous wetlands were identified within the study area. Wetlands are discussed in Section 3.9.

3.10.2 Wildlife Species

Numerous species of wildlife were observed or are known to occur within the study area, including many species of mammals, birds, fish, reptiles, and amphibians.

Mammals

A relatively isolated population of mule deer (*Odocoileus hemionus*) occupies habitat along the Jordan River corridor in areas less disturbed by human activity and development. This population moves north and south along the Jordan River but generally does not seasonally migrate due to the fragmented habitat east and west of the Jordan River.

Other mammal species observed or known to occur in the study area and especially in the Jordan River corridor include, but are not limited to, red fox (*Vulpes fulva*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), Bottae's pocket gopher (*Thomomys bottae*), and muskrat (*Ondatra zibethica*).

Birds

Habitats in the study area support song sparrow (*Melospiza melodia*), cedar waxwing (*Bombycilla cedrorum*; wintering populations), black-billed magpie (*Pica hudsonia*), bank swallow (*Riparia riparia*), black-capped chickadee (*Poecile atricapilla*), western tanager (*Piranga ludoviciana*), western meadowlark (*Sturnella neglecta*), western kingbird (*Tyrannus verticalis*), ring-

necked pheasant (*Phasianus colchicus*), American robin (*Turdus migratorius*), and common yellowthroat (*Geothlypis trichas)*.

A variety of birds use the Jordan River, Willow Creek, and associated wetlands for year-round and/or nesting habitat as well as seasonal migration routes north or south. Species observed during site visits include:

- Snowy egret (*Egretta thula*);
- Caspian tern (*Sterna caspia*);
- Ring-billed gull (*Larus delawarensis*);
- Cinnamon teal (*Anas cyanoptera*);
- Mallard (*Anas platyrhynchos*);
- Killdeer (*Charadrius vociferous*);
- Spotted sandpiper (*Actitis macularia*);
- Bullock's oriole (*Icterus galbula*);
- Mourning dove (*Zenaida macroura*);
- Western meadowlark (*Sturnella neglecta*);
- Bank swallow (*Riparia riparia*);
- Red-wing blackbird (*Agelaius phoeniceus*);
- Yellow-headed blackbird (*Xanthocephalus xanthocephalus*);
- Brewer's blackbird (*Euphagus cyanocephalus*);
- Song sparrow (*Melospiza melodia*); and
- American goldfinch (*Carduelis tristis*).

An occupied red-tailed hawk (*Buteo jamaicensis*) nest was observed in a grove of cottonwoods on a farm located in the south-central portion of the study area near the 11400 South crossing of Willow Creek. While no other raptors were observed during site visits, other potential nesting habitat occurs at most woodland habitat within the study area for Swainson's hawk (*Buteo swainsoni*), American kestrel (*Falco sparverius*), great horned owl (*Bubo virginianus*), western screech owl (*Otus kennicottii*), and other raptor species (Sibley 2000). Bald eagles (*Haliaeetus leucocophalus*) are discussed in the following section on Special Status Species.

All bird species present in the study area are protected by the Migratory Bird Treaty Act (MBTA), which prohibits destruction or disturbance of nests that results in loss of eggs or young. Birds protected under this act include raptors, waterfowl, rare and sensitive species, and all other wild birds except for house sparrow (*Passer domesticus*), rock dove (*Columba livia*), and European starling (*Sturnus vulgaris*).

Fishes

Fish habitat in the study area is mostly limited to the Jordan River and its tributaries (including Midas and Willow Creeks). Generally, these waterways have been degraded from channelization and poor water quality (NAS 2000). The Jordan River is currently stocked with channel catfish (*Ictalurus punctatus*) and was formerly stocked with rainbow trout (*Oncorhynchus mykiss)* for recreational fishing (Slater 2003). Surveys conducted in 2001 and 2002 by the U.S. Geological Survey (USGS) found the following fish species in waters within the vicinity of the study area (Slater 2003): common carp (*Cyprinus carpio*), fathead minnow (*Pimephales promelas*), and white bass (*Morone chrysops*). Less common species occurring in the Jordan River and its tributaries within the study area include:

- Mountain sucker (*Catostomus platyrhynchus*);
- Green sunfish (*Lepomis cyanellus*);
- Black crappie (*Pomoxis nigromaculatus*);
- Long-nosed dace (*Rhinichthys cataractae*);

- Brown trout (*Salmo trutta*);
- Walleye (*Stizostedion vitreum*);
- Utah chub (*Gila atraria*); and
- Redside shiner (*Richardsonius balteatus*).

Reptiles and Amphibians

Species not observed during site visits but likely to occur in the study area include wandering garter snake (*Thamnophis elegans vagran*), common garter snake (*Thamnophis sirtalis*), greater short-horned lizard, (*Phrynosoma hernandesi*), Great Basin rattlesnake (*Crotalus viridis lutosus*), gophersnake (*Pituophis catenifer*), Great Basin spadefoot, (*Spea intermontana*), Great Plains toad (*Bufo cognatus),* tiger salamander, (*Ambystoma tigrinum*), and American bullfrog, (*Rana catesbeiana*) (Stebbins 1985).

3.10.3 Special Status Species

Special status species include those that are listed as threatened, endangered, candidate, proposed, or sensitive by the USFWS or the UDWR. Threatened or endangered species are plants or animals that are protected under the Endangered Species Act (ESA) or state law. Sensitive species, as well as federal candidate species for listing, are not legally protected but are considered when assessing impacts.

Lists of threatened, endangered, candidate, and sensitive species potentially occurring in Utah and in the study area were obtained from letters received from USFWS (Appendix D – December 12, 2003 letter from USFWS) and UDWR (Appendix D – June 6, 2003 letter from UDWR). USFWS provided a list of four wildlife species: June sucker, bald eagle, western yellow-billed cuckoo, and Canada lynx, of which only one, the bald eagle is likely to occur in the study area. This FEIS analyzes impacts to only those species that have the potential to occur in the study area. Table 3-14 presents federally listed and state special status wildlife species that may occur in the study area.

Two federally listed plant species were identified as having the potential to occur in the study area: Slender moonwort and Ute Ladies'-tresses. However, neither of these plant species is likely to occur in the study area due to lack of suitable habitat. No other federal or state special status plant species are known to occur in the study area.

Bald Eagle

Bald eagles are afforded protection under the ESA, MBTA, and the Bald and Golden Eagle Protection Act. Bald eagles are primarily winter residents in Utah. Cottonwood trees along rivers, lakes, and reservoirs are used for roost and nest sites. Wintering bald eagles arrive in Utah in November, reach peak densities in January and February, and migrate north to summer breeding grounds in March. Wintering populations occur in the study area in the vicinity of the Jordan River (Crawford 2003). While bald eagles are occasionally observed foraging or migrating through the area, no roosts or nests have been observed or recorded in the study area (Sakaguchi 2003). As of 1997, four bald eagle nests were known to exist in Utah (Messmer et al. 1998). While one nest occurs in Salt Lake County, it is not in the vicinity of the study area (Sakaguchi 2003).

Table 3-14.
Special Status Species that May Occur in the Study Area

Common Name	Scientific Name	Status	Habitat	Occurrence
Bald eagle	*Haliaeetus leucocophalus*	T	Occurs near coasts, lakes, rivers, and reservoirs	Wintering populations occur along Jordan River; nests occur in Salt Lake County
Common yellowthroat	*Geothlypis trichas*	S	Marshes, riparian areas, brushy pastures, and old fields.	Records of occurrence in study area; presence known.
Blue grosbeak	*Passerina caerulea*	S	Scattered trees, riparian woodlands, scrub, or woodland edges	Recent records of occurrence in study area, suitable habitat along Jordan River.
Western burrowing owl	*Athene cunicularia*	S	Open grassland and prairies, often in association with prairie dog towns	Recent records of occurrence in study area, although none were observed during site visit.

T = Federal Threatened
S = Utah Division of Wildlife Resources Species of Special Concern

Common Yellowthroat

The common yellowthroat is a species of special concern in Utah. Populations have declined as a result of the loss of riparian nesting habitat due to development and nest parasitization from brown-headed cowbirds (*Molothrus ater*) (UDWR 2003b). Yellowthroats are wood warblers typically associated with marshes, riparian woodlands, and wetlands. These birds are also found in drier upland habitats with dense shrub cover for foraging and nesting. Yellowthroats are primarily insectivorous, gleaning insects and spiders from low vegetation or off the ground. Nests are constructed on or just above ground at the base of a shrub or clump of grasses or cattails. Additionally, yellowthroats nest in close proximity to another pair and nesting activity begins in mid-May to late August.

During site visits, a common yellowthroat was observed in an upland brushy area. Furthermore, UDWR has records of recent occurrences of the species in the vicinity of the study area.

Blue Grosbeak

Blue grosbeaks are considered a sensitive species in Utah due to population declines and their relatively small range in Utah. Blue grosbeaks inhabit riparian woodlands and scrub. Nests are usually constructed just above ground level in trees or shrubs, but can vary up to 21 feet. Grosbeaks are insectivorous, but also eat seeds and fruits. In Utah, the blue grosbeak generally nests in the southern portion of the state, but UDWR has records of recent blue grosbeak occurrences in the vicinity of the study area (Appendix D – June 6, 2003 letter from UDWR). The study area contains some areas of potential habitat and occurrence is possible.

Western Burrowing Owl

Burrowing owls are a state species of concern that occur throughout Utah as uncommon summer residents in open grassland and prairies (UDWR correspondence June 6, 2003). Burrowing owls are opportunistic feeders, eating terrestrial invertebrates and a variety of small mammals, birds, frogs, toads, lizards, and snakes (UDWR 2003). Burrowing owls nest in underground burrows, and for this reason, they are often found in association with prairie dogs and ground squirrels, though they sometimes excavate their own burrows. Although no burrowing owls were observed during site visits, they are known to occur in grassland environments in Salt Lake County and may utilize less disturbed open habitats within the study area for nesting (UDWR correspondence, June 6, 2003).

3.11 Historic and Archaeological Preservation

3.11.1 Introduction

NEPA requires agencies to consider the effects of a planned federal undertaking upon the cultural environment, which includes historic cultural resources. Historic cultural resources can be sites, buildings, structures, districts, or objects that are more than 50 years old. They are further categorized as either prehistoric or historic depending upon their relative ages. Those resources from the era before permanent settlement by European settlers are categorized as prehistoric, while those from the subsequent period of permanent European settlement are categorized as historic.

Besides NEPA, planned federal undertakings must comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966 (16 USC 470, as amended) and implementing regulations (36 CFR 800). Section 106 requires federal agencies to take into account the effects of an undertaking on historic properties. NHPA defines historic properties as those cultural resources that are listed, or are eligible for listing, in the National Register of Historic Places (NRHP).

Within the study area, both an evaluation of previously undocumented standing structures and an intensive archaeological survey were conducted. Electronic copies of the architectural databases for the cities of Draper, Sandy, South Jordan, and Riverton were obtained from the Utah Division of State History, Preservation Section, on May 30, 2003.

Information concerning historic properties was solicited from the Historical Commissions for the involved communities at meetings on the following dates: June 19, 2003 – Riverton and Sandy; July 16, 2003 – South Jordan; and September 16, 2003 – Draper. In addition, files maintained by the UDOT Region 2 Archaeologist were searched on January 28, 2004.

A letter was sent to the Utah Geological Survey (UGS) to determine if there are any known or potential paleontological resources located within the study area. The UGS responded that there were no known locations within the study area, nor were there likely to be any given the geologic setting. (see Appendix D – July 18, 2003 letter from UGS).

3.11.2 Methods

Background information and a list of previously documented sites within the study area were compiled from site records available from the Utah Division of State History, Preservation Section and UDOT Region 2. Based on this review, areas of additional archaeological survey and architectural inventory were identified. Much of the architectural resources over 45 years old within the study area had been previously recorded. Thus, an effort was made to identify those architectural properties 45 years old or older that had not been previously inventoried and to record them in conjunction with this project. Properties 45 years or older were

recorded to account for the amount of time that would pass before construction activities would occur. Previous archaeological inventories within the study area were mainly related to previous roadway improvement projects, and most of the likely alternatives to be considered by this project had been surveyed. However, a few areas of additional survey were identified.

Intensive surveys for archaeological resources were conducted along 600-foot-wide corridors that encompass the Build Alternatives, as well as their associated facilities. These surveys were performed from September 2 to 5, 2003, and on April 20, 2004. The results of these surveys are documented in Tucker (2004).

A selective reconnaissance inventory of the remaining architectural resources over 45 years old was performed from September 2 to 5, 2003, and the results of which are presented in Mutaw and Wiltberger (2004). The Area of Potential Effect (APE) for the architectural survey was defined as the project study area (Bangerter Highway to 700 East and 12300/12600 South to 10400/10600 South) so as to accommodate all possible alternatives for the FEIS.

All of the known historic sites within the study area that may be subject to impacts from the alternatives were evaluated for NRHP eligibility. A site is considered eligible to the NRHP if it retains enough integrity to express its significance and if it meets one of four criteria (USDI 1990:40). The integrity of a site is based on seven fundamental qualities: location, design, setting, materials, workmanship, feeling, and association (USDI 1990:44). In order for a site to retain its integrity, it should possess several if not most of these qualities (USDI 1990:44). In addition to retaining integrity, a site must meet at least one of the following criteria, as shown at 36 CFR 60.4:

(a) It is associated with events that have made significant contribution to the broad patterns of our history; or

(b) It is associated with the lives of persons significant in our past; or

(c) It possesses distinctive characteristics of a type, period, or method of construction, or that represents the work of a master, or that possesses high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction; or

(d) It has yielded or may be likely to yield, information important in prehistory or history.

Definable segments of eligible linear resources (e.g., roads, ditches, railroad grades, etc.) and any associated structures or features are also evaluated as to whether they retain sufficient integrity to support the eligibility of the resource as a whole. The portions or features of linear resources that support the eligibility of the resource are those that demonstrate or add to the qualities or associations that cause it to be eligible to the NRHP. The portions that do not support the eligibility of the resource are those that do not demonstrate the qualities or add to the associations that cause it to be eligible to the NRHP.

In addition to the NRHP criterion, as part of the Utah State Historic Preservation Officer (SHPO) procedures for reconnaissance surveys, additional eligibility ratings are applied to each property. The ratings are as follows:

A – Eligible. Built within the historic period and retains integrity; excellent example of a style or type; unaltered or only minor alterations or additions; individually eligible for National Register under criterion “C”; also buildings of known historical significance.

B – Eligible. Built within the historic period and retains integrity; good example of a style or type, but not as well-preserved or well-executed as "A": buildings; more substantial alterations or additions than "A" buildings, though overall integrity is retained; eligible for National Register as part of a potential historic district or primarily for historical, rather than architectural, reasons.

C – Ineligible. Built during the historic period but has had major alterations.

D – Out of period. Constructed outside the historic period.

Buildings rated eligible under USHPO A or B categories may be eligible under National Register Criterion[1] A, but B-rated historic buildings generally are eligible only as contributing properties to a historic district or as part of a Multiple Property submission. USHPO A-rated historic buildings and structures can be nominated alone under National Register Criterion C if they meet the age and integrity requirements. Under National Register Criterion C, "retention of design, workmanship, and materials will usually be more important than location, setting, feeling, and association" (Andrus 1997:48). If a property is eligible under National Register Criterion A or B, integrity of design and workmanship might not be as important.

[1] National Register Criteria for Evaluation: The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or (d) that have yielded, or may be likely to yield, information important in prehistory or history.

3.11.3 Resources Identified

Table 3-15 lists the results of the background research and intensive inventory for historic and archaeological resources. Within the study area, hundreds of potential historic properties were identified. Many of these, particularly architectural properties, have been subject to evaluation and effects determination in conjunction with other roadway improvement projects. In an effort to focus on the resources that may be affected by the alternatives discussed in this study, only those properties that are listed on or eligible for listing on the National Register and located along a roadway corridor impacted by one of the advanced alternatives for this project are listed below and shown on Figure 3-7. The SHPO has given verbal concurrence with these eligibility determinations.

The residential structures and the single commercial structure are considered significant because they reflect a type or period of architectural style and generally retain their historic integrity. The Fairbourn Historic District is significant because these properties are representative of the late 19th and early 20th Century agrarian lifestyle and multigenerational family farms, and for its association with William Fairbourn, a locally prominent member of the community of Crescent and the Church of Jesus Christ of Latter-Day Saints. A brief description of each property is given following Figure 3-7.

Table 3-15.
Historic Properties Located within Area of Potential Effect

Address	Description	Construction Date	NRHP Criterion	SHPO Rating
1836 West 10400 South	Bungalow	1926	C	A
1547 West 10400 South	20th Century Crosswing	1904	Not Eligible	C
1476 West 10400 South	Bungalow	1904	C	A
1432 West 10400 South	20th Century Foursquare	1928	Not Eligible	C
1402 West 10400 South	Bungalow with Victorian Elements	1910	C	A
1350 West South Jordan Parkway	Art Deco – Elementary School Auditorium	1929	C	A
3414 West 11400 South	Other Style - Rectangular Plan	1938	Not Eligible	C
3244 West 11400 South	World War II Era Cottage	1941	C	A
3113 West 11400 South	One-Story Ranch	1957	C	B
11323 South 2700 West	Early Ranch	1950/1958	C	A
2555 West 11400 South	Early Ranch/Rambler	1956 and 1960	Not Eligible	C
2497 West 11400 South	One Story Early Ranch	1954	Not Eligible	C
11395 South Redwood Road (aka 11389 South Redwood Road, 11367 South Redwood Road, 11369 South 1700 West)	Ranch Style Residence and Bungalow	1950 and 1915	C	B
11386 South 1300 West	Two-Story Brick Bungalow	1947	C	B
11407 South 1300 West	Rear Half of House	1901	C	A
1327 West 11400 South (aka 1323 West 11400 South)	Foursquare Bungalow	1920	C	A
11450 South 800 West (aka 11450 South 700 West)	Single Story Foursquare Structure, Bungalow, and Shot-gun Style House	1920	C	A
455 West 11400 South (aka 437 West 11400 South)	Foursquare Bungalow-type Structure	1923	C	A
434 West 11400 South	Crosswing Victorian Eclectic Style Structure	1880, 1925, or 1903	C	A

Table 3-15. (cont.)
Historic Properties Located within Area of Potential Effect

Address	Description	Construction Date	NRHP Criterion	SHPO Rating
170-260 West 11400 South	Historic District, Late 19th and Early 20th Century Agrarian Lifestyle	1921-1940	Historic District	Historic District
12653 South 3600 West	World War II Era Cottage	1950 or 1940	C	A
2797 West 12600 South	Residential Structure	1936	Not Eligible	C
2779 West 12600 South	Former Gas Station	1935	C	A
2767 West 12600 South	Residential Structure	1938	Not Eligible	C
2630 West 12600 South	Ranch-Style Post War Residence	1950	C	B
2487 West 12600 South	World War II Style Cottage	1941	C	B
2435 West 12600 South	Foursquare type Residential Structure	1907	Not Eligible	C
2431 West 12600 South	World War II Style Cottage	1940 or 1960	C	B
2395 West 12600 South (aka 2295 West 12600 South)	Striated Brick Structure	1954	C	B
2314 West 12600 South	Semi-Subterranean Basement	1939	C	B
2284 West 12600 South	World War II Cottage	1934	Not Eligible	C
1604 West 12600 South	Queen Anne Victorian Eclectic Style	1941	C	A
1526 West 12600 South	World War II Cottage	1949	C	B
1512 West 12600 South	Striated Brick Residential Structure	1955	C	B
1396 West 12600 South	1-1/2 Story Victorian Eclectic	1916	C	B
736 West 12300 South	Gambrel-Roofed Barn/Residence	1950	C	B
692 West 12300 South (aka 691 West 12300 South)	Colonial Revival Vernacular	1920	C	A
681 West 12300 South	20th Century Vernacular Residence	1938	C	B
675 West 12300 South	20th Century Vernacular Residence	1938	C	A

Table 3-15. (cont.)
Historic Properties Located within Area of Potential Effect

Address	Description	Construction Date	NRHP Criterion	SHPO Rating
611 West 12300 South	Post War Residence converted to commercial usage	1949	C	B
390 West 12300 South (aka 438 West 12300 South)	Single Cell House	1910	C	B
274 West 12300 South (aka 270 West 12300 South)	20th Century Other	1899	C	B
191 West 12300 South	Residential Structure converted to machine shop	1954	C	B
11687 South State Street	Residential Structure	1950	C	B
11613 South State Street	Victorian Style	1910	C	A
11450 South State St (aka 11440 South State St)	Victorian Eclectic Crosswing Structure	1900	C	A
11550 South 260 West	Hall-Parlor Type House	1910	C	A
Bridge at c. 200 West 11400 South	Jordan and Salt Lake City Canal Bridge	1935	C	--
Utah Lake Distributing Canal (42SL286)	Irrigation Canal	1952	A	--
Utah and Salt Lake Canal (42SL307)	Irrigation Canal	1872	A	--
South Jordan Canal (42SL291)	Irrigation Canal	1875	A and B	--
Beckstead Ditch (42SL297)	Irrigation Canal	1859	A and B	--
Galena Canal (42SL284)	Abandoned Irrigation Canal	1873	A	--
Jordan and Salt Lake City Canal (42SL214)	Irrigation Canal	1879-1882	A	--
Denver and Rio Grande Western (D&RGW) Railroad (42SL293)	Railroad Tracks	1885	A	--

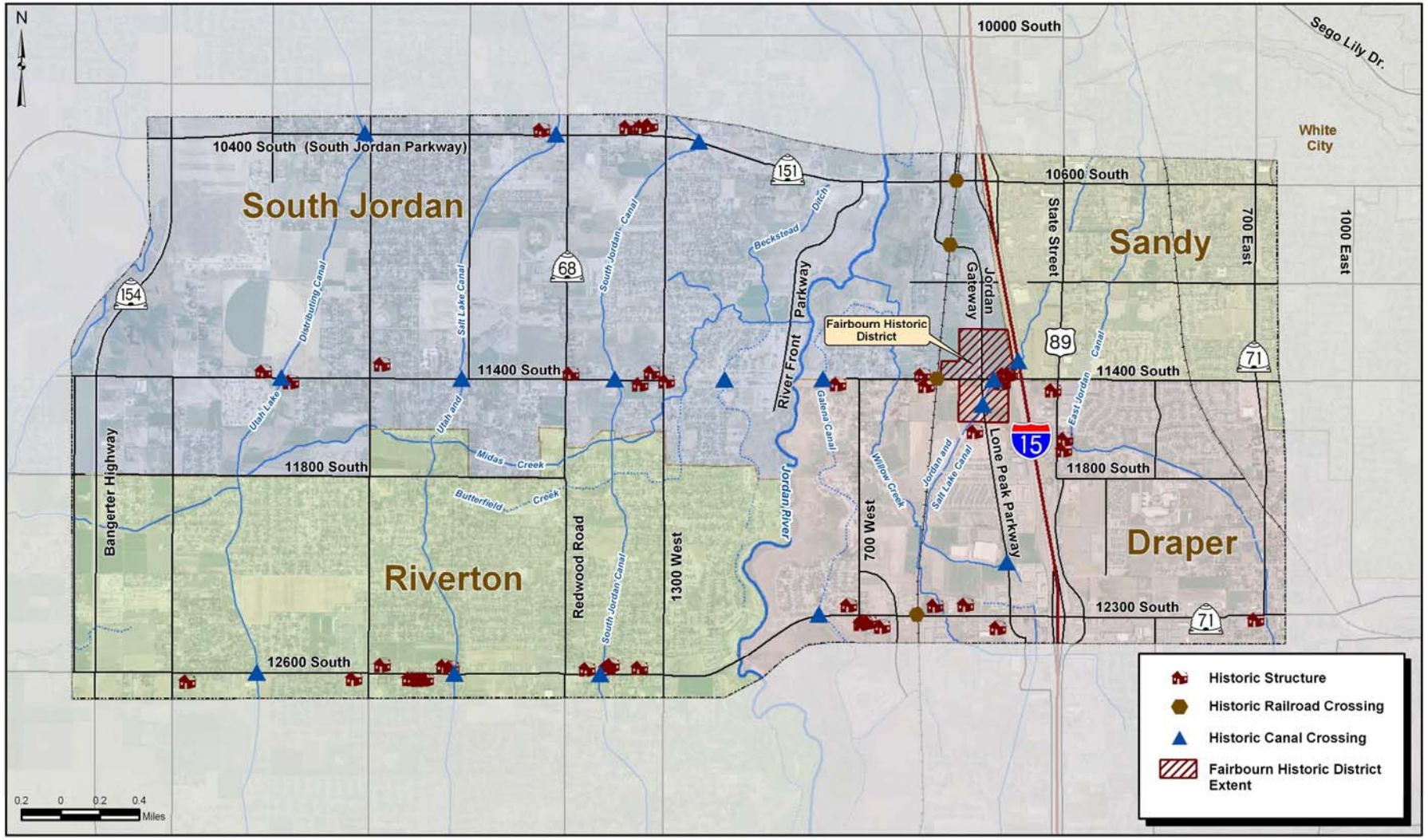

Figure 3-7. Historic Properties on Affected Corridors

1836 West 10400 South – This historic house is a bungalow type structure that may have been constructed as early as 1926. The foundation and basement are constructed of concrete, while the remainder of the house is of dark brown brick. A chain link fence surrounds the property. One shed located on this property is a non-contributing outbuilding. No major alterations have changed the style of this structure. FHWA and UDOT have determined and SHPO has concurred that this historic house is eligible for the NRHP under Criterion C and has a SHPO Rating of A.

1547 West 10400 South – This historic structure was built in 1904 and has been altered. Changes include a large rear addition and attached carport. It is an Early 20th Century style crosswing type residence. Due to the alterations, FHWA and UDOT have determined and SHPO has concurred that this house is not eligible for the NRHP.

1476 West 10400 South – This historic house is a bungalow type structure that was constructed in 1904. The structure has recently been remodeled. Alterations include enlargement of the window and door openings on the front façade, replaced windows throughout, and new front door and porch rail. However, FHWA and UDOT have determined and SHPO has concurred that this property is still eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of A.

1432 West 10400 South – This historic structure was built in 1928. It is an Early 20th Century style foursquare type residence. Recent observed alterations to the structure include the addition of window awnings and the expansion of the fireplace and chimney. The assessor's records indicate that the house was originally built in 1928 and that in 1948, an addition to the rear of the house and the infilling of a corner porch on the southeast façade occurred. The detached two-car garage was added in 1952 and a front addition in 1955. Due to the alterations, FHWA and UDOT have determined and SHPO has concurred that this house is not eligible for the NRHP.

1402 West 10400 South – This historic house is a bungalow type structure with Victorian elements that was constructed in 1910. FHWA and UDOT have determined and SHPO has concurred that this historic house is eligible for the NRHP under Criterion C and has a SHPO Rating of A.

1350 West South Jordan Parkway – The South Jordan Elementary School auditorium is an Art Deco type structure constructed in 1929. FHWA and UDOT have determined and SHPO has concurred that it is eligible for the NRHP under Criterion C as a historic structure that has had few alterations and is indicative of the time period in which it was constructed and has a SHPO Rating of A. This property is considered a locally significant landmark to the South Jordan community.

3414 West 11400 South – This one story Other/Unclear Style residence is rectangular in plan with a side-gabled roof and plank siding. Assessor's records, a poor quality undated photograph, and visual observations support a conclusion that its current appearance is the result of three separate building episodes. The eastern portion appears to be the original minimal traditional style structure. The central portion appears to be a bunkhouse that was moved to the site and attached to the original structure in or around 1938. The western portion appears to have been constructed around the 1960s as an attached garage that was later converted to living space. FHWA and UDOT have determined and SHPO has concurred that these alterations appear to be substantial enough to support a conclusion that the property is not eligible for the NRHP and has a SHPO Rating of C.

3244 West 11400 South – This historic house is a World War II era cottage constructed in 1941. FHWA and UDOT have

determined and SHPO has concurred that it is eligible for the NRHP under Criterion C and has a SHPO Rating of A.

3113 West 11400 South – This one-story Ranch with Garage is rectangular in plan with a side-gabled roof and a multi-colored brick finish. Windows are fixed-pane and sliding aluminum. An attached side-gabled two-car garage projects from the west façade. This historic house was constructed in 1957. FHWA and UDOT have determined and SHPO has concurred that it is eligible for the NRHP under Criterion C and has a SHPO Rating of B.

11323 South 2700 West – This historic house is an Early Ranch style constructed in 1950 according to the assessor's records or 1958 according to the SHPO database. The structure has been minimally altered. The windows may have been changed but appear to be in keeping with the original type. FHWA and UDOT have determined and SHPO has concurred that it is eligible for the NRHP under Criterion C and has a SHPO Rating of A.

2555 West 11400 South – This one-story Early Ranch/Rambler is rectangular in plan with a side-gabled roof and a multi-colored brick finish. According to the assessor's records, this building was originally constructed in 1956 as a Basement House with the ranch style superstructure added around 1960. These alterations have substantially altered the original in period structure and the ranch structure itself is out of period. Therefore, FHWA and UDOT have determined and SHPO has concurred that this building is not eligible for the NRHP and has a SHPO Rating of C.

2497 West 11400 South – This one-story Early Ranch with Garage constructed in 1954 is rectangular in plan with a front-gabled roof and clapboard siding. This structure appears to have been substantially altered. Historical data from the assessor's office indicate that the building was moved on the site and remodeled in 1963, as well as other additions that were completed by 1969. Based on undated photograph that appears to represent the original condition, these alterations included a gable roofed side addition that provides a new entrance to the building, a gable roofed carport addition on the front façade and a shed roofed porch addition connecting the carport with the side addition. These alterations have greatly altered the building from its original appearance. FHWA and UDOT have determined and SHPO has concurred that it not eligible for the NRHP and has a SHPO Rating of C.

11395 South Redwood Road – (aka 11389 South Redwood Road, 11367 South Redwood, 11367 South 1700 West and 11369 South 1700 West) – This property contains two structures, a 1950 ranch style residence and 1915 bungalow. The assessor's records included historic information and photographs for both of these and they both appear to be minimally altered. The ranch style house is currently occupied while the bungalow is abandoned and deteriorated. This historic property also contains two contributing outbuildings – an animal pen and a shed. FHWA and UDOT have determined and SHPO has concurred that it is eligible for the NRHP under Criterion C and has a SHPO Rating of B. The bungalow is also a locally significant landmark to the South Jordan community.

11386 South 1300 West – This historic brick house is a two-story bungalow that was constructed in 1947. The structure has been minimally altered. The house is characteristic of homes built during the World War II era. There are several outbuildings located on this property, including a detached garage and other farm related structures. However, these outbuildings are out of period and do not contribute to the historic value of the property. FHWA and UDOT have determined and SHPO has concurred that the house is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of B.

11407 South 1300 West – This historic property was constructed in 1901. The structure is the rear half of a house that, according to Karen Bashore (Riverton City Certified Local Government) was moved here in fulfillment of a divorce settlement. The front half is still extant and is located on Redwood Road, south of the study area. A small addition has been built onto the east façade. The assessor's records include a 1938 photograph showing the house at this location but no other information. This property is considered an important cultural landmark by South Jordan City. FHWA and UDOT have determined and SHPO has concurred that this house is eligible for the NRHP under Criteria C and has a SHPO Rating of A.

1327 West 11400 South (aka 1323 West 11400 South) – This foursquare historic house is a bungalow type structure constructed in 1920, with a pyramidal shaped porch. Two chimneys are located near the center of the roof. The structure has been minimally altered. The possible addition of a door on the east facade is the only change of note. Seven long chicken coop-type buildings, a detached garage, and two sheds are all contributing outbuildings. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of A.

11450 South 800 West (aka 11450 South 700 West) – This property consists of three structures, all of which may have been residential at one time, but now only the easternmost structure appears to be occupied. The house was constructed in 1920 and is a single story foursquare type structure. There are two chimneys located on the north side of the house and mature cottonwood trees on the south side of the house. The two smaller structures on the property contribute to its eligibility. One is a small bungalow-type structure with a clipped gable roof. This building is located directly west of the historic house and has been used as a storage area. The second outbuilding is a small, narrow, shot-gun style house. There are other outbuildings on this historic property but they do not contribute to the historic value of the property. FHWA and UDOT have determined and SHPO has concurred that this property is eligible for listing on the NRHP under Criterion C and has a SHPO Rating of A.

455 West 11400 South (aka 437 West 11400 South) – This historic house is an example of a foursquare type structure and has some characteristics of a bungalow-type house. The brick house was built in 1923 and has a pyramidal type roof and a large front porch supported by two brick columns. There are no outbuildings that contribute to the historic value of the property. FHWA and UDOT have determined and SHPO has concurred that this property is eligible for listing on the NRHP under Criterion C and has a SHPO Rating of A.

434 West 11400 South – This cross-wing type historic house was built in 1880 or 1925 according to the SHPO database, or 1903 according to the assessor's records, which appears to be an average of the other two dates. The type, Victorian Eclectic style, and adobe construction material are most consistent with the 1880 date. The house is a single story structure built with a projecting bay on the right side. The double-hung windows are original and the front entryway is a covered porch. The structure has been somewhat altered. Changes include a fairly new asphalt roof, a porch addition on the south façade, and a large awning, stairwell enclosure, and a new aluminum storm and non-original interior door on the north façade. Given the uniqueness of the property, FHWA and UDOT have determined and SHPO has concurred that these alterations can be overlooked and the property would be eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of A. There are three contributing outbuildings associated with this historic property – a detached garage, an animal pen, and a storage shed/barn.

170-260 West 11400 South - The Fairbourn Historic District is significant because these properties, constructed 1921-1940, are representative of the late 19th and early 20th Century agrarian lifestyle and multigenerational family farms, and for its association with William Fairbourn, a locally prominent member of the community of Crescent and the Church of Jesus Christ of Latter-Day Saints. The District includes the William Fairbourn Farmstead (175 West), the Richard Fairbourn Farmstead (170 West), the Reuben Fairbourn Farmstead (180 West), and the Leslie Fairbourn Farmstead (260 West). These properties can be best understood as a historic district under the theme *The Fairbourn Farmsteads: Multi-Generational Agrarian Lifestyle in Crescent, Utah 1883-1954*. Comprised of numerous residences and a variety of outbuildings and cultural features, the District provides historical data on the evolution of a complex of family farms that individually and collectively reflect the struggles and successes of an agrarian lifestyle dating from the 1880s to the present. The areas of significance include: A, Agricultural; B, Association with William Fairbourn; and C, Architecture and Land-use patterns. The period of significance is 1883-1954. FHWA and UDOT have determined and SHPO has concurred that It has been determined this property to be eligible as a National Register District.

12653 South 3600 West – This historic house is a World War II era cottage built in 1950 according to the assessor's records or 1940 according to the SHPO database. The property has one contributory outbuilding, which is a semi-subterranean root cellar. Access to this property is from 3600 West. FHWA and UDOT have determined and SHPO has concurred that this house is eligible for the NRHP under Criterion C and has a SHPO Rating of A.

2797 West 12600 South – This historic structure was built in 1936 and has been extensively altered. Changes include new siding, doors, windows, roofing and gutters, altered window massing, a front porch addition, a rear addition, and new skylights. Due to these alterations, FHWA and UDOT have determined and SHPO has concurred that this house is not eligible for the NRHP.

2779 West 12600 South/2767 West 12600 South – There are two structures on this property, but only one (2779 West) is considered historic. This structure, built in 1935, was a former gas station that has been minimally altered. It was previously identified as adobe, but it is actually cinder block construction. The door and window opening were boarded up and the entire structure has been painted gray. The brick sills on the front windows may be non-original. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of A. The other structure on the property (2767 West) was built in 1938 and has recently been extensively altered and is no longer considered eligible for the NRHP.

2630 West 12600 South – This historic house is an early ranch style post-war residence built in 1950. The detached garage located on this property is a contributing outbuilding to this historic property. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of B.

2487 West 12600 South – This structure is a World War II style cottage built in 1941. Alterations include aluminum siding, a detached garage, and a side bay. There are no contributing outbuildings. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of B.

2435 West 12600 South – This historic house was built in 1907 and is considered a four-square type structure with a detached garage. The house has been covered with aluminum siding, and the windows and porch posts have been changed. A historic photograph of the property in the assessor's records indicates that

it may at one time been part of 2473 West. Due to the alterations, FHWA and UDOT have determined and SHPO has concurred that the property is not eligible for inclusion on the NRHP.

2431 West 12600 South – This historic house is a World War II style cottage built in either 1940, according to the SHPO database, or 1960, according to the assessor's records. There are two contributory outbuildings located on the property, a shed and a garage/barn. Alterations to this house include shingle siding and the addition of brick. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of B.

2395 West 12600 South (aka 2295 West 12600 South) – This striated brick structure is a post-war house built in 1954. There are no contributing outbuildings located on this property. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of B.

2314 West 12600 South – This historic house is a semi-subterranean basement or "hope house" that was built in 1939. There are no contributing outbuildings located on this property. The historic structure is a Vernacular type. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of B.

2284 West 12600 South – This historic house is described as a World War II cottage built in 1934. The house has been modified with the addition of aluminum siding and some stucco on the trim. There are no contributing outbuildings located on this property. Due to these alterations, FHWA and UDOT have determined and SHPO has concurred that the property is not eligible for inclusion on the NRHP.

1604 West 12600 South – This historic house is a Queen Anne Victorian Eclectic style side passage structure that was built in 1941. There is also a commercial structure on the property that was built in 1939. It is a simple one-story structure with a Mansard style roof, but is otherwise architecturally indistinctive. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of A.

1526 West 12600 South – This historic house is a World war II cottage that was constructed in 1949. The exterior of this structure is striated brick and alterations have been made to the windows, roof, bay window, and there is an addition. There are no contributing outbuildings located on this property. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of B.

1512 West 12600 South – This historic structure has no discernable style and was built in 1955. The exterior is striated brick and there have been several alterations made to the structure. There are no contributing outbuildings located on this property. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of B.

1396 West 12600 South – This historic structure is a 1-½ story Victorian Eclectic residence that was built in 1916. There appear to be no major alterations to the historic structure. There are four contributing outbuildings located on this property. This property is considered an important cultural landmark by Riverton City (Horrocks, 12300/12600 EA, 2001). FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of B.

736 West 12300 South – This historic house is a post-war residence that was built in 1950. The structure appears to be a gambrel-roofed barn that was converted to a residence, Changes include a porch addition on the north façade, a shed-roofed addition on the east façade, boarding up of some of the windows, and a partial covering of the upper story with asphalt shingles. The exterior has had no major alterations. There are no contributing outbuildings located on this property. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of B.

692 West 12300 South (aka 691 West 12300 South) – This historic structure is a colonial revival vernacular house that was built in 1920. There have been no major alterations to this historic structure. There are no contributing outbuildings located on this property. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of A.

681 West 12300 South – This historic house is described as a 20th Century vernacular residence that was built in 1938. The structure appears to have been somewhat altered. Changes include a large rear addition. The exterior has aluminum siding and the original windows have been replaced. There are no contributing outbuildings located on this property. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of B.

675 West 12300 South – This historic structure is a 20th Century vernacular residence that was built in 1938. The exterior is drop/novelty siding and has had no major alterations. There are no contributing outbuildings located on this property. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of A.

611 West 12300 South – This historic structure is a post-war residence that was built in 1949, and has recently been converted to commercial usage. The exterior is asbestos siding and striated brick. There are no contributing outbuildings located on this property. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of B.

390 West 12300 South (aka 438 West 12300 S) – This historic structure was built in 1910 and is a single cell house. There are no contributing outbuildings located on this property. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of B.

274 West 12300 South (aka 270 West 12300 South) – This house is a 20th Century other and was built in 1899. The exterior has been remodeled with stucco. There are no contributing outbuildings located on this property. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of B.

191 West 12300 South – This historic house was built in 1954 and has no discernable style. The house has been converted to a machine shop and has been resided since its original construction. There are no contributing outbuildings located on this property. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for inclusion on the NRHP under Criterion C and has a SHPO Rating of B.

11687 South State Street – This residential structure was built in 1950. The structure has been somewhat altered. Changes include

conversion of the attached garage to a shop with replacement of the garage door with a standard door entry; one of the windows in the west façade may have been replaced, a rear addition for a mud-room and porch enclosure for a hot-tub, and non-original window awnings and a new storm door on the front façade. An out-of-period garage is located south of the house. FHWA and UDOT have determined and SHPO has concurred that this house is eligible for the NRHP under Criterion C with a SHPO Rating of B.

11613 South State Street – This Victorian style structure, which was constructed in 1910, appears to be minimally altered. Changes include a small rear addition and a new asphalt shingle roof. Two contributing outbuildings are located behind the house. FHWA and UDOT have determined and SHPO has concurred that the property is eligible for the NRHP under Criterion C and has a SHPO Rating of A.

11450 South State Street (aka 11440 South State St) – This house is a cross-wing type structure in Victorian Eclectic style that was built around 1900 and is now being used as an office within an industrial complex. The brick house has a pyramidal roof with asphalt shingles and is built on a concrete foundation. The front windows are paired having arched openings on the top. The windows and doors on the cottage appear to retain original massing but most windows are now aluminum double hung, with the exception of one window in the east façade that appears original. The entrance on he south façade has been altered and there is a small addition on the southwest corner. Although the property itself contains recent commercial buildings and the surrounding setting has been altered, FHWA and UDOT have determined and SHPO has concurred that the house itself has been determined to be eligible for listing on the NRHP under Criterion C, and has a SHPO Rating of A.

11550 South 260 West – This property is a farmstead with a Hall-Parlor type house with Classical elements that was built around 1910. The residence has had extensive alterations. Changes to the house include an addition to the east façade, which may be historic in itself. Two windows on the east façade of the addition have been filled-in with brick, aluminum storm windows have been added and the double-hung interior windows may or may not be original. A window and door opening on the south façade have been filled in and reworked for a single double-hung aluminum window. There are two contributing outbuildings, a garden shed and a wooden garage. FHWA and UDOT have determined and SHPO has concurred that this property is eligible for listing on the NRHP under Criterion C, and has a SHPO Rating of A.

Bridge over Jordan and Salt Lake City Canal – This historic bridge spans the Jordan and Salt Lake City Canal on 11400 South Street at approximately 200 West. The bridge was constructed in 1935 and is a single span structure with concrete T-beams and abutments. The bridge span length is 23 feet with a deck width of 22 feet. The site is eligible for the NRHP under Criterion C: it is representative of Depression-era bridge structures.

Canals and Ditches

The ditches and canals are generally significant because of their association with the development of irrigation in the region, an important event in the settlement of the Salt Lake Valley. The Jordan and Salt Lake Canal was built to increase the potable water supply to Salt Lake City. The Galena Canal was built and used to provide water to copper and lead smelters in the Midvale area. A brief description of each of the archeological resources is included below.

Utah Lake Distributing Canal (West of 2700 West) – The Utah Lake Distributing Canal (42SL286) runs north from the Murdock Pumping Station at Utah Lake to Kearns in the Salt Lake Valley.

The canal has earthen banks and its general dimensions are approximately 15-20 feet wide and 2-3 feet deep. The canal is still in use and is regularly maintained. Historical records indicate that the Utah Lake Irrigation Company filed an application to appropriate water from Utah Lake in 1908 (Hooton 1989). The application was certificated in 1931 and corrected in 1944. In 1952, the Utah Lake Distributing Company acquired the rights to the company. The canal passes under 12600 South Street through a concrete bridge or culvert. The canal is carried under 11800 South Street through a concrete box culvert, which measures 18 feet wide and 4 feet deep. The canal crosses 12600 South, 11400 South, and 10400 South West Streets between 2700 West and 3600 West Streets. The Utah Lake Distributing Canal is eligible for the NRHP under Criterion A: it is associated with events that have made a significant contribution to the broad pattern of history in the area.

Utah and Salt Lake Canal (around 2200 West) – The Utah and Salt Lake Canal (42SL307) derives its water from Utah Lake and the Jordan River and runs northward and westward from the Jordan River near the Salt Lake and Utah county border. The canal has earthen banks, measures approximately 25 to 30 feet wide and 3-4 feet deep, and is still used and regularly maintained. Historical records indicate that the Utah and Salt Lake Canal was constructed in 1872 and 1881 (Bashore and Crump 1994). The West Jordan Canal Company, which was created in 1877 to construct the canal, was reorganized as the Utah and Salt Lake Canal Company in 1880 in order to eliminate problems with precinct boundaries. The canal was enlarged in 1924 to support the Utah Copper Company. The canal is carried under 11800 South Street through a concrete box culvert, which measures 30 feet wide and 3 feet deep. The canal crosses under 10400 South Street just west of Redwood Road (1700 West Street) through a box culvert, which has recently been enhanced by concrete abutments, with guardrails, chain link fencing, and a catwalk on the south side of the road. The Utah and Salt Lake Canal is eligible for the NHRP under Criterion A: it is associated with events that have made a significant contribution to the broad pattern of history in the area.

South Jordan Canal (about 1500 West) – The South Jordan Canal (42SL291) diverts water from the west side of the Jordan River near Point of the Mountain and runs northward along the eastern edge of the Salt Lake Valley and terminates at Kearns. It provides water to Riverton, South Jordan, and West Jordan. The canal has earthen banks, measures approximately 40-45 feet wide and 10 feet deep, and is still used and regularly maintained. A box culvert and diversion structures were added in 1977 where the canal crosses under the South Jordan Parkway. Historical records indicate that the canal was constructed in approximately 1875, and it has been enlarged and modified over the years. The canal flows through a culvert under 11400 South Street at approximately 1550 West Street. The South Jordan Canal is eligible for the NRHP under Criteria A and B: it retains much of the character of an early irrigation canal and it is associated with prominent figures in the history of the area (i.e., Archibald Gardner, Isaac Wardle, and Jesse Fox).

Beckstead Ditch (west of the Jordan River) – The Beckstead Ditch (42SL297) derives its water from the Jordan River near 12300 South Street and follows the base of the bluff at the western edge of the Jordan River valley. The ditch is approximately 10 feet wide and 5 feet deep and used for agricultural purposes. Historical records indicate that Alexander Beckstead, his sons Samuel Alexander and Thomas, and Isaac J. Wardle constructed the Beckstead Ditch in 1859, the first irrigation ditch to be built in the South Jordan area (Brough 1898). The Beckstead Irrigation Company was incorporated in 1888. The ditch has been piped underneath 11400 South Street and is no longer visible on the

surface. The ditch crosses Midas Creek by a concrete flume and is conveyed under the South Jordan Parkway through a steel culvert. A section north of the South Jordan Parkway has been realigned and lined with riprap materials. The ditch is eligible for the NRHP under Criteria A and B: it retains much of the original character of an early pioneer ditch and is associated with prominent figures in the history of the area (i.e., the Becksteads and Isaac Wardle).

Galena Canal – The Galena Canal (42SL284) derived its water from the Jordan River and follows the base of the bluff at the eastern edge of the Jordan River valley. The canal was built and used to provide water to copper and lead smelters in the Midvale area. It has earthen banks and it measures 6-25 feet wide and 5 feet deep. Historical records indicate that Archibald Gardner constructed the Galena Canal in 1873 (Nielson 1978). The canal was in continual use until the early 1970s when the only remaining Midvale smelter, operated by the U.S. Smelting Refining and Mining Company, was closed (Eccles 1998: 12). The Galena Canal is no longer used for agricultural and industrial purposes and has been considerably altered by work on 10600 South Street and the Union Pacific railroad. The Galena Canal is eligible for the NRHP under Criterion A: it is the only canal in Utah that was used to divert water for the smelting industry.

Jordan and Salt Lake City Canal – The Jordan and Salt Lake City Canal (42SL214) derives its water from the Jordan River and follows the topographic contours on a gentle slope above and east of the Jordan River valley. It is owned, operated, and maintained by the Salt Lake City Department of Public Utilities. The earthen-lined canal measures approximately 30 feet wide and 5-8 feet deep. It is still in use and is regularly maintained. Historical records indicate that the Jordan and Salt Lake City Canal was constructed between 1879 and 1882 (Harris 1942: 5). It was the first canal built from the Jordan River to Salt Lake City and areas to the south, so as to increase the supply of potable water to those areas and was never used for farming purposes (Polk et al. 1994: 34). The canal crosses under 12300 South via a concrete culvert or bridge and is carried under Lone Peak Parkway through a concrete box culvert that measures 22 feet wide and 5 feet high. The Jordan and Salt Lake City Canal is eligible for the NRHP under Criterion A: it was the first canal built from the Jordan River to Salt Lake City and areas to the south

Denver and Rio Grande Western Railroad (UPRR) – The Denver and Rio Grande Western (D&RGW) Railroad (42SL293) runs north and south along the western side of Interstate 15. The railroad right-of-way is 45 feet wide from fence to fence and includes an access road on the western side of the tracks. Historical records indicate that construction of the D&RGW Railroad was completed in 1885. It was later purchased by the Union Pacific railroad (UPRR). These tracks are in constant use and regularly maintained by the UPRR. The railroad crosses 11400 South and 12300 South Streets at-grade. The D&RGW Railroad is eligible for the NRHP under Criterion A: it has played a major role in the development of the Salt Lake Valley.

3.12 Hazardous Waste Sites

An environmental records search was conducted and reviewed for the 11400 South study area as part of this FEIS. The objective of the records search and review was to identify and describe recognized environmental conditions associated with the present and historical uses of the properties located within the study area. A recognized environmental condition is defined in the American Society for Testing and Materials (ASTM) Practice E 1527-00 as follows:

> The presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions termed *de minimis* are not recognized environmental conditions.

The assessment identified the following potential areas of concern within the study area.

- 2 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites, both of which are closed;
- 29 leaking underground storage tank (LUST) sites, 25 of which are closed; and
- 63 underground storage tank (UST) sites, 35 of which are closed.

The CERCLA sites and the open LUST and UST sites are shown on Figure 3-8.

3.12.1 EPA CERCLIS Sites

The EPA's Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) list contains sites that are either proposed for or included on the National Priority List (NPL) and sites that are in the screening and assessment phase for possible inclusion on the NPL. The two EPA CERCLA sites that have been identified in the study area are the Victorian Drive Lab Pack site and the Allstate Landscaping site.

- The Victorian Drive Lab Pack site, located at 2883 West Victorian Drive in Riverton, has been remediated. It consisted of a cache of chemicals of explosive nature that were discovered at a private residence. The chemicals included nitromethane, oxidizers, corrosives, mercury, and shock-sensitive picric acid. No site assessment was required, and removal was completed on August 12, 2002.
- The Allstate Landscaping site, located at 492 West 12300 South in Draper, Utah, has been determined to require no further action. The site consisted of a trench possibly contaminated with pesticides and waste oil. Site assessment was undertaken and completed on June 18, 2002. No hazardous materials were found, and the site has been closed with a No Further Remedial Action Planned (NFRAP) status.

3.12.2 Leaking Underground Storage Tank Sites

The UDEQ LUST database was examined. Twenty-nine LUST sites were identified within the approximately 16.5-square-mile study area. Petroleum contamination associated with these LUSTs was present in soil and/or groundwater at each location. Twenty-five of the sites have been remediated and closed in accordance with Utah regulations. The four open sites are shown on Figure 3-8 and Table 3-16. Investigation and remediation at these four sites is ongoing.

3.12.3 Underground Storage Tank Sites

The UDEQ UST database was also analyzed. Of the 63 UST sites identified within the 11400 South study area boundaries, 35 have been closed in accordance with Utah regulations. The 28 remaining UST sites include 81 associated tanks, and are located throughout the study area primarily along major roads (see Figure 3-8 and Table 3-16). The condition of these tanks, and the presence or extent of any contamination associated with them, is not known at this time. The possibility of encountering contamination during excavation activities in these areas is considered moderate.

3.12.4 Resource Conservation and Recovery Act Sites

A review of EPA's Resource Conservation Recovery Information System (RCRIS) indicated that no Resource Conservation and Recovery Act (RCRA) Large Quantity Generator of hazardous waste was located in the project area. Large quantity generators are defined as those producing more than 1,000 kilograms per month of non-acutely hazardous waste, or more than 1 kilogram per month of acutely hazardous waste.

Nineteen RCRA Small Quantity Generators were identified in the project area. Each of these generators is properly registered with the EPA. According to the Utah Division of Solid and Hazardous Waste, each is currently in compliance with Utah State regulations. These Small Quantity Generators do not present a concern at this time.

3.12.5 Other Sites

As part of the records search, the following state and federal databases were also checked. No sites within the project area were found on these lists.

- NPL — National Priority List
- ROD — Record of Decisions
- CERCLIS-NFRAP — CERCLIS No Further Remedial Action Planned
- CORRACTS — Corrective Action Report
- SWF/LF — List of Landfills
- VCP — Voluntary Cleanup Site List
- INDIAN UST — Underground Storage Tanks on Indian Land
- CONSENT — Superfund (CERCLA) Consent Decrees
- De-listed NPL — National Priority List Deletions
- MINES — Mines Mater Index File
- NPL Liens — Federal Superfund Liens
- PADS — PCB Activity Database System
- DOD — Department of Defense Sites
- RAATS — RCRA Administrative Action Tracking System
- TSCA — Toxic Substances Control Act
- SSTS — Section 7 Tracking Systems

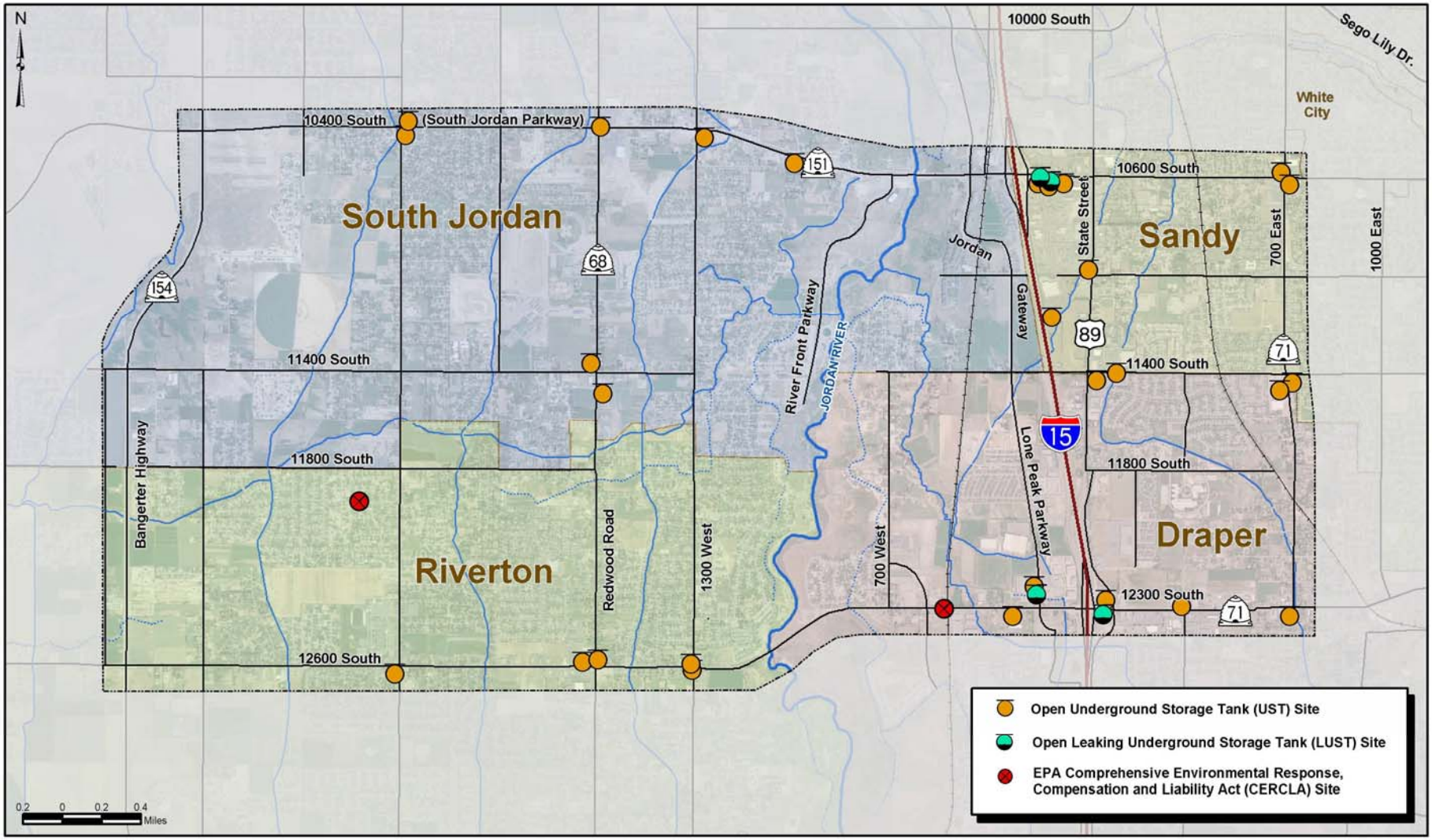

Figure 3-8. Hazardous Materials Locations on Affected Corridors

Table 3-16.
Underground Storage Tanks (USTs) and Leaking Underground Storage Tanks (LUSTs)

Site	Address	# of Open USTs	# of Open LUSTs
10400 / 10600 South			
Sinclair #43032	2680 West 10400 South	3	
Harmon's - South Jordan	10400 S Redwood Road	3	
Southtown Phillips 66 # 27608	175 West 10600 South	3	1
Rainbo #32	151 West 10600 South	3	1
Conoco #44014	95 West 10600 South	2	
11400 South			
Albertson's Express #394	11400 S State Street	2	
Harmon's – Draper	11400 South 700 East	3	
12300 / 12600 South			
Maverik #264 Riverton	2707 West 12600 South	3	
7-Eleven 1852-20137	1754 West 12600 South	3	
Holiday Oil #33	1327 West 12600 South	3	
Chevron	231 West 12300 South	3	
Flying J – Draper	87 East 12300 South	3	
Holiday Oil #7	293 East 12300 South	3	
South Point 66 # 57064	692 East 12300 South	3	
2700 West			
Maverik #333 / Old Circle K #8	10419 South 2700 West	3	
Redwood Road			
Phillips 66 #27938	11366 S Redwood Road	3	
South Jordan #45	11500 S Redwood Road	2	

Table 3-16. (cont.)
Underground Storage Tanks (USTs) and Leaking Underground Storage Tanks (LUSTs)

Site	Address	# of Open USTs	# of Open LUSTs
Holiday Oil #32	12573 S Redwood Road	4	
1300 West			
Maverik #223 South Jordan	10425 South 1300 West	2	
Rainbo #45	12592 South 1300 West	3	
Lone Peak Parkway			
Lone Park 66 # 29057	12292 South Lone Peak Parkway	4	2
State Street			
Larry H Miller Corp Southtowne	10986 South State Street	3	
700 East			
7-Eleven 1852-16345	10592 South 700 East	3	
Rainbo #17	10615 South 700 East	4	
Maverik #304 / Old Circle K #5	11415 South 700 East	3	
Others			
Premier 66	1033 W 10530 S (South Jordan Parkway)	3	
Costco Wholesale #487	11000 S Auto Mall Drive	3	

3.13 Visual Qualities

The project area is within a regional landscape that is comprised of developed areas along the Wasatch Front. This is a landscape with a high degree of manmade development, extending from Ogden on the north to Provo on the south, and the development provides the overall visual context for evaluating the visual resources of the project area. Four main landscape types are identified within the project area, including suburban/residential, commercial, undeveloped/ agricultural, and the Jordan River Floodplain.

Suburban/residential is the predominant visual character type within the study area. Concentrated areas of residential development are found east of State Street and west of the Jordan River. These areas are characterized mostly by single-family homes with landscaping that is typically a combination of grass with planted shrubs and trees. Many of the older neighborhoods have mature landscaping which adds to the scenic quality of the surroundings. Most schools and churches, and many of the recreational facilities are located within the suburban development character type and are visual components of the overall community. Open areas at the schools and parks provide a better opportunity for the viewer to observe the surrounding landscape, including the Wasatch Mountains to the east and the Oquirrh Mountains to the west.

The commercial visual character type is more concentrated in its extent within the study area. Major areas of commercial development occur along the I-15 corridor, on State Street, and along portions of 10600 South and 12300 South.

Scattered throughout the study area, small amounts of undeveloped/ agricultural land adds to the visual diversity of the area, and adds a rural component to the landscape character. Much of the agricultural land is irrigated, and provides relatively large vegetated areas of green color in the growing season. Views of the open, undeveloped/agricultural land provide a visual change from the built-up environment that predominates in the study area. Much of the undeveloped land in the study area is for sale and planned for development, and this landscape type will become a smaller visual component in the future. Currently, the major areas of this character type are found between the Jordan River and I-15, and along the west edge of the study area along the Bangerter Highway.

West of I-15, the Jordan River bisects the study area from north to south. The river is located in the center of a broad floodplain of approximately one mile in width, which can easily be seen as one descends the bluffs either eastbound or westbound on 10600 South or 12300 South, descending toward the Jordan River. The floodplain visually provides a large open space area with a water feature and a linear pattern of vegetation along the river.

The river varies between 20 and 50 feet across. Riparian vegetation borders the water's edge on both sides of the river and is composed primarily of grasses and sedges, and non-native woody species such as Russian olive and tamarisk. Land adjacent to the river is mostly undeveloped, although residential development has encroached into the valley bottom in several locations, and some of the bottomland is used as pasture. Recreational facilities are present along the river, with several parks providing picnicking and play areas near 11000 South and 12300 South. The Jordan River Parkway Trail is planned for completion along the river, and currently extends within the study area from 10600 South to approximately 11400 South, and from 11800 South to 12300 South.

The Jordan River and its broad floodplain create a unique visual landscape type in the study area. There is a high degree of visual

variety created by the landform of the river valley, the different vegetation types, the presence of the water feature (Jordan River), and a low level of manmade development, which combine to make a distinctive visual pattern within the study area. The quality of the scenery is somewhat diminished by residential development that has visually encroached into the river viewshed in some areas, on both the side hills and on the valley floor. These factors introduce discordant elements into the character of the landscape that results in a moderate level of intactness of the overall visual resources of the Jordan River.

3.14 Utilities

The 11400 South study area includes several significant utility corridors including 11400 South, 10600 South, and 12300 South. The 11400 South study area contains all of the typical utilities such as water, sewer, gas, power, communications, television cable, irrigation, storm drains, fiber optic as well as four railroad crossings. In some instances, there is more than one provider for each utility. Utilities identified to date are discussed below; additional utilities may exist within the study area. Figure 3-9 illustrates the major utilities found within the corridor.

Water

Jordan Valley Water Conservancy supplies the primary water to the cities of South Jordan, Sandy, Draper, and Riverton. A 78-inch high-pressure piped aqueduct runs along 3200 West crossing 12600 South and 11400 South. Just north of 11400 South the line turns northwest and crosses 10400 South at about Bangerter Highway. Future plans will add a 78-inch branch to the aqueduct at the bend. This branch will cross 10400 South at approximately 3200 West. This aqueduct supplies water to a high-pressure 33-inch line that runs along the south side of 11400 South. This line has approximately 5 feet of cover and may need to be relocated if 11400 South is widened. Currently, this line is trenched under the Jordan River and would have to be relocated if a river crossing is constructed.

The cities of South Jordan, Sandy, Draper, and Riverton each manage distribution loops and main feeder trunk lines for primary water in the study area. Water Pro has both culinary and secondary lines. They supply culinary water to both Draper and Bluffdale and secondary water to Sandy, Bluffdale, and Draper. Their main 16-inch line runs down the east side of 700 East.

Sewer

This project falls within the South Valley Sewer District. Along 12300 South, the major sewer line is a 42-inch line that runs from Jordan River to 100 West. A 42-inch and 24-inch sewer line branch off of this line and flow north. The 42-inch line branches into two 48-inch lines at 11300 South and continues to 10600 South. These lines run along the ridgeline and have approximately 6 to 7 feet of cover. At 10600 South, the lines tie into a 24-inch line that runs from about 900 West to I-15.

Natural Gas

Questar Gas has an 8-inch intermediate high-pressure natural gas line that runs along the north side of 11400 South from Bangerter Highway to 1300 West. This 8-inch line then connects to a 10-inch line and runs along the East side of 1300 West for one block. An additional 20-inch high-pressure line runs along the east side of 1300 West.

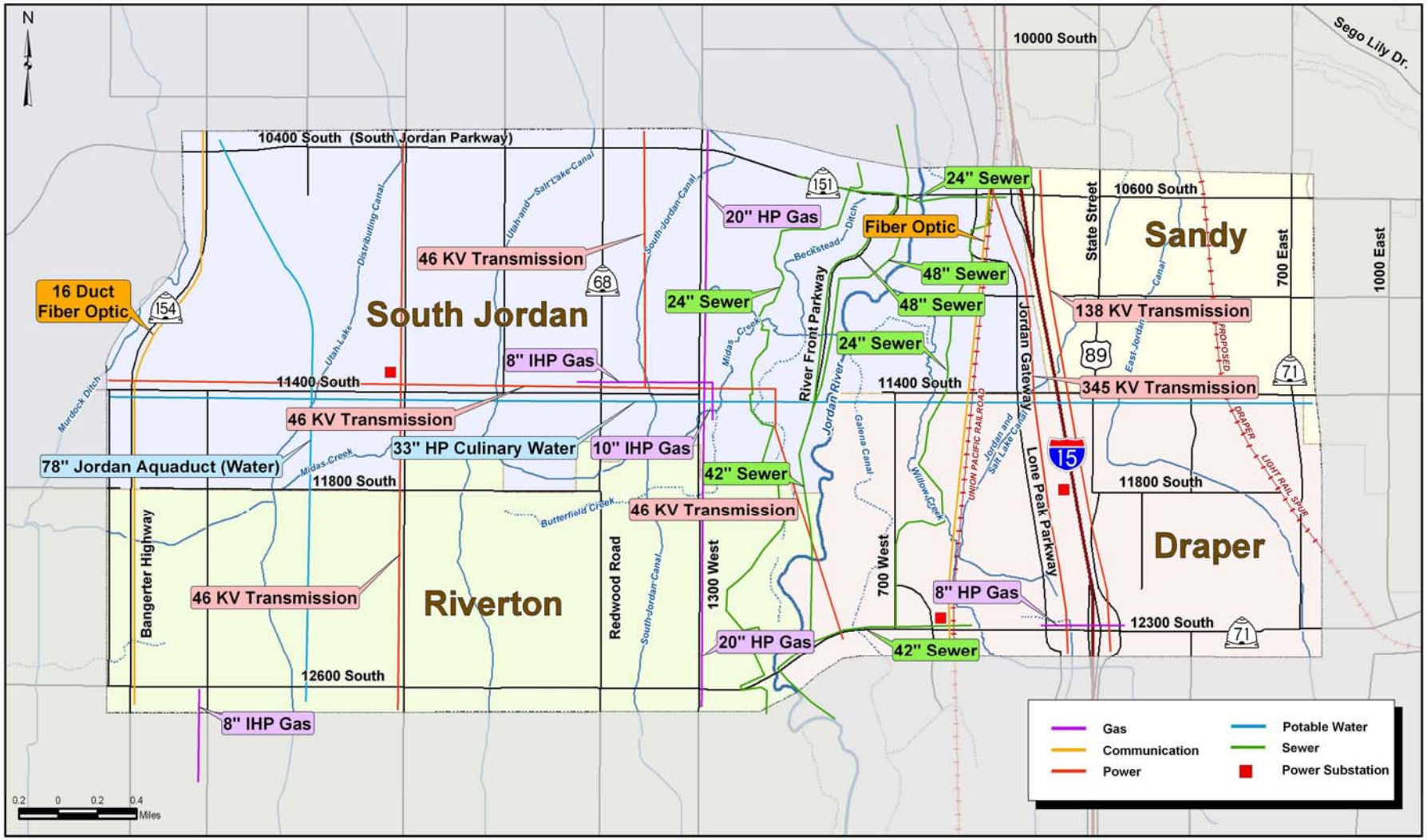

Figure 3-9. Utilities on Affected Corridors

Communications

Touch America Communications has a 16-duct underground bank of fiber optic lines that runs on the west side of Bangerter Highway from 10400 South to approximately 11000 South where it crosses over to the east side and runs to 12600 South. E.L.I. Fiber Optic has overhead lines running along 700 East from 12400 South to 10600 South, along 1300 West from 12500 South to 10400 South, and along 11400 South from I-15 to State Street. Transcore has fiber optic lines that run along 700 East, State Street, 12300 East, and 10600 South.

Comcast Cable has both overhead and buried lines throughout the corridor and maintains AT&T's fiber optic lines. Qwest has a network of buried lines throughout the corridor, with some overhead along 11400 South. MCI has two major lines in the corridor; one runs along the UPRR line, and the other follows State Street from 10600 South to 11800 South and then parallels I-15 to 12300 South.

Railroads

The UPRR crosses 10600 South, 11000 South, 11400 South, and 12600 South. Utah Transit Authority (UTA) owns the western 20 feet of ROW along the railroad for the future construction of Commuter Rail.

Power

PacifiCorp has four major overhead transmission lines, three substations, and overhead and underground distribution lines located throughout the study area. The locations of the overhead transmission lines are as follows:

- A 345-kilovolt (kV) line runs along the east side of Jordan Gateway.
- A 138 kV lines runs along the east side of I-15.
- A 46 kV line runs on the north side of 11400 South from Bangerter Highway to 1100 West where it turns south and runs to 12300 South. Another branch of this line turns north at the South Jordan Canal and runs to 10400 South.
- A 46-kV line runs along the west side of 2700 West.

The Bingham Substation is located on the northwest corner of 2700 West and 1400 South, the Draper Substation is on the northeast corner of the UPRR and 12300 South, and the 11800 South Substation is located between I-15 and the railroad at 11800 South.

Irrigation

There are five irrigation canals located within the study area: Utah Lake Distribution Canal, Utah and Salt Lake Canal, South Jordan Canal, Jordan and Salt Lake Canal, and East Jordan Canal. Irrigation canal crossings range in size from a 7-foot by 20-foot concrete box culvert to a 48-inch corrugated steel pipe. All of the irrigation canals are owned, operated, and maintained by individual canal companies except for the Jordan and Salt Lake City Canal, which is owned, operated, and maintained by Salt Lake City Department of Public Utilities. Water Pro also provides some secondary water to Draper and Riverton.

Storm Drain

The storm drain system in the study area is within the jurisdiction of Sandy, Riverton, and Draper. Storm water is also collected in the South Jordan Canal. Along 10600 South and 12300 South, the storm drain system is mainly piped underground. An outfall structure on the south side of 10600 South empties 5-foot, 4-foot 11-inch, and 4-foot 6-inch storm drain lines into the Jordan River on the west side. The existing storm drain systems along the potentially affected roadway corridors are shown on the alternatives figures in Section 2.