3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Environmental Categories without Project-Imposed Consequences

As part of the scoping and environmental analysis conducted for the proposed project, the following environmental impact categories were considered but no adverse impacts were identified. There is no further discussion regarding these issues in this document.

Air Quality: The MSB is meeting the Environmental Protection Agencies (EPA) National Ambient Air Quality Standards for all criteria pollutants, including those most associated with mobile sources: carbon monoxide, ozone, and particulate matter.

Coastal Barriers: No coastline, landforms, or coastal barriers that provide protection for diverse aquatic habitats are within the project vicinity.

Cultural Resources: The proposed project was developed in accordance with Section 106 of the National Historic Preservation Act. As part of the consultation process, DOT&PF coordinated with the State Historic Preservation Officer (SHPO), MSB, Knik Tribal Council, Cook Inlet Region, Inc., and Knikatnu Inc. and conducted an archaeological and architectural survey of the proposed project area. Results of these efforts indicated there were no historic properties eligible for listing on the National Register of Historic Places within the Area of Potential Effect. On 4/14/2014 the SHPO concurred with a finding of no historic properties affected for the subject project. Copies of all consultation materials and the survey report are available for review at the Department's Central Region Design and Construction office.

Farmland: No prime, unique, or farmlands of statewide importance have been designated in the State of Alaska. DOT&PF consulted with the National Resources Conservation Service (NRCS) to determine if the proposed project area contains any locally important farmlands. On 3/28/2014, the NRCS determined that the proposed project will not result in any farmland impacts (Appendix E).

Fisheries: The Alaska Department of Fish and Game (ADF&G) *Catalog of Waters Important to the Spawning, Rearing or Migration of Anadromous Fishes* (reviewed 12/30/2013) does not list any anadromous fish streams in the project area. Essential Fish Habitat (EFH) does not occur in the project area.

Floodplains: The proposed project is located on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) 02170C8090E, 02170C8080E, 02170C8070E, and 02170C8065E (all maps updated on 3/17/2011). The maps don't show the project location within any federally designated flood hazard area and no adverse floodplain impacts are anticipated. On 3/24/2014, DOT&PF received word from the MSB Deputy Floodplain Administrator that the project is outside any regulated flood zone and no permit would be required for construction (Appendix E). Soils in the project vicinity are generally known to be permeable so surface runoff infiltrates well and there is low potential for ponding and flooding.

Joint Development: The proposed project wouldn't be developed or constructed in conjunction with any other projects.

Parks and Recreation Areas [Section 4(f)/Section 6(f)]: The only Section 4(f) resource identified adjacent to the proposed project are the Frank Smith Youth Baseball Fields, located immediately adjacent to KGB Road near the intersection with South Endeavor Street. These fields are publicly owned, accessible to the public, and their primary purpose is recreation. At this time, the proposed project will not acquire any of the property and it is not anticipated to interfere with the activities for which the fields are used. The proposed project will create safer access by replacing any direct access with right-in, right-out driveways.

Threatened and Endangered Species: No federally listed or proposed species or designated or proposed critical habitat under the U.S. Fish and Wildlife Service or National Marine Fisheries Service jurisdiction occurs within the MSB. The DOT&PF determined that the proposed project would have no effect on listed species or critical habitat.

Waterbodies: There are no waterbodies in the project area. DOT&PF reviewed U.S. Geological Survey Quad Map Anchorage C-7 and aerial imagery from GoogleEarth (reviewed 12/30/2013) and found no waterbodies that could be impacted by the proposed project. In addition, a field investigation for jurisdictional waters under Section 404 of the Clean Water Act, found no waterbodies within 250 feet of the existing centerline. The closest waterbody is Cottonwood Creek in the vicinity of Edlund Road and KGB Road. In this area, the creek is approximately 350 feet south of KGB Road, which is outside any area of direct impact. Cottonwood Creek has limited potential to receive storm water from the proposed project. See the Water Quality section for discussion. Wetlands are found in the project area and a section within this document discusses expected impacts.

Wild and Scenic Rivers: No waterways within the proposed project vicinity are part of the National Wild and Scenic River System or under study for designation as a Wild and Scenic River.

3.2 Land Use

Land use and development are guided by the COW, the MSB, and the Knik-Fairview Community Council (KFCC) within the project area. The project segment from Centaur Avenue to Mack Drive is fully located within the boundaries of Wasilla, while the remainder of the project is located within the boundaries of the MSB and KFCC. From South Fern Street to Mack Drive, all lands south of the KGB Road ROW are located within the MSB.

Existing Zoning and Land Use

Existing land use and zoning adjacent to the project was determined by reviewing information from the COW, the MSB online parcel viewer, the MSB planning webpage and the MSB Code. Land ownership is predominantly private with a few parcels being owned by local or state government. Within the COW, zoning is a mixture of commercial, public, single and multi-family, and rural residential. The segment from Centaur Avenue to Fern Street is primarily commercial with one property supporting senior citizen housing and another for a Native Alaskan health care facility. Moving west from Fern Street within the COW, the primary land use transitions from commercial to rural residential near Mack Road and includes the Wasilla Frank Smith Youth Baseball Fields. The remainder of the proposed project corridor is located within the MSB. The MSB doesn't provide zoning designations for land within its boundaries, but it regulates different types of development and land use through Chapter 17 of the MSB

Code. Currently, the proposed project corridor is not located near any special land use, residential land use, or single family residential land use districts. Please refer to Figure 3.2.1.

The majority of land use directly adjacent to the project is residential with interspersed pockets of commercial and religious facilities. Approximately one third of the land along the project corridor is undeveloped. Development density is low, and most developed areas consist of single family homes on relatively large (one acre or larger) private lots; other development includes multi-family residences, community services, private businesses, and churches. Within the Knik-Fairview area, some light industrial and agricultural land uses also exist.

Population Growth Trends

Wasilla and the MSB are the fastest growing regions in the state. From 1990 to 2010, the MSB population more than doubled in size from 39,683 to 88,995 people, a growth of 124 percent in 20 years. Knik-Fairview, the primary community served by KGB and Fairview Loop Roads, experienced a population increase from 7,049 to 14,923 people (112 percent) from 2000 to 2010.

With a 3.1 percent average annual growth rate predicted through 2034 (2011 COW Comprehensive Plan), the MSB is expected to continue growing faster than other regions of the state. During this same time period, Alaska's statewide projected annual growth rate is 0.8 percent (Alaska Department of Labor and Workforce Development [ADOLWD], Research and Analysis Section).

Existing Land Use and Transportation Plans

DOT&PF Statewide Transportation Improvement Program (STIP), 2013-2015

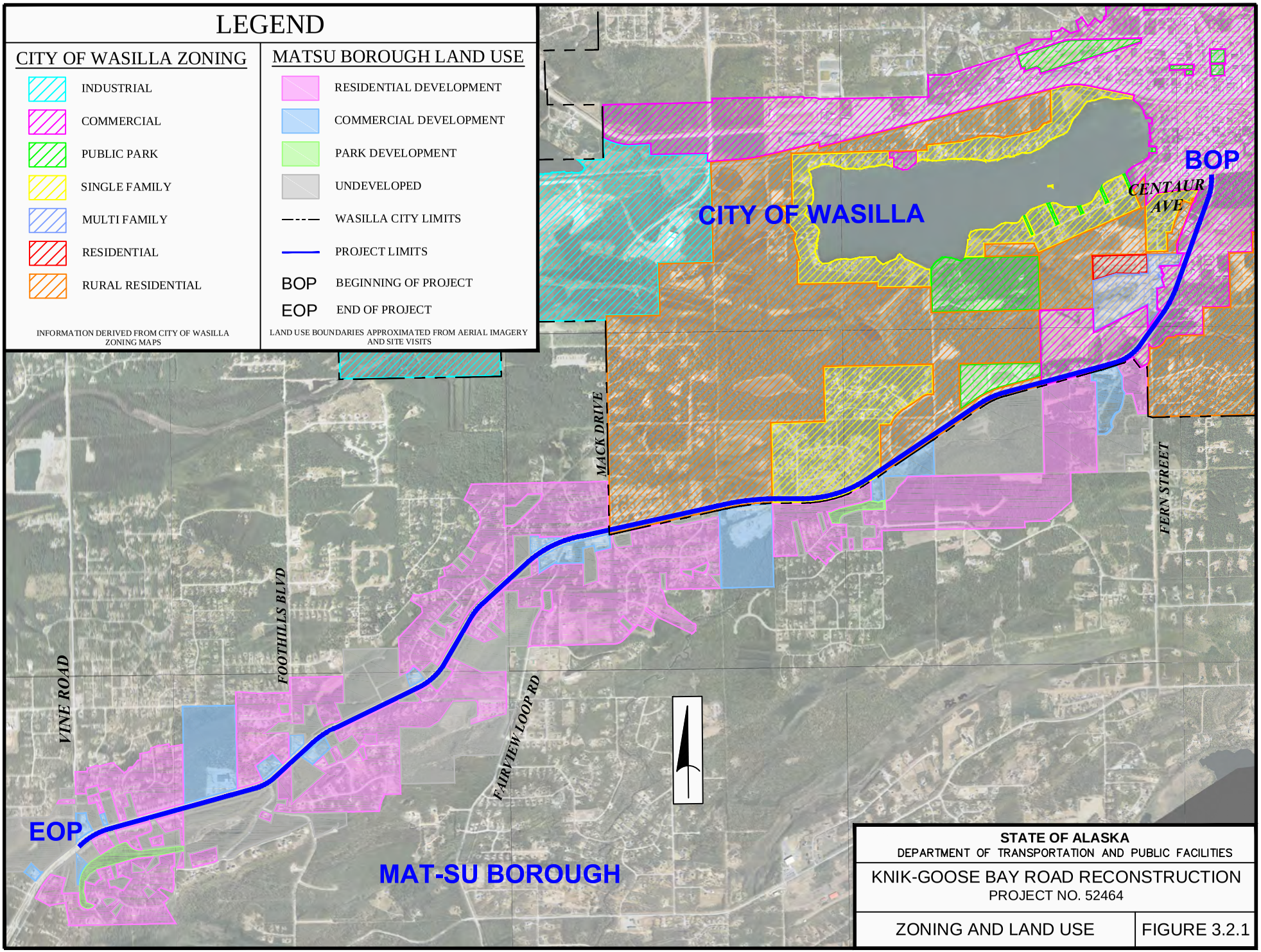
The STIP identifies widening KGB Road (Need ID 24596) to a four-lane divided facility from Centaur Avenue to Vine Road. The proposed project scope includes additional improvements aimed at reducing KGB Road's crash rate. The STIP specifies that construction can occur in multiple phases to fit funding.

MSB LRTP, June 2007

The MSB LRTP utilizes population growth projections to identify roadway improvements essential for future transportation system efficiency. The plan strives to develop an integrated roadway network that facilitates the efficient movement of people and goods. The LRTP sets the following goals for arterial roads in the Borough (not an exhaustive list):

- Facilitate mobility and protect the through traffic function
- Maintain and protect the integrity of LOS D
- Minimize the number of access points
- Increase safety along arterial roads

The plan identifies expansion of KGB Road to a four-lane major arterial from the Settler's Bay growth area north to its intersection with PWH.


LEGEND
CITY OF WASILLA ZONING
INDUSTRIAL
COMMERCIAL
PUBLIC PARK
SINGLE FAMILY
MULTI FAMILY
RESIDENTIAL
RURAL RESIDENTIAL
INFORMATION DERIVED FROM CITY OF WASILLA ZONING MAPS
MATSU BOROUGH LAND USE
RESIDENTIAL DEVELOPMENT
COMMERCIAL DEVELOPMENT
PARK DEVELOPMENT
UNDEVELOPED
WASILLA CITY LIMITS
PROJECT LIMITS
BOP BEGINNING OF PROJECT
EOP END OF PROJECT
LAND USE BOUNDARIES APPROXIMATED FROM AERIAL IMAGERY AND SITE VISITS
CITY OF WASILLA
BOP
CENTAUR AVE
MACK DRIVE
FERN STREET
VINE ROAD
FOOTHILLS BLVD
FAIRVIEW LOOP RD
EOP
MAT-SU BOROUGH
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
KNIK-GOOSE BAY ROAD RECONSTRUCTION
PROJECT NO. 52464
ZONING AND LAND USE
FIGURE 3.2.1

MSB Comprehensive Development Plan, 2005 Update

The MSB's Comprehensive Plan doesn't specifically identify the KGB Road Reconstruction Project, but it does incorporate by reference the MSB LRTP and encourages continual progress and enhancement of the Borough's transportation plan. The comprehensive plan lists a transportation goal of an integrated surface transportation network that facilitates the efficient movement of people, goods, and services throughout the Borough and region. It also lists an economic policy of enhancing the transportation infrastructure to reduce travel times and improve transportation efficiency and safety.

City of Wasilla 2011 Comprehensive Plan

The transportation section of this plan identifies transportation system improvements necessary to accommodate rapid population growth within Wasilla. Traffic demand is forecast to reach or exceed capacity by 2025 for many roads and it's recognized that this will create stop-and-go conditions and safety issues. Public input ranked issues with roadway connectivity, capacity, and safety as the highest priority.

Transportation Goals in the plan include:

1. Provide for streets and highways that promote mobility, connectivity and access for both present and future users
2. Provide a streets and highway network that supports economic development and growth
3. Support the City as transportation hub that provides connecting highways, railroad, and expanded air service
4. Provide a neighborhood street network that enhances the residents' quality of life
5. Maintain and improve City sidewalks and non-motorized pathways to increase walkability

One of the plan's objectives is to identify funds for regionally important road projects that promote mobility and better street connectivity for present and future users. KGB Road is listed as a regionally important roadway in need of improvement.

City of Wasilla Official Streets and Highways Plan, FY 2005-2025

This plan serves as a planning guide for the COW and other agencies, including DOT&PF, to use as the basis for decisions on street development and improvement in Wasilla. Its two primary goals are (1) to provide for a street and highway network that provides mobility, connectivity, and access to the City's present and future residents and (2) to develop a street and highway network supportive of economic development and growth. Rapid population growth is identified as one of the current issues facing development and maintenance of the City's transportation systems.

In order to achieve an efficient street and highway system, the COW Official Streets and Highways Plan (OSHP) adopted design standards based on roadway functional class. It identifies KGB Road as a major arterial and describes the functional class as having a main function of meeting the demand for movement of high volumes of vehicles at intermediate to high speeds. Access to adjacent lands is a secondary consideration for these types of roads. To promote arterial mobility, the OSHP supports additional improvements such as construction of a median, management of side road and driveway access, auxiliary turning lanes, raising (or maintaining) speed limits to an arterial standard, managing intersection spacing and appropriate intersection alignment. The plan also recognizes that KGB Road has a high crash rate.

Knik-Fairview Comprehensive Plan, 1997

The Knik-Fairview Comprehensive Plan (KFCP) is incorporated by reference to the MSB Comprehensive Plan and provides a greater level of guidance for how residents of the area envision future growth and development. The Knik-Fairview planning area encompasses all portions of the proposed project located outside the COW boundaries. The KFCP recognizes rapid regional population growth, and sets a goal of maintaining low density development along KGB Road and encouraging orderly growth and development.

It specifically states, "Residents want any future commercial development to occur along the developed transportation corridors, but they do not want to see commercial strip development." They want to plan for future growth to avoid contaminating environmental resources or negative impacts to quality of life.

Transportation goals include road system connectivity within the Knik-Fairview area and a transportation system that promotes safety, prevents congestion, and preserves roadway functionality. The plan promotes direct access from the planning area to important transportation corridors outside the planning area. KGB Road is identified as the main thoroughfare through the planning area and also as a future major arterial roadway. This plan identifies KGB Road as having a high crash rate, and recommends upgrades to KGB Road to improve safety, including widening.

Environmental Consequences

No Build Alternative

The No Build Alternative would not appreciably impact existing land use and zoning in the area. Without improvements, congestion along KGB Road would continue to worsen as development trends and population growth continues. The congestion will reduce mobility throughout the corridor and likely slow residential and commercial development in the area. The No Build Alternative is not consistent with area land use and transportation plans.

Preferred Alternative

The Preferred Alternative would require acquisition of approximately 25 acres of land currently undeveloped or utilized for commercial or residential purposes. The acquired property's land use designation would permanently change to a transportation use. Required ROW acquisition would slightly reduce the amount of land available for commercial and residential uses along KGB Road. There is sufficient undeveloped buildable land along the corridor to support predicted residential and commercial development in the area. The anticipated change in land use would be negligible.

Construction of the Preferred Alternative doesn't preclude development of any adjacent lands and is likely to facilitate residential and commercial development in the area due to improved and safer access. It would also reduce some of the side effects of rapid population growth by decreasing congestion and increasing safety. Reconstruction of the separated multi-use pathway and ADA crossings at signalized intersections would improve access to and from neighborhoods, commercial districts, and businesses. In order to balance growth with the goals of the affected communities, local planning groups, including the MSB, COW, and KFCC will need to take the lead in governing how and where development occurs.

By implementing access management techniques, the Preferred Alternative preserves the mobility function of KGB Road and enhances safety and transportation efficiency. Access management techniques consist of a non-traversable median with regularly spaced median breaks. Preserving the mobility function of this arterial route protects the investment of public funds associated with the proposed roadway improvements.

The Preferred Alternative is consistent with local land use and development plans and would support the goals and objectives stated therein. Most local plans include improvements/upgrades to KGB Road and support maintaining the mobility function of arterial roadways. On arguably the most important benefit of this project, safety improvements, the project is consistent with all plans. Additionally, the STIP includes widening KGB Road to accommodate predicted traffic volumes with appropriate safety engineering strategies.

3.3 Socioeconomics

KGB Road is a critical transportation route between local residential areas and the COW/Parks Highway transportation corridor. Schools, churches, businesses, recreational opportunities, and residential neighborhoods exist along the roadway. KGB Road is also the primary access route to Port MacKenzie, an important hub for the statewide transport of goods and services.

All socioeconomic data used in this analysis came from the 2010 Census, the American Community Survey (ACS), the EPA Environmental Justice View (EJView) mapping tool, and the ADOLWD. The 2010 Census Data is for the COW and the Knik-Fairview census designated places (CDP), see Figure 3.3.1. The study area for data from the EJView mapper is bounded by a 0.5 mile radius around the proposed project centerline. For comparison purposes, information is also provided for the MSB and the State of Alaska.

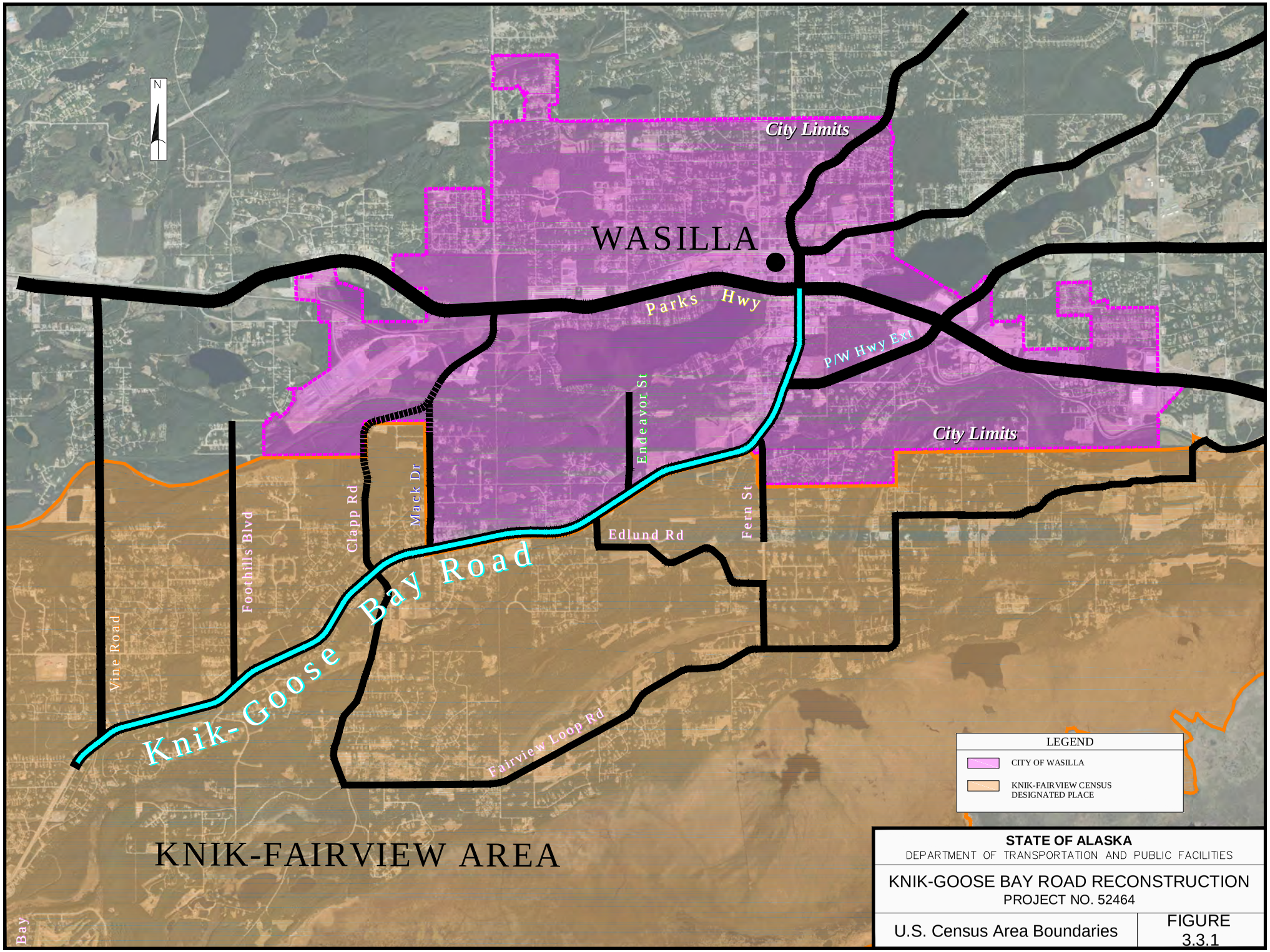
Community Growth

Alaska's population grew nearly 30% from 1990 to 2010, while the MSB population increased 124% and the COW increased 94%. Over the same 20 years, the Knik-Fairview CDP population increased nearly 55 times its 1990 population, making it the fastest growing area in the state. Table 3.3.1 presents historic population trends for the project area.

Table 3.3.1 - Historic Population Trends

Location	Median Age (2010)	Population				Annual Average Growth Rate (1900 to 2010)
		1980	1990	2000	2010	
COW	32.2	1,559	4,028	5,469	7,831	3.4 %
Knik-Fairview CDP	31.2	N/A	272	7,049	14,923	8.9 %
MSB	34.8	17,816	39,683	59,322	88,995	4.1 %
State of Alaska	33.8	401,851	550,043	626,932	710,231	1.3 %

Source: U.S. Census Bureau, 2010



STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION
PROJECT NO. 52464

U.S. Census Area Boundaries

FIGURE 3.3.1

Housing

The EPA EJView mapping tool was used to generate a demographic summary report for the study area using information from the 2006-2010 ACS. According to the summary report there are 1,564 housing units located in the study area. Vacancy rates are slightly higher in Wasilla than the Knik-Fairview CDP, MSB and the State. The Knik-Fairview CDP has the largest average household size at 3.03 individuals per household compared to 2.44 in Wasilla and 2.84 in the MSB. Table 3.3.2 presents housing information for the project region and the state.

Table 3.3.2 - Housing in the Project Region

	Population (2010)	Average Household Size	Housing Units	Homeowner Vacancy	Rental Vacancy (%)
COW*	7,831	2.44	3,535	2.3	7.6
Knik-Fairview CDP*	14,923	3.03	5,251	2.0	4.4
MSB*	88,995	2.84	40,578	2.3	5.1
State of Alaska*	710,231	2.71	305,445	1.4	5.5
EJView Report Study Area**	3,997	2.72	1,564	Not a report product	Not a report product

*Data from 2008-2012 ACS
**Data from 2006-2010 ACS

Business and Employment

According to the COW Comprehensive Plan, the number of jobs in the MSB grew more than three times as fast as the rest of the state in the past decade. This trend continues because residents are spending a growing share of their income locally. Wasilla is the commercial and retail center for the MSB and the MSB is considered Alaska's breadbasket because it's the state's major agricultural region. The COW has an expanding economy that offers a wide range of employment and business development opportunities, particularly in the retail and service industries. Table 3.3.3 provides a summary of employment information in the project region and the State.

Table 3.3.3 - 2013 Employment Information

	Residents Employed	Average Annual Earnings	Unemployment Claimants
COW	3,392	40,260	721
Knik-Fairview	6,372	45,529	1,198
MSB	38,342	42,672	7,185
State of Alaska	307,990	41,146	51,940

Source: ADLWD, Research and Analysis Section

There are several commercial developments along the proposed project corridor ranging from gas stations and convenience stores to equipment rental facilities. There is significant undeveloped land adjacent to the roadway that could be utilized for future commercial or residential development.

Table 3.3.4 presents employment by industry in the COW, Knik-Fairview CDP, and the MSB. Employment trends are similar for all three areas with Trade, Transportation and Utilities being the number one employment sector.

Table 3.3.4 - Employment by Sector

	Percent of Total Employed		
Industry	**Wasilla**	**Knik-Fairview CDP**	**MSB**
Natural Resources and Mining	7.3	8.9	7.5
Construction	11.4	12	11.2
Manufacturing	1.2	1.6	1.4
Trade, Transportation, and Utilities	21.5	21	20.5
Information	3.2	2.2	2.4
Financial Activities	3.2	3.8	3.2
Professional and Business Services	8.5	9	8.8
Educational and Health Services	17.6	15.5	15.5
Leisure and Hospitality	10.6	7.6	9.3
State Government	4.8	6.4	6.4
Local Government	8.5	9.4	11.2
Other	2.3	2.6	2.6

Source: ADLWD, Research and Analysis Section

Neighborhoods

There are 24 subdivisions developed adjacent to the proposed project corridor. All of the subdivisions were developed on only one side of KGB Road, i.e., none are divided by the road. This indicates that subdivisions and neighborhoods to the north and south of the road were platted using KGB Road as a boundary or divider. There are approximately 30 undeveloped tracts adjacent to the proposed project corridor, indicating there is considerable room for future residential and commercial development.

Travel Patterns

KGB Road is the primary link for residents living between Wasilla and Settler's Bay, the Goose Bay Airport and points further south. KGB Road currently experiences access and congestion problem especially during period of peak travel. Current access to commercial and residential properties adjacent to the roadway is via local road intersections and private driveways. Some intersections along the corridor have dedicated left-turn lanes, while others only have the through lanes and drivers must wait for gaps in oncoming traffic to make left turns off the roadway while holding up all through traffic in their lane. Right turning drivers do not block through traffic, but they do slow it down. During peak travel times, when congestion is at its worst, left turning traffic experiences long wait times, increasing driver frustration. This frustration can lead drivers to take risks that are frequently cited as factors in high severity crashes.

Community & Public Facilities

A variety of community and public facilities, including churches, emergency and other medical service centers, parks, schools, gyms, sporting arenas, and visitor facilities are located in the project area. Schools include Goose Bay Elementary, Knik Elementary, and Snowshoe Elementary. In addition, Wasilla High School and Wasilla Middle School are located within Wasilla's core area and are attended by students living out KGB Road.

Law enforcement in the project area is handled by the COW Police Department within city limits and the Alaska State Troopers within the MSB. Emergency fire and medical response services are provided from MSB Fire Station 6-2 located near MP 6.9 of KGB Road. The Benteh Nuutah Valley Native Primary Care Center is located at the intersection of PWH and KGB Road and the closest hospital is Mat-Su Regional Medical Center on the Parks Highway.

Some other public facilities located in the project area include the Wasilla Area Senior Center operated by Wasilla Area Seniors, Inc., Iditarod Trail Sled Dog Museum, Lake Lucille Park, Frank Smith Ball Fields, and Three Bears Grocery Store. The Senior Center provides living quarters, meals, rides, a food bank, information, exercise opportunities, and social activities to seniors in the greater Wasilla area. Fifty independent living units are connected to the Senior Center. The Knik-Fairview Plan identifies the Knik Museum and Sled Dog Mushers Hall as community centers/activity centers in the project vicinity.

There are several churches located along the corridor, including Wasilla Assembly of God, Christian Fellowship of Wasilla, Wasilla Christian Church, and Christ First United Methodist Church. There are several others in the area that people travel to via KGB Road.

Environmental Justice (EJ)

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, was signed by President Clinton on February 11, 1994, and requires compliance by all federal agencies. Specifically, the EO directs Federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law.

Because the proposed project's only potential to impact EJ populations is through the acquisition of ROW, a study area of 0.5 mile surrounding KGB Road was used for analysis. The EPA EJView mapping tool was used to generate a demographic summary report for the study area using information from the 2010 Census. Results of the report are shown in comparison to related geographic regions in Table 3.3.5.

Table 3.3.5 - Environmental Justice Population Information within 0.5 Mile of the Project Corridor

	Population*	Median Household Income**	American Indian or AK Native (%)	White (%)	African American (%)	Asian (%)	Hispanic (%)	Other (%)
EJView Study Area	4,320	Not available	4*	84*	1*	2*	4*	1*
Project Region and Statewide								
COW	7,831	54,481	6**	82**	1**	2**	4**	0**
Knik-Fairview CDP	14,923	79,715	6**	83**	1**	3**	3**	0**
MSB	88,995	70,728	5**	85**	1**	1**	4**	1**
Alaska	710,231	69,014	14**	67**	3**	5**	6**	2**

*2010 Census
**2008-2012 American Community Survey

As defined by the CEQ, a minority population is defined as either (a) the minority population of the affected area exceeds 50 percent, or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population, or other appropriate geographical analysis. Based on this definition and the information presented in Table 3.3.5, there are no minority populations in the project area.

FHWA Order 6640.23 defines "low-income" as a person whose household income is at or below the U.S. Department of Health and Human Services (DHHS) poverty guidelines. The poverty guidelines are based on household size. Table 3.3.6 shows the 2012 DHHS Alaska Poverty guidelines and Table 3.3.2 shows the average house hold size in the project region ranges from 2.5 to 3.0 individuals per household. Therefore households in the study area must have a median household income below $19,090 to be considered a low-income population. Although the report generated by the EPA's EJView mapper doesn't include median household income information, it is reasonable to assume that the median household income for the study area is above the low-income threshold based on median incomes for the surrounding area.

Table 3.3.6 - 2012 DHHS Poverty Guidelines for Alaska

Size of Family Unit	Poverty Guideline ($)
1	11,170
2	15,130
3	19,090
4	23,050
5	27,010
6	30,970
7	34,930
8	38,890

For families/households with more than 8 persons, add $3,960 for each additional person.
Source: Federal Register, Vol. 77, No. 17, January 26, 2012, pp. 4034-4035.

No minority or low-income populations have been identified that would be impacted by the proposed project and in accordance with the provisions of EO 12898 and FHWA Order 6640.23, no further EJ analysis is required.

Environmental Consequences

No Build Alternative

The No Build Alternative would have no effect on socioeconomic conditions along the project corridor. Access to all adjacent residential properties, churches, recreation areas, and businesses would not change. Travel conditions for private, public, and commercial traffic would likely continue to deteriorate as volumes increase and LOS decreases. Future development may be curtailed or delayed due to the increasingly difficult travel conditions.

Preferred Alternative

Social

The Preferred Alternative is not likely to cause an appreciable change in community cohesion along KGB Road. The existing layout of neighborhoods is already separated by KGB Road and while the new facility will roughly double the roadway size, excessive disruption to neighborhoods is not anticipated because separation already exists. One neighborhood would be impacted by the acquisition of one residential property. However, the majority of neighborhoods along the project are not expected to experience any adverse effects. Displaced residences and businesses are expected to relocate within the project vicinity and according to the Conceptual Stage Relocation Study (Appendix A), there should be no difficulty in locating replacement housing within the Knik-Fairview community.

Community cohesion within adjacent neighborhoods and along the project as a whole, may improve due to safer travel conditions and consolidated access points. School boundaries, recreation areas, churches, and other essential components of a community are not expected to experience permanent adverse effects from the project. Benefits will include improved traffic flow, less congestion, and safer access to schools, neighborhoods, businesses, and services throughout the corridor. Wait times for vehicles turning on to or off of KGB Road will be shortened and merging with local traffic would be safer.

Police, fire, and other emergency services will be able to respond to emergencies quicker and more efficiently due to the additional lanes and improved traffic flow. In addition, vehicle incidents that require emergency services will likely decrease due to the improved safety features of the road. The primary safety features being additional lanes, consolidated access points, and a non-traversable median.

Local travel patterns will change following completion of construction due to consolidation of access points and creation of a non-traversable median with breaks for access. Some of the adjacent properties will be converted to right-in, right-out access with dedicated U-turn opportunities. Although right-turns followed by U-turns could slightly increase travel times, it is a substantial safety improvement that reduces driver stress by requiring attention to only one direction of traffic when merging onto the roadway. This access pattern increases safety by reducing the frequency of right-angle and left-turn crashes. Social interactions within the project area would not be affected as a result of the proposed access management.

Disproportionately high and adverse effects to low-income or minority populations (EJ populations) will not occur because neither of these population groups have been identified within 0.5 mile of the project area. These particular population groups may exist outside of this area of examination, but the proposed project has no potential for impacts beyond that range and no further research was conducted.

Economic

The Preferred Alternative would change access to commercial areas by limiting the number of locations where turning and crossing movements could occur. Median breaks and dedicated turn lanes remove turning vehicles from through lanes and create safer access to adjacent properties. Driveway access would be combined or limited to connections with existing or extended frontage roads where feasible. In locations without frontage roads, driveway access would be limited to right-in-right-out movements. Constructing the proposed project would improve safety by reducing right-angle and left-turn collisions, as well as encroachment collisions such as head-on and sideswipe crashes.

The proposed project will take several years to construct and offer local residents a multitude of employment opportunities through the contractor and sub-contractors building the project. Workers employed during the construction phase of the proposed project are expected to be locally available and housing impacts are unlikely. Construction worker spending would temporarily create additional jobs and boost local business revenues. The MSB tax revenues are likely to increase due to the sales tax collected on additional spending.

The changes in access and improved travel conditions are anticipated to result in economic benefits because commercial and consumer travel times will decrease. Improved travel

conditions would likely facilitate additional residential development which will increase the MSB and COW tax base. The predicted residential development would offset the potential loss of tax base due to ROW acquisition. The new access patterns will provide adequate and safe access options to properties on both sides of the road via median breaks and U-turn movements. Design of the Preferred Alternative will accommodate all commercial traffic. Economic impacts to commercial properties will be negligible after construction. The project doesn't preclude any commercial or residential development in currently undeveloped lands along the roadway; however it will encourage local governments to play an active role in regulating adjacent land use and access by requiring construction of frontage and local and collector roads to intersection access points.

While business access may be perceived as more limited under this alternative, research presented in the FHWA pamphlet *Safe Access is Good for Business*, indicates that access management projects do not adversely affect the long-term success of either "destination" (i.e., customers plan to visit in advance of the trip) or "drive-by" (i.e., customers frequent more on impulse or while driving by) businesses. The FHWA reviewed "before and after" studies conducted in several states and found that business along highways where access has been managed do as well or better after the projects are completed (FHWA 2006). When access is managed, customers adapt to the changes and continue to shop at certain businesses. Turn lanes at median openings and signalized intersections provide customers safer, more appealing locations to access businesses. Access management reduces congestion, improves traffic flow, and facilitates vehicle movement from one business to another.

3.4 Relocation

The existing ROW width on KGB Road varies from 100 feet on the northern end, up to 200 feet along the rest of the corridor. Lands directly bordering DOT&PF ROW are located within the MSB and COW and consist of private residential, commercial, and institutional land uses. There are also multiple undeveloped parcels. Conditions along the existing ROW line include forested areas, parking lots, yards, fences, and a handful of structures.

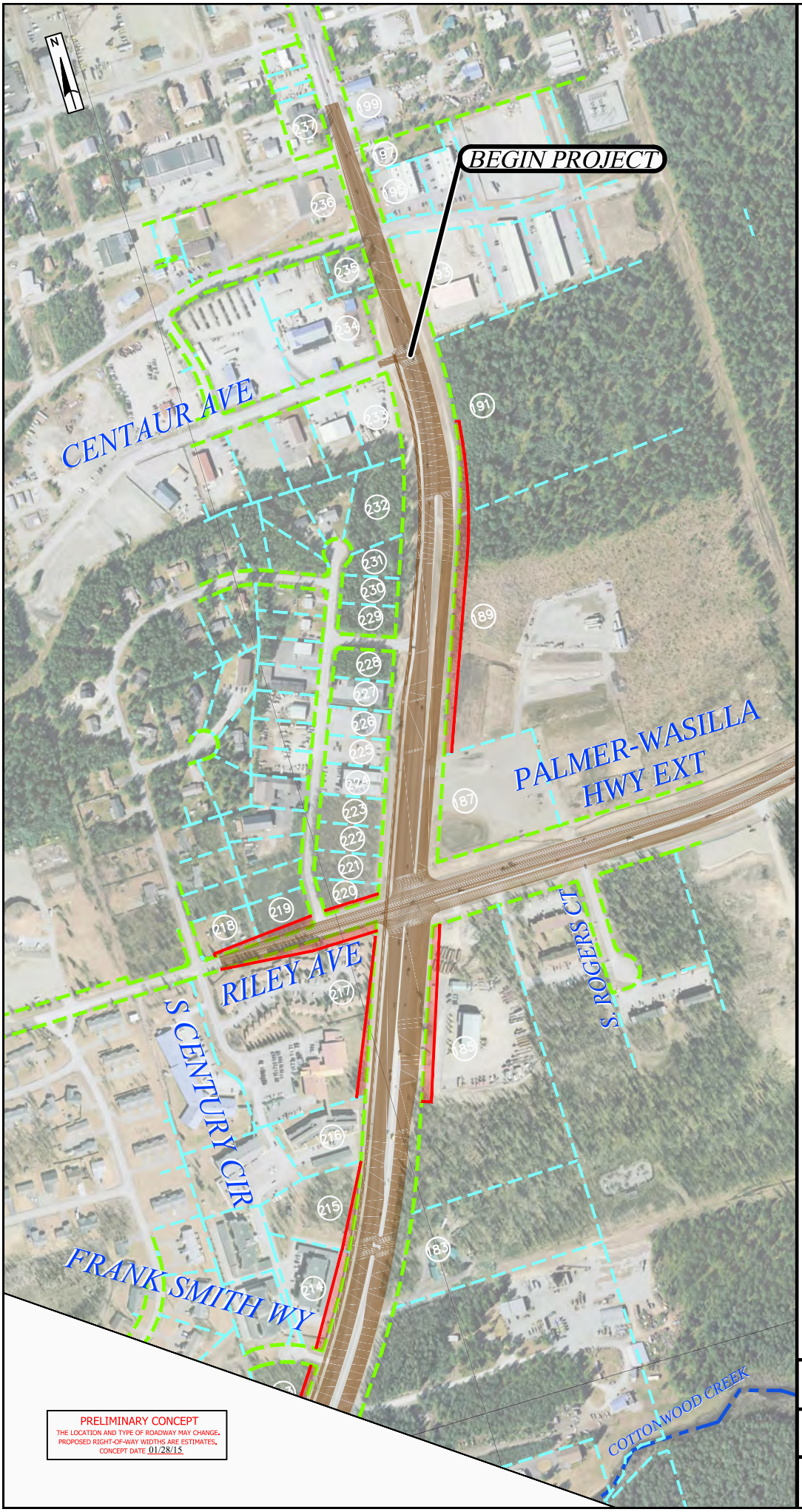
Environmental Consequences

No Build Alternative

Under the No Build Alternative, DOT&PF wouldn't acquire any additional ROW along KGB Road and no residents or businesses would need relocation.

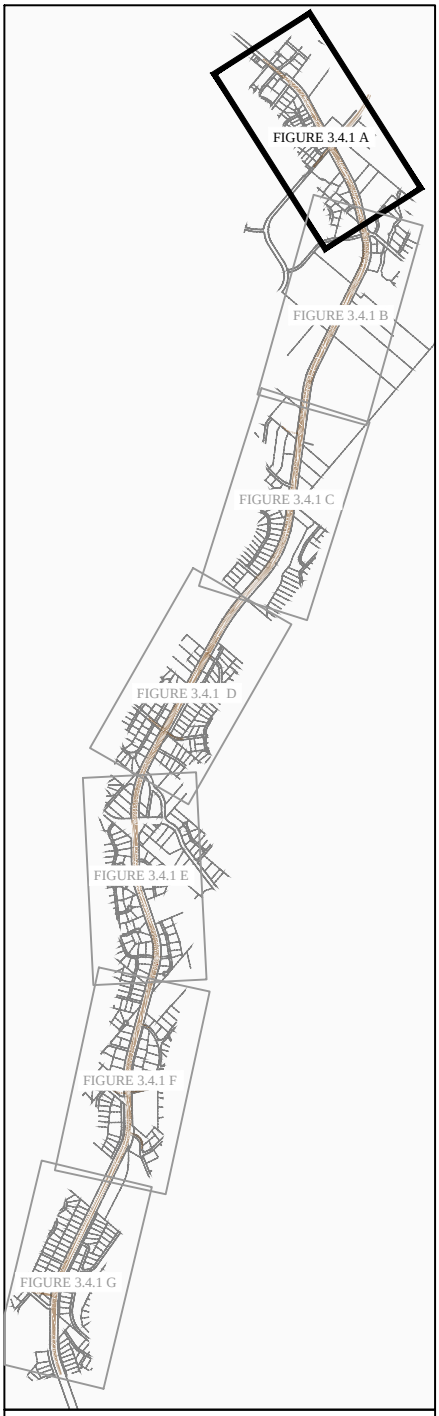
Preferred Alternative

The Preferred Alternative would require 106 partial and one full property acquisition, (approximately 25 acres), to expand the highway from two to four or six lanes. The full acquisition is a residential property (Parcel 32). See Figures 3.4.1A-G for anticipated ROW impacts. The remaining 106 partial acquisitions are all "strip takes" comprising less than ten percent of the affected parcel's total area. The strip takes affect both residential and commercial properties along the corridor. Other than diminished lot size, no impacts to those parcels affected by partial acquisition are anticipated. A retaining wall structure at Birch Harbor Estates was found to be cost effective to avoid full acquisitions of seven zero-lot line parcels (14 single family homes). The ROW acquisition numbers include the area required for build out to six-lanes, despite the plan to delay construction of the six-lane roadway until traffic volumes warrant the additional capacity. The locations and area of ROW acquisition are based on preliminary



LEGEND

EXISTING INFORMATION	PROPOSED INFORMATION
RIGHT-OF-WAY	RIGHT-OF-WAY
PROPERTY LINES	RIGHT-OF-WAY AREA
RIVER/CREEK	



OVERVIEW SCALE

0 250 500 1000

SCALE IN FEET

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

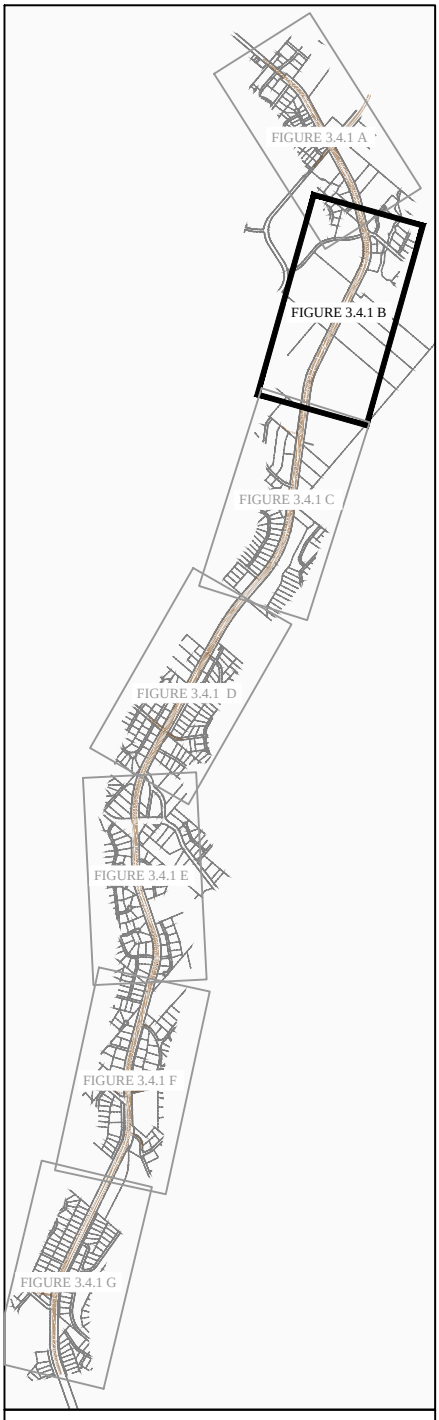
KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

RIGHT-OF-WAY IMPACTS

FIGURE 3.4.1 A

LEGEND

EXISTING INFORMATION	PROPOSED INFORMATION
RIGHT-OF-WAY	RIGHT-OF-WAY
PROPERTY LINES	RIGHT-OF-WAY AREA
RIVER/CREEK	



OVERVIEW SCALE

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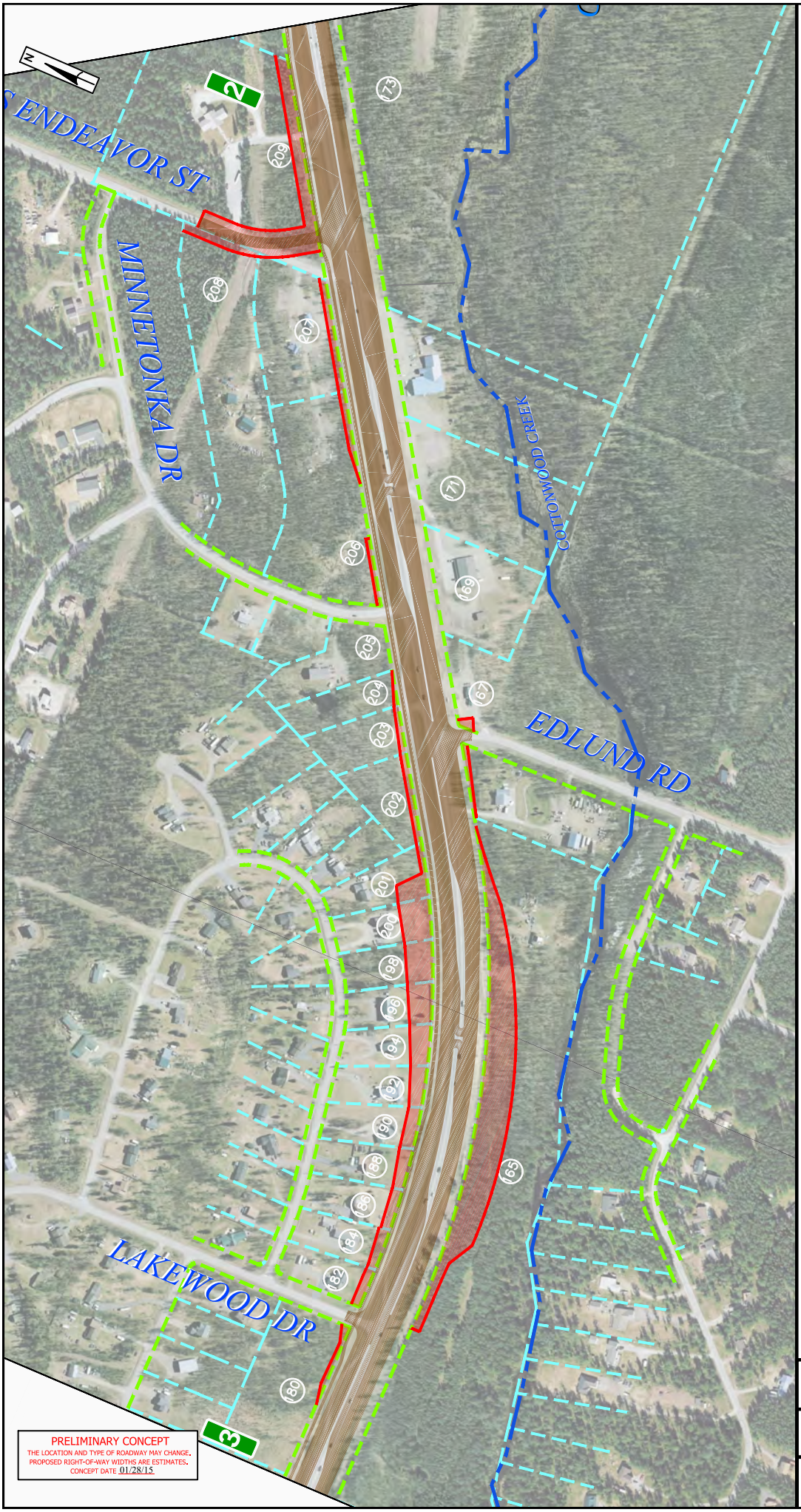
SCALE IN FEET

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

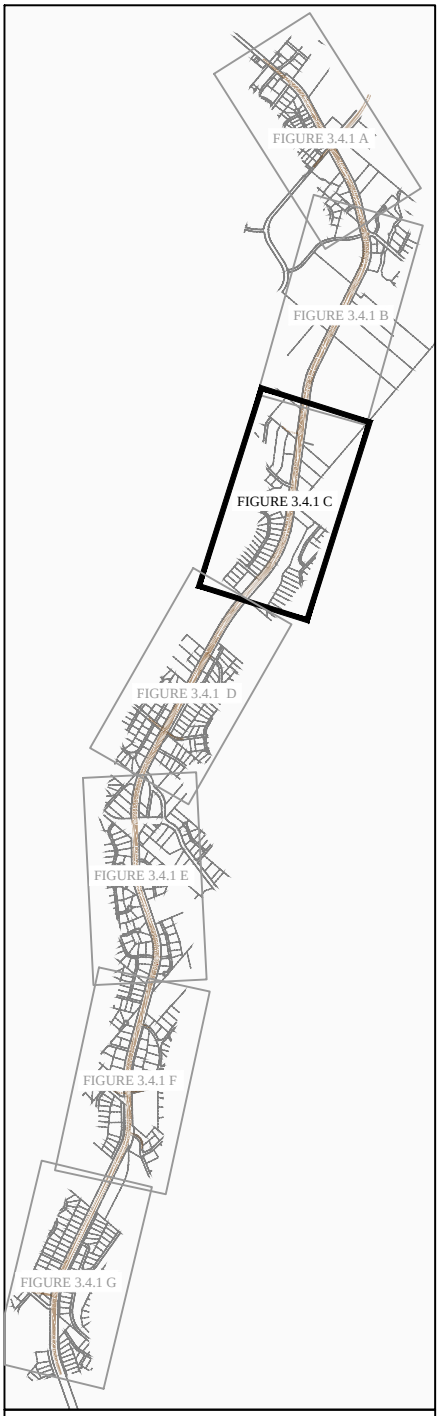
RIGHT-OF-WAY IMPACTS

FIGURE 3.4.1 B



LEGEND

EXISTING INFORMATION	PROPOSED INFORMATION
RIGHT-OF-WAY	RIGHT-OF-WAY
PROPERTY LINES	RIGHT-OF-WAY AREA
RIVER/CREEK	



OVERVIEW SCALE

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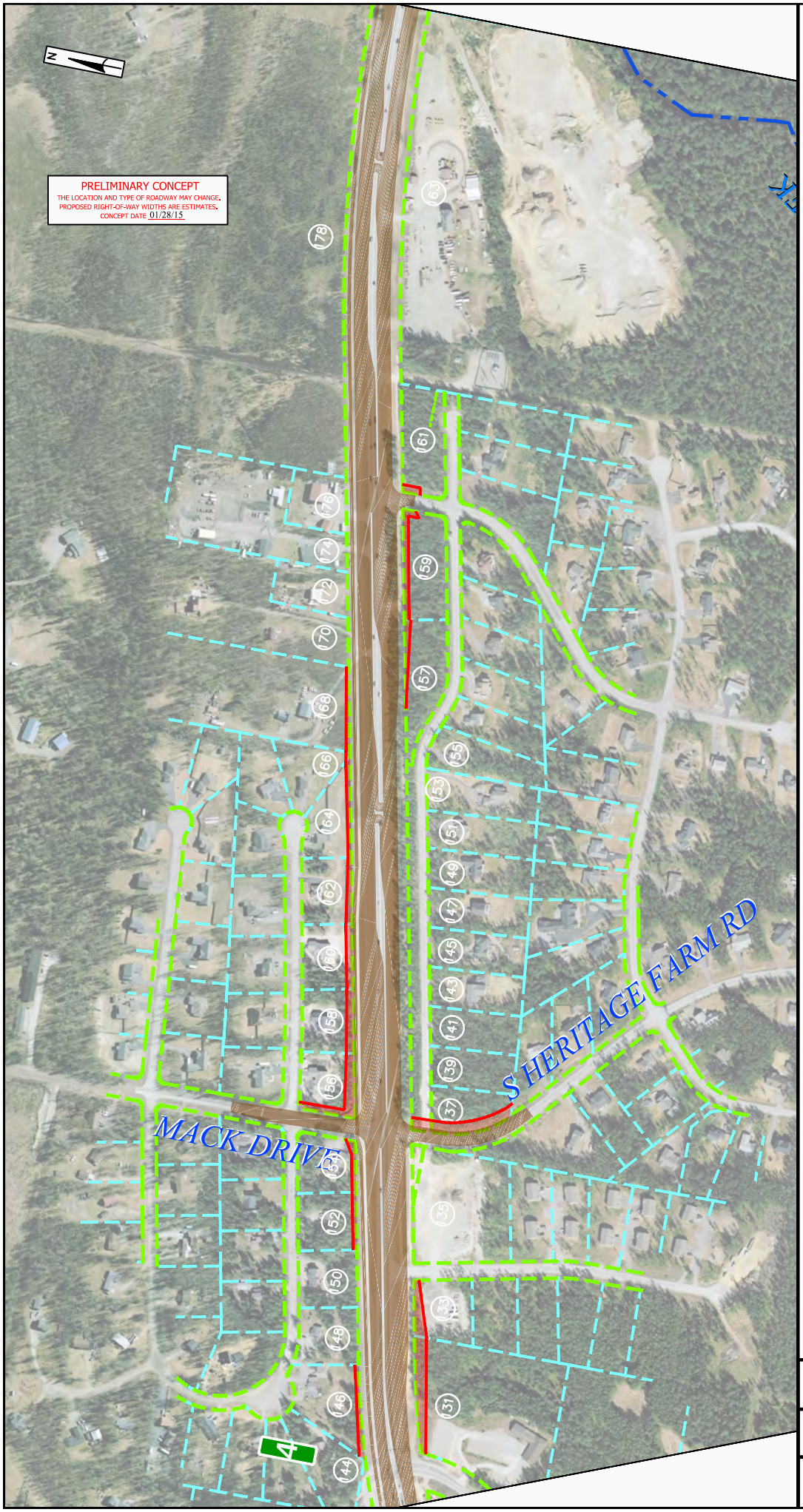
SCALE IN FEET

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

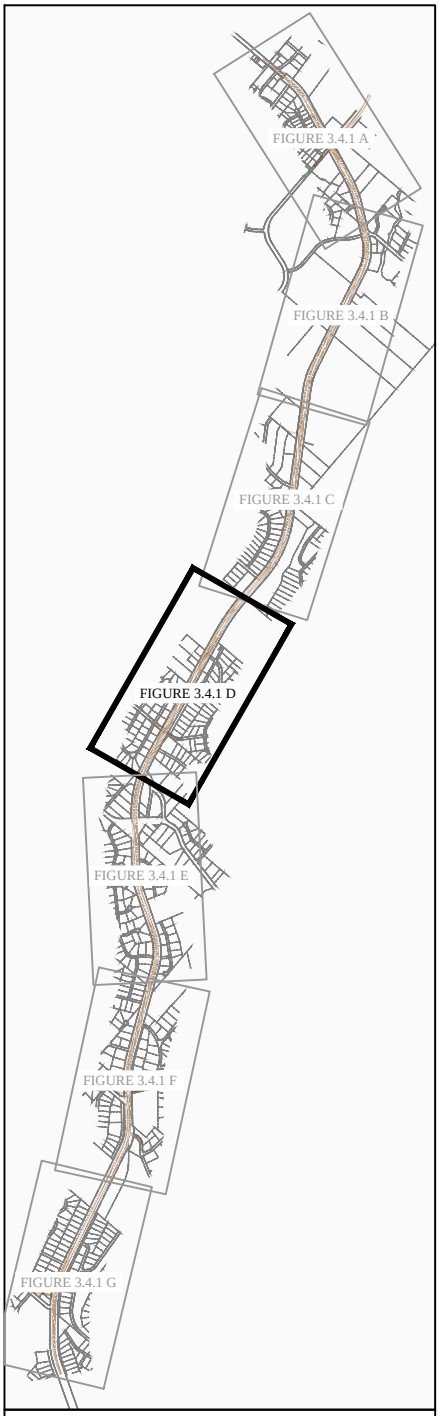
RIGHT-OF-WAY IMPACTS

FIGURE 3.4.1 C



LEGEND

EXISTING INFORMATION	PROPOSED INFORMATION
RIGHT-OF-WAY	RIGHT-OF-WAY
PROPERTY LINES	RIGHT-OF-WAY AREA
RIVER/CREEK	



OVERVIEW SCALE

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SCALE IN FEET

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

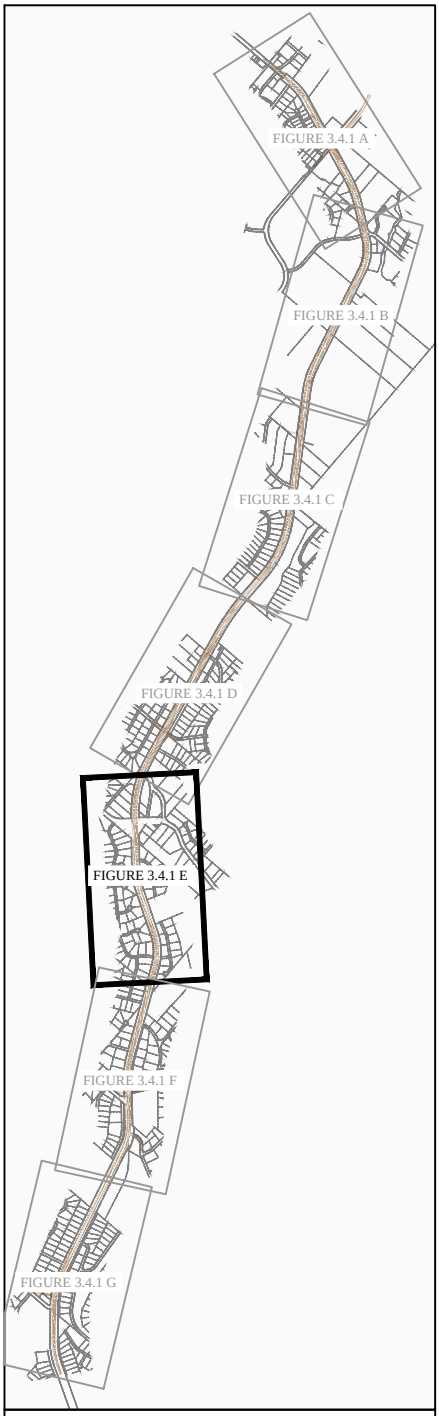
RIGHT-OF-WAY IMPACTS

FIGURE 3.4.1 D

PRELIMINARY CONCEPT
THE LOCATION AND TYPE OF ROADWAY MAY CHANGE. PROPOSED RIGHT-OF-WAY WIDTHS ARE ESTIMATES.
CONCEPT DATE 01/28/15

LEGEND

EXISTING INFORMATION	PROPOSED INFORMATION
RIGHT-OF-WAY	RIGHT-OF-WAY
PROPERTY LINES	RIGHT-OF-WAY AREA
RIVER/CREEK	



OVERVIEW SCALE
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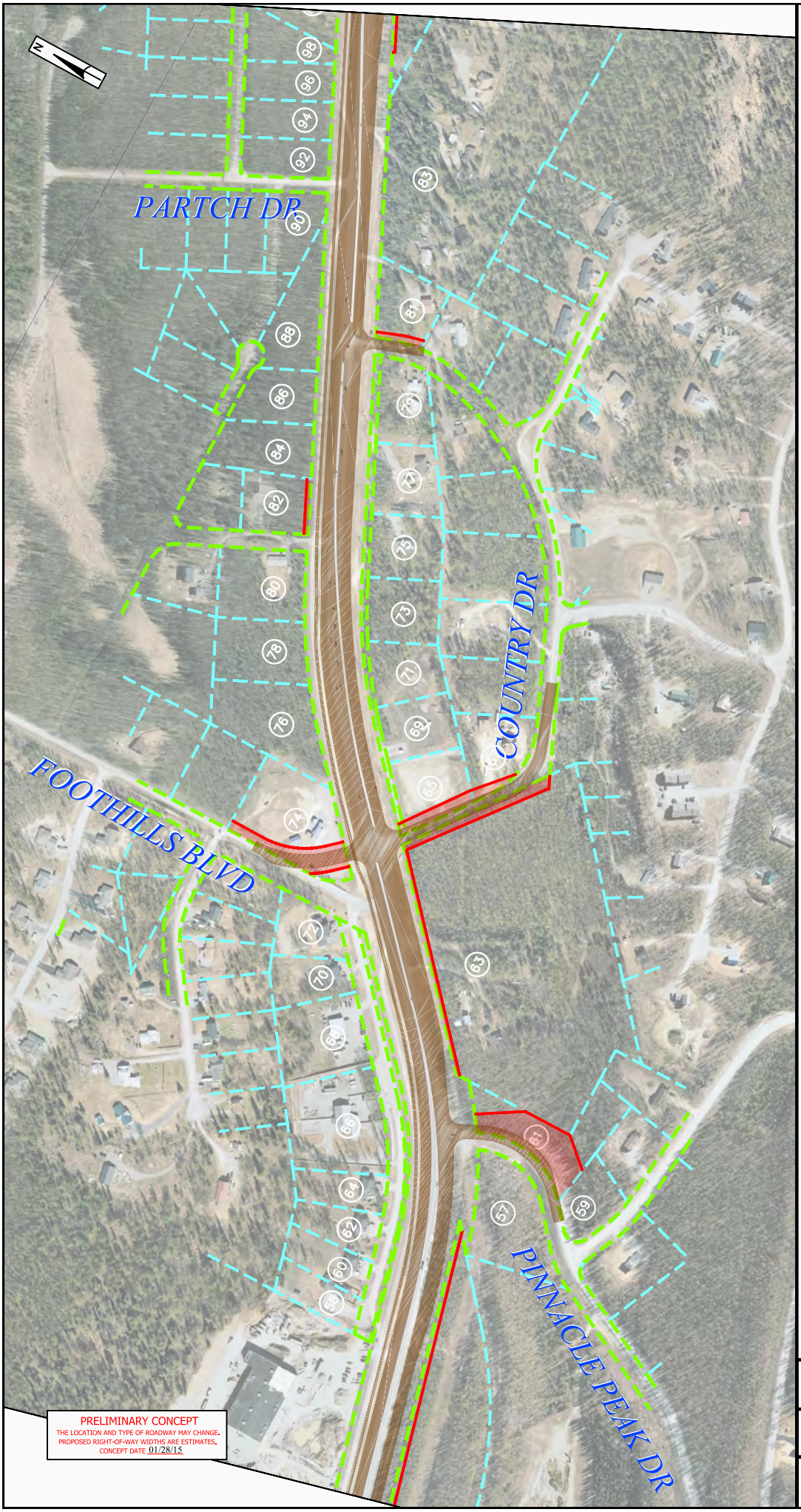
SCALE IN FEET

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

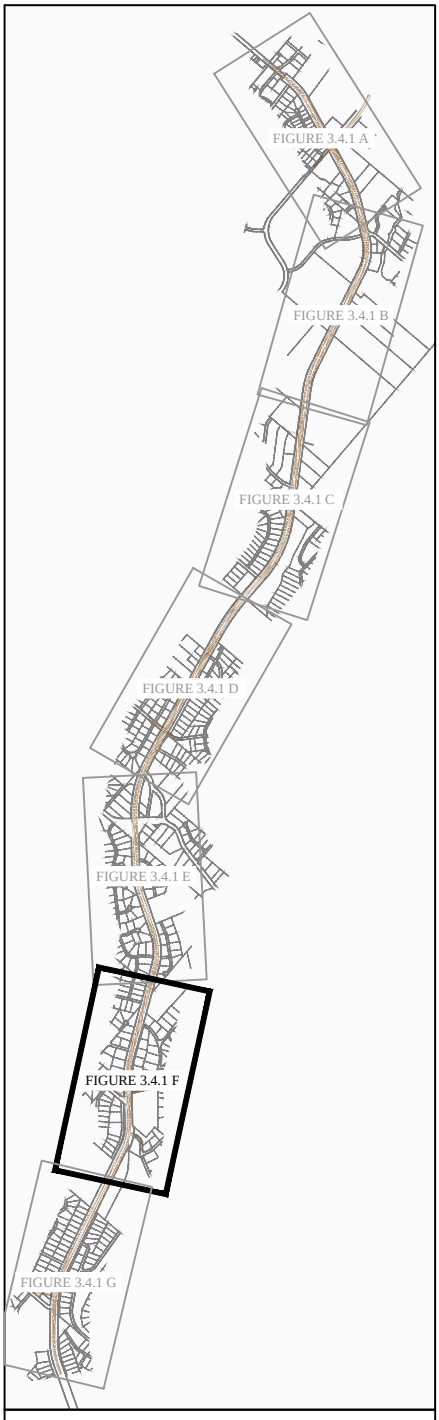
RIGHT-OF-WAY IMPACTS

FIGURE 3.4.1 E



LEGEND

EXISTING INFORMATION	PROPOSED INFORMATION
RIGHT-OF-WAY	RIGHT-OF-WAY
PROPERTY LINES	RIGHT-OF-WAY AREA
RIVER/CREEK	



OVERVIEW SCALE

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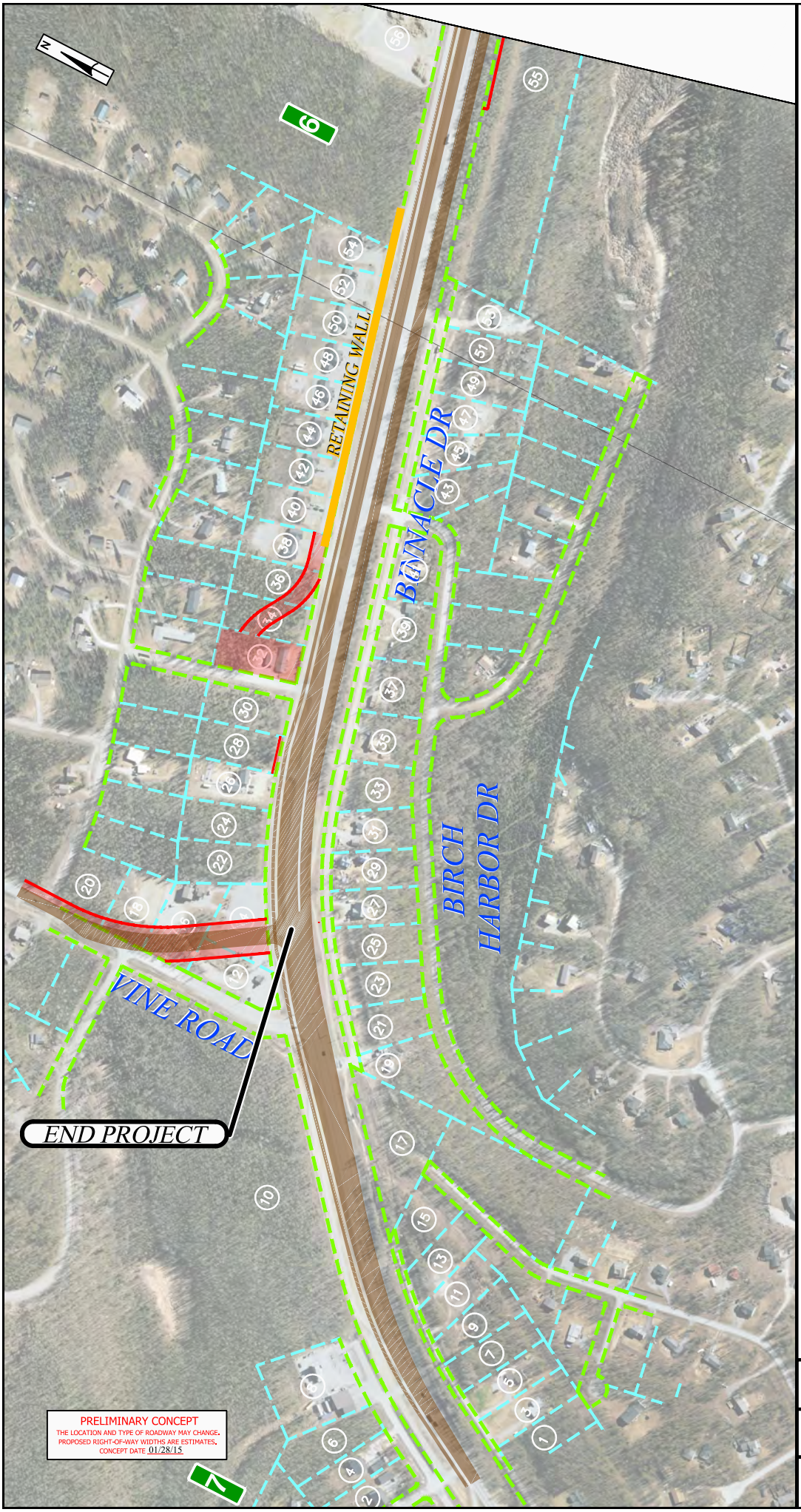
SCALE IN FEET

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

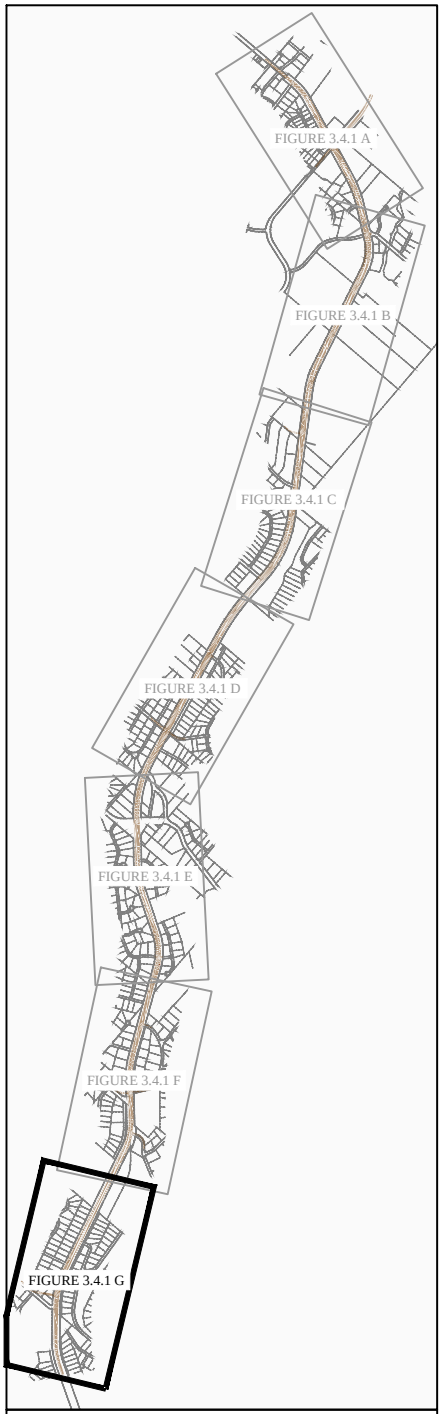
RIGHT-OF-WAY IMPACTS

FIGURE 3.4.1 F



LEGEND

EXISTING INFORMATION	PROPOSED INFORMATION
RIGHT-OF-WAY	RIGHT-OF-WAY
PROPERTY LINES	RIGHT-OF-WAY AREA
RIVER/CREEK	



OVERVIEW SCALE

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SCALE IN FEET

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

RIGHT-OF-WAY IMPACTS	FIGURE 3.4.1 G

design information and will be revised during final design of the project.

The full residential property acquisition has the potential to displace a single family residence that is not known to include unique characteristics. Within a reasonable period of time prior to displacement, displaced individuals would be advised of their eligibility status regarding relocation benefits. In addition to the potential total take residential property, 106 others may have partial impacts. A Conceptual Stage Relocation Study was conducted in March 2014 to evaluate real-estate market conditions and is provided in Appendix A. The study, based on current market information, found that DOT&PF can reasonably assure all displaced individuals can be relocated to a comparable property.

All acquisitions and relocations would be conducted in accordance with the provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), as amended. Relocation resources are available to all property owners without discrimination. Compliance with the Uniform Act is designed to mitigate the adverse effects of relocation and persons not satisfied with the relocation payments or assistance offered by the Department may file an appeal.

3.5 Considerations Relating to Pedestrians and Bicyclists

Pedestrian and bicycle facilities along the project consist of a paved, 10-foot wide, separated multi-use pathway that parallels the north side of KGB Road. The distance between the pathway and edge of roadway varies along its length from approximately 5 to 70 feet. There are established crosswalks at four signalized intersections, PWH, Fern Street, Fairview Loop Road, and Vine Road. The intersections with Vine Road and Fairview Loop Road have curb ramps to provide pedestrian refuge, while the others do not. At the northeastern end of the project the KGB pathway connects with an eastbound pathway along PWH and a northbound pathway from Centaur Avenue towards the Parks Highway. The current roadway shoulder width varies between four and six feet, and although not striped as a bike lane, meets AASHTO's minimum shoulder width for bicycle traffic.

Environmental Consequences

No Build Alternative

The No Build Alternative would not affect the existing pathway or pedestrian facilities.

Preferred Alternative

The pathway's function would remain essentially unchanged under the Preferred Alternative, but its location would change as needed to accommodate the proposed road improvements. It will remain as a 10-foot wide separated facility along the north side of KGB Road. A minimum separation of 10 feet between the mainline edge of pavement and pathway (providing at least 18 feet of separation from any travel lane) will be maintained where the path is adjacent to the four-lane section. Where the path is adjacent to the six-lane section, a minimum separation of four feet from the traveled way will be maintained. Access to the pathway for user groups on the south side of KGB Road will be provided at signalized intersections. The median will provide refuge for pedestrians at all locations along the corridor and allow for two stage crossings. Two stage crossings improve safety by allowing pedestrians to only navigate one direction of traffic at a time. Most residential areas are located on the north side of the highway and those on the south

side are generally near a signalized intersection. Further residential development on the south side will need to address non-motorized transportation options and access.

Overall safety for pedestrians and other non-motorized users would increase through the following improvements:

- The number of vehicle-pedestrian conflict points would be reduced by combining or altering access to driveways and minor cross streets.
- Improving LOS along the mainline and providing Right-Turn-U-Turn (RTUT) movements for drivers would decrease conflicts for pathway users by reducing the amount of delay drivers currently experience when accessing the highway.
- All signalized intersections will have pedestrian refuges constructed or replaced, including median refuge.
- The four-lane section will include eight-foot shoulders and the six-lane section will have six-foot shoulders with an adjacent pathway.

3.6 Noise

A traffic noise analysis report was prepared for the proposed KGB Road Reconstruction Project in November 2014. The purpose of the analysis was to determine if project-related traffic noise impacts would occur and whether noise abatement measures would be warranted based on FHWA criteria and the 2011 DOT&PF Noise Policy. The study area for the analysis included noise sensitive receivers located along the first row of properties adjacent to the proposed project corridor. The analysis and report were completed in accordance with the 2011 DOT&PF Noise Policy and FHWA regulations at 23 CFR 772 – Procedures for Abatement of Highway Traffic Noise and Construction Noise. FHWA Traffic Noise Model (TNM) 2.5 was validated in accordance with 23 CFR 772.11(d)(2) and used to predict existing and design year noise levels. A copy of the report is provided in Appendix B.

For purposes of identifying traffic noise impacts, the FHWA has identified seven land use categories that encompass all possible land use activities occurring adjacent to a proposed project. The DOT&PF has accepted the FHWA definition of these activity categories. In addition to identifying land use categories, the FHWA has assigned Noise Abatement Criteria (NAC) representing maximum traffic noise levels that still allow for uninterrupted use within each activity category. Table 3.6.1 lists the seven land use categories and their associated NAC.

Table 3.6.1 - FHWA Land use Categories and NAC

Activity Category	NAC (Leq(h) dBA)	Evaluation Location	Description of Activity Category
A	57	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	67	Exterior	Residential.
C	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools,

			television studios, trails, and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A–D or F.
F	None	None	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	None	None	Undeveloped lands that are not permitted.

Source: 23 CFR 772 Table 1

Properties neighboring KGB Road consist of residential, recreational, medical, churches, businesses, undeveloped lands, emergency services, and maintenance facilities that fit into activity categories B through G.

According to 23 CFR 772.5, a traffic noise impact occurs when predicted noise levels approach or exceed the NAC established for a receptor's land use category or substantially exceeds existing traffic noise levels. The DOT&PF Noise Policy further defines "approach" as a noise level within one dBA of the NAC. The noise policy defines a "substantial increase" as an increase in noise level of 15 dBA or greater over existing levels.

The traffic noise analysis took ambient noise measurements at 10 locations and modeled existing and design year noise levels at 64 locations (see note at bottom of Table 3.6.2) along the project corridor. As shown in Table 3.6.2, 16 of the modeled receptor locations currently exceed their applicable NAC. Figures 3.6.1A-G show noise receptor and measurement locations.

Table 3.6.2 - Noise Level Comparison between Existing and Proposed, Build/No Build Conditions

Receptor	Activity Category	Land Use Description	NAC as Modified by DOT&PF (dBA)	Existing (2012) (dBA)	No Build (2039) (dBA)	No Build Change (dBA)	Build (2039) (dBA)	Build Change (2039) (dBA)
R1	E	Business	71	63	69	6	68	5
R2	E	Business	71	60	65	5	66	6
R3	E	Business	71	65	69	4	72	7
R4	B	Residence	66	59	64	5	66	7
R5	B	Residence	66	60	69	9	71	11
R6	B	Residence	66	65	70	5	72	7
R7	E	Business	71	70	75	5	74	4
R8	E	Business	71	71	75	4	76	5
R9	C	Baseball Fields	66	65	73	8	69	4
R10	B	Residence	66	69	73	4	73	4
R11	C	Church	66	67	72	5	73	6
R12	E	Business	71	66	71	5	70	4
R13	B	Residence	66	65	70	5	72	7
R14	B	Residence	66	62	73	11	68	6
R15	B	Residence	66	51	72	21	72	21
R16	E	Business	71	54	70	16	71	17
R17	E	Business	71	64	68	4	69	5
R18	B	Residence	66	63	67	4	68	5

R19	B	Residence	66	66	71	5	72	6
R20	B	Residence	66	68	72	4	73	5
R21	B	Residence	66	65	72	7	72	7
R22	C	Church	66	56	66	10	66	10
R23	E	Business	71	57	74	17	73	16
R24	B	Residence	66	65	72	7	72	7
R25	B	Residence	66	63	69	6	69	6
R26	B	Residence	66	64	70	6	70	6
R27	B	Residence	66	66	72	6	72	6
R28	B	Residence	66	64	71	7	71	7
R29	B	Residence	66	66	73	7	73	7
R30	B	Residence	66	64	70	6	71	7
R31	C	Church	66	64	70	6	70	6
R32	B	Residence	66	64	70	6	70	6
R33	B	Residence	66	64	71	7	71	7
R34	B	Residence	66	63	72	9	72	9
R35	E	Business	71	66	71	5	71	5
R36	B	Residence	66	65	71	6	71	6
R37	B	Residence	66	68	74	6	75	7
R38	B	Residence	66	65	71	6	71	6
R39	B	Residence	66	66	71	5	71	5
R40	B	Residence	66	63	70	7	71	8
R41	C	School/ Daycare	66	67	73	6	73	5
R42	B	Residence	66	61	71	10	71	10
R43	B	Residence	66	60	72	12	72	12
R44	B	Residence	66	57	66	9	65	8
R45	E	Business	71	65	72	7	73	8
R46*	B	Residence	66	59**	-	-	71	12
R47*	B	Residence	66	70**	-	-	70	0
R48*	B	Residence	66	71**	-	-	72	1
R49*	C	Baseball Fields	66	65**	-	-	67	2
R50*	B	Residence	66	62**	-	-	71	9
R51*	B	Residence	66	62**	-	-	64	2
R52*	B	Residence	66	51**	-	-	68	17
R53*	B	Residence	66	64**	-	-	66	2
R54*	B	Residence	66	63**	-	-	70	7
R55*	B	Residence	66	66**	-	-	70	4
R56*	B	Residence	66	66**	-	-	69	3
R57*	B	Residence	66	64**	-	-	69	5
R58*	B	Residence	66	64**	-	-	67	3
R59*	B	Residence	66	66**	-	-	70	4
R60*	B	Residence	66	64**	-	-	68	4
R61*	B	Residence	66	63**	-	-	66	3
R62*	B	Residence	66	66**	-	-	69	3
R63*	B	Residence	66	66**	-	-	69	3
R64*	B	Residence	66	65**	-	-	70	5

Red text indicates a noise impact.
*R46-R49 were added to the model for purposes of analyzing the feasibility and reasonableness of noise barriers only. No-build sound levels were not modeled or estimated.
**Existing noise levels were not modeled, numbers shown are estimates based on adjacent modeled receptors.

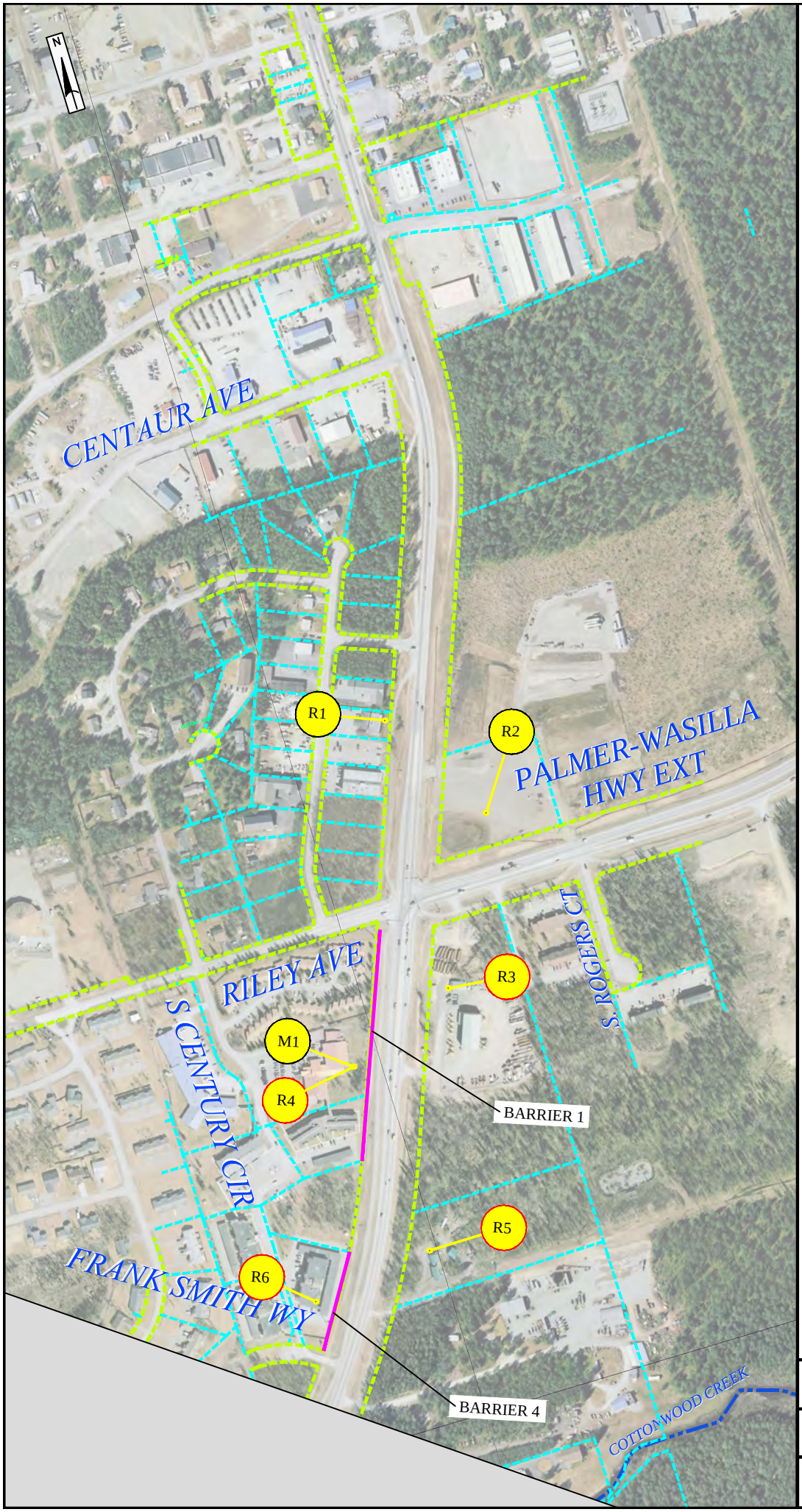
Environmental Consequences

No Build Alternative

Under the No Build Alternative, the existing two-lane roadway configuration would remain without improvement. Existing noise levels approach or exceed the applicable NAC at 16 locations (R8, R10, R11, R20, R27, R29, R37, R39, R41, R47, R48, R55, R56, R59, R62, and R63), while 39 receptors (R5-R15 and R18-R45) would experience noise impacts by the project design year. The No Build Alternative wouldn't consider any abatement measures and affected receivers would continue to experience noise impacts.

Preferred Alternative

Under the preferred alternative, 58 receptors (R3-R11; R13-R16; R18-R43; R45-R50; and R52-R64) would approach or exceed the applicable NAC by the project design year. The receptors impacted by the six-lane section are R3-R11; R13-R16; R18; and R19. These impacts are a result of increasing traffic volumes, increased roadway width, increased number of through lanes, and slight changes in vertical and horizontal alignment.



LEGEND

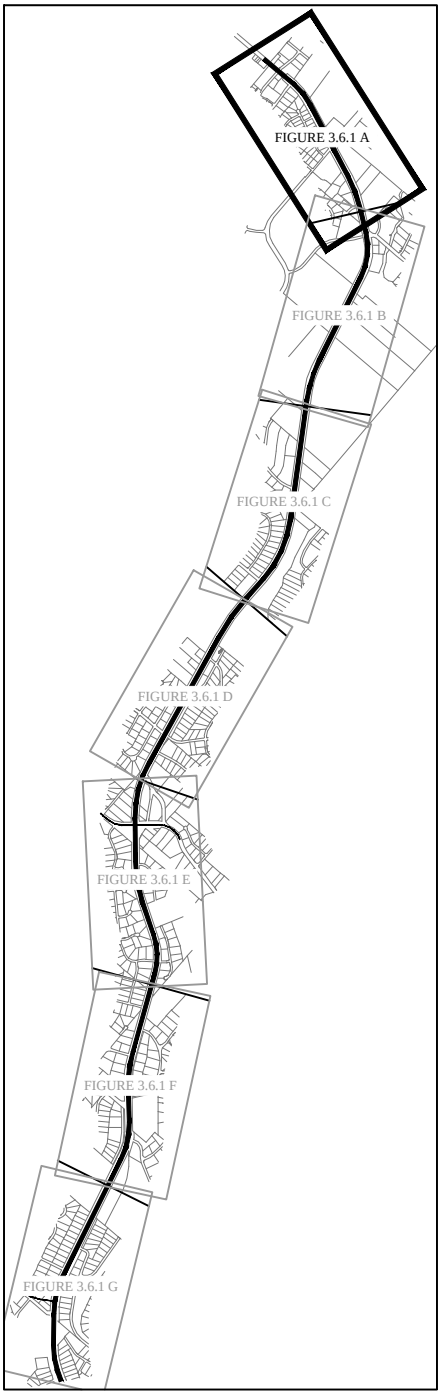
RIGHT-OF-WAY

PROPERTY LINES

BARRIER RECOMMENDED

MONITOR LOCATION (M#)

RECEIVER LOCATION (R#) (NOTE: RED INDICATES A NOISE IMPACT)



OVERVIEW SCALE

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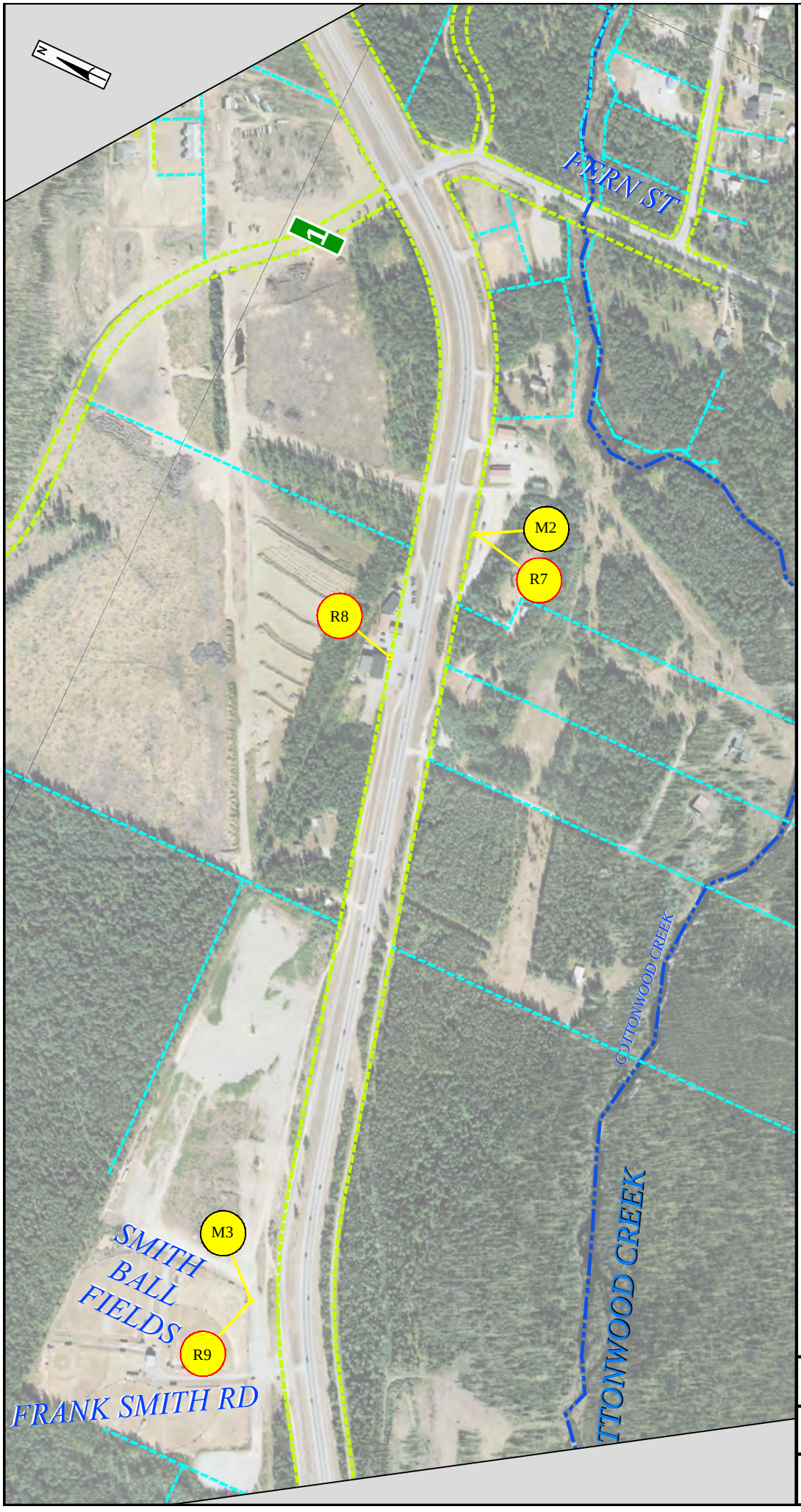
SCALE IN FEET

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

NOISE STUDY COMPONENTS | FIGURE 3.6.1 A



LEGEND

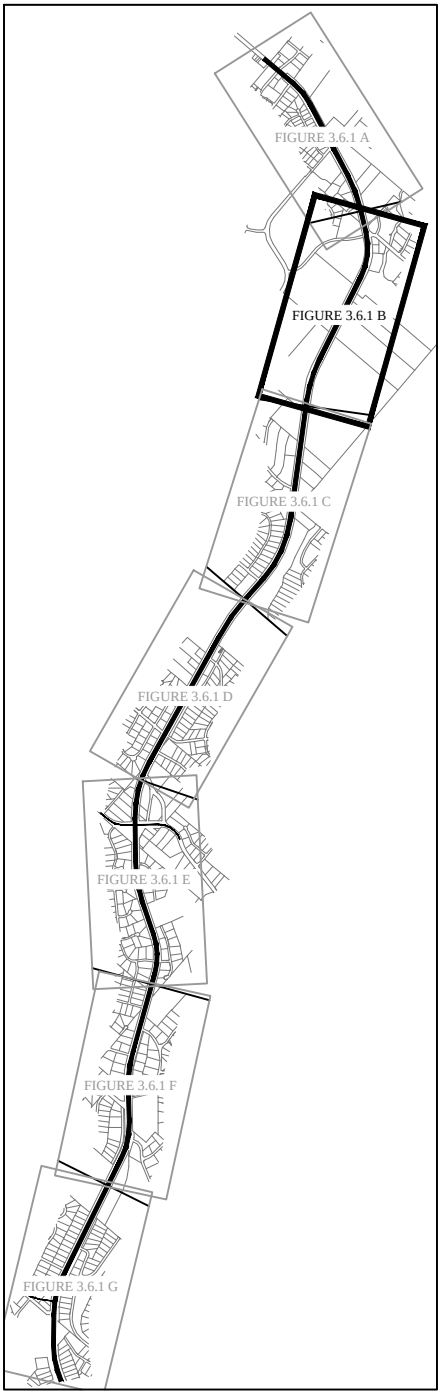
RIGHT-OF-WAY

PROPERTY LINES

BARRIER RECOMMENDED

MONITOR LOCATION (M#)

RECEIVER LOCATION (R#) (NOTE: RED INDICATES A NOISE IMPACT)



OVERVIEW SCALE

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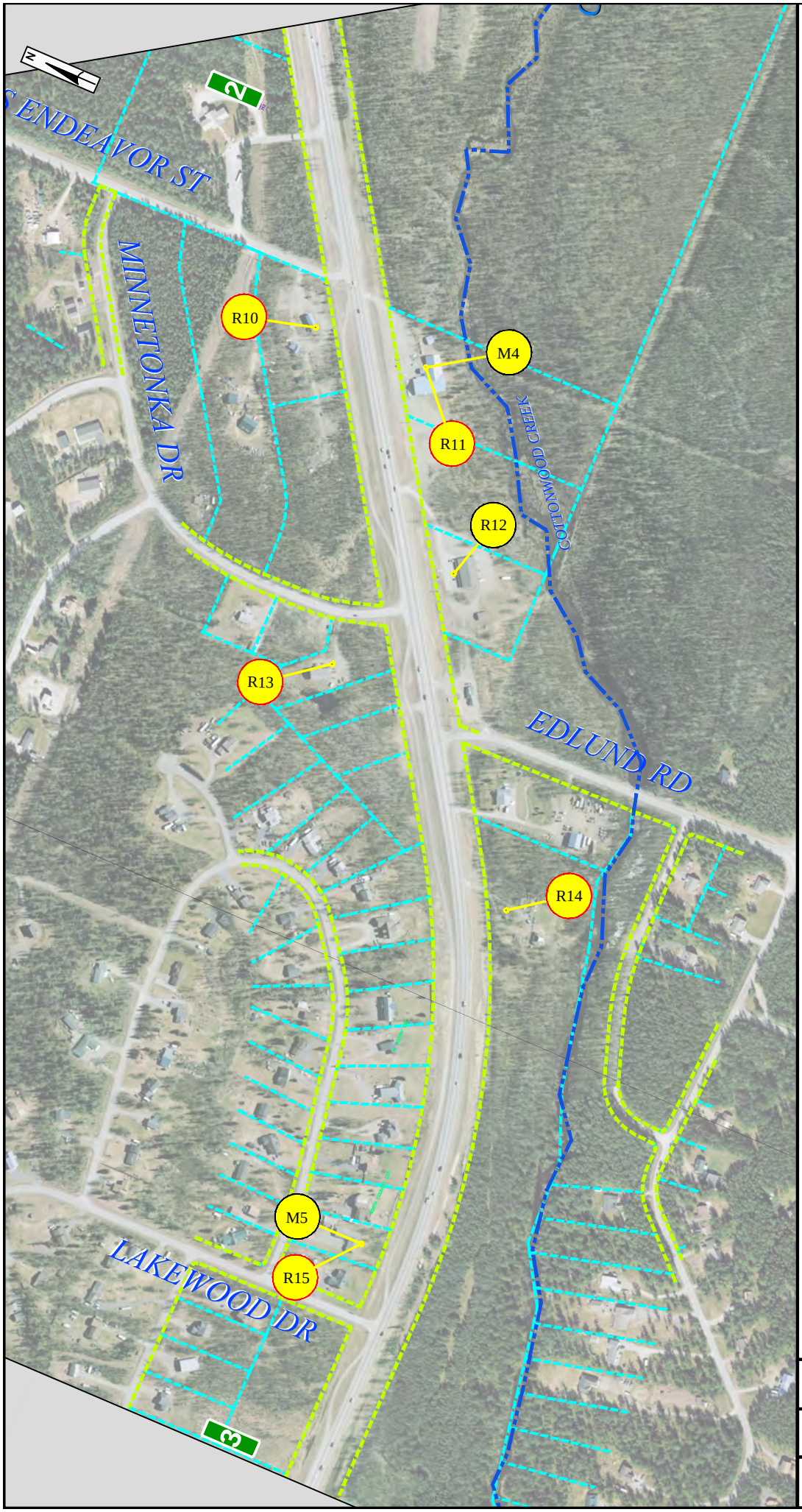
SCALE IN FEET

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

NOISE STUDY COMPONENTS	FIGURE 3.6.1 B



LEGEND

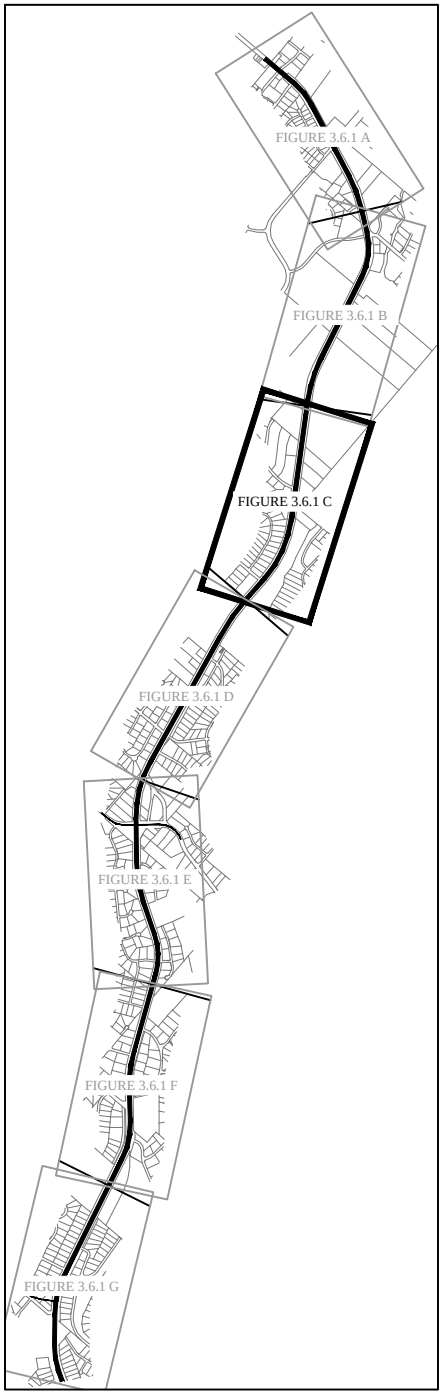
RIGHT-OF-WAY

PROPERTY LINES

BARRIER RECOMMENDED

MONITOR LOCATION (M#)

RECEIVER LOCATION (R#) (NOTE: RED INDICATES A NOISE IMPACT)



OVERVIEW SCALE

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SCALE IN FEET

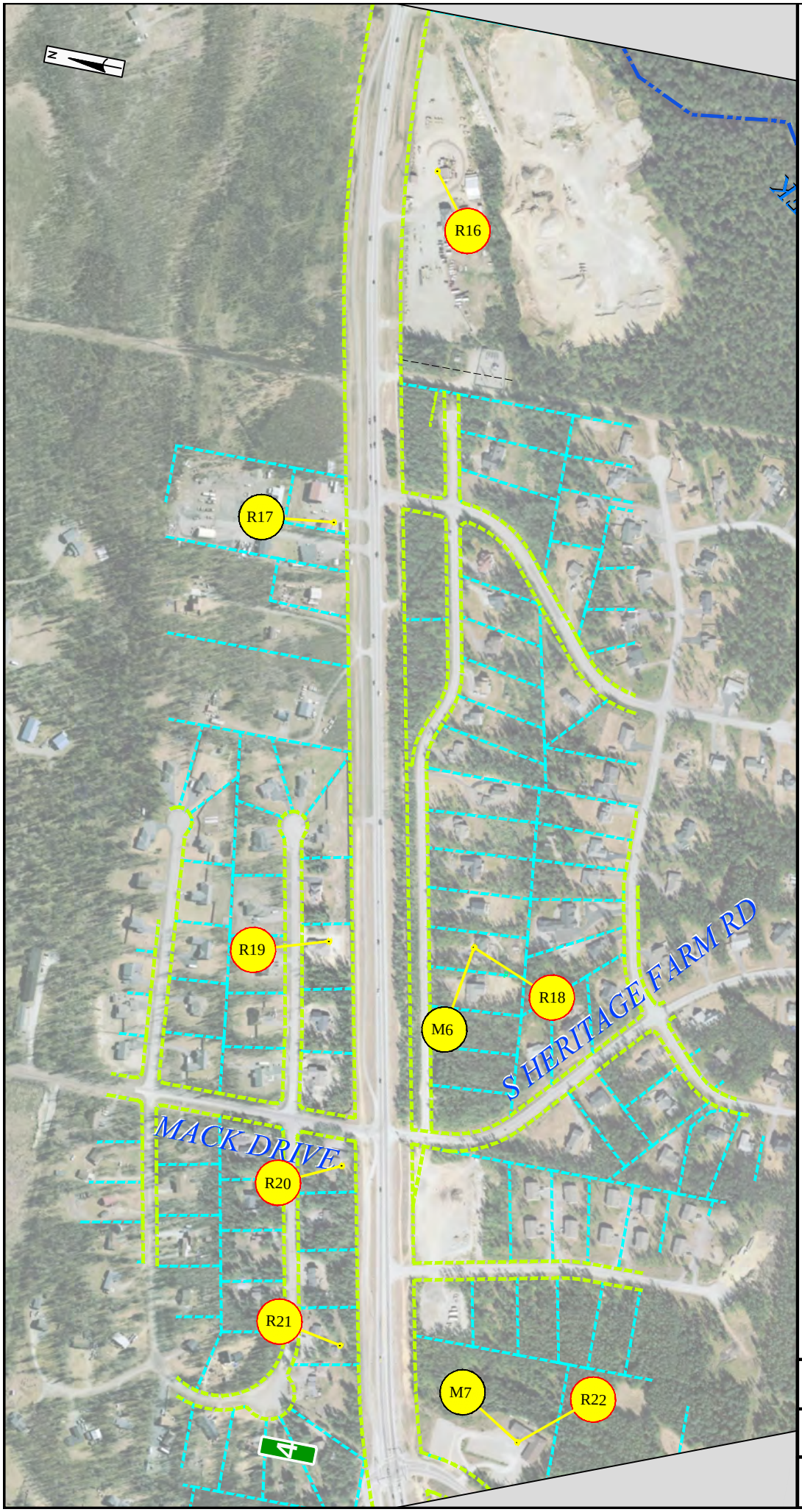
STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

NOISE STUDY COMPONENTS

FIGURE 3.6.1 C



LEGEND

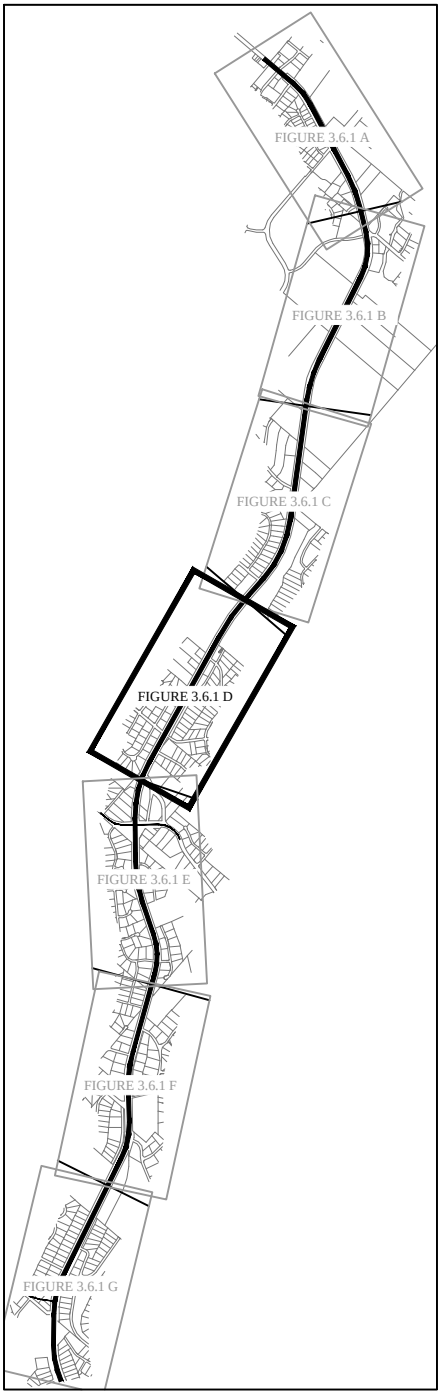
RIGHT-OF-WAY

PROPERTY LINES

BARRIER RECOMMENDED

MONITOR LOCATION (M#)

RECEIVER LOCATION (R#) (NOTE: RED INDICATES A NOISE IMPACT)



OVERVIEW SCALE

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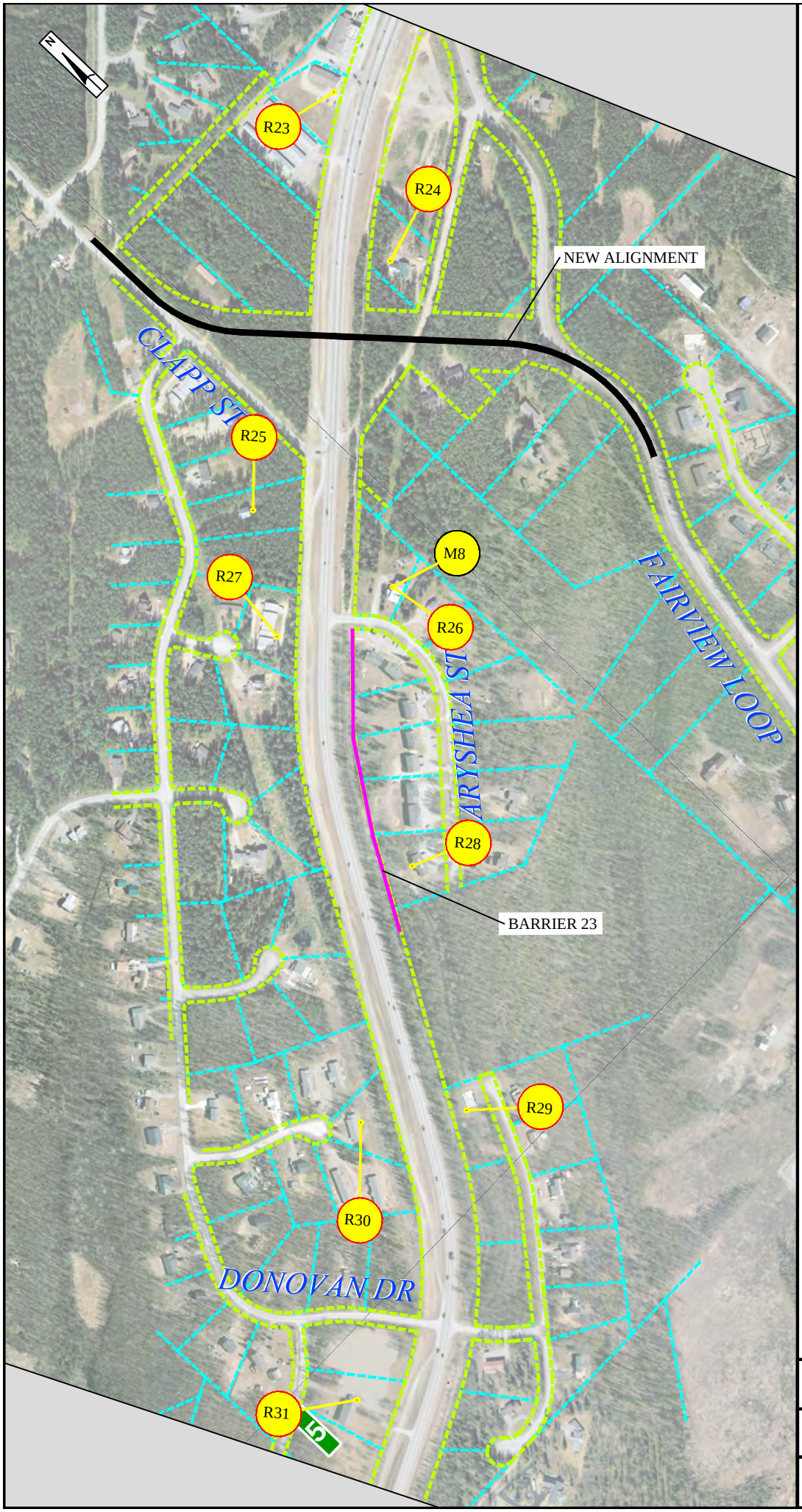
SCALE IN FEET

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

NOISE STUDY COMPONENTS | FIGURE 3.6.1 D



LEGEND

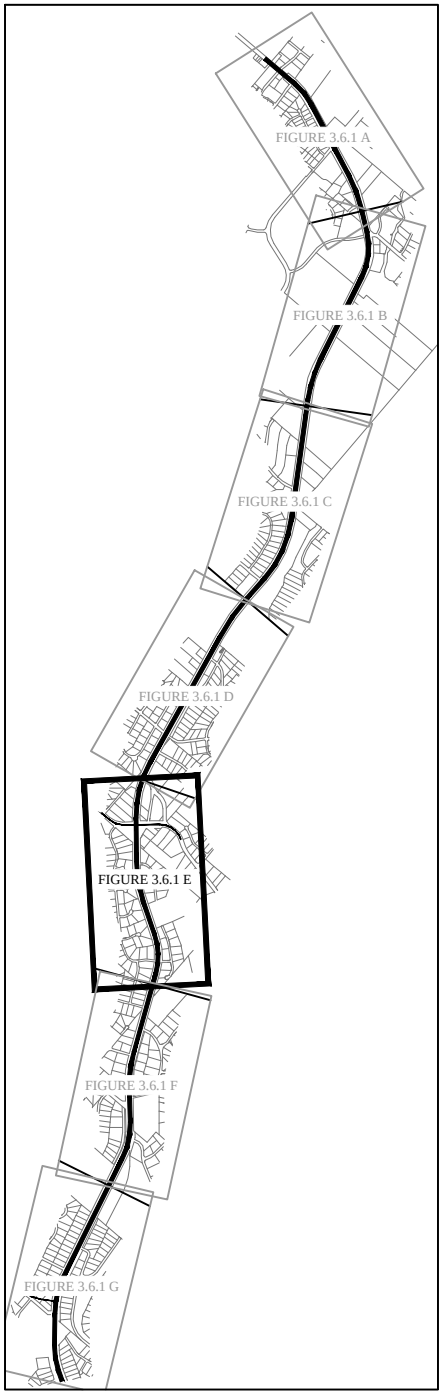
RIGHT-OF-WAY

PROPERTY LINES

BARRIER RECOMMENDED

MONITOR LOCATION (M#)

RECEIVER LOCATION (R#) (NOTE: RED INDICATES A NOISE IMPACT)



OVERVIEW SCALE

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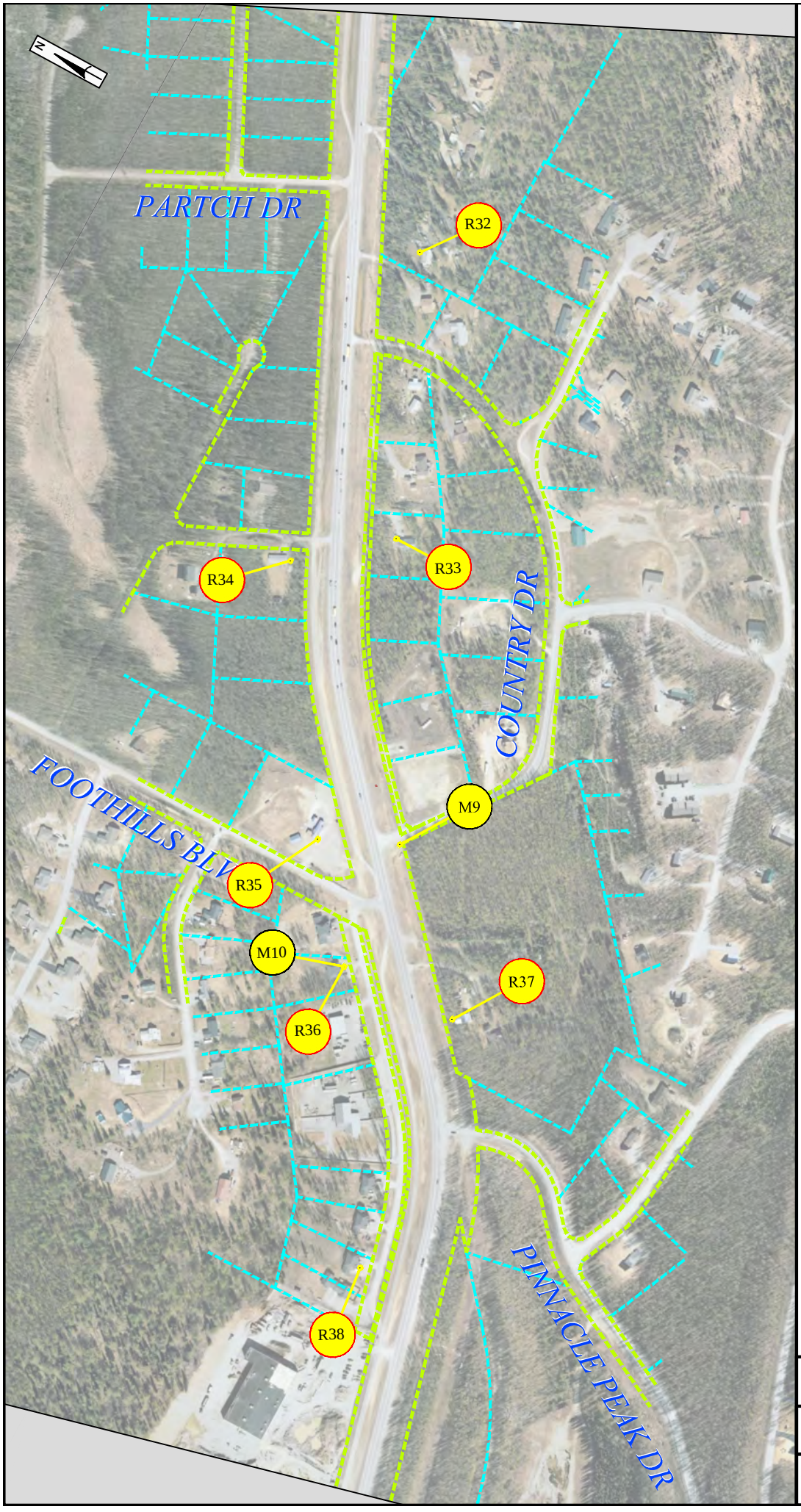
SCALE IN FEET

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

NOISE STUDY COMPONENTS | FIGURE 3.6.1 E



LEGEND

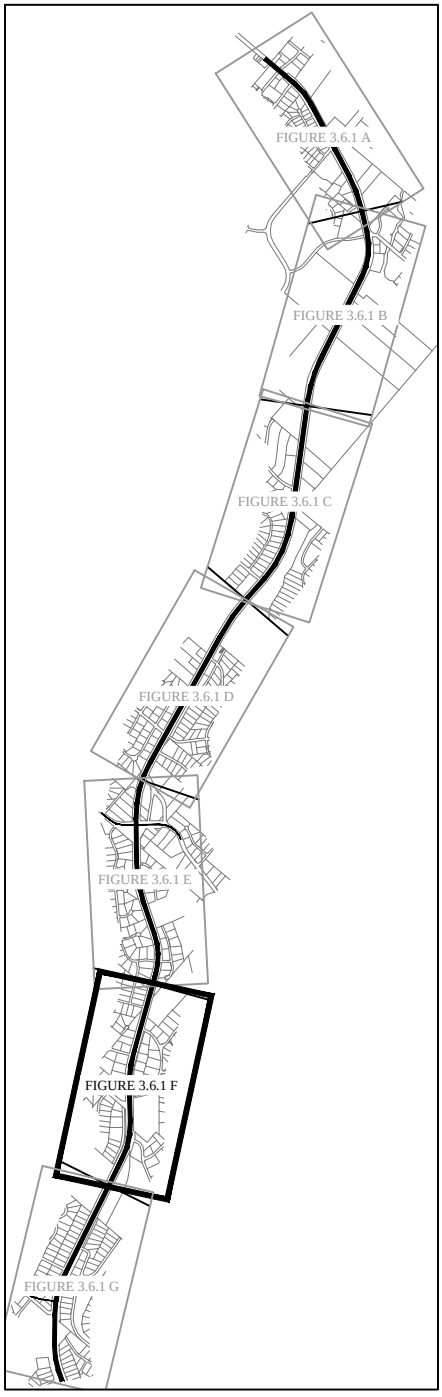
RIGHT-OF-WAY

PROPERTY LINES

BARRIER RECOMMENDED

MONITOR LOCATION (M#)

RECEIVER LOCATION (R#) (NOTE: RED INDICATES A NOISE IMPACT)



OVERVIEW SCALE

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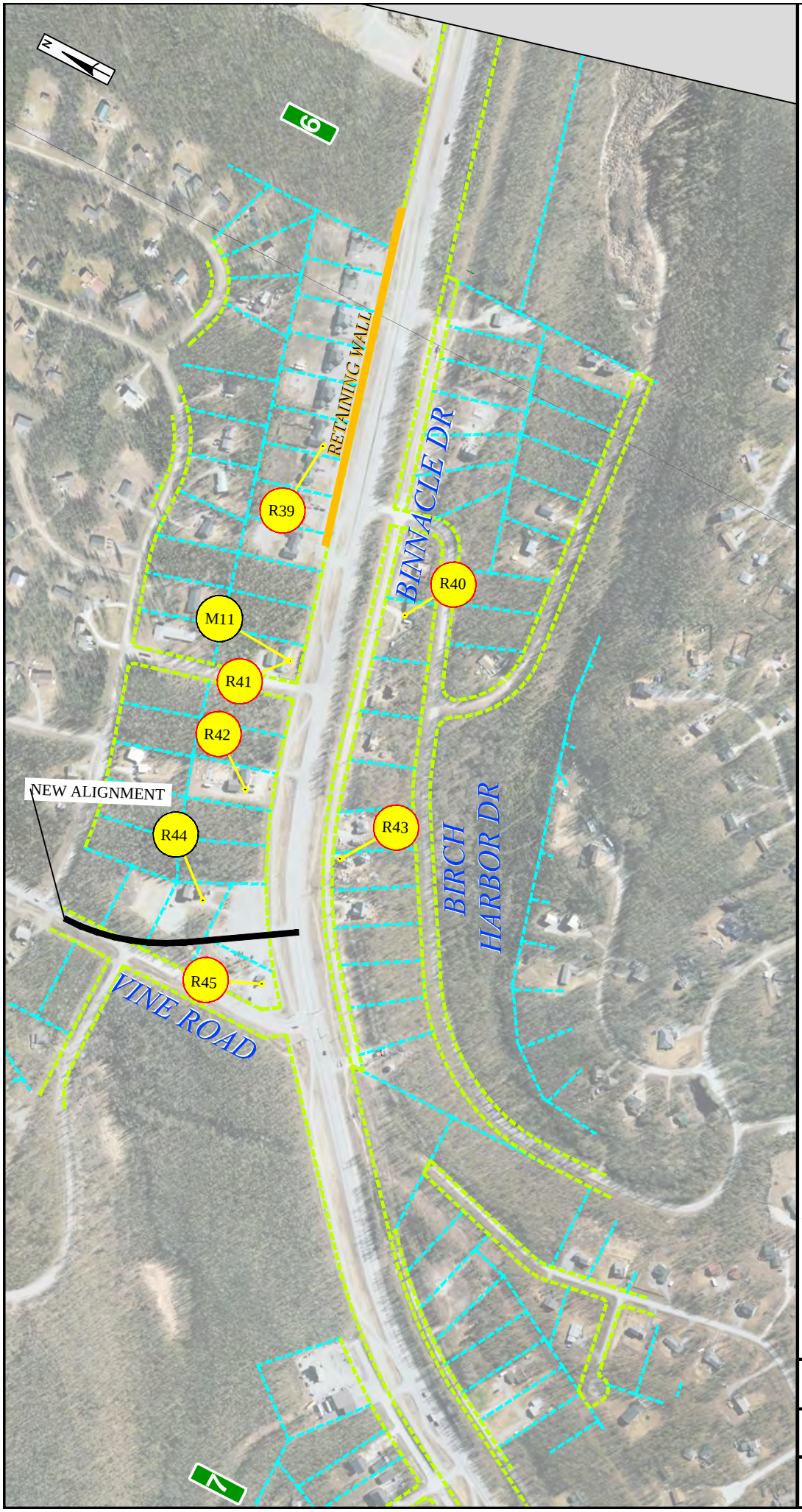
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

NOISE STUDY COMPONENTS | FIGURE 3.6.1 F



LEGEND

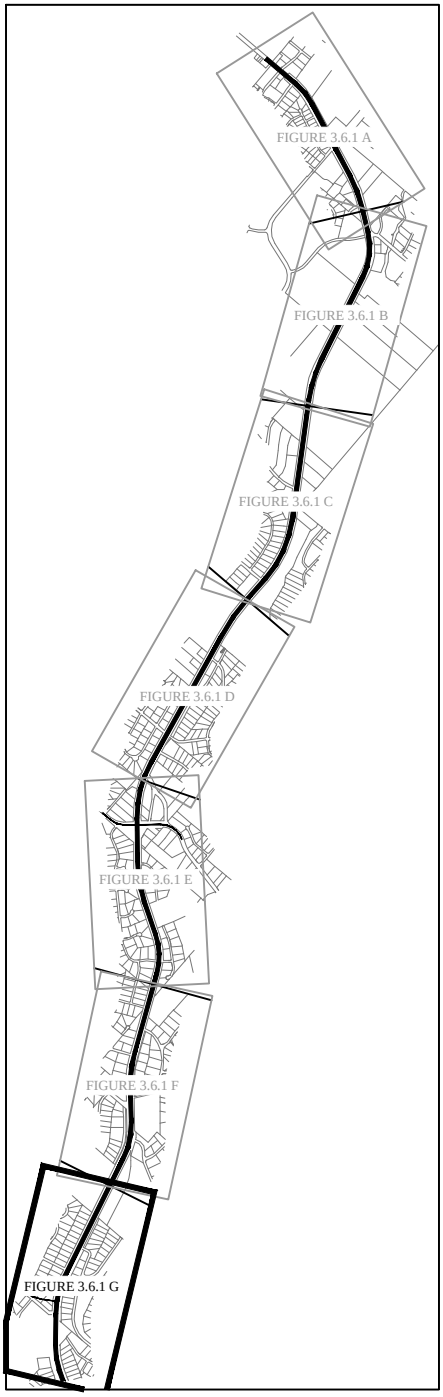
RIGHT-OF-WAY

PROPERTY LINES

BARRIER RECOMMENDED

MONITOR LOCATION (M#)

RECEIVER LOCATION (R#) (NOTE: RED INDICATES A NOISE IMPACT)



OVERVIEW SCALE

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SCALE IN FEET

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

NOISE STUDY COMPONENTS | FIGURE 3.6.1 G

In accordance with the DOT&PF Noise Policy, noise abatement measures were considered and evaluated for acoustic feasibility and reasonableness for all impacted receptors. Several noise abatement options exist for incorporation into the project to reduce traffic noise impacts:

- Construction of noise barriers
- Traffic management measures (e.g. time-use restrictions for certain vehicle types, modified speed limits, exclusive lane designations)
- Alteration of horizontal and vertical alignment
- Acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone

Constructing noise barriers on KGB Road was determined to be the most effective noise mitigation measure due to the current level of property development along the corridor. Roadway realignment would require substantial property acquisition and traffic management measures would not meet the project purpose and need.

The acoustic feasibility and reasonableness evaluation of noise barriers is based on the following criteria:

Construction of noise barriers is considered acoustically feasible if:

1. A minimum of 5 dBA or more reduction is achieved for at least 50% of front row dwelling units.
2. They don't create a safety hazard to the driving public.

Construction of noise barriers is considered reasonable if:

1. They are cost effective, having a cost per benefitted receptor of less than or equal to $32,000 (amount adjusted for inflation).
2. They have greater than 60% approval from property owners and affected residents.
3. A DOT&PF design goal of 7 dBA reduction can be achieved for 50% of front row dwellings.

As a result of the feasibility and reasonableness analysis conducted in support of this environmental document, the DOT&PF is proposing to incorporate three noise barriers into the proposed project (described below). These noise abatement recommendations are preliminary and based upon the feasibility and reasonableness analysis completed at the time of the environmental document. Final recommendations for noise abatement will be based upon the feasibility and reasonableness analysis conducted during the detailed design of the project. Any changes in the final abatement recommendations will result in the reevaluation of the approved NEPA document and the solicitation of additional public comment.

1. Barrier 1 – On east side of KGB Road, beginning south of the intersection with PWH and running south 850 feet (Figure 3.6.1A). Proposed barrier height is seven feet.
2. Barrier 4 – On east side of KGB Road, beginning north of the intersection with South Century Circle and running north 380 feet (Figure 3.6.1A). Proposed barrier height is 15 feet.

3. Barrier 23 – On south side of KGB Road, beginning south of the intersection with Caryshea Street and running west for 1,000 feet. Proposed barrier height is 12 feet. (Figure 3.6.1E)

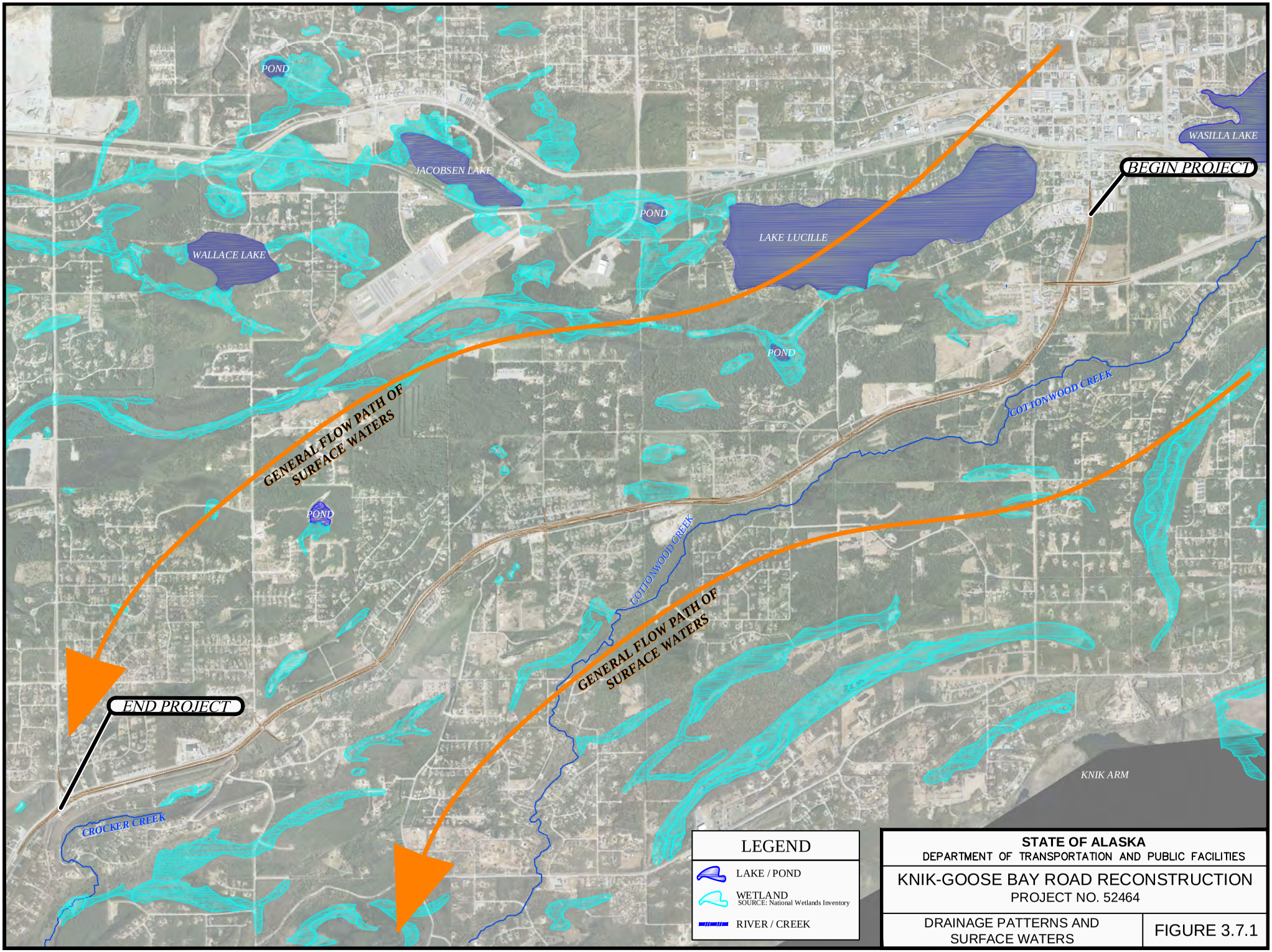
Abatement measures for all other impacted receivers were found to be not feasible, reasonable, or both. All three barriers are recommended for implementation through the proposed project. Design-level detail has not yet been discussed in public involvement efforts, and the views of affected property owners and residents are not known at this time. Outreach with the affected property owners will be done during the feasibility and reasonableness analysis conducted during the detailed design of the project.

3.7 Water Quality

There are no surface waters located directly within the project area and there are none adjacent that receive storm water runoff directly from KGB Road. Cottonwood Creek, Lake Lucille, Wasilla Lake, and Crocker Creek are the principal surface waters closest to the project (Figure 3.7.1). Lake Lucille and Wasilla Lake are located at the east end of the project and separated from the project by a network of roads and developed commercial areas. This development makes it unlikely that either of these water bodies would receive storm water from KGB Road. In addition, the general drainage patterns in the area show that surface water flows south and west which is away from these lakes. Cottonwood Creek flows out of Wasilla Lake in a south-westerly direction; roughly paralleling KGB Road on the south side for approximately 4.5 miles before it makes a southerly turn towards Knik Arm. Cottonwood Creek is a low volume water body.

Topography in the project area consists of gently rolling hills with surface water generally moving in a southerly direction and ultimately into Knik Arm. Soils generally consist of sands and gravels with varying concentrations of fines mixed in. Storm water within the project area sheet flows off the roadway and is captured by adjacent ditches, swales and culverts, and conveyed to low points where it is allowed to infiltrate the ground or evaporate. Curb and gutter with a storm drain system is proposed for the project section located within Wasilla city limits. The organic layer is generally less than two feet thick. Groundwater is present at depths of eight feet and greater within the existing road embankment and at depths of 4.5 feet or greater along the toe of the existing embankment. According to the Alaska Department of Environmental Conservation (ADEC) Drinking Water Protection Map (reviewed May 2014), there are also numerous drinking water wells located in the project vicinity.

The project area is located in an area that is transitional between a coastal and continental climate. Precipitation generally occurs as snow in the winter months or as rain during the spring, summer, and fall, with midwinter rain events not uncommon. Data from the Western Regional Climate Center shows the mean annual precipitation in Wasilla is approximately 17 inches, with 51 inches of snow on average each winter.



STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION
PROJECT NO. 52464

DRAINAGE PATTERNS AND SURFACE WATERS

FIGURE 3.7.1

The ADEC Impaired Waters List (2010) includes Lake Lucille (Category 4a) for low levels of dissolved oxygen from urban runoff and Cottonwood Creek (Category 5) for fecal coliform from urban runoff. Category 4a waters are impaired and have a final/approved Total Maximum Daily Load (TMDL). Category 5 waters are impaired and included on the 303(d) list and require a TMDL.

Environmental Consequences

No Build Alternative

Under the No Build Alternative, current storm water drainage patterns would remain intact, and impacts to water quality from the highway facility would be unchanged. Existing stormwater drainage problems would persist.

Preferred Alternative

The proposed project would not have any permanent adverse impacts on water quality in the project area, including Cottonwood Creek. All improvements would be constructed well above and separated from the ordinary high water of all surface waters in the area. KGB Road currently consists of approximately 44 acres of impervious surface area within the project limits and would expand to approximately 105 acres at full build out. However, the improved drainage facilities will be designed to handle the increased storm water runoff. Construction of new cross-drain culverts would improve drainage in the project area by reducing areas of concentrated runoff; in addition, they would reduce the amount of water that ponds on or next to the roadway. The existing drainage patterns are not anticipated to substantially change. Culverts treated with outlet protection measures would dissipate energy, reduce runoff velocities, and decrease the erosion potential of stormwater runoff.

Exacerbation of existing impairment in Lake Lucille from the project is not likely to occur. Lake Lucille lies 1,500 feet from the project area at its closest point and no direct conveyance of storm water from KGB Road is expected. Additionally, storm water would have to make it over multiple vegetated barriers and ditches or vacant lots composed of highly porous material. Contamination in Lake Lucille likely results from the fact that its shores are almost one-hundred percent occupied with residential development and it directly borders the COW along its northwestern shore. During the preliminary design and environmental process, including communication with adjacent landowners, no impacts to private drinking water wells were identified.

3.8 Permits

Construction of the Preferred Alternative would require the following permits:

- U.S. Army Corps of Engineers (USACE), Clean Water Act (CWA) Section 404 Permit
  - Permit will authorize the discharge of fill material into the wetlands located west of Lakewood Drive on the north side of KGB Road.
- ADEC, CWA Section 401 Water Quality Certification
  - Due to the anticipated area of impact, 0.60 acre, the project doesn't fit within the limits of any applicable nationwide permits and an individual permit will be necessary, and ADEC will be given the opportunity to provide a water quality assurance certificate.

- ADEC, Alaska Pollution Discharge Elimination System (APDES) General Permit for Discharges from Large and Small Construction Activities (CGP)
  - Coverage under this permit is necessary because the project will disturb greater than one acre of soil and there is potential for storm water to leave the project and enter waters of the U.S.

3.9 Invasive Species

Invasive species are those species non-native to the ecosystem under consideration and whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health. They originate from another region and are able to thrive because the natural predators, diseases, or other biological mechanisms from its former habitat are missing in the new environment. Once established they can overcome native species in their environment and permanently change the structure and function of ecosystems by hybridizing with native species, altering soil and water composition, and degrading water quality. Noxious weeds are invasive species that have been designated by federal or State government as injurious to public health, agriculture, recreation, wildlife, or property. In aquatic systems, established invasive plants can restrict or impede fish migration and damage fish habitat. The majority of invasive species have been identified near populated areas. As people and equipment move about, roadway systems often provide a way to transport invasive species to new locations and then spread throughout the landscape.

The Alaska Natural Heritage Program (ANHP) maintains the Alaska Exotic Plants Information Clearinghouse (AKEPIC) database which contains information on over 390 non-native plant species found in Alaska. The State of Alaska regulates and manages the spread of invasive and noxious weed species that could pose a public health risk or harm the agricultural industry. The State has prohibited 14 and restricted 9 noxious weeds (11 AAC 34.020). Prohibited species are harmful to public health and the environment and are often very difficult to control or eradicate. Prohibited species cannot be sold or grown in the state. Restricted species are generally considered as nuisances or economically detrimental, but can be controlled more easily.

The AKEPIC database (reviewed 1/16/2014) identified 35 invasive plant species within one mile of the proposed project corridor. Of those identified, one State of Alaska prohibited noxious weed was found, Quackgrass (*Elymus repens (L.) Gould*). Four of the 35 species are State of Alaska restricted noxious weeds, Yellow Toadflax (*Linaria vulgaria P. Mill.*), Common Plantain (*Plantago major L.*), Annual Bluegrass (*Poa annua L.*), Bird Vetch (*Vicia cracca L. ssp. cracca*). The U.S. Department of the Interior (USDOI) Bureau of Land Management (BLM) identifies White Sweet Clover (*Melilotus alba Medikus*) as an additional high priority invasive species found in the project area.

Environmental Consequences

No Build Alternative

The No Build Alternative would have no effect on the current status of non-native and invasive plant species in the project corridor. No invasive species would be introduced into the proposed project area by roadway construction activities. Existing invasive species may continue to grow and be transported throughout the state on vehicles, people, or wildlife travelling through the area.

Preferred Alternative

Preferred Alternative construction activities such as clearing, grubbing, excavation, and material import/export could introduce or cause the spread of invasive species throughout the project corridor and the state. Non-native species may be inadvertently introduced to the project area or off-site waste disposal sites by transportation of infested fill and waste materials. Construction equipment could serve as a carrier for the dispersal of non-native/invasive weeds from outside the project area and further the spread within the project area. Invasive species and/or seeds can easily be transported on the wheels of construction equipment. Similarly, seed mixes, landscaping materials, and erosion control devices could contain invasive species in addition to the specified species.

Additional clearing would cause the permanent loss of some native vegetation adjacent the existing highway. This could change the composition of vegetation or alter ecological integrity and provide a more suitable environment for invasive species.

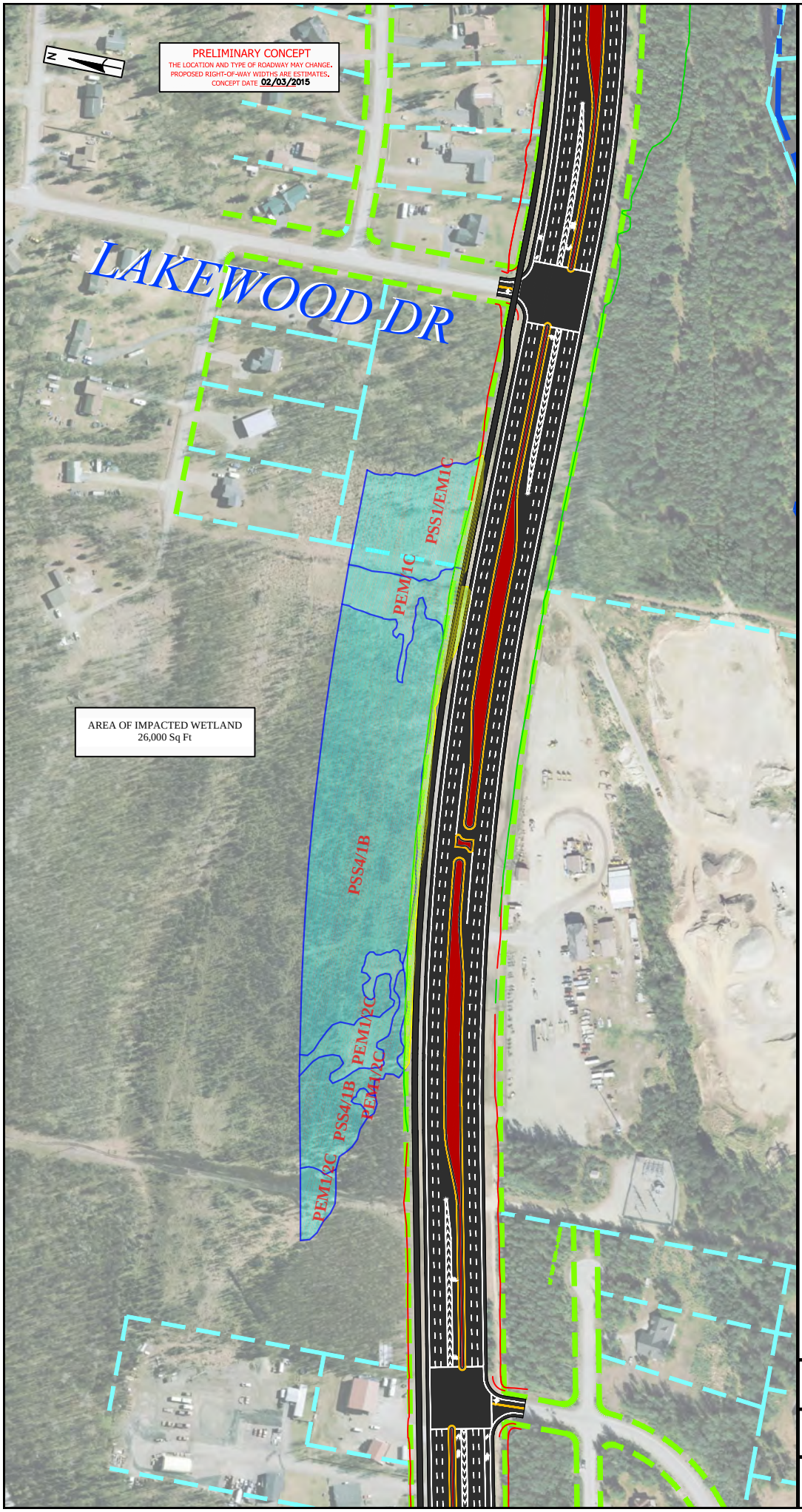
Impact Minimization Measures

In compliance with the EO on Invasive Species, EO 13112, and subsequent guidance from the FHWA, the landscaping and erosion control measures included in the project will not use invasive species. The following measures are typical construction practices employed by DOT&PF to avoid and minimize the introduction and spread of invasive species. These measures are typically included in soil stabilization and revegetation plans identified in the contractor's Storm Water Pollution Prevention Plan (SWPPP) and required by the ADEC Construction General Permit (CGP).

- All construction equipment and vehicles would be washed prior to being brought on site to remove dirt, seeds, roots, and other plant fragments to prevent any invasive species from being brought onto the project or into Alaska.
- All construction equipment and vehicles would be washed on site to remove dirt, seeds, roots and other plant fragments to prevent any invasive species from leaving the project area.
- Any erosion control materials made from straw or hay (e.g., wattles, bales of hay, etc.) would be made from certified weed free straw or hay. If certified materials are not available, locally produced products would be utilized to minimize potential importation of new weed propagules from outside Alaska.
- All disturbed areas would be reseeded with weed-free seed and vegetated with native species per the ADNR publication, *Alaska Coastal Revegetation & Erosion Control Guide*

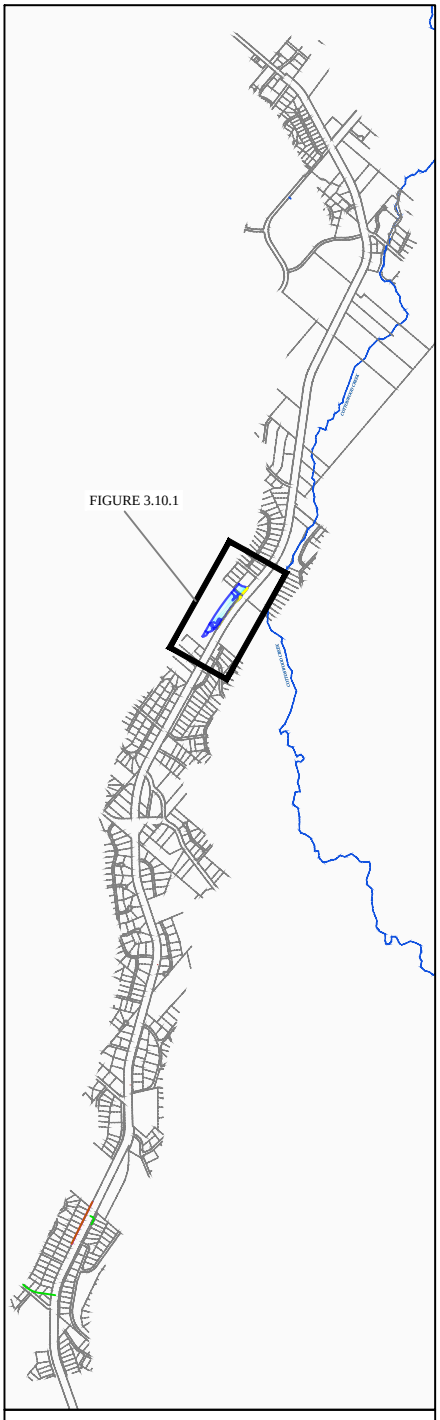
3.10 Wetlands and Waters of the U.S.

Waters of the U.S. include all navigable waters and all waters (wetlands, streams, lakes, and ponds) adjacent to or with a hydrological connection to navigable waters (33 CFR 328.3). To identify waters of the U.S. within the project corridor subject to the jurisdiction of the USACE, a 500-foot corridor centered on the existing KGB Road centerline from Centaur Avenue to Vine Road was evaluated and mapped. Wetlands within this study area were delineated using the 1987 USACE *Wetlands Delineation Manual* three-parameter method of determining an area's wetland status and methods described in the 2007 *Alaska Regional Supplement*. The wetland delineation report is contained in Appendix C.



LEGEND

EXISTING INFORMATION	PROPOSED INFORMATION
RIGHT-OF-WAY	NEW PAVEMENT
PROPERTY LINES	GRASS MEDIAN
DELINEATED WETLAND	FILL \ CUT LINES
	IMPACTED WETLAND



GRAPHIC SCALE

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SCALE IN FEET

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

WETLAND IMPACTS

FIGURE 3.10.1

Of the 604.14 acres mapped, 8.06 acres west of Lakewood Drive on the north side of KGB Road were determined to be wetlands (Figure 3.10.1). The wetlands were mapped as palustrine scrub-shrub (freshwater wetland with needle leaved evergreen scrub and broad leaved deciduous shrubs) and emergent (freshwater wetland dominated by rooted herbaceous plants). The wetlands are connected by surface and subsurface hydrology to adjacent wetlands to the north and to the south towards Cottonwood Creek. Cottonwood Creek is less than 1,000 feet south of the study area and a tributary of Knik Arm, a navigable water of the U.S. For this reason, DOT&PF believes that these are jurisdictional wetlands under Section 404 of the CWA.

The highest rated function of the palustrine wetlands within the project area is sediment/nutrient/toxicant retention and removal. The wetlands are located adjacent to a developed area and are able to collect and retain road runoff, pet waste and dust and they serve as an on-site treatment of surface water. Other functions of the wetlands include water storage and groundwater discharge/recharge. Overall, the wetlands were ranked as Category 3, moderate to low functioning, due to the low level of functions and services and high level of development within the project area.

Environmental Consequences

No-Build Alternative

The No Build Alternative would not result in impacts to wetland habitat.

Preferred Alternative

Under the Preferred Alternative, approximately 0.60 acre of palustrine wetland would be lost due to widening the highway from the existing two lanes, to six lanes with a center median (Figure 3.10.1). The amount of wetlands affected would not substantially affect the overall availability of wetlands on a regional scale, nor would the project substantially affect the functionality of the remaining wetlands within the project corridor or the Cottonwood Creek watershed.

Avoidance, Minimization, and Mitigation

Mitigation of potential impacts would be required for impacts to wetlands and water bodies under jurisdiction of USACE resulting from the Preferred Alternative. In accordance with 33 CFR Part 325.1(d)(7), wetland mitigation must describe how impacts to waters of the United States are to be avoided, minimized, and compensated.

Avoidance

The linear nature of the roadway and existing ROW width eliminate any practicable alternatives that would provide total avoidance of wetland impacts. The location of the wetland complex is directly adjacent to the existing toe of the pathway embankment within existing ROW. The project will utilize all available ROW space to locate the upgraded facility. In order to totally avoid impacts to the wetland, KGB Road would need realignment. Realignment would greatly increase the cost of construction, substantially increase the amount of ROW acquisitions, and may impact other wetlands in the general vicinity of Cottonwood Creek. The preferred alternative is the least environmentally damaging practicable alternative.

Minimization

To minimize unavoidable impacts to wetlands, the design for the proposed project would utilize existing facilities instead of constructing a new road on a new alignment. The pathway and road

embankments were pulled in as tight as state and federal design standards allow to minimize the project footprint. In addition, the alignment was shifted to the southern edge of ROW in the vicinity of the wetlands to minimize wetland impacts.

Compensatory Mitigation

Compensation for unavoidable impacts to waters of the U.S. shall be provided in accordance with USACE guidance, which requires a mitigation plan based on the functions and values of the affected wetlands, and compensatory mitigation for federally-funded projects. The wetland impacts would be compensated at an anticipated mitigation ratio of 1.5:1 for preservation because the wetlands were determined to be Category 3, moderate to low functioning, and are not unique to the area. The DOT&PF will likely purchase mitigation bank credits or use an in-lieu fee program at a 1.5:1 ratio to compensate for the 0.60 acre of wetland impact.

3.11 Wildlife

Terrestrial wildlife in the project area may include, but is not limited to, the following species: moose (*Alces alces*), fox (*Vulpes vulpes*), northern red-backed vole (*Myodes rutilus*), meadow vole (*Microtus pennsylvanicus*), marten (*Martes americana*), weasels (*Mustela* spp.), ermine (*Mustela erminea*), arctic ground squirrel (*Spermophilus parryii*), northern flying squirrel (*Glaucomys sabrinus yukonensis),* red squirrel (*Tamiasciurus hudsonicus*), brown bear (*Ursus arctos*), black bear (*Ursus americanus*), coyote (*Canis latrans*), lynx (*Lynx canadensis*), wolf (*Canis lupus*), porcupine (*Erethizon dorsatum*), and snowshoe hare (*Lepus americanus*). Due to the existing anthropogenic influence along the entire corridor it is unlikely that most of these species would regularly be found near the roadway. At any time however, it is possible to encounter any of these species in the project area as they migrate from one area to another.

A mix of developed and undisturbed native land exists adjacent to the roadway. Development is a blend of residential and commercial and accounts for approximately 60-70 percent of adjacent land. Undeveloped forested habitat along the road corridor makes up the rest and is primarily a mix of broad and needle leaf forests, mixed forests, low and tall scrub and open meadow areas. A very small percentage (<0.5%) of the project corridor meets the USACE definition of wetland. Within a few miles of the project exists a wider variety of habitat and wetlands with less development that wildlife may migrate between.

Moose in this area are of special concern because they present a substantial safety issue when congregating within highway ROW or crossing the traveled way. The highway ROW is generally cleared of vegetation and provides easier mobility for moose, especially in heavy snow years. Clearing, grubbing and reseeding will reduce moose browse within highway ROW. This practice is prioritized on routes with high MVC rates like KGB Road. Measures to reduce the number of moose-vehicle interactions are considered when constructing and maintaining state highways.

The proposed project is located within ADF&G Game Management Unit (GMU) 14A. ADF&G moose population estimates for GMU 14A over the ten year period from 1999-2009 show an increase from approximately 5,348 to 6,613 individuals. Accidental deaths due to collisions with motor vehicles range from 181 to 345 per year during the same ten year period. Accidental death numbers likely fluctuate depending on the amount of snow fall. They may also be increasing due to the increasing volume of traffic and moose population over time. One of the highest winter

densities of moose in the state is located within 20 miles of the proposed project at Point MacKenzie. The winter population density there exceeds 10 moose/mi^2 (Peltier, 2010).

Existing DOT&PF MVC information shows that collision frequencies exceed the 75th percentile for the entire project corridor and exceed the 95th percentile from approximately MP 1 to 3, as identified in the 1995 DOT&PF report, "Moose-Vehicle Accidents on Alaska's Rural Roads". A maximum frequency of 20 accidents/mile/5 year period occurred from approximately MP 1.3 to 2.3 between 2007 and 2011. Maximum rates were 0.6 accidents/million vehicle miles/5 year period and under the 75th percentile for the entire project corridor.

A variety of avian species, both resident and migratory, may be found within the project area. Some of the species include woodpeckers (*Picoides* spp.), boreal owl (*Aegolius funerus*), spruce grouse (*Falcipennis Canadensis*), chickadees (*Parus* spp.), sparrows (*Melospiza melodia* and *Zonotrichia leucophrys*), bald eagles (*Haliaeetus leucocephalus*), and ravens (*Corvus corax*). The Migratory Bird Treaty Act (MBTA) (16 USC 703-712) protects these and essentially any other native species that may be encountered by making it illegal to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations.

Additional and similar protections are provided to bald and golden (*Aquila chrysaetos*) eagles by the Bald and Golden Eagle Protection Act (16 USC 668-668[c]). There are no known nests near the project area based on window surveys of the project area conducted by DOT&PF staff during summer 2013. Bald eagles in Alaska generally nest in marine and freshwater coastal areas and in southcentral Alaska, they generally nest in cottonwood trees near water. Habitat types near the project roadway are not ideal, but have potential to support eagle nests, especially in the vicinity of Cottonwood and Crocker Creeks. The project area will be surveyed for the presence of eagles or their nests prior to construction in order to avoid impacts to nests or nesting birds.

Environmental Consequences

No-Build Alternative

The No Build Alternative would not alter current conditions for terrestrial and avian species in the project area. There would be no direct loss of habitat, and the frequency with which road maintenance activities result in disturbance of animals in the analysis area would remain unchanged.

Preferred Alternative

Permanent impacts to wildlife would primarily result from the loss and further fragmentation of habitat. Habitat would be permanently lost through roadway expansion and construction of a median to separate opposing traffic directions. Some individuals will likely be displaced as a result of the roadway expansion; however, the abundance of similar habitat in the near vicinity will provide those individuals with the opportunity to relocate. The increased lane count and 30-foot median will increase the distance that wildlife have to traverse to cross the roadway. This may exacerbate habitat fragmentation conditions already in place from the existing road. The addition of lanes and associated reduction in congestion could increase the travel speed within the project corridor and increase the rate of MVC. However, the proposed improvements are

expected to reduce the frequency and rate of MVC because of additional lighting and vegetation clearing within the ROW.

Migratory birds may be directly impacted by land clearing operations if conducted during the nesting season. If there are active nests (nests with eggs or young) within the construction limits, they could be crushed or harmed by clearing operations and the adult birds may permanently abandon the nests. Although some habitats adjacent to the highway would be lost, adverse effects to nesting land birds is expected to be negligible because they commonly nest in close proximity to human developments and would likely continue to nest near the highway. Construction activities may disturb breeding and foraging in the project area. However, the surrounding areas provide similar habitat and with the minimization measures discussed below, potential impacts to these species would be negligible.

Impact Minimization Measures

The following measures will be incorporated into the project design to avoid potentially adverse effects on wildlife:

- A pre-construction survey would be conducted to delineate environmentally sensitive areas to be avoided during construction;
- Clearing and grubbing will not be conducted within the USFWS migratory bird window except as permitted by, federal, state, and local laws and approved by the DOT&PF Project Engineer;
- If active bald or golden eagle nests are found within the project area, a primary zone of a minimum 330 feet will be maintained as an undisturbed habitat buffer around nesting eagles. If topography or vegetation does not provide an adequate screen or separation, the buffer will be extended to 0.25 mile, or a sufficient distance to screen the nest from human activities. Within the secondary zone (between 330 and 660 feet), no obtrusive facilities or major habitat modifications shall occur. If nesting occurs in sparse stands of trees, treeless areas, or where activities would occur within line-of-site of the nest, this buffer shall extend up to 0.5 miles. No blasting, logging, or other noisy, disturbing activities within the primary or secondary zones should occur during the nesting period (Feb 1 – August 31).
- Moose warning signs will be installed approximately every two miles;
- Clearing and removing (or stunting) moose browse to 50 feet off the roadway or to the ROW limits where feasible

3.12 Hazardous Waste

A Phase 1 All-Appropriate Inquiry/ Environmental Site Assessment (AAI/ESA) was conducted in 2011 to identify and record Recognized Environmental Conditions (REC) that may present an environmental liability to, or would restrict the use of, the subject property. The subject property includes KGB Road between MP 0.36 and 6.81 for a 500-foot width centered on the existing roadway centerline.

The AAI/ESA performed the following activities to obtain information about the subject property:

- A reconnaissance of the subject property and surrounding properties on July 7, 2011, to assess current usage, unusual conditions (e.g., stained soils, discarded drums, storage tanks, etc.), drainage patterns, and debris

- A review of historical aerial photographs spanning the years from 1949, 1953, 1972, 1988, and 1990
- A review of available information on soils, geology, and hydrology in the vicinity of the subject property
- A review of data obtained from a search conducted by Environmental First Search of federal, state, and local databases that meet the government records' search requirement for ASTM Standard Practice for Environmental Sites Assessments, E1527-05

Results of the AAI/ESA found 19 parcels with RECs within the subject property. See Table 3.12.1 for a summary of the parcels and Figures 3.12.1A-G for their locations.

Table 3.12.1 - Summary of Parcels with REC

Site No.	Property Type	REC	Comments
16	Residential	Large amount of vehicle storage	Further investigation may reveal a de minimis risk. Closer inspection not possible due to restricted access
17	Automotive	Large amount of long-term vehicle storage and dark staining on the ground	
24	Residential	Potentially abandoned building and materials	Closer inspection not possible due to fencing
25	Residential	Presence of trash and 55-gallon drums	
29	Automotive	Long-term vehicle storage and dark staining on the ground	
39	Residential	Presence of large trash pile	Trash appeared to be from residential sources
49	Fuel Station	Known risk associated with underground storage tanks (UST)	Site has history of Leaking UST (LUST) documented by DEC
53	Undeveloped	Presence of abandoned vehicles	Abandoned vehicles are known to leak hazardous chemicals
60	Automotive/Fuel Station	Known risk associated with USTs	
82	Undeveloped	Presence of old trash piles	Trash appeared to be from residential sources. Closer inspection not possible due to fencing
83	Industrial	Known risk with storage tanks, long-term vehicle storage, and possible mechanical activities associated with the garage	
101	Fuel Station	Known risk associated with USTs	
109	Residential	Significant amounts of bagged trash, tires, fuel tanks, and long-term vehicle storage	
126	Industrial	Large storage garages for equipment associated with asphalt and paving services	Further investigation may reveal a de minimis risk. Business appears well maintained. Closer inspection not possible due to fencing
127	Undeveloped	Long-term or abandoned vehicle storage	

128	Automotive	Extensive long-term vehicle storage and automotive repair facilities	
132	Industrial	Known risk associated with above-ground storage tanks, long-term vehicle storage, and possible mechanical activities associated with the garage	
145	Industrial	Welding supply company sales facility	Further investigation may reveal a de minimis risk
146	Industrial	Welding supply company fabrication facility	Further investigation may reveal a de minimis risk

The AAI/ESA also identified several off-site releases. However, based on the remediation status, expected groundwater flow direction, and distance from the subject property, none of the off-site releases are expected to pose risk. The AAI/ESA recommends further site investigation and owner interviews for the 19 sites with RECs prior to any property acquisition. Investigation of building interiors and other areas where access was restricted is also recommended. A copy of the complete AAI/ESA can be found in Appendix D. A review of the online ADEC Contaminated Sites map (3/19/2014) did not identify any additional sites within the subject property.

Environmental Consequences

No Build Alternative

There would be no potential for affecting hazardous waste with the No Build Alternative because no ground disturbing activities would occur.

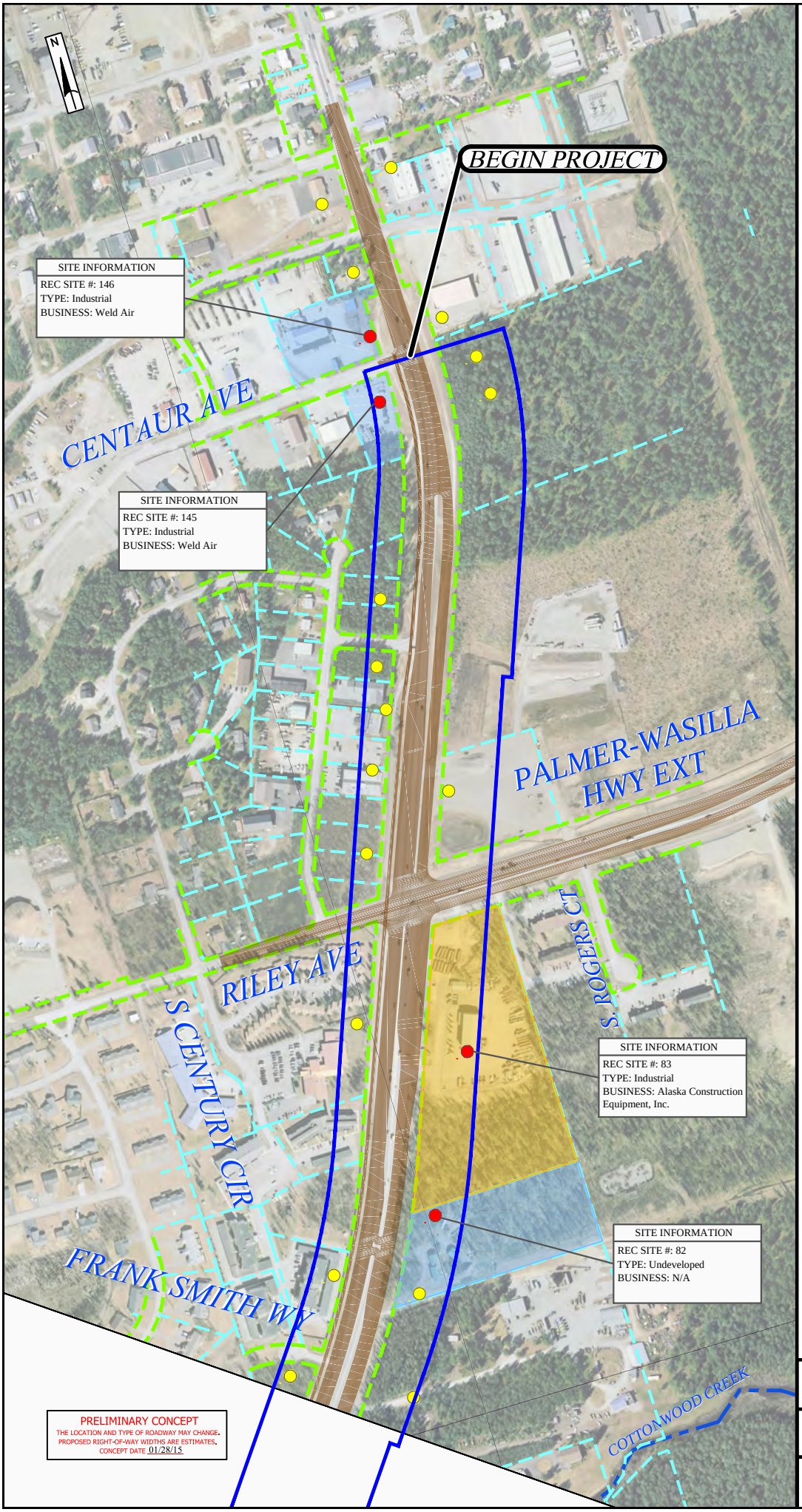
Preferred Alternative

Of the 19 sites with RECs, the Preferred Alternative would require partial acquisition of three REC parcels. Grading and excavation activities to construct the Preferred Alternative would occur in the vicinity of one other that is located directly adjacent to DOT&PF ROW. Table 3.12.2 provides a summary of the REC sites that may be impacted through ROW acquisition or by construction of the Preferred Alternative.

Table 3.12.2 - REC Parcels Impacted by the Proposed Project

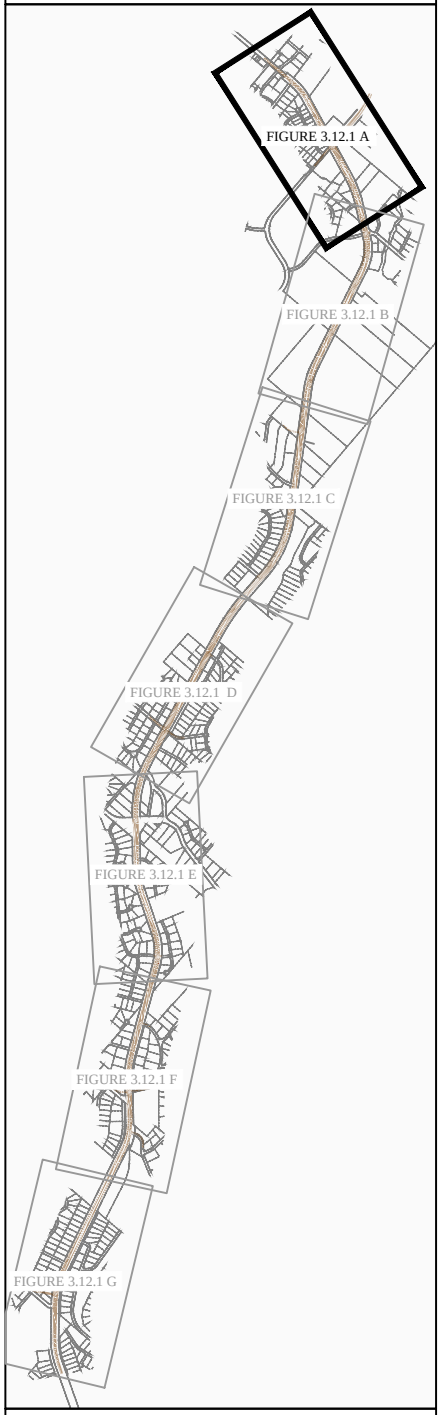
Site No.	Site Name	Location	ROW Impact	Potential Contamination
29	Duncan's Autohaus	3853 KGB Road	Partial Acquisition	GRO* and DRO*, motor oils, and other vehicle fluids
60	Knik Tire and Automotive/Fuel Station	Known risk associated with USTs	N/A	
83	Alaska Construction Equipment, Inc.	1301 KGB Road	Partial Acquisition	Heavy equipment and passenger vehicle fluids and chemicals
128	The Abbey	2790 KGB Road	Partial Acquisition	GRO and DRO, motor oils, and other vehicle fluids

*GRO – gasoline range organics; DRO – diesel range organics



LEGEND

- SAMPLE POINTS
- RECOGNIZED ENVIRONMENTAL CONDITION (REC)
- RIGHT-OF-WAY
- PROPERTY LINES
- STUDY AREA
- REC PROPERTY IMPACTED BY PROJECT
- REC PROPERTY ADJACENT TO PROJECT



OVERVIEW SCALE

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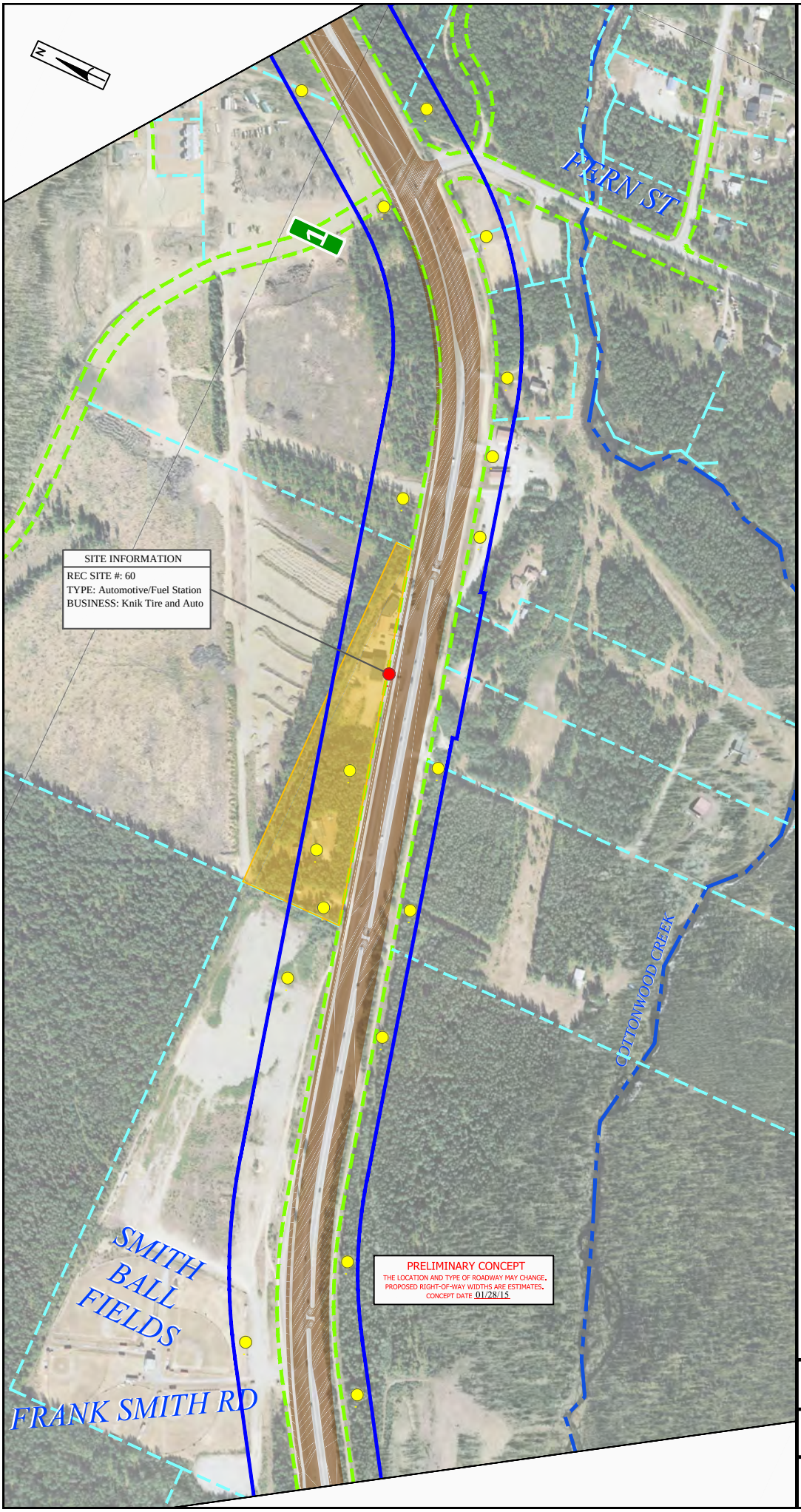
SCALE IN FEET

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

HAZARDOUS MATERIAL SITES | FIGURE 3.12.1 A



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- SAMPLE POINTS
- RECOGNIZED ENVIRONMENTAL CONDITION (REC)
- RIGHT-OF-WAY
- PROPERTY LINES
- STUDY AREA
- REC PROPERTY IMPACTED BY PROJECT
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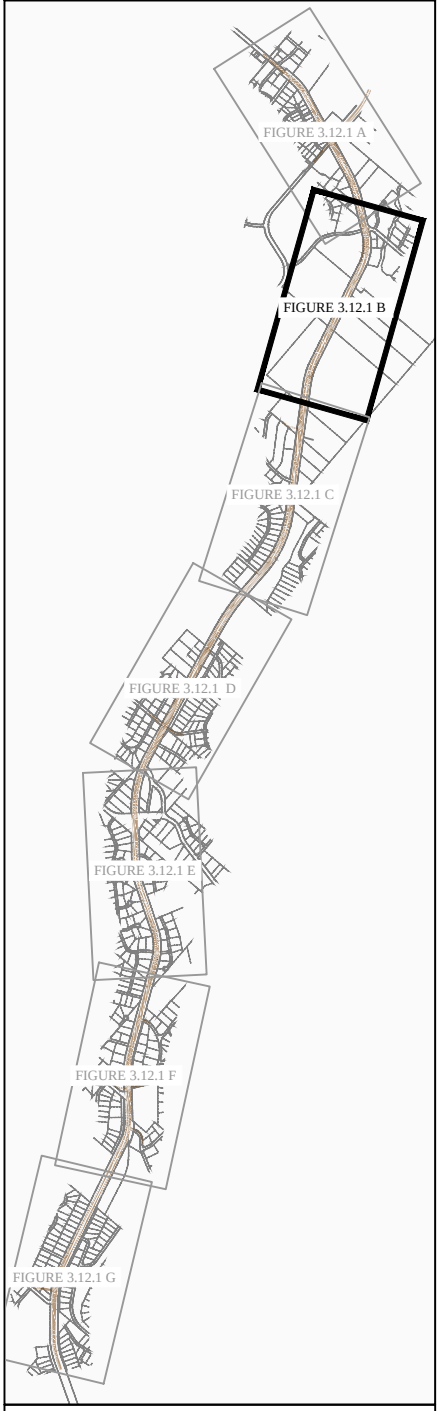

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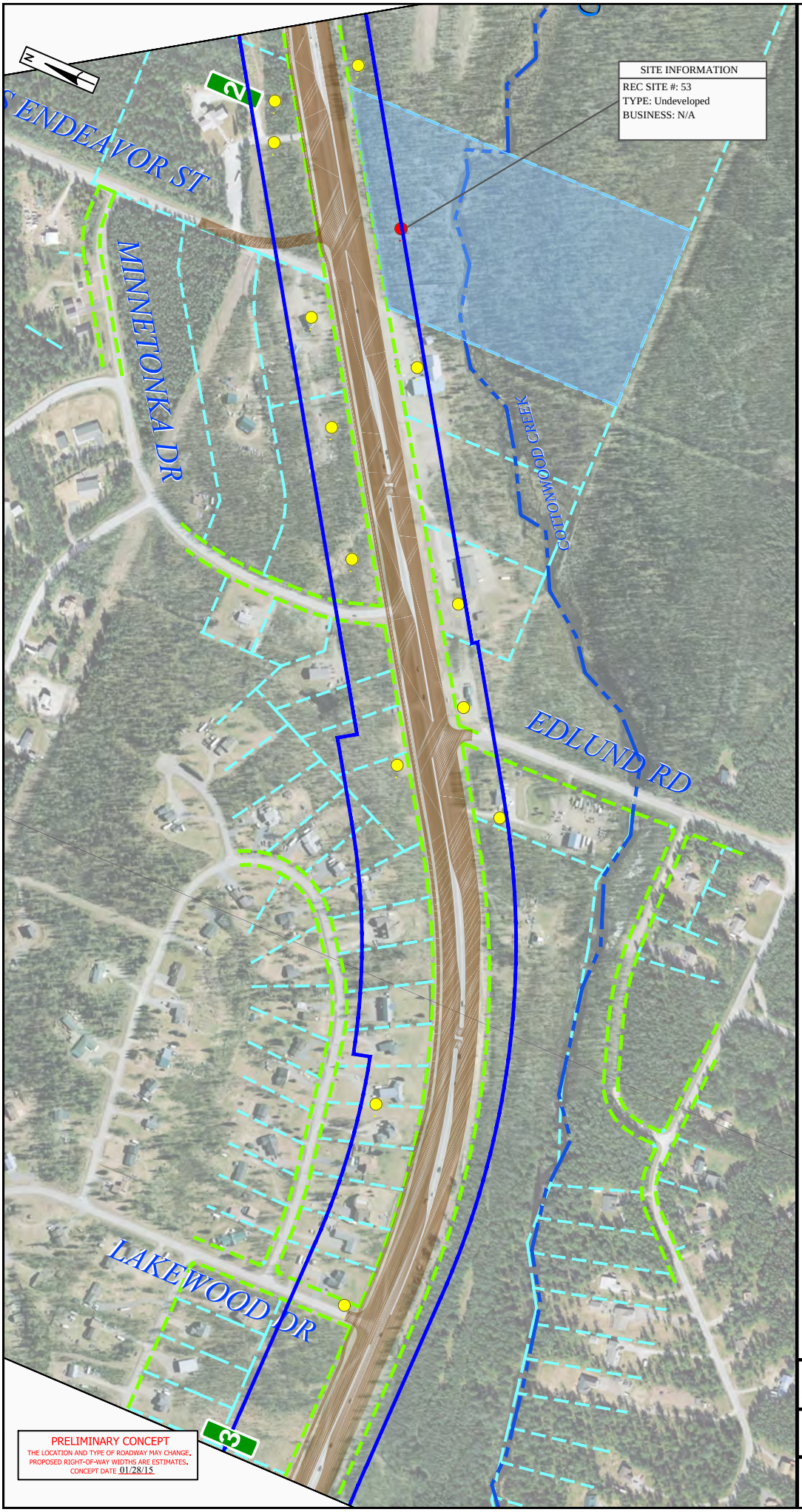
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

HAZARDOUS MATERIAL SITES | FIGURE 3.12.1 B



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- SAMPLE POINTS
- RECOGNIZED ENVIRONMENTAL CONDITION (REC)
- RIGHT-OF-WAY
- PROPERTY LINES
- STUDY AREA
- REC PROPERTY IMPACTED BY PROJECT
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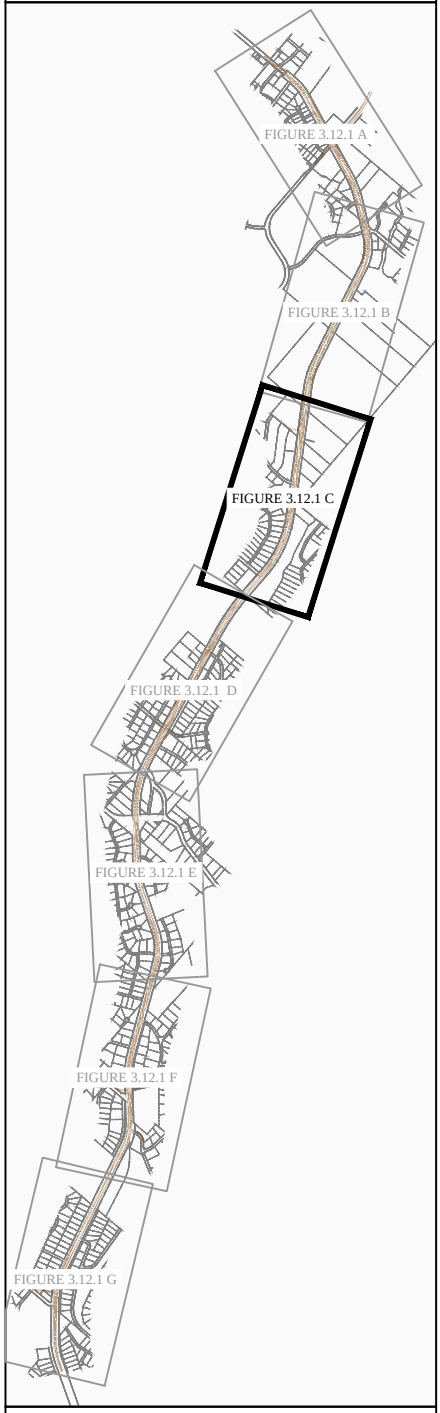

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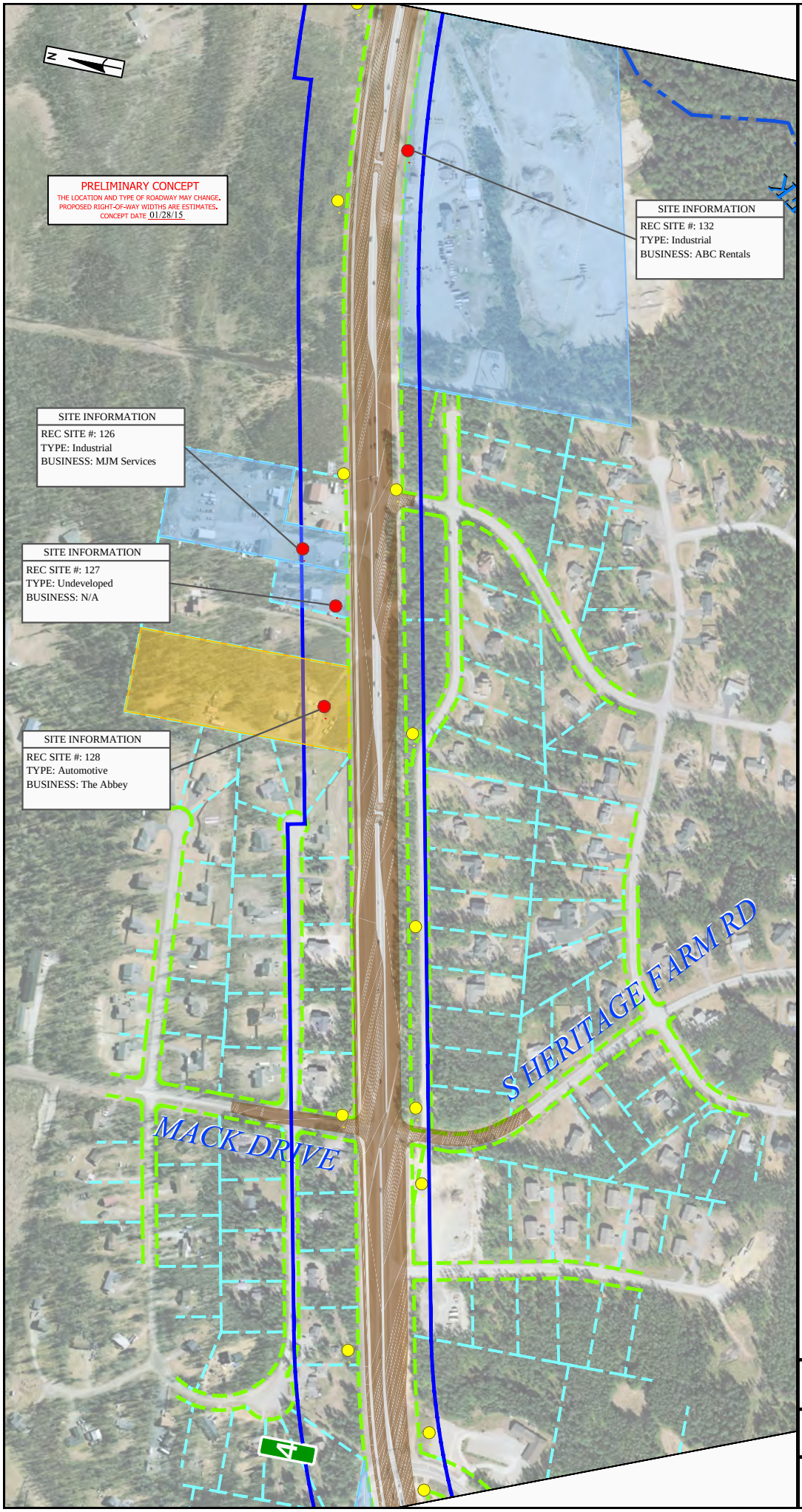
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

HAZARDOUS MATERIAL SITES | FIGURE 3.12.1 C



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- SAMPLE POINTS
- RECOGNIZED ENVIRONMENTAL CONDITION (REC)
- RIGHT-OF-WAY
- PROPERTY LINES
- STUDY AREA
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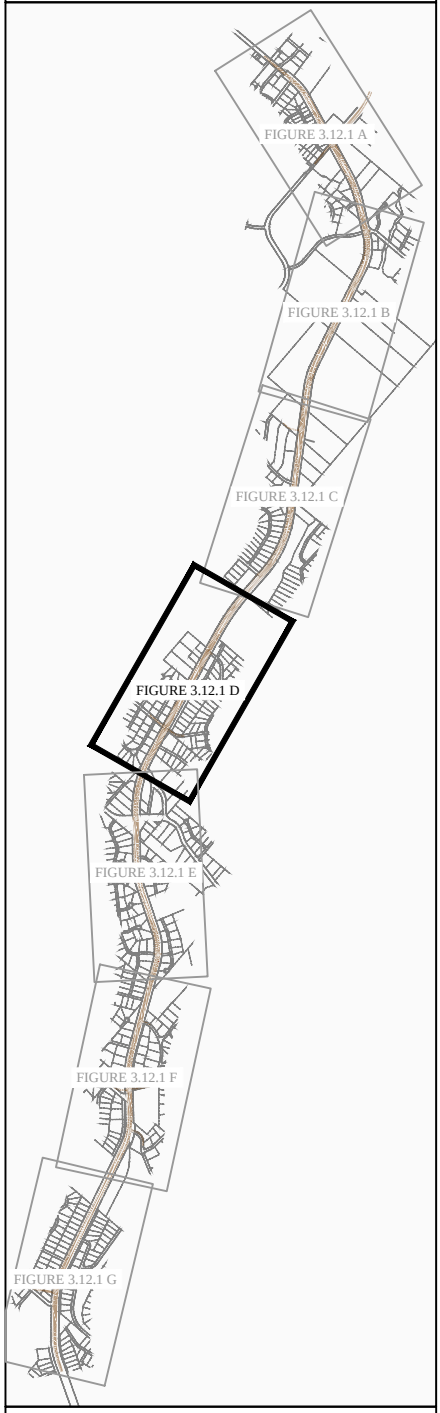
- REC PROPERTY ADJACENT TO PROJECT



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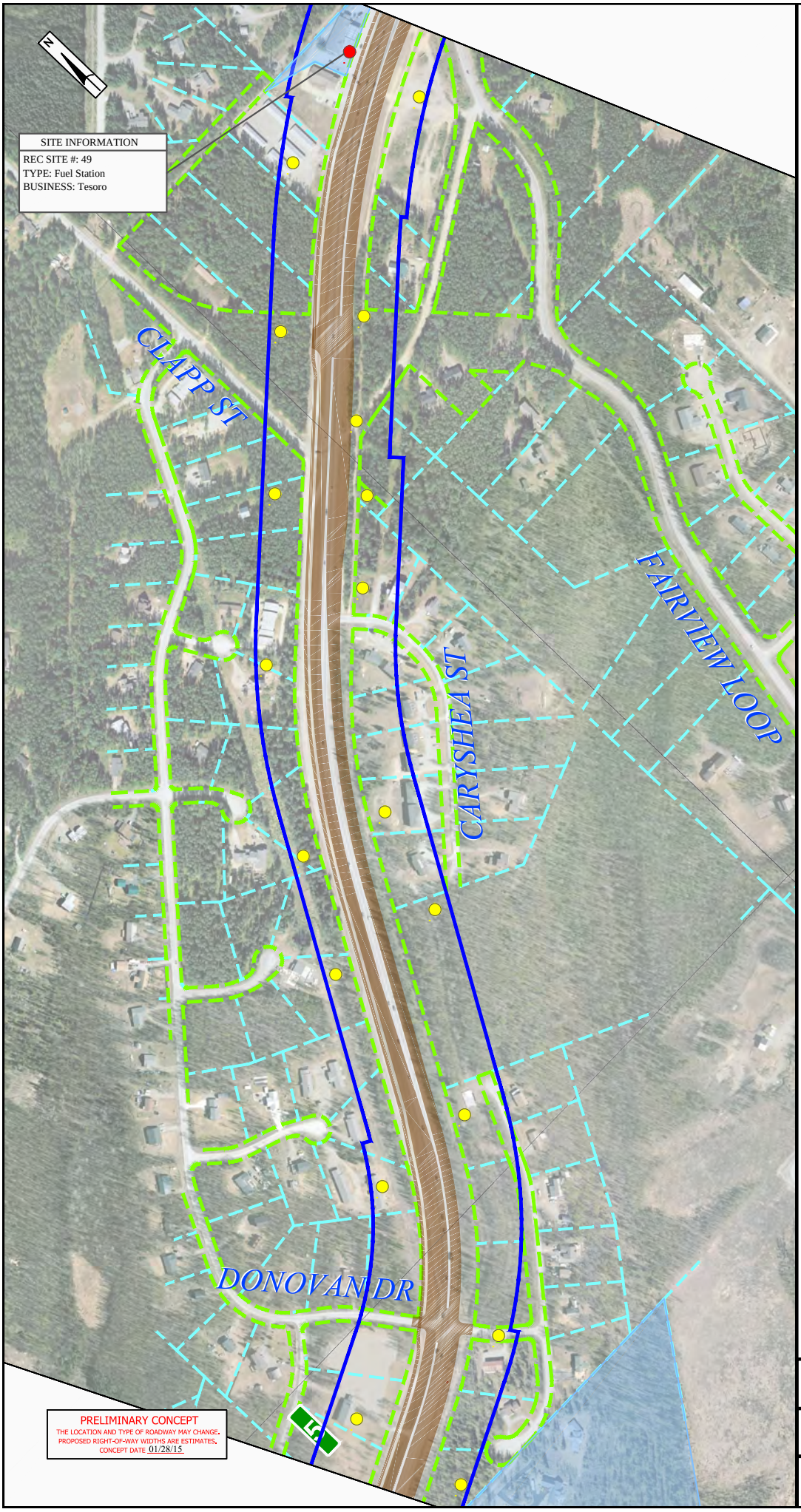
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

HAZARDOUS MATERIAL SITES	FIGURE 3.12.1 D



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- SAMPLE POINTS
- RECOGNIZED ENVIRONMENTAL CONDITION (REC)
- RIGHT-OF-WAY
- PROPERTY LINES
- STUDY AREA
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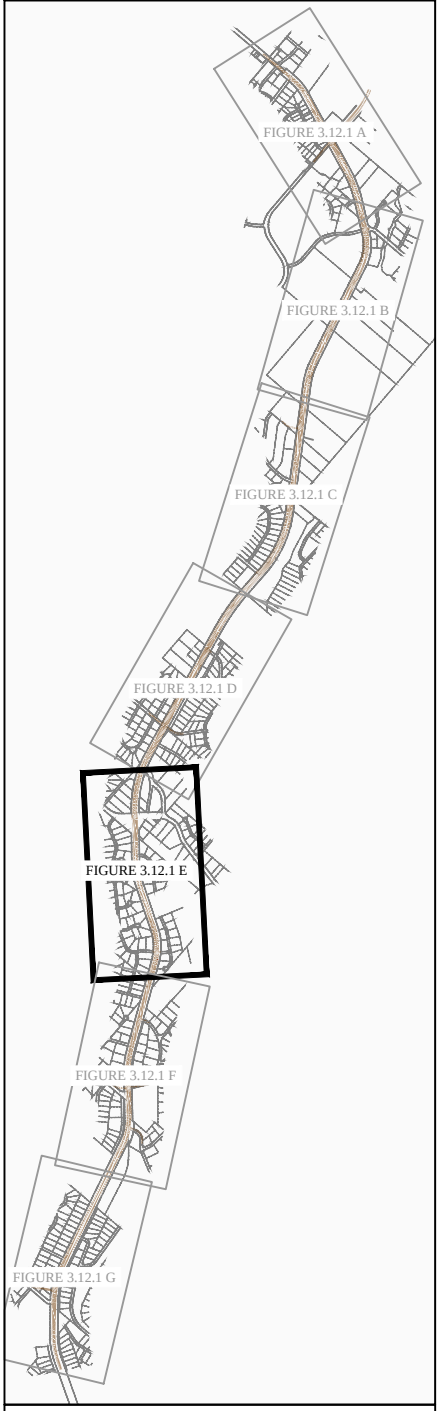
- REC PROPERTY ADJACENT TO PROJECT



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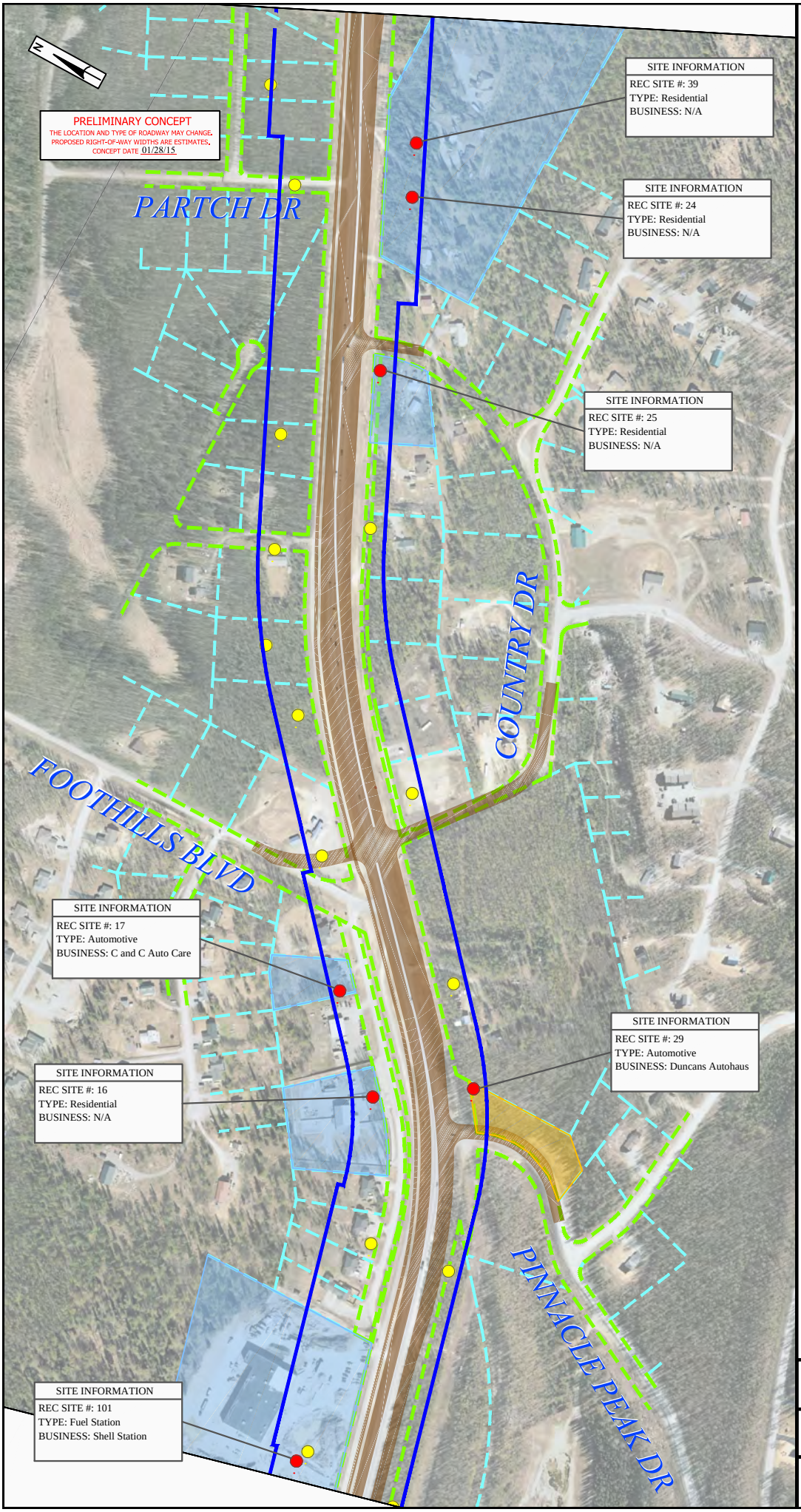
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

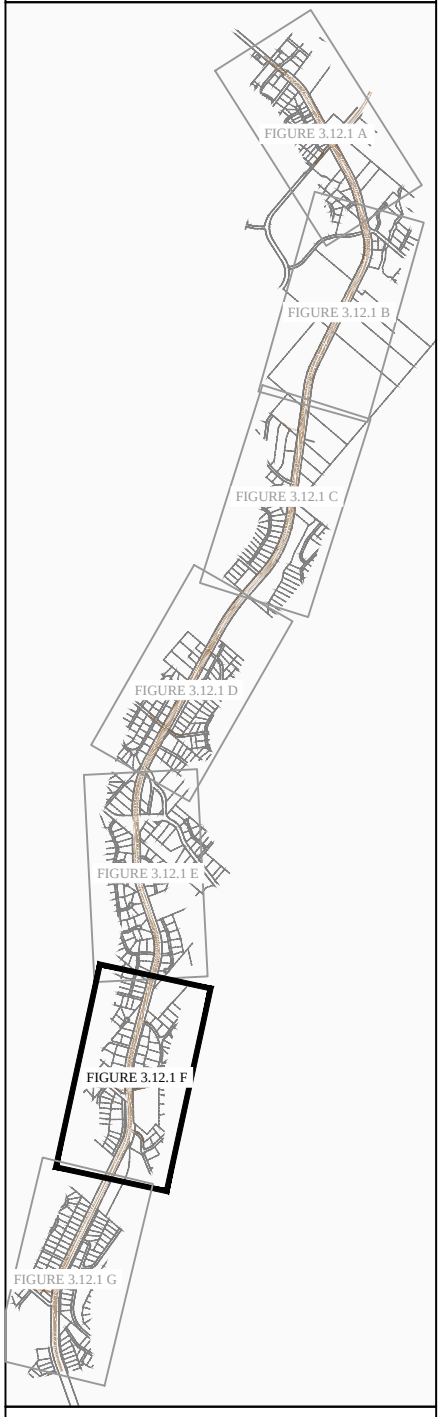
KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

HAZARDOUS MATERIAL SITES | FIGURE 3.12.1 E



LEGEND

- SAMPLE POINTS
- RECOGNIZED ENVIRONMENTAL CONDITION (REC)
- RIGHT-OF-WAY
- PROPERTY LINES
- STUDY AREA
- REC PROPERTY IMPACTED BY PROJECT
- REC PROPERTY ADJACENT TO PROJECT



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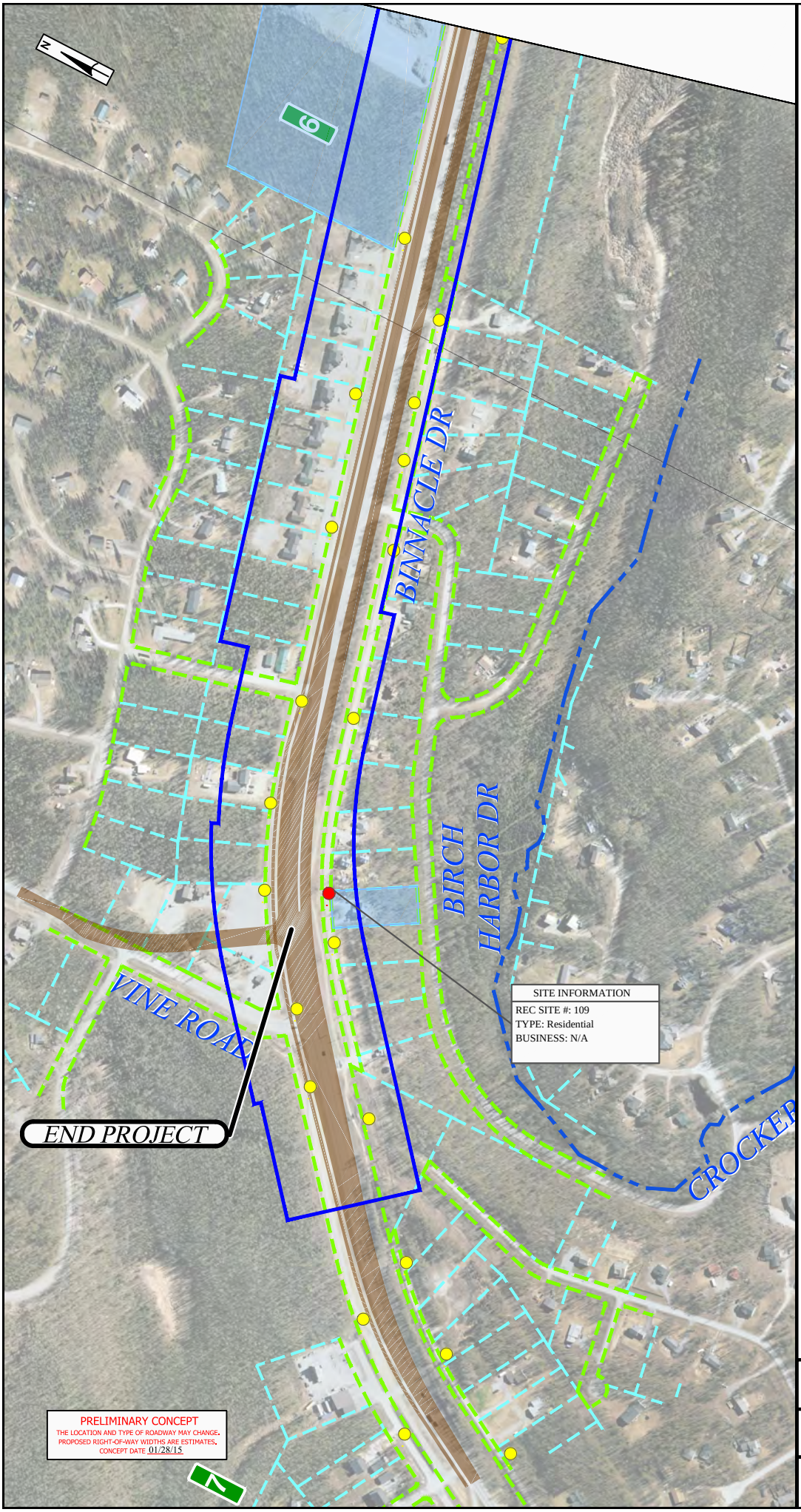
SCALE IN FEET

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

HAZARDOUS MATERIAL SITES | FIGURE 3.12.1 F



LEGEND

- SAMPLE POINTS
- RECOGNIZED ENVIRONMENTAL CONDITION (REC)
- RIGHT-OF-WAY
- PROPERTY LINES
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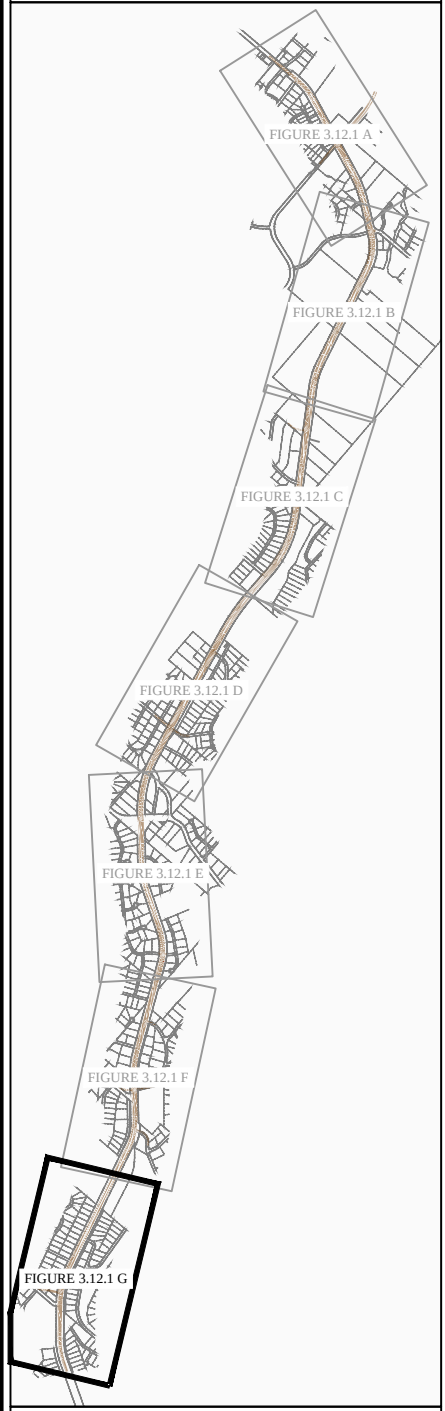

OVERVIEW SCALE

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SCALE IN FEET

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT #52464

HAZARDOUS MATERIAL SITES	FIGURE 3.12.1 G

Because the currently proposed ROW acquisitions are subject to change during final design, impacts to properties with REC's will be reevaluated during the final design process. The recommendation for further evaluation of the sites identified in the AAI/ESA will be revisited during final design when it is more certain where ROW acquisition and/or grading and excavation activities will occur. Depending on the extent of excavation, a Phase II site assessment, to provide a definitive description of contamination type and extent, may be necessary. There is no prudent or feasible alternative for avoidance of these sites. Soils found to be contaminated and affected by the project will be managed and disposed of in accordance with applicable federal and state laws and regulations and in a manner that will protect human health and environment.

Potential impacts to human health and safety are expected to be minimal as a result of constructing the Preferred Alternative. Some fuels, lubricants, hydraulic fluids, and related items will be present on site during construction, but management of these materials will be done in accordance with local, state, and federal regulations. Post construction hazardous waste conditions will not change from what currently exists. These conditions may improve if hazardous waste is encountered during construction because construction contractor specifications require they remove and dispose of hazardous materials, also in accordance with local, state, and federal regulations.

Prior to commencing construction, the contractor would prepare a site-specific Hazardous Materials Control Plan (HMCP). If contamination is found during construction, the ADEC would be notified and response efforts would be handled in accordance with an ADEC-approved Corrective Action Plan. Detailed BMPs and housekeeping measures would be outlined in the contractor's SWPPP and HMCP. The contractor would be required to practice proper hazardous material storage and handling and adhere to DOT&PF emergency response procedures. All work would stop immediately and the site would be secured to prevent unauthorized access. Appropriate regulatory authorities must be notified immediately. Phone numbers of the National Response Center and 911 emergency services would be accessible at work sites.

3.13 Visual

KGB Road within the project area is a highly linear two-lane roadway with a paved asphalt surface and four traffic signals along its 6.5 mile length. A substantial portion of a travelers viewing experience consists of birch and spruce forest along both sides of the road. A separated, paved multi-use pathway extends along the length of the project on the north side and there is evidence of long term ATV travel along both sides of the road for its entire length. The width of cleared vegetation varies from 150 to 180 feet throughout the project corridor and development is a mix of single- or multi-family residential homes and commercial/light industrial land uses. Overhead utility lines exist along the entire length. At the northern end of the project, the setting and viewshed of KGB Road is urban due to its location within the COW. As you move south and west from Centaur Avenue, past PWH, the setting changes to rural residential with forested areas along the ROW limits. Contributing to the rural feeling are residential lots that are approximately one acre or greater in size. There are also a handful of larger lots developed for industrial use. The forested areas and existing development generally confine views from the roadway to within the ROW. East bound travelers are exposed to limited views of the Chugach and/or Talkeetna Mountains depending on their trajectory, but the mountains are generally not a substantial part of the view. The few areas where land has been substantially cleared along the south side of the

road afford travelers a view across Knik Arm. Existing topography is relatively flat in the northeastern portion of the project and rolling terrain is more prevalent in the southwestern portion. All intersections are illuminated along the corridor. KGB Road is not a designated scenic byway nor does it traverse other scenic view sheds. There are no picnic areas, pull-offs, interpretive sites, or unique view features along the proposed project section of KGB Road.

Environmental Consequences

No Build Alternative

Under the No Build Alternative no road improvements would occur and the visual setting would remain unchanged. Existing trends in effects on the view shed in the project area would continue in their current status.

Preferred Alternative

The Preferred Alternative would more than double the width of the road from Centaur Avenue to Vine Road. The overall appearance and character would change from a rural two-lane road to a divided arterial roadway. The four/six lane configuration will look and feel like a large transportation corridor. Road widening would follow the existing alignment with very slight adjustments. The current width of vegetation clearing (150-180 feet) would increase to approximately 200 feet as part of the project, but that is likely to be perceived as a narrower cleared area due to the substantially wider roadway. The linear nature of the road would remain the same, defined by the generally flat to rolling terrain and by the surrounding forested areas and adjacent buildings and infrastructure. Existing views for travelers and area residents will not appreciably change but the feel of the roadway will be decidedly more urban as opposed to the existing two-lane country road. However, the high volumes of existing traffic along KGB Road likely detract from the rural feeling and improved traffic flow may actually restore some of that feeling by providing a perceived reduction in traffic densities. The larger cleared area will allow for more expansive views of the distant scenery, primarily the Chugach and Talkeetna Mountains. Residential lot sizing is regulated by the local government (MSB and COW) and is not expected to change as a result of the proposed project. Visual impacts were only considered along the road corridor itself because the relatively flat topography and vegetated areas limit the extent of these impacts.

Impact Minimization Measures

Measures to minimize visual impacts include recontouring the natural land surface and revegetating disturbed areas. These activities would return the disturbed ground to a vegetated state and help break up the linear features along the road with vegetation that is appropriate for the local environment. Dust control Best Management Practices (BMP) would be implemented during the construction phase to increase visibility and reduce air pollution. The remainder of the area would be reclaimed to its original landscape.

3.14 Energy

Operational energy requirements for the existing facility result from the raw materials and fuels used to operate, and maintain a functional and safe roadway. Other substantial energy requirements result from the fuels consumed by vehicles using the facility. Fuel consumed by facility users is variable depending on the type of vehicle, travel speed, and the geometry, congestion and condition of the facility. The recent and projected growth within the vicinity of the proposed project indicates a trend of increasing energy use.

Environmental Consequences

No Build Alternative

The No Build Alternative would not affect the rate or quantity of energy consumption. However, energy consumption would continue to rise in conjunction with the area's growth and development. Congestion issues would continue to worsen, potentially contributing to an increase in energy consumption as transit times increase. As the facility continues to age, energy consumption related to maintenance activities would also increase.

Preferred Alternative

The Preferred Alternative would likely result in greater energy consumption than the No Build Alternative due to use of the raw materials, fuel, and equipment necessary to build the facility. However, the improved facility should reduce operational energy requirements over the design life of the upgraded roadway. Reduced operational energy requirements would most likely result from a reduction in fuel consumption resulting from decreasing congestion and a reduction in traffic delays. Signal timing would be interconnected throughout the entire project, which would reduce the overall wait time of vehicles at signalized intersections and reduce the overall energy consumption of the improved facility.

3.15 Construction Impacts

Construction of the Preferred Alternative would likely result in temporary impacts to air and water quality, noise levels along the roadway, transportation flow, and local businesses. Construction impacts will last as long as it takes to build the project. The Department will require the contractor to take all practicable steps towards minimizing these impacts to the extent practicable and also require compliance with all applicable federal, state, and local laws, permit stipulations, and contract specifications. Public involvement measures would continue through the construction process to minimize traveler impacts as much as possible. The project would likely be constructed in phases to minimize impacts. Each section below discusses probable impacts and potential mitigation measures.

Air Quality

Air quality may degrade during construction because of increased vehicle emissions and fugitive dust and particulate matter. Fugitive dust and particulate matter are typically introduced as a result of site preparation, clearing, cut-and-fill activities, grading, material transportation and stockpiling. Emissions from construction equipment contain air pollutants such as carbon monoxide (CO), nitrogen oxides (NOx), volatile organic compounds (VOC), and some soot particulate. High concentrations of these chemicals may affect human health and ecosystems; however, levels of these pollutants are not expected to exceed local air quality standards during construction. Increased traffic congestion may also contribute to increases in exhaust pollutant concentrations.

Implementation of the following minimization measures would be used to reduce adverse air quality impacts during construction. A SWPPP in accordance with the ADEC APDES CGP for storm water discharge from construction sites would be followed during construction to minimize the amount of loose soils available for air transport. This includes vehicle track out reduction, watering, sweeping, and stabilization of all disturbed soils to suppress loose soil and prevent fugitive dust. Construction equipment and vehicles will be properly tuned and maintained and unnecessarily idling would be prohibited.

Water Quality

Construction-related impacts to water quality are not likely to be a major concern for this project because there are no surface water bodies closer than 300 feet to the project area. Cottonwood Creek is the closest, but the spatial separation is generally much greater than 300 feet with the area between the project and creek providing a substantial vegetated buffer. The wetland area west of Lakewood Drive and north of KGB Road is the only water of the U.S. with appreciable potential to receive stormwater. Impacts to water quality would generally result from earthwork, clearing and grading activities, paving, stockpiling, accidental equipment leaks or spills, material transport, and storm water runoff. These activities would expose loose soils to wind and rain erosion until those areas are temporarily or permanently stabilized. New ground disturbance could increase sedimentation and increase turbidity of receiving waters, but every effort would be made to prevent this. Surface runoff could carry additional nutrients or contaminants from cars and construction equipment. No culvert replacements or other work in flowing waters are proposed. Any impacts to water quality resulting from construction activities will subside once work is complete.

Measures will be taken to avoid and/or minimize potential impacts to water quality in accordance with the DOT&PF contract specifications, required permits, and permit special conditions and stipulations. The primary water quality protection measure will be preparation and implementation of a contractor prepared SWPPP in accordance with the APDES CGP and DOT&PF contract specification 641. The SWPPP will also contain a HMCP and Spill Prevention and Control Countermeasures (SPCC). In accordance with the DOT&PF 641 specification, the SWPPP must be approved by the Department prior to beginning work. The SWPPP would identify all receiving waters and specify the structural and procedural BMPs that would be utilized during construction to prevent erosion and untreated runoff from reaching nearby water bodies. All vehicles, trucks, and heavy equipment would be kept within construction limits and operated in a manner that limits unnecessary ground disturbance. Equipment would be routinely inspected and serviced to prevent leaks and accidental spills. If leaks or spills should occur, all contaminated material and soils would be contained and disposed of in an approved offsite location. Based on implementation of these measures, construction activities under the Preferred Alternative would not likely result in adverse effects on water quality or stream flow in the project area.

Noise

Construction equipment, vehicles, power tools and personnel will increase noise levels along KGB Road during the construction process.

For all Type I federally funded projects, it is the policy of DOT&PF to:

a) Identify land uses or activities potentially affected by noise from construction of the project
b) Determine the measures needed to minimize or eliminate adverse construction noise impacts to the community
c) Incorporate abatement measures in the plans and specifications

To comply with this policy, the Department will work during project development and construction to reduce noise impacts by requiring 1) compliance with all local noise rules, regulations, and ordinances, 2) proper maintenance of all construction vehicles and equipment,

including presence of mufflers in acceptable working condition, 3) haul route locations away from residential areas, 4) limitation of noisy procedures to daytime hours wherever possible, 5) location of stationary equipment as far as possible from noise sensitive receivers, 6) limitation of unnecessary equipment idling, 7) public notification of upcoming construction activities, and 8) incorporation of abatement measures into the contract plans and specifications.

Transportation Flow

Construction-related activities would cause temporary inconvenience to the traveling public. This may include, but is not limited to, altered traffic patterns, longer travel times, and limited or altered accessibility to businesses and residences. Public and institutional transportation services would temporarily experience similar delays and detours. Other roads in the vicinity of the project may experience increased traffic volumes as travelers try to avoid the construction area.

Efforts to minimize impacts to transportation flow will primarily consist of a requirement that the contractor implement a traffic control plan (TCP). The goal of a TCP is to maximize efficiency of travel for roadway users while minimizing delays and providing detours when necessary. The public, affected local schools, public service organizations, and emergency personnel would be notified in advance of construction activities and potential road closures. Access to all adjacent properties, public facilities, and recreation areas will be maintained at all times. All impacts to transportation flow would cease once construction is complete.

Economic

Economic impacts during construction are primarily related to business patrons avoiding an area because of anticipated construction delays and congestion. Adequate access will be available to all businesses during construction; however it may be limited or altered to accommodate construction activities. The contractor and DOT&PF will maintain open lines of communication with all affected parties and keep the public informed of delays or detours through newspaper ads, signage, and other community outreach mechanisms. Construction detours and delays would be localized and of short duration, thereby not permanently affecting or restricting economic vitality within the project area.

Wildlife

Construction activities would cause temporary and permanent disturbance to wildlife and wildlife habitat in the project area. Clearing and grading activities for the proposed project would result in the loss of approximately 70 acres of wildlife habitat. Injury, mortality, or temporary displacement of wildlife, particularly small mammals not mobile enough to avoid construction operations, could occur during construction activities. Larger, more mobile wildlife species have the ability to avoid initial clearing activities and move into adjacent habitat. Increased noise, dust levels, and human activity during construction would potentially disrupt normal foraging and breeding behavior of wildlife species adjacent to the construction area. However, these impacts would be localized and short-term. Therefore, noise impacts to wildlife would be minor. Implementation of the Preferred Alternative would not eliminate wildlife populations or substantially reduce wildlife population densities in the region.

3.16 Relationship of Local Short-term Uses vs. Long-term Productivity

Short-term uses of man's environment as a result of the proposed project would primarily be related to construction impacts. Impacts may include the use of resources, an increase in noise level, degradation of local air quality, changes in travel patterns and accessibility, economic

impacts, or decreased water quality. An important component of constructing any highway improvement project is creating a balance between the project's benefits and any potential impacts to man's environment. The local short-term use of man's environment should be commensurate with maintenance and enhancement of long-term productivity as a result of the project. KGB Road is a designated safety corridor and has one of the highest severe and fatal crash rates in Alaska. Over 42 percent of fatal crashes on KGB Road are head-on collisions. The proposed project is expected to reduce those crashes and dramatically improve safety for all roadway users. In addition, current and predicted future use of KGB Road greatly exceeds its present capacity. Roadway users now experience long delays and bumper to bumper traffic during peak travel times. Improving travel efficiency will greatly enhance long-term productivity and outweigh the short-term impacts on man's environment resulting from construction of the proposed project.

Environmental Consequences

No Build Alternative

The No Build Alternative would not result in a short-term use of man's environment. However, there would also be no improvement to the safety or capacity of the existing roadway. Crash rates, including head-on collisions, would remain high and the long term efficiency of the roadway would be diminished by increasing traffic and congestion. Maintenance activities would continue man's short-term use of the environment without providing the level of long-term productivity enhancement that the Preferred Alternative would accomplish.

Preferred Alternative

The short-term uses of man's environment associated with the proposed project would include changes in access, increases in energy consumption, higher noise levels, decreased air and water quality, and longer travel times. These impacts would only exist during the construction period and are minor relative to the benefits provided to all roadway users during the 20-year design life of the improved road. Commercial, recreational, and commuter traffic will enjoy increased capacity and improved safety along the corridor with the new facility. KGB Road is the primary overland traffic route between the Parks Highway and the Knik-Fairview community; traffic volumes will continue to rise and lead to increasingly unacceptable levels of congestion throughout the corridor. Constructing a divided roadway is essential to reducing the high rate of severe and fatal crashes this corridor experiences. The proposed project would enhance the quality of life for MSB residents and commuters by creating a safe transportation system and encouraging the long-term productivity and viability of the community.

3.17 Irreversible and Irretrievable Commitment of Resources

Construction of the Preferred Alternative would require the irreversible and irretrievable commitment of natural, physical, human, and fiscal resources. The additional land necessary to accommodate the larger footprint is approximately 70 acres. This land is considered an irreversible commitment for as long as the highway facility is in use. If the highway is ever determined to be unnecessary, or a greater need arises for use of the land, it could be converted to another use. At present, there is no reason to believe such a conversion will ever be necessary or desirable.

Considerable amounts of labor, fossil fuels, and construction materials such as aggregate, gravels, and bituminous materials would be expended during construction of the proposed

project. Additionally, large amounts of labor and natural resources would be used to produce construction materials. These materials are generally not retrievable; however, some construction materials could be reused at a later date if the highway is ever determined to be unnecessary. Construction materials are not in short supply and their use will not have an adverse effect upon their continued availability. Preliminary estimates indicate the project would require approximately 66,000 cubic yards of surface course materials, 900,000 cubic yards of borrow materials, and 700,000 cubic yards of excavation.

Expenditure of federal funds, which is estimated to total approximately $96,000,000 in current year dollars, will be irretrievably committed to the project. After construction, continual federal and/or state funding would be required to adequately maintain KGB Road. The commitment of these resources is expected to improve the transportation system and benefit residents in the immediate area, State, and region. These benefits include: improved accessibility and safety, reducing delay, and greater availability of quality services, which are anticipated to outweigh the commitment of the required resources.

3.18 Cumulative Impacts

The Council on Environmental Quality (CEQ) defines a cumulative impact as: "…the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time (40 CFR 1508.7)." The assessment of cumulative impacts in NEPA documents is required by CEQ regulations.

In order to address cumulative impacts on resources as a result of building the proposed project, it is important to identify the resources that will be directly or indirectly impacted. Those resources unaffected by the proposed project do not require further evaluation for cumulative effects. After an extensive public and agency scoping process and analysis of impacts to the resources described in chapter three, the following areas were selected for analysis of cumulative impacts:

- Land use
- Wetlands
- Wildlife – Moose
- Visual
- Invasive species

Present and Reasonably Foreseeable Actions

Table 3.18.1 identifies present and reasonably foreseeable actions that are likely to occur between now and the 2039 project design year within the project vicinity. The list is primarily composed of transportation projects sponsored by the MSB, COW, or DOT&PF. However, other major private and/or public infrastructure and development projects affecting similar resources as the KGB Road project are also likely to occur. Most of these transportation projects are included in either the most current MSB Long Range Transportation Plan or the Alaska Statewide Transportation Improvement Program (STIP).

Table 3.18.1 - Present and Reasonably Foreseeable Projects

Project Name	Sponsor	Scope	Anticipated Construction Year
Fairview Loop Road Realignment and Signalization at KGB Road	DOT&PF Proj. #: 54800	Realign approximately 0.2 miles of Fairview Loop Road at the west end to match future expansion of Clapp Road by the COW, relocate the traffic signal at KGB/Fairview Loop to this location, construct paved separated pathway, and related improvements to Fairview Loop Road.	2016
Fairview Loop Road Reconstruction	DOT&PF Proj. #: 51774	Add shoulders and rehabilitate pavement along existing alignment as required under 3R process. Construct a pathway from Top of the World Circle to Fireweed Road.	2016
Fern Street Intersection Improvements at KGB Road	DOT&PF Proj. #: 51896	Improve the intersection of KGB Road and Fern Street. Add new traffic signal, widen KGB Road for auxiliary lanes and illumination, re-establish drainage, reconstruct pathway.	Construction complete in 2015
Glenn Highway Reconstruction: Parks Highway to Old Glenn	DOT&PF Proj. #: 58104	Widen to four lanes, add pathway and shoulders. Accommodate turning movements and add traffic and safety improvements as necessary.	2017
Knik Arm Crossing	DOT&PF STIP Need IDs:20255 and 20256	Construct a bridge over Cook Inlet's Knik Arm to connect Anchorage and the Matanuska-Susitna Borough (Mat-Su) through the Port MacKenzie District.	Undetermined
KGB Road Reconstruction: Vine Road to Settlers Bay	DOT&PF Proj. #: 51717	Reconstruct KGB Road from its intersection with Vine Road to its intersection with Settlers Bay Drive. Work may include additional thru traffic lanes, turning lanes, signals, and associated drainage and safety improvements.	2016
Machen Road Extension	COW	Extend Machen Road to the west end of Nicola Avenue, completing a connection to the Parks Highway. The proposed project is envisioned as a two-lane road with paved shoulders.	Undetermined
Museum Drive Extension	COW	Extend Museum Drive to Marigold Drive, completing a connection to the Parks Highway just west of Pittman Road. The proposed project is envisioned as a two-lane road with shoulders.	Undetermined
PWH Pavement Preservation: Parks Highway to KGB Road	DOT&PF Proj. #: 55270	Resurface PWH from the Parks Highway to KGB Road. Includes improvements to guardrail, guardrail end treatments, digouts, drainage, and signs as necessary.	In Construction
PWH: Center Turn Lane Widening	DOT&PF Proj. #: 51829	Widen the PWH to three lanes with center two-way left turn lane. Retain pathway and clear zones.	2017
PHAC Study & Land Use Model	DOT&PF, COW, MSB	Study of alternative Parks Highway routes around the congested COW area.	Undetermined

Parks Highway Reconstruction: Phase 1: Lucus Road to Church Road	DOT&PF Proj. #: 52914	Improve the Parks Highway by extending existing five lane section from Lucus Road to Church Road, installing illumination, and improving the existing pedestrian pathway.	Construction complete in 2015
Parks Highway Reconstruction: Phase 2: Church to Pittman	DOT&PF Proj. #: 52929	Upgrade the existing two-lane road to a four-lane divided highway with at-grade intersections every half-mile. Improve frontage roads and reconstruct or relocate existing pathway, provide full length illumination.	2015
Parks Highway Reconstruction: Phase 3: Pittman to Big Lake	DOT&PF Proj. #: 54373	Upgrade the existing two-lane road to a four-lane divided highway with at-grade intersections every half-mile. Improve existing frontage roads, add new frontage roads, reconstruct and/or relocate the existing pedestrian pathway, provide illumination, and replace the culvert at Little Meadow Creek with a small bridge.	2016
South Mack Road Extension	COW	Extend South Mack Road to connect the dead end of South Mack Road to the northern end of Clapp Road creating a connector between KGB Road and the Parks Highway.	2015
Vine Road Upgrade	MSB	The project will repair failed sections of the subgrade, improve drainage, add 4-foot shoulders, and repave Vine Road from the Parks Highway to KGB Road.	Undetermined
Wasilla Main Street Rehabilitation	DOT&PF Proj. #: 60077	Construct a one-way couplet in downtown Wasilla from Bogard Road to just north of PWH utilizing the existing KGB Road/Main Street and Yenlo/Talkeetna Street corridors.	2017
Port Mackenzie Rail Extension	MSB and Alaska Railroad Corporation	Construct a new rail line to connect Port Mackenzie to the existing ARRC rail system.	In construction
Seldon Road/Bogard Road Extension East	MSB	Extend the Bogard Road corridor east from Palmer to Wasilla to create another east-west route. Project goals are to improve safety, reduce traffic congestion and implement access management in the core area.	2015
Seldon Road Extension West	MSB	Extend Seldon Road from Church Road to Beverly Lake Road (~4 miles). It will provide a new east-west corridor to improve circulation and connectivity between Palmer and Houston.	2014-2016
South Big Lake Road Realignment	MSB	Construct a new segment of two-lane roadway from east of Jade Lake to the Burma Road/Susitna Parkway intersection.	2013-2015

As the amount of available land in the greater Anchorage area decreases, growth has extended northward. The Mat-Su Valley is one of the fastest growing regions in Alaska. Over the next ten

years, it is anticipated that vacant property within the Mat-Su Valley would continue to be developed by additional residential and commercial development.

Land Use

The geographic scope of analysis for cumulative impacts to land use includes the area defined in Figure 3.3.1. Increased development and urbanization in the study area has affected the overall number, size, and type of land use in the area. Comparison of historical and current aerial photography clearly shows the transformation of the area from predominately undeveloped vegetated lands to residential, commercial, industrial and recreational land uses (Figure 3.18.1). The land has transformed from being sparsely populated with a total population of 6,509 people in the MSB in 1970 to currently more than 82,515 people. While much of the land adjacent to major roadways is developed, a great deal of land in the study area, especially near waterways, is currently undeveloped. The developed land is primarily rural residential with some commercial, community service, and recreational uses. Land in the study area is predominately owned by the State, with some lands owned by the MSB, COW or private entities.

Past actions that have shaped the baseline condition, and in some cases continue to exert a persisting influence on the baseline, include the following:

- Mineral extraction activities (primarily gravel, coal, and gold)
- Parks Highway completed, 1971
- Point Mackenzie agricultural area established, 1974
- Palmer Hay Flats, Goose Bay, and Susitna Flats State Game Refuges established, 1975
- Trans Alaska Pipeline operational, 1977
- Residential and commercial growth, 1980s to the present
- Reconstruction of Park Highways from the Glenn Interchange through Wasilla, 2003
- Port Mackenzie deep-water port completed, 2005

Preferred Alternative Impacts

As commercial and residential development in the area continues, land use will continue to change from undeveloped and low-density residential (rural) to more higher-density residential (urban) and commercial areas. The projected growth is expected to have a much greater impact on land use than the direct and indirect effects of the proposed project. The proposed project would be responsible for conversion of 25 acres of ROW from residential or commercial land uses to transportation uses. However, when compared with the potential for changes in land use from potential future projects such as the Knik Arm Crossing, Port Mackenzie Rail Extension, Parks Highway Alternate Corridor, and other proposed transportation projects on new alignments, the contribution to cumulative impacts from the KGB Road reconstruction project is comparatively low. The potential future projects will require substantially more ROW acquisition and convert all of the acquired land to strictly transportation uses. It is also highly likely that the Knik Arm Crossing would be responsible for conversion of large quantities of currently undeveloped land into residential due to its proximity to improved access to Anchorage. The combined impact of all these actions could be quite large (likely in the order of hundreds of acres potentially); however the contribution from the KGB Road project is small in comparison. The potential future projects (particularly the Knik Arm Crossing) should take responsibility for these impacts through extensive planning and stakeholder coordination efforts.

The proposed project's contribution to the cumulative changes in land use in the study area is expected to be minimal. The ROW acquisitions would slightly reduce the amount of available residential and commercial land adjacent to the highway. There is sufficient supply of undeveloped, buildable land available to support predicted residential or commercial growth in the project area. The project may also facilitate an increase in commercial or industrial land uses in the area by improving safe access to parcels adjacent to the highway, which could result in additional light commercial development along the highway.

A secondary impact of the Preferred Alternative is potential facilitation of residential development in the area that could lead to a minor increase in residential land use designations. The project would reduce some of the negative effects of population growth such as congestion and related safety issues. Improvement of the frontage road systems and reconstruction of the pedestrian pathway would allow for safer access to and from neighborhoods, commercial districts, and businesses. The rural setting, coupled with improved mobility, may be more desirable to those wishing to obtain recreational property and/or those wishing to permanently relocate to a smaller community contributing to more urban and suburban sprawl.

Wetlands

The area of assessment for cumulative impacts to wetlands consists of the Cottonwood Creek watershed and a portion of the Crocker Creek watershed at the western end of the project (Figure 3.18.2). Within the study area and the greater MSB, there are thousands of acres of pristine wetlands that haven't been disturbed by human action. However, rapid growth in the MSB during the '70s and '80s contributed to the loss of wetlands and certainly affected their ecological function and values. Wetlands are generally avoided as areas for building because they don't provide a solid, dry foundation with which to build on, however as the population increases, it is safe to assume that further development will likely impact them due to space limitations.

Growth-induced development and expansion in the study area have affected the overall number, size, and ecological function and value of wetlands in the Cottonwood and Crocker Creek watersheds. Wetland losses resulting from land clearing for residences, recreational areas, agriculture, utilities, and transportation projects have occurred, but the availability of uplands has held wetland impacts to negligible levels

Preferred Alternative Impacts

Wetland impacts from the proposed project are a small part of the cumulative impacts to wetlands within the Cottonwood Creek and Crocker Creek watersheds. However, the proposed project will likely have some influence on future development along KGB Road because it will now be able to handle increased traffic volumes and residential and commercial development will continue within the study area. Continued development could impact remaining wetlands in the area which could further the effects of fragmentation and degradation of wetland function and values. If development continues in accordance with Section 404 of the Clean Water Act and the USACE current mitigation policies, potential future wetland impacts will be less severe. Specifically, the *2008 Compensatory Mitigation for Losses of Aquatic Resources* rule requires avoidance of wetlands when possible and minimization and compensation for all unavoidable impacts to wetlands. Compliance with this rule would result in less fill being placed in wetlands for future development.

The amount of wetlands affected would not substantially affect the overall availability of wetlands on a regional scale, nor would the project substantially affect the functionality of the remaining wetlands within the Cottonwood Creek or Crocker Creek watersheds. Other potential projects that could potentially affect wetlands in these watersheds include the Fairview Loop Road Reconstruction and the Parks Highway Alternative Corridor. The Fairview Loop Road Reconstruction project is not likely to substantially affect wetlands in these watersheds as the project will occur along the existing alignment and existing wetland mapping doesn't show many wetlands located within its potential area of impact. The PHAC, although still in planning stages, has potential to traverse these watersheds. Because design of this project hasn't begun, it is very difficult to predict what level of wetland impacts it might have, although it is likely that it will have at least a minimal impact to them. Due to the stringent requirements of Section 404 of the CWA in regards to avoidance, minimization, and mitigation of wetland impacts during design and permitting it is possible that the wetland impacts from this project could be minimal. At this time, cumulative impacts from past, present, and reasonably foreseeable actions, combined with those of the Preferred Alternative, would not have a substantial cumulative adverse effect on wetlands.

1985 - USGS Image

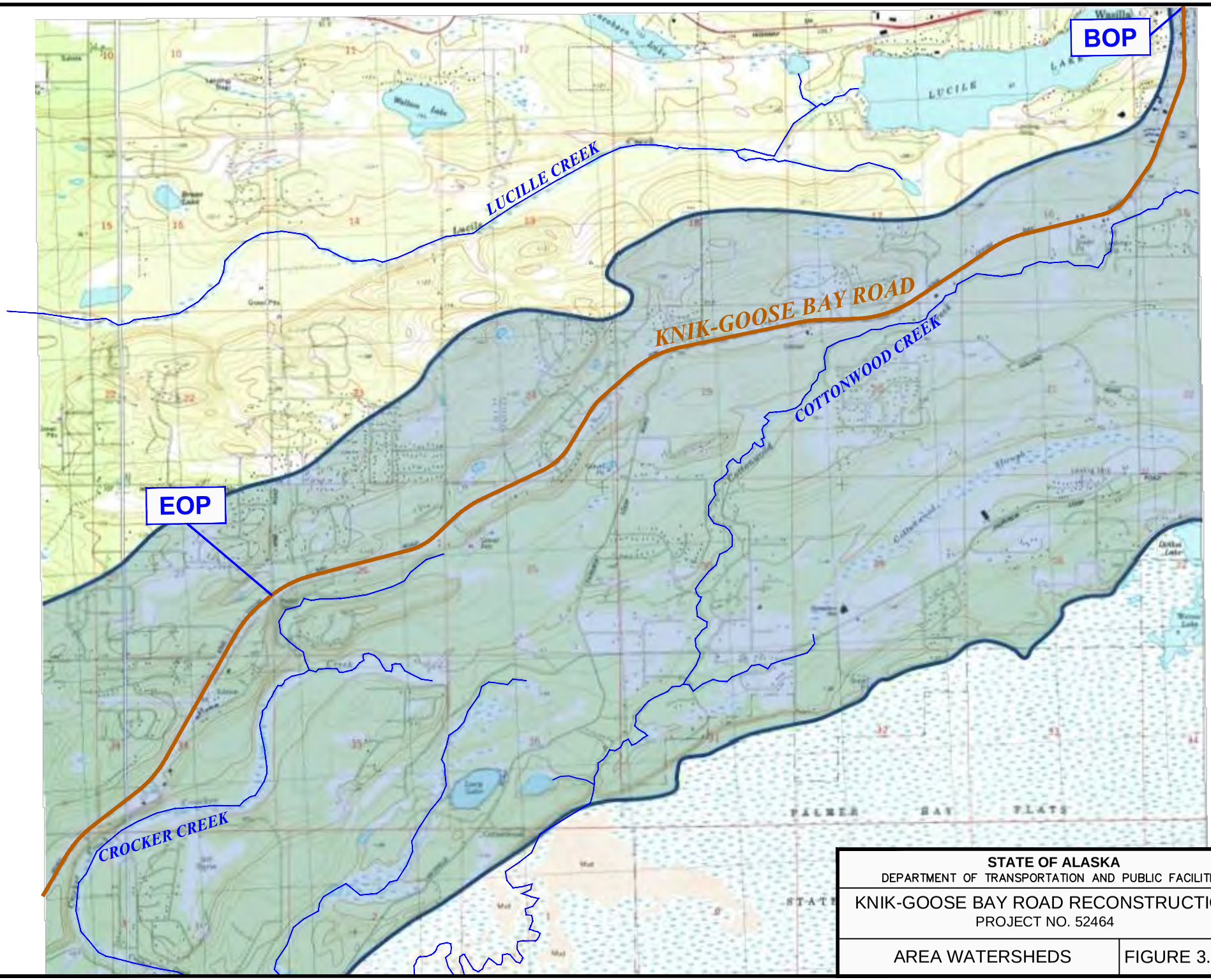
2004 - Google Earth Image

2012 - Google Earth Image

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

KNIK-GOOSE BAY ROAD RECONSTRUCTION
PROJECT NO. 52464

DEVELOPMENT TRENDS	FIGURE 3.18.1



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AREA WATERSHEDS | FIGURE 3.18.2

Wildlife – Moose

The geographic area of influence for the proposed project when considering cumulative impacts on moose populations is bounded by the ADF&G GMU 14A (Figure 3.18.3). Because the proposed project is centrally located within GMU 14A and the unit covers a large geographic area, it is unlikely that project impacts on moose populations will extend beyond this boundary. Moose populations in this area have fluctuated over time and were described as scarce in the 1930s, and reached upwards of 7,000 in the 1960s (Peltier 2010). ADF&G moose population surveys of the area between 2000 and 2009 show the population is relatively stable at approximately 6,500 animals. Although forest fires in the summer and snow fall in the winter affect moose populations, anthropogenic impacts on the landscape have exerted the strongest influence on area moose populations over time. Humans are responsible for large scale land clearing and development that have reduced the available habitat for moose in GMU 14A. In response to ongoing development in the project area, traffic volumes and transportation facilities continue to grow and negatively impact moose through moose-vehicle collisions. Moose fatalities from vehicle interactions have grown from an average of 180 in the 1990s to 194 in the 2000s and there appears to be an increasing trend of highway collisions (Peltier 2010). Existing DOT&PF MVC information shows that collision frequencies exceed the 75th percentile for the entire project corridor and exceed the 95th percentile from approximately MP 1 to 3, as identified in the 1995 DOT&PF report, "Moose-Vehicle Accidents on Alaska's Rural Roads." A maximum frequency of 20 accidents/mile/5 year period occurred from approximately MP 1.3 to 2.3 between 2007 and 2011. Maximum rates were 0.6 accidents/million vehicle miles/5 year period and under the 75th percentile for the entire project corridor.

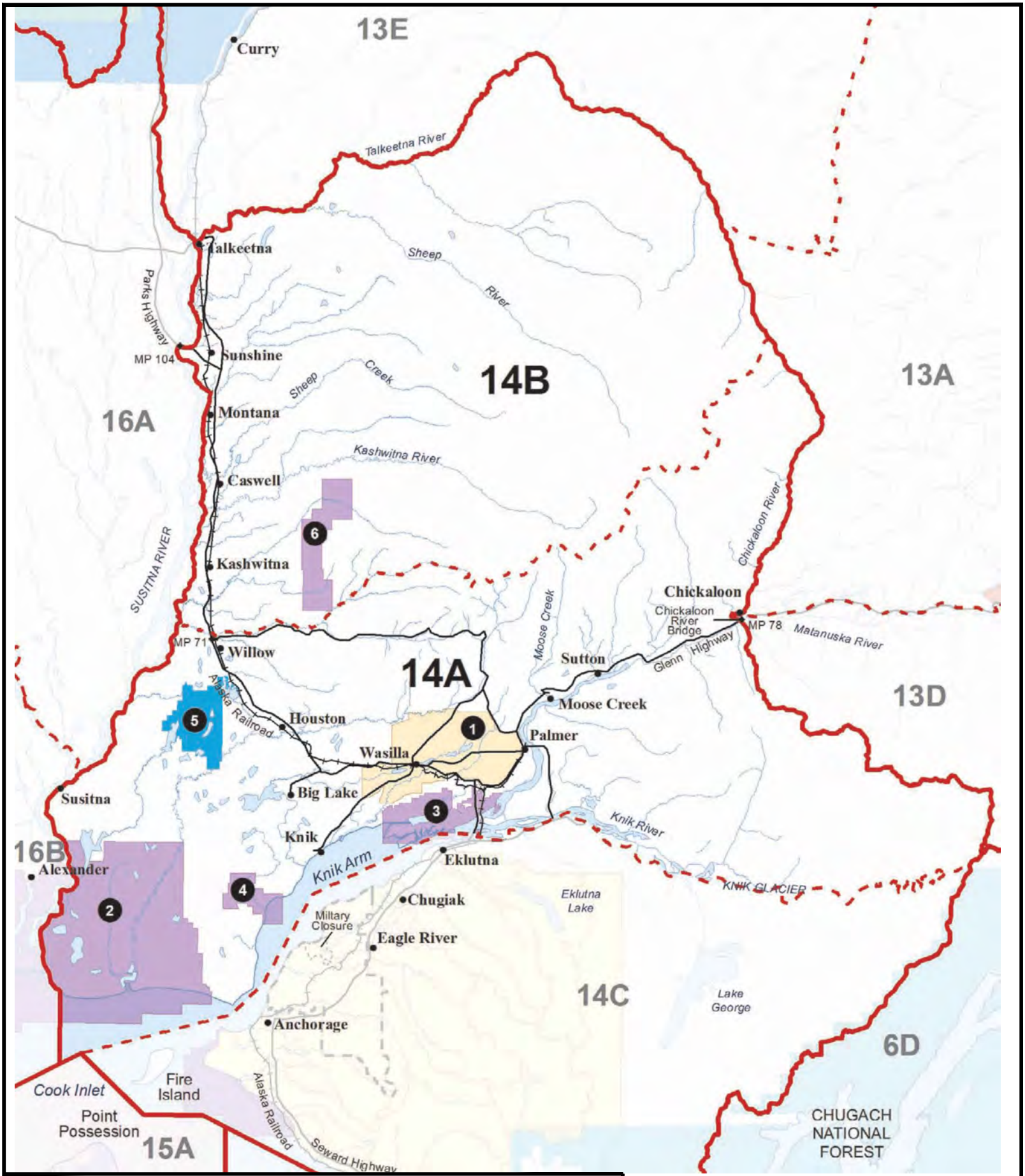
Preferred Alternative Impacts

Forecast human population increases and accompanying development within the MSB will exacerbate the existing habitat segmentation and ongoing loss of habitat. Several of the reasonably foreseeable actions listed in Table 3.18.1 will have similar impacts on moose populations and habitat. The Knik Arm Crossing, PHAC, and Port Mackenzie Rail Extension will construct miles of new road; many of them will likely pass through areas that provide ideal moose habitat. These projects would introduce new disturbance and human presence in previously undisturbed settings and would likely have a much greater impact than projects improving already existing facilities. The cumulative impacts from these projects combined with other projects proposing construction on new alignments will contribute a far greater cumulative impact to moose than the proposed project which is improving an existing facility. The cumulative effect of all the reasonably foreseeable actions would likely be adverse to moose populations because they will continually segment and destroy habitat and force the animals into smaller and smaller areas. MVCs are likely to increase through increased interaction between moose and highway facilities and the increased mileage of roads will serve to constrict wildlife movement. In addition, the moose will attempt to avoid habitat near roadways and other human development and force more of them into smaller amounts of prime habitat.

Although, the contribution from the proposed project to cumulative impacts in the area will be minimal because the existing highway, although less than half the size of the Preferred Alternative, already carries a large volume of traffic and functions as a barrier or deterrent to moose migration. Some moose habitat will be permanently lost because widening will require additional land be permanently converted to a transportation use. In addition to this, improved

travel conditions are likely to support residential development in the area and continue to displacing moose.

Habitat loss and alteration could result in a reduction of the carrying capacity for area moose populations. Some alterations could enhance moose habitat by increasing browse. Residential development and decreased predators in populated areas may have contributed to increases in wintering moose concentrations in the nearby Anchorage Bowl. The negative effects of future development on moose habitat and populations in the study area are mitigated to a degree by the amount of undeveloped and protected lands that surround the area. The Palmer Hay Flats, Goose Bay, and the Susitna Flats State Game Refuges protect approximately 340,000 acres of habitat. State-owned parks and the Matanuska Moose Range management area also protect important moose habitat.



STATE OF ALASKA
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KNIK-GOOSE BAY ROAD RECONSTRUCTION
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ADF&G GAME MANAGEMENT UNIT 14 | FIGURE 3.18.3

The proposed KGB Road reconstruction project contribution to the cumulative impacts on moose habitat and mortality are expected to be minimal. About 70 acres of vegetative clearing, including some moose habitat, will occur as a result of the proposed project. The amount of habitat loss is negligible when viewed against the area of existing habitat that will likely be developed within the foreseeable future. ROW clearing may decrease moose mortality due to greater visibility and reduced moose-vehicle collisions. The addition of lanes and associated reduction in congestion could increase the travel speed within the project corridor and increase the rate of MVCs, but increased lighting, sight distance, and signage should offset this.

Visual

The area of analysis for cumulative effects pertaining to visual quality includes the KGB Road ROW and all properties with a viewshed that includes the ROW. Past, present, and reasonably foreseeable future actions that may affect the visual quality of the analysis area include road construction and maintenance, residential development on private land, and commercial development. As residential populations have grown along KGB Road, the character of the corridor has slowly changed from a gravel road with little to no visible development, to a paved two-lane roadway carrying thousands of cars daily and all manner of development visible from the road. The proposed lighting from the beginning of the project to Mack Road will increase the ambient light levels in the MSB. When combined with lighting from the continuing development of the area, the level of darkness at nighttime will be reduced. Effects on visual quality from the Preferred Alternative, when added to other past, present, and reasonably foreseeable future actions, would likely contribute to the transformation from a more rural forested feel along the road to one that is more urban.

Invasive Species

The area of analysis for cumulative impacts from invasive species includes the KGB Road ROW. Past, present, and reasonably foreseeable future actions that may affect the presence of invasive species within the project area include road construction and maintenance, utility line construction and maintenance (including hazard tree removal), and residential, recreational, and commercial development. These activities could result in alteration or removal of vegetation, introduction and spread of noxious weeds, and/or disturbance of soil conditions. Revegetation efforts associated with the Preferred Alternative, combined with efforts by agencies to control noxious weeds in the project area, would minimize invasive species impacts. Incremental impacts from the Preferred Alternative, when added to the past, present, and reasonably foreseeable future actions, would not result in measurable invasive species impacts.