DOT

SH 402 Environmental Assessment

Environmental Assessment and Draft Section 4(f) Evaluation

July 2007

U.S. Department of Transportation
Federal Highway Administration

DOT
DEPARTMENT OF TRANSPORTATION

CDOT STA 402A-003

SH 402

US 287 to I-25 Interchange

ENVIRONMENTAL ASSESSMENT

and

DRAFT SECTION 4(F) EVALUATION

Larimer County, Colorado

Submitted Pursuant to

42 USC 4332(2)(c), 49 USC 303

by the

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

and

THE COLORADO DEPARTMENT OF TRANSPORTATION

Submitted By:

7/5/07

Karla Harding, P.E.
Region 4 Transportation Director
Colorado Department of Transportation

Date

Concurred By:

7-16-07

Pamela Hutton, P.E.
Chief Engineer
Colorado Department of Transportation

Date

Approved By:

7-23-07

FOR David A. Nicol, P.E.
Division Administrator, Colorado Division
Federal Highway Administration

Date

FHWA Guidance on 23 USC 139(1)

A Federal agency may publish a notice in the Federal Register, pursuant to 23 USC 139(1), indicating that one or more federal agencies have taken final actions on permits, license, or approvals for a transportation project. If such notice is published, claims seeking judicial review of those Federal agency action will be barred unless such claims are filed within 180 days after the date of the notice, or within such shorter time period as is specified in the Federal laws pursuant to which judicial review of the Federal agency action is allowed. If no notice is published, then the periods of time that otherwise are provided by the federal laws governing such claims will apply.

Title VI

CDOT ensures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin or sex in the provision of benefits and services resulting from its federally assisted programs and activities. For questions regarding CDOT's Title VI Program, you may contact the Department's Title VI Coordinator at (303) 757-9310.

Table of Contents

GLOSSARY

CHAPTER 1. PURPOSE AND NEED 1-1
1.1 Introduction 1-1
1.2 Project Purpose: Mobility and Safety 1-2
1.2.1 Existing SH 402 Cross Section 1-2
1.2.2 Level of Service 1-6
1.2.3 Crash Analysis 1-6
1.3 Project Need: Travel Demand and Growth 1-7
1.3.1 Travel Demand 1-7
1.3.2 Land Use and Growth 1-10
1.4 Photographic Essay 1-11

CHAPTER 2. ALTERNATIVES 2-1
2.1 Alternatives Identification 2-1
2.2 Alternative Modes of Transportation 2-1
2.2.1 Bus 2-1
2.2.2 Bicycle/Pedestrian 2-2
2.2.3 Carpool/Vanpool 2-2
2.2.4 High Occupancy Vehicle Lanes/Rapid Transit/Commuter Rail 2-2
2.2.5 Conclusion 2-2
2.3 Alternatives Development 2-2
2.3.1 Action Alternative Highway Cross Sections 2-3
2.3.2 Action Alternative Descriptions 2-6
2.4 Screening Process 2-8
2.4.1 Agency and Public Involvement 2-8
2.4.2 Screening 2-8
2.5 Screening Results 2-11
2.6 Alternatives Retained for Study in the EA 2-12
2.6.1 Alternative #4 – Meander Alternative (alignment that shifts between the north and south sides of the current highway alignment) 2-12
2.6.2 No Action Alternative 2-15

CHAPTER 3. IMPACTS AND MITIGATION MEASURES 3-1
3.1 Socioeconomics 3-2
3.1.1 Population 3-2
3.1.2 Economics and Employment 3-3
3.1.3 No Action Alternative 3-3
3.1.4 Meander Alternative 3-3
3.1.5 Mitigation Measures 3-3
3.2 Right-of-Way Acquisition and Relocations 3-4
3.2.1 No Action Alternative 3-4
3.2.2 Meander Alternative 3-4
3.2.3 Mitigation Measures 3-4

3.3 Environmental Justice 3-6
3.3.1 Background 3-6
3.3.2 Method 3-6
3.3.3 Minority and Low-income Populations in the Project Area 3-7
3.3.4 No Action Alternative 3-9
3.3.5 Meander Alternative 3-9
3.3.6 Mitigation Measures 3-10
3.4 Land Use 3-10
3.4.1 Existing and Proposed Land Uses 3-10
3.4.2 No Action Alternative 3-15
3.4.3 Meander Alternative 3-15
3.4.4 Mitigation Measures 3-15
3.5 Farmland 3-15
3.5.1 No Action Alternative 3-15
3.5.2 Meander Alternative 3-16
3.5.3 Mitigation Measures 3-16
3.6 Visual Resources 3-16
3.6.1 Overview 3-18
3.6.2 No Action Alternative 3-18
3.6.3 Meander Alternative 3-18
3.6.4 Mitigation Measures 3-18
3.7 Recreation Resources 3-19
3.8 Hazardous Materials/ Waste 3-19
3.8.1 No Action Alternative 3-20
3.8.2 Meander Alternative 3-20
3.8.3 Mitigation Measures 3-20
3.9 Utilities and Services 3-21
3.9.1 No Action Alternative 3-21
3.9.2 Meander Alternative 3-21
3.9.3 Mitigation Measures 3-21
3.10 Emergency Services 3-21
3.10.1 No Action Alternative 3-21
3.10.2 Meander Alternative 3-21
3.10.3 Mitigation Measures 3-21
3.11 Historic Preservation 3-21
3.11.1 Historic Overview and Inventory Results 3-22
3.11.2 No Action Alternative 3-25
3.11.3 Meander Alternative 3-25
3.11.4 Mitigation 3-26
3.12 Archaeology 3-26
3.12.1 Prehistoric Overview and Inventory Results 3-26
3.12.2 No Action Alternative 3-27
3.12.3 Meander Alternative 3-27
3.12.4 Mitigation Measures 3-27
3.13 Native American Consultation 3-27
3.13.1 Mitigation Measures 3-28
3.14 Sections 4(f) and 6(f) Resources 3-28

3.15 Noise 3-28
3.15.1 Existing Noise Levels 3-29
3.15.2 No Action Alternative 3-29
3.15.3 Meander Alternative 3-29
3.15.4 Mitigation Measures 3-32
3.16 Air Quality 3-34
3.16.1 No Action Alternative 3-37
3.16.2 Meander Alternative 3-37
3.16.3 Mitigation Measures 3-37
3.17 Ecology 3-37
3.17.1 Vegetation 3-37
3.17.2 Noxious Weeds 3-38
3.17.3 Wildlife 3-38
3.17.4 No Action Alternative 3-40
3.17.5 Meander Alternative 3-40
3.17.6 Mitigation Measures 3-40
3.18 Threatened and Endangered Species and Species of Special Concern 3-42
3.18.1 Bald Eagle *(Haliaeetus leucocephalus)* 3-42
3.18.2 Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*) 3-43
3.18.3 TES Plants 3-43
3.18.4 Candidate TES Species 3-43
3.18.5 Downstream TES Species 3-44
3.18.6 No Action Alternative 3-44
3.18.7 Meander Alternative 3-44
3.18.8 Mitigation Measures 3-44
3.19 Wetlands 3-44
3.19.1 No Action Alternative 3-47
3.19.2 Meander Alternative 3-47
3.19.3 Mitigation Measures 3-47
3.20 Floodplains 3-48
3.20.1 No Action Alternative 3-48
3.20.2 Meander Alternative 3-48
3.20.3 Mitigation Measures 3-48
3.21 Water Quality 3-48
3.21.1 Existing Surface Water Environment 3-48
3.21.2 Colorado Discharge Permit Overview 3-51
3.21.3 No Action Alternative 3-52
3.21.4 Meander Alternative 3-52
3.21.5 Mitigation Measures 3-52
3.22 Geology 3-53
3.22.1 No Action Alternative 3-54
3.22.2 Meander Alternative 3-54
3.22.3 Mitigation Measures 3-54
3.23 Paleontology 3-55
3.23.1 No Action Alternative 3-55
3.23.2 Meander Alternative 3-55
3.23.3 Mitigation Measures 3-55

3.24 Construction Costs 3-56
3.24.1 No Action Alternative 3-56
3.24.2 Meander Alternative 3-56
3.25 Construction Impacts 3-56
3.25.1 Visual Resources 3-56
3.25.2 Hazardous Materials/Waste 3-56
3.25.3 Access/Traffic Control/ Emergency Services 3-56
3.25.4 Archaeology 3-57
3.25.5 Noise 3-57
3.25.6 Air Quality 3-57
3.25.7 Ecology and Noxious Weeds 3-57
3.25.8 TES Species 3-59
3.25.9 Wetlands 3-59
3.25.10 Water Quality 3-59
3.25.11 Geology and Soils 3-60
3.25.12 Paleontology 3-60
3.26 Preferred Alternative – Meander Alternative 3-61
3.27 Mitigation and Benefits Summary 3-63

CHAPTER 4. SECTION 4(F) EVALUATION 4-1
4.1 Section 4(f) Legislation 4-1
4.2 Project Purpose and Need 4-2
4.3 Alternatives Evaluated 4-2
4.3.1 No Action Alternative 4-2
4.3.2 Preferred Alternative - #4 Meander Alternative 4-2
4.4 Section 4(f) Resources 4-4
4.4.1 Weber Farm (5LR10725) 4-4
4.4.2 De Minimis Findings 4-7
4.5 Avoidance Alternatives 4-10
4.5.1 Big Thompson River Relocation Alternative 4-10
4.5.2 Parallel Corridor Alternatives 4-11
4.5.3 No Action Alternative 4-12
4.6 Measures to Minimize Harm 4-12
4.7 Coordination 4-13

CHAPTER 5. CUMULATIVE IMPACTS 5-1
5.1 Regulatory Guidelines and Methods 5-1
5.2 Scope of Cumulative Impact Analysis 5-1
5.2.1 No Action Alternative 5-1
5.2.2 Resources Not Directly or Indirectly Impacted Under the Meander Alternative 5-2
5.2.3 Resources Directly or Indirectly Impacted That May Result in Cumulative Impacts 5-2
5.2.4 Geographic Area and Timeframe 5-2
5.2.5 Past, Present, and Reasonably Foreseeable Future Actions 5-2
5.2.6 Transportation and Development Actions 5-3
5.2.7 Summary of Cumulative Impacts 5-3

CHAPTER 6. PUBLIC INVOLVEMENT 6-1
6.1 Public and Agency Involvement Programs 6-1
6.1.1 Scoping 6-1
6.1.2 Agency Coordination 6-1
6.1.3 Public Participation 6-2
6.2 Program Results 6-4
6.2.1 Agency Status Meeting Results 6-4
6.2.2 Public Involvement Program Results 6-9

CHAPTER 7. REFERENCES 7-1

APPENDICES: Contained on CD inside back cover.

APPENDIX A. ENVIRONMENTAL COORDINATION
APPENDIX B. WETLAND FINDING REPORT
APPENDIX C. PUBLIC INVOLVEMENT PROGRAM
APPENDIX D. CDOT NOISE ANALYSIS AND ABATEMENT GUIDELINES
APPENDIX E. NOXIOUS WEED MANAGEMENT PLAN
APPENDIX F. SH 402 AIR QUALITY TECHNICAL MEMORANDUM FOR MOBILE SOURCE AIR TOXICS

List of Figures

Figure 1-1. Project Location and Study Area 1-3
Figure 1-2. Existing SH 402 Cross Section 1-5
Figure 1-3. 2001 and 2030 Average Daily Traffic (ADT), Through Traffic Level of Service (LOS) and Intersection LOS 1-9
Figure 1-4. Front Range Area Population Growth 1-10
Figure 1-5. Photographic Essay 1-13

Figure 2-1. Urban Cross Section for Action Alternatives 2-4
Figure 2-2. Rural Cross Section for Action Alternatives 2-5
Figure 2-3. Stopping Sight Distance Cross Sections 2-7
Figure 2-4. Alignments for Alternatives #1, #2, and #4 Showing Corridor Wetlands and Historic Properties 2-9
Figure 2-5. Alignment of Meander Alternative 2-13
Figure 2-6. Intersection Improvements, US 287 to CR 11H (Boise Avenue) 2-17
Figure 2-7. Intersection Improvements, CR 9 to Heron Drive 2-18
Figure 2-8. Intersection Improvements, CR 7 (Charlotte Court) to Carpool Lot 2-19

Figure 3-1. Larimer County Growth Indicators 3-2
Figure 3-2. Larimer County Building Permits 3-2
Figure 3-3. Meander Alternative Right-of-Way and Associated Relocations 3-5
Figure 3-4. 2000 Census, Socioeconomic, and Demographic Statistics 3-8
Figure 3-5. Existing Land Use 3-11
Figure 3-6. City of Loveland Land Use Plan Map 3-13
Figure 3-7. Project Study Area Prime Farmland Soil Types 3-17
Figure 3-8. Project Study Area Featuring Historic Properties 3-23
Figure 3-9. Noise Measurement and Receptor Locations 3-31
Figure 3-10. Wetlands and the Big Thompson River 100-Year Floodplain 3-45

Figure 4-1. Project Study Area Featuring Historic Properties 4-3
Figure 4-2. Weber Farm – Detail of Buildings (5LR10725) 4-5
Figure 4-3. Context Map for Weber Farm Discussion 4-6
Figure 4-4. Weber Farm Main House and Chicken Brooder House 4-8

Figure 5-1. City of Loveland Land Use Plan Map 5-11

List of Tables

Table 1-1. 1998–2002 Safety Records: SH 402 Averages per MVMT and WHI 1-7
Table 1-2. Intersection LOS, No Action Alternative 1-8
Table 1-3. Through Traffic LOS, No Action Alternative 1-8

Table 2-1. Wetland Impact Estimates 2-11
Table 2-2. Relocation Estimates 2-11
Table 2-3. Impacts on Weber and Propp Farms (acres) 2-11
Table 2-4. Intersection LOS, Meander Alternative 2-15
Table 2-5. Through Traffic LOS, Meander Alternative 2-15
Table 2-6. Intersection LOS, No Action Alternative 2-16
Table 2-7. Through Traffic LOS, No Action Alternative 2-16

Table 3-1. Population in the City of Loveland and Larimer County 3-2
Table 3-2. Minority and Low-income Population Comparisons 3-9
Table 3-3. Prime Farmland Soil Types in the Project Area 3-16
Table 3-4. Relationship Between Decibels and Perception of Loudness 3-28
Table 3-5. Typical Noise Levels 3-29
Table 3-6. CDOT Noise Abatement Criteria Hourly A-Weighted Sound Level in Decibels [dB(A)] 3-30
Table 3-7. Measured and Predicted Noise Levels [L_{eq} dB(A)] 3-30
Table 3-8. Weedy Species: Larimer County and Colorado Noxious Weed Lists 3-39
Table 3-9. TES Species Identified by USFWS as Potentially Occurring in the Project Area 3-43
Table 3-10. SH 402 Wetlands by Location and Potential Impacts of Meander Alternative 3-46
Table 3-11. Principal Functions and Values[a] of Project Area Wetlands 3-46
Table 3-12. CDPHE Water Quality Control Commission Regulation #38 Surface Water Quality Classifications and Standards Region 2 – Big Thompson River 3-50
Table 3-13. Summary of Impacts 3-61
Table 3-14. Mitigation Measures for Preferred Alternative—Meander Alternative 3-63
Table 3-15. Mitigation Measures for Construction—Meander Alternative 3-70

Table 4-1. Avoidance Alternative Discussion Summary 4-11

Table 5-1. Cumulative Impacts on Environmental Resources 5-4

Table 6-1. Summary of Public Outreach and Comments Received 6-9

This page intentionally left blank.

Glossary

Glossary

AASHTO

American Association of State Highway and Transportation Officials

Alternatives Analysis

The process by which alternatives identified in the scoping process are screened to determine how well each meets the project purpose and need. Alternatives that qualify after screening are included in the environmental assessment for further analysis and ultimately in the identification of the preferred alternative.

AMI

area median income

APCD

Air Pollution Control Division (of the Colorado Department of Public Health and Environment)

Average Daily Traffic (ADT)

The average two-way traffic (number of vehicles) on a given highway over a 24-hour period.

Best Management Practice (BMP)

Any program, technology, process, siting criteria, operating method measure, or device that controls, prevents, removes, or reduces effects from a project or activity on the surrounding area.

Capacity

The maximum rate of traffic flow at which vehicles can traverse a point of highway in 1 hour.

CDOW

Colorado Division of Wildlife

CDOT

Colorado Department of Transportation

CDPHE

Colorado Department of Public Health and Environment

CE

categorical exclusion

Clean Water Act (CWA)

The Federal Water Pollution Control Act enacted in 1972 by Public Law 92-500 and amended by the Water Quality Act of 1987. The CWA prohibits discharge of pollutants to waters of the United States without a National Pollutant Discharge and Elimination System permit. Section 404 of the CWA addresses protection of wetlands and aquatic habitats from dredge and fill activities.

CNHP

Colorado Natural Heritage Program

Corridor

In this document, a highway and associated right-of-way only.

Council on Environmental Quality (CEQ)

The US Congress established the CEQ within the Executive Office of the President as part of the National Environmental Policy Act of 1969. Additional responsibilities were provided by the Environmental Quality Improvement Act of 1970.

CR

county road

dB

decibel

dB(A)

A-weighted decibel

DOLA

Department of Local Affairs

DOT

Department of Transportation

Early Action Compact (EAC)

Agreements between Environmental Protection Agency and communities to reduce ground-level ozone pollution. EACs require communities to develop and implement air pollution control strategies; account for emissions growth, and achieve and maintain the national 8-hour ozone standard.

EB

eastbound

Endangered Species Act (ESA)

Legislation passed by Congress in 1973 to protect listed plant and animal species and their habitats from harm.

Environmental Assessment (EA)

A document prepared by a federal agency under National Environmental Policy Act regulations to provide sufficient evidence and analysis of a proposed project or action to determine whether to prepare an environmental impact statement or a finding of no significant impact.

Environmental Protection Agency (EPA)

The US agency responsible for controlling air pollution, water pollution, noise, radiation hazards, pesticide hazards, solid waste disposal, and other potential risks to the natural environment.

EO

Executive Order

Expressway

A multilane, divided highway designed to move large volumes of traffic at high speeds under free-flow conditions with full control of access.

Farmland Protection Policy Act (FPPA)

Enacted in 1981 to minimize the extent to which federally funded projects contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses.

FEMA

Federal Emergency Management Agency

FHWA

Federal Highway Administration

Finding of No Significant Impact (FONSI)

A decision rendered as the result of an environmental assessment indicating that a proposed action has no significant environmental impacts that cannot be appropriately mitigated.

FIS

Flood Insurance Study

Floodplain

An area adjacent to a stream or lake that is inundated periodically by high flows.

GIS

geographic information system

Grade-Separated Intersection

An intersection of highway roads, railroad tracks, or dedicated transit rail tracks that run either parallel or across at different surface elevations.

Growth Management Area (GMA)

The result of the 1980s' Intergovernmental Agreement between Larimer County and the city of Loveland. The primary purpose of the Loveland GMA is to focus urban development adjacent to cities and towns in areas that could be annexed.

Habitat

The environment in which an organism lives; the arrangement of food, water, cover, climate, and space suitable to meet the needs of an animal or a plant.

HASP

Health and Safety Plan

Hazardous Materials

Materials that pose a risk to human health or the environment.

HCS

Highway Capacity Software

HHS

Health and Human Services (US Department of)

HOV

High Occupancy Vehicle

HUD

Housing and Urban Development (US Department of)

IGA

intergovernmental agreement

LEDPA

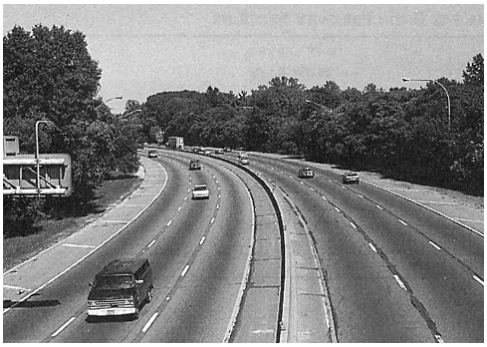
least environmentally damaging practicable alternative per CFR 40 Part 230 Section 404(b)(1)

LESA

Land Evaluation and Site Assessment

Level of Service (LOS)

A qualitative measure of the operational characteristics of a traffic stream, ranked from A (best) to F (worst). LOS is described in terms of speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.



Level of Service A: Free-flow operations; vehicles are able to move freely within the traffic stream. Average spacing between vehicles is 528 feet or 26 car lengths, giving motorists a high comfort level. Effects of minor traffic incidents are easily absorbed, with traffic quickly returning to free-flow operation.

Level of Service B: Reasonably free-flow; speeds are generally maintained. Lowest average spacing between vehicles is 330 feet or 18 car lengths. Ability to maneuver within the traffic stream is only slightly restricted; the motorist has a generally high comfort level. Incidents are still quickly absorbed.

Level of Service C: Speeds are still at or near free-flow speeds, but freedom to maneuver is noticeably restricted; lane changes require vigilance. Minimum average spacing between vehicles is in the range of 220 feet or 11 car lengths. Queues may form behind any significant lane blockage. Drivers experience an increase in tension because of additional vigilance required for safe operation.

Level of Service D: Speeds begin to decline slightly with increasing flows. Vehicles are spaced at about 165 feet or 9 car lengths. In this range, density begins to increase more quickly with increasing flow. Freedom to maneuver is more limited; drivers experience reduced physical and psychological comfort levels. Even minor disturbances create queuing.

Level of Service E: Operations are volatile, because there are virtually no usable gaps in the traffic stream. Vehicles are spaced at approximately 6 car lengths, with little room to maneuver at more than 50 mph. Any disruption (vehicles entering from an entrance ramp or changing lanes) causes a disruption wave to move throughout the traffic flow. The lower boundary of LOS E (between LOS E and LOS F) is considered to be operating at capacity, at which point the traffic stream has no ability to dissipate any disruptions. Maneuverability is extremely limited, and driver comfort level is extremely poor.

Level of Service F: This LOS signifies a breakdown in vehicular flow. Queues form behind breakdown points that occur because of traffic incidents and recurring points of congestion (merging or weaving where the number of vehicles arriving is greater than the number of vehicles discharged). Breakdown occurs when the ratio of arrival flow rate to actual capacity or the forecast flow rate to estimated capacity exceeds 1.00. Whenever LOS F conditions exist, there is a potential for breakdown in traffic flow to extend upstream for significant distances.

LUST

leaking underground storage tank

M-ESA

Modified Environmental Site Assessment

MMP

Materials Management Plan

Mobility

The ability of traffic to move unimpeded through a highway or highway corridor.

MP

milepost

MPO

Metropolitan Planning Organization

MS4

Colorado Department of Transportation's municipal separate storm sewer system

MSA

Metropolitan Statistical Area

MVMT

million vehicle miles traveled

NAAQS

National Ambient Air Quality Standards

NAC

Noise Abatement Criteria

National Environmental Policy Act (NEPA)

The National Environmental Policy Act of 1969 establishes policy, sets goals, and provides a means for protection of the environment in federal decision-making. Under NEPA, all federal agencies must consider the environmental impacts of any proposed action that includes federal money or affects federal land and public input in relevant decisions. The Council on Environmental Quality regulations for implementing NEPA are found in 43 CFR 1500–1508.

NAWMA

North American Weed Management Association

NB

northbound

NCEDC

Northern Colorado Economic Development Corporation

NFRT & AQPC

North Front Range Transportation and Air Quality Planning Council

NHPA

National Historic Preservation Act of 1966

No Action Alternative

The project alternative that represents projected conditions in a study area without improvement; serves as a baseline for comparing action alternatives.

NPDES

National Pollutant Discharge and Elimination System

NRCS

Natural Resources Conservation Service

NRHP

National Register of Historic Places

OAHP

Office of Archaeology and Historic Preservation

PCB

polychlorinated biphenyl

PEM

Palustrine Persistent Emergent

PFO

Palustrine Persistent Forested

PIP

Public Involvement Program

$PM_{2.5}$

particulate matter of 2.5 microns or less

PM_{10}

particulate matter of 10 microns or less

Preferred Alternative

The alternative identified by means of the environmental assessment process as the action recommended to meet the purpose and need of a project.

Prime Farmland

Soil units with the best combination of physical and chemical characteristics to produce feed, food, forage, fiber, and oilseed crops as identified in the Farmland Protection Policy Act of 1981.

Purpose and Need

The underlying reason for conducting environmental studies and analysis; the purpose and need to which the agency is responding by proposing alternative solutions.

REA

Rural Electric Association

Receptor

A term used in noise analysis to refer to a site or location potentially subject to noise impacts.

Right-of-Way

A general term denoting land, property, or interest same; usually a strip acquired for or devoted to transportation purposes.

RTP

Regional Transportation Plan

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)

Legislation that replaces the Transportation Equity Act for the Twenty-First Century (TEA-21); signed into law on August 10, 2005, as Public Law 109-59. SAFETEA-LU represents the largest surface transportation investment in US history. SAFETEA-LU builds on the foundation of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and TEA-21, supplying the funds and refining the programmatic framework for investments needed to maintain and grow the nation's vital transportation infrastructure. SAFETEA-LU continues an emphasis on a strong fundamental core formula program, coupled with targeted investment, featuring safety, equity, innovative finance, congestion relief, mobility and productivity, efficiency, environmental stewardship, and environmental streamlining.

SB

southbound

Scoping

An open public process initiated at the beginning of an environmental assessment to help identify the relevant agencies' and public's concerns and recommended solutions.

Screening (alternatives analysis)

A systematic process in which a broad range of alternatives is narrowed down to those that best meet the goals of a project based on the project's purpose

and need, and on key issues and concerns related to the study area. Alternatives that pass through the screening process are taken into environmental assessment to identify a preferred alternative.

Section 4(f)

Properties that are defined under Section 4(f) of the Department of Transportation Act of 1966 (49 USC 303). DOT regulations explicitly state that the Secretary of Transportation cannot approve the acquisition of publicly owned land from a park, recreation area, or wildlife refuge, or land from a national, state, or local historic site unless no feasible and prudent alternative exists. These properties are commonly referred to as 4(f) properties.

Section 6(f)

Properties that are defined under Section 6(f)(3) of the Land and Water Conservation Fund Act signed into law on September 3, 1964. These properties consist of publicly owned land, including parks and recreation areas purchased or improved with monies from the Land and Water Conservation Fund, and are intended to remain in use for public recreation in perpetuity.

SH

state highway

SHPO

State Historic Preservation Officer

SIMTRAFFIC

A type of traffic analysis software.

SMARTTrips™

A regional public program designed to reduce automobile dependency and promote the use of alternative transportation in northern Colorado. SMARTTrips is a division of the North Front Range Transportation and Air Quality Planning Council. The program includes marketing bus transit service to northern Colorado communities. SMARTTrips encourages residents to leave their cars at home at least one day a week to help preserve air quality, decrease traffic congestion, conserve fuel, and promote better health.

Statewide Transportation Improvement Program (STIP)

Identifies necessary transportation improvements throughout Colorado that currently have funding available.

Study Area

In this document, an area larger than the corridor width and associated with a particular resource. The study area varies with the resource being analyzed.

SWMP

stormwater management plan

SYNCHRO HCM

A type of traffic analysis software that uses the average delay to define level of service for signalized and unsignalized intersections.

Threatened and Endangered Species (TES Species)

A classification of plant and animal species listed in the Endangered Species Act. Endangered species are in danger of becoming extinct; threatened species are in danger of being listed as endangered.

Transportation Improvement Program (TIP)

A prioritized program of transportation projects to be implemented in appropriate stages over 3 to 5 years as set forth in Department of

Transportation's joint regulations for transportation programming. The projects are recommended from those in the transportation systems management element and the long-range element of the planning process. Participation in this program is required as a condition for a locality to receive federal transit and highway grants.

UPRR

Union Pacific Railroad

USCOE

United States Army Corps of Engineers

USFWS

United States Fish and Wildlife Service

VMT

vehicle miles traveled

WB

westbound

Weighted Hazard Index (WHI)

Compares the frequency and severity of crashes to the statewide average. WHI values greater than zero exceed the statewide average, and values less than zero are below the statewide average.

WET

wetland evaluation technique

Wetland

An area sufficiently inundated by surface water or groundwater to support a predominance of vegetation adapted for life in saturated soil conditions (bogs, ponds, estuaries, marshes).

Chapter 1

Purpose and Need

Chapter 1. Purpose and Need

1.1 Introduction

State Highway 402 (SH 402) is a heavily used two-lane, east-west arterial connecting United States Highway 287 (US 287, also known as Lincoln Avenue) and Interstate 25 (I-25).[1] This 4-mile highway is located south of the city of Loveland in Larimer County, Colorado. SH 402 serves local residents and businesses and is used as a commuter route to I-25. The project location is shown in Figure 1-1.

Access to a carpool lot (approximately 88 spaces) located at the southwest quadrant of the SH 402 and I-25 interchange was included as a part of this study. Potential improvements at the I-25 interchange are being addressed under the current *North I-25 Environmental Impact Statement*.

SH 402 begins at US 287 and ends at I-25. An existing four-lane highway extends west of US 287 and is known as 14th Street in the city of Loveland. East of I-25, a rural two-lane county highway segment extends east through the edge of Johnstown and into the town of Evans, where it ends.

This Environmental Assessment (EA) encompasses the 4-mile length of SH 402 although improvements are not needed for the area between US 287 and CR 13C (St. Louis Avenue), which was widened by developers in coordination with the city of Loveland and the Colorado Department of Transportation (CDOT) under a Categorical Exclusion (CE) dated September 18, 2003. The EA was undertaken to investigate mobility and safety improvements along the SH 402 corridor. Analysis included assessment of both current travel conditions and projections for 2030 to identify and address both current and future travel demand needs.

The **purpose** of this project is to improve mobility and safety along the existing SH 402 from the US 287 intersection east to the I-25 interchange.

The **need** for this project is established by identifying and analyzing the 2030 travel demand and expected growth and development. The existing two-lane highway's substandard design from CR 13C to I-25 includes no turn lanes, narrow shoulders, and poor sight distances (how far ahead a driver can see from the road), resulting in mobility and safety concerns.

Mobility and safety concerns will worsen as traffic increases between now and 2030. Currently, traffic congestion and slowing are observed during peak periods. Public experiences of safety problems are common. Failure to address these problems will result in a highway with heavy congestion, significant delays, and exacerbated safety problems before 2030.

The eastbound morning peak traffic and westbound afternoon peak traffic indicate that SH 402 is used heavily by commuters for access to I-25.

The following terms are used throughout this document. *Corridor* refers to a highway and associated right-of-way only. *Study area* refers to an area larger than the corridor width and associated with a particular resource. The study area varies with the resource being analyzed.

This EA was conducted in accordance with the National Environmental Policy Act. The Federal Highway Administration (FHWA) is the lead agency, and CDOT is the applicant. FHWA requires completion of this study before initiation

[1] An urban cross section has been developed and partially built from US 287 east to CR 13C; the interim condition will remain until the development on the south side of SH 402 is constructed. This section was constructed by developers in coordination with the city of Loveland and CDOT under a Categorical Exclusion, dated September 18, 2003. Impacts related to widening between US 287 and CR 13C are not included in this analysis, and the existence of this developed portion of SH 402 did not restrict consideration of alternatives.

of any improvements using federal money. Should improvements be warranted, FHWA will make the final decision on the appropriate action to be taken.

The project is included in the *Statewide Transportation Improvement Program (STIP)*. The STIP identifies necessary transportation improvements throughout Colorado that currently have funding available.

The North Front Range Transportation and Air Quality Planning Council (NFRT & AQPC) *2030 Regional Transportation Plan (RTP)* also shows improvement of SH 402 between US 287 and the I-25 interchange on its list of priorities within the *corridor vision #13 US 34 urban* category. The primary investment need for this corridor is mobility, which is consistent with this EA.

The 2005 update to the *Loveland 1994 Comprehensive Master Plan* cites the highway as a "significant arterial corridor." This formal recognition of the importance of SH 402 and its future mobility and safety indicate that improvements to SH 402 are part of the local and regional goals. SH 402 will be inconsistent with local plans and policies if improvements are not implemented.

The following sections support the project purpose and need.

- Project Purpose: Mobility and Safety
  - Existing SH 402 cross section
  - Level of service (LOS)
  - Crash analysis
- Project Need: Travel Demand and Growth
  - Travel demand
  - Land use and growth
- Photographic Essay

1.2 Project Purpose: Mobility and Safety

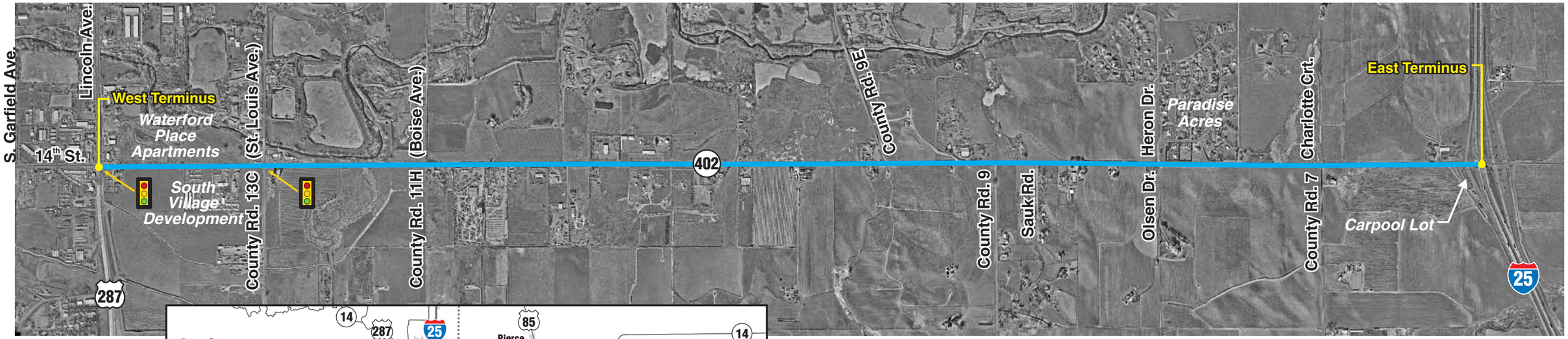
Mobility involves connecting more people and vehicles in less time with their work, school, community services, marketplaces, and each other. Congestion has a significant effect on mobility. Congestion is directly related to the ability of the highway to carry traffic efficiently. Key elements for identifying congestion are the cross section of the highway and the level of service (LOS). The cross section identifies the number and width of lanes and shoulders, as well as other typical highway features such as turn lanes and medians. LOS is a qualitative measure of the operational characteristics of the traffic stream. This section provides information on the existing cross section and the appropriate LOS for SH 402.

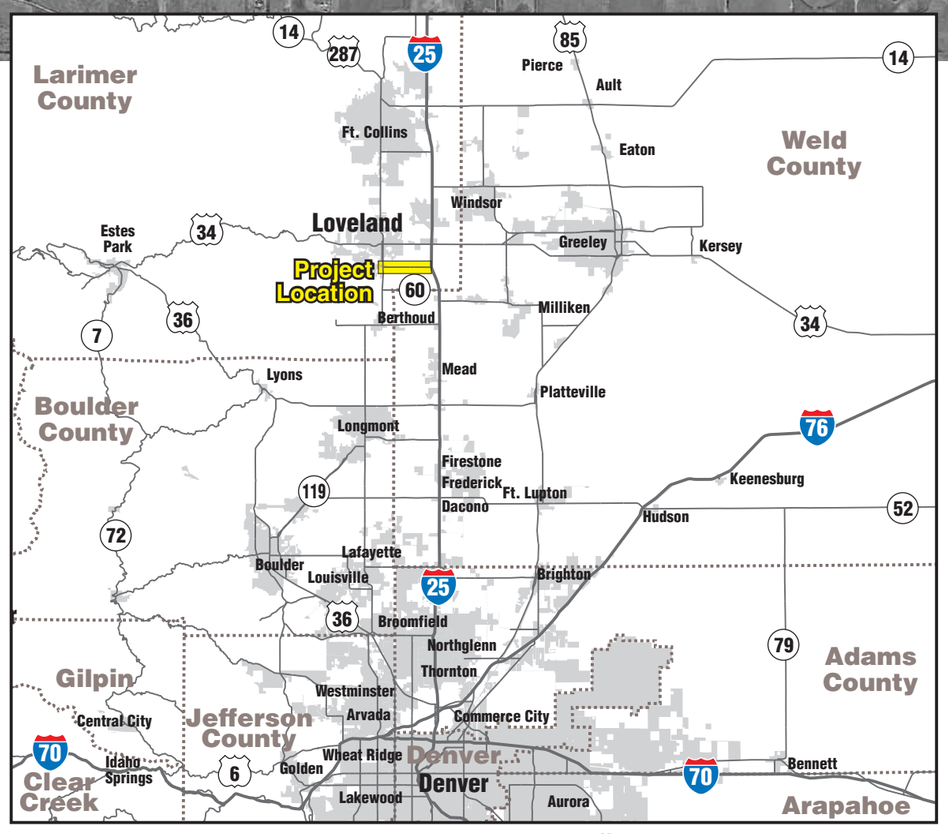
Mobility and safety are closely tied together. As congestion builds, crash rates increase, and as crashes increase, there is more congestion. This section also summarizes crash information and related corridor characteristics for SH 402.

1.2.1 Existing SH 402 Cross Section

The existing SH 402 between US 287 and CR 13C is a four-lane highway with two signalized intersections and a raised median allowing limited access and associated turn lanes. Between CR 13C and the I-25 interchange, it is a two-lane highway with seven unsignalized intersections (see Figure 1-1). SH 402 is classified as a minor urban arterial for its entire length.

Substandard narrow shoulders extend for most of the length of the existing highway, with numerous direct residential and business accesses. Figure 1-2 illustrates the cross section of the existing SH 402 east of CR 13C. Although right-of-way width varies along SH 402, it is generally 60 feet to the east of CR 13C.





N
W E
S

0 1000 2000 3000 4000
Approximate Scale in Feet

Note: SH 402 project does not include I-25 interchange improvements at the east terminus. SH 402 project does include intersection improvements at US 287, the west terminus. These improvements extend west of the intersection to tie into existing 14th Street.

N
W E
S

0 5 10 15 20
Approximate Scale in Miles

U.S. Department of Transportation
Federal Highway Administration

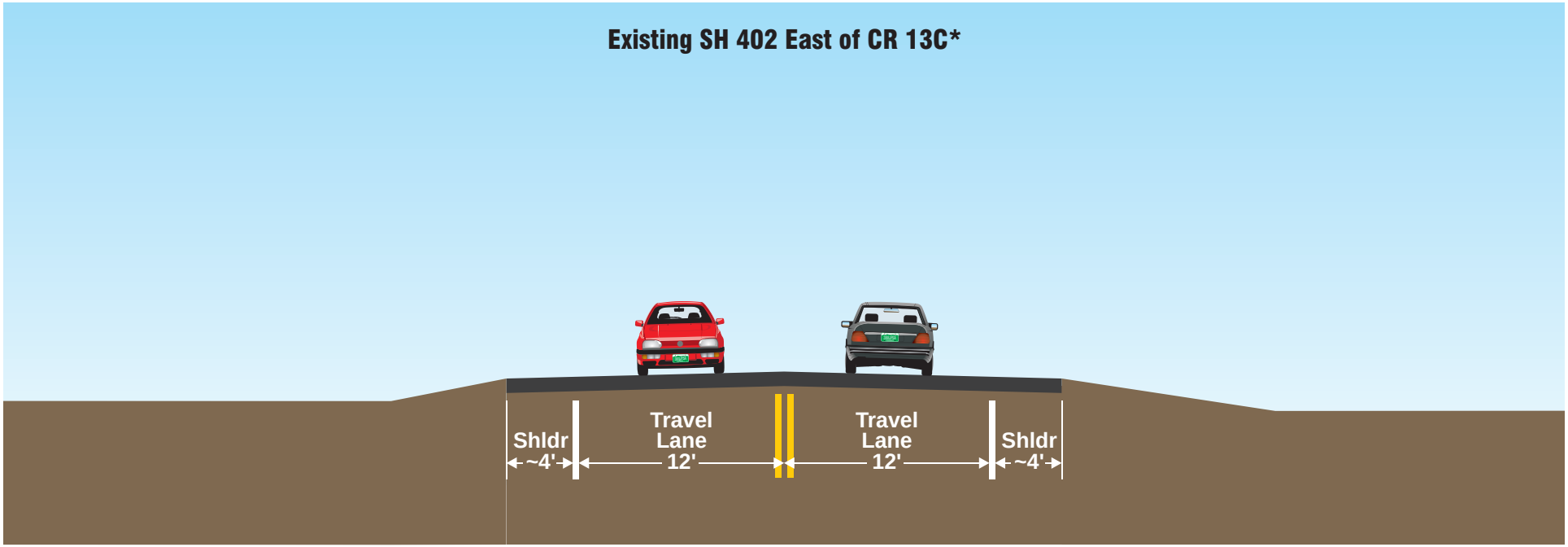
DOT
DEPARTMENT OF TRANSPORTATION

DOT SH 402 Environmental Assessment

Project Location and Study Area

FIGURE 1-1

This page intentionally left blank.



*Existing right of way is approximately 60'

U.S. Department of Transportation
Federal Highway Administration

DOT
DEPARTMENT OF TRANSPORTATION

DOT SH 402 Environmental Assessment

Existing SH 402 East of CR 13C

FIGURE 1-2

1.2.2 Level of Service

LOS is a qualitative measure of the operational characteristics of a traffic stream, ranked from A (best) to F (worst). LOS is described in terms of speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Highway LOS ratings are as follows:

LOS A	free-flow operations
LOS B	reasonably free-flow operations
LOS C	noticeable traffic
LOS D	declining speeds and congestion beginning to form
LOS E	maximum service flow (full capacity)
LOS F	heavy congestion, significant delays, stop-and-go-traffic

The factors used to determine LOS differ with the type of highway and intersection:

- Highway segment LOS is generally based on the ratio of volume over capacity.
- Intersection LOS is based on vehicle seconds of delay.

For two-lane highways, the percentage of no-passing zones is also taken into consideration when determining LOS. The LOS shown in this document is for the peak morning and evening hours.

The Rural and Urban Arterials category from the American Association of State Highway and Transportation Officials (AASHTO) design guide applies to SH 402. According to AASHTO (AASHTO *Green Book*, 2004, fifth edition), rural and urban arterials and their auxiliary facilities (turning lanes, intersections, interchanges) should generally be designed for LOS C. However, LOS D is more appropriate in heavily developed areas. Therefore, the design goal for SH 402 for the US 287 intersection to CR 13C is LOS D, with LOS C for the remainder of SH 402 east of CR 13C. This also complies with city of Loveland transportation plan requirements.

1.2.3 Crash Analysis

Data collected by CDOT between January 1, 1998, and December 31, 2002, were used to perform a crash analysis. CDOT crash rates calculated for SH 402 cover the entire length of the highway between US 287 and I-25 but do not include I-25 crashes. During the five years analyzed, 194 crashes occurred: 112 involved property damage only, 81 involved injuries, and 1 involved a fatality. The most common crash types were rear-end (48 percent), collisions with fixed objects (21 percent), and broadsides (14 percent). Rear-end and broadside crashes typify the design deficiencies of the existing SH 402, including poor sight distance and inadequate turn lanes and shoulders.

The highest percentage of crashes (83 percent or 143) involved travel along SH 402. Most of the overall crashes on SH 402 (52 percent) were at intersections or intersection-related, and 20 percent were driveway-related. The remainder (17 percent) occurred in driveways and at intersections (mainly US 287, CR 13C, and CR 9E).

Analysis of crash data, together with a preliminary field safety inspection, reveals the following SH 402 corridor characteristics:

- The shoulders along SH 402 are typically about 4 feet wide, although this varies. The standard width for a highway of this type is 10 feet.
- Numerous residential and business driveways are located along the highway in the study area. Some of these driveways are very close to intersections.
- Turning onto side roads and driveways requires slowing that can catch drivers by surprise. Because speeds are fast, a sudden drop in speed by a vehicle turning left or right creates a high-speed differential, increasing the risk of rear-end accidents.

- Sight distance problems were observed at several locations. Some unsignalized intersections (for example, SH 402 and CR 9E) require vehicles to stop well beyond a stop sign in order to see traffic on SH 402. In the eastern section of the study area with its rolling terrain, Sauk Road, Heron Drive/ Olsen Drive, and CR 7 access SH 402 with inadequate stopping sight distance due to the terrain.
- Restricted sight problems exist for some driveways, including one at the northeast end of the intersection of SH 402 and CR 13C. The line of westbound vehicles at the intersection blocks sight of vehicles traveling east on SH 402.
- Traffic volumes are high and are expected to increase in the future. Increased traffic, combined with high speeds, unexpected stops, inadequate shoulders, and restricted or inadequate sight distances, makes this section of SH 402 a candidate for safety improvements.

Table 1-1 provides safety information for the SH 402 corridor. Note that the Weighted Hazard Index (WHI) is -2.56 for the entire project length, which is less than the statewide average. However, WHI for the rural section (CR 13C to I-25) is 1.98, which is worse than the statewide average for this type of highway.

Table 1-1. 1998–2002 Safety Records: SH 402 Averages per MVMT and WHI

Safety Criteria	SH 402
Property Damage Only per MVMT	5.32
Injury Crashes per MVMT	3.85
Fatalities per 100 MVMT	0.05
Total Crashes per MVMT	9.22
Weighted Hazard Index	-2.56

MVMT = million vehicle miles traveled

WHI compares the frequency and severity of crashes to the statewide average. WHI values greater than zero exceed the statewide average, and values less than zero are below the statewide average.

1.3 Project Need: Travel Demand and Growth

Travel demand is calculated by identifying trip generation (sources of trips such as commute to work, shopping, home), distribution (where trips go), mode choice (automobile, bus), and traffic assignment (uses this information to generate trips on various highway networks). For this project, travel demand was forecast for 2030. Because travel demand is forecast based on assumptions about land use and growth, additional information is provided in this section on land use and growth.

1.3.1 Travel Demand

Volumes for current average daily traffic (two-way traffic in number of vehicles per day, or ADT) were based on traffic counts taken in November 2001. ADT volumes in 2001 were 16,100 between US 287 and CR 13C, and ranged from 13,400 to 14,000 between CR 13C and the I-25 interchange. Existing conditions are represented in this study using 2001 traffic counts.

To investigate 2030 travel conditions, a “best fit” linear regression line for a data set that included past, present, and future (2025) ADT was applied. Additional information on 2030 traffic can be found in the *Traffic Report: State Highway 402 Environmental Assessment from US 287 (MP 0.00) to I-25 (MP 4.00)* prepared by J.F. Sato and Associates in July 2004.

The 2030 traffic projections identify ADT volumes ranging from 36,700 between US 287 and CR 13C to 37,150 between CR 13C and the I-25 interchange on a typical weekday during a school year. These calculations indicate a 128 percent increase in traffic volumes in the western portion of the project area near the intersection with

US 287, and a 170 percent increase in the eastern portion of the project area near the I-25 interchange.

Increases in 2030 traffic result from local and regional population growth and travel demands along SH 402. Travel projections for SH 402 are increasing at a higher rate than the area population as one new person generates more than one new trip. In addition to population projections, traffic forecasts for SH 402 include NFRT & AQPC, Larimer County, and city of Loveland planning assumptions, area employment opportunities, retail development patterns, and through traffic movements.

Traffic volumes are expected to increase 128 percent in the western portion of the project area near the intersection with US 287, and 170 percent in the eastern portion of the project area near the I-25 interchange.

Table 1-2 and Table 1-3 show LOS values for intersections and through traffic for the existing highway (No Action Alternative). LOS values were determined as follows. Future turning movement counts were calculated using the SIMTRAFFIC model and calibrated from traffic counts taken in November 2001. Average delay values for intersections were also obtained from the SIMTRAFFIC model of the traffic analysis software. The SYNCHRO HCM (Highway Capacity Manual) model then uses the average delay to define LOS for signalized and unsignalized intersections. Thus, the delay limits in HCM were used to determine LOS at the intersections and carpool lot.

The traffic composition on SH 402 includes 6 percent trucks. Of that 6 percent, two-thirds are single-unit trucks and one-third are semitrailer trucks. The percentage of truck traffic indicates that this highway is used to transport goods, as well as people. Peak travel times are 7:00 AM to 8:00 AM and 4:00 PM to 5:00 PM. The morning peak hour direction is eastbound, and the afternoon peak direction is westbound. Figure 1-3 illustrates 2001 and 2030 through traffic (ADT), through traffic LOS, and intersection LOS.

Table 1-2. Intersection LOS, No Action Alternative

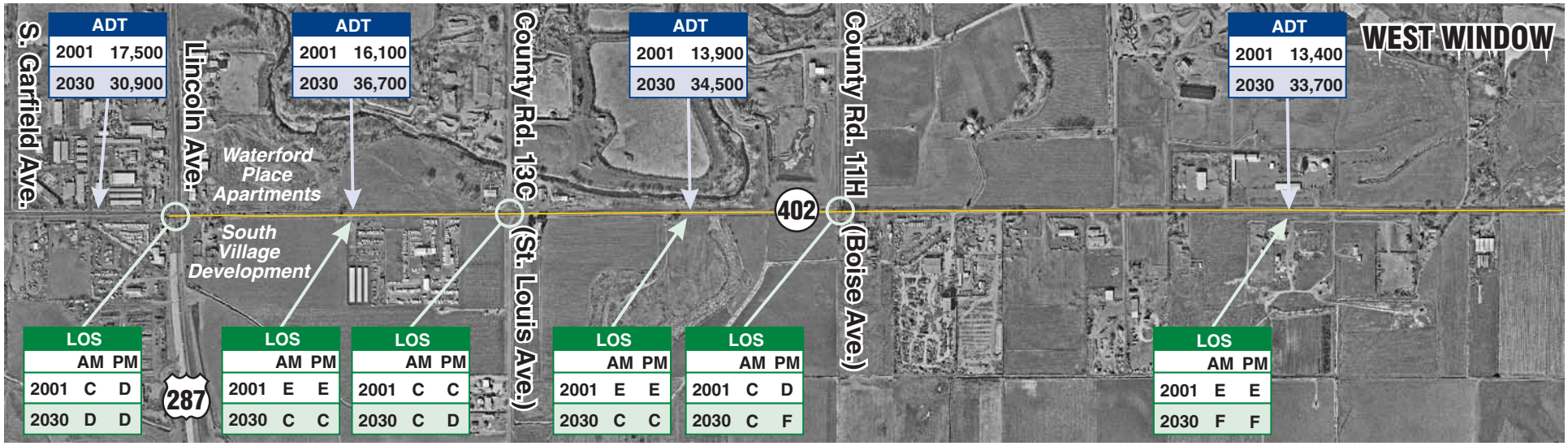
Intersection	Existing 2001		2030	
	AM	PM	AM	PM
US 287 (Lincoln Avenue)	C	D	D	D
CR 13C (St. Louis Avenue)	C	C	C	D
CR 11H (Boise Avenue)	C	D	C	F
CR 9E	D	C	F	F
CR 9	A	B	F	F
Heron Drive/Olsen Drive	B	B	B	B
CR 7 (Charlotte Court)	A	A	F	F
Carpool Lot Access Road	A	A	A	F

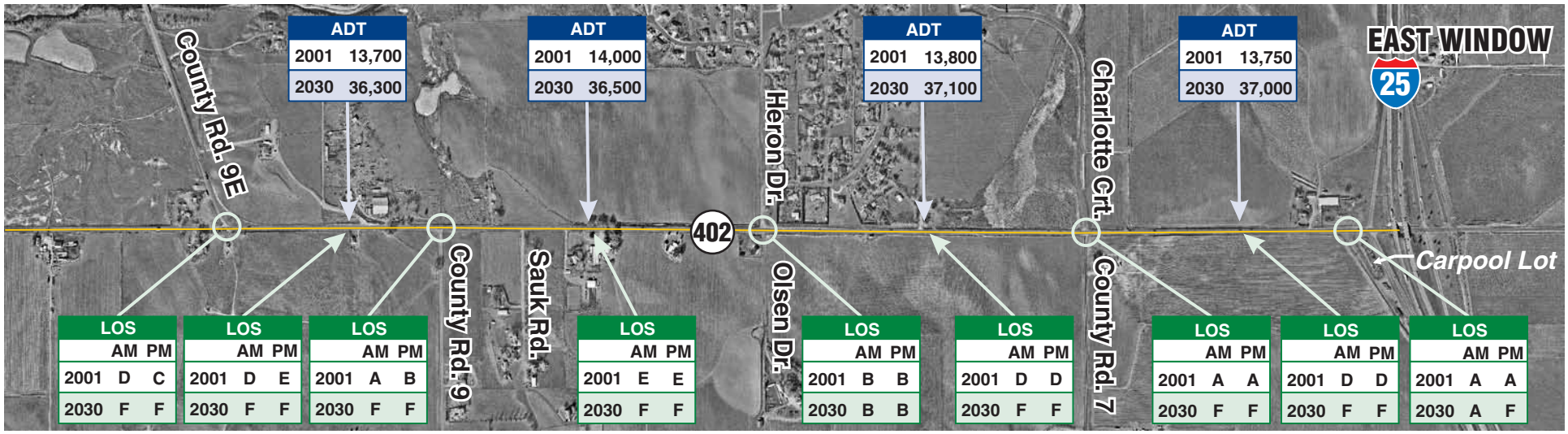
Table 1-3. Through Traffic LOS, No Action Alternative

Highway Segment	Existing 2001		2030	
	AM	PM	AM	PM
US 287 to CR 13C	E	E	C	C
CR 13C to CR 11H	E	E	C	C
CR 11H to CR 9E	E	E	F	F
CR 9E to CR 9	D	E	F	F
CR 9 to Heron Drive	E	E	F	F
Heron Drive to CR 7	D	D	F	F
CR 7 to Carpool Lot Access Road	D	D	F	F

As illustrated in Table 1-2, the intersections with the worst performance for 2001 (LOS C or D) were US 287, CR 13C, CR 11H, and CR 9E. As illustrated in Table 1-3, through traffic operated between LOS D and E along the entire length of SH 402 for year 2001.

Without improvements to SH 402 east of CR 13C, by 2030, most intersections and through traffic east of CR 11H would experience LOS F during both morning and afternoon peak periods.





N
W E
S

0 1000 2000 3000 4000
Approximate Scale in Feet

ADT Average Daily Traffic
LOS Level of Service
Through Traffic Data
Intersection Data

DOT SH 402 Environmental Assessment

U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

2001 & 2030 Average Daily Traffic (ADT), Through Traffic Level of Service (LOS), and Intersection LOS

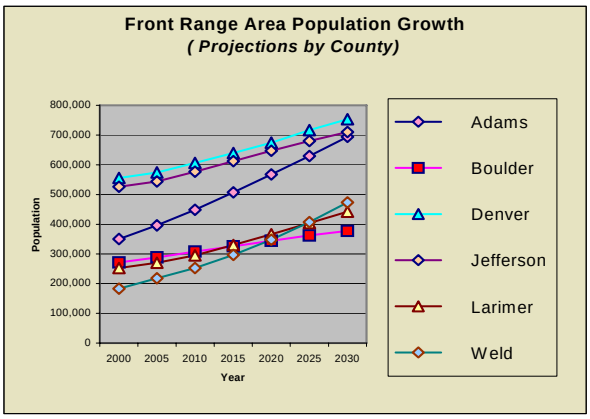
FIGURE 1-3

1.3.2 Land Use and Growth

Population Growth Rates

Land use patterns influence the travel demand on transportation corridors, and future land use plans shape how each corridor will be maintained and potentially improved. Projected land use for a corridor is taken into account when examining the need for transportation improvements. The following discussion addresses growth and development expected in the SH 402 project area regardless of improvements to SH 402 between US 287 and the I-25 interchange.

As with other Colorado Front Range counties, Larimer County has experienced substantial growth since the 1970s. County population grew 66 percent between 1970 and 1980, then slowed to 25 percent growth rate between 1980 and 1990, and rose again to 35 percent between 1990 and 2000. While state forecasts for Larimer County population (Colorado Department of Local Affairs [DOLA], Demography Section, 2003) show a conservative 75 percent growth between 2000 and 2030 (25 percent every 10 years), actual growth could be as much as 100 percent (closer to the current trend of 35 percent every 10 years). See Figure 1-4.



Source: DOLA 2003

Figure 1-4. Front Range Area Population Growth

The city of Loveland has also experienced tremendous growth since the 1970s. Population grew 86 percent between 1970 and 1980, 24 percent between 1980 and 1990, and 35 percent between 1990 and 2000. City of Loveland population trends are estimated to follow or exceed county trends between 2000 and 2030.

For additional information on population and related topics, see *Section 3.1.* A detailed discussion of land use can be found in *Section 3.4*.

Land Use Plans and Policies

Local planners anticipate population and employment growth in this area. In the 1980s an Intergovernmental Agreement (IGA) between Larimer County and the city of Loveland resulted in development of the Loveland Growth Management Area (GMA). The primary purpose of the GMA is to focus urban development adjacent to cities and towns in areas that could be annexed. The IGA was updated in January 2004.

In 1997 the SH 402 study area was categorized as rural land in the *Larimer County Master Plan and Partnership Land-Use System* (November 1997), and had not yet been incorporated into the GMA. However, the *Loveland, Colorado 1994 Comprehensive Master Plan* identified SH 402 as part of the GMA and as an important arterial associated with potential plans for a neighborhood activity center. The *IGA for Growth Management* between the city of Loveland and Larimer County (January 12, 2004) also includes SH 402 in the GMA boundaries. Additional information on specific land uses in the SH 402 study area is located in *Section 3.4.*

Transportation Plans

SH 402 is included in the STIP and is listed as a priority project in the 2030 RTP.

The 2030 RTP also shows SH 402 as a four-lane arterial with signalized intersections at CR 11H (Boise Avenue), CR 9, and CR 7 (Charlotte Court). This plan also shows SH 402 with on-street bikeways and as a proposed transit route. SH 402 is an integral part of the area's transportation network, providing linkage between I-25 and the city of Loveland to the north, and to businesses and residences between and to the west of I-25 and US 287.

A carpool lot with approximately 88 parking spaces, including 4 handicap spaces, is located on the southwest corner of the SH 402 and I-25 interchange. This lot is not currently serviced by public transportation but is used by private carpools and vanpools. Vehicle counts taken in October 2001 indicated approximately 40 to 60 vehicles per day at the carpool lot during the week.

The *City of Loveland 2020 Transportation Plan* includes the SH 402 and I-25 interchange as a transit center that is "an important feeder point for south Loveland residents using regional transit in the I-25 corridor and seeking access to planned commercial and employment facilities to be developed in the vicinity of the interchange."

CDOT is currently investigating improvements to US 34, a parallel highway approximately 2 miles to the north. The two parallel corridors provide a different means of connectivity in the area and serve different markets. US 34 serves city of Loveland and adjacent commercial-business development, as well as provides a direct route to Rocky Mountain National Park to the west, while SH 402 is a primary east-west route for residents and businesses located along the highway and further to the west. High morning and evening peak traffic on SH 402 indicates that this highway is also used heavily by commuters for access to I-25. Continued development in the area around SH 402 will only increase the need for improvements to the highway, regardless of whether improvements to US 34 are pursued.

1.4 Photographic Essay

Figure 1-5 provides a descriptive photographic essay of the SH 402 study area.

View east along SH 402 at US 287

View east just west of CR 13C (St. Louis Avenue)

Cattail marsh and agricultural land along SH 402

DOT SH 402 Environmental Assessment

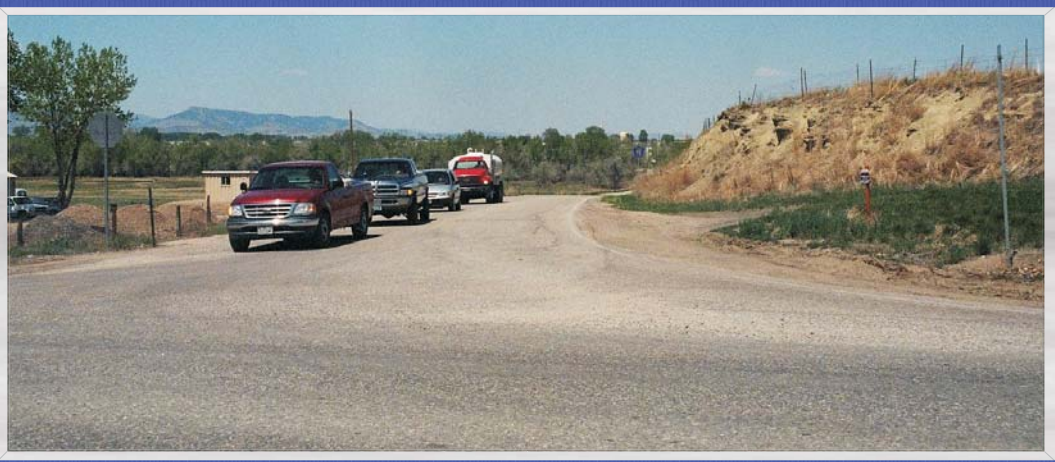
SH 402 to the I-25 Interchange:
Photographic Essay (from west to east)

FIGURE 1-5

U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

Big Thompson River east of CR 13C (St. Louis Avenue)



View north at CR 9E

Irrigation ditch A, north of SH 402

DOT SH 402 Environmental Assessment

SH 402 to the I-25 Interchange:
Photographic Essay (from west to east)

FIGURE 1-5 (cont.)

U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

View east toward the I-25 interchange

Carpool lot in the SW quad of I-25 and SH 402

DOT SH 402 Environmental Assessment

SH 402 to the I-25 Interchange:
Photographic Essay (from west to east)

FIGURE 1-5 (cont.)

U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

Chapter 2

Alternatives

Chapter 2. Alternatives

This chapter describes the alternatives considered and the analysis conducted for State Highway 402 (SH 402) between United States Highway 287 (US 287) and the Interstate 25 (I-25) interchange. Principal concepts include:

- alternatives identification
- alternative modes of transportation
- alternatives development
- screening process
- screening results
- alternatives retained for study

2.1 Alternatives Identification

Scoping was initiated at the start of the Environmental Assessment (EA) process to identify issues and concerns related to SH 402 and its potential improvement. These issues and concerns were used to:

- develop project purpose and need
- develop alternatives to examine
- identify screening criteria to apply
- identify alternatives to retain for further study

A detailed agency and public involvement process was initiated during project scoping. *Chapter 6 – Public Involvement* provides specific information about this process, which included:

- agency meetings
- public workshops
- project website
- factsheets and postcards
- comment sheets
- mailings to an extensive list

2.2 Alternative Modes of Transportation

Alternative modes of transportation were considered during the scoping process. Across the country and in Colorado, transportation planning entities have added emphasis to examining ways to increase transit use and reduce reliance on the automobile. The North Front Range Transportation and Air Quality Planning Council (NFRT & AQPC) has included the goal of transferring some single-occupancy vehicle trips made in the area to a different mode of transportation (pedestrian, bicycle, carpool, transit, or vanpool) in its Regional Transportation Plan. For the SH 402 corridor, the alternative mode of transportation known as SMARTTrips™ carpooling and vanpooling is currently used. Planned alternative modes of transportation include extension of local bus service into the SH 402 corridor and provision for bicycle lanes as a part of the 10-foot shoulder of widening alternatives (described below). Implementation of all of these alternative modes depends on mobility and safety improvements and on meeting 2030 travel demand on SH 402.

2.2.1 Bus

Although no local bus routes currently travel east of US 287 on SH 402, the *City of Loveland 2020 Transportation Plan* (July 18, 2000) calls for extension of local bus service (City of Loveland Transit, COLT) into this corridor with a transit center. COLT is managed by the city, and as such is considered a constant among the alternatives.

SMARTTrips is a regional public program designed to reduce automobile dependency and promote the use of alternative transportation in northern Colorado. SMARTTrips is a division of the NFRT & AQPC. The program includes marketing bus transit service to northern Colorado communities. SMARTTrips encourages residents to leave their cars at home at least one day a week to help preserve air quality, decrease traffic congestion, conserve fuel, and promote better health. The program's regional office is located at the NFRT & AQPC headquarters in the city of Fort Collins. The cities of Loveland, Fort Collins, and Greeley are the major participants in the SMARTTrips program. The impact of this program on SH 402 travel demand has not been calculated.

2.2.2 Bicycle/Pedestrian

Currently no bicycle or pedestrian trails parallel SH 402 between US 287 and the I-25 interchange. The roadway's narrow shoulders are inconsistent and not conducive to either use. Ten-foot shoulders are included in the rural cross section for the action alternatives to encourage bicycle/pedestrian use. In addition, a sidewalk is included for the urban section of the project. The sidewalk will be attached in areas where the right-of-way reduction avoids direct impact on a structure (such as a home or business). SMARTTrips promotes bicycling programs that could be applicable for future use in the SH 402 corridor.

2.2.3 Carpool/Vanpool

The NFRT & AQPC and northern Colorado Front Range communities support carpooling and vanpooling through SMARTTrips. The carpool lot at the southwest quadrant of the SH 402 and I-25 interchange has been used as a meeting place for program participants. Other groups and individuals use the lot independently of SMARTTrips.

2.2.4 High Occupancy Vehicle Lanes/Rapid Transit/Commuter Rail

High occupancy vehicle (HOV) lanes were examined for potential inclusion in the range of alternatives for SH 402 improvements. However, these lanes are generally better suited to freeway or expressway facilities with controlled access than they are to arterial roads and streets with numerous access points. Rapid transit and commuter rail systems work well in areas with a large, high-density population base. Because SH 402 between US 287 and the I-25 interchange is not a freeway or expressway and does not have a large, high-density population base, HOV lanes, fixed guideway rapid transit, or commuter rail do not meet the needs of the traveling public on this highway.

The Colorado Department of Transportation (CDOT) does not have plans for HOV lanes, rapid transit, or commuter rail in this corridor, nor does 2030 travel demand justify this level of improvement.

2.2.5 Conclusion

After examination of existing and planned carpooling and vanpooling programs, bus transit service, and bike/pedestrian systems in the vicinity of SH 402, it was concluded that as stand-alone solutions, none of these alternative transportation modes would measurably contribute to a reduction in highway traffic along SH 402 by the 2030 design year. Therefore, no alternative modes of transportation as stand-alone solutions were examined further. However, alternative transportation modes were retained to enhance an action alternative that would support the project purpose and need.

2.3 Alternatives Development

The purpose and need for this project are to improve mobility and safety while addressing requirements for 2030 travel demand and growth on the existing SH 402 between US 287 and the I-25 interchange. Five alternatives were identified initially: a No Action Alternative and four action alternatives. As required by the Council on Environmental Quality (CEQ), the No Action Alternative was considered throughout the EA as a viable alternative.

All action alternatives include widening to four through lanes with associated auxiliary and turn lanes, plus a bike lane. A 25-foot utility corridor easement along the south side of the highway is also included for all action alternatives. Proposed COLT service will operate along SH 402 regardless of the alternative selected. Detailed discussions of alternative cross sections and alignments follow.

- Alternative #1: hold the centerline and widen on both the north and south sides
- Alternative #2: hold the north edge of the right-of-way and widen on the south side
- Alternative #3: hold the south edge of the pavement and widen on the north side
- Alternative #4: Meander Alternative

2.3.1 Action Alternative Highway Cross Sections

The Rural and Urban Arterials category from the American Association of State Highway and Transportation Officials (AASHTO) Design Guide applies to SH 402. According to AASHTO (AASHTO *Green Book*, 2004, fifth edition), rural and urban arterials and their auxiliary facilities (turning lanes, intersections, and interchanges) should generally be designed for level of service (LOS) C. However, LOS D is more appropriate in heavily developed sections of metropolitan areas. The section of SH 402 between US 287 and CR 13C (St. Louis Avenue) has already been partially constructed and will meet AASHTO requirements. The design goal for SH 402 from US 287 to CR 13C is LOS D, with LOS C for the rest of the corridor. This also complies with city of Loveland transportation plan requirements.

Urban Cross Section

An urban cross section has been developed and partially built from US 287 east to CR 13C; the interim condition will remain until development on the south side of SH 402 is constructed. Developers constructed this section in coordination with the city of Loveland and CDOT. The 175-foot right-of-way includes:

- 18 to 26 feet set aside for a raised median and left turn lane in the center of the highway
- four 12-foot general-purpose travel lanes (two in each direction)
- two 7-foot bike lanes (one in each direction)
- two 12-foot auxiliary lanes (one in each direction)
- two 6-foot sidewalks separated from the highway by approximately 10 feet (where space permits)
- curb and gutter
- 25-foot utility corridor easement along the south side of the highway[1]

This cross section is the standard for four-lane arterial highways in the city of Loveland. Design speed for the urban section of SH 402 (US 287 to CR 13C) is 45 miles per hour (mph), with a posted speed of 40 mph. (CDOT has directed that posted speeds be 5 mph lower than the design speed.) Figure 2-1 illustrates the proposed urban cross section associated with all action alternatives.

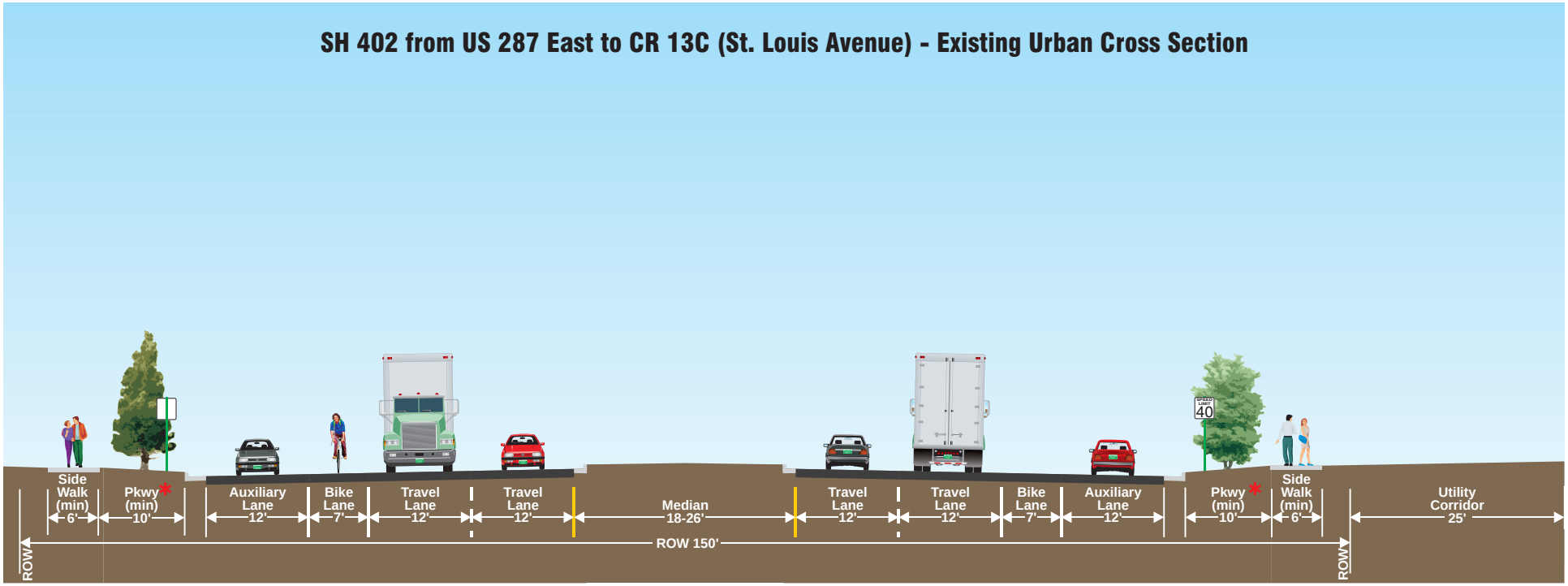
Rural Cross Section

The rural cross section is from CR 13C east to the I-25 interchange. The 160- to 175-foot right-of-way includes:

- four 12-foot general-purpose travel lanes (two in each direction)
- 16-foot painted median that serves as a continuous left turn lane
- two 10-foot shoulders that include a 7-foot bike lane separated from the highway by 3 feet
- 25-foot utility corridor easement on the south side of the highway[1]

Right-of-way for the rural cross section of the action alternatives is sufficient to allow for a future change in classification from rural to urban, should this be warranted. Projected 2030 traffic volumes do not indicate the need for an urban cross section. Design speed for the rural section of SH 402 would be 55 mph, with a posted speed of 50 mph. Figure 2-2 illustrates the proposed rural cross section associated with all action alternatives.

[1]The 25-foot utility corridor easement on the south side is proposed to accommodate existing south side utilities and new utilities. Utilities currently on the north side of SH 402 will not be moved into the 25-foot utility corridor easement along the south side. These utilities will be relocated further north and will remain within the SH 402 footprint defined by the 160-foot to 175-foot cross section.



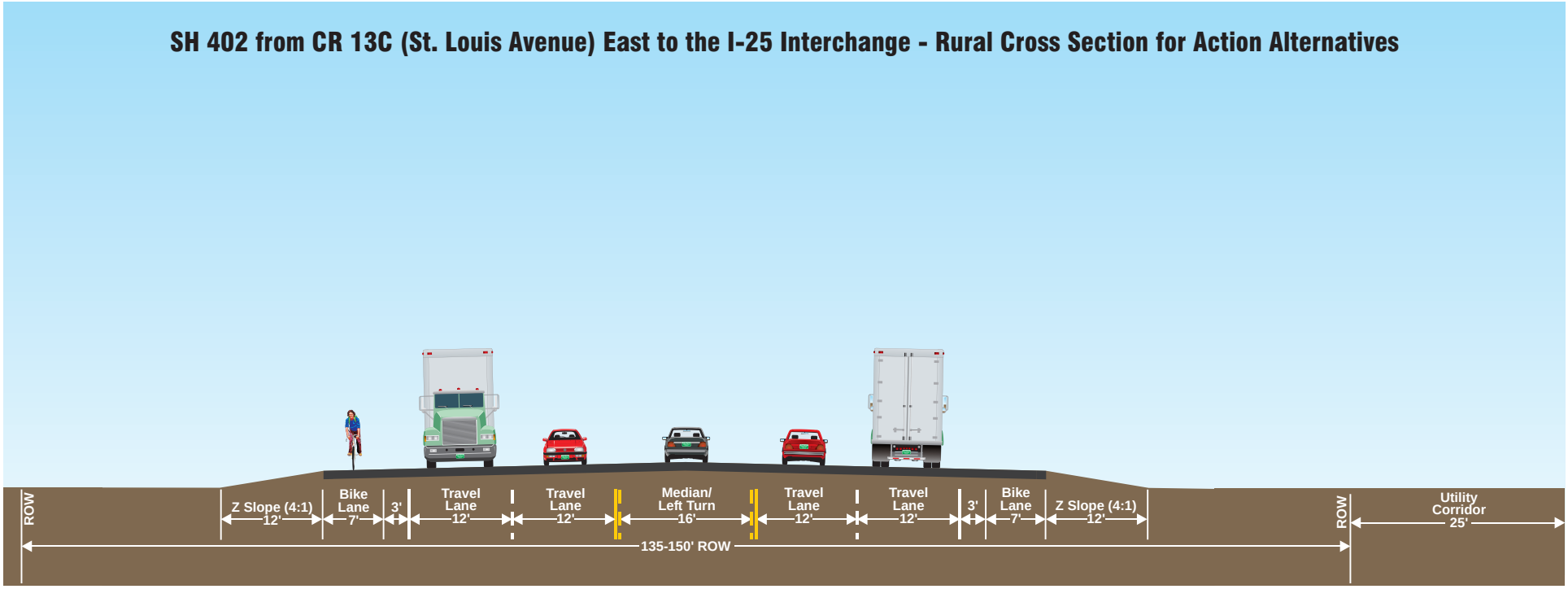
* Where space permits

U.S. Department of Transportation
Federal Highway Administration

DOT
DEPARTMENT OF TRANSPORTATION

DOT SH 402 Environmental Assessment

SH 402 from US 287 East to CR 13C (St. Louis Avenue)
Existing Urban Cross Section
FIGURE 2-1



U.S. Department of Transportation
Federal Highway Administration

DOT
DEPARTMENT OF TRANSPORTATION

JFS&A
J. F. SATO AND ASSOCIATES

DOT SH 402 Environmental Assessment

SH 402 from CR 13C (St. Louis Avenue) East to the I-25 Interchange
Rural Cross Section for Action Alternatives
FIGURE 2-2

Cross Section Development

The right-of-way originally considered was 225 feet (200-foot right-of-way and a 25-foot utility corridor). During alternatives development and screening, the cross section was narrowed to respond to public and agency comments, while maintaining desired design characteristics.

Conceptual design for all action alternatives was based on achieving LOS D at urban intersections, LOS C at rural intersections, and LOS C for through traffic for 2030. LOS would meet these goals in 2030 if any of the action alternatives were implemented. During the morning peak hour, only the intersection at US 287 will experience LOS D. The US 287 and CR 13C intersections will both reach this LOS during the afternoon peak hour. All other intersections would operate at LOS C or better, and through sections would operate at LOS C. Note that in the urban section the bicycle lane is shown between the auxiliary lane and the travel lanes. The auxiliary lane drops off the rural section for a smooth transition of the bicycle lane to a position outside the travel lanes. The location of the bicycle lane might shift in final design.

Access

If an action alternative is selected, CDOT will work with affected property owners to maintain or bring access onto SH 402 into compliance with the State Highway Access Code. *Chapter 3 – Impacts and Mitigation Measures, Section 3.2* includes additional access-related discussions.

2.3.2 Action Alternative Descriptions

Alternative #1 – hold the centerline and widen on the north and south sides

The Alternative #1 design widened SH 402 evenly on both sides of the existing centerline.

Alternative #2 – hold the north edge of the right-of-way and widen on the south side

Alternative #2 proposed to hold the north edge of right-of-way constant, meaning that this design required property acquisitions only from the south side of the road. To analyze impacts from an alternative that widens only the south side of the roadway, Alternative #2 held the right-of-way constant and shifted all new right-of-way requirements to south of the existing highway.

Alternative #3 – hold the south edge of the pavement and widen on the north side

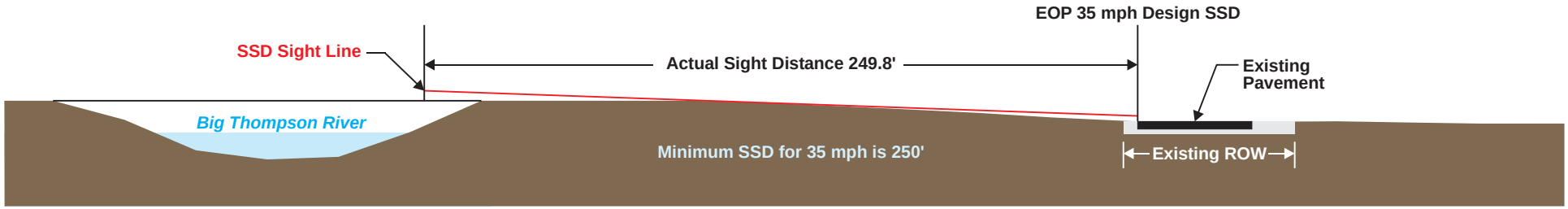
Holding the south edge of the pavement would widen the highway to the north and move the signalized intersection at SH 402 and CR 13C farther to the north where a bridge crosses the Big Thompson River. This would interfere with driver ability when headed south on CR 13C to see the intersection, including traffic stopped at a red light. When the south edge of the pavement was held, the sight distance (how far ahead a driver can see from the road) at the intersection with CR 13C was reduced to 167 feet, and the minimum sight distance required by AASHTO is 250 feet. See Figure 2-3. The bridge currently meets safety requirements for sight distance on southbound CR 13C for the 35 mph posted speed limit.

The elevation of the bridge is 12 feet, which must be maintained because of the freeboard needed to meet floodplain requirements. To maintain the current sight distance, the road could not be aligned any further to the north.

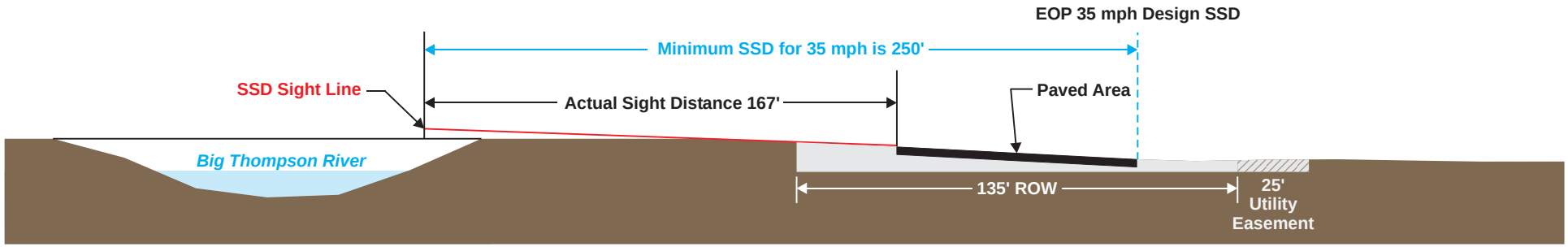
Alternative #4 – Meander Alternative (alignment that shifts between the north and south sides of the current highway alignment)

Alternative #4, the Meander Alternative, shifts between the north and south sides of the current highway alignment, minimizing impacts on the human and natural environments while meeting design criteria for a four-lane highway in this corridor.

Individual constraints in the study area that guided the development of the Meander Alternative were identified during project scoping, then mapped, and used to develop the meander alignment. Versions of the Meander Alternative were analyzed to identify the best-fit alignment that minimized impacts while meeting design criteria.



Existing Cross Section



Alternative #3 Cross Section

0 25 50 75
Approximate Scale in Feet

EOP = Edge of Pavement
SSD = Stopping Sight Distance

U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

DOT SH 402 Environmental Assessment

SH 402 from US 287 East to CR 13C (St. Louis Avenue)
St. Louis Ave. Stopping Sight Distance Cross Sections
FIGURE 2-3

2.4 Screening Process

2.4.1 Agency and Public Involvement

The following agency and public involvement activities were part of the screening process. *Chapter 6 – Public Involvement* provides additional details on the public involvement program and participants.

- Screening criteria and initial screening results were reviewed and agreed upon by local, state, and federal agencies at Agency Status Meetings in October 2001 and August 2002. Initial screening results were presented to the public in September 2002.
- The four initial alignments with a 225-foot right-of-way were evaluated and the results presented to the public and agencies.
- To respond to agency and public comment in August and September 2002 and reduce potential impacts on the surrounding environment and property owners, the project team refined the action alternatives to a narrower 160- to 175-foot right-of-way.
- Screening results were presented to the agencies in February 2003 and to the public in April 2003 for feedback.

2.4.2 Screening

Screening criteria were developed based on purpose and need elements, potential human and community resource impacts, natural environment impacts, and public and agency comments.

The action alternative alignments were evaluated at widths of 160 to 175 feet. Screening was conducted for the action alternatives extending from US 287 to I-25. In 2006, after screening was completed, area developers constructed the portion of SH 402 between US 287 and CR 13C. The constructed design is consistent with future potential improvements.

Screening for Purpose and Need

Screening criteria were developed to determine whether each alternative met the purpose and need for the project. Detailed discussion of purpose and need is found in *Chapter 1 – Purpose and Need*.

As a result of screening for purpose and need elements, Alternative #3 was eliminated during screening because of sight distance safety issues in the vicinity of CR 13C (see discussion on page 2-6).

Three action alternatives (#1, #2, and #4) met the project purpose and need, and along with the No Action Alternative, were carried forward for additional analysis.

Screening for Human Resources and Natural Environment

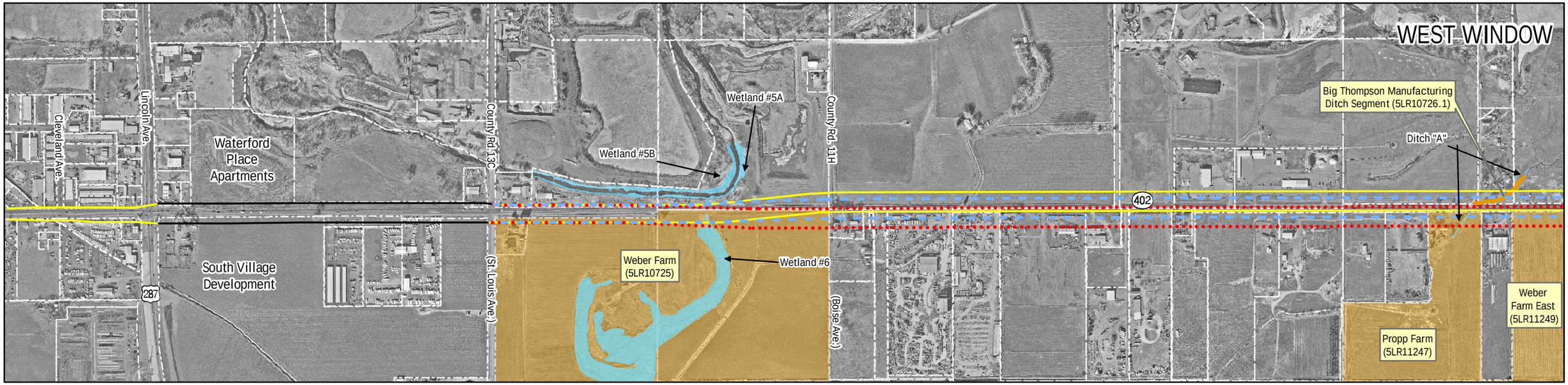
Initially, a set of resources was identified for screening; however, for some resources, there was a lack of presence in the corridor or a lack of differentiation of impacts due to the similarities of Alternatives #1, #2, and #4. The following resources were not used to screen the remaining alternatives for the reasons mentioned above:

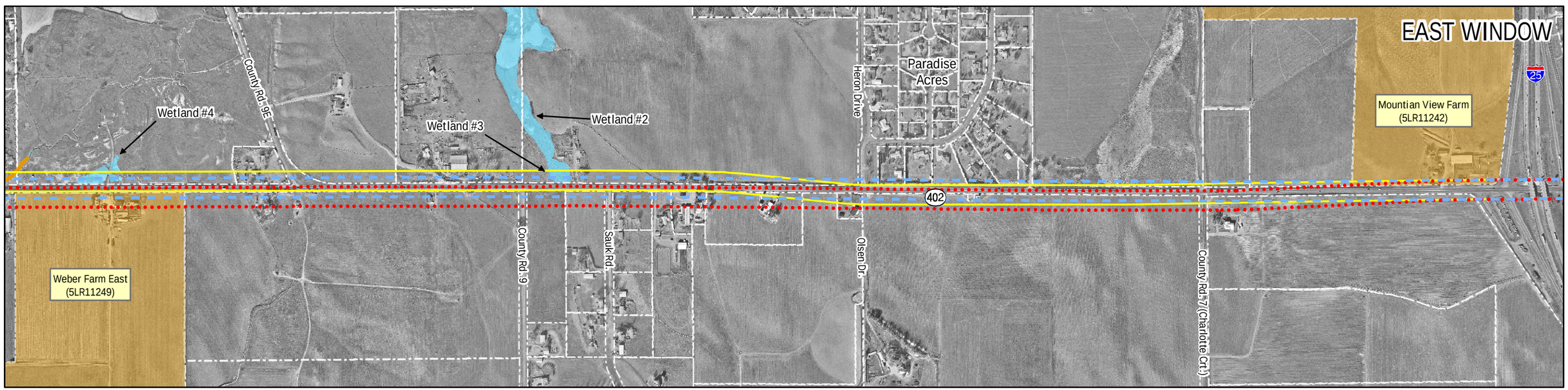
- Threatened and Endangered Species and/or Potential Habitat
- Vegetation and Wildlife Impacts
- Potential Hazardous Materials Sites
- Floodplain
- Construction Related: traffic issues and estimated construction costs

Resources retained for screening were:

- Wetlands
- Right-of-Way and Relocations
- Historic Properties

Figure 2-4, an aerial photo with parcel boundaries, illustrates the alignments of the three alternatives discussed below, including identification of wetlands and historic properties within the corridor.





LEGEND

- Existing Right-of-Way
- Property Parcel Boundaries
- Alternative #1 (Hold Centerline) Right-of-Way
- Alternative #2 (Hold North Edge) Right-of-Way
- Alternative #4 (Meander) Right-of-Way (Preferred)
- Historic Properties
- Historic Ditches
- Wetlands

N W E S

SCALE - 1:9,000 or 1" = 750'

0 375 750 1,500 Feet

SOURCE: 2001 1/2-foot resolution aerial photography and parcel information provided by the City of Loveland. Wetland information obtained through field observation and aerial photo interpretation by JFSA. Historic information provided by WCRM. Map produced May 25, 2007 by JFSA.

U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

DOT SH 402 Environmental Assessment

Alternatives #1, #2, and #4 with Wetlands, Historic Properties and Parcel Boundaries.

FIGURE 2-4

Map Document: (H:\projects\402\2007_mxd\EA_FINAL_SIGNATURE\sh402_Alternatives_11x17_070525.mxd)
5/29/2007 -- 10:41:03 AM

This page intentionally left blank.

Wetlands. Direct impacts on both jurisdictional and nonjurisdictional wetlands were initially assessed on the basis of aerial photography and site visits. Alternative #4 – Meander Alternative had the highest number of wetlands impacts at just under 0.9 acres.

Table 2-1 shows estimated total acres of wetlands affected by the alternatives.

Table 2-1. Wetland Impact Estimates

Alternative	Wetland Acreage
#1 – Hold Centerline	0.41
#2 – Hold North Edge	0.01
#4 – Meander	0.89

See *Chapter 3, Section 3.19,* for a detailed discussion of wetlands and mitigation opportunities.

Right-of-Way and Relocations. The right-of-way needed from property owners for each alternative was determined from conceptual design. The potential number of residential and commercial acquisitions within 10 feet of the right-of-way was also included in the estimate of potential relocations. For additional discussion, see *Chapter 3, Section 3.2*.

Table 2-2 shows the estimated number of relocations.

Table 2-2. Relocation Estimates

Alternative	Homes	Businesses
#1 – Hold Centerline	9	1
#2 – Hold North Edge	10	2
#4 – Meander	6	0

Historic Properties. Structures listed or eligible for listing on the NRHP are protected under Section 106 of the National Historic Preservation Act of 1966 as amended, and Section 4(f) of the Department of Transportation Act of 1966. Sites of local, state, or national significance must be identified and avoided where there is a prudent and feasible alternative. Section 4(f) regulations allow for use of publicly owned land in a public park, recreation area, or wildlife/waterfowl refuge, or land of a historic site of national, state, or local significance (as determined by the officials having jurisdiction over the park, recreation area, refuge, or site) only if (1) there is no feasible and prudent alternative to such use, and (2) the project includes all possible planning to minimize harm. For additional discussion, see *Chapter 3, Section 3.11,* and *Chapter 4.*

Five NRHP eligible historic properties were identified in the corridor, as follows:

- Weber Farm
- Weber Farm East
- Big Thompson Manufacturing Ditch
- Propp Farm
- Mountain View Farm

Due to the potential for all three action alternatives to affect all five of these properties, each alternative was re-examined under Section 106 and Section 4(f). General impacts on the Weber Farm, Big Thompson Manufacturing Ditch, and Mountain View Farm are expected to be the same order of magnitude for Alternatives #1, #2, and #4.

Impacts (in acres) on the Weber Farm East and Propp Farm vary as noted in Table 2-3.

Table 2-3. Impacts on Weber and Propp Farms (acres)

Alternative	Weber Farm East	Propp Farm
#1 – Hold Centerline	1.2	0.4
#2 – Hold North Edge	3.4	1.0
#4 – Meander	None	None

2.5 Screening Results

The information presented in the previous section was used to determine which alternatives should progress to the next stage of the EA for in-depth investigation and ultimate selection of a preferred alternative. Input from local, state, and federal agencies and the public, was considered in the decision.

Although Alternatives #1 and #2 resulted in less impact on wetlands than Alternative #4, both

resulted in higher numbers of relocations and more NRHP eligible historic properties affected. As a result, Alternatives #1 and #2 were eliminated from detailed study in the EA. Alternative #4 – the Meander Alternative and the No Action Alternative were advanced for detailed analyses.

2.6 Alternatives Retained for Study in the EA

2.6.1 Alternative #4 – Meander Alternative (alignment that shifts between the north and south sides of the current highway alignment)

The Meander Alternative consists of a 175-foot urban section between US 287 and CR 13C that is being constructed as development occurs in this area (Figure 2-1), a 160-foot section in the vicinity of the Big Thompson River, and a 175-foot rural section east of the Big Thompson River to the I-25 interchange (Figure 2-2). Cross-section variation is an effort to reduce encroachment into the Big Thompson River floodplain. This is in direct response to agency comment.

During the public involvement activities, the majority of commenters preferred this alternative, recognizing that the design minimized right-of-way impacts. While this alternative did not have the least impact on wetlands, it had the fewest relocations and least number of impacts on historic properties, minimizing effects on two of the three historic properties along the south side of SH 402. This alternative was retained for further analysis.

Meander Alternative Alignment Description

Figure 2-5 illustrates the alignment of the Meander Alternative, described below.

1. Starting at the western terminus of SH 402 at US 287, the Meander Alternative would be designed to include necessary intersection improvements such as turn lanes to accommodate 2030 traffic. The section between US 287 and CR 13C has already been partially constructed and will be completed as development on the south side of SH 402 is completed. These improvements do not preclude future improvements to the remainder of SH 402.
2. East of CR 13C the alignment would shift to the south side, away from the Big Thompson River.
3. West of CR 11H (Boise Avenue) the alignment would shift back to the north side and remain there until the highway reaches Heron Drive/Olsen Drive.
4. At CR 9E, the intersection would be straightened to improve sight distance.
5. The alignment would shift slightly south again, then gradually return to the existing alignment where it ends at the I-25 interchange.

In addition to horizontal alignment shifts, the Meander Alternative would also be designed to smooth the vertical profile of the roadway near the Heron Drive/Olsen Drive, Sauk Road, CR 9, and CR 9E intersections to maintain the required sight distance along the corridor. Side slopes would also be cut back to account for the increased distance from stop signs to the highway at unsignalized intersections.

The alignment shifts are the result of an extensive design effort that focused on improving roadway mobility and safety while minimizing potential negative impacts on the surrounding human and natural environments. The Meander Alternative's limited alignment shifts were developed to meet speed and safety criteria for posted speed limits (40 to 50 mph) while taking into account driver expectations. By limiting the number of alignment shifts and maintaining the right-of-way width of 160 to 175 feet, the Meander Alternative minimized impacts on the number of relocations and historic properties while meeting the purpose and need. Additional refinements to the Meander Alternative would occur during final design.

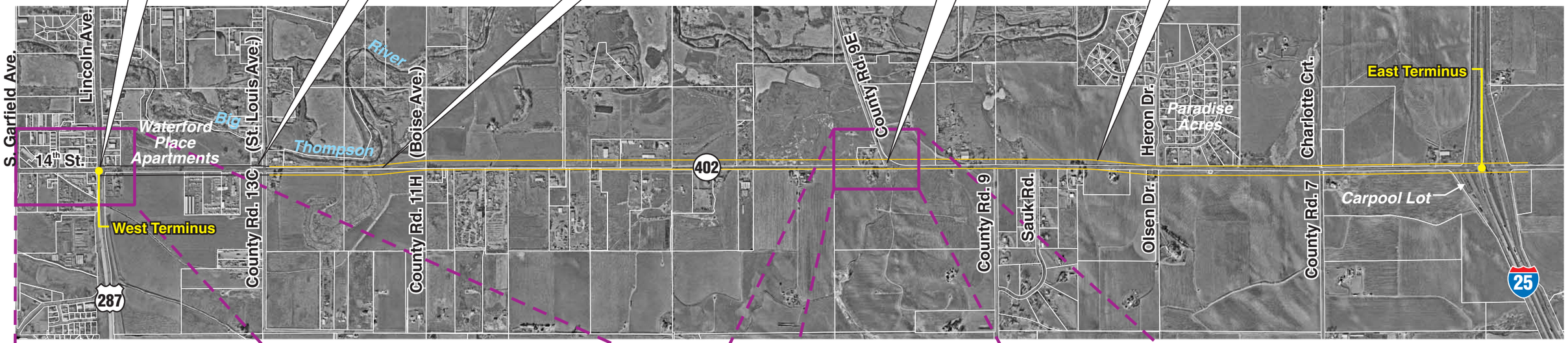
1 Starting at the western terminus of SH 402 and US 287, the Meander Alternative was designed to include necessary intersection improvements, such as turn lanes, to accommodate 2030 traffic.

2 East of CR 13C, the alignment shifts to the south side, away from the Big Thompson River.

3 West of CR 11H (Boise Avenue) the alignment shifts back to the north side and remains along the north side until Heron Dr./ Olsen Dr.

4 At CR 9E, the intersection will be straightened to improve sight distances.

5 The Meander Alternative shifts slightly south again and then gradually returns to the existing alignment where it ends at the I-25 interchange.



0 100 200 300 400 500
Approximate Scale in Feet

0 1000 2000 3000 4000
Approximate Scale in Feet

N W E S

Property Parcel Boundaries
Existing Right-of-Way
Proposed Meander Alternative Right-of-Way
Lane Details

U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

DOT SH 402 Environmental Assessment

Alignment of the Meander Alternative

FIGURE 2-5

This page intentionally left blank.

Meander Alternative Level of Service

The Meander Alternative would improve travel conditions by providing more capacity, a left turn lane in the median, and consistent shoulders. These features address mobility and safety issues, especially those associated with the difficulty of making a left turn onto or off the highway, and allowing cars to pull off to the side of the facility on the shoulders without blocking traffic.

Intersection LOS varies by intersection in the urban section. US 287 and CR 13C operate at LOS D during peak hours. All other intersections are in the rural section and would operate at LOS C or better during peak hours. Table 2-4 details LOS at intersections for the Meander Alternative.

Table 2-4. Intersection LOS, Meander Alternative

Intersection	2001		2030	
	AM	PM	AM	PM
US 287 (Lincoln Avenue)	C	D	D	D
CR 13C (St. Louis Avenue)	C	C	C	D
CR 11H (Boise Avenue)	C	C	A	C
CR 9E	C	C	C	B
CR 9	A	B	A	A
Heron Drive/Olsen Drive	B	B	A	A
CR 7 (Charlotte Court)	A	A	C	B
Carpool Lot Access Road	A	A	A	A

Table 2-5 illustrates through traffic LOS for the Meander Alternative for morning and evening peak traffic directions. LOS C would be achieved along the entire route.

Table 2-5. Through Traffic LOS, Meander Alternative

Highway Segment	2001		2030	
	AM	PM	AM	PM
US 287 to CR 13C	E	E	C	C
CR 13C to CR 11H	E	E	C	C
CR 11H to CR 9E	E	E	C	C
CR 9E to CR 9	D	E	C	C
CR 9 to Heron Drive	E	E	C	C
Heron Drive to CR 7	D	D	C	C
CR 7 to Carpool Lot Access Road	D	D	C	C

Meander Alternative Design Features

Design features needed to achieve LOS C for through traffic on SH 402 in 2030 are shown for each intersection in Figure 2-6 through Figure 2-8. These figures show the 2001 condition and the proposed 2030 intersection designs.

2.6.2 No Action Alternative

As required by the CEQ, the No Action Alternative was considered throughout the EA as a viable alternative. This alternative would result in no physical changes to the existing highway; however, standard operation (including proposed COLT bus service and SMARTTrips) and maintenance practices would continue. The existing human and natural environments bordering the highway would remain as they are, except for any development that might occur independently of improvements to the highway.

The No Action Alternative includes developer improvements between US 287 and CR 13C, which result in improved 2030 LOS for the US 287 and CR 13C intersections and through traffic LOS between US 287 and CR 11H.

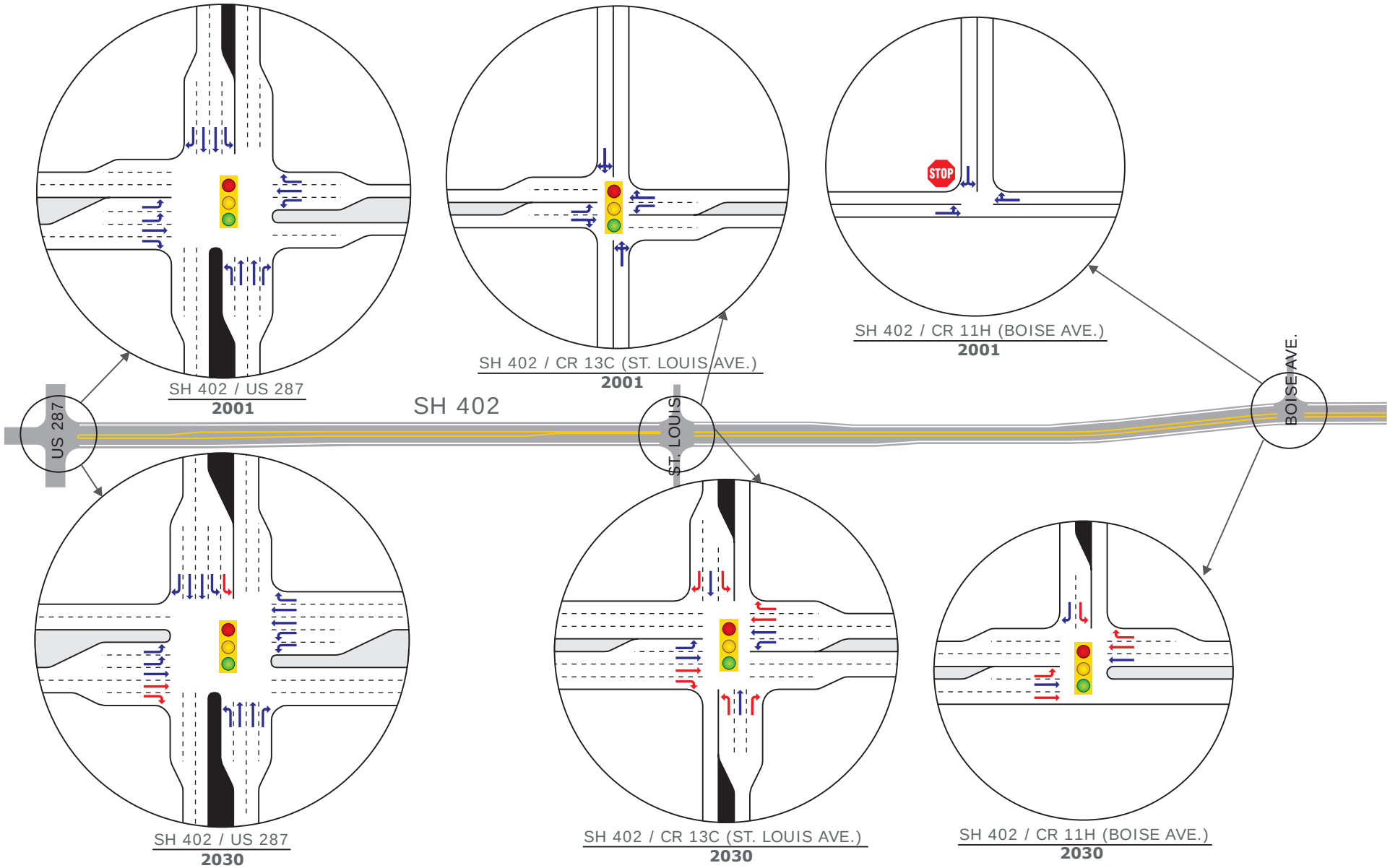
Mobility and safety concerns are expected to escalate as traffic volumes increase. As shown in Table 2-6, SH 402 traffic volumes in 2030 under the No Action Alternative will result in LOS F at most intersections east of CR 13C. The LOS for highway through segments between intersections is projected to decline to LOS F east of CR 11H in 2030 (Table 2-7). It is also expected that the difficulty of making a left turn onto or off the highway will increase with higher traffic volumes.

Table 2-6. Intersection LOS, No Action Alternative

Intersection	Existing 2001		2030	
	AM	PM	AM	PM
US 287 (Lincoln Avenue)	C	D	D	D
CR 13C (St. Louis Avenue)	C	C	C	D
CR 11H (Boise Avenue)	C	D	C	F
CR 9E	D	C	F	F
CR 9	A	B	F	F
Heron Drive/Olsen Drive	B	B	B	B
CR 7 (Charlotte Court)	A	A	F	F
Carpool Lot Access Road	A	A	A	F

Table 2-7. Through Traffic LOS, No Action Alternative

Highway Segment	Existing 2001		2030	
	AM	PM	AM	PM
US 287 to CR 13C	E	E	C	C
CR 13C to CR 11H	E	E	C	C
CR 11H to CR 9E	E	E	F	F
CR 9E to CR 9	D	E	F	F
CR 9 to Heron Drive	E	E	F	F
Heron Drive to CR 7	D	D	F	F
CR 7 to Carpool Lot Access Road	D	D	F	F



N
W E
S

Lane Additions

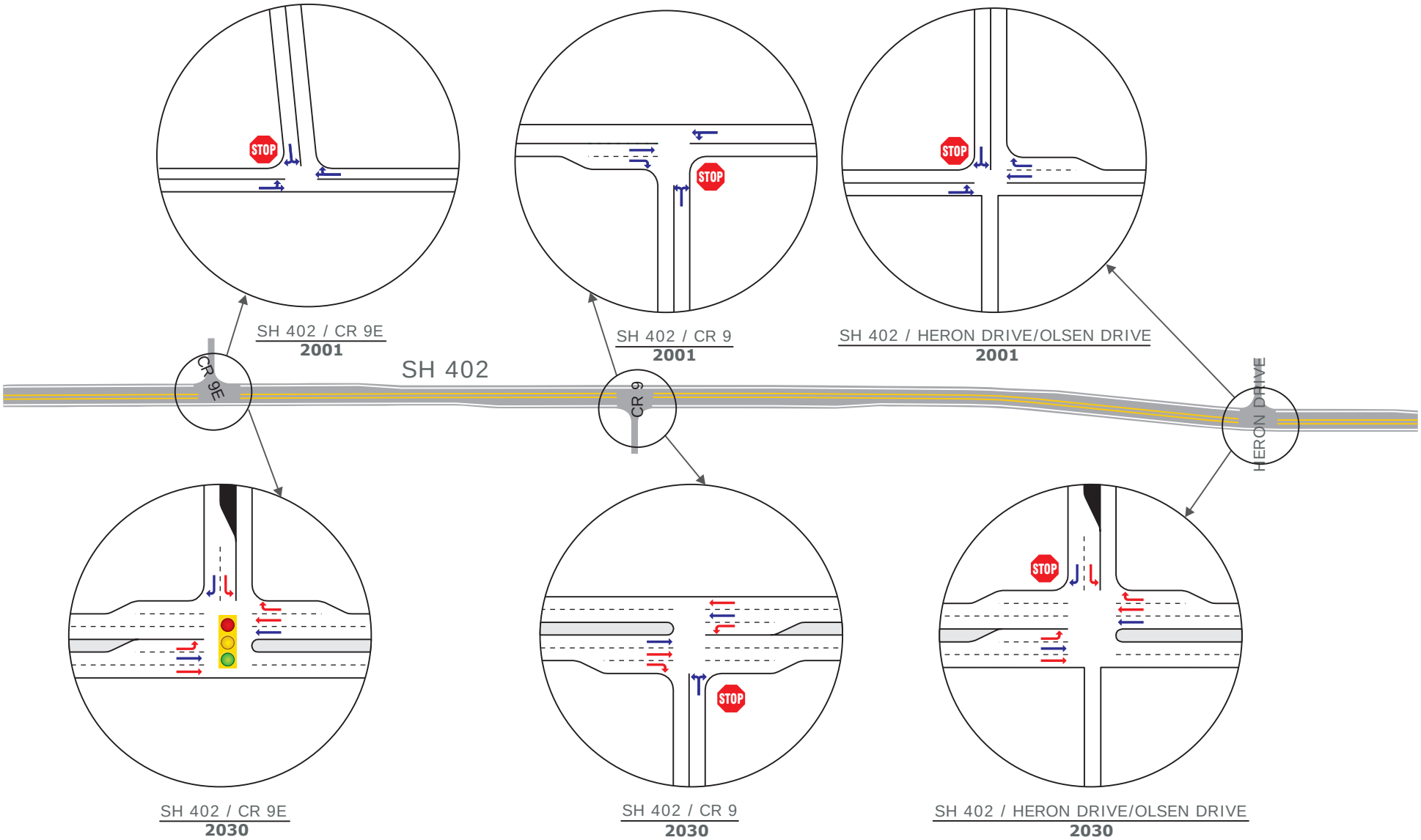
Existing Lanes

U.S. Department of Transportation
Federal Highway Administration

DOT
DEPARTMENT OF TRANSPORTATION

DOT SH 402 Environmental Assessment

Existing and Meander Alternative Intersection Configuration
US 287 to CR 11H (Boise Avenue)
FIGURE 2-6



N
W E
S

Lane Additions

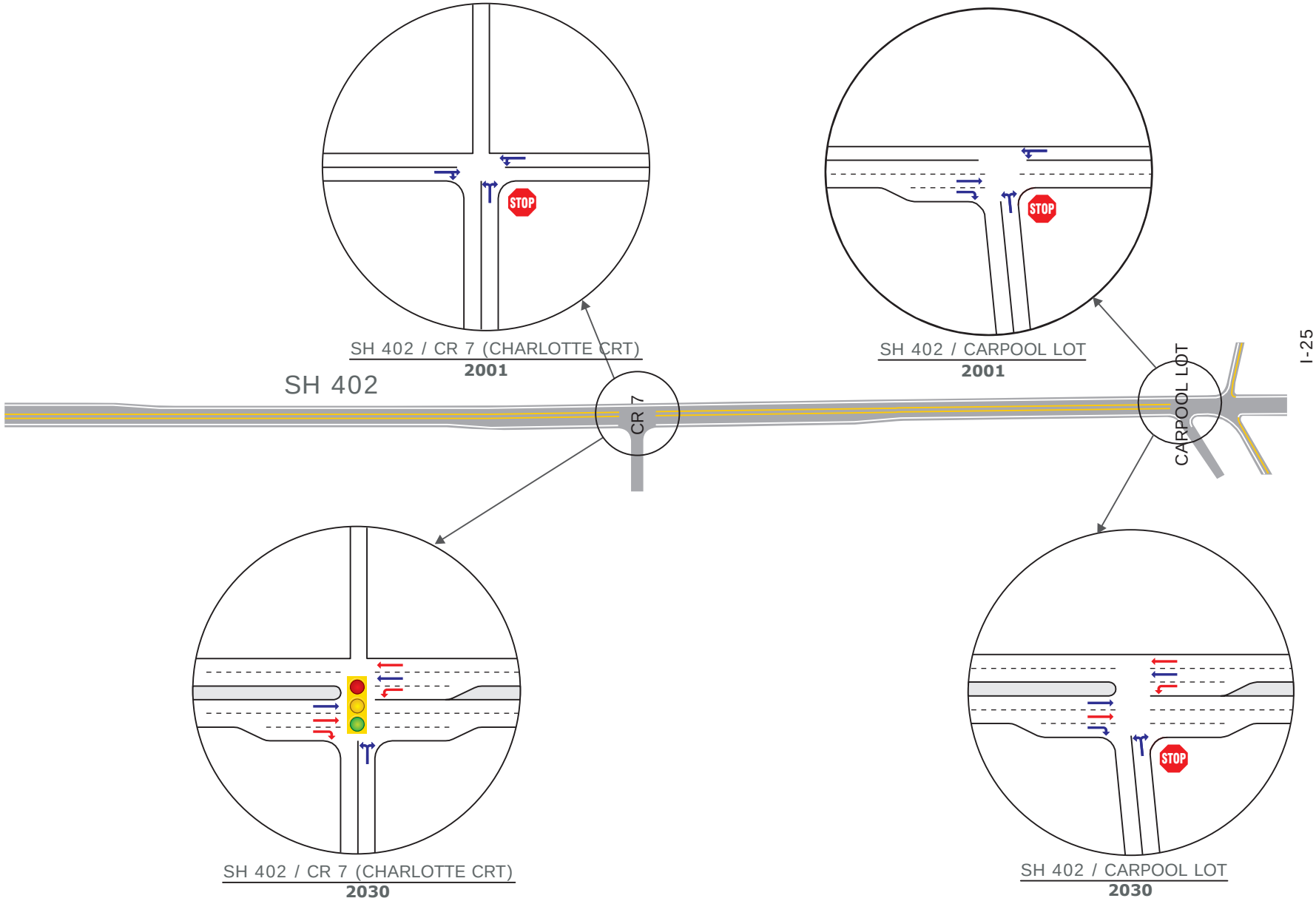
Existing Lanes

U.S. Department of Transportation
Federal Highway Administration

DOT
DEPARTMENT OF TRANSPORTATION

DOT SH 402 Environmental Assessment

Existing and Meander Alternative Intersection Configuration
CR 9E to Heron Drive/Olsen Drive
FIGURE 2-7



N
W E
S

Lane Additions

Existing Lanes

U.S. Department of Transportation
Federal Highway Administration

DOT
DEPARTMENT OF TRANSPORTATION

DOT SH 402 Environmental Assessment

Existing and Meander Alternative Intersection Configuration
CR 7 (Charlotte Crt.) to Carpool Lot
FIGURE 2-8

This page intentionally left blank.

Chapter 3

Impacts and Mitigation Measures

Chapter 3. Impacts and Mitigation Measures

The Colorado Department of Transportation (CDOT) and Federal Highway Administration (FHWA) conducted a comparative analysis to examine key issues associated with the No Action and Meander Alternatives for potential improvements to SH 402 from US 287 east to the I-25 interchange. This chapter describes the direct and indirect impacts and mitigation measures associated with these two alternatives, in accordance with the requirements of the National Environmental Policy Act (NEPA). Impacts related to widening between US 287 and CR 13C (St. Louis Avenue) are not included in this analysis and the existence of this developed portion of SH 402 did not restrict consideration of alternatives. The impacts discussed in this chapter are organized by resource and are based on conceptual design.

Human and Community Resources

Human and community resources and issues described in this section include:

- socioeconomics
- right-of-way acquisitions and relocations
- environmental justice
- land use
- farmland
- visual resources
- recreation resources
- hazardous materials and waste
- utilities and services
- emergency services
- historic preservation
- archaeology
- Native American consultation
- Sections 4(f) and 6(f) resources
- noise

3.1 Socioeconomics

Much of the data describing the existing socioeconomic environment are available only on a countywide basis. County data were used in this analysis to describe broad regional trends. Socioeconomic information was obtained from the Colorado Department of Labor and Employment and State Demographer's Office websites. Most of the detailed local data presented are from 2001 or 2002. For consistency, all data, except forecasts and trends, are provided for comparable time periods.

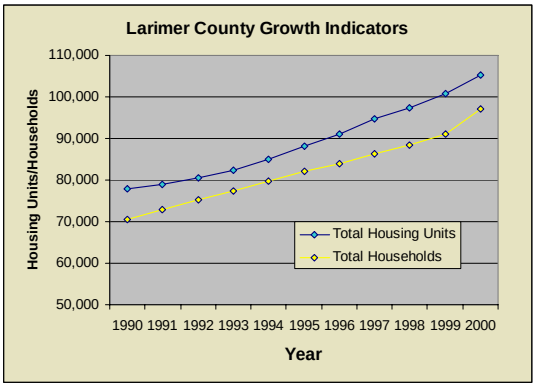
3.1.1 Population

Loveland city limits extend east of US 287 to CR 13C and include the Waterford Place Apartments. The remainder of the project area is located in unincorporated Larimer County. The entire SH 402 corridor is within the city of Loveland's Growth Management Area (GMA).

Table 3-1 presents historic population data for the city of Loveland and unincorporated Larimer County. Larimer County and the city of Loveland have experienced continuous growth over the past three decades.

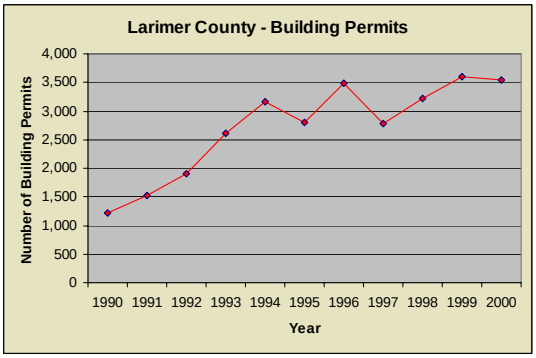
Predictions by the state of Colorado indicate that Larimer County will experience a 46 percent increase in population, reaching 366,115 by 2020, and an additional 20 percent increase by 2030 to 441,904 (Colorado DOLA 2003). This results in a total population increase of 76 percent between 2000 and 2030. City of Loveland planners anticipate continued growth in population and employment, including the SH 402 project area.

Larimer County growth from 1990 to 2000 is reflected in housing growth and building permits issued, as shown in Figure 3-1 and Figure 3-2. In 2002 the city of Loveland accounted for 30 percent of total new dwelling units in Larimer County.



Source: DOLA 2003

Figure 3-1. Larimer County Growth Indicators



Source: DOLA 2003

Figure 3-2. Larimer County Building Permits

Table 3-1. Population in the City of Loveland and Larimer County

Location	1970	1970–1980	1980	1980–1990	1990	1990–2000	2000
City of Loveland	16,220	86%	30,215	24%	37,357	35%	50,608
Unincorporated Larimer County	26,413	79%	47,384	13%	53,557	28%	68,819
Total Larimer County	89,900	66%	149,184	25%	186,136	35%	251,494

Source: Department of Local Affairs (DOLA) 2003

3.1.2 Economics and Employment

Larimer County's economy supports a diverse array of industries and employment opportunities. As in any local economy, local services and retail trade provide a significant portion of the jobs (21 percent and 13 percent, respectively). Government—including elementary, secondary, and college educational institutions—provides 17 percent of employment, while manufacturing provides 15 percent of county jobs. Construction provides approximately 8 percent of employment in Larimer County (Northern Colorado Economic Development Corporation [NCEDC] 2004, based on available 2001 annual averages).

In the economic projections summary for 2000 to 2010, the state demographer projects that Colorado's employment growth rate will slightly exceed the national average. Additionally, the demographer estimates that northern Colorado's employment growth rate will exceed the state's. The demographer also notes that jobs in traditional economic base sectors such as agribusiness, mining, and manufacturing will grow slowly (City of Loveland, Economic Development website 2004).

Retail trade and service jobs are expected to continue increasing, with the fastest growth in business service jobs, and construction jobs are expected to increase, but at a slower pace than during the 1990s. In the government sector, state jobs (largely in education) are expected to account for most of the growth.

Employment trends from 1990 to 2000 indicate relatively steady growth in Larimer County (US Census 2000). Employment projections indicate a sharper growth rate after 2005. The top five employers (by number of employees) in the Loveland area include the Big Thompson School District, Agilent Technologies, Wal-Mart Distribution Center, McKee Medical Center, and Hewlett-Packard (NCEDC 2004). No major employers are located along SH 402 in the study area.

Between 2000 and 2010, northern Colorado's employment growth rate is expected to exceed the state's.

Most Larimer County workers live in the county, and most out-of-county workers are from Weld County (DOLA Demography Section, Summary of US Census 2000 Data on Place-of-Work, March 2003). Many of Agilent Technologies' 2,400 employees use SH 402 to commute to and from work. Most Larimer County commuters travel to Boulder County. Remaining commuter destinations are primarily southward and include the Denver metropolitan area.

3.1.3 No Action Alternative

The No Action Alternative will not provide adequate transportation infrastructure for expected population and economic growth in and around the city of Loveland. SH 402 capacity for peak hour commuters will be limited under the No Action Alternative and might force commuters to use other routes or discourage commuters in general. Given the availability of land, city and county land use plans (zoning and future annexation of land into the city of Loveland), it is anticipated that development will occur regardless of whether improvements are made to SH 402.

3.1.4 Meander Alternative

The Meander Alternative would provide adequate capacity to accommodate 2030 travel demand. SH 402 would continue to be used as an access route between US 287 and I-25 and to play an important role in Larimer County's transportation infrastructure. Implementing the Meander Alternative is consistent with current zoning, local policies, and plans; it is not expected to affect land use or development.

3.1.5 Mitigation Measures

No mitigation measures are required. Implementation of the Meander Alternative is consistent with long-range local and regional land use and transportation plans.

3.2 Right-of-Way Acquisition and Relocations

The information in this section is based on conceptual design; the actual number of relocations will be known when final design is complete. Measures to further reduce the number of relocations will be implemented as part of final design.

3.2.1 No Action Alternative

The No Action Alternative would not require right-of-way acquisitions or residential/commercial relocations.

3.2.2 Meander Alternative

The Meander Alternative has been designed to avoid and minimize impacts on existing properties to the greatest extent possible. Implementation of the Meander Alternative would require acquisition of six homes and three outbuildings (small barns and sheds). Figure 3-3 shows the locations of these acquisitions. The six residential structures located in close proximity to SH 402 are on properties that would otherwise be most adversely affected by loss of yards, parking, and driveways. For the right-of-way, 47.58 acres of residential property and 7.15 acres of commercial property will need to be acquired. Due to the dispersed rural development pattern that currently exists for most of the project corridor, loss of frontage on SH 402 will most often mean loss of unimproved portions of large tracts.

Right-of-way impacts are greatest on the north side of SH 402 between CR 11H (Boise Avenue) and Heron Drive. This will result in acquisition of approximately 120 feet off the property frontages (measured from the edge of the existing right-of-way). Several non-residential parcels, including the Larimer County buildings and the CDOT Loveland Residency, will also experience loss of parking along the frontage to their buildings. Minimal to no acquisition will occur at Paradise Acres east of Heron Drive. The frontage lost on the west and east ends of the project will be approximately 50 feet. Accesses may be altered as part of the implementation of the Meander Alternative. During final design, an access control plan will be developed. The Meander Alternative would be designed to minimize residential, business, and environmental impacts.

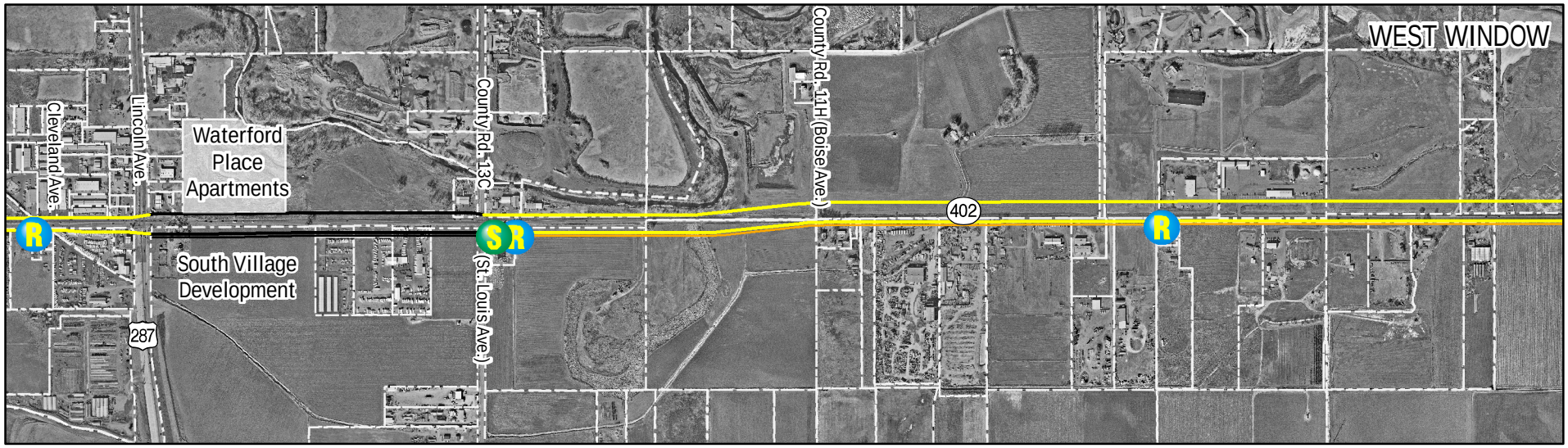
3.2.3 Mitigation Measures

To minimize unavoidable residential relocations, measures to further reduce the number of relocations will be implemented as part of final design.

CDOT will comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act), which provides for uniform and equitable treatment of all persons displaced from their homes, businesses, or farms. The Uniform Act is a form of compensation, not mitigation.

The owner of real property acquired for right-of-way will be compensated based on fair market value. Assistance will be provided to any eligible owner or tenant in relocating their business or residence at the time of displacement. Benefits under the Uniform Act to which each eligible owner or tenant might be entitled will be determined on an individual basis and explained in detail.

No relocatees will have to move from a dwelling without at least 90 days' written notice. A 90-day notice is not effective for a residential occupant unless a comparable replacement dwelling has been identified. Qualified relocatees receive monetary payments, which may include payments for moving expenses, business in lieu of payments, rent supplements, down payments, or increased interest payments. No person will be displaced by a federally assisted project unless and until adequate replacement housing has been offered to all affected persons, regardless of race, color, religion, sex, national origin, age, or disability. CDOT will assist any eligible owner or tenant to relocate a business or residence at the time of displacement.



LEGEND

- Property Parcel Boundaries
- Proposed Meander Alternative Right-of-Way
- Proposed Meander Alternative Utilities Right-of-Way (25-feet)
- Existing Right-of-Way
- S Outbuilding Relocation
- R Residential Relocation

N W E S

SCALE - 1:14,700
or 1" = 1,225'

0 500 1,000 Feet

SOURCE: 2001 1/2-foot resolution aerial photography. Land use and parcel information provided by the City of Loveland. Map produced November 29, 2006 by JFSA.

U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

DOT SH 402 Environmental Assessment

Meander Alternative Right-of-Way and Associated Relocations

FIGURE 3-3

Map Document: (H:\projects\402\2007_mxd\EA_FINAL_SIGNATURE\sh402_meander_takes_8x11_061129.mxd)
5/1/2007 -- 4:22:26 PM

Benefits under the Uniform Act to which each eligible owner or tenant might be entitled will be determined individually and explained to the parties in detail, along with information about financial options.

3.3 Environmental Justice

3.3.1 Background

Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations," was signed on February 11, 1994, and published in the Federal Register on February 16, 1994. The EO focuses federal attention on the environmental and human health conditions of minority and low-income populations, promotes nondiscrimination in federal programs affecting human health and the environment, and provides minority and low-income populations with access to public information and an opportunity to participate in matters relating to the environment. The United States Department of Transportation (DOT) issued an order on environmental justice in 1997 (DOT Order 5610.2), followed by the Federal Highway Administration in 1998 (FHWA Order 6640.23). Both of these orders directly address environmental justice activities and responsibilities at the DOT and FHWA.

A minority individual is one who identifies himself or herself as belonging to at least one of the following groups: Black, Hispanic, Asian, American Indian or Alaskan Native, Hawaiian or Other Pacific Islander, Some Other Race, or Two or More Races. Low income is usually defined as household income (or in the case of a community or group, median household income) at or below the US Department of Health and Human Services (HHS) poverty guidelines. FHWA Order 6640.23 defines minority and/or low-income population as "any readily identifiable group of minority and/or low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons who will be similarly affected by a proposed FHWA program, policy or activity."

3.3.2 Method

For this project, the following methodology was used to identify low-income and minority populations and the potential for disproportionate impacts on these populations:

- Census tracts and block groups in the study area were identified.
- Demographic information was gathered for each study area block group. Additional research by blocks was conducted for minority populations. (Note that income data are not available at the block level.)

> A block is a subdivision of a census tract, and the smallest geographic unit for which the Census Bureau tabulates 100 percent data. A collection of blocks is called a block group. Many blocks correspond to individual city blocks bounded by streets, but some blocks, especially in rural areas, encompass many square miles and may have boundaries that are not streets. Information about race is tabulated by block, and income information is tabulated by block group.

- Council on Environmental Quality (CEQ) guidance states that the standard for the definition of an environmental justice population is either over 50 percent, or containing a minority population meaningfully larger than the minority percentage in the general population (CEQ 1997). Environmental justice requirements would apply to all block groups or sets of blocks adjacent to SH 402 that contain minority or low-income populations approaching or exceeding 50 percent, or greater than the Larimer County average minority populations. Larimer County's minority population is 12.5 percent (US Census 2000).
- Low-income populations are populations with income below the federal poverty thresholds. According to HHS, the 1999 poverty threshold is $17,029 for a family of four. Because the federal poverty threshold is considered low compared to the cost of

living, 50 percent of area median income (AMI is used to determine housing assistance because housing typically makes up the majority of cost for a household. Due to higher costs of living in the project area, 50 percent of the AMI was used to screen for low income for this project.)This follows US Department of Housing and Urban Development guidelines for defining low income. Fifty percent of AMI in the Fort Collins-Loveland Metropolitan Statistical Area (MSA) was $22,229 in 1999.

Note that the HHS low-income figure for a family of four increased to $18,850 in 2004. The AMI data for the Fort Collins-Loveland MSA are from 2002, showing 50 percent of AMI for a family of four as $30,400. However, because detailed population and income data are based on the 2000 Census information, the updated HHS low-income figure and AMI can be used only as a qualitative measure of the dollar amount.

Poverty Threshold Summary

HHS (family of 4):
1999 - $17,029
2004 - $18,850

50% Fort Collins-Loveland MSA AMI:
1999 - $22,229
2002 - $30,400

3.3.3 Minority and Low-income Populations in the Project Area

Minority and low-income population designations are based on 2000 Census data and environmental justice guidance prepared by the Environmental Protection Agency (EPA). Information from the US Census 2000 was used in the analysis.

The project area houses a dispersed rural population, including portions of four census tracts:

- Census Tract 17.05
- Census Tract 17.04
- Census Tract 20.08
- Census Tract 20.07

Refer to Figure 3-4 for census tract locations.

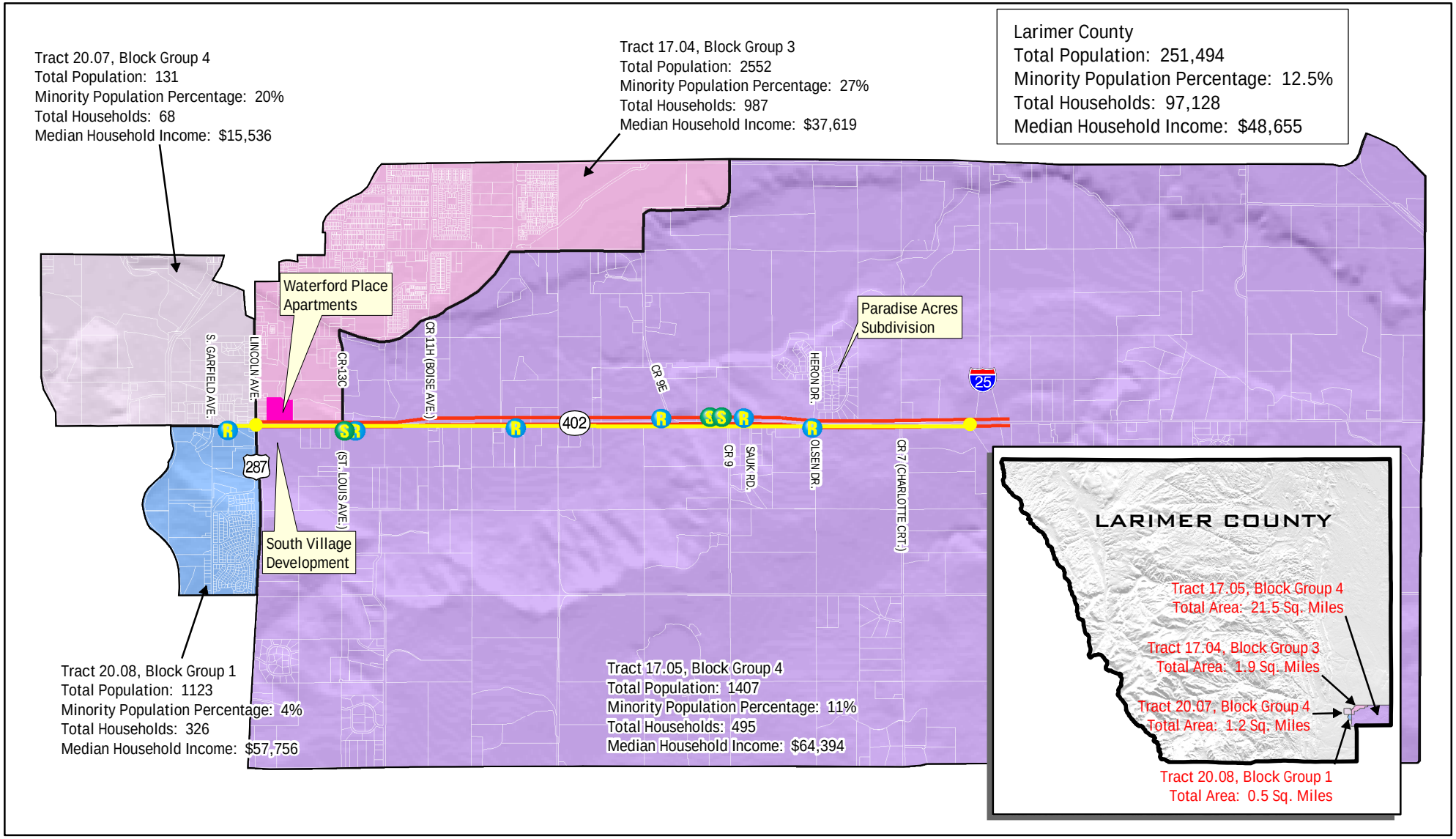
Census Tract 17.05

Most of the study area population resides in Census Tract 17.05, Block Group 4. This includes the north side of SH 402 from CR 13C east to the I-25 interchange, and the south side of SH 402 from US 287 to the I-25 interchange. Block Group 4 covers 21.5 square miles and includes 1,407 residents. Sixty-eight households or 13.7 percent lived below 50 percent of AMI in 1999. There are 311 people in this block group (22 percent) who reside in blocks adjacent to SH 402. Seven percent of the 311 are minority individuals (based on block group data), and 13.7 percent are low income (based on block group data). Table 3-2 summarizes minority and low-income population information for Block Group 4.

Other Census Tracts

Other census tracts relevant to this study are Census Tract 17.04, Block Group 3; Census Tract 20.08, Block Group 1; and Census Tract 20.07, Block Group 4. Thirteen individuals from these three block groups were recorded in the US Census 2000 as residing in the blocks adjacent to the highway and none identified themselves as minority. Income data are not available for Census tract blocks.

It is important to note that after the US Census 2000, the Waterford Place Apartments were constructed northeast of the intersection of US 287 and SH 402, to provide affordable housing for Larimer County residents. The development has 128 units, and rent calculations are based on 40, 50, and 60 percent of local median income. The current occupancy rate is about 65 percent. This project will not have an impact on the Waterford Place Apartments.



LEGEND

- Property Parcel Boundaries
- SH402 Between US287 and I-25
- Residential Relocation
- Outbuilding Relocation

SCALE - 1:51,600 or 1" = 4300'

0 2,000 4,000 Feet

SOURCE: 2001 1/2-foot resolution aerial photography. Land use and parcel information provided by the City of Loveland. Socioeconomic information obtained from the 2000 US Census Summary File 3. Demographic information obtained from the 2000 US Census Summary File 1. Map produced November 29, 2006 by JFSA.

U.S. Department of Transportation Federal Highway Administration

DOT

JFS&A J.F. SATO AND ASSOCIATES

DOT SH402 Environmental Assessment

2000 Census Socioeconomic and Demographic Statistics

FIGURE 3-4

Map Document: (H:\projects\402\2007_mxd\EA_FINAL_SIGNATURE\sh402_census_8x11_070404.mxd)
5/1/2007 -- 4:31:49 PM

Table 3-2. Minority and Low-income Population Comparisons

Minority[a]								
Demographic Area	Hispanic[b]	Black Alone	American Indian or Alaskan Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone[c]	Two or More[c]	Percent of Total Population
Census Tract 17.05, Block Group 4	110	5	13	8	0	2	17	11.0%
Census Tract 17.04, Block Group 3	612	16	11	11	1	9	33	27.2%
Census Tract 20.08, Block Group 1	39	3	0	0	0	1	3	4.0%
Census Tract 20.07, Block Group 4	15	0	3	3	0	0	5	19.8%
Larimer County	20,811	1,511	1,171	3,840	152	234	3,616	12.5%

[a] *US Census 2000 Summary File 1, Table P8 Total Population, Hispanic or Latino by Race*
[b] *All Hispanic and Latino individuals, including those who claimed to be some other race alone and two or more races*
[c] *Not Hispanic or Latino*

Low-Income (50% AMI)	
Census Tract 17.05, Block Group 4	13.7%
Census Tract 17.04, Block Group 3	26.3%
Census Tract 20.08, Block Group 1	20.7%
Census Tract 20.07, Block Group 4	71.8%
Larimer County	22.8%

3.3.4 No Action Alternative

The No Action Alternative would not resolve mobility and safety requirements on SH 402 and would not meet the 2030 travel demand and growth needs; low-income and minority populations are expected to experience the same lack of benefits as the population as a whole. No disproportionate and adverse impacts on low-income or minority populations were identified for the No Action Alternative.

3.3.5 Meander Alternative

No disproportionate and adverse impacts on low-income or minority populations were identified for the Meander Alternative. The Meander Alternative uses an alignment that shifts from north to south, minimizing impacts on the human and natural environments. These shifts resulted from ongoing design efforts to improve highway mobility and safety while minimizing potential adverse impacts, including residential relocations. The Meander Alternative would improve travel conditions by providing greater highway capacity, a left turn lane in the median, and consistent shoulders.

Six residential relocations may be required. The acquisitions are dispersed throughout the 4-mile corridor. The Meander Alternative was designed to minimize relocations. On the basis of population and income information, the probability of disproportionate and adverse

impacts on low-income and minority populations is very low.

All residents affected by relocation will be provided with CDOT's relocation package. All individuals using the improved highway would experience the benefits of enhanced mobility and safety. Improvements include bicycle and pedestrian lanes/sidewalks.

3.3.6 Mitigation Measures

No minority or low-income population was identified along SH 402. Public outreach was extended to the entire study area.

Because no disproportionate and adverse impacts are associated with the Meander Alternative, no mitigation measures are cited.

3.4 Land Use

This section describes existing and proposed land uses in the project area, and potential impacts on land use. *Section 1.3.2* provides information about land use and transportation policies and plans for the study area.

3.4.1 Existing and Proposed Land Uses

SH 402 is located 2 miles south of the city of Loveland in Larimer County. The project area is located along SH 402 between the US 287 intersection and the I-25 interchange in the city of Loveland's GMA.

The *Loveland, Colorado 2005 Comprehensive Master Plan* identifies SH 402 as part of the Loveland GMA. The *2004 Intergovernmental Agreement (IGA) for Growth Management* between the city and county includes these GMA boundaries (IGA 2004).

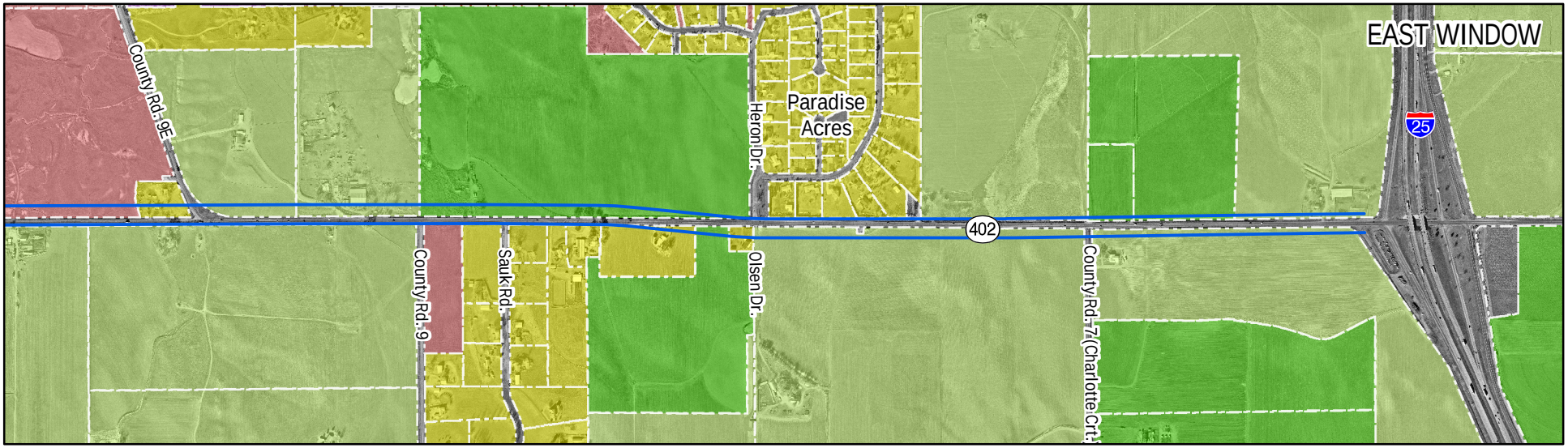
Although current land use is chiefly rural agricultural, dispersed low-density residential areas also exist (including the residential subdivision, *Paradise Acres)*. Paradise Acres is located on the north side of SH 402, with access from Heron Drive/Olsen Drive. The Waterford Place Apartments are located in the northeast quadrant of the intersection of SH 402 and US 287. See Figure 3-5 for existing land use in the study area. Figure 3-6 shows the city of Loveland future land use map.

Businesses in the corridor include gas stations, storage warehouses, a greenhouse, a landscaping center, and a feed yard. Public facilities include Larimer County's maintenance facility, the CDOT Region 4 Loveland Residency (on the north side of SH 402), and a carpool lot on the southwest corner near the I-25 interchange. Most of these properties are oriented toward the highway, with direct access and little definition of highway edge (that is, no sidewalks and little landscaping).

The *City of Loveland Land Use Plan* shows a neighborhood activity center at the intersection of US 287 and SH 402.

The *City of Loveland Land Use Plan* (May 2, 2000; amended March 6, 2007) categorizes the SH 402 corridor as an activity center mixed-use corridor. Activity center mixed uses provide shopping, services, public uses, and residences. The plan shows a community activity center in the southeast and southwest quadrants of the intersection of US 287 and SH 402. Low to medium density residential development north of SH 402 is shown between CR 9E and I-25. Development on the south side of SH 402 from CR 11H east to the I-25 interchange and on the north side between CR 11H and CR 9E is expected to produce employment opportunities.

Land use plans are meant to help focus growth in specific areas; they do not ensure that growth will occur.



LEGEND

- Agricultural
- Agricultural / Residential
- Commercial
- Industrial
- Existing Right-of-Way
- Public
- Residential
- Vacant
- Property Parcel Boundaries
- Meander Alternative Right-of-Way

SCALE - 1:14,700 or 1" = 1225'

0 500 1,000 Feet

SOURCE: 2001 1/2-foot resolution aerial photography. Land use and parcel information provided by the City of Loveland. Map produced November 29, 2006 by JFSA.

U.S. Department of Transportation Federal Highway Administration

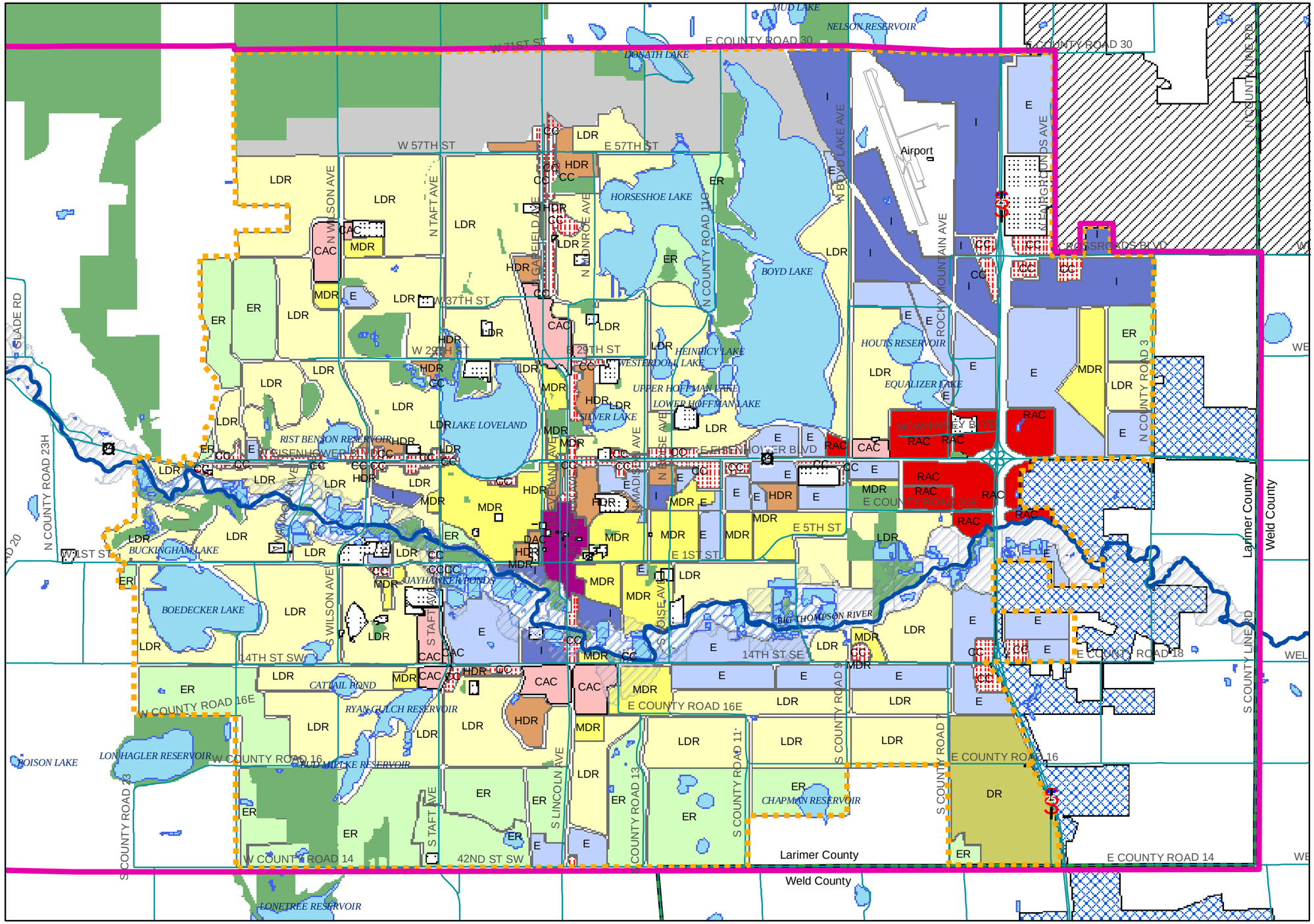
DOT SH 402 Environmental Assessment

Existing Land Use

FIGURE 3-5

Map Document: (H:\projects\402\2007_mxd\EA_FINAL_SIGNATURE\sh402_landuse_8x11_061129.mxd)
5/1/2007 -- 4:37:06 PM

This page intentionally left blank.



(1) This map is intended to serve as a guide for future land use patterns within Loveland's GMA and is advisory in nature. Land use patterns depicted on the map are generalized, recognizing that development proposals may contain a mixture of land uses and density levels which achieve the intent of the Comprehensive Master Plan. All development is subject to City standards for protection of evironmentally sensitive areas, and other performance guidelines.

(2) For details regarding appropriate land uses within the Airport Influence Area refer to section 4.6, "Airport and Surrounding Areas" of the Comprehensive Master Plan.

(3) The 100-year Floodway is displayed only within City Limits, awaiting further data.

City of Loveland

0 0.5 1 2 Miles

CITY OF LOVELAND FUTURE LAND USE PLAN

This page intentionally left blank.

3.4.2 No Action Alternative

If anticipated land use changes identified in the *City of Loveland Land Use Plan* occur, the No Action Alternative would not provide travel capacity and safety improvements needed for SH 402 and, therefore, would not support current zoning, local policies, and plans. Given the availability of land, city and county land use plans (zoning and future annexation of land into the city of Loveland), it is anticipated that development will occur regardless of whether improvements are made to SH 402.

3.4.3 Meander Alternative

Implementing the Meander Alternative is consistent with current zoning, local policies, and plans. No land use effects are expected. The project supports approved local plans, and the completion of portions of the highway widening by local developers ahead of the EA is an indicator of this trend.

3.4.4 Mitigation Measures

The Meander Alternative alignment was based on sensitivity toward existing land uses. No additional mitigation measures are required.

3.5 Farmland

Areas classified as prime, unique, statewide, or local-important farmlands must be identified under the requirements of the Farmland Protection Policy Act (FPPA 1981), which was enacted to minimize the extent to which federally funded projects contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses. Only prime farmlands were identified in the study area. The potential for the project site to contain prime farmland was determined by inspection of the Soil Survey mapping and descriptions developed by the Natural Resources Conservation Service (NRCS) for Larimer County in 1975. Information from NRCS electronic databases was used to overlay the Meander Alternative on a map of prime farmland soils (see Figure 3-7).

Seven soil types considered to be prime farmland occur adjacent to the existing SH 402 highway in the project area: Ascalon sandy loam, Caruso clay loam, Paoli fine sandy loam, Satanta loam, Table Mountain loam, Weld silt loam, and Wiley silt loam. Table 3-3 lists soil types and characteristics.

Observed agricultural use in the study area includes irrigated corn and hay production and rangeland for livestock grazing. NRCS also listed beans and alfalfa as crops grown in the study area.

The SH 402 corridor is located within the Loveland GMA, which encourages urban development within GMA boundaries. The *City of Loveland Land Use Plan* (adopted May 2, 2000, and amended March 6, 2007) projects a shift away from agricultural use along SH 402, showing no remaining agricultural land uses adjacent to SH 402 in the project study area.

Agricultural viability for sustained crop production on these lands has been reduced by either planned development or proximity to development, according to criteria developed by NRCS and adopted by the county (Larimer County Land Evaluation and Site Assessment System [LESA] 2001).

Although land in the SH 402 corridor is composed of prime soil types, the farmland itself is not subject to FPPA. According to 1989 FHWA guidelines, “Prime farmland which is already in or committed to urban development is by definition farmland not subject to the FPPA.”

All of the land adjacent to SH 402 is shown as residential or activity center mixed uses in the *City of Loveland Land Use Plan* (May 2, 2000, amended March 6, 2007).

3.5.1 No Action Alternative

The No Action Alternative would not affect prime farmland in the project area.

Table 3-3. Prime Farmland Soil Types in the Project Area

Soil Type	Percent Slope	Runoff/Permeability	Wind/Water Erosion Hazard
Ascalon sandy loam	0 to 3	Slow/moderate	Moderate/slight
Caruso clay loam	0 to 1	Slow/moderately slow above 25 inches and moderately rapid to rapid below	Slight
Paoli fine sandy loam	0 to 1	Slow/moderately rapid	Moderate/slight
Satanta loam	1 to 3	Slight/moderate	Slight to moderate
Table Mountain loam	0 to 1	Slow/moderate	Slight
Weld silt loam	0 to 3	Slow/moderate above 7 inches, moderately slow from 7 to 20 inches, and moderate below 20 inches	Slight, but soil losses can be substantial after heavy rains
Wiley silt loam	1 to 3	Slow to medium/moderate	Moderate

3.5.2 Meander Alternative

The Meander Alternative and associated utility corridor cross section with soil types and current land uses have identified a permanent loss of approximately 0.8 acre of Ascalon sandy loam, 4.23 acres of Caruso clay loam, 6.05 acres of Paoli fine sandy loam, 1.8 acres of Satanta loam, 6.7 acres of Table Mountain loam, 3.8 acres of Weld silt loam, and 0.8 acre of Wiley silt loam, for a total of approximately 24.2 acres of prime farmland soil impacts. Five acres of this will be affected by the utility corridor easement. Portions of the easement may be able to be returned to agricultural use.

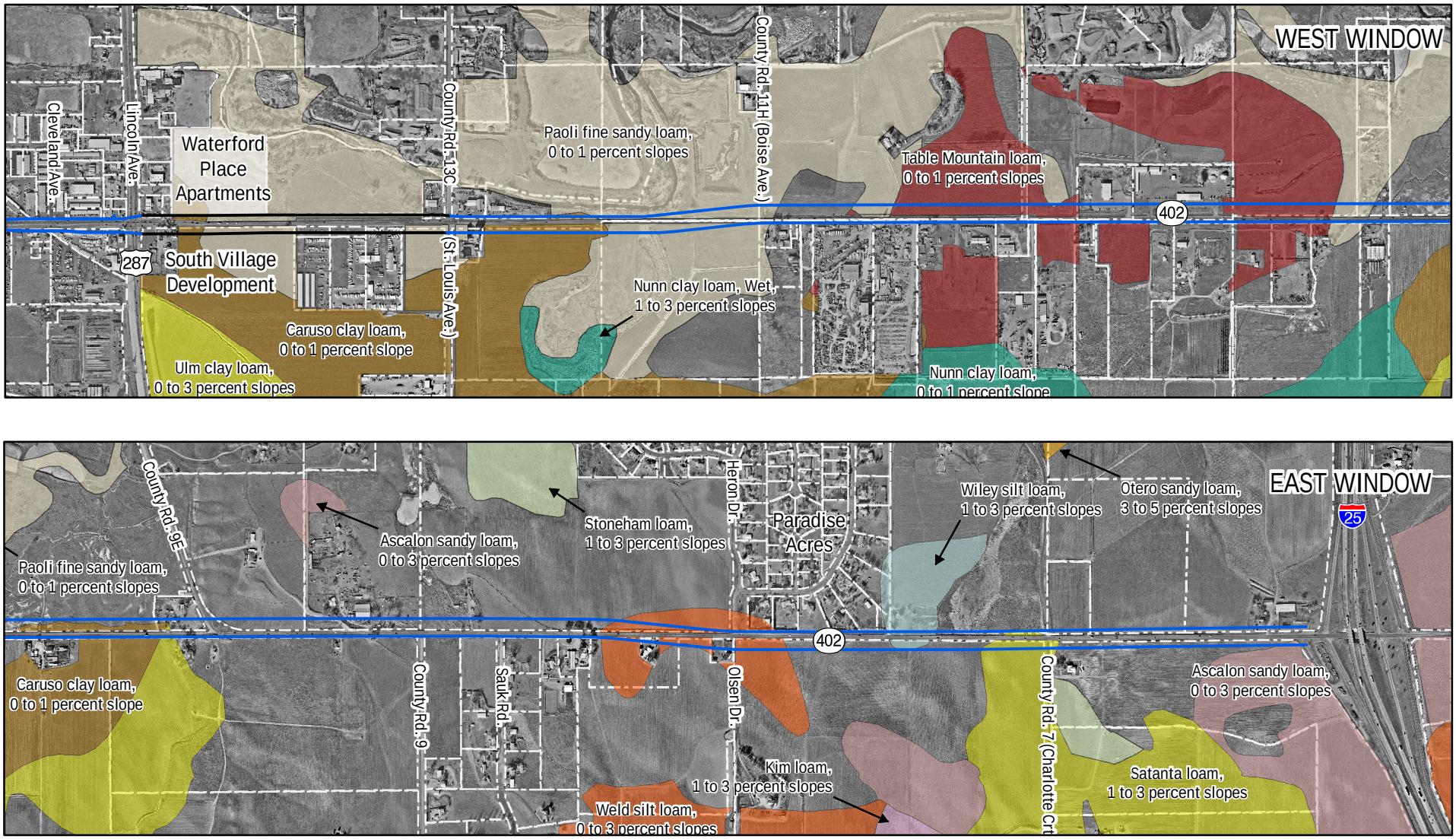
A LESA evaluation was conducted, and a US Department of Agriculture Form AD-1006 was submitted to NRCS in accordance with FHWA guidelines for implementing FPPA (FHWA 1989). The conversion impact rating for farmland in the SH 402 corridor was 213.2 points out of a possible 260 points (includes LESA) for the Meander Alternative (see *Appendix A*). The impact rating considers the total acres of prime farmland, percentage of farmland in the county that would be converted by the action, and 12 attributes that may detract from farmland being used to its full potential (that is, availability of farm support services and distance from urban development).

3.5.3 Mitigation Measures

Implementation of the Meander Alternative will result in the conversion of 24.2 acres of prime farmland along SH 402. Use of the periphery of currently active farms will be lost to highway right-of-way and easement. No mitigation is required under FPPA since FPPA does not apply for this corridor. Compensation for loss of property will occur under the Uniform Act (see *Section 3.2, Right-of-Way Acquisition and Relocations)*. Each property owner will be given the opportunity to accompany the appraiser during the inspection of the property. CDOT must then establish just compensation based on fair market value. The owner of real property acquired for right-of-way will be compensated at fair market value, in accordance with the Uniform Act, federal CFRs, state statutes, and CDOT policies and procedures.

3.6 Visual Resources

This visual assessment includes an inventory of the potentially affected environment and an assessment of the anticipated effects of the No Action and Meander Alternatives. Visual impacts associated with construction of the Meander Alternative were assessed by determining the potential for a change in the area's aesthetic quality as related to existing views.



LEGEND

- Ascalon sandy loam
- Caruso clay loam
- Kim loam
- Nunn clay loam
- Otero sandy loam
- Paoli fine sandy loam
- Satanta loam
- Stoneham loam
- Table Mountain loam
- Ulm clay loam
- Weld silt loam
- Wiley silt loam
- Meander Alternative Right-of-Way
- Existing Right-of-Way

N W E S

0 500 1,000
Feet

SCALE - 1:14,700
or 1" = 1225'

SOURCE: 2001 1/2-foot resolution aerial photography. Land use and parcel information provided by the City of Loveland. Prime farmland soil information provided by NRCS. Map produced November 29, 2006 by JFSA.

DOT SH 402 Environmental Assessment

Project Study Area
Prime Farmland Soil Types

FIGURE 3-7

U.S. Department of Transportation Federal Highway Administration

DOT

Map Document: (H:\projects\402\2007_mxd\EA_FINAL_SIGNATURE\sh402_farmland_8x11_061129.mxd)
5/1/2007 -- 5:16:50 PM

3.6.1 Overview

The appearance of landscape features varies with the viewing distance. For this assessment, views seen by area residents and/or travelers on SH 402 were divided into three distance zones: *foreground* (from the viewer to 0.5 mile), *near middleground* (0.5 mile to 1 mile), and *middleground* (1 to 3 miles).

The homogeneous appearance of the mostly agricultural landscape in the project area is highlighted by wooded drainages along the Big Thompson River that provide visual diversity in color, form, and texture. The project foreground includes large plains cottonwoods in this area. Other trees were visible along SH 402 as landscaping or shelterbelts. For additional discussion on trees and vegetation, see *Section 3.17, Ecology*. Distant views to the west of the Front Range add a distinctive and sometimes dominant quality to the scenery.

The natural appearance of the project area has been modified by structures and facilities concentrated along travel routes, including US 287, CR 13C, CR 9, and SH 402. Land uses in the project area are increasingly expected to shift from rural dispersed development to areas of commercial use and employment, as well as residential development of greater density (see *Section 3.4*, *Land Use,* for additional land use information). Viewing conditions associated with the current landscape are mostly open and unrestricted; minor screening potential is provided by variations in local terrain, dispersed development, and isolated tree stands.

Visual impacts are considered high if a project would dominate the landscape. Impacts are considered moderate if the project would attract attention and begin to dominate the landscape. Impacts are considered low when the project would be visible without attracting attention.

3.6.2 No Action Alternative

No direct or indirect visual impacts would be associated with the No Action Alternative.

3.6.3 Meander Alternative

The Meander Alternative would be constructed in an area with relatively open views from dispersed rural residences and existing developments. With the exception of the widened highway and grading associated with cut-and-fill slopes, few new structural elements are proposed as part of this alternative (such as signal or street lights, retaining walls, bridges, and signage). New signalized intersections would be added at CR 11H, CR 9E, and CR 7 (Charlotte Court). Cut-and-fill slopes required to accommodate the proposed project would range in height from 0 to 15 feet (average 4 feet). Landform changes associated with the Meander Alternative would be most noticeable in foreground and near middleground distance zones. Changes are expected to be subordinate to the landscape character in the setting, with low visual impacts after implementation of Best Management Practices (BMPs) and mitigation measures.

3.6.4 Mitigation Measures

BMPs and mitigation measures to reduce or eliminate potential visual resource impacts of construction of the Meander Alternative include the following:

1. All disturbed slopes will be treated for erosion control and revegetated as appropriate, using native grasses and forbs. Shrubs will be included when feasible.
2. Sensitive grading techniques will blend grading with the natural terrain. Cut-and-fill slopes will be blended with the surrounding terrain to the greatest extent possible by means of slope rounding, layback, and warping techniques. BMPs for reducing slope modification and landform contrast will be developed individually for cut-and-fill slopes. Cut slopes are more easily modified than fill slopes by using slope layback, slope rounding, and slope warping techniques. These techniques will be implemented as follows:

- Slope rounding: used at the top of all cuts except in rock.
- Slope layback: degree of layback would influence motorists' visual impression and would be crucial in establishing vegetation and preventing erosion. With the gentle nature of the terrain in the project area, cut-and-fill slopes could be laid back up to a 4:1 ratio.
- Slope warping: used to achieve a more natural-looking transition between two unlike surfaces by varying the pitch of the cut slopes. This provides greater variation in slope faces and allows for vegetation. This technique involves both vertical and horizontal slope rounding as a more natural extension of landform surface configurations.

3. Removal of native cottonwoods will be avoided wherever practicable and revegetation BMPs implemented as noted in *Section 3.17,* Ecology.

3.7 Recreation Resources

The Larimer County Planning Department and the Loveland Parks and Recreation Department were consulted to help identify publicly owned parks, recreation areas, and wildlife/waterfowl refuge areas. The county Geographic Information Systems Department provided data layers. The county and city concur that there are no publicly owned parks, recreation areas, or wildlife/ waterfowl refuge areas adjacent to the SH 402 corridor.

3.8 Hazardous Materials/ Waste

This section summarizes the findings of the Modified Environmental Site Assessment (M-ESA) reports prepared for the project area by Kumar and Associates in 2001 and 2004. The reports comply with American Society for Testing and Materials E 1527-00, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process,* and the CDOT scope of work for M-ESA reports. These reports were intended to identify environmental conditions that indicate an existing, a past, or a material threat of a release of hazardous substances or petroleum products into structures on the properties or into the soils, groundwater, or surface waters that could be affected by the No Action Alternative or Meander Alternative.

Government agencies were contacted and a database review was conducted to evaluate potential usage, storage, treatment, and disposal of hazardous waste and petroleum products at or near the site. Local agencies were contacted concerning records of spills or incidents involving hazardous substances or petroleum products that could have resulted in potential onsite contamination. Information was obtained from the Colorado Department of Oil Inspection Section (OIS), the Larimer County Department of Health and Environment (LCDHE), the Colorado Department of Public Health and Environment (CDPHE), and the Loveland Fire Department.

The database review was conducted in general accordance with the current ASTM standard for Phase I Environmental Site Assessments, except some additional records were reviewed. The following federal databases were included: National Priorities List; Comprehensive Environmental Response, Compensation, and Liability Information System; Resource Conservation and Recovery Information Systems; Emergency Response Notification System; PCB Activity Database System; Toxic Release Inventory; Section Seven Tracking System; Civil Enforcement Docket; and Toxic Substances Control Act Inventory.

The following State databases were searched: Colorado Hazardous Waste Sites List, Colorado Solid Waste Facilities, Colorado Leaking Underground Storage Tank List, and Colorado Underground Storage Tank List.

The M-ESA results indicated two sites in the SH 402 corridor that may contain hazardous materials or waste: the Diamond Shamrock gas

station at 1401 South Lincoln Avenue at the southwest corner of SH 402 and US 287, and A/B Auto Brokers and Chuck's Towing at the northwest corner of SH 402 and CR 13C. Neither of these sites will be affected by the Meander Alternative as improvements will be made to SH 402 from west of US 287 to North Garfield Avenue and from east of CR 13C. Right-of-way will not need to be acquired from these parcels.

In addition, no documentation of spills or leaking tanks was found for the Mini-Stop gas station, Wash Masters car wash, or convenience store also located in proximity to the northwest corner of SH 402 and US 287 (upgradient of SH 402) or the Loveland RV Service facility on the south side of SH 402 west of CR 13C. These sites are also outside the area of impact for the Meander Alternative.

No documentation of spills or leaking tanks was found for the Colorado Precast Concrete facility at 1820 SH 402 (south of SH 402 at CR 11H). The LaFarge Concrete Batch Plant, located behind a row of businesses in the northeast quadrant of SH 402 and CR 13C, is hydrogeologically isolated from the study area by the Big Thompson River and is not expected to have affected the subsurface of the study area. Numerous oil and gas wells are located on both sides of the highway but were set back 300 feet or more from the highway. No impacts are anticipated.

Two past LUSTs are associated with the Larimer County Fleet Shop and CDOT facility on the north side of SH 402 east of CR 11H. Current records indicate no further mitigation requirements.

Thirty pole-mounted transformers are located in or adjacent to the project area. Xcel Energy owns four, of which three have not been tested for polychlorinated biphenyls (PCB) content. One transformer has been tested, with negative results. The Poudre Valley Rural Electric Association owns the remaining 26 transformers and stated that these have not yet been tested. They consider unlabeled and untested transformers PCB-contaminated. PCBs are regulated under the Toxics Substance Control Act as a toxic chemical; untested transformers must be tested before disposal. All of the transformers appear to be in good condition, with no evidence of leaks.

3.8.1 No Action Alternative

The No Action Alternative would not disturb any hazardous materials or waste sites.

3.8.2 Meander Alternative

Proximity of the LUST site at the Diamond Shamrock station and its hydrogeological upgradient location mean there is the potential that fuel-contaminated groundwater may have migrated to areas under the intersection of US 287 and SH 402 into the area of impact for the Meander Alternative. Utilities adjacent to SH 402 containing transformers would be relocated.

3.8.3 Mitigation Measures

Ongoing review of semi-annual groundwater monitoring reports for the Diamond Shamrock LUST site is recommended. These reports will indicate the extent of groundwater contamination and potential offsite migration of contaminants. Pre-characterization of soils and groundwater for project personnel health and safety, materials management, and dewatering is required before disturbance of subsurface soils or groundwater by highway construction activities. Depending on the results of the pre-characterization test, coordination with various agencies and permitting may be required. If the test samples are deemed hazardous, a materials management plan will be developed, describing the specifics of the hazardous waste permitting and compliance issues.

If any of the transformers test positive for PCBs, the utility company of ownership will be responsible for handling and disposal.

If additional hazardous materials are encountered before or during construction of the Meander Alternative, CDOT's *Section 250, Environmental Health and Safety Management* specification will be used. If necessary, a health and safety plan will be prepared and implemented to mitigate potential health and safety hazards to workers and the public.

3.9 Utilities and Services

Major utilities in the form of overhead telephone and power lines are located both sides of existing SH 402. Poles for overhead utilities and underground water and gas lines are within 20 feet of the existing pavement edge.

3.9.1 No Action Alternative

Utilities and services would not be affected or changed under the No Action Alternative.

3.9.2 Meander Alternative

Proximity of major utilities to the existing SH 402 edge of pavement would necessitate relocation of some of these utilities. A 25-foot utility corridor easement on the south side of the Meander Alternative is proposed to accommodate existing south side utilities and new utilities. Utilities currently on the north side of SH 402 will not be moved into the 25-foot utility corridor easement along the south side. These utilities will be relocated further north and will remain within the SH 402 footprint defined by the 160-foot to 175-foot cross section. CDOT would purchase this easement and grant utility permits to the various utility companies that need to locate facilities within this easement. Utility relocation costs are estimated at approximately $1 million, based on conceptual design. Final design will allow more exact cost estimates.

3.9.3 Mitigation Measures

BMPs will be required to minimize any erosion or sediment disturbance that may be associated with utility construction within the CDOT easement. Coordination with county officials and local utility owners will minimize disruption of service.

3.10 Emergency Services

Project area emergency services are provided by the Larimer County Sheriff's Department, the Colorado State Patrol, Thompson Valley EMS, and the Loveland Fire and Rescue Department. McKee Medical Center in the city of Loveland is a full-size hospital. The new Medical Center of the Rockies is located near the northwest quadrant of US 34 and I-25, two miles north of SH 402. No emergency service providers are located on SH 402. Emergency services are provided for incidents along and accessed by SH 402.

3.10.1 No Action Alternative

Travel conditions on SH 402 would continue to deteriorate, resulting in a lower level of service (LOS) and increased travel times. It can be expected that travel time for emergency service vehicles will be affected by the worsening LOS resulting in longer travel time.

3.10.2 Meander Alternative

Better LOS associated with the addition of another travel lane, shoulders, and a center turn lane would be expected to improve traffic flow. This can be expected to result in faster travel time for emergency response vehicles when compared to the No Action Alternative.

3.10.3 Mitigation Measures

Emergency services will be coordinated with the appropriate authorities during construction.

3.11 Historic Preservation

Historic properties are protected under Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended; 16 USC 470 *et seq*; revised Advisory Council on Historic Preservation 36 CFR 800; and Section 4(f) of the US Department of Transportation Act of 1966.

Authorized under the NHPA of 1966, the National Register of Historic Places (NRHP) is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archaeological

and protect historic and archaeological resources. Properties listed in the NRHP include districts, sites, buildings, structures, and objects that are significant in American history.

To be eligible for the NRHP, a historic property, typically, must be 50 years old or older and meet one or more of the following integrity and significance requirements per 36 CFR 60.04:

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

3.11.1 Historic Overview and Inventory Results

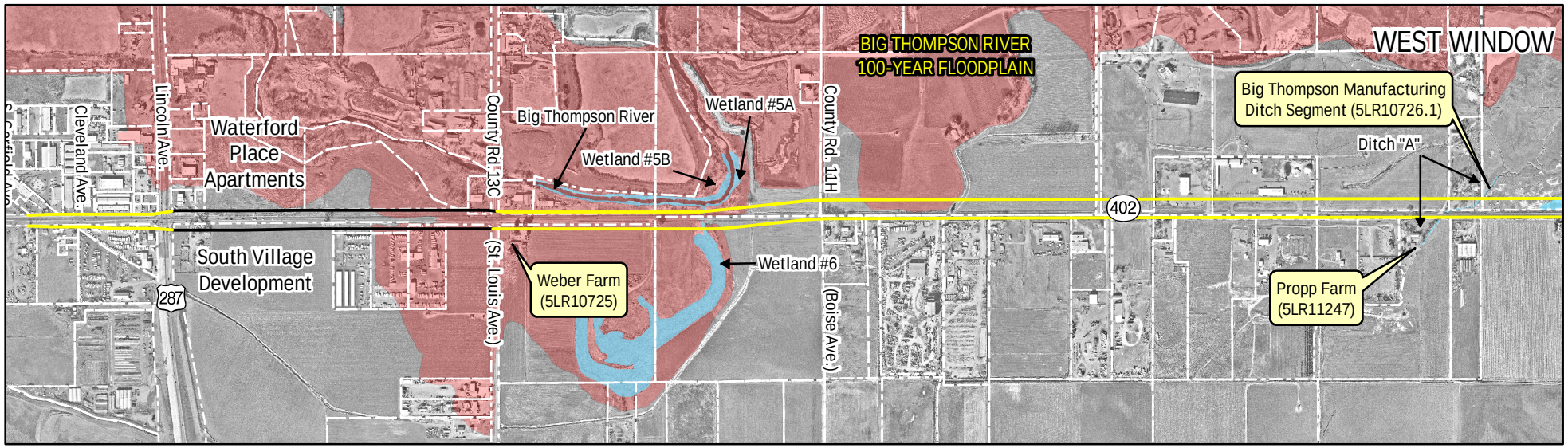
Three early settlement themes dominate the project area: exploration and fur trade, farming and ranching, and early transportation. Exploration and fur trade occurred between 1761 and 1859. Farming and ranching began in the late 1800s and continue to this day. The South Platte River and Big Thompson River served as important transportation routes and were significant in the early settlement of the area.

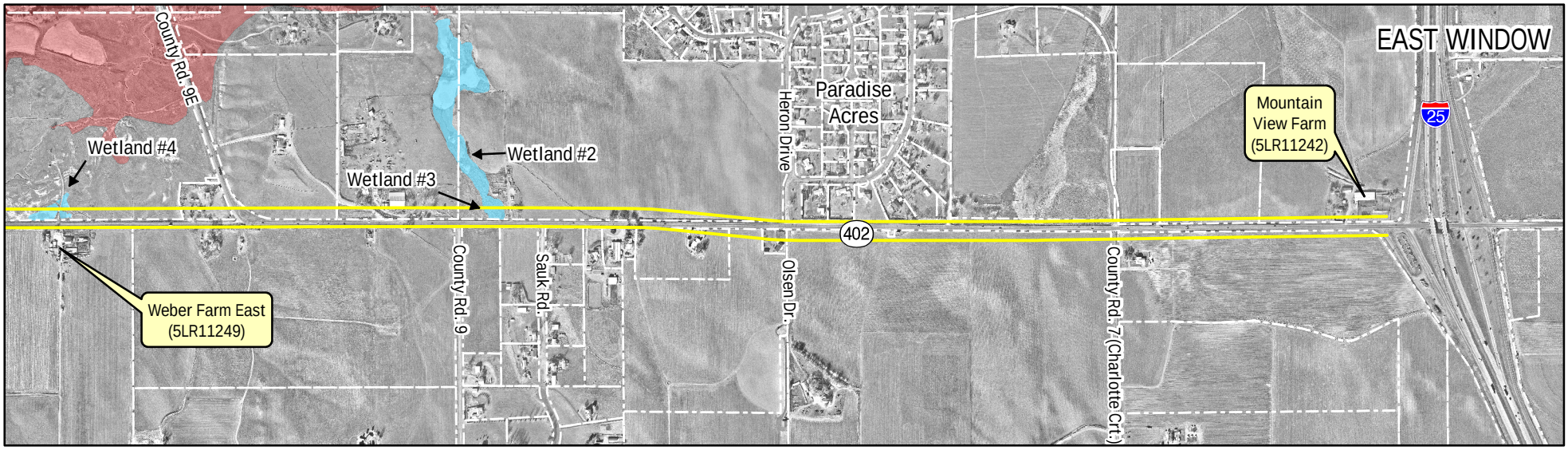
A flexible Area of Potential Effect (APE) has been identified for the project. Because direct impacts are anticipated to be contained within 250 feet to either side of the existing edge of pavement, intensive field inventory or pedestrian survey (Class III Survey) was conducted within this area covering a total of 265 acres. Areas containing potentially sensitive historic resources whose boundaries intersected with this area of direct impact but may have extended as much as 0.25 mile beyond, were also examined (Class II Survey).

Literature searches for the entire APE were conducted at the Colorado Historical Society's Office of Archaeology and Historic Preservation in 2003 and 2005. File searches were also conducted for various portions of the SH 402 study area at various dates between March 2001 and August 2005.

Appendix A of this document includes CDOT, SHPO, and consulting party correspondence.

Five NRHP eligible properties have been identified in the SH 402 APE and are described below. Figure 3-8 illustrates the locations of these properties.





LEGEND

- Wetlands
- Floodplain
- Property Parcel Boundaries
- Proposed Meander Right-of-Way
- Existing Right-of-Way

N W E S

SCALE - 1:14,700 or 1" = 1225'

0 500 1,000 Feet

SOURCE: 2001 1/2-foot resolution aerial photography. Land use and parcel information provided by the City of Loveland. Wetland information obtained through field observation and aerial photo interpretation by JFSA. Floodplain information provided by FEMA. Map produced November 29, 2006 by JFSA.

U.S. Department of Transportation Federal Highway Administration

DOT

DOT SH 402 Environmental Assessment

Historic Property Locations

Figure 3-8

Map Document: (H:\projects\402\2007_mxd\EA_FINAL_SIGNATURE\sh402_weber_studyarea_070131.mxd)
5/1/2007 -- 5:21:36 PM

Weber Farm (5LR10725)

The Weber Farm abuts the south side of existing SH 402 from CR 13C east to the location where CR 11H ties into SH 402 from the north. The buildings on this 80-acre farm complex are located in the area immediately south and east of the intersection at CR 13C. Access to the property comes from both SH 402 and CR 13C.

The farm complex, built during the period from 1911 to the 1930s, is an example of the early 20th century irrigated farming patterns of small land holdings and the family farm. This farm complex includes eight buildings, a feedlot, and tilled fields. The Weber family acquired the farm property in 1926 and still owns the property. Family members operate it as a small farm. Its associations with early 20th century farming and the high level of physical integrity make the Weber Farm eligible to the NRHP under Criterion A. The house and outbuildings are aging but all retain a high degree of integrity and completeness as representative buildings of an early 20th century Larimer County farm, also resulting in NRHP eligibility under Criterion C.

Big Thompson Manufacturing Ditch Segment (5LR10726.1)

The Big Thompson Manufacturing Ditch system extends 10 miles in length, beginning 0.25 mile east of Wilson Avenue on the Big Thompson River and ending just east of the resource segment 5LR10726.1. The ditch has been identified as one of the oldest in the system with rights dating back to 1863. The SHPO concurred with the determination that the overall linear feature 5LR10726 is an NRHP eligible resource under Criteria A and C and that segment 5LR10726.1 has a low degree of integrity. The segment under discussion is located north of SH 402 and piped under the existing SH 402 at milepost 1.9.

Propp Farm (5LR11247)

The Propp Farm abuts the south side of existing SH 402 and is crossed on the east by the Big Thompson Manufacturing Ditch Segment (5LR10726.1). The Weber Farm East (5LR11249) is one property east of the Propp Farm.

The Propp Farm was built in the mid-1920s. The current 21.8 acres includes 6 historic buildings and 18.5 acres of alfalfa hayfields.

The Propp Farm is eligible for inclusion in the NRHP under Criterion A for its association with a period of significance, the Colorado Plains - Post 1900 Agricultural - Sugar Beets context. The Propp Farm was part of a larger 80-acre farm then, where sugar beets, hay, and corn were grown.

Weber Farm East (5LR11249)

The Weber Farm East is under the same ownership as the Weber Farm (5LR10725). The Weber Farm East abuts the south side of existing SH 402 approximately 1.6 miles to the east of the Weber Farm. There are no cross streets in the vicinity, and the eastern boundary is approximately 870 feet west of CR 9E. This property accesses SH 402.

The Weber Farm East complex was built in the early 1900s with remodels to the main house. The 2.1-acre fenced complex consists of 13 buildings, a feedlot, and tilled fields.

The Weber Farm East is eligible for inclusion in the NRHP under Criterion A because it represents the typical early-to mid-20th century farming lifestyle in the Loveland and Larimer County area. The site is also eligible for inclusion in the NRHP under Criterion C as representative of early 20th century farm architecture in the Loveland area.

Mountain View Farm (5LR11242)

The Mountain View Farm is located in the northwest quadrant of the SH 402 and I-25 interchange.

The Mountain View Farm complex built in the 1920s includes both the farmstead and associated fields. The farmstead includes five historic buildings, six modern buildings, and eight modern features, including a feedlot. According

to the current owner, the main house was relocated and remodeled in 1964 due to the construction of I-25.

This property is eligible under Criterion A, for its association with the period of significance in the sugar beets context, even though the house has been moved. Previous owners grew hay, grain, and sugar beets and later ran a dairy at this location.

3.11.2 No Action Alternative

Implementation of the No Action Alternative would not affect any historic properties.

3.11.3 Meander Alternative

Implementation of the Meander Alternative will result in impacts on the following NRHP eligible resources:

- Big Thompson Manufacturing Ditch Segment (5LR10726.1)
- Propp Farm (5LR11247)
- Weber Farm East (5LR11249)
- Mountain View Farm (5LR11242)
- Weber Farm (5LR10725)

FHWA and CDOT, in consultation with the SHPO, concluded that this project widening will result in the following under Section 106 of the NRHP (see Appendix A for all Section 106 correspondence):

- No adverse effect
  - Big Thompson Manufacturing Ditch Segment (5LR10726.1) (see SHPO letter June 29, 2005, and again on September 13, 2006)
  - Propp Farm (5LR11247) (see SHPO letter August 22, 2006)
  - Weber Farm East (5LR11249) (see SHPO letter May 26, 2006, and again on September 13, 2006)
  - 5LR11242 Mountain View Farm (see SHPO letter August 22, 2006)
- Adverse effect
  - Weber Farm (5LR10725)

The City of Loveland Community and Strategic Planning Department was also afforded an opportunity to review the Section 106 findings. Impacts for each property are described below.

Big Thompson Manufacturing Ditch Segment (5LR10726.1)

The expansion of SH 402 will increase the length of the pipe under the highway. This would occur with all action alternatives. No other alterations to the ditch are anticipated. As a result of the finding of no adverse effect, no further action is required under Section 106 for ditch segment 5LR10726.1.

Propp Farm (5LR11247)

For the Meander Alternative, the alignment of the expanded SH 402 remains to the north, holding the existing southern edge of right-of-way the entire length of the Propp Farm. The only impact on the farm is the acquisition of a 25-foot permanent utility easement across the 410-foot front of the property.

Except for the possible loss of several trees associated with placing utilities underground, there will be no other impacts on the Propp Farm. Utility poles are currently located in an easement along the front of the property. The trees date from the 1960s and are not part of the historic landscape. As a result of the finding of no adverse effect, no further action is required under Section 106 regarding site 5LR11247.

Weber Farm East (5LR11249)

For the Meander Alternative, the alignment of the expanded SH 402 remains to the north, holding the existing southern edge of right-of-way the entire length of the Weber Farm East. The only impact on the farm is the acquisition of a 25-foot permanent utility easement across the front of the property.

Except for the probable loss of a cottonwood tree associated with placing utilities underground, no other physical features of the Weber Farm East property will be affected. The tree is not considered a part of the historic landscape. Utility

poles are currently located in an easement along the front of this property. As a result of the finding of no adverse effect, no further action is required under Section 106 for site 5LR11249.

Mountain View Farm (5LR11242)

The SH 402 project will taper from four to two lanes at the I-25 interchange adjacent to and east of the Mountain View Farm. The additional proposed right-of-way would take 35 feet off the front of the property for a distance of 1,935 feet. Potential physical highway improvements would generally remain south of the farm's existing fence line. The shoulder for the expanded SH 402 will end at the current fence; however, fill slopes associated with the construction would intrude further to the north. Possible impacts on features associated with the farm within the expanded right-of-way include loss of frontage from a modern feedlot, location adjacent to the front of the calving shed, and loss of a bank of weedy species trees located in front of the house. The field survey revealed an unkempt, dense growth of elms, sumac, and juniper. These trees, likely planted after the relocation of the house during the 1960s, are not part of the historic landscape. As a result of the finding of no adverse effect, no further action is required under Section 106 regarding site 5LR11242.

Weber Farm (5LR10725)

The widening of SH 402 at this location results in the need for additional right-of-way and a permanent utilities easement from the frontage of the Weber Farm with an approximate width of 58 feet for right-of-way and an additional 25 feet for permanent easement (total of 83 feet) the entire length of the SH 402 frontage.

In the vicinity of the buildings on the property, the result will be the loss of the main house and chicken brooder house. Note that the alignment veers north as SH 402 heads east past the Big Thompson River in the vicinity of the Manufacturing Ditch Lateral. This slightly reduces the right-of-way and easement requirements from the eastern 500 feet of Weber Farm frontage.

3.11.4 Mitigation

The SHPO was consulted on the impacts of the project. The following mitigation is recommended.

A Memorandum of Agreement to resolve adverse effects on this property was executed on February 9, 2007 (see *Appendix A*).

The Weber Farm (5LR10725) was recorded prior to construction so that there is a permanent record of its present appearance and history. Recordation consisted of Level II Documentation as determined in consultation with the SHPO and according to the standards established in Office of Archaeology and Historic Preservation Form #1595. The SHPO accepted the Level II Documentation on May 7, 2007 (see *Appendix A*). Copies of the documentation also will be sent to a local archive designated by the SHPO.

3.12 Archaeology

Cultural resources can be either prehistoric and/or historic, and may also be archaeological. These resources are nonrenewable and are protected by the same federal, state, and local laws, ordinances, and guidelines listed under Historic Preservation in *Section 3.11*.

3.12.1 Prehistoric Overview and Inventory Results

Prehistoric resources include the remains of artifacts and/or features representing one or more events. Artifacts include ceramics, bone, chipped stone, chipped volcanic glass, metal, perishable fiber, and wood. Features include stone, wood, earth, and mortar.

Colorado's Front Range and plains have been occupied by humans for more than 12,000 years. Four prehistoric cultural stages took place in the foothills and Front Range of the Platte River basin: the Pre-Projectile, the Paleoindian, the Archaic, and the Late Prehistoric (Chambellan et al. 2003). File and literature searches and the Class III inventory referred to in *Section 3.11*

included a search for archaeological sites over a total of 265 acres. No archaeological resources were found in the course of the pedestrian survey (intensive field survey conducted on foot), and no further work is recommended.

3.12.2 No Action Alternative

Implementation of the No Action Alternative would not have an impact on archaeological or prehistoric properties.

3.12.3 Meander Alternative

Implementation of the Meander Alternative would not affect any known archaeological or prehistoric properties.

3.12.4 Mitigation Measures

No mitigation is required.

Should evidence of historic or archaeological resources be discovered during construction of any alternative, the CDOT senior staff archaeologist will be notified immediately to ensure evaluation as required by NHPA and all other applicable state and federal regulations.

3.13 Native American Consultation

As mandated by Section 106 of the National Historic Preservation Act (as amended) and revised Advisory Council on Historic Preservation regulations (36 CFR 800), FHWA contacted 15 federally recognized Indian tribes with an established interest in Larimer County, Colorado. The tribes were invited to become consulting parties for the project (see *Appendix A*), thus acknowledging the government-to-government relationship between the United States and sovereign tribal groups. Federal agencies must be sensitive to the fact that historic properties of religious and cultural significance to one or more tribes may be located on ancestral, aboriginal, or ceded lands outside modern reservation boundaries. Consulting tribes are given an opportunity to voice concerns about cultural resources and how the proposed project might affect them. If it is found that a project would have an impact on cultural resources eligible for inclusion on the NRHP and of religious or cultural significance to one or more consulting tribes, their role in the consultation process may also include participation in resolving how best to avoid, minimize, or mitigate impacts. By consulting interested parties in the Native American community, FHWA and CDOT strive to protect areas important to Native Americans.

Tribes invited by letter to participate as a consulting party included:

- Ute Mountain Ute Tribe
- Southern Ute Indian Tribe
- Ute Tribe of the Uintah and Ouray Agency (“Northern” Ute)
- White Mesa Ute Tribe
- Cheyenne and Arapaho Tribes of Oklahoma
- Comanche Tribe of Oklahoma
- Kiowa Tribe of Oklahoma
- Pawnee Nation of Oklahoma
- Cheyenne River Sioux Tribe
- Crow Creek Sioux Tribe
- Oglala Sioux Tribe
- Rosebud Sioux Tribe
- Standing Rock Sioux Tribe
- Northern Arapaho Tribe
- Northern Cheyenne Tribe

Six tribes wrote back and asked to be included as consulting parties for the project: the Southern Ute Indian Tribe, the Cheyenne and Arapaho Tribes of Oklahoma, the Kiowa Tribe of Oklahoma, the Pawnee Nation of Oklahoma, the Rosebud Sioux Tribe, and the Northern Arapaho Tribe. These tribes will continue to receive information pertinent to the NEPA documentation process for the duration of the SH 402 EA project.

The Cheyenne and Arapaho Tribes of Oklahoma expressed general concern about discovery of buried human skeletal remains during construction.

Consulting tribes raised no additional issues concerning proposed highway improvements or locations considered to have cultural or religious

significance. Should Native American human remains be inadvertently exposed during any phase of work associated with the proposed project, the six consulting tribes will be notified immediately and provided the opportunity to take a proactive role in the treatment and disposition of the remains.

By initiating, encouraging, and facilitating Native American consultation, FHWA and CDOT have fulfilled their legal obligations in this regard as stipulated in the Section 106 and Advisory Council regulations.

3.13.1 Mitigation Measures

Based on available information, no mitigation is required.

3.14 Sections 4(f) and 6(f) Resources

FHWA and CDOT recognize the importance and value of properties defined by Section 4(f) of the DOT Act of 1966 (49 USC 303) and 6(f) properties defined by Section 6(f)(3) of the Land and Water Conservation Fund Act.

DOT regulations explicitly state that the Secretary of Transportation cannot approve the acquisition of publicly owned land from a park, recreation area, or wildlife refuge, or land from a national, state, or local historic site unless no feasible and prudent alternative exists. These properties are commonly referred to as 4(f) properties.

The area adjacent to SH 402 does not include any parks, recreation areas, or wildlife refuges or properties purchased with funds from the Land and Water Conservation Act Section 6(f). Therefore, no Section 6(f) resources have been identified.

- Five Section 4(f) NRHP eligible historic properties have been identified for this project. Four will have no adverse effects under Section 106 of the NRHP and, therefore, will have *de minimis* impacts under Section 4(f) as per the FHWA *de minimis* finding dated November 15, 2006:
  - Big Thompson Manufacturing Ditch Segment (5LR10726.1)
  - Propp Farm (5LR11247)
  - Weber Farm East (5LR11249)
  - Mountain View Farm (5LR11242)

A determination of adverse effect has been made for the Weber Farm (5LR10725) resulting in a use under Section 4(f).

See *Chapter 4, Section 4(f) Evaluation* for additional discussion.

3.15 Noise

This project is subject to *CDOT Noise Analysis and Abatement Guidelines* (December 1, 2002; *Appendix D*). CDOT guidelines are consistent with FHWA guidelines (23 CFR 772) and have been approved by FHWA for use on federal-aid projects.

Noise levels are measured in units called decibels (dB). Noise levels are generally "weighted" to reflect the fact that the human ear responds differently to sounds of various levels and frequencies. Weighted sound levels are expressed in units called A-weighted decibels or dB(A). All noise levels discussed herein are A-weighted. Table 3-4 summarizes the human ability to perceive loudness and changes in noise levels; Table 3-5 shows typical noise levels.

Table 3-4. Relationship Between Decibels and Perception of Loudness

Change in Sound Level	Typical Perception
+10 dB(A)	Twice as loud
+5 dB(A)	Readily perceptible increase
+3 dB(A)	Barely perceptible increase
0 dB(A)	No change
-3 dB(A)	Barely perceptible decrease
-5 dB(A)	Readily perceptible decrease
-10 dB(A)	Half as loud

Table 3-5. Typical Noise Levels

Noise Source	Noise Level, dB(A)
Amplified rock band	115–120
Commercial jet takeoff at 200 feet	105–115
Community warning siren at 100 feet	95–105
Busy urban street	85–95
Construction equipment at 50 feet	75–85
Freeway traffic at 50 feet	65–75
Normal conversation at 6 feet	55–65
Typical office interior	45–55
Soft radio music	35–45
Typical residential interior	25–35
Typical whisper at 6 feet	15–25
Human breathing	5–15
Threshold of hearing	0–5

CDOT's guidelines establish noise abatement criteria, design requirements, and cost-effectiveness requirements for noise mitigation. These guidelines state that noise mitigation must be considered for any receptor or group of receptors for which predicted traffic noise levels (using future traffic volumes and highway conditions) meet or exceed CDOT's Noise Abatement Criteria (NAC) shown in Table 3-6. CDOT defines the approach level as 1 dB(A) less than the values shown in Table 3-6. This means a noise impact for Category B receptors (residences) occurs when the future noise levels reach or exceed 66 dB(A).

CDOT noise guidelines also state that noise mitigation should be considered for a receptor when predicted noise levels in future conditions exceed existing noise levels by 10 dB(A) or more.

The SH 402 noise analysis consisted of identifying existing noise levels, predicting noise levels from both the No Action and Meander Alternatives, and comparing noise levels to CDOT impact thresholds. The feasibility and reasonableness of noise mitigation measures were analyzed for each location where noise thresholds were exceeded. The following sections summarize noise analysis procedures and results. For additional information, refer to the *Noise Analysis Report, State Highway 402 – U.S. 287 to Interstate 25* (Hankard Environmental Report 22-06-1, November 2004).

3.15.1 Existing Noise Levels

Noise levels were measured at the eight locations shown in Figure 3-9. Measurements are listed in Table 3-7 and range from 55 to 71 dB(A). During the noise measurements, the volume and speed of traffic on all nearby major streets were recorded. These data were input into a STAMINA 2.0 model created specifically for this study. Measured and predicted levels (also shown in Table 3-7) were then compared to check the accuracy of the model. On average, the STAMINA 2.0 model predicted noise levels within 2 dB(A) of measured levels, which is within the desired accuracy of ±3 dB(A).

3.15.2 No Action Alternative

Under the No Action Alternative in 2030, the loudest hour noise levels are predicted to equal or exceed the NAC Category B criterion of 66 dB(A) at eight residential locations: R5, R19, R25, R35, R43, R47, R50, and R69. Figure 3-9 illustrates residences where noise levels exceed 66 dB(A).

Loudest hour noise levels would be reached during the peak hour. Congestion limits how much noise is generated, as the loudest hour occurs when a substantial volume of traffic is able to travel at free-flow speeds. Noise levels were not predicted to reach or exceed the NAC Category C approach criterion of 71 dB(A) at any existing commercial locations.

3.15.3 Meander Alternative

Direct noise impacts were assessed by comparing predicted noise levels for the Meander Alternative in 2030 to the appropriate NAC Category Criterion and the 10 dB(A) increase criterion.

Noise levels attributed to 2030 traffic on I-25 were not assessed as a part of this analysis but are being analyzed as part of the North I-25 Environmental Impact Statement.

Results show that noise levels would meet or exceed the NAC Category B criterion of 66 dB(A) at 11 residential receptors: R19, R24, R25, R31, R43, R45, R47, R50, R57, R59, and R69 (not including residences R5 and R35, which would be acquired for widening under the Meander Alternative). Noise levels did not reach or exceed the NAC Category C approach criterion of 71 dB(A) at any business.

Figure 3-9 illustrates the residences affected by noise. Note that the eight residences affected by the No Action Alternative are also affected by the Meander Alternative.

Noise levels are predicted to increase an average of 4 dB(A) for adjacent properties in the corridor by 2030, with a maximum increase for one property of 8 dB(A). The increases in noise are due to a combination of projected traffic volume increases and realignment of SH 402 closer to receptors in some locations. Because the maximum projected increase is less than the 10 dB threshold for substantial increase, no properties are considered affected by this criterion.

Table 3-6. CDOT Noise Abatement Criteria Hourly A-Weighted Sound Level in Decibels [dB(A)]

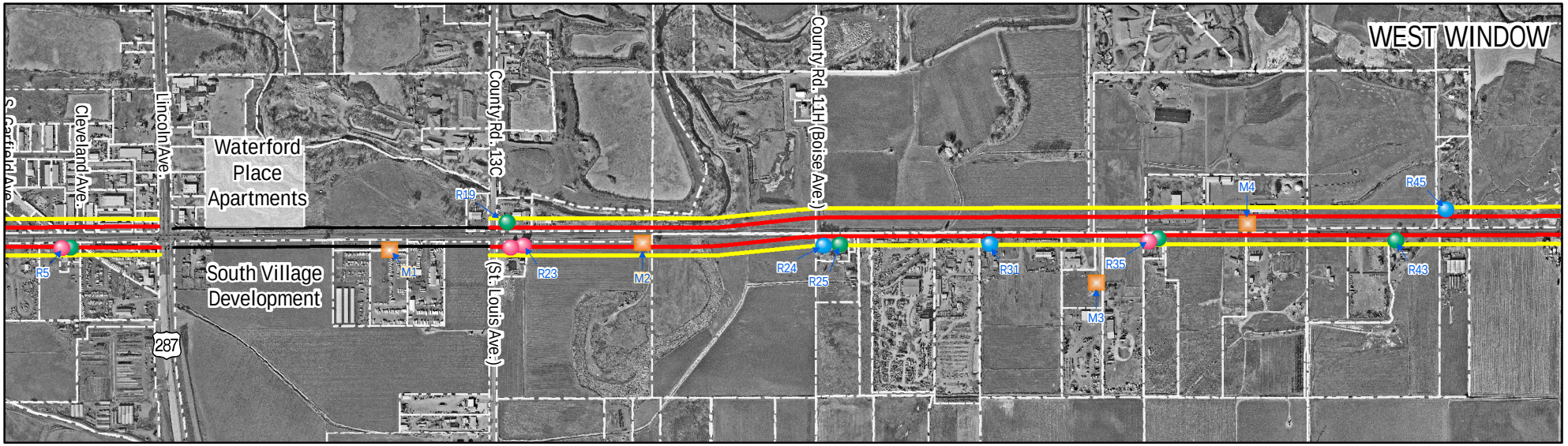
Activity Category	$L_{eq}(h)$[a]	Description of Activity Category
A	56 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	66 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	71 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	—	Undeveloped lands.
E	51 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

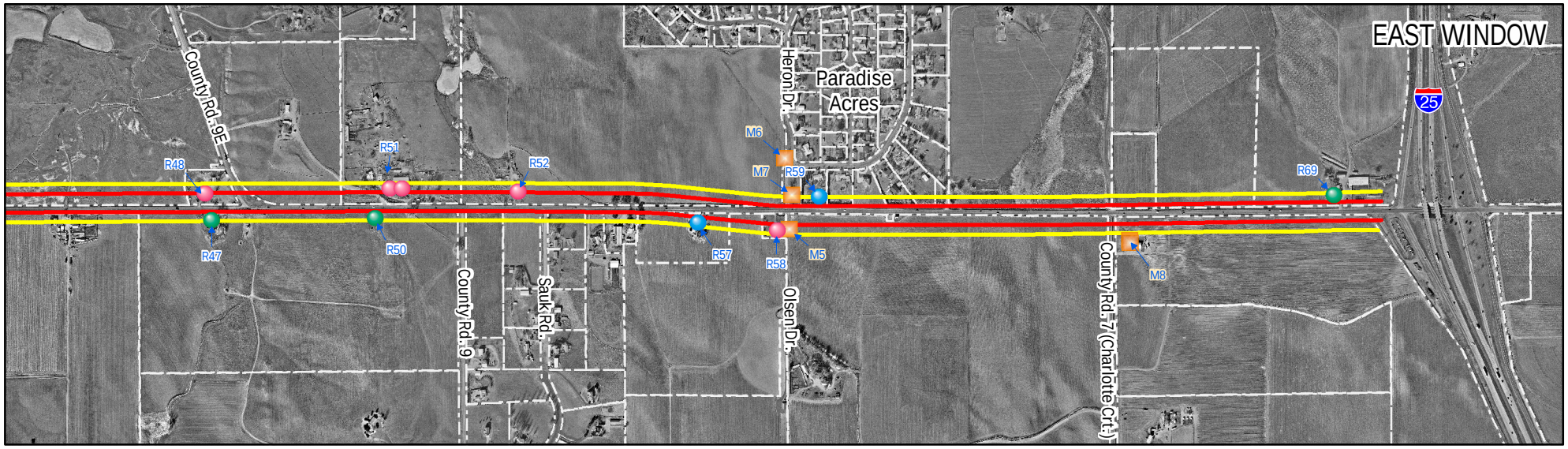
[a] *Hourly A-weighted equivalent level for the "loudest hour" of the day in the design year*

Table 3-7. Measured and Predicted Noise Levels [L_{eq} dB(A)]

Site	Time	Measured Level	Predicted Level	Predicted Minus Measured
M1	8:45 AM to 9:45 AM	64.9	63.9	-1.0
M2		67.1	69.0	1.9
M3		57.5	55.2	-2.3
M4		71.1	69.3	-1.8
M5	10:45 AM to 11:45 AM	65.0	62.4	-2.6
M6		55.4	56.2	0.8
M7		63.3	64.3	1.0
M8[a]		63.6	59.8	-3.8

[a] *Wind blowing from the highway into the microphone likely resulted in measured levels in excess of predicted levels at this location*





LEGEND

- Property Parcel Boundaries
- Existing Right-of-Way
- 66 dBA Noise Level Contour
- 71 dBA Noise Level Contour
- Receptors Only Impacted by Meander Alternative
- Receptor Impacted by Either No Action or Meander Alternative
- Home and Outbuilding Acquisitions under Meander Alternative
- Noise Measurement Locations

N W E S

SCALE - 1:14,700 or 1" = 1225'

0 500 1,000 Feet

SOURCE: 2001 1/2-foot resolution aerial photography. Land use and parcel information provided by the City of Loveland. Noise receptor information provided by Hankard Environmental. Map produced November 29, 2006 by JFSA.

DOT SH402 Environmental Assessment

Noise Measurement and Impact Locations

FIGURE 3-9

Map Document: (H:\projects\402\2007_mxd\EA_FINAL_SIGNATURE\sh402_noise_impacts_8x11_070201.mxd)
5/1/2007 -- 5:24:20 PM

3.15.4 Mitigation Measures

A noise mitigation analysis was conducted at each of the 11 residences where Meander Alternative noise levels are predicted to equal or exceed the 66 dB(A) criterion. Noise barrier configurations were analyzed for feasibility and reasonableness in accordance with CDOT *Noise Analysis and Abatement Guidelines (Appendix D).*

CDOT guidelines for feasibility are: 1) if constructed, can a barrier be built in a continuous manner; 2) can noise be reduced at least 5 dB(A); and 3) will maintenance or safety issues cause a "fatal flaw"?

Guidelines for reasonableness are: 1) do existing and future noise levels exceed the standards; 2) is the cost-benefit per affected receptor per decibel of noise reduction within a $4,000 limit; 3) does the mitigation meet the desires of the residents; and 4) how are Category B land uses affected? Cost-benefit is calculated using a simple formula of total estimated cost of mitigation divided by the number of homes benefited times the decibel reduction.

Noise mitigation was determined to be infeasible at eight locations (R19, R31, R43, R45, R47, R50, R57, R69) because all have direct access on to SH 402. A substantial break in the noise barrier would be required to allow for safe access, which would lessen the effectiveness of the mitigation. Furthermore, most of these residences are dispersed, resulting in a high cost per residence.

A noise wall 250 feet long in the proposed Meander Alternative right-of-way was modeled for R24 and R25 and would affect residences on the south side of the CR 11H intersection. Wall height would need to be 15 feet tall to achieve the required 5 dB(A) noise reduction. Using a cost index of $30 per square foot, the estimated cost of the wall would be $112,500. Two noise receptors would benefit, with an average noise reduction of about 5 dB(A). The resulting cost-benefit of $112,500 (cost of noise barrier divided by the number of benefited noise receptors and by the average noise reduction) would exceed the CDOT maximum of $4,000 per receptor. Although the noise wall would be feasible, it is not considered reasonable due to the high cost-benefit ratio. Thus, no noise mitigation is recommended for this location.

A noise wall 1,250 feet long in the proposed Meander Alternative right-of-way was modeled for the Paradise Acres neighborhood, located on the corner of SH 402 and Heron Drive. Though noise was considered to have an impact on only one location, R59, a noise wall, was designed to protect the entire neighborhood. Wall height would need to be at least 6 feet tall to achieve the required 5 dB(A) noise reduction, but it was determined that a 10-foot wall resulted in an improved cost-benefit. Using a cost index of $30 per square foot, the estimated cost of the 10-foot wall would be $375,000. Twelve noise receptors would benefit, with a noise reduction of 4.4 dB(A). The resulting cost-benefit of $7,100 exceeds the CDOT maximum of $4,000 per receptor. Although the noise wall would be feasible, it is not considered reasonable due to the high cost-benefit ratio. Thus, no noise mitigation is recommended for this location.

Two receptors, R5 and R35, will be acquired for the Meander Alternative highway widening and are not subject to noise mitigation.

Figure 3-9 illustrates noise impact locations based on 2030 traffic conditions. It also includes both 66 dB(A) and 71 dB(A) noise level contours. Future development of certain types (including residential) will not be compatible with noise levels that exceed 66 dB(A). The 66-foot contour line is estimated to fall between 135 and 180 feet from the edge of pavement of existing SH 402. The 71-foot contour line is closer, ranging from approximately 70 to 100 feet from the existing edge of pavement.

Natural Environment

Natural environment resources and issues described in this section include:

- air quality
- ecology
- threatened and endangered species and species of special concern
- wetlands
- floodplains
- water quality
- geology
- paleontology

3.16 Air Quality

The city of Loveland has a climate typical for mid-latitude high elevations and is strongly affected by local and regional topographic features. In general, the city experiences low relative humidity, light precipitation, and abundant sunshine. The combination of low moisture and windy days can increase airborne particulates (windblown particulate emissions and fugitive dust).

National Ambient Air Quality Standards (NAAQS)**.** The Clean Air Act of 1970 required the Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) for pollutants that pose a risk to public health. Standards were set for six "criteria" pollutants: sulfur dioxide, carbon monoxide (CO), ozone, lead, nitrogen dioxide, and particulates (of 2.5 microns [$PM_{2.5}$] or less and of 10 microns or less [PM_{10}]).

The State of Colorado has adopted the NAAQS for these pollutants. The Colorado Department of Public Health and Environment (CDPHE) Air Pollution Control Division (APCD) monitors concentration of these pollutants. Geographic areas that violate a particular NAAQS pollutant standard are considered "nonattainment" areas for that pollutant. Violations are determined by a prescribed number of exceedances of the particular standard.

The APCD also monitors for visibility, as well as pollutants that do not have a national standard established. These "noncriteria" pollutants include nitric oxide, total suspended particulates, arsenic, and sulfates.

Greenhouse gases (water vapor, carbon dioxide [CO_2], methane, and nitrous oxide) and emissions are discussed in *Climate Change & Colorado, A Technical Assessment* (CDPHE 1998) and the November 2000 supplement. The APCD has developed several CO_2 reduction strategies and will be considering regional programs to reduce station, area, and mobile CO_2 sources.

Carbon Monoxide (CO). Because the city of Loveland and town of Johnstown are outside the Fort Collins carbon monoxide attainment/maintenance area and that urban growth area, they are not required to conform to the requirements of the Fort Collins air quality maintenance plan for CO. Hot-spot modeling is not required for this project because the highway is located in a CO attainment area.

Ozone. In 2004 the EPA designated the Denver metropolitan area as nonattainment for the 8-hour ozone standard. This area includes portions of Larimer and Weld counties, including the city of Loveland and town of Johnstown.

An Early Action Compact (EAC) designed to achieve and maintain the 8-hour ozone standard has been developed for this nonattainment area. The EAC for ozone includes specific milestones that must be met to achieve the standard by December 31, 2007. The EAC was submitted to the EPA in July 2004. EPA has deferred nonattainment designation for the region as long as EAC milestones are met. No further action is required for the proposed SH 402 project at this time.

Particulates (PM_{10} and $PM_{2.5}$). Transportation conformity is required for federally supported transportation projects in areas that have been designated by EPA as not meeting NAAQS. On March 10, 2006, EPA issued amendments to the Transportation Conformity Rule to address localized impacts of particulate matter: *$PM_{2.5}$ and PM_{10} Hot-Spot Analysis in Project-level Transportation Conformity Determinations for the New $PM_{2.5}$ and Existing PM_{10} NAAQS (*71 FR 12468). These rule amendments require assessment of localized air quality impacts for federally funded or approved transportation projects for PM_{10} and $PM_{2.5}$ nonattainment and maintenance areas.

The entire city of Loveland and town of Johnstown are outside both the Fort Collins and Greeley air quality boundaries. This means that the SH 402 project corridor is located outside air quality boundaries for any nonattainment or maintenance areas for NAAQS related to those communities. Both Fort Collins and Greeley are in attainment for PM_{10}. No information was identified for $PM_{2.5}$ at this time. The amendments to the Transportation Conformity Rule do not apply to the SH 402 transportation improvement project.

Re-entrained dust from road sanding is a prime contributor to PM_{10}. CDOT reduces street sanding emissions for highway corridors through the use of alternative deicing compounds such as magnesium chloride, lower temperature "M-Caliber 1000 and 2000," and "Ice-slicer" and rapid sand cleanup.

Mobile Source Air Toxics**.** In addition to the NAAQS, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (such as airplanes), area sources (such as dry cleaners) and stationary sources (such as factories or refineries). The *FHWA Air Toxic Interim Guidance* (February 3, 2006) is used for analysis of mobile source air toxics (MSATs) for highway projects. The following discussion and the discussion in *Appendix F*, *SH 402 Air Quality Technical Memorandum for Mobile Source Air Toxics,* are in accordance with the interim guidance.

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

In the 2001 rulemaking, EPA identified six priority MSATs: benzene, acrolein, formaldehyde, acetaldehyde, 1,3- butadiene, and diesel exhaust. EPA is in the process of assessing the risks of various kinds of exposures to these pollutants.

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling to estimate ambient concentrations resulting from the estimated emissions, exposure modeling to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

Project Level MSAT Discussion. In this EA, FHWA has provided a qualitative analysis of MSAT emissions relative to the No Action and Meander Alternatives and has acknowledged that these may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

As discussed above, FHWA believes technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. This can give a basis for identifying and comparing the potential differences among MSAT emissions—if any—from the No Action and Meander Alternatives. The qualitative assessment presented below is based in part from a study conducted by the FHWA entitled *A*

Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives, found at: www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm.

Although the differences in 2030 ADT for the No Action and Meander Alternatives were not calculated, vehicle miles traveled (VMT) for the Meander Alternative is expected to be slightly higher than for the No Action Alternative because the additional capacity increases the efficiency of the highway and attracts some rerouted trips from elsewhere in the transportation network. Typically, the amount of MSATs emitted would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each alternative.

The increase in VMT would lead to slightly higher MSAT emissions for the Meander Alternative along the highway corridor, together with a corresponding decrease in MSAT emissions along other routes as user habits change. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds. According to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs, except diesel particulate matter, decrease as speed increases.

For SH 402, it is possible that the congestion relief and associated increases in speed as a result of the additional capacity (laneage) will have more of an effect on reducing emissions than the offset due to an increase in VMT. In the case of the proposed improvements, increased capacity will mean the difference between a design year (2030) LOS F for the No Action Alternative at most intersections east of CR 13C and for through traffic east of CR 11H versus a range of LOS A to D for intersections and LOS C for through traffic for the Meander Alternative. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

The additional travel lanes contemplated as part of the Meander Alternative will have the effect of moving some traffic closer to nearby homes and businesses; therefore, there may be localized areas where ambient concentrations of MSATs could be slightly higher under the Meander Alternative than the No Action Alternative. However, as discussed above, the magnitude and the duration of these potential increases compared to the No Action Alternative cannot be accurately quantified due to the inherent deficiencies of current models. In sum, when a highway is widened and, as a result, moves closer to receptors, the localized level of MSAT emissions for the Meander Alternative could be higher relative to the No Action Alternative, but this could be offset due to increases in speeds and reductions in congestion(which are associated with lower MSAT emissions). Also, MSATs will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause regionwide MSAT levels to be significantly lower than today's levels.

National Level MSAT Reductions. Regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 56 to 81 percent between 2005 and 2030. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

No air quality problems have been identified for the SH 402 corridor. Motor vehicle emissions in the study area would not result in any exceedance of the NAAQS; therefore, no direct project air quality mitigation is necessary.

3.16.1 No Action Alternative

No additional air quality conformity or analyses for CO, ozone, particulates of 10 microns or less, or MSATs are applicable to the No Action Alternative.

3.16.2 Meander Alternative

No additional air quality conformity or analyses for CO, ozone, particulates of 10 microns or less, or MSATs are applicable to the Meander Alternative.

3.16.3 Mitigation Measures

Based on available information, no mitigation is required.

3.17 Ecology

Both vegetation and wildlife are addressed in this section. Field trips to the project area were taken numerous times during the study. Local natural resource information was obtained from consultations with local biologists, city and county websites, the Colorado Natural Heritage Program (CNHP) Element Occurrence database, and the Colorado Division of Wildlife's (CDOW's) Natural Diversity Information System (NDIS).

3.17.1 Vegetation

Portions of the project area that are not residential or commercial are vegetated primarily by plants introduced as crop, pasture, or landscape species. Unused pasture and fallow croplands have been invaded by weedy species in many areas. The most valuable habitat for native vegetation species and structural diversity remaining in the project area is the riparian or streamside habitat along the Big Thompson River.

Riparian Habitat

The most diverse habitat in the project area occurs along the Big Thompson River as riparian forest and shrub (a fringe of wetlands is confined to the low-flow level along the bank). The river occurs within 60 feet of SH 402 near the intersection with CR 13C. The river angles north and then northeast from this point eastward and ranges from approximately 0.33 to 0.5 mile north of the highway to where it crosses I-25. Dominant riparian and wetland plant species include peach-leaved willow (*Salix amygdaloides*), sandbar willow (*S. exigua*), plains cottonwood (*Populus deltoides* ssp. *monilifera*), Russian-olive (*Elaeagnus angustifolia*), showy milkweed (*Asclepias speciosa*), reed canarygrass (*Phalaroides arundinacea*), and Emory sedge (*Carex emoryi*).

Although valuable in relation to other habitat along SH 402 because of structural diversity, the *Loveland Natural Areas* report (LNA 1996) indicates that this wildlife habitat along SH 402 near the Big Thompson River is of moderate to low value. The study included associated gravel mining ponds as part of this habitat. Probably due to extensive agricultural and other development activity as well as channelization of the river, the riparian habitat in this area near the highway occurs in a narrow corridor.

Woodlands

Large plains cottonwood trees (up to 30 inches diameter breast height [DBH]) characterize the area north of SH 402 where the Big Thompson River approaches the road and are also scattered along the corridor in association with farmsteads. Other trees that were observed along the road as landscaping or shelterbelts include Chinese elm (*Ulma pumila*), Russian-olive, red cedar (*Sabina virginiana*), honey locust (*Gleditsia triacanthos*), crab apple (*Malus* spp.), box elder (*Negundo aceroides*), sumac (*Rhus* spp.), weeping willow (*Salix babylonica*), peach-leaved willow (*Salix amygdaloides*), Austrian pine (*Pinus nigra*), ponderosa pine (*Pinus ponderosa* ssp. *scopulorum*), piñon pine (*Pinus edulis*), and blue spruce (*Picea pungens*). This area contains evidence of past disturbance with the understory dominated by crested wheatgrass (*Agropyron desertorum*), kochia (*Bassia sieversiana*), and smooth brome (*Bromopsis inermis*).

Upland Prairie

Representative prairie plants remaining in the project area occur along the eastern half of the corridor and include saltgrass (*Distichlis stricta*), fringed sage (*Artemisia frigida*), Canada wild rye (*Elymus canadensis*), sand dropseed (*Sporobolus cryptandra*), wild sunflower (*Helianthus annuus*), rubber rabbitbrush (*Chrysothamnus nauseosus*), and a mint (potentially horsemint [*Monarda fistula*]). A shortgrass prairie site with a black-tailed prairie dog town occurs approximately 0.25 mile north of SH 402 and immediately east of CR 9.

Developed/Reclaimed Vegetation (Weedy Species)

Areas that have been disturbed and left as fallow ground or reclaimed are characterized by ruderal or weedy species. Such areas occur sporadically in the highway right-of-way and along crop and field edges. Many of these weedy species are not included on the county, CDOT, or state noxious weed lists but, nonetheless, are good indicators for the developed/reclaimed vegetation type. Some of the species identified in the project area included curly dock (*Rumex crispus*), crested wheatgrass (*Agropyron desertorum*), yellow and white sweetclover (*Melilotus* spp.), prickly lettuce (*Lactuca seriola*), cocklebur (*Xanthium strumarium*), ragweed (*Ambrosia* spp.), reed canarygrass (*Phalaroides arundinacea*), lamb's quarters (*Chenopodium* spp.), Chinese elm (*Ulmus pumila*), smooth brome (*Bromopsis inermis*), and kochia (*Bassia sieversiana*).

3.17.2 Noxious Weeds

Colorado's current list of noxious weeds may be found in the Colorado Department of Agriculture, Plant Industry Division, 8 CCR 1203-19 Rules Pertaining to the Administration and Enforcement of the Colorado Noxious Weed Act C.S.R. 35-5.5 101-119. State-listed noxious weed species that were observed in the project area are noted in Table 3-8 and addressed in the Noxious Weed Management Plan (*Appendix E*). Invasive plant control is regulated by the state and carried out by CDOT along state highways, and by local governments on other public lands, focusing on weeds included on the Colorado Noxious Weeds List. Concentrated infestations noted in CDOT noxious weed mapping and during the October 1, 2004, weed survey include Canada thistle (*Breea arvense*), Russian-olive (*Elaeagnus angustifolia*), and field bindweed (*Convolvulus arvensis*). State-listed noxious weeds that were noted, but not in major infestations, included musk thistle (*Carduus nutans*), quackgrass (*Elytrigia repens*), and puncturevine (*Tribulus terrestris*). Canada thistle (*Breea arvense*) and Russian-olive (*Elaeagnus angustifolia*) tended to grow where extra moisture was available near ditches, in the old river meander, and on wetland edges. A map of state-listed noxious weed locations is presented in *Appendix E* as Figure E-1.

3.17.3 Wildlife

Big Thompson River Habitats

The portion of the Big Thompson River in the SH 402 study area near CR 13C provides habitat of moderate to low value, and the addition of highway and development activity in the area will not likely encourage habitat use. Highways tend to fragment habitat by reducing connectivity, depending on traffic volumes, noise, and species sensitivity (Singleton et al. 2002).

Upland Habitats

The existing pasture and adjacent crop fields also provide little habitat value for wildlife. Recent development projects on the western end of the project area have reduced the amount of habitat further, making the area even less suitable for wildlife species.

Table 3-8. Weedy Species: Larimer County and Colorado Noxious Weed Lists

Common Name	Scientific Name	Larimer County Weed List[a]	CDOT Weed List[b]	State Noxious Weed List[a]
Quackgrass	*Elytrigia repens*			B
Russian-olive	*Elaeagnus angustifolia*		X	B
Musk thistle	*Carduus nutans* ssp. *macrolepis*	X	X	B
Canada thistle	*Breea arvense*	X	X	B
Puncturevine	*Tribulus terrestris*			C
Field bindweed	*Convolvulus arvensis*			C

Taxonomy follows Colorado Flora: Eastern Slope, *Weber and Wittmann, 2001.*

[a] *From Colorado Department of Agriculture Plant Industry Noxious Weeds website, including 2003 Revised Rules Pertaining to the Administration and Enforcement of the Colorado Noxious Weed Act (8 CCR 1203-19), accessed 12 November 2003; includes county lists. State management plans include the following designations: A = species to be eradicated, B = stop continued spread, and C = species left to local jurisdictions and use of integrated weed management controls supported.*

[b] *From CDOT Noxious Weed Mapping Project June 2004.*

Project Area Wildlife

The wildlife species most likely to inhabit the project area are those adapted to using the edges of semirural to rural human environments. These include seasonal (such as breeding birds) and year-round residents (including mammals).

Species observed directly or by signs (such as tracks and scat) during limited site visits are described below.

Large mammal game trails were observed in riparian areas of the Big Thompson River near CR 13C. Large mammals common to Front Range agricultural and riparian areas that may inhabit the project area include mule deer (*Odocoileus hemionus*), white-tailed deer (*O. virginianus*), and coyote (*Canus latrans*).

Burrows were observed for the red fox (*Vulpes vulpes*). Old tree-cutting evidence of beaver (*Castor canadensis*) activity was seen along the Big Thompson River, and a muskrat (*Ondatra zibethicus*) was observed near the project area. Other medium-sized and small mammals that inhabit the riparian and wooded area near the Big Thompson River that parallels SH 402 near CR 13C area include the raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), eastern cottontail (*Sylvilagus floridanus*), and numerous small rodents (for example, deer mouse [*Peromyscus* spp.]).

Other bird species common to rural and semirural areas with tree cover and grasslands likely to occur in the project area include the house sparrow (*Passer domesticus*), house finch (*Carpodacus mexicanus*), northern flicker (*Colaptes auratus*), and American crow (*Corvus brachyrhynchos*). With the river's steep banks and lack of shrubs and native grasses, few waterfowl and shorebird nest sites are expected in the project area.

Numerous bird species in Colorado are adapted to habitat edges of human-altered landscapes and may spend at least part of the year in the project area. Birds observed during site visits included western meadowlark (*Stella neglecta*), black-billed magpie (*Pica pica*), blue jay (*Cyanocitta cristata*), Canada goose (*Branta canadensis*), American white pelican (*Pelecanus erythrorynchus*), mallard (*Anas platyrhynchos*), Brewer's blackbird (*Euphagus cyanocephalus*), mourning dove (*Zenaida macroura*), rock dove (*Columba livia*), red-winged blackbird (*Agelaius phoeniceus*), great blue heron (*Ardea herodias*), belted kingfisher (*Ceryle alcyon*), double-crested cormorant (*Phalacrocorax auritus*), and California gull (*Larus californicus*).

No birds of prey or raptor nests were observed in field visits to the project area. Birds of prey (raptors) that are common in Front Range semirural areas and hunt in croplands and other grasslands include the bald eagle (*Haliaeetus leucocephalus*), red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), American kestrel (*Falco sparverius*), great horned owl (*Bubo virginianus*), and short-eared owl (*Asio flammeus*).

3.17.4 No Action Alternative

No loss of vegetation or wildlife habitat is associated with the No Action Alternative.

3.17.5 Meander Alternative

Vegetation Impacts

The Meander Alternative includes highway improvements that would primarily impact CDOT right-of-way and edges of previously disturbed vegetation. Disturbance of native wetland vegetation areas is discussed in detail in *Section 3.19, Wetlands.* Permanently disturbed land cover/vegetation types (determined from aerial photographs and field inspections) were estimated at 23.7 acres. Of the total 23.7 acres of vegetation impacts, 0.3 acre is prairie, 8.0 acres are pasture, 12.5 acres are cropland, 2.5 acres are already disturbed (that is, driveways), and 0.4 acre is woodlands. Thus, more than 80 percent is used for crops, pasture, or other agricultural purposes. Approximately 3 percent of the impacts will occur in woodland or upland prairie.

The Meander Alternative avoids the loss of cottonwood trees to the extent possible. However, based on GIS mapping of the alternative footprint and aerial photograph interpretation with field inspections, a grove of approximately 27 cottonwoods with trunks between 4 and 10 inches in diameter near the Big Thompson River would need to be removed. This would affect part of the Big Thompson River woodland habitat. An additional 145 trees within the alternative footprint (many of which were planted as part of landscaping or shelterbelts along SH 402 in association with rural fields and residences) would need to be removed for construction. Probable species affected include plains cottonwood, Chinese elm, Russian-olive, and red cedar (*Sabina virginiana*).

Wildlife Impacts

Few direct impacts on wildlife are associated with the Meander Alternative. This alternative was specifically designed to reduce residential relocations and also reduces impacts on wildlife by minimizing direct impacts on the habitat around the Big Thompson River. No additional wildlife habitat fragmentation would occur under the Meander Alternative because the existing highway already divides the area. The design of the Meander Alternative will minimize direct impacts on habitat around the Big Thompson River corridor, especially trees and wetlands. Specific habitat impacts are described under Vegetation above. Wildlife species that can adapt to the rapidly developing area would be expected to continue to use the riparian corridor, remaining cropland edges, and rural residences once highway construction is complete.

Temporary indirect impacts on wildlife would include daytime and nighttime disturbances from construction activities, increased noise, and additional human presence in the area during construction. Specific effects from highway improvements construction may be comparable to other construction disturbances associated with ongoing development in the area. Wildlife species now present may already be habituated to these types of disturbances, while others may have abandoned the area.

3.17.6 Mitigation Measures

Vegetation

Permanent impacts on vegetation from the Meander Alternative were estimated at 23.7 acres. More acreage would be temporarily affected by construction activities but will be reclaimed after construction is completed in individual areas.

Vegetation replacement will be coordinated with landowners (city of Loveland and private property), and agricultural land mitigation will be based on crops or pastures disturbed for project implementation. Native species will be used to the greatest extent feasible, depending on designated land use, and will be specified for CDOT rights-of-way. Riparian trees will be replaced on a 1:1 basis; all other trees will be replaced when feasible.

Techniques used by CDOT to stabilize and minimize erosion and to revegetate areas are outlined in detail in *Standard Specifications for Road and Bridge Construction* (2005), part of CDOT BMPs.

The following measures are designed to reduce direct and indirect impacts on vegetation and to control soil erosion and noxious weeds:

- Specification 207 covers salvaging and stockpiling topsoils for reuse in reclamation. No imported topsoil will be allowed. Topsoil heavily infested with noxious weeds will be removed from the site or buried under a minimum of 5 feet of fill.
- Specification 208 directs contractors to permanently stabilize (that is, cover disturbed areas with final seed and mulch as indicated in plans) each 17-acre increment of the project immediately after grading is finished for that section.
- Specifications 208 and 216 cover other mechanical erosion prevention methods (besides seeding, for example) and include use of soil retention blankets, placement of bales in drainages, use of silt fence, berms/diversions, slope drains, storm drain protection, check dams, channel stabilization, sediment traps or basins, and sandbag barriers.
- Specification 212 covers seeding.
- Specification 213 covers mulching seeded and other bare soil areas.
- Specification 214 covers planting.
- Specification 217 covers herbicide treatments, if needed for weed control.

A weed management plan has been developed and a weed survey was conducted to locate and map weed populations that may be spread by construction activities. Required construction contractor practices to minimize new weed infestations and control the spread of current weed populations are described in detail in *Appendix E, Noxious Weed Management Plan*. Practices include:

- application of appropriate herbicides
- requirement that construction vehicles arrive at the construction site free of soil or vegetative plant parts capable of containing noxious weed seed/plant parts
- storage of weed-free topsoil and restriction on importation of topsoil
- use of only weed-free mulch for reclamation in accordance with the Weed Free Forage Act, CRS Title 35, Article 27.5
- monitoring and care of revegetation will be accomplished by the CDPS permit requirements
- restrictions on mowing and cutting weeds when seeds are ripe for dispersal

In addition to the above required practices, sensitive areas such as riparian habitat, woodlands, and wetlands in the vicinity of project construction activities will be fenced to prevent vegetation damage from construction machinery. Construction access will be limited to fenced areas to curtail erosion, weed invasions, and damage to habitats.

Wildlife

Few direct or indirect impacts on wildlife are associated with the Meander Alternative. Mitigation for impacts includes CDOT BMPs specified under Vegetation above. Clearing of vegetation should be done between September and April to reduce the effects on nesting

activities and to comply with Migratory Bird Act requirements.

3.18 Threatened and Endangered Species and Species of Special Concern

The Endangered Species Act (ESA) of 1973 established measures for conservation of federally listed plant and animal species, including protection of critical habitat necessary for their continued existence (16 USC §§ 1531 *et seq*). Critical habitat is defined as designated areas of a listed species' habitat that are essential to the conservation of that species. Federally listed and state listed threatened, endangered, and other sensitive species (including federally proposed species and candidates for federal listing), state species of concern, and species considered imperiled in the state by CNHP were assessed for potential project impacts. These species are collectively referred to as TES species. CNHP, the organization responsible for cataloging TES species in Colorado, was queried for plant and animal species recorded in the project area. Other state and federal agency specialists, websites, and current literature were consulted to aid in the development of a comprehensive list of TES species that may occur in the proposed project area. Additionally, project biologists performed a series of site visits to make direct observations of suitable habitat for TES species potentially present.

In accordance with Section 7 of the ESA, an informal consultation was conducted with the US Fish and Wildlife Service (USFWS) to obtain a list of species with potential to occupy the project area. (See *Appendix A* for correspondence.) An initial coordination letter was received on November 18, 2003. Table 3-9 lists the individual TES species identified by the USFWS for Larimer County in this letter.

Additional evaluations and surveys, if warranted, will be conducted prior to project construction for any new TES species identified subsequent to the current study.

3.18.1 Bald Eagle *(Haliaeetus leucocephalus)*

The bald eagle was officially delisted from protection under the ESA on June 28, 2007. It is still offered some protection under the Bald and Golden Eagle Protection Act of 1940 as amended in 1978. The bald eagle is also protected under the Migratory Bird Treaty Act. Although no nest or roost sites have been identified in the study area, foraging activities may occur along this stretch of the Big Thompson River.

Bald eagles are seasonal migrants and winter residents in Larimer County and have been recorded to use urban lakes and rivers for foraging and roosting. The entire Big Thompson River corridor from west of the city of Loveland into the vicinity of the SH 402 project area along SH 402 is designated by CDOW as bald eagle concentration area, bald eagle winter forage area, and part of the extensive bald eagle winter range that covers Colorado's Front Range (NDIS 2003). Important areas include roost sites—usually tall cottonwoods on the edge of water sources. The nearest recorded roost site is approximately 9 miles southeast of the project area on Saint Vrain Creek. No bald eagles have been recorded as nesting in the city of Loveland; the nearest known nest is outside the southern city limits about 2 miles from the project area (NDIS 2003).

Table 3-9. TES Species Identified by USFWS as Potentially Occurring in the Project Area

Species	Scientific Name	Status	Probability of Occurrence/ Potential to Be Affected
Bald eagle (delisted June 28, 2007)	*Haliaeetus leucocephalus*	FT, ST	No; occasional winter roosting is possible; no presence observed/No adverse effect anticipated.
Preble's meadow jumping mouse	*Zapus hudsonius preblei*	FT, ST	No; nine studies in the area were negative; area is quite disturbed/No adverse effect anticipated.
Ute ladies'-tresses orchid	*Spiranthes diluvialis*	FT	No; lack of suitable wet meadows and no individuals observed during site survey/No adverse effect anticipated.
Colorado butterfly plant	*Gaura neomexicana* ssp. *coloradensis*	FT	No; lack of undisturbed wet meadows and no individuals observed during site survey/No adverse effect anticipated.

FT = listed as federally threatened, ST = listed by Colorado as threatened

Based on observations of no bald eagle nests or roost sites in the study area, and because the overlap of winter forage and concentration along SH 402 is only 1 mile long, minimal use of the study area by the bald eagle is expected. Typical winter prey species include fish (where water remains open), waterfowl, and rodents such as prairie dogs. No prairie dog towns are located in the project area, but fish and waterfowl are potentially available along the Big Thompson River and associated wetlands.

There are no direct project impacts on bald eagles along the Big Thompson River.

3.18.2 Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*)

CNHP records indicate that nine potential habitat sites along the Big Thompson River were determined to be not suitable, or Preble's meadow jumping mouse (PMJM) were not present before 2001. In 2001, a mouse was captured on the east side of I-25 approximately 1.5 miles from the project area. PMJM habitat assessments were conducted during field investigations (fall 2001) in the project area. Suitable habitat for this mouse requires structural diversity, including tree, shrub, and grass components next to running streams. No suitable PMJM habitat was identified in the project area. Most potential habitats in the study area have been previously disturbed and are accessible to predators such as domestic dogs and cats. This negatively affects habitat quality for PMJM; therefore, this species is not expected in the project area. *Appendix A* contains USFWS concurrence dated July 29, 2004. USFWS concurrence must be renewed before construction.

3.18.3 TES Plants

Habitat assessments were also conducted for the Ute ladies'-tresses orchid (*Spiranthes diluvialis)* in wet areas along the SH 402 corridor. The project area has been almost completely modified from its natural state and is now dominated by introduced species. The project area does not contain a floodplain with suitable hydrology and vegetation cover conditions necessary for suitable ladies'-tresses or Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*) habitat. *Appendix A* includes USFWS concurrence dated October 13, 2004.

3.18.4 Candidate TES Species

The black-tailed prairie dog (*Cynomys ludovicianus*) was listed in the USFWS letter of correspondence dated November 18, 2003. However, in a news release dated August 12, 2004, the USFWS stated that it has determined that the black-tailed prairie dog does not meet the Endangered Species Act definition of threatened and is being removed as a candidate for listing (USFWS 2004). Field reconnaissance verified that black-tailed prairie dogs inhabit a relatively small patch of shortgrass prairie immediately north (that is, outside) of the project construction envelope. No other suitable black-tailed prairie dog habitat has been identified in the project area.

3.18.5 Downstream TES Species

The USFWS letter dated November 2003 listed eight TES species occurring in Nebraska, downstream from the project area, which use habitat on the South Platte River. It is presumed that if this project were to take enough water from the Big Thompson River to cause water depletions on the South Platte River in Nebraska, indirect impacts could affect whooping crane (*Grus americana*), piping plover (*Charadrius melodus*), interior least tern (*Sterna antillarum*), western prairie fringed orchid (*Platanthera praeclara*), American burying beetle (*Nicrophorus americanus*), bald eagle (*Haliaeetus leucocephalus*), Eskimo curlew (*Numenius borealis*), and pallid sturgeon (*Scaphirhynchus albus)*. At this time, there is no information to suggest a need for water depletions from the Big Thompson River and subsequent downstream effects on the South Platte River.

3.18.6 No Action Alternative

The No Action Alternative would not affect any TES species.

3.18.7 Meander Alternative

The Meander Alternative would not affect any TES species.

3.18.8 Mitigation Measures

No mitigation is required.

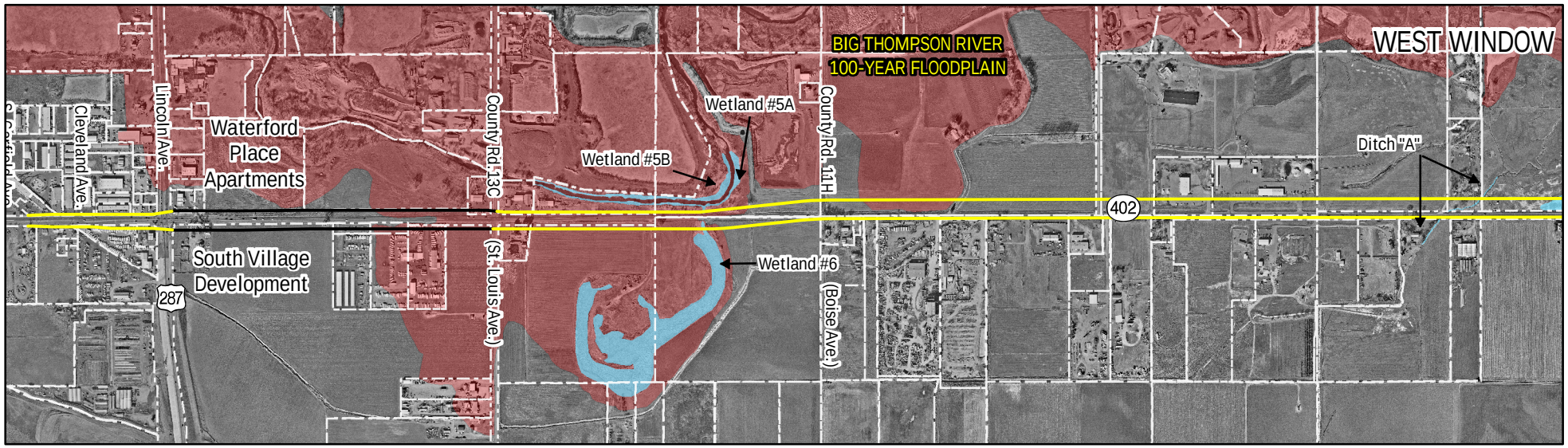
3.19 Wetlands

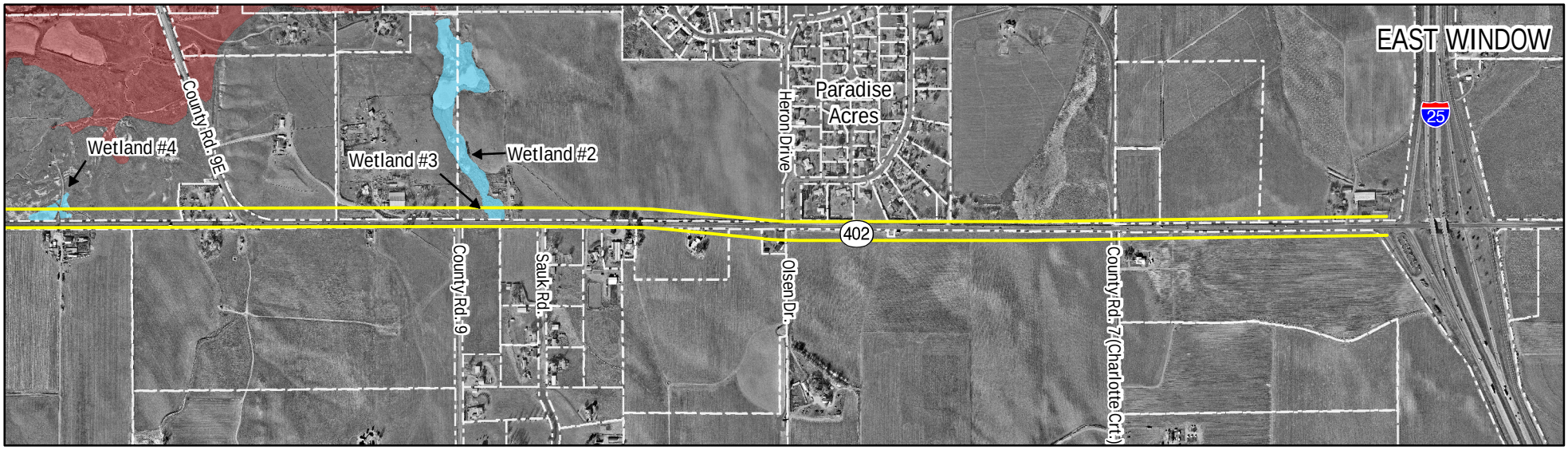
The presence of wetlands in the project area was determined from aerial photograph interpretation and confirmed in field investigations. Aerial photography used for initial wetland identification and to assist with delineations included color photography obtained in 2001 with a 2-foot pixel resolution and gray-scale photography obtained in 2002 with a 0.5-foot pixel resolution. Wetland determination methods followed 1987 US Army Corps of Engineers (USCOE) guidelines that specify vegetation, soil, and hydrology characteristics used to identify wetlands.

Detailed descriptions of the six wetlands recorded and their indicator plant species are presented in *Appendix B, Wetland Finding Report*. Wetlands are mapped in Figure 3-10. Table 3-10 summarizes these six wetlands by type and the area affected. Wetland delineations were conducted on August 24 and 25, 2001; October 25, 2001; and March 13, 2003. Wetland delineations were inspected by USCOE on May 19, 2004 (See USCOE letter dated June 1, 2004, in *Appendix B2*).

Most of the wetlands were classified as Palustrine Emergent (PEM) type, following Cowardin et al. (1979). The PEM type consists of marshlike wetlands, which, in the project area, are characterized by typical wetland indicator plant species including bulrush (*Scirpus palidus*), broad-leaved cattail (*Typha latifolia*), spikerush (*Eleocharis palustris*), reed canarygrass (*Phalaroides arundinacea*), and Emory sedge (*Carex emoryi*). The exception is the Palustrine Forested/Emergent (PFO/EM) wetlands of peach-leaved willow (*Salix amygdaloides*), sandbar willow (*S. exigua*), scattered plains cottonwood (*Populus deltoides* ssp. *monilifera*), reed canarygrass, and Emory sedge that occur along the Big Thompson River (Sites 5A and 5B). Soils of the PEM wetlands either contained mottles indicating a fluctuating water table or were very dark to grayish-blue (gleyed), indicating anaerobic conditions from nearly continuous saturation. Near the river, soil was either saturated to the surface or within 6 inches of the surface.

All of the identified wetlands except Site 4 are USCOE jurisdictional, with surface water or defined channel connections to other navigable waters of the US (such as the Big Thompson River). Based on USCOE CFR 33, Section 323 guidelines, jurisdiction under Section 404 of the Clean Water Act (CWA) applies to such waters (including wetlands) that have surface connections to waters of the US or other navigable waters.





LEGEND

- Wetlands
- Floodplain
- Property Parcel Boundaries
- Proposed Meander Right-of-Way
- Existing Right-of-Way

N
W E
S

SCALE - 1:14,700 or 1" = 1225'

0 500 1,000 Feet

SOURCE: 2001 1/2-foot resolution aerial photography. Land use and parcel information provided by the City of Loveland. Wetland information obtained through field observation and aerial photo interpretation by JFSA. Floodplain information provided by FEMA. Map produced November 29, 2006 by JFSA.

DOT SH 402 Environmental Assessment

Wetlands and the Big Thompson River 100-Year Floodplain

FIGURE 3-10

Map Document: (H:\projects\402\2007_mxd\EA_FINAL_SIGNATURE\sh402_wetlands_floodplain_8x11_070201.mxd)
5/1/2007 -- 5:31:18 PM

In addition, all of the wetlands in the study area have been altered in some way by human activities, including irrigation ditch diversions, upstream development, and stock pond construction. Site 5B (PFO/PEM) is on the north side of the Big Thompson River and will not be affected by activities on SH 402.

Functions and values for wetland sites were determined on the basis of their role in the ecological processes of each area according to Adamus et al. (1987) and are listed in Table 3-11. The highest functional value wetland habitat in the project area is associated with the Big Thompson River in the western portion of the project area (Sites 5A/5B and 6), with ratings of moderate to high.

Table 3-10. SH 402 Wetlands by Location and Potential Impacts of Meander Alternative

Site	Location	Descriptions	Area (acres)	Permanent Impacts (acres)	Temporary Impacts (acres)
		Jurisdictional to Section 404, Clean Water Act			
2	N. SH 402, E. CR 9E[a]	PEM[a]; cattail marsh	6.49	0.234	0.03
3	N. SH 402, E. CR 9	PEM[a]; transitional edge of Site 3, wildrye, Baltic rush	0.14	0.124	0.01
Irrigation ditch A[a]	Bisects SH 402 ~1/2 mile west of CR 9E	PEM; reed canarygrass and Emory sedge at edge of ditch	0.16	0.061	<0.01
5A/5B	N. SH 402 along Big Thompson River	PFO/PEM; reed canarygrass with willows along channel	0.95	<0.005	0.01
6	S. SH 402, E. CR 13C	PEM; reed canarygrass, cattail marsh	10.65	0.029	0.01
Total			18.39	0.453	0.06
		Nonjurisdictional to Section 404, Clean Water Act			
4[a]	N. SH 402, W. CR 9E	PEM[a]; saltgrass alkali seep	0.67	0.440	0.03
Totals			**19.06**	**0.893**	**0.09**

[a] *Cowardin et al. (1979) classification: PEM = Palustrine emergent wetland; PEM/SS = Palustrine emergent and scrub-shrub wetland*

Table 3-11. Principal Functions and Values[a] of Project Area Wetlands

Functions	Wetland Sites					
	2	3	4	Ditch A	5A/5B	6
Groundwater recharge	M	L	L	L-M	M	M
Groundwater discharge						L
Floodflow alteration	M	L	M	L	H	M
Sediment stabilization	M	L	L	L	M	L
Sediment/toxicant retention	H					M
Production export	L	L				
Aquatic diversity/abundance					L	
Wildlife diversity/abundance for breeding, wintering, migration	L	L			M	M
Recreation and uniqueness/heritage					M	
Qualitative functional rating	M	L	L-M	L	M	L-M

[a] *Functional values: L = low, M = moderate, H = high, blank = no identified function*

The river has the most reliable perennial source of water and the most diverse habitat and is less disturbed than the other wetland areas. However, the larger PEM marsh wetland (Site 2) provides high functions for sediment/toxicant retention (water quality improvement).

3.19.1 No Action Alternative

No impacts on wetlands are associated with the No Action Alternative.

3.19.2 Meander Alternative

Approximately 0.89 acre of wetlands will be permanently affected by fill actions to expand the roadbed, of which 0.45 acre is jurisdictional. An additional area that includes 5 feet at the edge of the cut-and-fill line was included to ensure that impacts were not underestimated.

Wetlands associated with a stock pond (Site 2, 0.23 acre) and an alkali seep (Site 4, 0.44 acre) would incur the largest losses from construction of the Meander Alternative.

Temporary impacts will total 0.09 acre, of which 0.06 acre is jurisdictional. Temporary impacts were calculated within a 10-foot area from the construction footprint (with the 5-foot addition). This area includes impacts from exclusion fence and silt fence construction, dismantling of fences, and culvert work. This area will be reclaimed.

3.19.3 Mitigation Measures

CDOT BMPs include mitigation for all jurisdictional and nonjurisdictional wetlands permanently affected by construction projects, including replacement with created wetland areas or enhancement of existing areas to achieve a replacement-to-loss ratio of 1:1. Temporary disturbances of wetland areas can be mitigated by reclamation and revegetation with appropriate species. Topsoil from disturbed wetlands can be salvaged and reused for mitigation purposes unless infested with noxious weeds.

0.89 acre of wetlands will be replaced on a 1:1 basis.

Mitigation measures to offset impacts on wetlands during construction are addressed by BMPs that control erosion and minimize sedimentation in wetlands adjacent to construction sites.

General mitigation techniques include replacement plantings for native riparian species, especially trees and shrubs, between the river terrace and the highway toe-of-fill.

Should construction access roads and work pads be constructed in wetlands, protective material (fabric or hay) will be used, and topped with aggregate and/or soil fill. When construction is completed, the protective material will be removed with the goal of preserving the original wetland plant community. Any plants damaged will be replaced with species appropriate for the site.

A number of potential wetland mitigation sites have been identified during the environmental assessment process. Possible locations along SH 402 include the vicinity of Sites 2, 3, and 6.

Should it not be possible to create replacement sites in these areas, mitigation of wetland losses are proposed at the Big Thompson Ponds State Wildlife Area (SWA), which is approximately 0.5 mile north of SH 402 near I-25. The mitigation concepts for these sites are described in *Appendix B, Wetland Finding Report*.

Along SH 402, wetlands could be expanded by approximately 0.45 acre to account for losses of jurisdictional wetlands. Plant species such as bulrush, burreed, and sedges are suggested for this area to increase the wetland community diversity from primarily cattail-dominated marsh.

Nonjurisdictional wetland loss (approximately 0.44 acre) may be replaced at the Big Thompson Ponds SWA. Should potential wetland replacement sites along SH 402 not provide an adequate solution due to lack of landowner cooperation or lack of a suitable site, jurisdictional wetland loss can also be mitigated at the Big Thompson Ponds SWA.

Because the project impacts on jurisdictional wetlands are less than 0.5 acre and affect nontidal waters-wetlands, a Nationwide Permit 14 is appropriate (Carey 2004). Finalization of wetland mitigation site location and design of mitigation are required to obtain the Nationwide Permit 14 approval. Monitoring of mitigation sites will be specified in the USCOE permit.

3.20 Floodplains

The Big Thompson River meanders generally eastward on the north side of SH 402. The river dips south to within 60 feet of the highway between CR 13C and CR 11H before turning northward again. The existing SH 402 highway crosses through 5.78 acres of the Federal Emergency Management Agency (FEMA) 100-year floodplain for a linear distance of approximately 0.3 mile. The 100-year floodplain and floodway boundaries for the Big Thompson River were delineated in the 1999 FEMA Flood Insurance Study (FIS) for unincorporated areas of Larimer County (see Figure 3-10).

3.20.1 No Action Alternative

No floodplain impacts are expected under the No Action Alternative.

3.20.2 Meander Alternative

HEC-RAS (USCOE software used to determine flood profile) was used to gauge the impact of widening the highway on base flood elevations of the river. Because FEMA was unable to locate the data used to delineate the floodplain and floodway in the 1999 study, a model was created using river station locations from the 1999 FIS and ground survey contours created for the project area in 2002 (see FEMA letter in *Appendix A*). The analysis included stretches of the floodplain that overlap SH 402. The limits of the model are from just west of US 287 (FIS River Station X) to just east of CR 11H (FIS River Station I). Model results indicate that the greatest increase in base flood elevation is only 0.02 foot at river stations Q and S from the FEMA FIS. River station Q is located immediately upstream of CR 13C, and river station S is located approximately 0.3 mile further upstream.

Based on the analysis, the Meander Alternative would have minimal impacts on the floodplain, within the limits set by Larimer County and FEMA.

3.20.3 Mitigation Measures

No mitigation is required. The base flood elevation increase of 0.02 foot is much less than Larimer County's limit/requirement of 0.1 foot and also less than FEMA's limit/requirement of 1 foot.

3.21 Water Quality

3.21.1 Existing Surface Water Environment

The dominant surface water feature in the project study area is the Big Thompson River, a perennial stream with headwaters in Rocky Mountain National Park. Its gently meandering channel flows eastward through the southern part of the city of Loveland and joins the South Platte River south of Greeley. In the reach of the Big Thompson between US 287 and I-25, numerous ponds are located near the river, and several minor drainages with wetland components feed into the river (see Figure 3-10). Urban development adjacent to SH 402 is prevalent in the westerly portion of the project corridor within the Loveland city limits.

Groundwater in the project area is associated with the alluvial and terrace deposits of the Big Thompson watershed. According to the Modified Environmental Site Assessment (M-ESA), 90 registered wells are within a 1-mile radius of the study area, 29 of which are monitoring wells. Only one well, a monitoring well owned by Total

Petroleum, is immediately adjacent to SH 402. No domestic or municipal wells are immediately adjacent to SH 402.

The Water Quality Control Commission (WQCC) and Colorado Department of Public Health and Environment (CDPHE) have identified water quality impaired streams and streams with classifications and standards to protect these resources under Section 303(d) of the Clean Water Act (CWA). Waters are classified according to the uses for which they are presently suitable or intended to become suitable. Numeric water quality standards apply for protection of these designated uses.

Two segments of the Big Thompson River in the project corridor have surface water classifications and standards. Segment 4b is located in the western project corridor and extends from US 287 to CR 11H, and Segment 4c continues from CR 11H to I-25. Both segments are classified as "use protected" for:

- Warm Water Aquatic Life Class 2 (fish are of catchable size and normally consumed are present and fishing occurs regularly)
- Agriculture
- Recreation Class 1A (streams generally unsuitable for primary contact recreation due to water temperatures and stream flows)
- Recreation Class 2 (primary contact recreation does not exist and cannot reasonably be expected to exist in the future and where municipal discharges are present).

More than 30 water quality standards are in effect for each of these segments. Classification standards for these segments are shown in Table 3-12.

Neither of these two segments of the Big Thompson River is classified for drinking water supply use, and there are no drinking water plants in the immediate area of SH 402. Although the city of Loveland Water Treatment Plant is located on the north side of the river on the east side of CR 11H approximately 0.25 mile north of SH 402, there are no water intakes located along the river in the vicinity of SH 402.

Segments identified as impaired are those in which one or more classification or standard is not or may not be fully achieved. As necessary for the protection of the water resource to meet the requirements of the CWA, total maximum daily loads (TMDLs) are established by the Water Quality Control Division of CDPHE to set the maximum amount of pollutant that may be allowed while still complying with water quality standards. The two segments of the Big Thompson River in the project area are not impaired for their designated uses and are not on the current CDPHE TMDL list.

The effects of development and urbanization in the Big Thompson watershed are the primary water quality concerns in Larimer County. These development activities can increase stormwater runoff peak flows due to increased impervious surface area, and increase certain types of water pollutant sources. Pollutant sources can include point sources associated with industrial and wastewater discharge, as well as nonpoint sources such as from vehicles, commercial operations, and sediment from development construction activities. Existing land uses along the highway that already could have an impact on area water quality include agricultural, residential, commercial, and light industrial operations.

In 1986, the *City of Loveland Master Drainage Plan* and *Storm Drainage Criteria Manual* were initially completed and adopted. The city's *Drainage Criteria Manual* was updated in September 2002. The drainage plan outlined improvements to the existing system and established criteria that developers must follow for new developments. The projects include building regional detention ponds, increasing the size of existing storm sewers, and solving flooding problems following heavy rainstorms.

Table 3-12. CDPHE Water Quality Control Commission Regulation #38 Surface Water Quality Classifications and Standards Region 2 – Big Thompson River

Segment	Classifications	Standards	
4b. Mainstem of the Big Thompson from the Greeley-Loveland Canal diversion to County Road 11H.	Use Protected Aq Life Warm 2 Agriculture 5/1 – 10/15 Recreation 1a 10/16 – 4/30 Recreation 2	D.O. = 5.0 mg/l pH = 6.5-9.0 5/1 – 10/15 F.Coli=200/100ml E.Coli=126/100ml 10/16 – 4/30 F.Coli=2000/100ml E.Coli=630/100ml NH3(ac)=TVS NH3(ch)=0.10 Cl2(ac)=0.019 Cl2(ch)=0.011 CN=0.005 S=0.002 B=0.75 NO2=0.5 Fish Ingestion Organics	As(ch)=100(Trec) Cd(ac/ch)=TVS CrIII(ac/ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Hg(ch)=0.01(Tot) Ni(ac/ch)=TVS Se(ac/ch)-TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS
4c. Mainstem of the Big Thompson from County Road 11H to I-25.	Use Protected Aq Life Warm 2 Agriculture 5/1 – 10/15 Recreation 1a 10/16 – 4/30 Recreation 2	D.O. = 5.0 mg/l pH = 6.5-9.0 5/1 – 10/15 F.Coli=200/100ml E.Coli=126/100ml 10/16 – 4/30 F.Coli=2000/100ml E.Coli=630/100ml NH3(ac)=TVS NH3(ch)=0.10 Cl2(ac)=0.019 Cl2(ch)=0.011 CN=0.005 S=0.002 B=0.75 NO2=0.5 Fish Ingestion Organics Temporary modifications F. Coli=2000/100ml; and E.Coli=181/100ml Expiration date 12/31/04.	As(ch)=100(Trec) Cd(ac/ch)=TVS CrIII(ac/ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Hg(ch)=0.01(Tot) Ni(ac/ch)=TVS Se(ac/ch)-TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS

The *Master Drainage Plan* comprises all of Loveland's Growth Management Area (GMA) and covers the entire project corridor. According to the city's Comprehensive Plan, the city intends to eventually provide services to the entire GMA.

The western portion of the urban section of SH 402 from US 287 to CR 13C is drained by a curb and gutter system into the city of Loveland's municipal sewer. The curb and gutter system is in place along the northern highway from US 287 to the eastern edge of the Waterford Place development. Stormwater in the municipal sewer is combined with other urban runoff and discharged to the Big Thompson River. As further development takes place along the urban section, the curb and gutter system will be extended. Highway runoff in undeveloped portions of the urban section and the rural

section of SH 402 from CR 13C to I-25 is drained to vegetated ditches and swales. Numerous irrigation ditches that support area agriculture also cross the rural project area. Highway runoff may drain into irrigation ditches in areas where they are adjacent to the roadway. Conveyance of runoff in the rural section is less likely to affect receiving waters except during large storm events, because vegetated ditches and swales are likely to slow flows, filter sediment and other pollutants, and allow runoff to infiltrate into the ground.

A portion of the rural section of SH 402 between CR 13C and CR 11H is within 200 feet of the Big Thompson River. This highway section is flanked by vegetated ditches that allow for stormwater infiltration or conveyance to nearby irrigation ditches. No direct discharge of highway runoff into the river was identified in the rural section. In addition, existing riparian vegetation and wetland areas along the river in this area serve as a natural water quality buffer.

CDOT winter maintenance activities associated with existing SH 402 include application of a salt/sand mixture at a normal rate of 220 pounds per lane-mile. The liquid deicer magnesium chloride is currently applied at a rate of 40 gallons per lane-mile, but only in exceptional weather conditions. CDOT anticipates that the use of liquid deicer will become more prevalent in the future.

According to the hazardous waste M-ESA, the only documented hazardous materials spills in the project corridor have occurred at the I-25/ SH 402 interchange. These spill incidents have been addressed appropriately to avoid contamination of surface water and groundwater.

3.21.2 Colorado Discharge Permit Overview

Construction and post-construction runoff discharge associated with development activities and government/commercial/industrial operations are regulated under the National Pollutant Discharge Elimination System (NPDES) administered by the CDPHE Water Quality Control Division. The Colorado permit is referred to as the Colorado Discharge Permit System (CDPS) instead of NPDES. This permit system authorizes discharges from municipal separate storm sewer systems (MS4s), industrial activities, and construction sites that disturb one or more acres of land. MS4 permits generally include stormwater management program requirements such as maintenance of structural controls, new development and redevelopment planning program, industrial facilities program, construction sites program, and control of facility runoff program. CDOT will coordinate with the city of Loveland and Larimer County to ensure that the effort regarding the MS4 permits is not duplicative.

On March 13, 2003, the city of Loveland received its MS4 CDPS Permit and Certification from the CDPHE Water Quality Control Division. The CDPS general permit authorizes the city of Loveland to discharge stormwater from portions of its MS4 located in urbanized areas to state waters, including but not limited to the Big Thompson River. CDOT also has a MS4 permit (No. COS-000005) authorizing new or existing discharges composed entirely of stormwater from CDOT's MS4 in urbanized areas. CDOT's permit includes the designation of "sensitive" waters that are generally coincident with CDPHE's TMDL list. The Big Thompson River is not included on CDOT's sensitive waters list. CDOT's *New Development/Redevelopment MS4 Stormwater Management Program* calls for comprehensive planning procedures and controls to reduce the discharge of pollutants after new construction is complete.

The urban section of SH 402 (from US 287 to CR 13C) is under authority of both the city and CDOT MS4 permits. Larimer County also has an MS4 permit and would generally have authority over the rural section of the SH 402 corridor. However, the city includes the rural section in its Master Drainage Plan and GMA, and eventual

urbanization of the area might lead to both city and CDOT MS4 jurisdiction in the future. As noted previously, all three entities will work together on the permitting requirements.

3.21.3 No Action Alternative

Routine highway maintenance operations that include plowing, sanding, and resurfacing of the highway would continue under the No Action Alternative. Historic stormwater runoff from the highway and the potential for hazardous materials spills also would continue to exist under this alternative. However, spill impacts on area water resources are not a significant concern based on previously documented spill incidents. CDOT anticipates increased use of liquid deicers and decreased use of sand/salt mixture for winter maintenance in the future. Decreased sand usage would decrease the amount of sediment in highway runoff. Existing water quality in the Big Thompson River in the project corridor is not impaired for its designated uses. Runoff from SH 402 has not been identified as a specific concern for protection of Big Thompson watershed surface water quality. The No Action Alternative would not change existing stormwater runoff impacts associated with SH 402.

3.21.4 Meander Alternative

Potential impacts of the Meander Alternative include increased highway stormwater runoff because of an approximate 31-acre increased potential for highway runoff pollutants due to a projected 140 percent increase in traffic by year 2030. Increased highway runoff has the potential to impact the Big Thompson River with increased sediments, roadway deicers, metals from vehicle wear, particulates from vehicle exhaust, and petroleum products related to motor vehicles. The potential for hazardous materials spills would continue to exist with this alternative.

The urban section of the Meander Alternative includes a complete curb and gutter drainage system and will increase highway runoff to the municipal sewer system that discharges to the Big Thompson River. However, the city's continuing drainage improvements and city and CDOT MS4 permit compliance and monitoring are expected to provide adequate protection to the river's water quality. Permit compliance includes mitigation requirements discussed in *Section 3.21.5* below. In addition, the city's *Storm Drainage Criteria* and *Master Drainage Plan* include regional strategies to address growth and development effects on water quality.

The rural section of the Meander Alternative will increase highway runoff to roadway ditches and swales. Some highway runoff in combination with other runoff will eventually discharge into the Big Thompson River. Because the rural section of SH 402 is included in the city's GMA, the city's *Storm Drainage Criteria* and *Master Drainage Plan* would be applicable tools to address growth and development effects on water quality. Larimer County's MS4 permit is currently in effect for the rural section, and the city and CDOT MS4 permits should also be considered for the rural section in light of future planning. Permit compliance includes mitigation requirements discussed in *Section 3.21.5* below.

With the continuation of city, county, and CDOT stormwater programs, the increased highway runoff associated with the Meander Alternative is not expected to have an impact on designated uses of the Big Thompson River in the project area. Mitigation activities required by CDPS permits and city and county land use codes will minimize water quality impacts due to increased highway runoff and the associated increase in highway runoff pollutants resulting from the Meander Alternative.

3.21.5 Mitigation Measures

City and county land use codes protect the river floodplain area from development activities. CDPS permits, city and county land use codes and storm drainage criteria, and CDOT guidance will generally specify mitigation activities. CDOT will comply with and obtain all necessary permits

for protection of water resources, including CDPS and dewatering permits as necessary.

Best management practices (BMPs) for temporary and permanent erosion control will be implemented with the construction of the Meander Alternative to minimize the impact of disturbance on receiving waters. The CDOT project design team will seek to minimize soil disturbance impacts on irrigation ditches and other drainages in the study area as part of the final design process. In addition, the 4:1 slopes created by placement of fill materials will be reseeded to reduce erosion and sedimentation.

Long-term drainage from highway projects may require permanent BMPs under applicable permitting to protect receiving waters from erosion, sedimentation, and other contaminants. City, county, and CDOT MS4 permits currently cover the entire project corridor. In addition, the *City of Loveland Storm Drainage Criteria*, updated in 2002, will apply to the entire project corridor and is within the city's *Master Drainage Plan* area. Drainage criteria and MS4 permits (both city and CDOT) would generally require regional and/or onsite detention that includes 100 percent capture volume for the first 0.5 inch of runoff and 80 percent capture of total suspended solids to the "maximum extent practicable" (note that project-specific requirements will vary). Other permanent BMP options such as maintenance programs, sediment traps, and flow control structures might also be implemented under MS4 requirements.

CDOT is obligated under its MS4 permit to "…develop and implement comprehensive planning procedures and controls to reduce the discharge of pollutants after construction is completed, from areas of new highway development and significant redevelopment and associated drainages…" Project plans for the Meander Alternative will be evaluated under the criteria of the MS4 for the need to include permanent stormwater BMPs. This review will occur as early as possible during the final design process and will be guided by the CDOT MS4 *New Development Program* guidelines and procedures and the *CDOT Erosion Control and Stormwater Quality Guide.* This guide provides design and maintenance criteria for permanent BMPs. Based on the results of the design review process and in coordination with the city and county, CDOT will incorporate permanent BMPs to the maximum extent practicable and/or apply maintenance and administrative controls that provide equivalent protection for receiving waters. During final design, highway deicing and long-term maintenance and safety policy will be evaluated to determine the applicability of permanent controls.

The fact that CDOT, the city of Loveland, and Larimer County are all MS4 entities with separate permits will warrant interagency coordination due to potential issues of overlapping authority. This coordination will help prevent duplication of effort. According to CDPHE, a permitted MS4 entity would not be required to impose their program requirements on CDOT projects due to the MS4's limited authority to regulate CDOT, nor would an MS4 be responsible for regulating activities outside its jurisdiction. Coordination among CDOT, the city, and the county will occur during the project design phase to determine specific permanent BMPs for the project.

3.22 Geology

Impacts related to geological resources are considered important if:

- risk to human health and safety is increased
- impact leads to other adverse impacts
- unique geological or paleontological features or sites are impacted
- subsidence, erosion, or siltation are substantial
- recovery of other geological resources is impeded

The geological analysis was performed by evaluating available data and reports, followed by a drive-through of the corridor to review current

site conditions. No additional data collection or field investigations were done (Yeh and Associates 2004).

The bedrock formation directly underlying SH 402 in the project area is the Pierre Shale Formation. The Pierre Shale, a shale containing fossils and some limestone lenses, is about 6,800 feet thick in the project area. Ammonite fossils of *Baculites grandis*, *Baculites baculus*, *Baculites eliasi*, and *Baculites clinobatus* may be found in the project area. The Pierre Shale crops out in a belt as much as 20 miles wide from Loveland northward. The age of the Pierre Shale in the Loveland area ranges from Campanian to middle Maestrichtian, or about 67 to 82 million years ago. The structure of the bedrock in the project area is generally characterized by beds dipping gently east. Units of the Pierre Shale along SH 402 include an unnamed sandstone member and the type member Pierre Shale.

The Loveland oil field underlies the project area from US 287 to I-25 and is still in production. The method of production uses deep extraction that pulls primarily from the Dakota Formation. The proposed project is not expected to affect any existing extraction locations in the Loveland oil field and would not affect oil field production.

Alluvial gravels along the Big Thompson River are a possible source of construction aggregate material. These materials may be encountered near Hollowell's Corner, where the river passes close to SH 402 between CR 13C and CR 11H. Gravel pits are located north of SH 402. Local construction materials may be available from the gravel pits or from other alluvial deposits of the Big Thompson River.

Potential effects related to geological conditions include seismicity, expansive soils, slope instability/landslides, unique geological features, and erosion. Additional impacts related to soil type are identified in *Section 3.5.2*.

Seismicity. The project is located in an area of low seismic activity with no recent faulting and low topographic relief.

Expansive Soils. Bedrock in the project area is relatively flat-lying, and SH 402 has not historically experienced differential movements due to swelling soils.

Slope Instability/Landslides. The proposed project is located in an area of low topographic relief. Little impact is expected with properly designed cut-and-fill slopes.

Unique Geological Features. There are no unique geological resources in the project area; consequently, construction and operation of the proposed project is not expected to affect unique features.

Erosion. The project area is flat to gently sloping, with little surface disturbance and relatively competent soils. The proposed project is not expected to produce substantial erosion or to be adversely affected by erosion.

3.22.1 No Action Alternative

The No Action Alternative would not result in impacts on the geology, soils, or mineral resources of the project area. Gravel mining operations in the area will not be affected by this alternative.

3.22.2 Meander Alternative

The Meander Alternative involves limited disturbance and occurs in a relatively flat area. SH 402 would not be affected by any known geologic hazard and would have no impact on existing geological resources. Soil and erosion potential have not been identified for the project area. Gravel mining operations in the area will not be affected by the Meander Alternative.

3.22.3 Mitigation Measures

No mitigation is required.

3.23 Paleontology

Paleontological records searches were conducted at the University of Colorado at Boulder Museum and the Denver Museum of Nature and Science. A review of geological and paleontological literature was conducted at the Colorado School of Mines, and on October 2, 2003, a limited field survey of the project area was conducted (Erathem-Vanir Geological PLLC 2003).

No fossil localities were identified in the project area in the records searches. Scott and Cobban (1965, 1986) recorded three US Geological Survey (USGS) fossil invertebrate localities in the Pierre Shale, in and near the project area. These include 1) USGS D3638, from an unnamed sandstone member of the Pierre Shale, about 0.15 mile north of SH 402; 2) USGS D4054, from the middle part of the Pierre Shale, about 0.35 mile north of SH 402; and 3) USGS D4060, from the base of the "upper transitional member" of the Pierre Shale (Scott and Cobban 1986), about 0.75 mile north of SH 402.

These and other USGS and University of Colorado Museum fossil localities in the Pierre Shale that are further from the project area generally yielded only the remains of fossil invertebrates (cephalopods, bivalves, and gastropods). The localities are also well known for their ammonites and nautiloids. Scott and Cobban (1986) reported the presence of fish teeth at USGS locality D3638. In addition, the Pierre Shale and its marine equivalents in the Rocky Mountain region have produced rare bones of fish, hadrosaurian dinosaurs, mosasaurs (marine lizards), plesiosaurs, sharks, and turtles.

3.23.1 No Action Alternative

The No Action Alternative would not affect paleontological resources.

3.23.2 Meander Alternative

Although ultimately underlain by the Pierre Shale, soils at the surface of the project area formed on parent materials of Pleistocene or younger age. Therefore, depending on the depth of grading, either the Quaternary sediments or underlying Upper Cretaceous sediments of the Pierre Shale may be disturbed. As a result, disturbance could uncover fossils of Quaternary or Upper Cretaceous age.

After fieldwork, CDOT's staff paleontologist identified a Pierre Shale exposure along SH 402. A scientifically significant fossil locality (extremely rare, second known occurrence in the Pierre Shale bedrock unit in western North America) has been discovered in this Pierre Shale exposure. No impacts on this fossil locality are expected to occur based on conceptual design for the Meander Alternative.

3.23.3 Mitigation Measures

Only the following BMPs are required:

- If during design it is determined that any construction activities resulting from the proposed project will affect the Pierre Shale outcrop, CDOT will mitigate effects by preconstruction salvage of a representative sample of the fossils present at that locality.
- Should any fossil material be uncovered during construction grading or excavation, project personnel will contact the CDOT staff paleontologist immediately so that a more in-depth evaluation can be made to determine whether additional fossil recovery or mitigation is warranted.

Construction

3.24 Construction Costs

The following construction costs are stated in year 2003 dollars and do not include right-of-way acquisitions, relocations, utilities, or mitigation measures.

3.24.1 No Action Alternative

Because no construction would be done on SH 402 between US 287 and the I-25 interchange, there would be no cost under the No Action Alternative.

3.24.2 Meander Alternative

Construction of the Meander Alternative would cost approximately $17.7 million based on conceptual design.

The project is currently programmed in the CDOT 2006 – 2007 STIP with a total of $1 million (STIP #NF3392) for 2009. The North Front Range 2030 Plan identifies SH 402: US 287 to I-25, two to four lanes with a cost estimate of $23.6 million.

3.25 Construction Impacts

Implementation of the Meander Alternative would result in short-term impacts related to construction. The following discussion describes these potential impacts and associated mitigation measures. Construction activities will be consistent with CDOT's Environmental Stewardship Guide.

3.25.1 Visual Resources

Impacts

Although construction impacts are short term, they usually result in some of the most noticeable visual contrast. Construction operations are highly visible activities: excavation, equipment, dust, and traffic are likely to attract the most attention. Impacts on visual resources during construction may result from removal of vegetation required to accommodate the proposed project, disrupting landscape frontages of residences and businesses.

Mitigation Measures

The short-term highly visible construction equipment related activities cannot be mitigated. Dust impacts are discussed under *Section 3.25.6, Air Quality*. Access and traffic-related impacts are discussed under *Section* 3.25.3, *Access/Traffic Control/Emergency Services*. Permanent revegetation will be completed in disturbed areas and is further discussed in *Section 3.25.7, Ecology and Noxious Weeds*.

3.25.2 Hazardous Materials/Waste

Impacts

Use of heavy equipment during construction activities may result in inadvertent spillage or leakage of fuel, oil, grease, or chemicals.

Mitigation Measures

Releases will be contained and disposed of in accordance with CDOT BMPs and all applicable laws and regulations. Known contaminated sites will be characterized and cleaned up before construction. Leaks and spills will be prevented, contained, and remediated according to all applicable laws and requirements. A Materials Management Plan may be required. If hazardous materials are encountered before or during construction, CDOT's *Section 250, Environmental Health and Safety Management* specification will be used. If necessary, a health and safety plan will be prepared and implemented to mitigate the potential health and safety hazards to workers and the public.

3.25.3 Access/Traffic Control/ Emergency Services

Impacts

Short-term disruption of residence and business access may occur during construction.

Mitigation Measures

Although traffic movement along SH 402 may be affected during construction, these impacts will be controlled by application of standard highway construction practices for traffic management. Highway construction practices would be coordinated with local emergency service providers to ensure that construction does not disrupt emergency assistance.

3.25.4 Archaeology

Impacts

Buried cultural materials may be exposed during construction.

Mitigation Measures

If cultural materials are exposed, the CDOT senior staff archaeologist will be notified immediately to ensure evaluation as required by NHPA and all other applicable state and federal regulations.

3.25.5 Noise

Impacts

Construction will generate noise and vibration from diesel-powered excavation equipment such as dump trucks and bulldozers, backup alarms on certain equipment, compressors, and pile drivers. Construction noise levels at offsite locations would usually depend on the loudest piece or two of equipment operating at the same time. Noise levels from diesel-powered equipment range from 80 to 95 dB(A) at a distance of 50 feet. Impact equipment such as rock drills and pile drivers can generate even more noise.

Mitigation Measures

Contractors will be encouraged to schedule construction activities during daytime hours to minimize and mitigate noise impacts. Weekend work would be discouraged, with the exception of activities best suited to off-peak hours.

Temporary construction noise impacts will be reduced by requiring contractors to use well-maintained equipment (with particular attention to mufflers), adapt work hours, monitor noise during work hours, and make use of measures such as temporary noise barriers where applicable.

The construction project will follow applicable sections of the *Ordinance Concerning Noise Levels in Unincorporated Larimer County* (No. 97-03).

3.25.6 Air Quality

Impacts

Possible construction impacts on air quality include fugitive dust that can result in elevated levels of particulates less than 10 microns without appropriate BMP mitigation.

Mitigation Measures

BMPs will be implemented to reduce the project's potential for impact due to particulates less than 10 microns during construction, including:

- spraying exposed soil and soil surfaces with water, wetting agents, and/or soil binding agents
- covering trucks carrying fine materials
- minimizing mud tracking from the construction area
- controlling speed limits for trucks traveling on roads with high silt loading in the construction area

3.25.7 Ecology and Noxious Weeds

Impacts

Temporary impacts on species may include disturbances from construction activities, noise, and increased human presence in the area during construction.

Bald Eagles

Although no impacts on TES have been identified, bald eagles could use the adjacent

riparian area for winter roosting. Some trees may be taken during project construction.

Mitigation Measures - Vegetation

Techniques used by CDOT to stabilize and minimize erosion and to revegetate areas are outlined in detail in *Standard Specifications for Road and Bridge Construction* (1999), part of CDOT BMPs.

The following measures are designed to reduce direct and indirect impacts on vegetation and to control soil erosion and noxious weeds:

- Specification 207 covers salvaging and stockpiling topsoils for reuse in reclamation. No imported topsoil will be allowed. Topsoil heavily infested with noxious weeds will be removed from the site or buried under a minimum of 5 feet of fill.
- Specification 208 directs contractors to permanently stabilize (that is, cover disturbed areas with final seed and mulch as indicated in plans) each 17-acre increment of the project immediately after grading is finished for that section.
- Specifications 208 and 216 cover other mechanical erosion prevention methods (besides seeding, for example) and include use of soil coverings, placement of bales in drainages, use of silt fence, berms/ diversions, slope drains, storm drain protection, check dams, channel stabilization, sediment traps or basins, and sandbag barriers.
- Specification 212 covers seeding.
- Specification 213 covers mulching seeded and other bare soil areas.
- Specification 214 covers planting.
- Specification 217 covers herbicide treatments, if needed for weed control.

A weed management plan has been developed and a weed survey was conducted to locate and map weed populations that may be spread by construction activities. Required construction contractor practices to minimize new weed infestations and control the spread of current weed populations are described in detail in *Appendix E, Noxious Weed Management Plan*. Practices include:

- application of appropriate herbicides
- inspection of construction vehicles and use of designated equipment cleaning areas
- storage of weed-free topsoil and restriction on importation of topsoil
- use of only weed-free mulch for reclamation in accordance with the Weed Free Forage Act, CRS Title 35, Article 27.5
- monitoring and care of revegetation sites for three years
- restrictions on mowing and cutting when seeds are ripe for dispersal

In addition to the above required practices, sensitive areas such as riparian habitat, woodlands, and wetlands in the vicinity of project construction activities will be fenced to prevent vegetation damage from construction machinery. Construction access will be limited to fenced areas to curtail erosion, weed invasions, and damage to habitats.

Mitigation Measures – Wildlife

Additional evaluations and surveys, if warranted, will be conducted prior to construction for any new TES species identified subsequent to the current study. Should bald or golden eagles be observed at that time, recommendations to avoid or minimize impacts are as follows:

1. Avoid unnecessary damage to the riparian area, especially cutting large trees.
2. If bald eagles frequent the area, construction should be scheduled between March 1 and November 30 to avoid disturbance. If this is not possible, then follow #3.
3. Avoid harassment of the eagle from project-generated noise and activity during the

winter months. Between December 1 and April 30, if an eagle is observed perching or roosting in the riparian area, the USFWS recommends a buffer of 0.125 to 0.25 miles depending on the line of sight.

3.25.8 TES Species

Impacts

The bald eagle (*Haliaeetus leucocephalus*) was officially delisted from protection under the ESA on June 28, 2007. For additional information on mitigation, see *Section 3.25.7*.

3.25.9 Wetlands

Impacts

Approximately 0.89 acre of wetlands will be permanently affected by fill actions to expand the roadbed, of which 0.45 acre is jurisdictional. An additional area that includes 5 feet at the edge of the cut-and-fill line was included to ensure that impacts were not underestimated.

Temporary impacts will total 0.09 acre, of which 0.06 acre is jurisdictional. Temporary impacts were calculated within a 10-foot area from the construction footprint (with the 5-foot addition). This area includes impacts from exclusion fence and silt fence construction, dismantling of fences, and culvert work. This area will be reclaimed.

Mitigation Measures

Because the project impacts on jurisdictional wetlands are less than 0.5 acre and affect nontidal waters-wetlands, a Nationwide Permit 14 is appropriate (Carey 2004). Construction measures must conform to the specifications and conditions of the 404 permit issued by USCOE. Site monitoring will occur as specified in the 404 permit to ensure that wetland communities are developing as required by the permit.

Applying CDOT BMPs to construction operations will help minimize construction impacts on wetlands, including the following BMPs in *Standard Specifications for Road and Bridge Construction,* section 107.25 (Water Quality) and section 208 (Erosion Control):

- Perimeter fencing will be installed to prevent access to wetlands, silt fencing will be installed to protect wetlands from sedimentation during construction, and erosion control techniques will be used whenever possible to prevent siltation and sedimentation.
- Should construction access roads and work pads be constructed in wetlands, protective material (fabric or hay) will be used, and topped with aggregate and/or soil fill. When construction is completed, the protective material will be removed with the goal of preserving the original wetland plant community. Any plants damaged will be replaced with species appropriate for the site.
- The area adjacent to the toe-of-fill will be reclaimed when erosion control materials and fencing are removed.
- Equipment maintenance areas and fueling locations will be at least 100 feet outside wetlands. Berms will be used and protective (absorbent) material will be available to prevent spills from reaching wetland areas.

3.25.10 Water Quality

Impacts

Potential impacts on water quality include sedimentation associated with erosion due to construction stormwater runoff. Erosion is prevalent when the surface vegetation is disturbed as required for roadway widening. The Meander Alternative alignment was designed so that construction areas of impact would minimize the impact on the riparian zone of the Big Thompson River.

Mitigation Measures

Temporary erosion control and stormwater measures will be implemented during construction activities. Construction mitigation

activities are specified under CDPS permitting, city and county requirements for developments, and CDOT guidelines. CDOT will obtain an NPDES Construction Discharge Permit (CDPS construction permit) from CDPHE for the project.

To comply with CDOT's MS4 CDPS permit and the CDPS construction permit, CDOT requires the development and implementation of a Stormwater Management Plan (SWMP) and an Inspection and Maintenance Program. The SWMP is intended to ensure that the water quality of receiving waters is protected during construction. The SWMP protects receiving waters by including BMPs necessary to provide for erosion, sediment, and general pollution prevention controls.

CDOT will develop a SWMP that details BMPs used for construction during the design phase. The SWMP will be prepared in accordance with the CDOT *Erosion Control and Stormwater Quality Guide, CDOT Standard Specifications 107.25-Water Quality and 208-Erosion Control.* Erosion controls will be designed and implemented to minimize or eliminate downgradient sedimentation and siltation.

Required BMPs include:

- staging construction to reduce disturbances due to storage, use, and maintenance of construction equipment
- minimizing access to the construction area
- temporary seeding of disturbed areas
- early final grading and phased seeding of completed areas during construction
- establishing clean water diversion upgradient of the construction areas
- establishing water quality ponds before construction to intercept construction runoff
- using soil blankets or mulch/mulch tackifier on temporarily disturbed slopes or slopes that cannot be seeded due to seasonal constraints

3.25.11 Geology and Soils

Impacts

No construction impacts on geology and soils have been identified.

The area contains potential sources for construction borrow materials. Alluvial gravels along the Big Thompson River are a possible source of construction aggregate material. These materials may be encountered where the river passes close to SH 402 between CR 13C and CR 11H. Gravel pits are located north of SH 402.

Mitigation Measures

No mitigation is required based on available information.

3.25.12 Paleontology

Impacts

Important fossils are associated with local outcrops of Pierre Shale and may be found during construction activities in Pierre Shale outcrops.

Mitigation Measures

CDOT's staff paleontologist will examine the project design plans to estimate the extent of disturbance of the Pierre Shale, if any, that may occur during construction. Preconstruction mitigation will be stipulated as appropriate. If any subsurface bones or other fossils are found in the corridor during construction, the CDOT staff paleontologist will be notified immediately to assess their significance.

Impact and Mitigation Summary

3.26 Preferred Alternative – Meander Alternative

The Meander Alternative meets the project purpose and need by improving capacity and addressing safety issues associated with the existing SH 402 alignment.

In addition, alignment of the Meander Alternative has been engineered to minimize potential impacts on human and natural environments while maximizing safety benefits and improving mobility to accommodate 2030 travel demand.

The No Action Alternative would result in continued and worsening mobility and safety concerns.

Table 3-13 provides a summary of impacts for both alternatives.

With the selection of the Meander Alternative, FHWA and CDOT are committed to the mitigation measures listed in Table 3-14 to lessen or eliminate the negative environmental impacts associated with this alternative. Implementation of the Meander Alternative may result in short-term impacts related to construction activities. Table 3-15 describes general mitigation measures that may be used to minimize or eliminate construction impacts.

Table 3-13. Summary of Impacts

Resource	Alternatives Retained for Detailed Environmental Analysis	
	No Action Alternative	Meander Alternative
Socioeconomic	Does not provide adequate capacity for future population and employment.	Provides adequate capacity for future population and employment.
Right-of-Way and Relocations	No additional requirements.	6 homes, 47.58 acres of residential property, no businesses, 7.15 acres of commercial property, and 3 outbuildings (small barns and sheds) for a total of approximately 54.7 acres
Environmental Justice	No disproportionate and adverse impacts on low-income or minority populations. Access and safety problems continue for all populations.	No disproportionate impacts on low-income or minority populations. Improves access and safety for all populations.
Land Use	Does not support current zoning, local policies, and plans.	Consistent with current zoning, local policies, and plans.
Farmland	No impact.	24.2 acres of currently used prime farmland will be converted to SH 402 right-of-way or utility corridor easement. The entire SH 402 corridor is planned for development, and FPPA does not apply.
Visual	No impact.	Changes are expected to be low contrast to the landscape character in the setting. Low impact anticipated after implementation of BMPs and mitigation.
Recreation	No impact.	No impact.
Hazardous Materials/Waste	No impact.	Possible impact from Diamond Shamrock via groundwater under SH 402 and US 287 intersection site. Would require relocation of transformers, could contain PCBs.
Utilities and Services	No impact.	Creation of utility corridor.
Emergency Services	No impact.	No impact.
Historic Preservation	No impact.	Adverse effect on Weber Farm (5LR10725)

Resource	Alternatives Retained for Detailed Environmental Analysis	
	No Action Alternative	Meander Alternative
Archaeology	No impact.	Only BMPs are required as noted: if cultural materials are exposed, the CDOT senior staff archaeologist will be notified immediately to ensure evaluation as required by NHPA and all other applicable state and federal regulations.
Native American Consultation	No impact.	No impact.
Sections 4(f) and 6(f)	No impact.	A determination of adverse effect has been made for the Weber Farm (5LR10725) resulting in a use under Section 4(f). *De minimis* impacts were found for the following per the FHWA *de minimis* finding of November 15, 2006: ❑ Big Thompson Manufacturing Ditch Segment (5LR10726.1) ❑ Propp Farm (5LR11247) ❑ Weber Farm East (5LR11249) ❑ Mountain View Farm (5LR11242)
Noise	Noise levels equal to or in excess of 66 dB(A) at 8 residential locations.	Noise levels equal to or in excess of 66 dB(A) at 11 residential locations; not including 2 residences, which would need to be acquired for improvement to be implemented.
Air Quality	No air quality conformity or analysis is applicable.	No impact; only construction BMPs are required.
Ecology	No habitat loss.	No impact; mitigation and BMPs are required during construction.
Vegetation	No impact	23.7 acres
TES Species	No impact.	No impact; mitigation and BMPs are required during construction.
Wetlands	No impact.	0.89 acre of wetlands permanently impacted.
Floodplains	No impact.	A base flood elevation increase of 0.02 foot.
Water Quality	No impact.	No impact; only construction BMPs are required.
Geology	No impact.	No impact.
Paleontology	No impact.	No impact; only BMPs are required.
Cumulative Impacts	No quantifiable impacts. Does not meet purpose and need.	No quantifiable impacts. Meets purpose and need.

3.27 Mitigation and Benefits Summary

With the selection of the Meander Alternative, FHWA and CDOT are committed to the following mitigation measures to lessen or eliminate negative environmental impacts associated with this alternative. Mitigation measures for the Preferred Alternative are listed in Table 3-14. Mitigation measures and BMPs specific to construction are listed in Table 3-15. For additional information on impacts, see individual resource discussions in this chapter.

Table 3-14. Mitigation Measures for Preferred Alternative—Meander Alternative

Resources and Impacts	Mitigation or Benefits
Socioeconomic	**No mitigation is required.**
Right-of-Way Acquisition and Relocations	**Mitigation is required.**
Implementation of the Meander Alternative would require acquisition of six homes and three outbuildings (small barns and sheds). The locations of these acquisitions are shown in Figure 3-3. The six residential structures located in close proximity to SH 402 are on properties that would otherwise be most adversely affected by loss of yards, parking, and driveways. For the right-of-way, 47.58 acres of residential property and 7.15 acres of commercial property will need to be acquired. Due to the dispersed rural development pattern that currently exists for most of the project corridor, loss of frontage on SH 402 will most often mean loss of unimproved portions of large tracts.	To minimize unavoidable relocation of residents, measures to further reduce the number of relocations will be implemented as part of final design. CDOT will comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act), which provides for uniform and equitable treatment of all persons displaced from their homes, businesses, or farms. The Uniform Act is a form of compensation, not mitigation. The owner of real property acquired for right-of-way will be compensated based on fair market value. Assistance will be provided to any eligible owner or tenant in relocating their business or residence at the time of displacement. Benefits under the Uniform Act to which each eligible owner or tenant might be entitled will be determined on an individual basis and explained in detail. No relocatees will have to move from a dwelling without at least 90 days' written notice. A 90-day notice is not effective for a residential occupant unless a comparable replacement dwelling has been identified. Qualified relocatees receive monetary payments, which may include payments for moving expenses, business in lieu of payments, rent supplements, down payments, or increased interest payments. No person will be displaced by a federally assisted project unless and until adequate replacement housing has been offered to all affected persons, regardless of race, color, religion, sex, national origin, age, or disability. CDOT will assist any eligible owner or tenant to relocate a business or residence at the time of displacement. Benefits under the Uniform Act to which each eligible owner or tenant might be entitled will be determined individually and explained to the parties in detail, along with information about financial options.
Environmental Justice	**No mitigation is required.**
Land Use	**No mitigation is required.**
Farmland	**No mitigation is required.**

Table 3-14. Mitigation Measures for Preferred Alternative—Meander Alternative

Resources and Impacts	Mitigation or Benefits
Visual	**Mitigation is required.**
The Meander Alternative would be constructed in an area of relatively open views from dispersed rural residences and existing developments. With the exception of the widened highway and grading associated with cut-and-fill slopes, few new structural elements are proposed as part of this alternative (such as signal or street lights, retaining walls, bridges, and signage). New signalized intersections would be added at CR 11H, CR 9E, and CR 7 (Charlotte Court). Cut-and-fill slopes required to accommodate the proposed project would range in height from 0 to 15 feet (average 4 feet). Landform changes associated with the Meander Alternative would be most noticeable in foreground and near middleground distance zones. Changes are expected to be subordinate to the landscape character in the setting, with low visual impacts after implementation of BMPs and mitigation measures.	BMPs and mitigation measures to reduce or eliminate potential visual resource impacts of construction of the Meander Alternative include the following: 1. All disturbed slopes will be treated for erosion control and revegetated as appropriate, using native grasses and forbs. Shrubs will be included when feasible. 2. Sensitive grading techniques will blend grading with the natural terrain. Cut-and-fill slopes will be blended with the surrounding terrain to the greatest extent possible by means of slope rounding, layback, and warping techniques. BMPs for reducing slope modification and landform contrast will be developed individually for cut-and-fill slopes. Cut slopes are more easily modified than fill slopes by using slope layback, slope rounding, and slope warping techniques. These techniques will be implemented as follows: • Slope rounding: used at the top of all cuts except in rock. • Slope layback: degree of layback would influence motorists' visual impression and would be crucial in establishing vegetation and preventing erosion. With the gentle nature of the terrain in the project area, cut-and-fill slopes could be laid back up to a 4:1 ratio. • Slope warping: used to achieve a more natural-looking transition between two unlike surfaces by varying the pitch of the cut slopes. This provides greater variation in slope faces and allows for vegetation. This technique involves both vertical and horizontal slope rounding as a more natural extension of landform surface configurations. 3. Removal of native cottonwoods will be avoided wherever practicable, and revegetation BMPs implemented as noted in Section 3.17, Ecology.
Recreation	**No resources or impacts have been identified.**

Table 3-14. Mitigation Measures for Preferred Alternative—Meander Alternative

Resources and Impacts	Mitigation or Benefits
Hazardous Materials/Waste	**Mitigation is required.**
Proximity of the LUST site at the Diamond Shamrock station and its hydrogeological upgradient location mean there is the potential that fuel-contaminated groundwater may have migrated to areas under the intersection of US 287 and SH 402 into the area of impact for the Meander Alternative. Utilities adjacent to SH 402 containing transformers would be relocated.	Ongoing review of semi-annual groundwater monitoring reports for the Diamond Shamrock LUST site is recommended. These reports will indicate the extent of groundwater contamination and potential offsite migration of contaminants. Pre-characterization of soils and groundwater for project personnel health and safety, materials management, and dewatering is required before disturbance of subsurface soils or groundwater by highway construction activities. Depending on the results of the pre-characterization test, coordination with various agencies and permitting may be required. If the test samples are deemed hazardous, a materials management plan will be developed describing the specifics of the hazardous waste permitting and compliance issues. If any of the transformers test positive for PCBs, the utility company of ownership will be responsible for handling and disposal. If additional hazardous materials are encountered before or during construction of the Meander Alternative, CDOT's *Section 250, Environmental Health and Safety Management* specification will be used. If necessary, a health and safety plan will be prepared and implemented to mitigate potential health and safety hazards to workers and the public.
Utilities and Services	**Mitigation is required.**
Proximity of major utilities to the existing SH 402 edge of pavement would necessitate relocation of some of these utilities. A 25-foot utility corridor easement on the south side of the Meander Alternative is proposed to accommodate existing south side utilities and new utilities. Utilities currently on the north side of SH 402 will not be moved into the 25-foot utility corridor easement along the south side. These utilities will be relocated further north and will remain within the SH 402 footprint defined by the 160-foot to 175-foot cross section. CDOT would purchase this easement and grant utility permits to the various utility companies that need to locate facilities within this easement. Utility relocation costs are estimated at approximately $1 million, based on conceptual design. Final design will allow more exact cost estimates.	BMPs will be required to minimize any erosion or sediment disturbance that may be associated with utility construction within the CDOT easement. Coordination with the county and local utility owners will minimize disruption of service.
Emergency Services	**Mitigation is required.**
Better LOS associated with the addition of another travel lane, shoulders, and a center turn lane would be expected to improve traffic flow and response time.	Emergency services will be coordinated with the appropriate authorities during construction.

Table 3-14. Mitigation Measures for Preferred Alternative—Meander Alternative

Resources and Impacts	Mitigation or Benefits
Historic Preservation	**Mitigation is required.**
FHWA and CDOT, in consultation with the SHPO, concluded that this project widening will result in the following under Section 106 of the NRHP (see Appendix A for all Section 106 correspondence): ❒ No adverse effect • Big Thompson Manufacturing Ditch Segment (5LR10726.1) (see SHPO letter June 29, 2005, and again on September 13, 2006) • Propp Farm (5LR11247) (see SHPO letter August 22, 2006) • Weber Farm East (5LR11249) (see SHPO letter May 26, 2006, and again on September 13, 2006) • 5LR11242 Mountain View Farm (see SHPO letter August 22, 2006) ❒ Adverse effect • Weber Farm (5LR10725)	The SHPO was consulted on the impacts of the project. The following mitigation is recommended. A Memorandum of Agreement to resolve adverse effects on this property was executed on February 9, 2007 (see Appendix A). The Weber Farm (5LR10725) was recorded prior to construction so that there is a permanent record of its present appearance and history. Recordation consisted of Level II Documentation as determined in consultation with the SHPO and according to the standards established in Office of Archaeology and Historic Preservation Form #1595. The SHPO accepted the Level II Documentation on May 7, 2007 (see Appendix A). Copies of the documentation also will be sent to a local archive designated by the SHPO.
Archaeology	**Mitigation could be required.**
Implementation of the Meander Alternative would not affect any known archaeological or prehistoric properties.	If cultural materials are exposed, the CDOT senior staff archaeologist will be notified immediately to ensure evaluation as required by NHPA and all other applicable state and federal regulations.
Native American Consultation	**No mitigation is required.**
Sections 4(f) and 6(f)	**Mitigation is required.**
Five Section 4(f) NRHP eligible historic properties have been identified for this project. Four will have no adverse effects under Section 106 of the NRHP and, therefore, will have *de minimis* impacts under Section 4(f) as per the FHWA *de minimis* finding of November 15, 2006: ❒ Big Thompson Manufacturing Ditch Segment (5LR10726.1) ❒ Propp Farm (5LR11247) ❒ Weber Farm East (5LR11249) ❒ Mountain View Farm (5LR11242) A determination of adverse effect has been made for the Weber Farm (5LR10725) resulting in a use under Section 4(f).	Analysis of Avoidance Alternatives found that there were no prudent or feasible alternatives to the Meander Alternative. The following measures will be taken to minimize harm: Regarding the alignment of the Meander Alternative, measures to minimize crossing the Big Thompson Manufacturing Ditch Segment (5LR10726.1) include crossing a portion of the ditch that has low integrity. Those measures being used in association with the Meander Alternative to minimize harm to both the Weber Farm East (5LR11249) and the Propp Farm (5LR11247) result in the identification of only a utility easement across the front of these properties. Those measures being used in association with the Meander Alternative to minimize harm to the Mountain View Farm (5LR11242) include the avoidance of loss of any historic buildings. Only a modern feedlot frontage and bank of trees that is not part of the historic landscape will be affected. Even with a reduction in right-of-way through portions of the Weber Farm (5LR10725), there is no prudent and feasible action alternative that alleviates the use of this historic property. The SHPO was consulted and mitigation is described under Historic Preservation above.
Noise	**No mitigation is feasible or reasonable.**
Air Quality	**No mitigation is required.**

Table 3-14. Mitigation Measures for Preferred Alternative—Meander Alternative

Resources and Impacts	Mitigation or Benefits
Ecology	**Mitigation is required.**
Vegetation Permanent impacts on vegetation from the Meander Alternative were estimated at 23.7 acres. More acreage would be temporarily affected by construction activities but will be reclaimed after construction is completed in individual areas. Wildlife Few direct or indirect impacts on wildlife are associated with the Meander Alternative. Mitigation for impacts includes CDOT BMPs specified under Vegetation above. Clearing of vegetation should be done between September and April to reduce the effects on nesting activities and to comply with Migratory Bird Act requirements.	Vegetation replacement will be coordinated with landowners (city of Loveland and private property), and agricultural land mitigation will be based on crops or pastures disturbed for project implementation. Native species will be used to the greatest extent feasible, depending on designated land use, and will be specified for CDOT rights-of-way. Riparian trees will be replaced on a 1:1 basis; all other trees will be replaced when feasible. Techniques used by CDOT to stabilize and minimize erosion and to revegetate areas are outlined in detail in *Standard Specifications for Road and Bridge Construction* (1999), part of CDOT BMPs. The following measures are designed to reduce direct and indirect impacts on vegetation and to control soil erosion and noxious weeds: ❒ Specification 207 covers salvaging and stockpiling topsoils for reuse in reclamation. No imported topsoil will be allowed. Topsoil heavily infested with noxious weeds will be removed from the site or buried under a minimum of 5 feet of fill. ❒ Specification 208 directs contractors to permanently stabilize (that is, cover disturbed areas with final seed and mulch as indicated in plans) each 17-acre increment of the project immediately after grading is finished for that section. ❒ Specifications 208 and 216 cover other mechanical erosion prevention methods (besides seeding, for example) and include use of soil retention blankets, placement of bales in drainages, use of silt fence, berms/diversions, slope drains, storm drain protection, check dams, channel stabilization, sediment traps or basins, and sandbag barriers. ❒ Specification 212 covers seeding. ❒ Specification 213 covers mulching seeded and other bare soil areas. ❒ Specification 214 covers planting. ❒ Specification 217 covers herbicide treatments, if needed for weed control. A weed management plan has been developed and a weed survey was conducted to locate and map weed populations that may be spread by construction activities. Required construction contractor practices to minimize new weed infestations and control the spread of current weed populations are described in detail in *Appendix E, Noxious Weed Management Plan*. Practices include: ❒ application of appropriate herbicides ❒ requirement that construction vehicles arrive to the construction site free of soil or vegetative plant parts capable of containing noxious weed seed/plant parts ❒ storage of weed-free topsoil and restriction on importation of topsoil ❒ use of only weed-free mulch for reclamation in accordance with the Weed Free Forage Act, CRS Title 35, Article 27.5 ❒ monitoring and care of revegetation sites will be accomplished by the ADPS permit requirements ❒ restrictions on mowing and cutting weeds when seeds are ripe for dispersal

Table 3-14. Mitigation Measures for Preferred Alternative—Meander Alternative

Resources and Impacts	Mitigation or Benefits
	In addition to the above required practices, sensitive areas such as riparian habitat, woodlands, and wetlands in the vicinity of project construction activities will be fenced to prevent vegetation damage from construction machinery. Construction access will be limited to fenced areas to curtail erosion, weed invasions, and damage to habitats.
TES Species	**No mitigation is required.**
Wetlands	**Mitigation is required.**
Approximately 0.89 acre of wetlands will be permanently affected by fill actions to expand the roadbed, of which 0.45 acre is jurisdictional. An additional area that includes 5 feet at the edge of the cut-and-fill line was included to ensure that impacts were not underestimated. Wetlands associated with a stock pond (Site 2, 0.23 acre) and an alkali seep (Site 4, 0.44 acre) would incur the largest losses from construction of the Meander Alternative. Temporary impacts will total 0.09 acre, of which 0.06 acre is jurisdictional. Temporary impacts were calculated within a 10-foot area from the construction footprint (with the 5-foot addition). This area includes impacts from exclusion fence and silt fence construction, dismantling of fences, and culvert work. This area will be reclaimed.	CDOT BMPs include mitigation for all jurisdictional and nonjurisdictional wetlands permanently affected by construction projects, including replacement with created wetland areas or enhancement of existing areas to achieve a replacement-to-loss ratio of 1:1. Temporary disturbances of wetland areas can be mitigated by reclamation and revegetation with appropriate species. Topsoil from disturbed wetlands can be salvaged and reused for mitigation purposes unless infested with noxious weeds. Mitigation measures to offset impacts on wetlands during construction are addressed by BMPs that control erosion and minimize sedimentation in wetlands adjacent to construction sites. General mitigation techniques include replacement plantings for native riparian species, especially trees and shrubs, between the river terrace and the highway toe-of-fill. Should construction access roads and work pads be constructed in wetlands, protective material (fabric or hay) will be used, and topped with aggregate and/or soil fill. When construction is completed, the protective material will be removed with the goal of preserving the original wetland plant community. Any plants damaged will be replaced with species appropriate for the site. A number of potential wetland mitigation sites have been identified during the environmental assessment process. Possible locations along SH 402 include the vicinity of Sites 2, 3, and 6. Should it not be possible to create replacement sites in these areas, mitigation of wetland losses are proposed at the Big Thompson Ponds State Wildlife Area (SWA), which is approximately 0.5 mile north of SH 402 near I-25. The mitigation concepts for these sites are described in *Appendix B, Wetland Finding Report*. Along SH 402, wetlands could be expanded by approximately 0.45 acre to account for losses of jurisdictional wetlands. Plant species such as bulrush, burreed, and sedges are suggested for this area to increase the wetland community diversity from primarily cattail-dominated marsh. Nonjurisdictional wetland loss (approximately 0.44 acre) will be replaced at the Big Thompson Ponds SWA. Should potential wetland replacement sites along SH 402 not provide an adequate solution due to lack of landowner cooperation or lack of a suitable site, jurisdictional wetland loss can also be mitigated at the Big Thompson Ponds SWA.

Table 3-14. Mitigation Measures for Preferred Alternative—Meander Alternative

Resources and Impacts	Mitigation or Benefits
	Because the project impacts on jurisdictional wetlands are less than 0.5 acre and affect nontidal waters-wetlands, a Nationwide Permit 14 is appropriate (Carey 2004). Finalization of wetland mitigation site location and design of mitigation are required to obtain the Nationwide Permit 14 approval. Monitoring of mitigation sites will be specified in the USCOE permit.
Floodplains	**No mitigation is required.**
Water Quality	**Mitigation is required.**
Potential impacts of the Meander Alternative include increased highway stormwater runoff because of a nearly 31-acre increased potential for highway runoff pollutants due to a projected 140 percent increase in traffic by year 2030. Increased highway runoff has the potential to impact the Big Thompson River with increased sediments, roadway deicers, metals from vehicle wear, particulates from vehicle exhaust, and petroleum products related to motor vehicles. The potential for hazardous materials spills would continue to exist with this alternative. The urban section of the Meander Alternative includes a complete curb and gutter drainage system and will increase highway runoff to the municipal sewer system that discharges to the Big Thompson River. However, the city's continuing drainage improvements and city and CDOT MS4 permit compliance and monitoring are expected to provide adequate protection to the river's water quality. Permit compliance includes mitigation requirements discussed in *Section 3.21.5*. In addition, the city's *Storm Drainage Criteria* and *Master Drainage Plan* include regional strategies to address growth and development effects on water quality. The rural section of the Meander Alternative will increase highway runoff to roadway ditches and swales. Some highway runoff in combination with other runoff will eventually discharge into the Big Thompson River. Because the rural section of SH 402 is included in the city's GMA, the city's *Storm Drainage Criteria* and *Master Drainage Plan* would be applicable tools to address growth and development effects on water quality. Larimer County's MS4 permit is currently in effect for the rural section, and the city and CDOT MS4 permits should also be considered for the rural section in light of future planning. Permit compliance includes mitigation requirements discussed in *Section 3.21.5*. With the continuation of city, county, and CDOT stormwater programs, the increased highway runoff associated with the Meander Alternative is not expected to have an impact on designated uses of the Big Thompson River in the project area. Mitigation activities required by CDPS permits and city and county land use codes will minimize water quality impacts due to increased highway runoff and the associated increase in highway runoff pollutants resulting from the Meander	City and county land use codes protect the river floodplain area from development activities. CDPS permits, city and county land use codes and storm drainage criteria, and CDOT guidance will generally specify mitigation activities. CDOT will comply with and obtain all necessary permits for protection of water resources, including CDPS and dewatering permits as necessary. Best management practices (BMPs) for temporary and permanent erosion control will be implemented with the construction of the Meander Alternative to minimize the impact of disturbance on receiving waters. The CDOT project design team will seek to minimize soil disturbance impacts on irrigation ditches and other drainages in the study area as part of the final design process. In addition, the 4:1 slopes created by placement of fill materials will be reseeded to reduce erosion and sedimentation. Long-term drainage from highway projects may require permanent BMPs under applicable permitting to protect receiving waters from erosion, sedimentation, and other contaminants. City, county, and CDOT MS4 permits currently cover the entire project corridor. In addition, the *City of Loveland Storm Drainage Criteria*, updated in 2002, will apply to the entire project corridor and is within the city's *Master Drainage Plan* area. Drainage criteria and MS4 permits (both city and CDOT) would generally require regional and/or onsite detention that includes 100 percent capture volume for the first 0.5 inch of runoff and 80 percent capture of total suspended solids to the "maximum extent practicable" (note that project-specific requirements will vary). Other permanent BMP options such as maintenance programs, sediment traps, and flow control structures might also be implemented under MS4 requirements. CDOT is obligated under its MS4 permit to "…develop and implement comprehensive planning procedures and controls to reduce the discharge of pollutants after construction is completed, from areas of new highway development and significant redevelopment and associated drainages…" Project plans for the Meander Alternative will be evaluated under the criteria of the MS4 for the need to include permanent stormwater BMPs. This review will occur as early as possible during the final design process and will be guided by the CDOT MS4 *New Development Program* guidelines and procedures and the *CDOT Erosion Control and Stormwater Quality Guide.* This guide provides design and maintenance criteria for permanent BMPs. Based on the results of the design review process and in coordination with the city and county, CDOT will incorporate permanent BMPs to

Table 3-14. Mitigation Measures for Preferred Alternative—Meander Alternative

Resources and Impacts	Mitigation or Benefits
Alternative.	the maximum extent practicable and/or apply maintenance and administrative controls that provide equivalent protection for receiving waters. During final design, highway deicing and long-term maintenance and safety policy will be evaluated to determine the applicability of permanent controls. The fact that CDOT, the city of Loveland, and Larimer County are all MS4 entities with separate permits will warrant interagency coordination due to potential issues of overlapping authority. This coordination will help prevent duplication of effort. According to CDPHE, a permitted MS4 entity would not be required to impose their program requirements on CDOT projects due to the MS4's limited authority to regulate CDOT, nor would an MS4 be responsible for regulating activities outside its jurisdiction. Coordination among CDOT, the city, and the county will occur during the project design phase to determine specific permanent BMPs for the project.
Geology	**No mitigation is required.**
Paleontology	**No mitigation is required.**
A scientifically significant fossil locality (extremely rare, second known occurrence in the Pierre Shale bedrock unit in western North America) has been discovered in this Pierre Shale exposure. No impacts on this fossil locality are expected to occur based on conceptual design for the Meander Alternative.	If during design it is determined that any of the construction activities resulting from the proposed project will affect the Pierre Shale outcrop, CDOT will mitigate effects by preconstruction salvage of a representative sample of the fossils present at that locality. See Table 3-15 for construction mitigation.
Construction Costs	**No mitigation is required.**

Table 3-15. Mitigation Measures for Construction—Meander Alternative

Resources and Impacts	Mitigation or Benefits
Visual Resources	**Mitigation is required.**
Although construction impacts are short term, they usually result in some of the most noticeable visual contrast. Construction operations are highly visible activities: excavation, equipment, dust, and traffic are likely to attract the most attention. Impacts on visual resources during construction may result from removal of vegetation required to accommodate the proposed project, disrupting landscape frontages of residences and businesses.	The short-term highly visible construction equipment related activities cannot be mitigated. Dust impacts are discussed under *Section 3.25.6, Air Quality*. Access and traffic-related impacts are discussed under *Section 3.25.3, Access/Traffic Control/Emergency Services*. Permanent revegetation will be completed in disturbed areas and is further discussed in *Section 3.25.7, Ecology and Noxious Weeds*.
Hazardous Materials/Waste	**Mitigation is required.**
Use of heavy equipment during construction activities may result in inadvertent spillage or leakage of fuel, oil, grease, or chemicals.	Releases will be contained and disposed of in accordance with CDOT BMPs and all applicable laws and regulations. Known contaminated sites will be characterized and cleaned up before construction. Leaks and spills will be prevented, contained, and remediated according to all applicable laws and requirements. A Materials Management Plan may be required. If hazardous materials are encountered before or during construction, CDOT's *Section 250, Environmental Health and Safety Management* specification will be used. If necessary, a health and safety plan will be prepared and implemented to mitigate the potential health and safety hazards to workers and the public.

Table 3-15. Mitigation Measures for Construction—Meander Alternative

Resources and Impacts	Mitigation or Benefits
Access/Traffic Control/Emergency Services	**Mitigation is required.**
Short-term disruption of residence and business access may occur during construction.	Although traffic movement along SH 402 may be affected during construction, these impacts will be controlled by application of standard highway construction practices for traffic management. Highway construction practices would be coordinated with local emergency service providers to ensure that construction does not disrupt emergency assistance.
Archaeology	**Mitigation is required.**
Buried cultural materials may be exposed during construction.	If cultural materials are exposed, the CDOT senior staff archaeologist will be notified immediately to ensure evaluation as required by NHPA and all other applicable state and federal regulations.
Noise	**Mitigation is required.**
Construction will generate noise and vibration from diesel-powered excavation equipment such as dump trucks and bulldozers, backup alarms on certain equipment, compressors, and pile drivers. Construction noise levels at offsite receptor locations would usually depend on the loudest piece or two of equipment operating at the same time. Noise levels from diesel-powered equipment range from 80 to 95 dB(A) at a distance of 50 feet. Impact equipment such as rock drills and pile drivers can generate even more noise.	Contractors will be encouraged to schedule construction activities during daytime hours to minimize and mitigate noise impacts. Weekend work will be discouraged, with the exception of activities best suited to off-peak hours. Temporary construction noise impacts will be reduced by requiring contractors to use well-maintained equipment (with particular attention to mufflers), adapt work hours, monitor noise during work hours, and make use of measures such as temporary noise barriers where applicable. The construction project will follow applicable sections of the *Ordinance Concerning Noise Levels in Unincorporated Larimer County* (No. 97-03).
Air Quality	**Mitigation is required.**
Possible construction impacts on air quality include fugitive dust that can result in elevated levels of particulates less than 10 microns without appropriate BMP mitigation.	BMPs will be implemented to reduce the project's potential for impact due to particulates less than 10 microns during construction, including: ❒ spraying exposed soil and soil surfaces with water, wetting agents, and/or soil binding agents ❒ covering trucks carrying fine materials ❒ minimizing mud tracking from the construction area ❒ controlling speed limits for trucks traveling on roads with high silt loading in the construction area

Table 3-15. Mitigation Measures for Construction—Meander Alternative

Resources and Impacts	Mitigation or Benefits
Ecology	**Mitigation is required.**
Temporary impacts on species may include disturbances from construction activities, noise, and increased human presence in the area during construction. Bald eagles could use the adjacent riparian area for winter roosting. Some trees may be taken during project construction.	Techniques used by CDOT to stabilize and minimize erosion and to revegetate areas are outlined in detail in *Standard Specifications for Road and Bridge Construction* (1999), part of CDOT BMPs. The following measures are designed to reduce direct and indirect impacts on vegetation and to control soil erosion and noxious weeds: ❒ Specification 207 covers salvaging and stockpiling topsoils for reuse in reclamation. No imported topsoil will be allowed. Topsoil heavily infested with noxious weeds will be removed from the site or buried under a minimum of 5 feet of fill. ❒ Specification 208 directs contractors to permanently stabilize (that is, cover disturbed areas with final seed and mulch as indicated in plans) each 17-acre increment of the project immediately after grading is finished for that section. ❒ Specifications 208 and 216 cover other mechanical erosion prevention methods (besides seeding, for example) and include use of soil coverings, placement of bales in drainages, use of silt fence, berms/diversions, slope drains, storm drain protection, check dams, channel stabilization, sediment traps or basins, and sandbag barriers. ❒ Specification 212 covers seeding. ❒ Specification 213 covers mulching seeded and other bare soil areas. ❒ Specification 214 covers planting. ❒ Specification 217 covers herbicide treatments, if needed for weed control. A weed management plan has been developed, and a weed survey was conducted to locate and map weed populations that may be spread by construction activities. Required construction contractor practices to minimize new weed infestations and control the spread of current weed populations are described in detail in *Appendix E, Noxious Weed Management Plan*. Practices include: ❒ application of appropriate herbicides ❒ inspection of construction vehicles and use of designated equipment cleaning areas ❒ storage of weed-free topsoil and restriction on importation of topsoil ❒ use of only weed-free mulch for reclamation in accordance with the Weed Free Forage Act, CRS Title 35, Article 27.5 ❒ monitoring and care of revegetation sites for three years ❒ restrictions on mowing and cutting when seeds are ripe for dispersal In addition to the above required practices, sensitive areas such as riparian habitat, woodlands, and wetlands in the vicinity of project construction activities will be fenced to prevent vegetation damage from construction machinery. Construction access will be limited to fenced areas to curtail erosion, weed invasions, and damage to habitats. Additional evaluations and surveys, if warranted, will be conducted prior to construction for any new TES species identified subsequent to the current study.

Table 3-15. Mitigation Measures for Construction—Meander Alternative

Resources and Impacts	Mitigation or Benefits
	Should bald or golden eagles be observed at that time, recommendations to avoid or minimize impacts are as follows: 1. Avoid unnecessary damage to the riparian area, especially cutting large trees. 2. If bald eagles frequent the area, construction should be scheduled between March 1 and November 30 to avoid disturbance. If this is not possible, then follow #3. 3. Avoid harassment of the eagle from project-generated noise and activity during the winter months. Between December 1 and April 30, if an eagle is observed perching or roosting in the riparian area, the USFWS recommends a buffer of 0.125 to 0.25 miles depending on the line of sight.
TES Species	**Mitigation is not required.**
Wetlands	**Mitigation is required.**
Approximately 0.89 acre of wetlands will be permanently affected by fill actions to expand the roadbed, of which 0.45 acre is jurisdictional. An additional area that includes 5 feet at the edge of the cut-and-fill line was included to ensure that impacts were not underestimated. Temporary impacts will total 0.09 acre, of which 0.06 acre is jurisdictional. Temporary impacts were calculated within a 10-foot area from the construction footprint (with the 5-foot addition). This area includes impacts from exclusion fence and silt fence construction, dismantling of fences, and culvert work. This area will be reclaimed.	Because the project impacts on jurisdictional wetlands are less than 0.5 acre, and affect nontidal waters-wetlands, a Nationwide Permit 14 is appropriate (Carey 2004). Construction measures must conform to the specifications and conditions of the 404 permit issued by USCOE. Site monitoring will occur as specified in the 404 permit to ensure that wetland communities are developing as required by the permit. Applying CDOT BMPs to construction operations will help minimize construction impacts on wetlands, including the following BMPs in *Standard Specifications for Road and Bridge Construction,* section 107.25 (Water Quality) and section 208 (Erosion Control): ❒ Perimeter fencing will be installed to prevent access to wetlands, silt fencing will be installed to protect wetlands from sedimentation during construction, and erosion control techniques will be used whenever possible to prevent siltation and sedimentation ❒ Should construction access roads and work pads be constructed in wetlands, protective material (fabric or hay) will be used, and topped with aggregate and/or soil fill. When construction is completed, the protective material will be removed with the goal of preserving the original wetland plant community. Any plants damaged will be replaced with species appropriate for the site. ❒ The area adjacent to the toe-of-fill will be reclaimed when erosion control materials and fencing are removed. ❒ Equipment maintenance areas and fueling locations will be at least 100 feet outside wetlands. Berms will be used and protective (absorbent) material will be available to prevent spills from reaching wetland areas.

Table 3-15. Mitigation Measures for Construction—Meander Alternative

Resources and Impacts	Mitigation or Benefits
Water Quality	**Mitigation is required.**
Potential impacts on water quality include sedimentation associated with erosion due to construction stormwater runoff. Erosion is prevalent when the surface vegetation is disturbed as required for roadway widening.	Temporary erosion control and stormwater measures will be implemented during construction activities. Construction mitigation activities are specified under CDPS permitting, city and county requirements for developments, and CDOT guidelines. CDOT will obtain an NPDES Construction Discharge Permit (CDPS construction permit) from CDPHE for the project. To comply with CDOT's MS4 CDPS permit and the CDPS construction permit, CDOT requires the development and implementation of a Stormwater Management Plan (SWMP) and an Inspection and Maintenance Program. The SWMP is intended to ensure that the water quality of receiving waters is protected during construction. The SWMP protects receiving waters by including BMPs necessary to provide for erosion, sediment, and general pollution prevention controls. CDOT will develop a SWMP that details BMPs used for construction during the design phase. The SWMP will be prepared in accordance with the *CDOT Erosion Control and Stormwater Quality Guide, CDOT Standard Specifications 107.25-Water Quality and 208-Erosion Control.* Erosion controls will be designed and implemented to minimize or eliminate downgradient sedimentation and siltation. Required BMPs include: ❒ staging construction to reduce disturbances due to storage, use, and maintenance of construction equipment ❒ minimizing access to the construction area ❒ temporary seeding of disturbed areas ❒ early final grading and phased seeding of completed areas during construction ❒ establishing clean water diversion upgradient of the construction areas ❒ establishing water quality ponds before construction to intercept construction runoff ❒ using soil blankets or mulch/mulch tackifier on temporarily disturbed slopes or slopes that cannot be seeded due to seasonal constraints
Geology and Soils	**No mitigation is required.**
Paleontology	**Mitigation is required.**
Important fossils are associated with local outcrops of Pierre Shale and may be found during construction activities in Pierre Shale outcrops.	CDOT's staff paleontologist will examine project design plans to estimate the extent of disturbance of the Pierre Shale, if any, that may occur during construction. Preconstruction mitigation will be stipulated as appropriate. If any subsurface bones or other fossils are found in the corridor during construction, the CDOT staff paleontologist will be notified immediately to assess their significance.

Chapter 4

Section 4(f) Evaluation

Chapter 4. Section 4(f) Evaluation

4.1 Section 4(f) Legislation

Section 4(f) of the 1966 US Department of Transportation Act (49 USC 303 and 23 USC 138) states that the Federal Highway Administration (FHWA) may not approve the use of land from a significant publicly owned public park, recreation area, or wildlife and waterfowl refuge, or any significant historic site unless a determination is made that:

(i) There is no feasible and prudent alternative to the use of land from the property; and

(ii) The action includes all possible planning to minimize harm to the property resulting from such use.

Details of Section 106 of the National Historic Preservation Act (NHPA) and its relevancy to the SH 402 project are included in *Chapter 3, Section 3.11, Historic Preservation.*

On August 10, 2005, the President signed into law the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Major provisions of Section 6009 include the first substantive revision of Section 4(f) legislation since passage of the US Department of Transportation Act of 1966.

> The requirements of Section 4(f) of the Department of Transportation Act will be considered satisfied with respect to a Section 4(f) resource if it is determined that a transportation project will have only a "*de minimis* impact" on the 4(f) resource. The Agencies with jurisdiction must concur in writing with the determination. For historic properties the *de minimis* criteria are defined as "no adverse effect" or "no historic properties affected" under Section 106 of the National Historic Preservation Act.

The *Guidelines for Determining De Minimis Impacts to Section 4(f) Resources* (December 13, 2005) state:

> Section 4(f) requires that the State Historic Preservation Officer (SHPO) and/or THPO (Tribal Historic Preservation Officer), and Advisory Council on Historic Preservation (ACHP) if participating, must concur in writing in the Section 106 determination of "no adverse effect" or "no historic properties affected." The request for concurrence in the Section 106 determination should include a statement informing the SHPO or THPO and ACHP, if participating, that the FHWA or Federal Transit Administration intends to make a *de minimis* finding based upon their concurrence in the Section 106 determination.

The FHWA Division Administrator for Colorado is responsible for determining that this project meets the criteria and procedures set forth in the federal regulations. Application of 4(f) requires a determination of whether there are prudent and feasible alternatives that avoid the use of the 4(f) resource. An alternative may be rejected as not being prudent and feasible for any of the following reasons:

1. It does not meet the project purpose and need;
2. It involves extraordinary operational or safety problems;
3. There are unique problems or truly unusual factors present with it;
4. It results in unacceptable and severe adverse social, economic, or other environmental impacts;
5. It would cause extraordinary community disruption;
6. It has additional construction costs of an extraordinary magnitude, or
7. There is an accumulation of factors that collectively, rather than individually, have adverse impacts that present unique problems or reach extraordinary magnitudes.

The determination must be made whether one or more of the alternatives to avoid the use of land from Section 4(f) property is prudent and feasible. If such avoidance alternatives exist, one of them must be selected. If all the remaining and prudent and feasible alternatives use land from the Section 4(f) properties, then a least harm analysis must be performed to determine which alternative does the least overall harm to the Section 4(f) properties. In performing this analysis, the net harm (after mitigation) to the properties is the governing factor.

4.2 Project Purpose and Need

SH 402 is a heavily used two-lane, east-west arterial connecting US 287 (also known as Lincoln Avenue) and I-25.[1] This 4-mile highway is located south of the city of Loveland in Larimer County, Colorado. SH 402 serves local residents and businesses and is used as a commuter route to I-25. The proposed action encompasses the entire 4-mile length of SH 402. Access to a carpool lot (88 spaces) located at the southwest quadrant of the SH 402 and I-25 interchange was included as a part of this study. Potential improvements at the I-25 interchange are being addressed under the current *North I-25 Environmental Impact Statement*. Figure 4-1 illustrates the project study area and National Register of Historic Places (NRHP) eligible properties.

The purpose of this project is to improve mobility and safety along the existing SH 402 from the US 287 intersection east to the I-25 interchange.

The need for this project was established by identifying and analyzing the 2030 travel demand and expected growth and development. The existing two-lane highway's substandard design includes no turn lanes, narrow shoulders, and poor sight distances (how far ahead a driver can see from the road), resulting in mobility and safety concerns. Key elements for identifying mobility impacts are the cross section of the highway and the level of service. *Chapter 1, Purpose and Need,* includes additional discussion.

4.3 Alternatives Evaluated

A detailed agency and public involvement process was initiated during project scoping. A range of alternatives was developed and evaluated, including alternate transportation modes, a no action alternative, and four action alternatives.

The alternatives evaluated in detail in this EA are the No Action Alternative and one action alternative (Alternative # 4 – Meander Alternative). Figure 4-1 shows the right-of-way proposed for the Meander Alternative. The Meander Alternative is the Preferred Alternative.

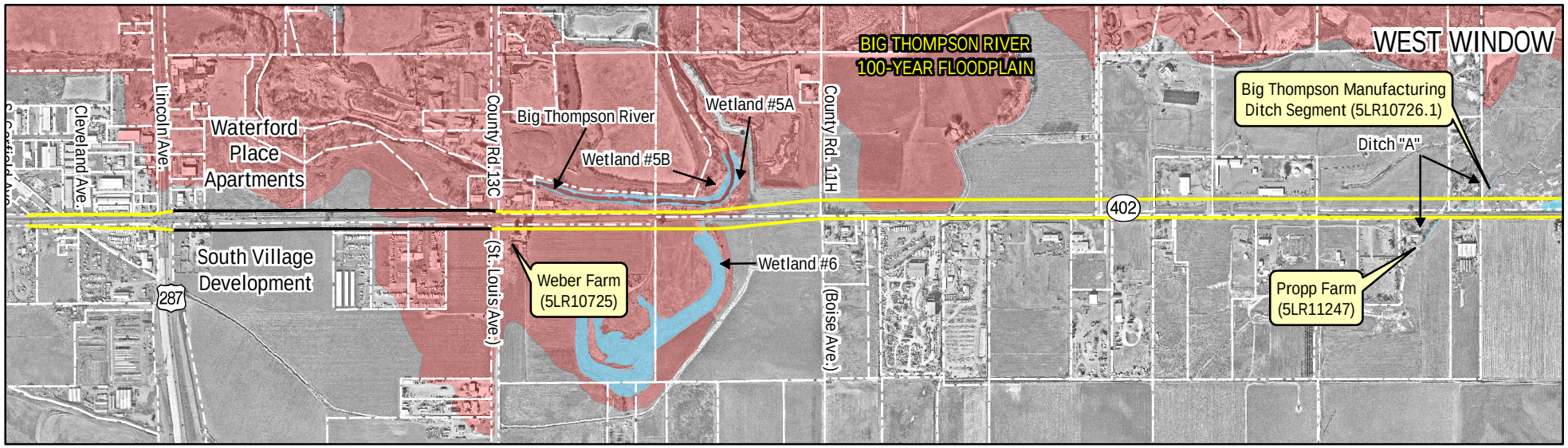
4.3.1 No Action Alternative

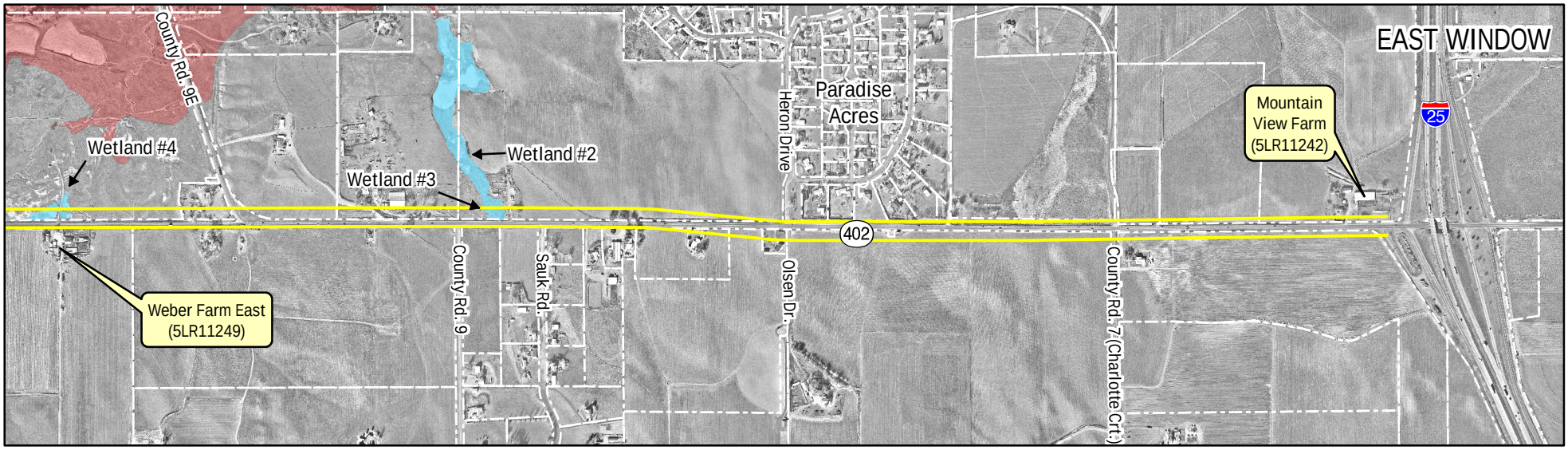
The No Action Alternative would result in no physical changes to the existing highway; however, standard operation and maintenance practices would continue. The existing human and natural environments bordering the highway would remain as they are, except for any development that might occur independently of improvements to the highway.

4.3.2 Preferred Alternative - #4 Meander Alternative

The Meander Alternative shifts between the north and south sides of the current highway alignment, minimizing impacts on the human and natural environments while meeting design criteria for a four-lane highway in this corridor.

[1] An urban cross section has been developed and partially built from US 287 east to CR 13C; the interim condition will remain until the development on the south side of SH 402 is constructed. This section was constructed by developers in coordination with the city of Loveland and CDOT under a Categorical Exclusion, dated September 18, 2003. Impacts related to widening between US 287 and CR 13C are not included in this analysis, and the existence of this developed portion of SH 402 did not restrict consideration of alternatives.





LEGEND

- Wetlands
- Floodplain
- Property Parcel Boundaries
- Proposed Meander Right-of-Way
- Existing Right-of-Way

N W E S

SCALE - 1:14,700 or 1" = 1225'

0 500 1,000 Feet

SOURCE: 2001 1/2-foot resolution aerial photography. Land use and parcel information provided by the City of Loveland. Wetland information obtained through field observation and aerial photo interpretation by JFSA. Floodplain information provided by FEMA. Map produced November 29, 2006 by JFSA.

U.S. Department of Transportation Federal Highway Administration

DOT

DOT SH 402 Environmental Assessment

Project Study Area
Featuring Historic Properties

Figure 4-1

Map Document: (H:\projects\402\2007_mxd\EA_FINAL_SIGNATURE\sh402_studyarea_070131.mxd)
5/1/2007 -- 5:42:58 PM

Individual constraints in the study area that guided the development of the Meander Alternative were identified during project scoping, hen mapped, and used to develop the meander alignment. Versions of the Meander Alternative were analyzed to identify the best-fit alignment that minimized impacts while meeting design criteria.

The Meander Alternative's limited alignment shifts were developed to meet speed and safety criteria for posted speed limits (40 to 50 mph) while taking into account driver expectations. By limiting the number of alignment shifts and maintaining the right-of-way width of 160 to 175 feet, the Meander Alternative has the least number of relocations while meeting the purpose and need. While the Meander Alternative does not have the least impacts on all resources, it adversely affects only one historic property, and the lower number of relocations was also a key screening factor.

4.4 Section 4(f) Resources

Within the SH 402 project study area, the proposed action will have no impact on any existing public parks, recreation areas, wildlife refuges, or waterfowl refuges.

Five historic properties are eligible for the NRHP in the project area of potential effect (APE) as shown in Figure 4-1.

All five of these properties will have uses under Section 4(f) for the Preferred Alternative as defined by *49 USC 303* and *23 USC 138*.

For the Weber Farm (5LR10725), located in the southeast quadrant of SH 402 and CR 13C (St. Louis Avenue), a finding of adverse effect under Section 106 has been made. Due to the finding of adverse effect, the use of this property requires a full Section 4(f) evaluation.

For four properties, the Big Thompson Manufacturing Ditch Segment (5LR10726.1), the Weber Farm East (5LR11249), the Propp Farm (5LR11247), and the Mountain View Farm (5LR11242), the project will result in *de minimis* impacts.

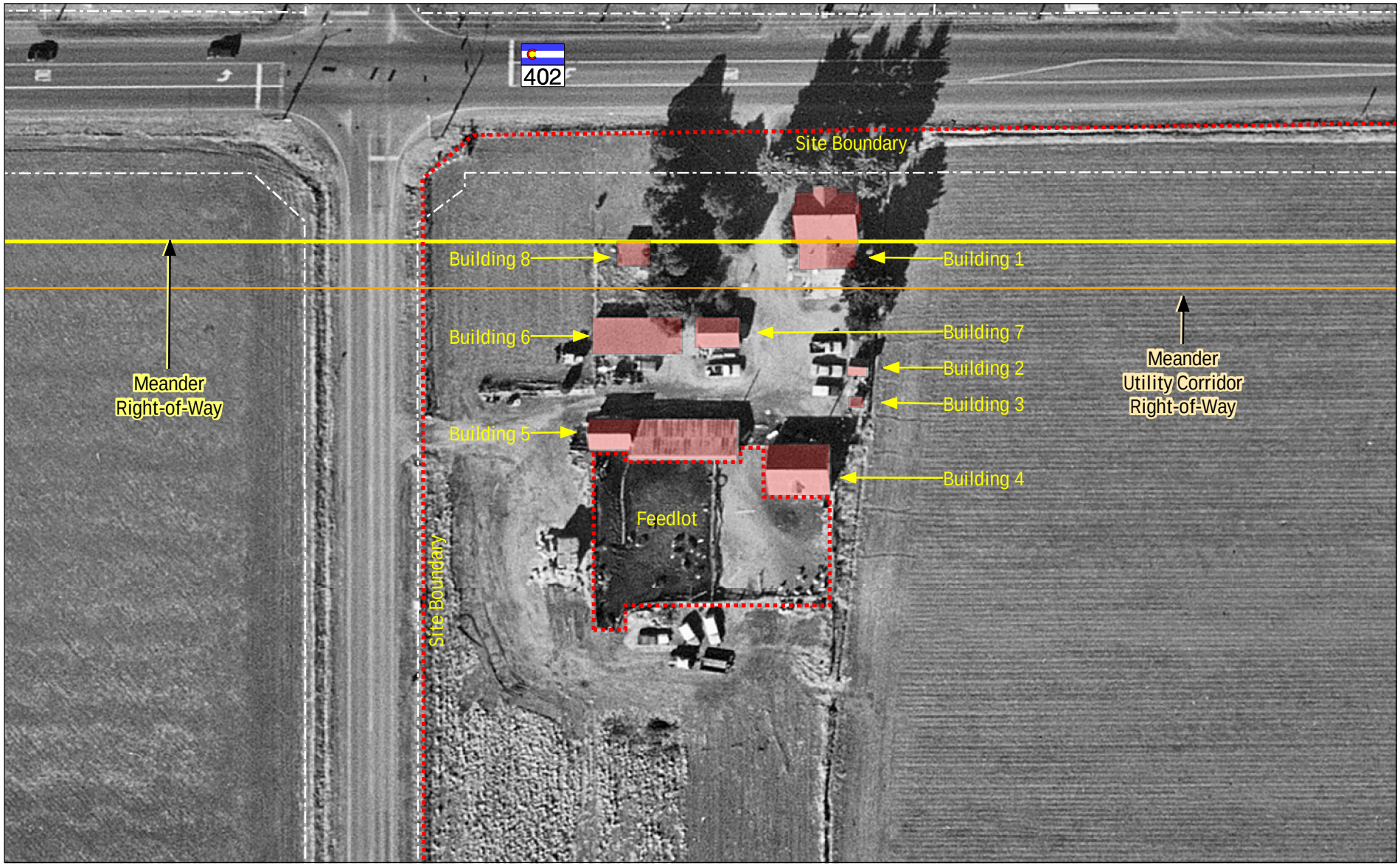
4.4.1 Weber Farm (5LR10725)

Property Description

The Weber Farm abuts the south side of existing SH 402 from CR 13C east to the location where CR 11H (Boise Avenue) ties into SH 402 from the north. The buildings on this 80-acre farm complex are located in the area immediately south and east of the intersection at CR 13C. Access to the property comes from both SH 402 and CR 13C.

The farm complex, built during the period from 1911 to the 1930s, is an example of the early 20th century irrigated farming patterns of small land holdings and the family farm. This farm complex includes eight buildings, a feedlot, and tilled fields (see Figure 4-2). The Weber family acquired the farm property in 1926 and still owns the property. Family members operate it as a small farm. Its associations with early 20th century farming and the high level of physical integrity make the Weber Farm eligible to the NRHP under Criterion A. The house and outbuildings are aging but all retain a high degree of integrity and completeness as representative buildings of an early 20th century Larimer County farm, also resulting in NRHP eligibility under Criterion C.

The farm complex is in close proximity to the Big Thompson River that meanders along the north side of SH 402 in this area (see Figure 4-3). Additional information on the river, associated wetlands and wildlife habitat can be found in *Chapter 3, Impacts and Mitigation Measures*.



LEGEND

- Property Parcel Boundaries
- Meander Alternative Right-of-Way
- Meander Alternative Utility Corridor Right-of-Way
- Site Boundary

N W E S

0 25 50 75 Feet

SCALE - 1:900 or 1" = 75'

SOURCE: 2001 1/2-foot pixel resolution aerial photography. provided by Wilson & Co. Land use and parcel information provided by the City of Loveland. Historic information provided by WCRM. Map produced November 2006 by JFSA.

U.S. Department of Transportation Federal Highway Administration

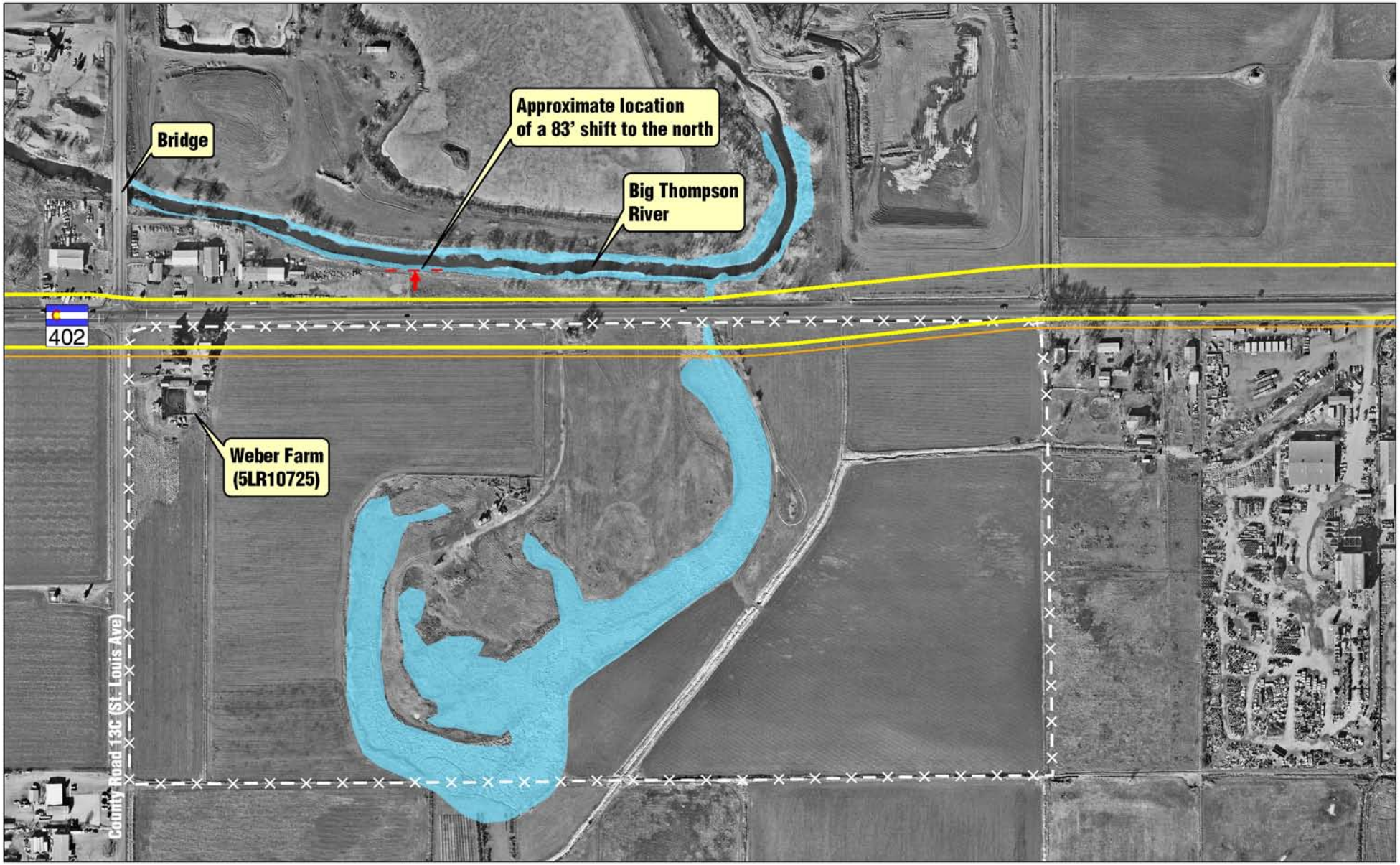
DOT DEPARTMENT OF TRANSPORTATION

DOT SH 402 Environmental Assessment

Weber Farm - Detail of Buildings
5LR10725

FIGURE 4-2

Map Document: (H:\projects\402\2007_mxd\EA_FINAL_SIGNATURE\sh402_weber_historic_8x11_061129.mxd)
5/1/2007 -- 5:53:27 PM



LEGEND

- Meander Alternative Right-of-Way
- Meander Alternative Utility Corridor Right-of-Way
- Site Boundary
- Jurisdictional Wetlands

N W E S

0 200 400 Feet

SCALE - 1:4,800 or 1" = 400'

SOURCE: 2001 1/2-foot pixel resolution aerial photography provided by Wilson & Co. Land use and parcel information provided by the City of Loveland. Historic information provided by WCRM. Map produced November 2006 by JFSA.

U.S. Department of Transportation Federal Highway Administration

DOT SH402 Environmental Assessment

Context Map for Weber Farm Discussion

Figure 4-3

Map Document: (H:\projects\402\2007_mod\EA_Update_Feb2007\sh402_weber_context_8x11_070201.mxd)
2/1/2007 -- 2:07:43 PM

Description of Use of the Weber Farm (5LR10725)

The widening of SH 402 at this location results in the need for additional right-of-way and a permanent utilities easement from the frontage of the Weber Farm with an approximate width of 58 feet for right-of-way and an additional 25 feet for permanent easement (total of 83 feet) the entire length of the Weber Farm - SH 402 frontage.[2] This results in a total need for an additional 4 acres of new right-of-way for the highway widening and an additional 1.4 acres for the permanent easement. Note that the alignment veers north as SH 402 heads east past the Big Thompson River in the vicinity of a lateral ditch. This slightly reduces the right-of-way and easement requirements from the eastern 500 feet of Weber Farm frontage.

In the vicinity of the buildings on the property, the result will be the loss of the main house (building 1) and chicken brooder house (building 8). These buildings are illustrated in Figure 4-4. The magnitude of this impact is an adverse effect on the NRHP eligible Weber Farm (5LR10725). A Memorandum of Agreement to resolve adverse effects on this property was executed on February 9, 2007 (see *Appendix A*).

4.4.2 *De Minimis* Findings

Big Thompson Manufacturing Ditch Segment (5LR10726.1)

Property Description

The Big Thompson Manufacturing Ditch system extends 10 miles in length, beginning 0.25 mile east of Wilson Avenue on the Big Thompson River and ending just east of the resource segment 5LR10726.1. The ditch has been identified as one of the oldest in the system with rights dating back to 1863. The SHPO concurred with the determination that the overall linear feature 5LR10726 is an NRHP eligible resource under Criteria A and C and that segment 5LR10726.1 has a low degree of integrity. The segment under discussion is piped under the existing SH 402 at milepost 1.9 (see Figure 4-1).

Description of Use of the Big Thompson Manufacturing Ditch Segment (5LR10726.1)

The expansion of SH 402 will increase the length of the pipe under the highway. This would occur with all action alternatives. No other alterations to the ditch are anticipated.

FHWA and CDOT, in consultation with the SHPO, determined that this project widening will result in a finding of no adverse effect under Section 106 of the NRHP. Subsequently, CDOT and FHWA have made a finding for *de minimis* impact under Section 4(f). SHPO concurred with the "no adverse effect" finding in correspondence dated June 29, 2005, and again on September 13, 2006. The City of Loveland Community and Strategic Planning Department was also afforded an opportunity to review the Section 106 findings. CDOT notified the SHPO of the *de minimis* determination for this property in correspondence dated March 10, 2006. FHWA signed the *de minimis* finding for the property on November 15, 2006 (see Appendix A for correspondence).

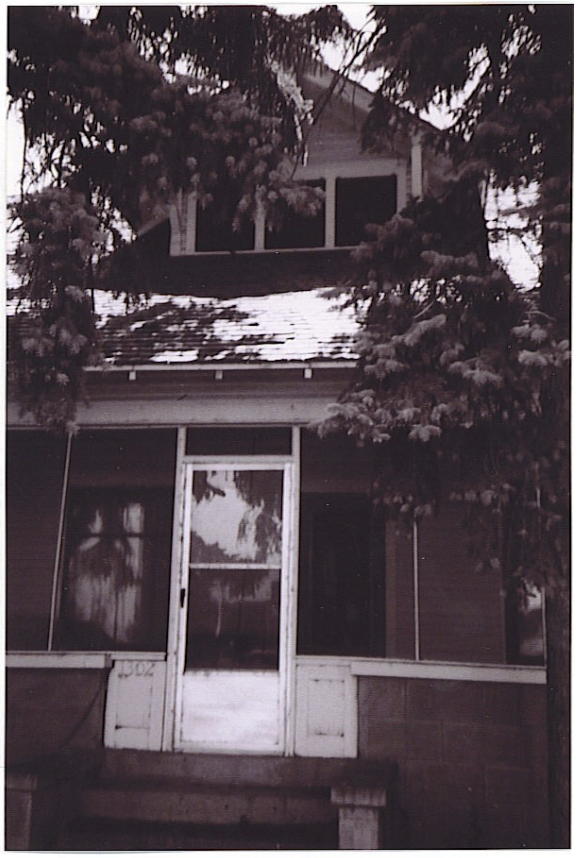
Weber Farm East (5LR11249)

Property Description

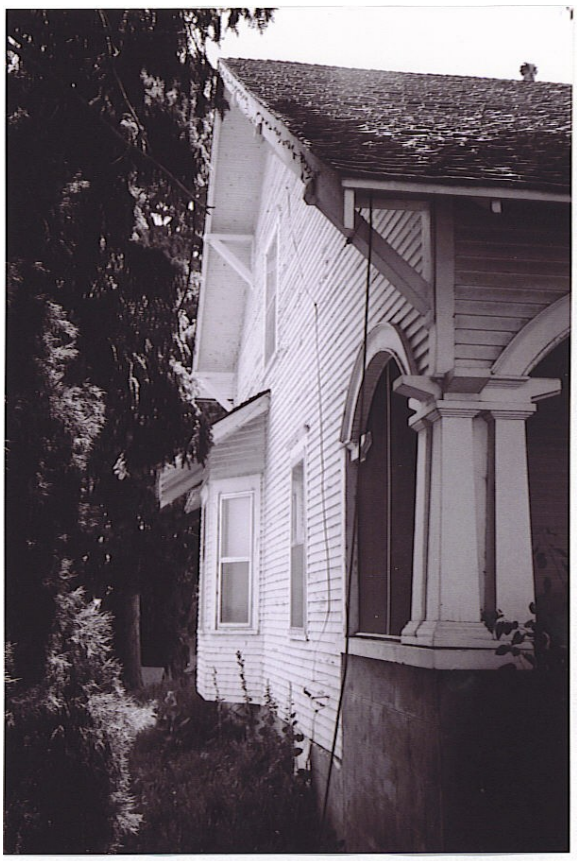
The Weber Farm East is under the same ownership as the Weber Farm (5LR10725). The Weber Farm East abuts the south side of existing SH 402 approximately 1.6 miles to the east of the Weber Farm (see Figure 4-1). There are no cross streets in the vicinity, and the eastern boundary is approximately 870 feet west of CR 9E. This property accesses SH 402.

[2] Parcel data from the Larimer County Assessor's Office and City of Loveland (2003) show the Weber Farm legal boundary as located within CDOT right-of-way for approximately 1,200 feet of SH 402 frontage. The remaining legal boundary for the Weber property is shown as extending to the existing SH 402 centerline. The numbers described above treat the existing farm fence as the NRHP boundary. This discrepancy in current ownership data does not alter the adverse effect on the historic property.

Figure 4-4. Weber Farm Main House and Chicken Brooder House



Main House: front door and dormer, view to south



Main House: east elevation, showing bay window, view to south

Main House: rear elevation, view to northeast

Building 8: chicken brooder house, front elevation, view to northeast

The Weber Farm East complex was built in the early 1900s with remodels to the main house. The 2.1-acre fenced complex consists of 13 buildings, a feedlot, and tilled fields.

The Weber Farm East is eligible for inclusion in the NRHP under Criterion A because it represents the typical early-to mid-20th century farming lifestyle in the Loveland and Larimer County area. The site is also considered eligible for inclusion in the NRHP under Criterion C as representative of early 20th century farm architecture in the Loveland area.

Description of Use of the Weber Farm East (5LR11249)

As a result of the identification of the Meander Alternative as the Preferred Alternative, the alignment of the expanded SH 402 remains to the north, holding the existing southern edge of right-of-way the entire length of the Weber Farm East. The only impact on the farm is the acquisition of a 25-foot permanent utility easement across the front of the property. Except for the probable loss of a cottonwood tree associated with placing utilities underground, no other physical features of the Weber Farm East property will be affected. The tree is not considered a part of the historic landscape. Utility poles are currently located in an easement along the front of this property.

FHWA and CDOT, in consultation with the SHPO, determined that this project widening will result in a finding of no adverse effect under Section 106. Subsequently, CDOT and FHWA have made a finding for *de minimis* impact under Section 4(f). SHPO concurred with the "no adverse effect" finding in correspondence dated May 26, 2006, and again on September 13, 2006. The City of Loveland Community and Strategic Planning Department was also afforded an opportunity to review the Section 106 findings. CDOT notified the SHPO of the *de minimis* determination for this property in correspondence dated March 10, 2006. FHWA signed the *de minimis* finding for the property on November 15, 2006 (see *Appendix A* for correspondence).

Propp Farm (5LR11247)

Property Description

The Propp Farm abuts the south side of existing SH 402 and is crossed on the east by the Big Thompson Manufacturing Ditch Segment (5LR10726.1). The Weber Farm East (5LR11249) is one property east of the Propp Farm.

The Propp Farm complex was built in the mid-1920s. The current 21.8 acres includes 6 historic buildings and 18.5 acres of alfalfa hayfields.

The Propp Farm is eligible for inclusion in the NRHP under Criterion A for its association with a period of significance, the Colorado Plains – Post 1900 Agricultural – Sugar Beets context. The Propp Farm was part of a larger 80-acre farm then, where sugar beets, hay, and corn were grown.

Description of Use of the Propp Farm (5LR11247)

As a result of the identification of the Meander Alternative as the Preferred Alternative, the alignment of the expanded SH 402 remains to the north, holding the existing southern edge of right-of-way the entire length of the Propp Farm. The only impact on the farm is the acquisition of a 25-foot permanent utility easement across the 410-foot front of the property.

Except for the possible loss of several trees associated with placing utilities underground, there will be no other impacts on the Propp Farm. Utility poles are currently located in an easement along the front of the property. The trees date from the 1960s and are not part of the historic landscape.

FHWA and CDOT, in consultation with the SHPO, determined that this project widening will result in a finding of no adverse effect under Section 106 of the NRHP. Subsequently, CDOT and FHWA have made a finding for *de minimis* impact under Section 4(f). SHPO concurred with the "no adverse effect" finding in correspondence dated August 22, 2006. The City of Loveland

Community and Strategic Planning Department was also afforded an opportunity to review the Section 106 findings. CDOT notified the SHPO of the *de minimis* determination for this property in correspondence dated August 15, 2006. FHWA signed the *de minimis* finding for the property on November 15, 2006 (see *Appendix A* for correspondence).

Mountain View Farm (5LR11242)

Property Description

The Mountain View Farm is located in the northwest quadrant of the SH 402 and I-25 interchange.

The Mountain View Farm complex built in the 1920s includes both the farmstead and associated fields. The farmstead includes five historic buildings, six modern buildings, and eight modern features, including a feedlot. According to the current owner, the main house was relocated and remodeled in 1964 due to the construction of I-25.

This property is eligible under Criterion A, for its association with the period of significance in the sugar beets context, even though the house has been moved. Previous owners grew hay, grain, and sugar beets and later ran a dairy at this location.

Description of Use of the Mountain View Farm (5LR11242)

The SH 402 project will taper from four to two lanes at the I-25 interchange adjacent to and east of the Mountain View Farm. The additional proposed right-of-way would take 35 feet off the front of the property for a distance of 1,935 feet. Potential physical highway improvements would generally remain south of the farm's existing fence line. The shoulder for the expanded SH 402 will end at the current fence; however, fill slopes associated with the construction would intrude further to the north. Possible impacts on features associated with the farm within the expanded right-of-way include loss of frontage from a modern feedlot, location adjacent to the front of the calving shed, and loss of a bank of weedy species trees located in front of the house. The field survey revealed an unkempt, dense growth of elms, sumac, and juniper. These trees, likely planted after the relocation of the house during the 1960s, are not part of the historic landscape.

FHWA and CDOT, in consultation with the SHPO, determined that this project widening will result in a finding of no adverse effect under Section 106. Subsequently, CDOT and FHWA have made a finding for *de minimis* impact under Section 4(f). SHPO concurred with the "no adverse effect" finding in correspondence dated August 22, 2006. The City of Loveland Community and Strategic Planning Department was also afforded an opportunity to review the Section 106 findings. CDOT notified the SHPO of the *de minimis* determination for this property in correspondence dated August 15, 2006. FHWA signed the *de minimis* finding for the property on November 15, 2006 (see *Appendix A* for correspondence).

4.5 Avoidance Alternatives

Table 4-1 provides a summary of avoidance alternatives.

4.5.1 Big Thompson River Relocation Alternative

The following discussion examines the potential for avoidance of all impacts on the Weber Farm (5LR10725). This alternative would require an adjustment to the Meander Alignment from west of CR 13C to east of CR 11H, a distance of approximately 0.75 mile, to avoid all direct use of the Weber Farm. To accommodate the widened SH 402 and associated utility easement, this segment of SH 402 would have to be to shifted 83 feet to the north: 58 feet for the alignment and another 25 feet to locate the utility easement outside the Weber property (see Figure 4-3).

Table 4-1. Avoidance Alternative Discussion Summary

Alternative	Weber Farm (5LR10725)	Weber Farm East (5LR11249)	Big Thompson Manufacturing Ditch Segment (5LR10726.1)	Propp Farm (5LR11247)	Mountain View Farm (5LR11242)	Prudent and Feasible
No Action	Avoids	Avoids	Avoids	Avoids	Avoids	No (a,b)
Action Alternative #4 - Meander	Use	No Adverse Effect *de minimis*	No Adverse Effect *de minimis*	No Adverse Effect *de minimis*	No Adverse Effect *de minimis*	Yes
Big Thompson Relocation Alternative	Avoids or No Adverse Effect *de minimis*	No Adverse Effect *de minimis*	No Adverse Effect *de minimis*	No Adverse Effect *de minimis*	No Adverse Effect *de minimis*	No (c)
Parallel Route - US 34 in Lieu of SH 402 improvements	Avoids	Avoids	Avoids	Avoids	Avoids	No (a,b)
Parallel Route - SH 60 in Lieu of SH 402 improvements	Avoids	Avoids	Avoids	Avoids	Avoids	No (a,b)

a) Does not meet the project purpose and need because it does not address mobility concerns or meet regional travel demand
b) Does not meet project purpose and need because it does not address safety concerns
c) Does not meet USCOE permit requirements for least environmentally damaging practicable alternative (LEPDA) per CFR 40 Part 230 Section 404(b)(1). Results in excessive costs.

The US Army Corps of Engineers will issue a permit for only the least environmentally damaging practicable alternative (LEPDA) per *CFR 40 Part 230 Section 404(b)(1).* The Big Thompson River Relocation Alternative would not meet this requirement due to extensive river relocation (approximately 1,200 feet) and associated wetlands impacts (approximately 1 acre of moderate to high functional value jurisdictional wetlands).

The Big Thompson River Relocation Alternative is not prudent and feasible because it has adverse impacts on the river and it would not be the LEPDA per US Army Corps of Engineers permit requirements.

4.5.2 Parallel Corridor Alternatives

The possibility of new or parallel alignment corridors was also considered. Parallel highway corridors already exist: US 34 and SH 60. The project purpose and need: to improve mobility and safety along SH 402 while meeting 2030 travel demand and expected growth and development for the SH 402 corridor, cannot be met by improvement to either US 34 or SH 60 because shifting the alignment to US 34 or SH 60 would not satisfy safety issues (see Figure 1-1 for parallel corridor locations).

Specific safety issues for the SH 402 corridor are identified in *Section 1.2.3, Crash Analysis*, and include the following observations that are corridor-specific and cannot be remedied by improving parallel corridors:

- Substandard shoulder widths on SH 402,
- Close proximity of driveway accesses to intersections and related slowing of drivers to make turns into side roads and driveways increasing risk of rear-end crashes
- Sight distance problems on SH 402 at numerous intersections.

An Environmental Assessment was completed in April 2007 addressing mobility on US 34 between US 287 to the west and LCR 3 east of I-25. The Action Alternative is for the widening of US 34 from four to six lanes. The proposed SH 402 widening is included in the 2030 travel demand forecast for US 34, meaning that US 34 widening alone will not meet regional travel demand.

An added concern at SH 60, located south of SH 402, is that it does not include full access to

I-25. There are no plans to expand the SH 60/I-25 access, which could cost as much as $15 million. Assessment of the status of this interchange is included in the separate *North I-25 Front Range EIS*.

4.5.3 No Action Alternative

The No Action Alternative does not address FHWA and CDOT project purpose and need, mobility, and safety concerns or 2030 travel demand and expected growth and development needs. The design goal for SH 402 from US 287 to CR 13C was level of service (LOS) D (based on its urban functional classification), with LOS C for the remainder of SH 402 east of CR 13C (based on its rural functional classification).

The No Action Alternative includes developer improvements between US 287 and CR 13C, which result in improved 2030 LOS for the US 287 and CR 13C intersections and through traffic LOS between US 287 and CR 11H.

SH 402 traffic volumes in 2030 under the No Action Alternative will result in LOS F at most intersections east of CR 13C. Highway through segments between intersections are projected to decline to LOS F east of CR 11H in 2030. Therefore, the No Action Alternative is not prudent and feasible.

4.6 Measures to Minimize Harm

The following discussion represents efforts made for all possible planning to minimize harm to the Weber Farm property while following the Preferred Alternative, Meander Alternative alignment.

During alternatives development and screening, the cross section was narrowed to a total of 175 feet to reduce potential impacts on adjacent properties, including the Weber Farm, and to respond to public and agency comments, while maintaining desired design characteristics. Later, due to constraints related to the proximity to the Big Thompson River, the right-of-way in this segment was further reduced to 160 feet.

Even with the reduction in right-of-way through portions of Weber Farm, there is no prudent and feasible alternative that alleviates the use of the Weber Farm (5LR10725).

The SHPO was consulted on the impacts of the project. The following mitigation is recommended for the Weber Farm (5LR10725).

The Weber Farm (5LR10725) was recorded prior to construction so that there is a permanent record of its present appearance and history. Recordation consisted of Level II Documentation as determined in consultation with the SHPO and according to the standards established in Office of Archaeology and Historic Preservation Form #1595. The SHPO accepted the Level II Documentation on May 7, 2007 (see *Appendix A*). Copies of the documentation also will be sent to a local archive designated by the SHPO.

Regarding the alignment of the Preferred Alternative (Meander Alternative), measures to minimize harm to crossing the Big Thompson Manufacturing Ditch Segment (5LR10726.1) include crossing a portion of the ditch that has low integrity. The ditch generally runs perpendicular to SH 402 and any substantial realignment of SH 402 could result in a crossing of a portion of the ditch that may have higher integrity, resulting in an adverse effect on this ditch, rather than the current finding of no adverse effect.

Those measures being used in association with the Preferred Alternative (Meander Alternative) to minimize harm to both the Weber Farm East (5LR11249) and the Propp Farm (5LR11247) result in the identification of only a utility easement across the front of these properties. Some utilities already run across the front of each of these properties in a narrower easement.

Those measures being used in association with the Preferred Alternative (Meander Alternative) to minimize harm to the Mountain View Farm (5LR11242) include the avoidance of loss of any historic buildings. Only a modern feedlot frontage and bank of trees that is not considered part of the historic landscape will be affected.

4.7 Coordination

In consultation with the SHPO, the FHWA and CDOT have determined that this project will have adverse effects on the Weber Farm (5LR10725). FHWA, CDOT, and the SHPO agreed that this project will have no adverse effects on the Big Thompson Manufacturing Ditch Segment (5LR10726.1), the Weber Farm East (5LR11249), the Propp Farm (5LR11247), and the Mountain View Farm (5LR11242). The SHPO concurred with these findings and has been informed of the determination of *de minimis* impacts. Relevant Section 106 and 4(f) related correspondence is found in *Appendix A*.

This page intentionally left blank.

Chapter 5

Cumulative Impacts

Chapter 5. Cumulative Impacts

This chapter addresses cumulative impacts of the Preferred Alternative (Meander Alternative). Cumulative impacts are defined as "the impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or persons undertake such actions" (40 CFR Part 1508.7 Council on Environmental Quality [CEQ] Regulations).

5.1 Regulatory Guidelines and Methods

Methods follow those outlined by CEQ (1997) and the Federal Highway Administration (FHWA) (2003). Resource data focus on the human and natural environment features that would be affected by the Meander Alternative in the project area. Available data sources for the project cumulative impacts area include Federal Emergency Management Agency (FEMA), Colorado Division of Wildlife (CDOW), and Colorado Natural Heritage Program (CNHP) mapping; National Wetland Inventory mapping; city of Loveland land use and transportation documents; and Larimer County land use documents. Larimer County and city of Loveland planning documents were reviewed and planners were interviewed to identify cumulative impacts associated with reasonably foreseeable future transportation and development projects in the area of influence. Reasonably foreseeable transportation projects are projects for which funding has been identified, completed projects, and projects in progress. This information, in combination with impacts of past projects, constitutes the "baseline" condition. Impacts expected from implementation of the Meander Alternative were added to the baseline to determine the proposed project's contribution to cumulative impact.

5.2 Scope of Cumulative Impact Analysis

The scope of the cumulative impact analysis for the No Action Alternative is to first identify the past, present, and reasonably foreseeable projects in the area. Second is to provide a discussion on whether implementation of the No Action Alternative will contribute to impacts on surrounding resources.

For the Meander Alternative, the scope consists of identifying those resources upon which the alternative will have an impact and identifying the geographic area and timeframe for the cumulative impact analysis. If the Meander Alternative will not have a direct or an indirect impact on a resource, it is not analyzed for cumulative impacts. The reason is that there is no impact from the action to contribute to the cumulative impacts on that particular resource.

5.2.1 No Action Alternative

The entire area surrounding SH 402 between US 287 and I-25 is zoned for development. The *City of Loveland Land Use Plan* (May 2, 2002; amended March 6, 2007) shows that all parcels adjacent to SH 402 are expected to be converted from agricultural to other land uses. This planned development includes estate, medium, and low-density residential areas, employment centers, and neighborhood activity facilities. This development will change the visual character of the area, increase noise levels, and result in the loss of prime farmlands.

This development is expected to occur regardless of whether improvements are made to the SH 402 corridor. The impacts related to this development will contribute to the overall cumulative impacts for the area.

5.2.2 Resources Not Directly or Indirectly Impacted Under the Meander Alternative

For this local highway safety and mobility improvement project, no direct or indirect effects have been identified for a Preferred Alternative resource; thus, the project is not expected to contribute to cumulative effects on that resource.

No direct or indirect impacts have been identified for the following resources under the Meander Alternative:

- socioeconomic
- environmental justice
- land use
- recreation
- emergency services
- archaeology
- Native American consultation
- air quality
- threatened or endangered species
- floodplains
- geology

5.2.3 Resources Directly or Indirectly Impacted That May Result in Cumulative Impacts

Direct or indirect impacts of the Meander Alternative that may contribute to cumulative impacts have been identified for the following resources. Table 5-1 lists possible impacts.

- visual
- right-of-way and residential relocations
- hazardous materials/waste
- utilities and services
- historic preservation
- Section 4(f)/6(f)
- paleontological resources
- noise
- ecology
- wetlands
- water quality
- farmland

5.2.4 Geographic Area and Timeframe

Existing conditions are described only for resources with direct impacts from Meander Alternative construction that may contribute to cumulative impacts. The area of influence is adjacent to the SH 402 right-of-way. Also known as the cumulative effects area, it encompasses the development and ecosystems most likely to be influenced by the proposed project. Past conditions are between 1980 and 2000, present condition is defined as 2000 to present, and the reasonably foreseeable future extends to 2030.

5.2.5 Past, Present, and Reasonably Foreseeable Future Actions

Past actions include gradual development of the area, especially near US 287 and SH 402, extending east toward CR 13C. Present conditions include ongoing residential development, most recently construction of the Waterford Place Apartments. Reasonably foreseeable future actions include residential, commercial, and office development along SH 402. The proposed project is located within the city of Loveland Growth Management Area (GMA). Land use planning guidance features a future neighborhood activity center at US 287 and SH 402, commercial growth adjacent to the interchange at SH 402 and I-25, and development of employment opportunities throughout the south side of the corridor. Residential development is focused on the north side of SH 402. The trend for continued development in the project area is taken into consideration in city of Loveland and Larimer County land use and transportation plans. The Meander Alternative supports these local planning efforts.

Figure 5-1, a city of Loveland future land use plan map, indicates planned growth in the area.

5.2.6 Transportation and Development Actions

A review of the top 15 priority transportation projects identified in the North Front Range 2020 Regional Transportation Plan revealed no other proposed projects in the immediate cumulative impact area of influence. Improvements to I-25 and to US 34 are currently under study. The city of Loveland includes the SH 402 corridor in its GMA and expects increases in population and corresponding traffic volumes in the area.

5.2.7 Summary of Cumulative Impacts

Table 5-1 summarizes potential cumulative impacts associated with SH 402 past, present, and reasonably foreseeable future actions and with the Meander Alternative.

Table 5-1. Cumulative Impacts on Environmental Resources

Environmental Resource	Impact of Past and Present Actions	Impact of Foreseeable Future Actions	Impact of Meander Alternative	Cumulative Impact
Visual	Past agricultural, residential, and commercial development in the project area has contributed to visual resource cumulative impacts. Construction of the Waterford Place Apartments has changed the project area's landscape setting.	The visual character of the project area will continue to change as the area develops within the city of Loveland GMA under the guidance of the *Loveland Land Use Plan*.	Changes are expected to be low contrast to the landscape character in the setting. There will be localized impacts only.	There will be cumulative visual impacts within the SH 402 area of influence (adjacent to SH 402 right-of-way). The visual character will shift from rural and agricultural toward urbanized, with or without the implementation of the Meander Alternative.
Right-of-way and Residential Relocations	SH 402 right-of-way acquisitions and related residential relocations do not carry any associated past or present actions (residential acquisitions) for this corridor. (Also see discussion on Utilities below.)	No foreseeable future actions, other than the SH 402 acquisitions, have been identified. Minor loss of acreage from the future property tax base is not considered a cost when compared with the benefits of the proposed project.	The acquisition of right-of-way (47.58 acres of residential and 7.15 acres of commercial property) for improvements associated with SH 402 will not affect land use patterns or planning. Relocations (6 homes and 3 outbuildings) will be conducted in compliance with the Uniform Act and will not affect overall housing patterns, needs, or availability.	No cumulative impacts have been identified for this mitigated action.
Hazardous Materials/Waste	Fuel-contaminated groundwater could have migrated offsite from the leaking underground storage tank (LUST) site at the Diamond Shamrock gas station. No indications of hazardous materials or waste at the A/B Auto Brokers and Chuck's Towing property currently exist, but historic use raises the potential for contamination.	Contamination related to sites in proximity to SH 402 may affect other area projects in the foreseeable future. These impacts are independent of the proposed project.	Should hazardous materials be encountered as a part of the proposed project, at any sites, any impact will be mitigated at that site. Transformers on utilities adjacent to SH 402 will be relocated.	No cumulative impacts have been identified for this mitigated action.

Environmental Resource	Impact of Past and Present Actions	Impact of Foreseeable Future Actions	Impact of Meander Alternative	Cumulative Impact
Utilities and Services	Utility corridors often follow linear transportation corridors to minimize impacts. Utilities associated with SH 402 in the past and present remain in this corridor.	It is possible that utility company uses of the SH 402 corridor will vary in the foreseeable future as services are modified or upgraded.	Proximity of major utilities to the existing SH 402 edge of pavement would necessitate relocation of some of these utilities. A 25-foot utility corridor easement on the south side of the Meander Alternative is proposed for existing southside and new utilities. Utilities currently on the north side will be relocated further north within the SH 402 footprint.	Creation of a utility corridor adjacent to SH 402 will not result in a cumulative effect on utilities in the city or county. No cumulative impacts have been identified.
Historic Preservation	Historically, the SH 402 corridor has supported the agricultural heritage of the eastern plains. Numerous farming uses remain today. However, residential and commercial development is encroaching from the west end, and development pressure is also present in the vicinity of I-25.	Many of the historic farms in the corridor will lose their historic integrity as the rural farmsteads and associated lands give way to the construction of residential and commercial projects along SH 402.	There will be an adverse effect on one historic property, the Weber Farm (5LR10725).	The cumulative impacts of the economically supported growth trend outside the SH 402 right-of-way on historic properties are likely to occur as development continues, with or without the implementation of the Meander Alternative.
Sections 4(f)/6(f)	No impacts on parks, recreation areas, wildlife or waterfowl refuges have been identified for this project. One historic property will be used under Section 4(f). See additional discussion under Historic Preservation above.	See additional discussion under Historic Preservation above.	There will be a use of one historic property, the Weber Farm (5LR10725). FHWA has made a finding of *de minimus* impacts for four properties.	See additional discussion under Historic Preservation above.
Paleontology	Paleontological resources have been salvaged in the Loveland area in the past.	Paleontological resources can continue to be salvaged in the Loveland area in the future.	No known resources will be affected by the proposed project.	Preconstruction salvage, if identified, of potentially impacted fossils will not contribute to loss of paleontological data from the area.

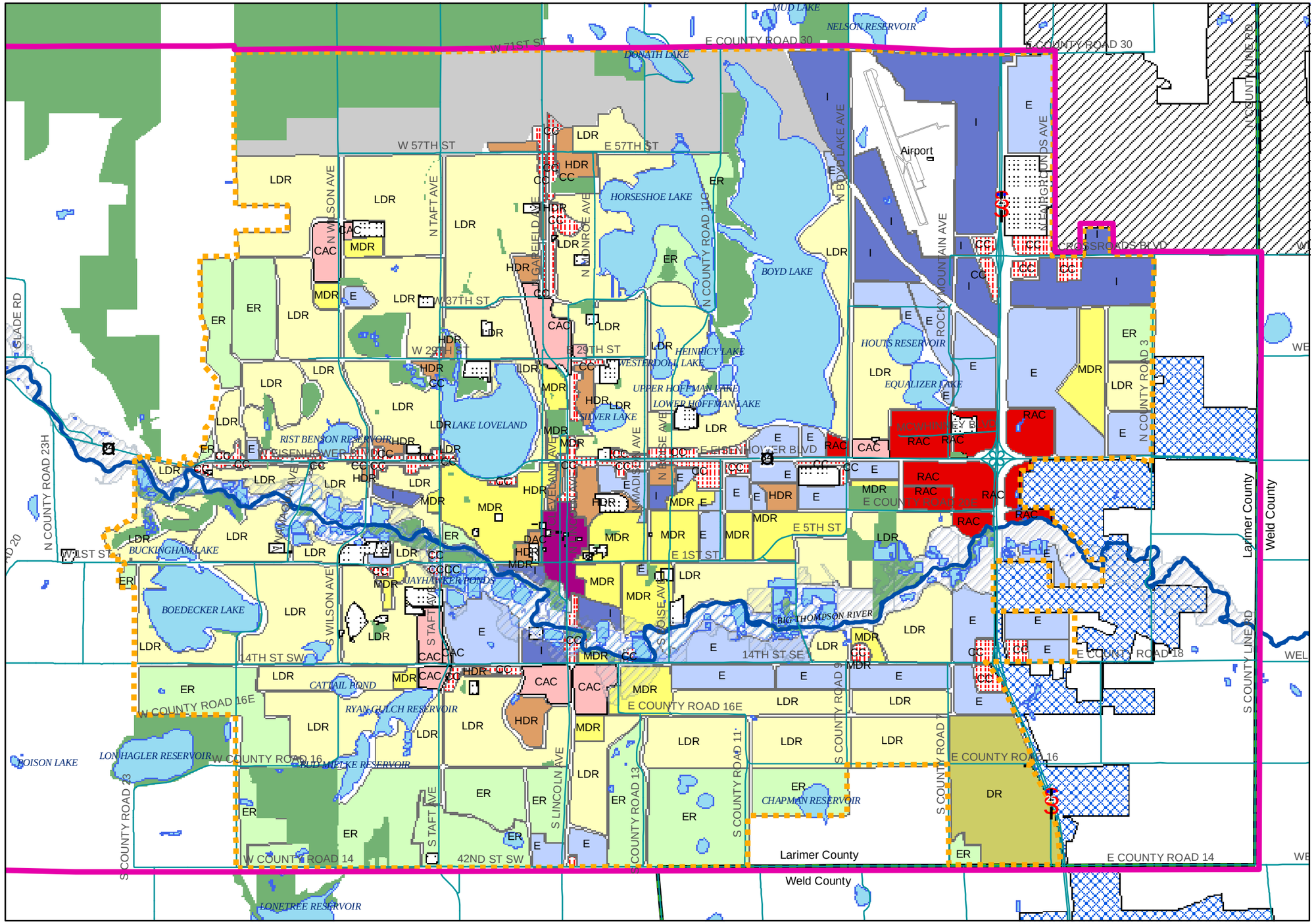
Environmental Resource	Impact of Past and Present Actions	Impact of Foreseeable Future Actions	Impact of Meander Alternative	Cumulative Impact
Noise	No past or present noise-generating transportation projects have been identified in the SH 402 study area; however, continuing traffic increases due to development and growth in the region have contributed to the existing noise environment.	Future noise impacts are possible along SH 402 near the I-25 interchange due to increased traffic volumes on I-25. These impacts will be addressed in a forthcoming I-25 project and are not included in the current project. Planned development will also contribute to increased noise. Figure 5-1, a city of Loveland land use plan map, indicates the planned development in the area.	Year 2030 noise levels would meet or exceed the CDOT NAC B criterion of 66 dB(A) at 11 residences, not including 2 residences, which would need to be acquired for improvement to be implemented.	Noise pattern changes and decibel level increases are likely to occur as development continues, with or without the implementation of the Meander Alternative.
Ecology	Past and present agricultural and residential/commercial development have affected the quality of the ecological habitat by contributing to fragmentation and removing large tracts of land from natural productivity. Land development, especially along the Big Thompson River riparian areas, has made it more difficult for wildlife to access the river and has fragmented habitat. Past conversion of shortgrass prairie to cropland and residential areas has reduced the diversity of cover, food, and breeding areas available to wildlife. Development has introduced other indirect impacts, including human presence, domestic pets (as predators), noise disturbances, and the dangers associated with roads. Other negative effects include addition of impermeable surfaces that contribute to increased runoff entering creeks and riparian systems, and introduction of non-native or invasive (noxious) weeds.	Planned development in the area will result in further loss and/or fragmentation of riparian habitats and conversion from open cropland to buildings, parking lots, and landscaped areas. Disturbances of this type will decrease the numbers and diversity of wildlife inhabiting the area.	Permanent disturbance of land cover vegetation was estimated at 23.7 acres. Of this, more than 80 percent is crops, pasture, and agricultural uses. The Meander Alternative will not have an impact on high-quality habitat or cause any new fragmentation of habitat.	Additional development is zoned and planned for future conversion to urban land uses with or without the implementation of the Meander Alternative. Based on the minimum habitat losses associated with the Meander Alternative, project implementation will have little cumulative effect on remaining habitat in the study area.

Environmental Resource	Impact of Past and Present Actions	Impact of Foreseeable Future Actions	Impact of Meander Alternative	Cumulative Impact
Wetlands	Project area wetlands have been affected by past activities, including agricultural development, road construction, and residential and commercial development.	Additional development planned for this area, especially along the western part of the corridor, converts land from agricultural use. Impacts on wetlands and other waters of the US include increased erosion, sedimentation, and rapid runoff from paved and nonvegetated surfaces, leading to stream incision and loss of wetland hydrology, area invasion by weed and non-native plant species, and increased concentrations of chemicals such as nitrogen, phosphorus, and heavy metal.	Approximately 0.89 acre of wetlands will be permanently affected by fill actions to expand the roadbed, of which 0.45 acre is jurisdictional. An additional area extending 5 feet from the cut-and-fill line has been included to ensure that impacts were not underestimated. CDOT will replace lost wetlands on a 1:1 basis, resulting in no net loss of wetlands. Replacement wetlands will be developed adjacent to SH 402 or in the study area.	Wetland impacts associated with development planned for the study area will occur with or without the implementation of the Meander Alternative.

Environmental Resource	Impact of Past and Present Actions	Impact of Foreseeable Future Actions	Impact of Meander Alternative	Cumulative Impact
Water Quality	The dominant surface water feature in the project study area is the Big Thompson River. Development to date has affected stormwater runoff to the river. Groundwater in the project study area is also affected by increasing development. Increased development can also increase the potential for hazardous materials spills in the area. According to the hazardous waste M-ESA, the only documented hazardous materials spills in the project corridor have occurred at the I-25/SH 402 interchange. The urban section, which has already been constructed from US 287 to CR 13C, includes a complete curb and gutter drainage system that increases highway runoff to the municipal sewer system that discharges to the Big Thompson River.	The effects of development and urbanization in the Big Thompson watershed are the primary water quality concerns in Larimer County. These development activities can increase stormwater runoff peak flows due to increased impervious surface area, and increase certain types of water pollutant sources. Pollutant sources can include point sources associated with industrial and wastewater discharge and nonpoint sources such as vehicles, commercial operations, and sediment from development construction activities. Existing land uses along the highway that already could have an impact on area water quality include agricultural, residential, commercial, and light industrial operations.	Potential impacts of this alternative include increased highway stormwater runoff because of a nearly 31-acre increased potential for highway runoff pollutants due to a projected 140 percent increase in traffic by year 2030. Increased highway runoff has the potential to impact the Big Thompson River with increased sediments, roadway deicers, metals from vehicle wear, particulates from vehicle exhaust, and petroleum products related to motor vehicles. The urban section of the Meander Alternative includes a complete curb and gutter drainage system and will increase highway runoff to the municipal sewer system that discharges to the Big Thompson River. The rural section of the Meander Alternative will increase highway runoff to roadway ditches and swales. Some highway runoff in combination with other runoff will eventually discharge into the Big Thompson River. No groundwater impacts have been identified for the Meander Alternative.	With continuation of city, county, and CDOT stormwater programs, the increased highway runoff associated with the Meander Alternative and area development is not expected to have an impact on designated uses of the Big Thompson River in the study area. No groundwater impacts have been identified for the project; therefore, no cumulative impacts have been identified. Hazardous materials spill incidents will be addressed appropriately to avoid contamination of surface water and groundwater. Figure 5-1 provides a city of Loveland land use map, which indicates the growth that the city plans for in the area. The Meander Alternative will not affect this plan.

Environmental Resource	Impact of Past and Present Actions	Impact of Foreseeable Future Actions	Impact of Meander Alternative	Cumulative Impact
Farmland	Parts of the SH 402 study area have been converted from agricultural use to commercial and higher-density residential development.	Continued conversion of farmland in the SH 402 corridor within the city of Loveland GMA (under the guidance of the *Loveland Land Use Plan*) is expected. All parcels adjacent to SH 402 are zoned for development according to the city's land use plan. This development can be expected to change the visual character of the corridor, increase noise levels, and result in a loss of prime farmland.	For this project, 24.2 acres of prime farmland will be converted to SH 402 right-of-way; 5 acres of which will be used as a 25-foot utility corridor easement. Although land in the SH 402 corridor is composed of prime soil types, the farmland itself is not subject to FPPA. According to 1989 FHWA guidelines, "Prime farmland which is already in or committed to urban development is by definition farmland not subject to the FPPA." All of the land adjacent to SH 402 is shown as residential or activity center mixed uses in the *City of Loveland Land Use Plan* (May 2, 2000, amended April 3, 2001).	Farmland within the city of Loveland GMA will be converted for future urban development with or without the implementation of the Meander Alternative (see *City of Loveland Land Use Plan,* May 2, 2000). Right-of-way acquisition for this project will contribute to farmland conversion.

This page intentionally left blank.



(1) This map is intended to serve as a guide for future land use patterns within Loveland's GMA and is advisory in nature. Land use patterns depicted on the map are generalized, recognizing that development proposals may contain a mixture of land uses and density levels which achieve the intent of the Comprehensive Master Plan. All development is subject to City standards for protection of evironmentally sensitive areas, and other performance guidelines.

(2) For details regarding appropriate land uses within the Airport Influence Area refer to section 4.6, "Airport and Surrounding Areas" of the Comprehensive Master Plan.

(3) The 100-year Floodway is displayed only within City Limits, awaiting further data.

City of Loveland

0 0.5 1 2 Miles

CITY OF LOVELAND FUTURE LAND USE PLAN

This page intentionally left blank.

Chapter 6

Public Involvement

Chapter 6. Public Involvement

The Public Involvement Program (PIP) for this project was developed in accordance with Colorado Department of Transportation (CDOT) and Federal Highway Administration (FHWA) guidance and is being conducted throughout the environmental assessment (EA) process to ensure agency and public participation.

The main purpose of the PIP is to inform appropriate local, state, and federal agencies and members of the general public about the project; identify their issues and concerns; and allow for feedback during the entire EA process. A key element of the program is being responsive to agency and public concerns related to the project. This requires an integrated program tailored to meet the needs of agencies and the public.

Program effectiveness requires timely information dissemination. To meet this goal, the following tools have been and continue to be used:

- agency meetings
- public workshops
- project website
- factsheets and postcards
- mailings to an extensive list of recipients

The PIP will conclude at the close of the 30-day public and agency review period. Within this period, a public hearing will be conducted and formal comments received. Responses to all comments will be provided in the National Environmental Policy Act (NEPA) decision document.

6.1 Public and Agency Involvement Programs

6.1.1 Scoping

Although scoping is the first step in the EA process, public and agency involvement is a critical component that continues throughout the process. Scoping was done at the onset of the project to identify the range or scope of public and agency issues and concerns related to potential widening of SH 402. Scoping identified the alternatives to be studied and shaped the alternatives selection process. Primary issues raised were safety, mobility, potential relocations, and impacts on wetlands, noise, and water quality.

6.1.2 Agency Coordination

Local, state, and federal agencies were involved at project initiation and all key milestones in the EA process. FHWA and CDOT solicited input from local and regional planning and transportation representatives and worked with resource and regulatory agencies to help identify environmental issues and potential impacts associated with the project.

Three Agency Status Meetings were conducted to solicit comments from these agencies: the first in October 2001, the second in August 2002, and the third in February 2003. Representatives from the following agencies were invited to attend:

- CDOT, Region 4 specialists: Environmental, Engineering, Access, Traffic, Design, Right-of-Way, and Utilities
- Environmental Protection Agency (EPA)
- Federal Emergency Management Agency (FEMA)
- US Army Corps of Engineers (USCOE)
- US Fish and Wildlife Service (USFWS)
- Natural Resources Conservation Service (NRCS)
- Colorado Division of Wildlife (CDOW)
- Colorado Department of Public Health and Environment (CDPHE)
- Colorado Office of Archaeology and Historic Preservation (OAHP)
- Larimer County departments: Planning, Public Works, and Engineering

- City of Loveland departments: Planning, Transportation, and Engineering
- North Front Range Transportation and Air Quality Planning Council (NFRT & AQPC)

October 2001 Agency Status Meeting

The purpose of the October 2001 Agency Status Meeting was to introduce the project, discuss relevant issues, and obtain input. At this meeting, agency representatives were provided with a presentation of the proposed project: draft purpose and need statement, project goals, project schedule, and description of the environmental assessment process (including PIP). Agency representatives provided comments and preliminary information regarding issues and concerns, and consensus on key elements of the purpose and need statement.

August 2002 Agency Status Meeting

The purpose of the August 2002 Agency Status Meeting was to update agencies on the status of the project and tasks performed to date. The project team sought feedback from agencies on the alternatives analysis. Agency representatives were provided with a presentation of preliminary traffic study results, screening criteria, alternatives developed to date, and initial screening results. In addition, a summary of public comments received was provided. Agencies gave feedback on the information presented, as well as concurrence on the screening process criteria and alternatives being studied.

February 2003 Agency Status Meeting

The chief purpose of the February 2003 Agency Status Meeting was to provide the project team with agency feedback on the recommendation to take the No Action Alternative and Meander Alternative reduced-right-of-way forward into detailed environmental analysis.

The four original action alternatives had a right-of-way width of 225 feet. Initial screening was based on this design, which was presented at the August 2002 Agency Status Meeting. The same information was presented to the public at a workshop in September 2002. As a result of public feedback and input, FHWA and CDOT decided to explore the concept of narrowing the right-of-way to further minimize impacts before completing the screening process. All four action alternatives were modified to a 160- to 175-foot right-of-way width. *Chapter 2, Alternatives*, includes a detailed discussion of this process. The Meander Alternative was refined to reduce the number of property acquisitions while minimizing environmental impacts. These narrower alternatives were then evaluated against the original screening criteria.

In addition, the project team sought agency input on the information to be presented at the public workshop scheduled for April 2003. At this meeting, agencies agreed that the No Action and Meander Alternatives should progress to detailed environmental analysis.

6.1.3 Public Participation

Throughout the PIP, information about the project has been distributed via mailings, project website (www.sh402ea.com), and public workshops held in September 2002 and April 2003.

Mailings

Seven factsheets and one notification letter have been produced and distributed.

First Factsheet, October 2001. Shortly after the project began, a factsheet containing a postage-paid comment sheet was mailed to recipients on the project mailing list to solicit input on concerns about the existing highway, potential improvements, and the surrounding environment. In an effort to reach SH 402 corridor users, these materials were left in an information box at the carpool lot at the southwest quadrant of the SH 402 and I-25 interchange. Subsequently, a bulk mailing was sent to the SH 402 addresses on the rural route in the project vicinity. More than 60 comment sheets were returned, and most focused on concerns about safety, access, and potential relocation. A small number

expressed concern about environmental issues such as noise, wetlands, and farmland impacts.

Second Factsheet, November 2002. The second factsheet summarized the first public workshop, including a synopsis of comments and feedback provided by attendees, together with the remaining EA schedule and next steps.

Third Factsheet, April 2003. The third factsheet notified individuals about the second public workshop scheduled for April 2003, provided an update on refinement of the alternatives, and solicited comments.

Fourth Factsheet, July 2003**.** The fourth factsheet provided an update on the two alternatives that would progress into the next phase of study, environmental analysis, and the No Action Alternative and Meander Alternative. The second public workshop and the comments received were summarized.

Fifth Factsheet, April 2004**.** The fifth factsheet provided the general project status and an update on the forthcoming completion of the EA document and project schedule.

Notification Letter and Study Area Map to Stakeholders West of SH 402 and US 287, April 2004**.** Property owners and business operators located adjacent to the SH 402 and US 287 intersection and west to South Garfield Avenue received a letter and a map illustrating potential intersection improvements should the Meander Alternative be selected as the Preferred Alternative.

Sixth Factsheet, January 2005. The sixth factsheet told readers that the EA would include the Meander Alternative and the No Action Alternative. It also included a map of the Meander Alternative and an updated project schedule.

Seventh Factsheet, September 2005. The seventh factsheet provided an overview of the project and activities that had occurred during 2005. It also explained the additional research underway for historic preservation. The Meander Alternative alignment was illustrated in this factsheet.

Project Website

A website was established to provide up-to-date information and allow interested members of the public to ask questions, request information, and be placed on the mailing list. Besides being a source of information, the website serves as an alternate method to register comments. The website address is www.sh402ea.com.

Public Workshops

Two public workshops were held at CDOT, Region 4 Loveland Residency at 2207 East Highway 402 in Loveland. Postcards advertising both events were sent to recipients on the mailing list and to rural route box holders in the study area. In addition, public notices were posted in the *Loveland Reporter-Herald* and on the project website.

First workshop**,** September 19, 2002, 4:00 PM to 7:00 PM**.** This workshop presented information on the following topics:

- project overview
- environmental assessment process
- project schedule
- project goals
- initial alternatives
- screening criteria
- environmental mapping
- potential impacts associated with the alternatives
- traffic data

The workshop was informal, allowing attendees to discuss the project one-on-one with CDOT, FHWA, and consultant team representatives. Fifty people attended the workshop, and 14 comments were received in the form of Post-It™ notes attached to exhibits and comment sheets. Workshop stations included:

- Station #1: Attendees were greeted, asked to sign in, and given an information packet. Post-It notes and comment sheets were provided for indicating comments.
- Station #2: Displays featured the project purpose and need, study area aerial map, project goals, issue identification, and EA process.
- Station #3: Displays featured traffic growth issues, level of service, traffic safety issues, and cross sections of the existing SH 402 and conceptual action alternatives.
- Station #4: Displays featured the alternatives analysis, the screening process, and next steps in the EA process.
- Station #5: Displays featured right-of-way information; two CDOT Right-of-Way staff members were present to answer questions.

Second workshop, April 15, 2003, 4:00 PM to 7:00 PM**.** This workshop presented information on the following topics:

- reduced right-of-way-width alternatives and alternative analysis update
- modified screening results
- alternatives recommended for further environmental analysis

The workshop format was informal and promoted discussion about the project with CDOT, FHWA, and consultant team representatives. Participants were encouraged to use various maps to identify areas of specific interest to them. Forty-five individuals attended the workshop and 13 comments were received. Workshop stations included:

- Station #1: Attendees were greeted, asked to sign in, and given an information packet. Post-It™ notes and comment sheets were provided for indicating comments.
- Station #2: Displays featured project orientation, including project purpose and need, project goals, the EA process, and a map of the entire study area.
- Station #3: Displays presented information on traffic analysis results and traffic-related safety issues.
- Station #4: Displays illustrated action alternative cross sections, reduced right-of-way action alternatives, and associated environmental analyses.
- Station #5: Displays provided right-of-way information; two CDOT Right-of-Way staff members were present to answer questions.
- Station #6: Displays illustrated next steps in the EA process and PIP information.

Mailing List

As of November 2006, the project mailing list contained 302 names and addresses. The list includes federal, state, and local agency representatives; elected officials; special interest groups; business owners; property owners; and other interested parties. The mailing list is updated throughout the life of the project as individuals ask to be added. Besides recipients on the mailing list, SH 402 rural route box holders receive project information.

6.2 Program Results

All of the questions and comments received from agencies and the public were compiled, organized by topic, analyzed, and summarized.

6.2.1 Agency Status Meeting Results

The following summarizes the issues and concerns identified in the Agency Status Meetings held in October 2001, August 2002, and February 2003.

Project Schedule/Funding	
Issue. If construction money isn't available, why is the EA on such an aggressive schedule?	**Response.** Construction money is not actually available until after 2008. SH 402 is identified as "future funds" in the current *Statewide Transportation Improvement Program (STIP)* listing of projects. Several activities need to occur between the EA and construction. Once the EA is complete and a public hearing has been held, FHWA will issue a decision document, resulting in selection of either the No Action Alternative or the Meander Alternative. Should the Meander Alternative be selected as the Preferred Alternative, CDOT would complete final design of the alternative and begin working with affected property owners. Only after these steps are complete can construction begin. Please note that this response has been updated to reflect current funding availability and timeframe.

Traffic/Highway Design	
Issue. Does the long-range plan call for urban or rural design?	**Response.** The city of Loveland plans for this highway to be a four-lane facility. Based on current land use projections and traffic volumes, an urban design is warranted from US 287 to CR 13C. A rural design is warranted between CR 13C and the I-25 interchange.
Issue. Are there any plans to go east of I-25?	**Response.** Current and projected traffic patterns and volumes do not warrant expansion east of the I-25 interchange. Should changes in travel occur, the area to the east would need to be examined in a separate study.
Issue. What is the current road width and right-of-way?	**Response.** Current width is approximately 32 feet: two 12-foot lanes and two 4-foot shoulders. The current right-of-way varies but is generally 60 feet wide.
Issue. Would fixing the vertical sight distance near Paradise Acres go out of 200 feet planned right-of-way?	**Response.** Yes, but only in a few very limited areas. The planned right-of-way is now 160 to 175 feet.
Issue. Do we have a goal for other corridors that can serve the same purpose?	**Response.** FHWA and CDOT examined traffic volumes and patterns and determined that SH 402 as a stand-alone project needs to be improved to address mobility and safety issues specifically associated with the highway. Improvement of parallel roads will not address the needs of SH 402. This need must be addressed regardless of actions taken to improve other facilities in the area.
Issue. Explain why an alternative along this corridor is the only option to meet the purpose and need, and why no other roads can improve through traffic flow.	**Response.** Early consensus was reached among the agencies (October 2001 Status Meeting) that the established purpose and need only justified looking at alternatives on the existing alignment.

Traffic/Highway Design	
Issue. A raised median should be included in the design for safety/capacity reasons. This should not affect the EA in terms of roadway width.	**Response.** A raised median is included in the design for the urban section from US 287 east to CR 13C. Rural section design includes a center turn lane in the median rather than a raised median. These designs are appropriate for current and projected traffic volumes. The rural section could be modified in the future to include a raised median should this be warranted.
Issue. Give consideration to design for joint trench utilities, especially communications providers.	**Response.** All action alternatives include a 25-foot utility corridor on the south side for placement of most utilities. Should an action alternative be selected, CDOT will coordinate closely with responsible parties to ensure appropriate handling of communications services.
Issue. Impacts should be evaluated based on the 225-foot cross section.	**Response.** Originally four action alternatives were developed with a right-of-way width of 225 feet on the south side. This information was presented to the public and, as a result of public feedback and input, CDOT decided to investigate narrowing the right-of-way to further minimize impacts before completing screening. As a result, all four action alternatives were modified to a 160- to 175-foot right-of-way. The Meander Alternative was refined to reduce the number of property acquisitions while minimizing environmental impacts. The narrower alternatives were then evaluated with the same criteria applied to the 225-foot alternatives. For more information, see *Chapter 2.*

Environmental Concerns/Mitigation	
Issue. How are you going to handle runoff from the section between CR 13C and I-25 where there is no vegetation, curb, or gutter?	**Response.** Roadside ditches will be provided as part of the cross section for the rural portion of SH 402.
Issue. Will there be any noise impacts?	**Response.** Noise impacts exceeding 66 dB(A) would occur at eight residential receptors under the No Action Alternative. Three additional residences would be affected by the Meander Alternative. Information specific to noise impacts and mitigation can be found in *Chapter 3*, *Section 3.15, Noise.*
Issue. Are there any environmental justice issues?	**Response.** Based on block level analyses, no environmental justice impacts are expected. Information specific to environmental justice can be found in *Chapter 3, Section 3.3, Environmental Justice.*

Environmental Concerns/Mitigation	
Issue. How is air quality affected?	**Response.** Air quality and the potential impacts of the No Action and Meander Alternatives were analyzed; see *Chapter 3, Section 3.16, Air Quality,* for analysis results. The city of Loveland is outside the Fort Collins attainment/ maintenance area and is not subject to conformity with their maintenance plan for carbon monoxide. Carbon monoxide hot-spot modeling is not required for SH 402. Because SH 402 is not located in a particulate less than 10 micron nonattainment or maintenance area, a detailed analysis of particulate less than 10 micron impacts is not required. Numerous counties along the Front Range, including Larimer County, are in violation of the 8-hour ozone standard. An Early Action Compact (EAC) designed to achieve and maintain the 8-hour ozone standard has been developed for this nonattainment area. Therefore, the Environmental Protection Agency has deferred the effective date of the nonattainment designation as long as the EAC milestones are met. Conformity to the 8-hour ozone standard does not apply to this project.
Issue. Significant sandy gravel resources are present in this area—you may want to include them in your mapping. Mining is governed by state law; the area is zoned commercial-mineral resources.	**Response.** Impacts and mitigation for geology and soils are discussed in *Chapter 3, Section 3.22, Geology.* Gravel mining operations in the area will not be affected by either the No Action Alternative or the Meander Alternative.
Issue. Regarding prime farmland, in addition to the National Resources Conservation Service (NRCS) soil analysis, Larimer County adopted the Land Evaluation and Site Assessment (LESA) study.	**Response.** NRCS used LESA guidelines to assess impacts on SH 402 area farmlands. For further discussion, see *Chapter 3, Section 3.5, Farmland.*
Issue. Do we have a good feel for floodplain and mapping? With regard to the Big Thompson, cumulative effects will be a big issue.	**Response.** The Meander Alternative does have an impact on the Big Thompson floodplain, but because the floodplain is very wide and flat in the affected area, the Meander Alternative will have minimal effect on base flood elevations. See *Chapter 3, Section 3.20, Floodplains* for further information specific to floodplain impacts and mitigation.
Issue. The city of Loveland has an Open Lands Plan that rates natural areas, including wetlands and parks. Also, the Parks Plan has proposed a trail route going through this area.	**Response.** At this time, the city has no plans to develop a trail near the Big Thompson River. Larimer County Open Space officials stated that they requested easements along both sides of the Big Thompson River, but the proposed trail has not been planned at this time.
Issue. Mitigate cumulative impacts and demonstrate how you've done so with the city and county. Issues of specific interest are floodplains, wetlands, prime farmlands, and any threatened and endangered species found.	**Response.** Each resource was evaluated for cumulative impacts; specific information can be found in *Chapter 5, Cumulative Impacts.* The information is also summarized at the end of the chapter for easy reference.
Issue. If the farmhouses go, then what happens to the integrity of the barns? How does this relate to the complex as a whole?	**Response.** SH 402 will have an adverse effect on the historic Weber Farm as a whole (5LR10725) with the acquisition of the farmhouse and a chicken brooder house. No other historic properties will be adversely impacted by this project.

Environmental Concerns/Mitigation	
Issue. The following modifications to the Alternatives Analysis Matrix were suggested: 1) note the mitigation potential for environmental impacts, 2) show acreages for potential threatened and endangered species, 3) give more details for the public workshop, 4) quantify impacts from highest to lowest instead of comparing them, and 5) include the No Action Alternative.	**Response.** 1) Mitigation measures are considered in the environmental analysis phase of the study and can be found in *Chapter 3, Impacts and Mitigation Measures.* 2) The bald eagle is the only threatened or endangered species that may be present. Habitat encroachment is outlined in the Alternatives Analysis Matrix in *Chapter 2, Alternatives.* 3) The Alternatives Analysis Matrix provides an overview of impacts on factors that shape the screening process. Supporting documentation can be found in *Chapter 2, Alternatives.* 4) Quantification, where possible, is provided in the Alternatives Analysis Matrix in *Chapter 2, Alternatives.* 5) The No Action Alternative is included in the Alternatives Analysis Matrix in *Chapter 2, Alternatives.*

Screening	
Issue. Do we have any other criteria for screening for migratory birds and terrestrial wildlife?	**Response.** Screening criteria are described in *Chapter 2, Alternatives,* and provided on the Alternatives Analysis Matrix in Chapter 2. New ground disturbance was a screening consideration.
Issue. Concerned over considering costs during screening.	**Response.** Cost was not a differentiating factor among the alternatives.

Public Involvement	
Issue. Tenants, property owners, and commuters all need to be reached with public involvement.	**Response.** Project information was mailed to property owners and all box holders along Rural Route 402, posted at the carpool lot in the corridor, advertised in local newspapers, and posted on the project website www.sh402ea.com. Refer to *Section 6.1.3* above for a description of how the PIP was conducted throughout the EA process.
Issue. The Johnstown planning consultant should be included in this project as well. Johnstown boundaries come very close to the eastern terminus of the project area.	**Response.** All local and municipal authorities were included in the PIP and have had access to public involvement materials.

Bicycle/Pedestrian Use	
Issue. Bicycle/pedestrian use is important. Will 10-foot shoulders be provided now or in the future?	**Response.** A 10-foot shoulder is included in the conceptual design for all action alternatives and could accommodate both pedestrians and bicyclists for the rural section east of CR 13C (St. Louis Avenue). A sidewalk is included in the urban section west of CR 13C. The No Action Alternative has no provision for either mode of transportation.

6.2.2 Public Involvement Program Results

The following summarizes issues and concerns identified in responses to Factsheets 1 through 7, and the public workshops held on September 19, 2002, and April 15, 2003. Comments from the public were associated with access, safety, carpool lot safety, irrigation, right-of-way, traffic, and environmental issues. Table 6-1 provides a tally of outreach and comments received.

Table 6-1. Summary of Public Outreach and Comments Received

Factsheets (seven were mailed out)	Totals
Factsheets mailed	3,260
Comments received	64
Public workshops (two were held)	
Total in attendance	95
Comments received	27
Project website	
Total site visits	>100
Comments received	0

Access	
Issue. Access issues include Rocky Mountain Tranquility, property entrances, business entrances, Paradise Acres, and Heron Drive.	**Response.** Access is considered in the conceptual design. All accesses to Rocky Mountain Tranquility will be maintained—even during construction—should the Meander Alternative be selected as the Preferred Alternative.
Issue. Lanes are needed for turning (especially left) and acceleration; four if possible.	**Response.** The Meander Alternative includes a center turn lane for vehicles turning left, as well as a 10-foot shoulder and four general-purpose travel lanes.
Issue. Some attendees noted that the roadway cross-section, especially the median and wider shoulder, is a much-needed improvement.	**Response.** Noted.
Issue. There was some dislike for the raised median (from US 287 to CR 13C) from attendees who are directly affected by losing their access and other attendees.	**Response.** Noted.

Public Involvement	
Issue. Many attendees expressed appreciation for the workshop and noted that the format was conducive to participating in the process. Some attendees stated that the public workshop was an excellent means of identifying property owner issues.	**Response.** Noted.

Safety	
Issue. Safety concerns include the need for left turn lanes, a wider shoulder, and improved sight distance at intersections. Presently vehicles pass on the shoulders.	**Response.** These features are a part of the proposed project.

Carpool Lot Safety	
Issue. A turning lane for the "Park-N-Ride" would improve safety.	**Response.** The Meander Alternative will improve traffic flow (that is, decrease congestion) in the area of the carpool lot. A designated right turn only for the carpool lot is not warranted under the improved condition.

Irrigation	
Issue. Concerns about the irrigation ditch include effects on the current ditch, cost to relocate the ditch, and drainage.	**Response.** Potential impacts on irrigation ditches have been examined; should the Meander Alternative be selected, the function of the irrigation ditch will not be affected. Drainage has been examined as part of the environmental analysis and is discussed in *Chapter 3, Impacts and Mitigation Measures.*
Issue. Water rights are an issue for some attendees because they have a water right that allows them to draw out of the existing ditches; what would happen if the water were put into pipes?	**Response.** Water rights will not be compromised regardless of whether portions of a ditch would be piped in the vicinity of SH 402. Ditch access will be clarified during design.

Right-of-Way	
Issue. How much property (feet) would be used by the expansion? How are structures and property values affected? Some residents prefer other alternatives that don't affect their property.	**Response.** The amount of right-of-way width would increase from approximately 60 to 160 to 175 feet. Should the Meander Alternative be selected, CDOT Right-of-Way staff will work directly with each affected property owner to determine appropriate compensation. If the right-of-way comes within 15 feet of a structure, CDOT considers this an acquisition. If a property extends away from the road, CDOT will discuss on an individual basis the option to relocate the structure should the Meander Alternative be selected.
Issue. The majority of support was for the Meander Alternative with a 160- to 175-foot right-of-way. The Meander Alternative was preferred by most of the attendees who commented that this alignment would address most issues within the study area and provide the best balance of environmental impacts.	**Response.** Noted.

Traffic/Highway Design	
Issue. Increased traffic volume and congestion are concerns.	**Response.** These factors were considered in both identifying project purpose and need and in conceptual design of the action alternatives.
Issue. Will the north or south side be widened?	**Response.** Alternatives that widen to both sides, widen only to the south, widen only to the north, or meander (a limited number of slight shifts in the highway) were all considered in the alternative analysis. A discussion can be found in *Chapter 2, Alternatives.* As a result of screening, only the Meander Alternative progressed into the environmental analysis.

Environmental Concerns	
Issue. Issues include: noise, pollution, loss of vegetation, loss of wildlife habitat, and loss of rural character.	**Response.** The Meander Alternative was designed to minimize impacts on the natural and human environments to the greatest extent possible. *Chapter 3* presents a detailed discussion on impacts and mitigation.

Project Funding	
Issue. Many attendees wanted to know when construction would begin.	**Response.** Construction money is not available until after 2008.
Issue. Will there be enough funds to complete the project?	**Response.** This project is a part of the Statewide Transportation Improvement Program (STIP), and CDOT will budget for completion in a timely manner should the Meander Alternative be selected.

This page intentionally left blank.

Chapter 7

References

Chapter 7. References

Adamus, P.R., E.J. Clairain, Jr., R.D. Smith, and R.E. Young. 1987. *Wetland Evaluation Technique (WET).* Volume II: Methodology. Department of the Army, US Army Corps of Engineers and US Department of Transportation, Federal Highway Administration. Washington DC.

American Association of State Highway and Transportation Officials. 2004. *AASHTO Green Book—A Policy on Geometric Design of Highway and Streets.* Fifth edition.

Carey, T. 2004. USCOE, Omaha District. Personal communication with L. Hettinger, JFSA. July 26, 2004.

Chambellan, C., C.C. Muniz, and S.F. Mehls. 2003. *A Cultural Resource Inventory of Portions of the Proposed State Highway 402 Expansion, Larimer County, Colorado*. October 1.

City of Loveland. 1986. *Master Drainage Plan and Storm Drainage Criteria Manual*.

—. 1996. *Natural Areas Report*. Parks and Recreation Department.

—. 2000. *Loveland Land Use Plan*. Loveland Colorado Comprehensive Master Plan. Amended March 6, 2007.

—. 2000. *Loveland 2020 Transportation Plan.* July 18. Online: http://www.ci.loveland.co.us/PublicWorks/TransPlanMain.htm. Accessed: June 3, 2004.

—. 2002. *Zoning District Map.* Adopted February 18, 1997; revised January 2002. Online: http://www.ci.loveland.co.us/Land Records/images/zone2.pdf.

—. 2002. Storm Drainage Criteria (Addendum to the Urban Storm Drainage Criteria Manuals Volumes 1, 2, and 3). September 1.

—. 2004. *Proposed Intergovernmental Agreement for Growth Management.* January 12.

—. 2004. Economic Development website. Online: http://www.ci.loveland.co.us/econdev/econdevhomepage.htm

—. 2005. *Loveland Colorado Comprehensive Master Plan*.

City of Loveland and Larimer County Colorado. 2004. *Intergovernmental Agreement for Growth Management.* Online: http://www.co.larimer.10.us/planning/planning/loveland_igs.pdf. January 12. Accessed May 26.

Colorado Department of Agriculture. 2003. Plant Industry Division. 8 CCR 1203-19. Rules Pertaining to the Administration and Enforcement of the Colorado Noxious Weed Act. C.S.R. 35-5.5 101-119. Online: http://www.ag.state.co.us/DPI/weeds/statutes/weedrules.pdf

Colorado Department of Local Affairs. 2003. *Draft Population Forecasts by Region 2000–2030*. June 18. Online: http://www.dola.state.co.us.

—. 2003. DOLA Demography Section. Summary of US Census 2000 Data in Place-of-Work. March.

Colorado Department of Public Health and Environment. 1998. *Climate Change & Colorado: A Technical Assessment*. September.

—. 2000. *Colorado Gas Emissions Update*. Addendum to 1998 Climate Change & Colorado: A Technical Assessment. November.

Colorado Department of Transportation (CDOT). 1995. *CDOT Noise Analysis and Abatement Guidelines.* February 1.

—. 1999. *Standard Specifications for Road and Bridge Construction.*

—. 1999–2000. *Integrated Noxious Weed Management Plan.*

—. 2002. *Erosion Control and Stormwater Quality Guide.*

—. 2002. *Noise Analysis and Abatement Guidelines.* December 1.

—. 2003. *CDOT Transportation Safety and Traffic Engineering Detailed Accident Summary Report for Highway 402A.* Obtained from CDOT Accident Data Manager, February 14.

—. 2003. North I-25 Front Range Transportation Alternatives Feasibility Study. Online: http://www.dot.state.co.us/nfrtafs/. Accessed May 13, 2003.

—. 2004. North I-25 Front Range Transportation Environmental Impact Statement. Online: http://www.dot.state.co.us/Northi25eis/boards1/PN051904.pdf. Accessed May 27, 2004.

—. 2005. *Standard Specifications for Road and Bridge Construction.*

Colorado Division of Wildlife. 2003. State Wildlife Area maps and information. Online: http://www.wildlife.state.co.us/swa/view.asp.

Colorado Natural Heritage Program. 2001. Sensitive species information received in response to data request for Highway 402 project area. February 28.

—. 2004. *CDOT Noxious Weed Mapping Project*. Final Report July 2000 to June 2004. June 29.

Compass of Larimer County. 2004. Fort Collins Real Estate-Real Estate Insider. Online: http://www.co.larimer.co.us./humanservices/compas/Residential_Sales_CD_ housing.htm. Accessed May 26.

Council on Environmental Quality. 1997. *Environmental Justice, Guidance Under the National Environmental Policy Act.*

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States.* Office of Biological Services, US Department of Interior, Fish and Wildlife Service. Washington, DC.

Design Workshop, Inc., ERO Resources Corp., Stoecker Ecological Consultants, Inc., 1996. *In the Nature of Things*, *Loveland Natural Areas.* Revised October.

Erathem-Vanir Geological PLLC. 2003. *Paleontologic Resources Letter Report.* October 8, 2003. Pocatello, Idaho.

Farmland Protection Policy Act. 1981 (7 CFR 658).

Federal Highway Administration. 1989. *Guidelines for Implementing the Final Rule of the Farmland Protection Policy Act for Highway Projects*. May.

—. 1998. Order 6640.23*. FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. December 2.

—. 2005. *Guidelines for Determining De Minimis Impacts to Section 4(f) Resources*. December 13.

—. 2006. *Interim Guidance on Air Toxic Analysis in NEPA Documents.* February 3.

—. 2006. *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*.

Federal Register. Executive Order 12898. February 11, 1994. *Federal Actions to Address Environmental Justice in Minority Populations.* Federal Register, Vol 59, No 32, Wednesday, February 16, 1994. 7629-7633, Washington, DC.

Federal Uniform Relocation and Real Property Acquisition Act of 1970 (Public Law 91-646), as amended in 1987 (Public Law 100-17), 1991 (Public Law 102-240), and 1997 (Public Law 105-117).

Hankard Environmental. 2004. *Noise Analysis Report, State Highway 402 – US 287 to Interstate 25.* Report 22-06-1.

J.F. Sato and Associates. *Final Traffic Report: State Highway 402 Environmental Assessment from US 287 (MP 0.00) to I-25 (MP 4.00).* July 2004*.*

Kumar and Associates, Inc. 2001. *Modified Environmental Site Assessment (M-ESA) SH 402 between US 287 and Interstate 25. Loveland, Colorado.* November 26*.*

—. 2004. *Modified Environmental Site Assessment (M-ESA) SH 402 between US 287 and Garfield Drive. Loveland, Colorado.* April 24.

Larimer County. 1997. *Master Plan and Partnership Land-Use System*. November.

—. 2001. *Land Evaluation and Site Assessment System.* Handbook prepared by American Farmland Trust. Fort Collins, Colorado.

Migratory Bird Treaty Act of 1918 as amended (16 USC 703) and Bald and Golden Eagle Protection Act of 1940 (16 USC 668-668d).

National Historic Preservation Act. 1966. Section 106 and Revised Advisory Council on Historic Preservation regulations 36 CFR 800.

Natural Diversity Information System (NDIS). 2003. Online: http://ndis.nrel.colostate.edu.

Northern Colorado Economic Development Corporation. 2004. Online: http://www.ci.loveland.co.us/econdev/economicprojectonsp2.htm.

North Front Range Transportation and Air Quality Planning Council. 2004. *2030 Regional Transportation Plan.* October.

Peterson, J. 2003. Biologist with USFWS. Personal communication with D. Barringer, JFSA. April 1.

Reed, P.B. Jr. 1988. Edited copy of *National List of Plant Species That Occur in Wetlands: 1988 for Colorado.* For National Wetlands Inventory, US Fish and Wildlife Service.

Sale, P.J.M., and R.G. Wetzel. 1983. Growth and metabolism of *Typah* species in relation to cutting treatments. Aquatic Botany 15: 321-334.

Scott, G.R., and W.A. Cobban. 1965. Geologic and biostratigraphic map of the Pierre Shale between Jarre Creek and Loveland, Colorado: US Geological Survey Miscellaneous Geological Investigations Map I-439.

—. 1986. Geologic, biostratigraphic, and structure map of the Pierre Shale between Loveland and Roud Butte, Colorado. US Geological Survey Miscellaneous Investigations Map: 1-1700.

Singleton, P.H., W.L. Gaines, and J.F. Lehmkuhl. 2002. *Landscape Permeability for Large Carnivores in Washington: A Geographical Information System Weighted-Distance and Least-Cost Corridor Assessment.* Research Paper PNW-RP-549. Forest Service, Pacific Northwest Research Station. USDA. Stoecker, Robert E. and ERO Resources, Inc. 1993. *Loveland Wildlife and Wetland Database, User's Manual.*

US Army Corps of Engineers. 1987. *Corps of Engineers Wetlands Delineation Manual.* Technical Report Y-87-1. Environmental Laboratory, Waterways Experiment Station, Vicksburg, Mississippi.

US Census Bureau. 2000. US Census.

US Department of Health and Human Services. 1999. *Federal Poverty Guidelines Definition of Low Income.*

US Department of Homeland Security. Federal Emergency Management Agency (FEMA). 1999. *Flood Insurance Study.*

US Department of Transportation. 1997. *Order 5610.2 to Address Environmental Justice in Minority and Low-Income Populations*. April 15.

US Department of Transportation and Federal Highway Administration. 1987. *Section 4(f) Policy Paper*. October 5.

US Environmental Protection Agency. 2000. *Technical Support Document: Control of Emissions of Hazardous Air Pollutants from Motor Vehicles and Motor Vehicle Fuels*. Document No. EPA420-R-00-023. December.

—. 2006. *$PM_{2.5}$ and PM_{10} Hot-Spot Analysis in Project-level Transportation Conformity Determinations for the New $PM_{2.5}$ and Existing PM_{10} NAAQS. Final Rule Summary*. March 10.

US Fish and Wildlife Service. 2004. Federal Register. Vol 69, No 159, Wednesday, August 18.

Weber, W.A., and R.C. Wittmann. 2001. *Colorado Flora: Eastern Slope.* University of Colorado Press. Boulder, Colorado.

Weed Free Forage Act. CRS Title 35, Article 27.5.

Wilson and Company. 2001. Aerial photography.

Yeh and Associates. 2004. Geology, Soils and Mineral Resources Report for SH 402 EA. Prepared by Richard Andrew. July 27.

This page intentionally left blank.

Appendix A

Environmental Coordination

Appendix A. Environmental Coordination

The following project agency correspondence is included:

Agency	Date
FEMA	January 15, 2003
USFWS Ecological Services to JF Sato and Associates, initial coordination	November 18, 2003
USFWS Preble's meadow jumping mouse concurrence letter to JF Sato and Associates	July 29, 2004
USFWS Ute ladies'-tresses orchid concurrence letter to JF Sato and Associates	October 13, 2004
USDOT, FHWA to tribes	April 7, 2004
USDOT, FHWA Section 106 Tribal Consultation Interest Response Forms from:	
Cheyenne and Arapaho Tribes of Oklahoma	April 26, 2004
Pawnee Nation of Oklahoma	April 26, 2004
Rosebud Sioux Tribe	May 3, 2004
Kiowa Tribe of Oklahoma	May 12, 2004
Southern Ute Indian Tribe	May 6, 2004
Northern Arapaho	June 3, 2004
Larimer County Engineering Department to CDOT	May 21, 2004
City of Loveland Public Works to CDOT	May 21, 2004
JF Sato and Associates to USCOE	May 24, 2004
USDA, NRCS AD 1006	June 16, 2004
FHWA, CDOT, SHPO Section 106 Consultation	
CDOT initial Section 106 letter to SHPO	September 27, 2004
SHPO response to CDOT initial letter	September 30, 2004
City of Loveland letter to CDOT on Section 106	October 6, 2004
CDOT response to City of Loveland	December 9, 2004
CDOT response to SHPO letter of September 30, 2004	May 23, 2005
CDOT letter to City of Loveland with added data	May 24, 2005
CDOT letter to SHPO with additional information	June 24, 2005
SHPO response to CDOT letters of May 23, 2005 and June 24, 2005	June 29, 2005

Agency	Date
CDOT letter to City of Loveland with added data	July 27, 2005
CDOT letter to SHPO with added data	July 27, 2005
SHPO response to CDOT letter of July 27 and July 29, 2005	August 9, 2005
CDOT letter to City of Loveland with added data	March 10, 2006
CDOT letter to SHPO with added data	March 10, 2006
SHPO response to CDOT letter of March 10, 2006	March 30, 2006
CDOT letter to SHPO with added data	May 1, 2006
SHPO response to CDOT letter of May 1, 2006	May 26, 2006
CDOT letter to SHPO with added data	July 17, 2006
SHPO response to CDOT letter of July 17, 2006	July 24, 2006
CDOT letter to City of Loveland with request for comment	August 15, 2006
CDOT letter to SHPO requesting concurrence	August 15, 2006
SHPO letter to CDOT including concurrence	August 22, 2006
SHPO letter to CDOT including concurrence	September 13, 2006
CDOT letter to ACHP on Adverse Effect	October 19, 2006
Memorandum of Agreement between FHWA and the Colorado SHPO regarding the Weber Farm (5LR10725)	February 9, 2007
SHPO letter to CDOT on Level II Documentation	May 7, 2007
Transmittal from CDOT Historian of SHPO Clearance	May 14, 2007
CDOT letter to FHWA and signed concurrence from FHWA on Section 4(f) *de minimis* impacts	September 29, 2006 and November 15, 2006

NATIONAL FLOOD INSURANCE PROGRAM
FEMA MAP COORDINATION CONTRACTOR

January 15, 2003

IN REPLY REFER TO:
Case No.: B0308016
Community: Larimer County, CO
Identifier: Big Thompson River

Ms. Brenda Kurschner
J.F. Sato & Associates
5898 South Rapp St.
Littleton, CO 80120

Dear Ms. Kurschner:

This letter is in response to your January 14, 2003, letter requesting a Hydraulic and Hydrology model for Big Thompson River shown on Panel 245B dated 04/02/79 in Larimer County, CO. I am writing to inform you that we could not locate the information that you requested.

If you have any questions regarding your request or this letter, or if we may be of further assistance, please contact me by telephone at (703) 317-6531, by fax at (703) 329-3023, or by electronic mail at *kporterfield@mbakercorp.com*.

Sincerely,

Kerri Porterfield

Kerri E. Porterfield
FEMA Project Library

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

IN REPLY REFER TO:
ES/CO:T&E
Mail Stop 65412

NOV 18 2003

Debra Barringer
J. F. Sato and Associates
5898 South Rapp Street
Littleton, Colorado 80122

Dear Ms. Barringer,

The U.S. Fish and Wildlife Service (Service) received your request September 24, 2003, regarding the proposed highway reconstruction project on State Highway 402 in Larimer County, Colorado. In that letter, you requested an updated list of Federal endangered and threatened species that may exist in the project area. Your previous list is from 2001. These comments have been prepared under the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et. seq.).

Following is a list of Federal endangered, threatened, proposed and candidate species for Larimer County, which may be used as a basis for determining additional listed species potentially present in the project area. While other species could occur at or visit the project area, endangered or threatened species most likely to occur include:

Birds:	Bald Eagle (*Haliaeetus leucocephalus*), Threatened
Mammals:	Preble's meadow jumping mouse (*Zapus hudsonius preblei*), Threatened
Plants:	Ute ladies'-tresses orchid (*Spiranthes diluvialis*), Threatened Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*), Threatened

The Service also is interested in the protection of species which are candidates for official listing as threatened or endangered (Federal Register, Vol. 61, No. 40, February 28, 1996). While these species presently have no legal protection under the Act, it is within the spirit of this Act to consider project impacts to potentially sensitive candidate species. It is the intention of the Service to protect these species before human-related activities adversely impact their habitat to a degree that they would need to be listed and, therefore, protected under the Act. Additionally, we wish to make you aware of the presence of Federal candidates should any be proposed or listed prior to the time that all Federal actions related to the project are completed. If any candidate species will be unavoidably impacted, appropriate mitigation should be proposed and discussed with this office.

While the Service has no specific knowledge of the presence of these species within the project area, the following may occur in or visit the project area.

Mammals: Black-tailed prairie dog (*Cynomys ludovicianus*)

Additionally, any water depletions to the South Platte River system that relate to this project may need to be consulted on with the Service as stipulated in section 7 of the Act. It has been determined by the Service that any depletions to this river system will have detrimental effects on eight threatened or endangered species found in Nebraska. Those species are: whooping crane, piping plover, interior least tern, Western prairie fringed orchid, American burying beetle, bald eagle, Eskimo curlew, and the pallid sturgeon.

If the Service can be of further assistance, please contact Alison Deans Michael of this office at (303) 275-2370.

Sincerely,

Susan C. Linner
Colorado Field Supervisor

pc: CDOT (T. Boyce)
Michael

Ref:Alison\CDOT2003\Reg4

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

IN REPLY REFER TO:
ES/CO: T&E/PMJM/Other
MS 65412 Lkwd

received
7/30/04

JUL 29 2004

Debra Barringer
J.F. Sato & Associates
5898 South Rapp Street
Littleton, Colorado 80120

Dear Ms. Barringer:

We are responding to your letter of July 12, 2004, facsimile of July 28, 2004, and email of July 28, 2004, requesting clearance under the authority conferred to the U.S. Fish and Wildlife Service (Service) by the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*). The Service has reviewed the Preble's meadow jumping mouse, *Zapus hudsonius preblei* (Preble's), 2001 habitat assessment report, with updated site photographs, for the proposed **road improvement project for State Highway 402 between US 287 and the I-25 interchange** in Larimer County, Colorado.

Based on the information provided, and given your compliance with the Preble's survey guidelines, the Service finds the report acceptable and agrees that a population of Preble's is not likely to be present within the subject area along the Big Thompson River. Thus, the Service concludes that the proposed project on this site should not have direct adverse affects to Preble's. Since Preble's populations exist downstream from the site, actions on the site that result in significant modifications of Preble's habitat downstream (for example, through alteration of existing flow regimes, or sedimentation) may be subject to provisions of the ESA.

Please note that this clearance is valid for one year from the date of this letter. Should project plans change or additional information on listed or proposed species becomes available, this determination may be reconsidered under the ESA. If the proposed project has not commenced within one year, please contact the Colorado Field Office to request an extension.

If we can be of further assistance, please contact Barbara Spagnuolo of my staff at (303) 275-2370.

Sincerely,

Susan C. Linner
Colorado Field Supervisor

cc: FWS/CFO: Alison Michael
FWS/CFO: B. Spagnuolo

Reference: BJS\Larimer\SH402.wpd

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

IN REPLY REFER TO:
ES/CO: T&E/*Spiranthes*/Larimer County
Mail Stop 65412

OCT 13 2004

Jeff Peterson
Colorado Department of Transportation
4201 E. Arkansas, Empire Park B-400
Denver, Colorado 80222

Dear Mr. Peterson,

Based on the authority conferred to the U.S. Fish and Wildlife Service (Service) by the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*), the Service reviewed the Ute ladies'-tresses orchid, *Spiranthes diluvialis* (orchid) survey report dated July 15, 2004, and received September 13, 2004, prepared by J.F. Sato and Associates. This report regards the **State Highway (SH402) Improvement Project** in Larimer County, Colorado. The proposed project includes widening the roadway and will result in impacts to wetland and riparian habitats.

Given your surveys of the area, as well as subsequent telephone conversations with the surveyor, the Service finds the report acceptable and agrees that the orchid is not present within the surveyed area. Thus, the Service concurs with the determination that the impacts resulting from the proposed project are not likely to adversely affect the continued existence of the orchid.

We appreciate your submitting this report to our office for review and comment. If the Service can be of further assistance, please contact Alison Deans Michael of my staff at (303) 275-2370.

Sincerely,

Susan C. Linner

Susan C. Linner
Colorado Field Supervisor

U.S. Department
Of Transportation
Federal Highway
Administration

Colorado Federal Aid Division
555 Zang Street, Room 250
Lakewood, CO 80228-1040

April 7, 2004

Ms. Maxine Natchees, Chairwoman
Uintah and Ouray Tribal Business Committee
P.O. Box 190
Ft. Duchesne, UT 84026

Dear Ms. Natchees:

Subject: Request for Section 106 Consultation;
State Highway 402, US 287 to I-25
Environmental Assessment, Larimer County, Colorado

The Federal Highway Administration (FHWA) and Colorado Department of Transportation (CDOT) are preparing an Environmental Assessment (EA) that will address the effects of proposed improvements to a four-mile segment of State Highway 402 in Larimer County, Colorado. The project seeks to improve mobility and safety along this narrow two-lane corridor, while simultaneously alleviating congestion. Pursuant to the National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality (CEQ) implementing regulations (40 CFR 1500-1508), FHWA and CDOT are documenting the potential social, economic and environmental consequences of this action. Please refer to the enclosed map and aerial photograph for specific locational information.

The FHWA will serve as the lead agency for this undertaking, and CDOT staff will facilitate the tribal consultation process. The agencies are seeking the participation of regional Native American tribal governments in cultural resources consultation, as described in Section 106 of the National Historic Preservation Act and implementing regulations 36 CFR 800 et seq. As a consulting party, you are offered the opportunity to identify concerns about cultural resources and comment on how the project might affect them. Further, if it is found that the project will impact cultural resources that are eligible for inclusion on the National Register of Historic Places and are of religious or cultural significance to your tribe, your role in the consultation process would also include participation in resolving how best to avoid, minimize, or mitigate those impacts. It is our hope that by describing the proposed undertaking we can be more effective in protecting areas important to American Indian people. If you have interest in this project and in cultural resources that may be of religious or cultural significance to your tribe, we invite you to be a consulting party.

BUCKLE UP AMERICA

The project corridor along State Highway 402 is largely rural, although residential developments, ranch properties and commercial businesses are also present in limited numbers (please refer to the aerial photograph). A comprehensive survey and assessment of historic properties in the project's area of potential effect will be conducted. Any information you may have regarding the location of cultural resources in this area would assist us in this effort.

We are committed to ensuring that tribal governments are informed of, and involved in, decisions that may impact places with cultural significance. If you are interested in becoming a consulting party for the State Highway 402 Environmental Assessment, please complete and return the enclosed Consultation Interest Response Form to CDOT Native American consultation liaison Dan Jepson **within 60 days** at the address or facsimile number listed at the bottom of that sheet. Mr. Jepson can also be reached via Email at Daniel.Jepson@dot.state.co.us or by telephone at (303) 757-9631. The 60-day period has been established to encourage your participation at this stage in project development. Failure to respond within this time frame will not prevent your tribe from becoming a consulting party at a later date. However, studies and decision-making will proceed and it may become difficult to reconsider previous determinations or findings, unless significant new information is introduced.

Thank you for considering this request for consultation.

Sincerely yours,

Michael E. Vandehoef

for William C. Jones
Division Administrator

Enclosures
cc: Ms. Betsy Chapoose, Director
Cultural Rights & Protection Office
J. Wallace, FHWA
B. Ploegstra, CDOT Region 4
D. Jepson, CDOT Env. Prog.

3

FEDERAL HIGHWAY ADMINISTRATION/COLORADO DEPARTMENT OF TRANSPORTATION
SECTION 106 TRIBAL CONSULTATION INTEREST RESPONSE FORM

PROJECT: State Highway 402 Environmental Assessment

The Cheyenne + Arapaho Tribes of Okla. Tribe [is / is not] (**circle one**) interested in becoming a consulting party for the Colorado Department of Transportation project referenced above, for the purpose of complying with Section 106 of the National Historic Preservation Act and its implementing regulations (36 CFR 800). If your tribe will be a consulting party, please answer the questions below.

Signed: William L Pedro NAGPRA
Name and Title
NHPA + Sand Creek Rep. for the Southern Arapaho

CONSULTING PARTY STATUS [36 CFR §800.2(c)(3)]
Do you know of any specific sites or places to which your tribe attaches religious and cultural significance that may be affected by this project?

Yes No If yes, please explain the general nature of these places and how or why they are significant (use additional pages if necessary). Locational information is not required.

SCOPE OF IDENTIFICATION EFFORTS [36 CFR §800.4(a)(4)]
Do you have information you can provide us that will assist us in identifying sites or places that may be of religious or cultural significance to your tribe?

Yes No If yes, please explain.

CONFIDENTIALITY OF INFORMATION [36 CFR §800.11(c)]
Is there any information you have provided here, or may provide in the future, that you wish to remain confidential?

(Yes) No If yes, please explain.

We concern about uncovering of Human Remains + All artifacts that might be uncovered during construction

Please complete and return this form within 60 days via US Mail or fax to:

Dan Jepson, Section 106 Native American Liaison
Colorado Department of Transportation
Environmental Programs Branch
4201 E. Arkansas Ave.
Denver, CO 80222
FAX: (303)757-9445

FEDERAL HIGHWAY ADMINISTRATION/COLORADO DEPARTMENT OF TRANSPORTATION
SECTION 106 TRIBAL CONSULTATION INTEREST RESPONSE FORM

PROJECT: State Highway 402 Environmental Assessment

The Pawnee Nation of Oklahoma Tribe [is / is not] (**circle one**) interested in becoming a consulting party for the Colorado Department of Transportation project referenced above, for the purpose of complying with Section 106 of the National Historic Preservation Act and its implementing regulations (36 CFR 800). If your tribe will be a consulting party, please answer the questions below.

Signed: Alice Alexander, THPO
Name and Title

CONSULTING PARTY STATUS [36 CFR §800.2(c)(3)]
Do you know of any specific sites or places to which your tribe attaches religious and cultural significance that may be affected by this project?

Yes No If yes, please explain the general nature of these places and how or why they are significant (use additional pages if necessary). Locational information is not required.

Plains Woodland Sites nearby

SCOPE OF IDENTIFICATION EFFORTS [36 CFR §800.4(a)(4)]
Do you have information you can provide us that will assist us in identifying sites or places that may be of religious or cultural significance to your tribe?

Yes No If yes, please explain.

THE PAWNEE TRAVELED & CAMPED THROUGH THIS AREA - C.P.T..

CONFIDENTIALITY OF INFORMATION [36 CFR §800.11(c)]
Is there any information you have provided here, or may provide in the future, that you wish to remain confidential?

Yes No If yes, please explain.

Please complete and return this form within 60 days via US Mail or fax to:

Dan Jepson, Section 106 Native American Liaison
Colorado Department of Transportation
Environmental Programs Branch
4201 E. Arkansas Ave.
Denver, CO 80222
FAX: (303)757-9445

FEDERAL HIGHWAY ADMINISTRATION/COLORADO DEPARTMENT OF TRANSPORTATION
SECTION 106 TRIBAL CONSULTATION INTEREST RESPONSE FORM

PROJECT: State Highway 402 Environmental Assessment
The Rosebud Sioux Tribe Tribe [is / is not] (**circle one**) interested in becoming a consulting party for the Colorado Department of Transportation project referenced above, for the purpose of complying with Section 106 of the National Historic Preservation Act and its implementing regulations (36 CFR 800). If your tribe will be a consulting party, please answer the questions below.

Signed: Janet Thompson, Admin. Asst.
Name and Title

CONSULTING PARTY STATUS [36 CFR §800.2(c)(3)]
Do you know of any specific sites or places to which your tribe attaches religious and cultural significance that may be affected by this project?

Yes No If yes, please explain the general nature of these places and how or why they are significant (use additional pages if necessary). Locational information is not required.

SCOPE OF IDENTIFICATION EFFORTS [36 CFR §800.4(a)(4)]
Do you have information you can provide us that will assist us in identifying sites or places that may be of religious or cultural significance to your tribe?

Yes No If yes, please explain.

CONFIDENTIALITY OF INFORMATION [36 CFR §800.11(c)]
Is there any information you have provided here, or may provide in the future, that you wish to remain confidential?

Yes No If yes, please explain.

Please complete and return this form within 60 days via US Mail or fax to:

Dan Jepson, Section 106 Native American Liaison
Colorado Department of Transportation
Environmental Programs Branch
4201 E. Arkansas Ave.
Denver, CO 80222
FAX: (303)757-9445

Jepson, Daniel

From: George Daingkau [pastor04@sbcglobal.net] KIOWA TRIBE OF OKLAHOMA
Sent: Wednesday, May 12, 2004 9:23 PM
To: Jepson, Daniel
Subject: Impact studies

These tracts of eis, or ea is what I am consulting you about today.

State Hwy 402, US 287 to I 25; Larimer County, Colo.
I-25 Front Range EIS Adams,Boulder,Broomfield, Denver, Larimar and Weld Counties
Powers Boulevard EA, El Paso County. Colo.

Powers Boulevard under taking is an existing road? Construction on widening it out?
What unsurveyed areas are you taking about? What eis do you have now? What ROW does CDOT have to do improvements?
In talking with the Elders on this road, there would have been many sites but since the construction of past roads and hwy's many of the sites were destroyed and now they want to consult us? I think what they met was that if new reality would be disturbed out side of the ROW then there would need to be an on site visit made.

Front Range; The I-25 that is existing now does not provide enough road way? These substandard roads your talking about, does it mean pull-offs, road parks, rest area, loops, off and on ramps, and (4) four more lanes?
Kiowa is known to be in this area up and down the East range of Colorado, so there must be some sites along this corridor. In this study area are you or CDOT asking for Tribal monitors to help with this undertaking? The only answer I can give now is we want to be a consulting party.

State Hwy 402 US 287 to I-25; Yes we will become a consulting party when this project is underway.

Well Dan, hope this helps. About the signing of the PEIS is still in limbo because now I am told there are some discrepancies on our newly appointed vice-chairman, or if he can sign at all. Be safe, Rev. Daingkau

Granted

FEDERAL HIGHWAY ADMINISTRATION/COLORADO DEPARTMENT OF TRANSPORTATION
SECTION 106 TRIBAL CONSULTATION INTEREST RESPONSE FORM

PROJECT: State Highway 402 Environmental Assessment

The SOUTHERN UTE INDIAN TRIBE Tribe [is / is not] (**circle one**) interested in becoming a consulting party for the Colorado Department of Transportation project referenced above, for the purpose of complying with Section 106 of the National Historic Preservation Act and its implementing regulations (36 CFR 800). If your tribe will be a consulting party, please answer the questions below.

Signed: Neil B. Cloud - NAGPRA COOR.
Name and Title

CONSULTING PARTY STATUS [36 CFR §800.2(c)(3)]
Do you know of any specific sites or places to which your tribe attaches religious and cultural significance that may be affected by this project?

Yes (No) If yes, please explain the general nature of these places and how or why they are significant (use additional pages if necessary). Locational information is not required.

SCOPE OF IDENTIFICATION EFFORTS [36 CFR §800.4(a)(4)]
Do you have information you can provide us that will assist us in identifying sites or places that may be of religious or cultural significance to your tribe?

(Yes) No If yes, please explain.

CONFIDENTIALITY OF INFORMATION [36 CFR §800.11(c)]
Is there any information you have provided here, or may provide in the future, that you wish to remain confidential?

Yes (No) If yes, please explain.

Please complete and return this form within 60 days via US Mail or fax to:

Dan Jepson, Section 106 Native American Liaison
Colorado Department of Transportation
Environmental Programs Branch
4201 E. Arkansas Ave.
Denver, CO 80222
FAX: (303)757-9445

FEDERAL HIGHWAY ADMINISTRATION/COLORADO DEPARTMENT OF TRANSPORTATION
SECTION 106 TRIBAL CONSULTATION INTEREST RESPONSE FORM

PROJECT: State Highway 402 Environmental Assessment

The NORTHERN ARAPAHO Tribe [is / is not] (**circle one**) interested in becoming a consulting party for the Colorado Department of Transportation project referenced above, for the purpose of complying with Section 106 of the National Historic Preservation Act and its implementing regulations (36 CFR 800). If your tribe will be a consulting party, please answer the questions below.

Signed: William J. C'Hair - Cultural Commission
NB Name and Title

CONSULTING PARTY STATUS [36 CFR §800.2(c)(3)]
Do you know of any specific sites or places to which your tribe attaches religious and cultural significance that may be affected by this project?

Yes No If yes, please explain the general nature of these places and how or why they are significant (use additional pages if necessary). Locational information is not required.

will explain if need arises

SCOPE OF IDENTIFICATION EFFORTS [36 CFR §800.4(a)(4)]
Do you have information you can provide us that will assist us in identifying sites or places that may be of religious or cultural significance to your tribe?

Yes No If yes, please explain.

Same as above

CONFIDENTIALITY OF INFORMATION [36 CFR §800.11(c)]
Is there any information you have provided here, or may provide in the future, that you wish to remain confidential?

Yes No If yes, please explain.

Please complete and return this form within 60 days via US Mail or fax to:

Dan Jepson, Section 106 Native American Liaison
Colorado Department of Transportation
Environmental Programs Branch
4201 E. Arkansas Ave.
Denver, CO 80222
FAX: (303)757-9445

LARIMER COUNTY
COMMITTED TO EXCELLENCE

ENGINEERING DEPARTMENT

Post Office Box 1190
Fort Collins, Colorado 80522-1190

(970) 498-5700
FAX (970) 498-7986

May 21, 2004

Rex Cantrell
Department of Transportation
Region 4 – Loveland Residency
2207 East Highway 402
Loveland, CO 80537

Re: SH 402 Environmental Assessment; SH 402 and CR 9E Intersection Design Memo

Rex,

We are in receipt of the SH 402 and CR 9E Intersection Design Memo, dated May 12, 2004. It is our understanding that you are requesting that we provide a letter that either supports or does not support the proposed conceptual alignment that is shown on the aerial photograph that is attached to the memo.

After reviewing the alignment, we agree that this would be a positive improvement to the intersection. Based on the last proposed cross section of SH 402 that we saw, we are assuming that a deceleration lane and left turn lane will be part of the striping plan for east bound SH 402 to north bound CR 9E traffic.

CR 9E is functionally classified as a minor collector and the improvements that you are proposing will not impact the classification or conflict with our current Transportation Master Plan.

We would appreciate it if you would keep us informed as the design progresses so that we can have the opportunity to review the plans. Please route all correspondence to me. Thank you for keeping us informed on the proposed change.

If you have any questions please give me a call at 498-5730.

Sincerely,

Rusty McDaniel, P.E.
Assistant County Engineer

f:\misc\cdot sh 402 .doc

CITY OF LOVELAND
PUBLIC WORKS
PROJECT ENGINEERING
410 East Fifth Street • Loveland, Colorado 80537
(970) 962-2627 • FAX (970) 962-2903 • TDD (970) 962-2620
www.ci.loveland.co.us

May 21, 2004

Mr. Rex Cantrell, P.E.
Colorado Department of Transportation
Region 4 – Loveland Residency
2207 East Highway 402
Loveland, Colorado 80537

Re: SH 402 and CR 9E Intersection

Dear Rex:

The City of Loveland has reviewed the SH 402 and CR 9E Realignment Alternative dated 5/12/2004. Based on that review, we offer the following:

- The proposed alternative is consistent with the information that the City has been provided and the process to date relative to the SH 402 Environmental Assessment project currently underway;
- The proposed alternative does not conflict with the City's 2020 Transportation Plan;
- The City proposed alternative meets or exceeds City standards for the classification of CR 9E (2 lane arterial); and
- The proposed alternative would greatly improve the safety of the intersection by removing the acute angle that CR 9E currently intersects with SH 402

As a result of the above referenced information, the City of Loveland, by this letter, accepts the design and looks forward to working with CDOT as the proposed improvements move forward.

If you have any questions or comments, or need additional information, please do not hesitate to contact me at (970) 962-2514. Thank you.

Sincerely,

David W. Klockeman

David W, Klockeman, PE
Engineering Manager

Cc: Dave DeBaere, Field Engineering Supervisor, City of Loveland

Printed on
Recycled Paper

J.F. SATO AND ASSOCIATES
Consulting Engineers
Project Managers & Planners
5898 So. Rapp St. • Littleton, CO 80120 • (303) 797-1200 • FAX (303) 797-1187

May 24, 2004

Project File: 0173

Mr. Terry McKee
US Army Corps of Engineers
Denver Regulatory Office
9307 South Wadsworth Boulevard
Littleton, CO 80128-6901

Subject: Revisions to SH 402 Wetland Delineations

Dear Terry:

Based on the field inspections conducted on May 19, 2004, revisions to wetland delineations are as follows:

- Wetland number 1 has been removed from the delineations, based on the amount of upland vegetation and the lack of soil wetland characteristics indicating that hydrology is insufficient to support wetlands.
- The boundary of wetland number 3 (adjacent to wetland No. 2) is narrowed based on vegetation and soils parameters (map attached).
- The boundary of wetland number 4 is extended slightly on the west side near the road to encompass an area that was inundated by surface water (map attached).
- Irrigation Ditch A was added to the mapping, and a data sheet on wetland characteristics was completed (map and data sheet attached)
- The wetland 5A boundary was offset on the map from where the wetlands occur along the river, and this was adjusted on the maps (map attached).

Please contact me if you have any questions on these revisions.

Your field review of the delineations is appreciated.

Sincerely,

Loren Hettinger

Loren Hettinger, PhD
Wetland Scientist

cc: Jim Eussen/Carol Parr - CDOT, Region 4
Amy Baerenklau - J.F. Sato & Associates
Michelle Li - J.F. Sato & Associates

Irrigation Ditch "A" unnamed - drains toward Big Thompson R.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: STATE Highway 402 Applicant/Owner: CDOT - Region 4 Investigator: Hoffmeier	Date: 5-19-04 County: Larimer State: CO
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation)? (Yes) No Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.) Irrigation Ditch	Community ID: ____ Transect ID: ____ Plot ID: ____

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Carex emoryi	H	FACW	9.		
2. Phalaris arundinacea (Reed Canary)	H	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-).

Remarks: Wetland ~ 3' at edge of flow channel on both banks

HYDROLOGY

___ Recorded Data (Describe In Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1-2" (in.)

Depth to Free Water in Pit: ____ (in.)

Depth to Saturated Soil: ____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- X Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Flowing ditch

Irrigation Ditch A

SOILS

Map Unit Name (Series and Phase): Carrizo Clay Loam

Drainage Class: Poor

Field Observations Confirm Mapped Type? Yes No

Taxonomy (Subgroup):

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

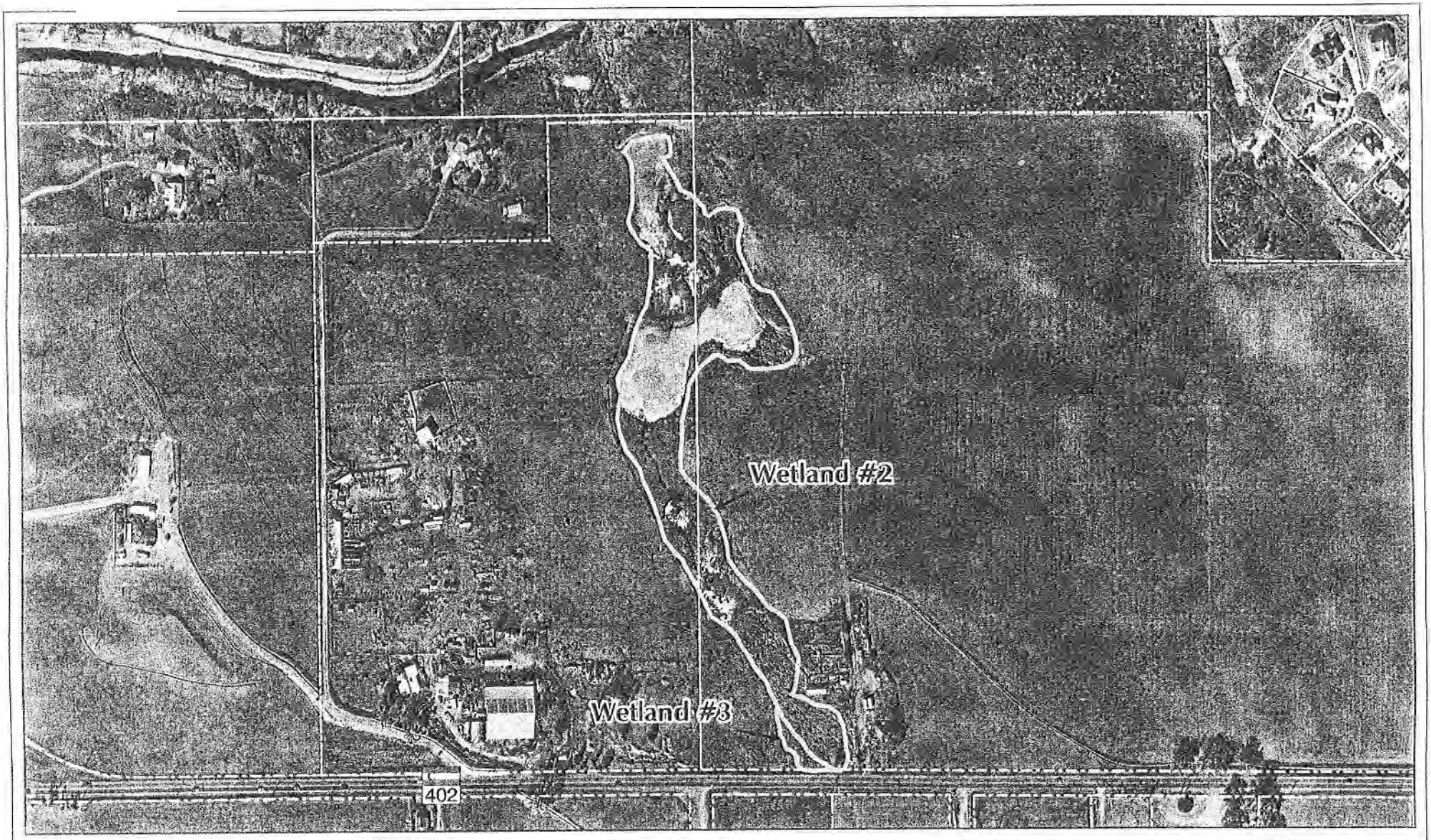
Remarks: Note - Saturated soil in conjunction with flow in ditch - ~3" width from water onto bank.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)	
Wetland Hydrology Present?	Yes No	
Hydric Soils Present?	Yes No	
Is this Sampling Point Within a Wetland?	Yes No (Circle)	

Remarks: Irrigation ditch.

Approved by HQUSACE 2/92



LEGEND

Wetland Boundary

N
W E
S

SCALE - 1:4,200 or 1" = 350'

0 100 200 Meters

0 250 500 Feet

SOURCE: 2000 aerial photography provided by Airphoto USA / KRPS. Land use and parcel information provided by the City of Loveland. Wetland information obtained through field observation and aerial photo interpretation by JFSA. Map produced August 1, 2003 by JFSA.

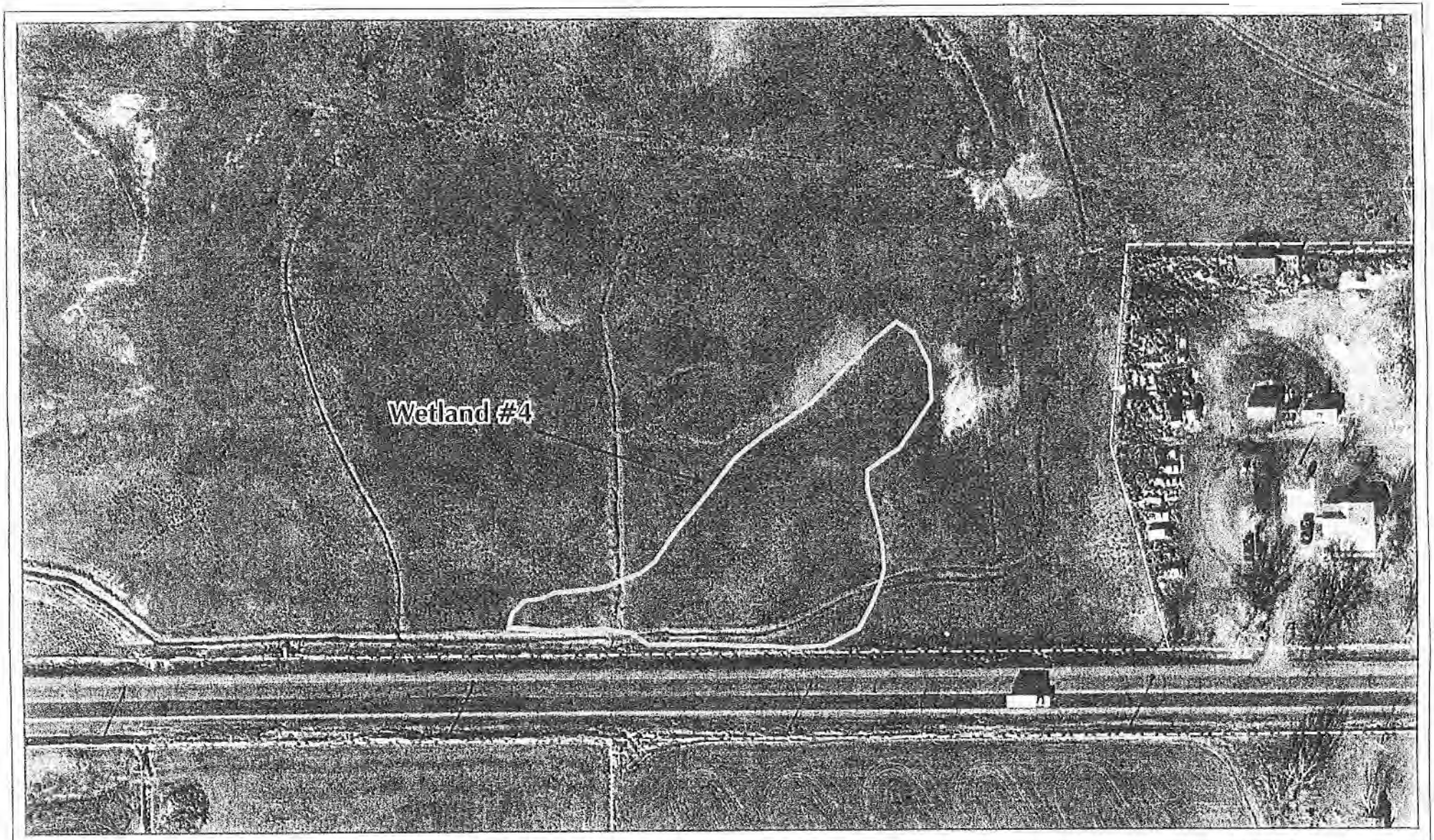
JFSA

DOT

SH 402

State Highway 402

Wetlands 2 and 3



LEGEND

Wetland Boundary

N
W E
S

SCALE - 1:1,200 or 1" = 100'

0 25 50 Meters

0 75 150 Feet

SOURCE: 2000 aerial photography provided by Airphoto USA / KRPS. Land use and parcel information provided by the City of Loveland. Wetland information obtained through field observation and aerial photo interpretation by JFSA. Map produced August 1, 2003 by JFSA.

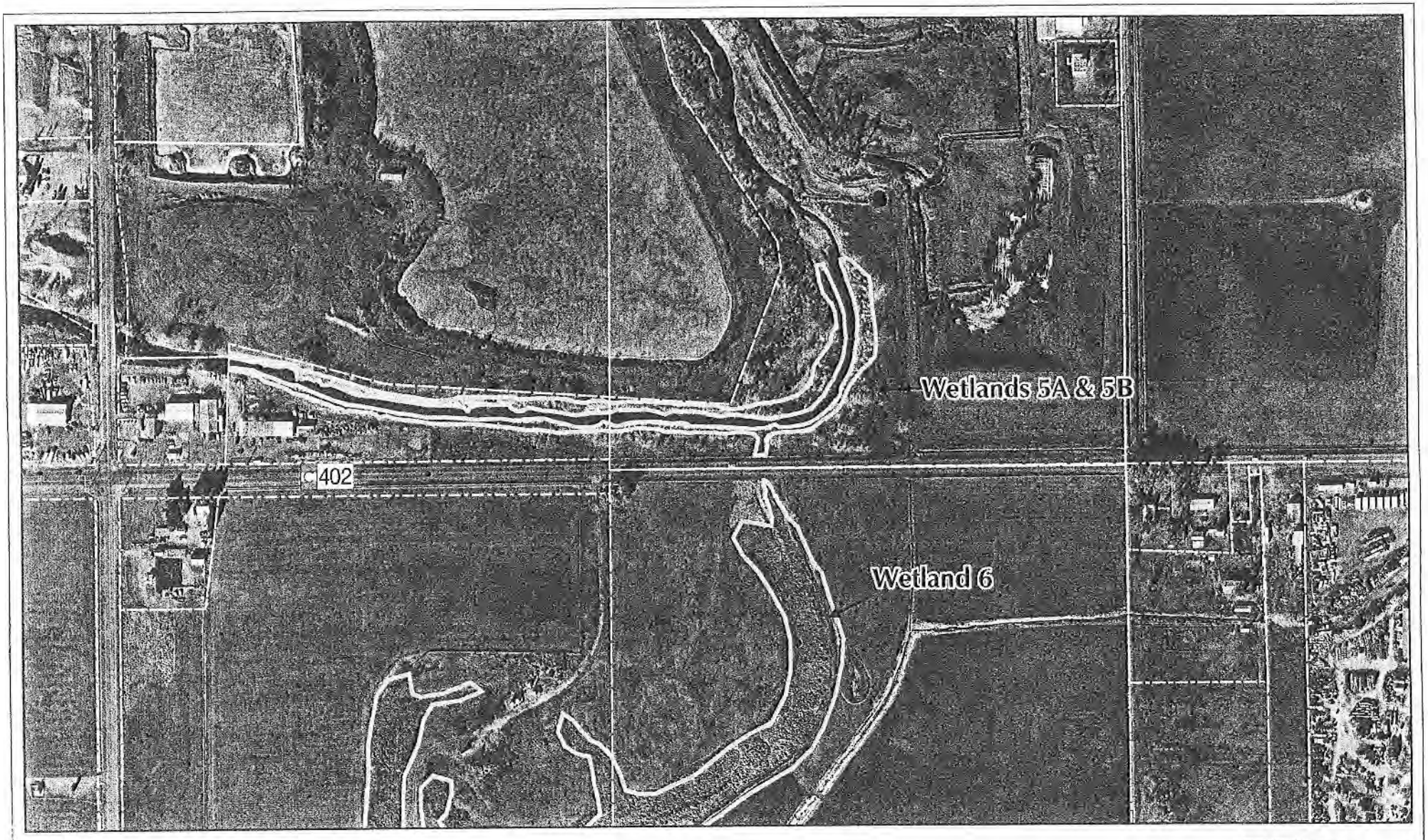
JFSA

DOT

SH 402

State Highway 402

Wetland #4



LEGEND

Wetland Boundary

N
W E
S

SCALE - 1:4,200 or 1" = 350'

0 100 200 Meters

0 250 500 Feet

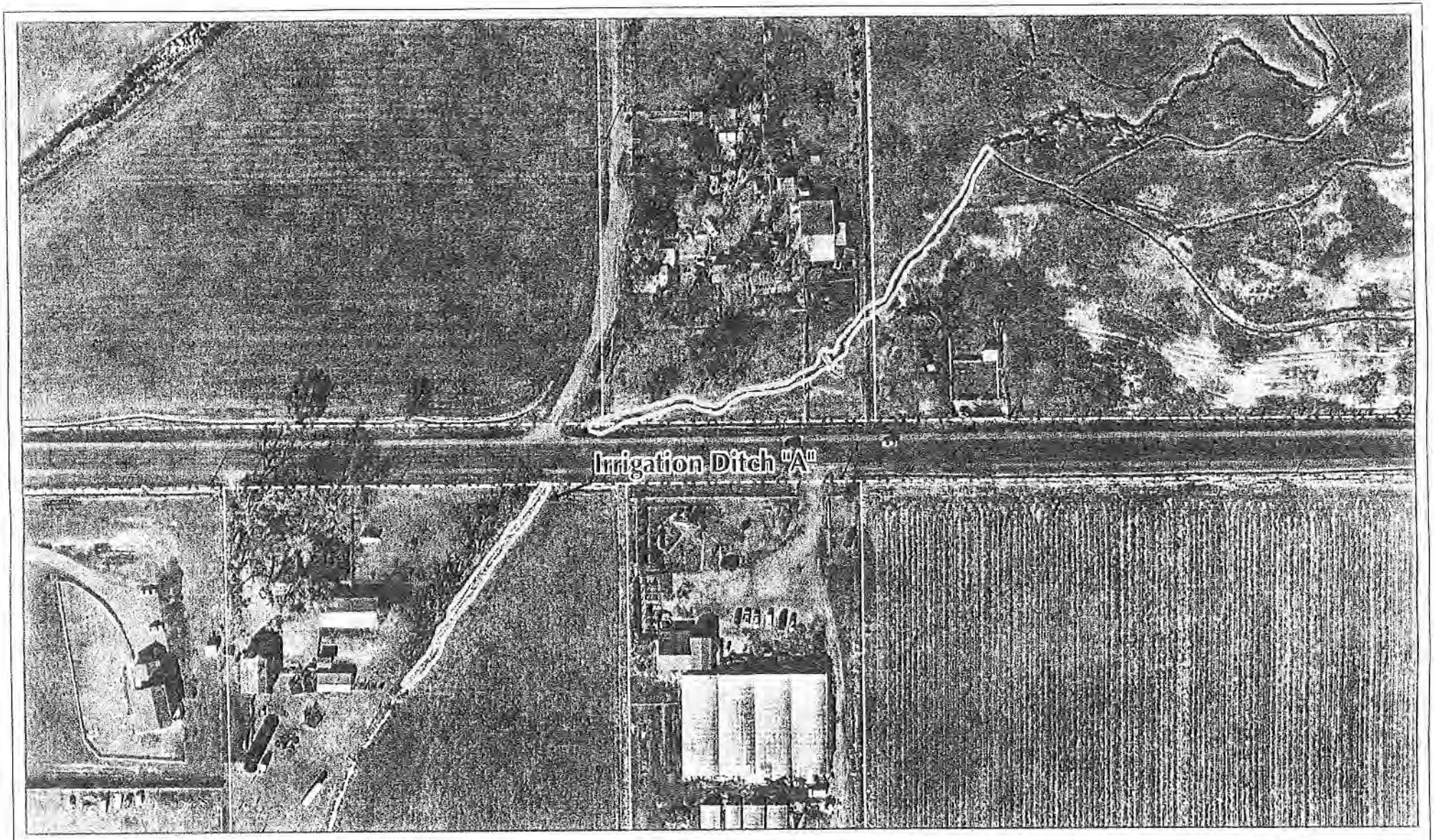
SOURCE: 2000 aerial photography provided by Airphoto USA / KRPS. Land use and parcel information provided by the City of Loveland. Wetland information obtained through field observation and aerial photo interpretation by JFSA. Map produced August 1, 2003 by JFSA.

DOT

DOT SH 402

State Highway 402

Wetlands 5 and 6



LEGEND

Wetland Boundary

N
W E
S

SCALE - 1:1,200 or 1" = 100'

0 25 50 Meters

0 75 150 Feet

SOURCE: 2000 aerial photography provided by Airphoto USA / KRPS. Land use and parcel information provided by the City of Loveland. Wetland information obtained through field observation and aerial photo interpretation by JFSA. Map produced August 1, 2003 by JFSA.

DOT

SH 402

State Highway 402

Irrigation Ditch "A"

JFS&A
J. F. SATO AND ASSOCIATES
Engineering, Environmental, and Program Management Services
5898 South Rapp Street • Littleton, CO 80120
Phone 303.797.1200 • Fax 303.797.1187
www.jfsato.com

June 16, 2004

Todd Boldt
District Conservationist
US Department of Agriculture
Natural Resource Conservation Service
Fort Collins Field Office
2150 Centre Ave Bldg A, Suite 116
Fort Collins, CO 80526

Re: SH 402 – SH 287 to I-25 Project AD 1006 form update

Dear Mr. Boldt:

Per our phone conversation today, I have amended the AD 1006 form that was submitted to your office in October 2003 to show the increase in project impact to 29.6 acres. Most of the increase is due to the addition of a twenty-five foot utility corridor. Per the attached map, all of this acreage is from prime farmland soil types. Also per our conversation, the Loveland Land Use plan shows the entire SH 402 as a location for future urban development (residential, commercial, employment) perhaps making the AD 1006 and FPPA not applicable. Please keep this informational update and transmittal in the appropriate project file. At this time it is my understanding that no further action is needed. Thanks for your help.

Sincerely,

Joanna Morsicato
Senior Project Manager

Attachment

CC: Carol Parr, CDOT R-4, Environmental Manager
Michelle Li, JFS&A, Project Manager
Amy Baerenklau, JFS&A
Admin File

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 10/27/03 06/16/04 update
Name Of Project SH 402 Road Improvements	Federal Agency Involved FHWA
Proposed Land Use Road widening and ROW	County And State Larimer County, Colorado
PART II *(To be completed by NRCS)*	Date Request Received By NRCS 10/27/03

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply – do not complete additional parts of this form)*	Yes ☑ No ☐	Acres Irrigated 80,310	Average Farm Size 240 ac
Major Crop(s) Corn, Beans, Alfalfa	Farmable Land In Govt. Jurisdiction Acres: 114,100 % 7	Amount Of Farmland As Defined in FPPA Acres: 75,250 % 5	
Name Of Land Evaluation System Used LESA	Name Of Local Site Assessment System Larimer County Assmntsys1.1	Date Land Evaluation Returned By NRCS 11/20/03	

PART III *(To be completed by Federal Agency)*	Meander Alt Alternative Site Rating Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	16.6			
B. Total Acres To Be Converted Indirectly	13.0			
C. Total Acres In Site	29.6	0.0	0.0	0.0
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	27.9			
B. Total Acres Statewide And Local Important Farmland	1.7			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	0.0			
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	27.3			
PART V *(To be completed by NRCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*	90	0	0	0

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use					
2. Perimeter In Nonurban Use					
3. Percent Of Site Being Farmed					
4. Protection Provided By State And Local Government					
5. Distance From Urban Builtup Area					
6. Distance To Urban Support Services					
7. Size Of Present Farm Unit Compared To Average					
8. Creation Of Nonfarmable Farmland					
9. Availability Of Farm Support Services					
10. On-Farm Investments					
11. Effects Of Conversion On Farm Support Services					
12. Compatibility With Existing Agricultural Use					
TOTAL SITE ASSESSMENT POINTS	160	0	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	90	0	0	0
Total Site Assessment *(From Part VI above or a local site assessment)*	160	~~8~~ 123.2	0	0	0
TOTAL POINTS *(Total of above 2 lines)* LESA	260	~~98~~ 213.2	0	0	0

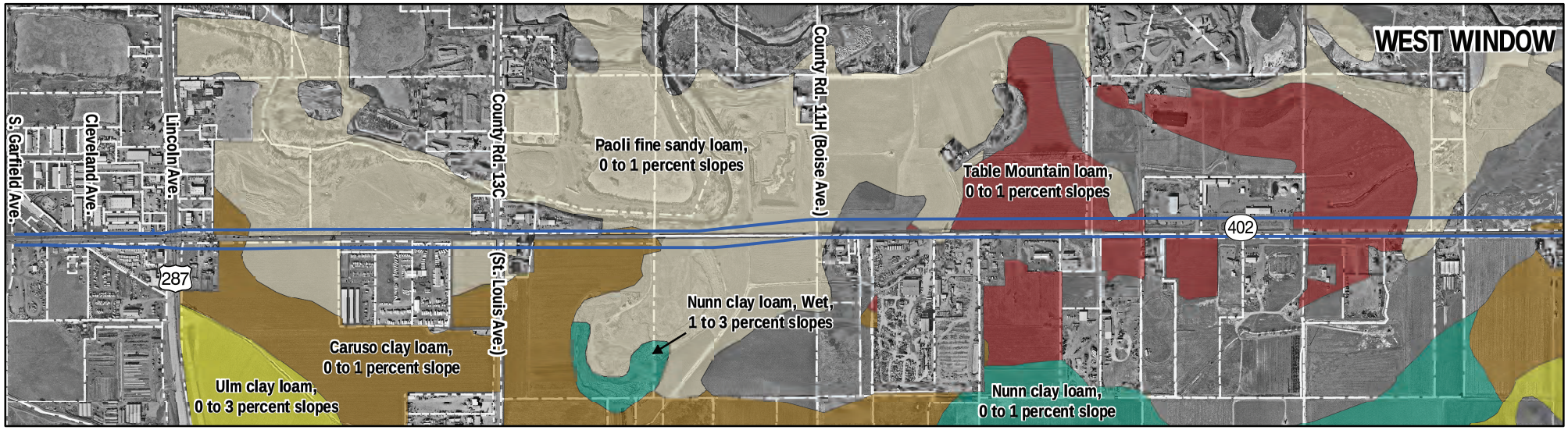
Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☑ No ☐

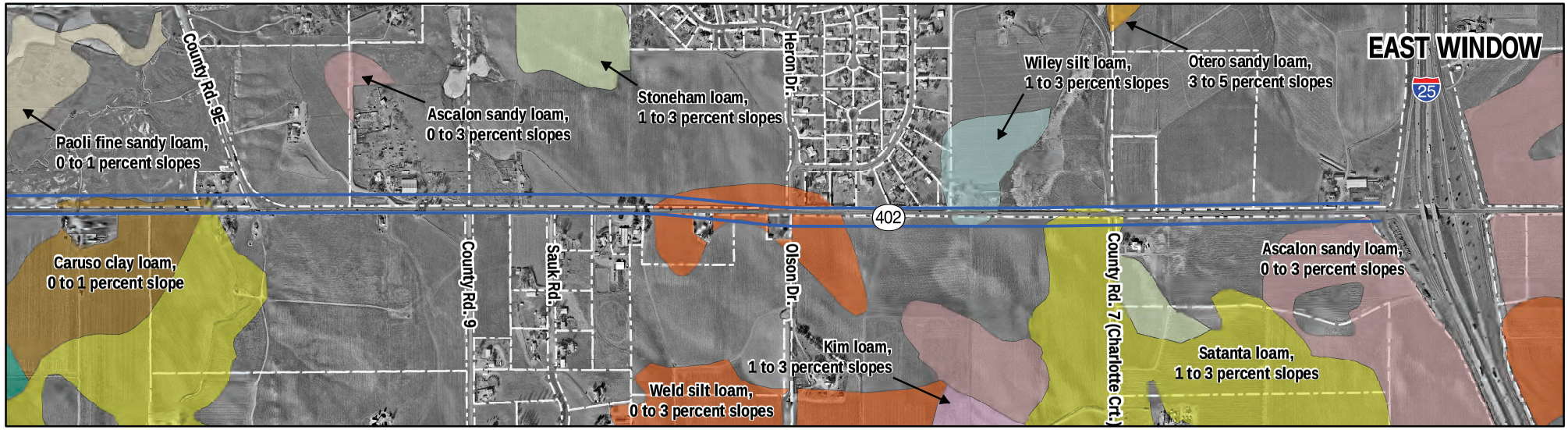
Reason For Selection:

(See Instructions on reverse side)

Form AD-1006 (10-83)

This form was electronically produced by National Production Services Staff





LEGEND

- Ascalon sandy loam, 0 to 3 percent slopes
- Caruso clay loam, 0 to 1 percent slope
- Kim loam, 1 to 3 percent slopes
- Nunn clay loam, 0 to 3 percent slopes
- Otero sandy loam, 3 to 5 percent slopes
- Paoli fine sandy loam, 0 to 1 percent slopes
- Satanta loam, 1 to 5 percent slopes
- Stoneham loam, 0 to 3 percent slopes
- Table Mountain loam, 0 to 1 percent slopes
- Ulm clay loam, 0 to 3 percent slopes
- Weld silt loam, 0 to 3 percent slopes
- Wiley silt loam, 1 to 3 percent slopes
- Meander Alternative Right-of-Way

N W E S

0 500 1,000
Feet

SCALE - 1:14,700
or 1" = 1225'

SOURCE: 2001 1/2-foot resolution aerial photography. Land use and parcel information provided by the City of Loveland. Prime farmland soil information provided by NRCS. Map produced August 1, 2003 by JFSA.

U.S. Department of Transportation Federal Highway Administration

DOT SH 402 Environmental Assessment

Project Study Area
Prime Farmland Soil Types

FIGURE 3-8

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Environmental Programs Branch
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9259

September 27, 2004

Ms. Georgianna Contiguglia
State Historic Preservation Officer
Colorado Historical Society
1300 Broadway
Denver, CO 80203

SUBJECT: Determinations of Eligibility, Project STA 402A-003, US 287 to I-25 Environmental Assessment, Larimer County

Dear Ms. Contiguglia:

This letter and the enclosed inventory report constitute a request for concurrence on Determinations of Eligibility for the transportation project referenced above. The project proposes improvements to State Highway 402 from US Highway 287 east to Interstate 25 in Larimer County, a distance of four miles.

PROJECT BACKGROUND

State Highway 402 is a two-lane, east-west arterial connecting US 287 (also known as Lincoln Avenue in Loveland) to Interstate 25. The project area involves private, state and Larimer County lands on either side of the existing highway. The proposed expansion will improve mobility and safety, and address the highway's substandard design that presently includes no turn lanes, narrow shoulders and poor sight distances.

AREA OF POTENTIAL EFFECT (APE) AND METHODOLOGY

The Area of Potential Effect (APE) established for the project is located on both sides of the highway 402 between I-25 on the east and US 287 on the west, and varies from 125 to 500 feet in width from the edge of existing right-of-way.

Western Cultural Resources Management, Inc. (WCRM) conducted the file search and survey for the project. Due to right-of-entry access issues, only 21 acres of the 60-acre APE was surveyed. Much of the survey area has recently been impacted by ground disturbance and various types of construction. Undisturbed areas requiring survey will be inventoried at a Class III level once access has been granted later in the NEPA documentation process. Please refer to the report for additional details regarding the methodology used during the survey.

SURVEY RESULTS

Six historic resources were recorded and evaluated within the 21 acres accessible to the surveyors. Four of the resources (5LR1729.3, 5LR17023, 5LR10726 and 5LR10727) were surveyed at a Class III level. The survey team was unable to gain permission from respective landowners to survey two historic

resources (5LR10724 and 5LR10725), and both properties were therefore recorded from the curbside. The following table describes these NRHP-eligible properties:

Historic Properties in the Study Area

Site No.	Address/Location	Description	Year Built/Constructed	Eligibility Determination
5LR1729.3	T5N, R68W, Section 20 SE/SE/ SW/SW¼.	Big Thompson Feeder Ditch Segment	Unknown	Not Eligible
5LR10723	4462 SE 14th Street, Loveland	Olson House	1910	Not Eligible
5LR10724	3363 SE 14th Street, Loveland	Bentley House	1896	Not Eligible
5LR10725	3064 SE 14th Street, Loveland	Weber House	1911	Not Eligible
5LR10726	T5N, R68W, Section 19 S of S½, SE/SW/SW¼ T5N, R68W, Section 30 NW/ NE/NW/NW¼.	Unnamed Ditch Segment (150 ft.)	Unknown	Not Eligible
5LR10727	T5N, R68W, Section 21, S½ of SW¼.	Unnamed Ditch Segment (1,650 ft.)	Unknown	Not Eligible

ELIGIBILITY DETERMINATIONS

None of these sites exhibit unique characteristics, nor are they associated with significant historic events or individuals. In addition, 5LR10723, 5LR10724 and 5LR10725 possess little remaining physical integrity. Therefore, CDOT has determined that these resources are *not eligible* for listing on the NRHP.

We request your concurrence with the Determinations of Eligibility outlined herein and in the enclosed report. Your response is necessary for the Federal Highway Administration's compliance with Section 106 of the National Historic Preservation Act (as amended) and with the Advisory Council on Historic Preservation's regulations.

If you have questions or require additional information in order to complete your review, please contact CDOT Senior Staff Historian Lisa Schoch at (303) 512-4258.

Very truly yours,

for Brad Beckham, Manager
Environmental Programs Branch

Enclosures: Survey Report and Site Forms

cc: Carol Parr, CDOT Region 4
Joanna Morsicato, J.F. Sato and Associates
Greg George, Loveland Historic Preservation Commission

COLORADO
HISTORICAL
SOCIETY

The Colorado History Museum 1300 Broadway Denver, Colorado 80203-2137

September 30, 2004

Brad Beckham
Manager, Environmental Programs Branch
Colorado Department of Transportation
Department of Transportation
Environmental Programs Branch
4201 East Arkansas Avenue
Denver, CO 80222

Re: CDOT Project STA 402A-003, Determination of Eligibility for SH 402 from US 287 to I-25 Larimer CO. (CHS #37440)

Dear Mr. Beckham,

Thank you for your correspondence dated September 27, 2004 and received by our office on September 29, 2004 regarding the above-mentioned project. We understand that this is only a partial survey of the project and that a final survey will be submitted to our office at a later date for review and comment.

After review of the submitted information regarding the Area of Potential Effect (APE), we are not able to concur with the proposed APE. In your cover letter, you state that the APE varies from 125 to 500 feet in width from the edge of the existing right-of-way. However, no justification for the 125- to 500-foot APE is provided. As defined in 36 CFR 800.16(d), the APE is the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of the historic properties, if any such historic properties exist." Does the proposed 125- to 500-foot APE include the possible indirect effects, such as visual effects, related to the proposed project? Please provide a project map showing the boundaries of the APE.

After review of the submitted information, we concur with your finding that the resources listed below are *not eligible* for the National Register of Historic Places.

- 5LR.10723
- 5LR.10724

We were unable to complete our National Register review of the following resources listed below.

- 5LR.1729.3
- 5LR.10725
- 5LR.10726
- 5LR.10727

We are unable to complete our review of resource 5LR.10725, the Weber House, because there are no photographs of the building attached to the survey form. In order for us to complete our review, please provide photographs of the building. Also, the historic boundary recorded on the survey form for this property, as well as the other buildings in the survey, is restricted to the footprint of the building. Typically, the footprint of a building does not mark the historic boundary of a building. A building exists within a setting and, if the setting or a portion of the setting retains historic significance and integrity, that setting should be included within the proposed historic boundary for the building. Typically, the property boundary or parcel marks the historic boundary for a property. Please refer to *National Register Bulletin 21: Defining Boundaries for National Register Properties* for further guidance on determining historic boundaries.

We are unable to complete our review for resources 5LR.1729.3, 5LR.10726, and 5LR.10727. All three resources are linear segments of a ditch/canal. The survey forms record only the sections of the ditch/canal that are located within the right-of-way, and in some cases, only on the side of the highway in which the ditch/canal may be affected by the project. In our opinion, the recorded segments are too short to evaluate for National Register eligibility. In order for us to complete our review, please survey the ditch/canal segments beyond the right-of-way so that we may evaluate the segments within a larger context. Whereas the area within the right-of-way may have a lesser degree of historic integrity, the area right outside the right-of-way may retain historic integrity. Enough of the ditch/canal must be surveyed so that the overall integrity of the ditch/canal can be evaluated.

We request being involved in the consultation process with the local government, which as stipulated in 36 CFR 800.3 is required to be notified of the undertaking, and with other consulting parties. Additional information provided by the local government or consulting parties might cause our office to re-evaluate our eligibility and potential effect findings.

If we may be of further assistance, please contact Amy Pallante, our Section 106 Compliance Coordinator, at (303) 866-4678.

Sincerely,

Georgianna Contiguglia
State Historic Preservation Officer

cc: Lisa Schoch/CDOT

CITY OF LOVELAND
LONG RANGE PLANNING
Civic Center • 500 East Third • Loveland, Colorado 80537
(970) 962-2346 • FAX (970) 962-2903 • TDD (970) 962-2620

October 6, 2004

Mr. Brad Beckham
Environmental Programs Branch
Colorado Dept. of Transportation
4201 East Arkansas Ave
Denver, CO 80222

RE: Section 106 Review for Project STA 202A-003, US287 to I-25 Environmental Assessment, Larimer County

Mr. Beckham:

This letter is in response to a request from the Colorado Department of Transportation to provide Section 106 comments on proposed improvements to State Highway 402 from US Highway 287 east to Interstate 25 in Larimer County, a distance of four miles.

The City of Loveland Long Range Planning Division reviewed its records, and the cultural resources inventory prepared by Western Cultural Resource Management Inc. for the proposed improvements to State Highway 402, and concurs that the proposed work will have no adverse effect on the following properties in the project area:

- Site No. 5LR1729.3 Big Thompson Feeder Ditch Segment
- Site No. 5LR10723 Olson House
- Site No. 5LR10724 Bentley House
- Site No. 5LR10726 Unnamed Ditch Segment (150ft)
- Site No. 5LR10727 Unnamed Ditch Segment (1,650 ft)

Additionally, the Long Rang Planning Division reviewed available information provided for Site No. 5LR10725 (Weber House), and at this time we cannot provide an informed opinion to support the assertion that there will not be an adverse effect on this property from the proposed work.

According to the text presented on page 27 of the cultural resource inventory report, direct access to Site No. 5LR10725 was not available to the consultants performing the field observations. The Management Data Form prepared for this property indicates that no photographs could be taken of the subject because the house is obscured from the road by vegetation. It is not clear how Western Cultural Resource Management Inc. was able to adequately evaluate the property and assess that this house possesses little remaining physical integrity if there is currently an obscured view of the house and the consultant staff was not able to physically access the property to make observations.

Printed on
Recycled Paper

If you have questions regarding these comments, please contact me at 970-962-2577.

Sincerely,

Matt Robenalt
Senior Planner

Cc: Greg George, Community Services Director

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Environmental Programs Branch
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9259

DEPARTMENT OF TRANSPORTATION

December 9, 2004

Mr. Matt Robenalt, Senior Planner
City of Loveland/Long Range Planning
Civic Center
500 East Third
Loveland, CO 80537

SUBJECT: Section 106 Review for CDOT Project STA 402A-003, State Highway 402, US 287 to I-25 Environmental Assessment, Larimer County

Dear Mr. Robenalt:

This letter is in response to your comments of October 6, 2004, regarding the Section 106 process for the CDOT project referenced above. We appreciate your concurrence with our findings that the project will have *no adverse effect* to the following sites: Big Thompson Feeder Ditch Segment (5LR1729.3), Olson House (5R10723), Bentley House (5LR10724), 150-foot unnamed ditch segment (5LR10726) and 1,650-foot unnamed ditch segment (5LR10727).

In response to your question regarding the documentation of the Weber House (5LR10725), we have enclosed photographs of the property supporting our determination that 5LR10725 is *not eligible* to the National Register of Historic Places. The photos illustrate the present integrity of the structure (or lack thereof) and clarify our determination. We have sent the same photos to the Colorado Office of Archaeology and Historic Preservation (OAHP) to complete their review of this resource.

Thank you again for your response. If you require additional information, please contact CDOT Senior Staff Historian Lisa Schoch at (303) 512-4258.

Very truly yours,

for Brad Beckham, Manager
Environmental Programs Branch

Enclosures: photos of 5LR10725

cc: Carol Parr, CDOT Region 4
Joanna Morsicato, JF Sato & Associates
File/RF/CF

5LR10725 Weber House looking north/northeast.

5LR10725 Weber house closeup, looking north/northeast.

5LR10725 Weber house outbuildings, looking east.

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Environmental Programs Branch
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9259

May 23, 2005

Ms. Georgianna Contiguglia
State Historic Preservation Officer
Colorado Historical Society
1300 Broadway
Denver, CO 80203

SUBJECT: CDOT Project STA 402A-003, Improvements to State Highway 402 from US 287 to I-25, Larimer County

Dear Ms. Contiguglia:

Thank you for your correspondence dated September 30, 2004 in which you sought additional information for the above-mentioned project. Enclosed is the information you requested including a revised cultural resources inventory report and site forms.

Area of Potential Effect and Projected Indirect Effects

In your September 30, 2004 letter, you disagreed with the proposed Area of Potential Effect (APE) described in the survey report. CDOT reestablished the APE's width to 200 feet on either side of the existing highway right-of-way. Project related impacts are not expected to extend beyond the APE. Construction will require acquisition of approximately sixty acres — roughly within 50 to 200 feet from the edge of the existing right-of-way. Direct disturbances from this project will be contained within the right-of-way and associated permanent easements.

You also sought clarification regarding whether the proposed APE accounts for possible indirect effects related to the project. With regard to potential visual effects, construction is scheduled within an area of relatively open views from dispersed rural residences and existing developments. With the exception of the widened highway and grading associated with cut-and-fill slopes, project plans include few new structural elements. In the boundaries of the project area's relatively flat terrain, most of the visual effects will occur adjacent to the existing SH 402 and within the defined APE.

Additional Information on Linear Resources

Your office was unable to complete a review of linear resources 5LR1729.3, 5LR10726, and 5LR10727, because the initial survey recorded a limited segment of each feature. We have resurveyed these ditch/canal segments beyond the right-of-way and re-evaluated their potential eligibility within a larger historic context. The following identifies these features with their new Office of Archaeology and Historic Preservation (OAHP) site numbers:

- 5LR1729.3 – Big Thompson Feeder Ditch segment is now 5LR10726.1
- 5LR10726 – Unnamed ditch segment is now 5LR10726.2 (The unnamed segment is now referred to in the report as the Big Thompson Manufacturing Ditch).

• 5LR10727 – Unnamed ditch segment is now 5LR1709.2 (The unnamed segment is now referred to in the report as the lateral segment of the Home Supply Ditch).

Additional information on the Weber House (5LR10725)

Included are photographs you requested of the Weber House (5LR10725). The recordation has also been revised in response to your concerns over the initial description of the historic boundaries of 5LR10725.

Methodology and Re-Evaluated Resources

In September 2003, the consultant Western Cultural Resources Management (WCRM) conducted a Class III cultural resource survey of the proposed project area. Because certain property owners denied access to WCRM, the survey recorded only 21 out of 90 acres of the entire APE and left out two potentially historic properties from the survey submitted to your office in September 2004. After a December 16, 2004 discussion with Dale Heckendorn of OAHP, it was agreed that WCRM would examine the Smith Homestead (5LR829) and the Osborn Farm (5LR1143) at a reconnaissance level to determine their potential NRHP eligibility. The survey found that the Smith Homestead had been completely altered and the balance of the original standing structures displayed no historic integrity or significant associations. In addition, there are no historic features or structures left standing on the Osborn Farm. Site forms for both the Smith Homestead and the Osborn Farm are attached for your review.

Subsequent to the September 2004 submission to your office, a review of properties in the vicinity of the APE uncovered an additional site — the Notman/Rust homestead (5LR1703) — requiring re-evaluation. CDOT conducted the initial survey of the Notman/Rust homestead (5LF1703) in 1993 and the property was determined officially *not eligible* to the National Register of Historic Places (NRHP). A re-evaluation of this property is also included in this submittal.

Eligibility Determinations

FHWA and CDOT have determined that the following properties are *not eligible* to the National Register of Historic Places. Please refer to the report and site forms for additional detail:

5LR829 (Smith Homestead)
5LR1143 (Osborn Farm)
5LR1703 (Notman/Rust Property)
5LR1709.2 (Lateral segment of the Home Supply Ditch)
5LR10723 (Olson House)
5LR10724 (Bentley House)
5LR10725 (Weber House)
5LR10726.1 (Big Thompson Feeder Ditch segment)
5LR10726.2 (Big Thompson Manufacturing Ditch segment)

We hereby request your concurrence with the determinations of eligibility outlined herein and in the enclosed report. Your response is necessary for the Federal Highway Administration's compliance with Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's regulations.

Thank you in advance for your prompt attention to this matter. If you require additional information, please contact CDOT Senior Staff Historian Lisa Schoch at (303) 512-4258.

Very truly yours,

Brad Beckham

Brad Beckham, Manager
Environmental Programs Branch

Enclosures: Survey Report and Site Forms

cc: Carol Parr, CDOT Region 4
Joanna Morsicato, J.F. Sato and Associates

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Environmental Programs Branch
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9259

May 24, 2005

Mr. Matt Robenalt
Senior Planner
City of Loveland/Long Range Planning
500 East Third
Loveland, CO 80537

SUBJECT: CDOT Project STA 402A-003, Improvements to State Highway 402 from US 287 to I-25, Larimer County

Dear Mr. Robenalt:

This letter and the attached materials constitute FHWA and CDOT's request for comment on additional information associated with the project referenced above. We initially contacted your office about this project in September 2004. Since then, we have revised the Area of Potential Effects (APE), re-evaluated some properties within the project area, and revised the original survey report. Some of the information below is in response to requests from the State Historic Preservation Officer (SHPO).

Area of Potential Effect and Projected Indirect Effects

Based on comments from the SHPO in September 2004, CDOT has revised the APE's width to 200 feet on either side of the existing highway right-of-way. Project related impacts are not expected to extend beyond the APE. Construction will require acquisition of approximately sixty acres — roughly within 50 to 200 feet from the edge of the existing right-of-way. Direct disturbances from this project will be contained within the right-of-way and associated permanent easements.

The SHPO also sought clarification regarding whether the proposed APE accounts for possible indirect effects related to the project. With regard to potential visual effects, construction is scheduled within an area of relatively open views from dispersed rural residences and existing developments. With the exception of the widened highway and grading associated with cut-and-fill slopes, project plans include few new structural elements. In the boundaries of the project area's relatively flat terrain, most of the visual effects will occur adjacent to the existing SH 402 and within the defined APE.

Additional Information on Linear Resources

In their response, the SHPO also requested additional information about some of the linear resources associated with the project (5LR1729.3, 5LR10726, and 5LR10727), because the initial survey recorded a limited segment of each feature. We have resurveyed these ditch/canal segments beyond the right-of-way and re-evaluated their potential eligibility within a larger historic context. The following identifies these features with their new Office of Archaeology and Historic Preservation (OAHP) site numbers:

- 5LR1729.3 – Big Thompson Feeder Ditch segment is now 5LR10726.1

• 5LR10726 – Unnamed ditch segment is now 5LR10726.2 (The unnamed segment is now referred to in the report as the Big Thompson Manufacturing Ditch).
• 5LR10727 – Unnamed ditch segment is now 5LR1709.2 (The unnamed segment is now referred to in the report as the lateral segment of the Home Supply Ditch).

Additional information on the Weber House (5LR10725)

We have also included new photographs of the Weber House (5LR10725). The recordation of this property has also been revised in response to the SHPO's concerns over the initial description of the historic boundaries.

Methodology and Re-Evaluated Resources

In September 2003, the consultant Western Cultural Resources Management (WCRM) conducted a Class III cultural resource survey of the proposed project area. Because certain property owners denied access to WCRM, the survey recorded only 21 out of 90 acres of the entire APE and left out two potentially historic properties from the survey submitted to your office in September 2004. After a December 16, 2004 discussion with Dale Heckendorn of OAHP, it was agreed that WCRM would examine the Smith Homestead (5LR829) and the Osborn Farm (5LR1143) at a reconnaissance level to determine their potential NRHP eligibility. The survey found that the Smith Homestead had been completely altered and the balance of the original standing structures displayed no historic integrity or significant associations. In addition, there are no historic features or structures left standing on the Osborn Farm. Site forms for both the Smith Homestead and the Osborn Farm are attached for your review.

Subsequent to the September 2004 submittal to your office, a review of properties in the vicinity of the APE uncovered an additional site — the Notman/Rust homestead (5LR1703) — requiring re-evaluation. CDOT conducted the initial survey of the Notman/Rust homestead (5LF1703) in 1993 and the property was determined officially *not eligible* to the National Register of Historic Places (NRHP) at that time. A re-evaluation of this property is also included in this submittal.

Eligibility Determinations

FHWA and CDOT have determined that the following properties are *not eligible* to the National Register of Historic Places. Please refer to the report and site forms for additional detail:

5LR829 (Smith Homestead)
5LR1143 (Osborn Farm)
5LR1703 (Notman/Rust Property)
5LR1709.2 (Lateral segment of the Home Supply Ditch)
5LR10724 (Bentley House)
5LR10725 (Weber House)
5LR10726.1 (Big Thompson Feeder Ditch segment)
5LR10726.2 (Big Thompson Manufacturing Ditch segment)

We request comment from the City of Loveland's Long Range Planning Office regarding these findings within 30 days of receipt of these materials. Your response is necessary for the Federal Highway Administration's compliance with Section 106 of the National Historic Preservation Act (as amended) and with the Advisory Council on Historic Preservation's regulations.

Thank you in advance for your prompt attention to this matter. If you require additional information, please contact CDOT Senior Staff Historian Lisa Schoch at (303) 512-4258.

Very truly yours,

FOR Brad Beckham, Manager
Environmental Programs Branch

Enclosures: Survey Report and Site Forms

cc: Carol Parr, CDOT Region 4
Joanna Morsicato, J.F. Sato and Associates

MEMORANDUM

DEPARTMENT OF TRANSPORTATION

Environmental Programs Branch
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9259

DOT
DEPARTMENT OF TRANSPORTATION

June 24, 2005

Ms. Amy Pallante
Section 106 Compliance Officer
Colorado Historical Society
1300 Broadway
Denver, CO 80203

Dear Ms. Pallante:

Enclosed are two photographs of the Weber House (5LR10725) necessary for your review of the State Highway 402 project. These pictures were omitted from our May 23, 2005 submission to your office.

If need you any further information, please contact me at (303) 757-9758.

Sincerely,

Bob Autobee

COLORADO
HISTORICAL
SOCIETY

The Colorado History Museum 1300 Broadway Denver, Colorado 80203-2137

June 29, 2005

Brad Beckham
Manager, Environmental Programs Branch
Colorado Department of Transportation
Department of Transportation
Environmental Programs Branch
4201 East Arkansas Avenue
Denver, CO 80222

Re: CDOT Project STA 402A-003, Determination of Eligibility for SH 402 from US 287 to I-25 Larimer CO. (CHS #37440)

Dear Mr. Beckham,

Thank you for your additional information correspondence dated May 23, 2005 and June 24, 2005 regarding the above-mentioned project.

After review of the submitted information, we agree that the proposed APE is appropriate for the proposed project.

We concur with the finding of not eligible for the resources 5LR.10726.2/Lateral segment of the Big Thompson Manufacturing Ditch and resource 5LR.1709.2/Lateral segment of the Home Supply Ditch. These two segments are minor laterals to larger canals/ditches. Although the laterals were associated with the larger canals/ditches they do not have a significant association to the historic context of irrigation due to their minor role.

We also concur with the findings of not eligible for the following resources.

- 5LR.829/Smith Homestead
- 5LR.1143/Osborn Farm
- 5LR.1703/Rust Property
- 5LR.10723/Olsen House
- 5LR.10724/Bentley House

We concur that the overall linear feature of the Big Thompson Manufacturing Ditch/resource 5LR.10726 is eligible for the National Register of Historic Places. We also concur that resource 5LR.10726.1/segment of the Big Thompson Manufacturing Ditch has a low level of integrity. Therefore, in our opinion, the project will result in a finding of no adverse effect under Section 106 of the National Historic Preservation Act for this resource.

We can not conur with the finding of not eligible for resource 5LR.10725/Weber House. The survey form lacks important details regarding the description and history of the property as well as a justification for the determination of eligbility. We understand that your staff was not given permission to go onto the property to conduct the survey. We have conducted limited research on the Larimer County Tax Assessor's website (http://www.co.larimer.co.us/assessor) and have printed and attached several aerial photographs of the property. From the aerial photographs, the setting of the property appears to include the c.1911 main house surrounded by mature trees and outbuildings within a landscape of work. The landscape of work opens up into agricultural fields featuring roads and other agricultural outbuildings. In our opinion, the property has the possibility of being eligible, but there is not enough information available to make a determination of eligibility. Also, the proposed historic boundary is limited to the footprint of the main house. In our opinion, the historic boundary would encompass the main house, immediate setting, and agricultural fields. We recommend using the phased indentification and evaluation procedure stipulated in 36 CFR 800.4(b)(2).

We request being involved in the consultation process with the local government, which as stipulated in 36 CFR 800.3 is required to be notified of the undertaking, and with other consulting parties. Additional information provided by the local government or consulting parties might cause our office to re-evaluate our eligibility and potential effect findings

If we may be of further assistance, please contact Amy Pallante, our Section 106 Compliance Coordinator, at (303) 866-4678.

Sincerely,

Georgianna Contiguglia
State Historic Preservation Officer

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Environmental Programs Branch
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9259

July 27, 2005

Mr. Matt Robenalt
Senior Planner
City of Loveland/Long Range Planning
500 East 3rd Street
Loveland, CO 80537

SUBJECT: Additional Site Eligibility Information, CDOT Project STA 402A-003, State Highway 402 from US 287 to I-25, Larimer County

Dear Mr. Robenalt:

This letter and the attached materials constitute a request for comment on additional information associated with the project referenced above. We initially contacted your office about this project in September 2004. In July 2005, Western Cultural Resources Management (WCRM), at the request of CDOT, gathered additional information regarding the Weber House. The historic property boundary was expanded beyond the footprint of the main house, immediate setting, and agricultural fields. This expansion also required a re-evaluation of the previously recorded lateral segment of the Big Thompson Manufacturing Ditch (5LR10726.2). Revised site forms for 5LR10725, including all outbuildings, and a re-evaluation form for 5LR10726.2 have also been transmitted to the Colorado State Historic Preservation Officer (SHPO) and are included herewith.

Eligibility Determinations

Weber House (5LR10725): The Weber House and associated outbuildings were constructed during the first third of the 20th century when irrigated agriculture dominated Northern Colorado's economy. The buildings within the Weber farm complex also display enough integrity to illustrate the importance of small farms during this period. CDOT has determined that its association with early 20th century farming and high level of physical integrity qualify 5LR10725 as *eligible* to the National Register of Historic Places under Criteria a and c.

Big Thompson Manufacturing Ditch (5LR10726.2): In your June 29 letter you concurred with our evaluation of *not eligible* for a 150-foot segment of the Big Thompson Manufacturing Ditch. As noted above, expansion of the historic boundary of 5LR10725 required a reevaluation and expansion of 5LR10726.2 from 150 to 1,750 feet. The July 2005 survey found no historic associations and little remaining integrity within the extended segment. We have therefore determined that this segment is also *not eligible* to the NRHP. Please see the attached reevaluation form for more detailed information.

We request comment from the City of Loveland's Long Range Planning Office regarding these findings within 30 days of receipt of these materials. Your response is necessary for the Federal Highway Administration's compliance with Section 106 of the National Historic Preservation Act (as amended) and with the Advisory Council on Historic Preservation's regulations.

Thank you in advance for your prompt attention to this matter. If you require additional information, please contact CDOT Senior Staff Historian Lisa Schoch at (303) 512-4258.

Very truly yours,

for Brad Beckham, Manager
Environmental Programs Branch

Enclosures: Site forms, 5LR10725
Reevaluation form, 5LR10726.2

cc: Carol Parr, CDOT Region 4
Joanna Morsicato, JF Sato and Associates
File/CF/RF

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Environmental Programs Branch
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9259

DOT
DEPARTMENT OF TRANSPORTATION

JUL 2005
J. F. Sato & Associates, Inc.

July 27, 2005

Ms. Georgianna Contiguglia
State Historic Preservation Officer
Colorado Historical Society
1300 Broadway
Denver, CO 80203

SUBJECT: Additional Site Eligibility Information, CDOT Project STA 402A-003, State Highway 402 from US 287 to I-25, Larimer County

Dear Ms. Contiguglia:

In correspondence dated June 29, 2005, you requested additional information regarding the Weber House (5LR10725), located within the project corridor referenced above.

In July 2005, Western Cultural Resources Management (WCRM), at the request of CDOT, gathered additional information regarding the Weber House. The historic property boundary was expanded beyond the footprint of the main house, immediate setting, and agricultural fields. This expansion also required a re-evaluation of the previously recorded lateral segment of the Big Thompson Manufacturing Ditch (5LR10726.2). Revised site forms for 5LR10725, including all outbuildings, and a re-evaluation form for 5LR10726.2 are included herewith.

Eligibility Determinations

Weber House (5LR10725): The Weber House and associated outbuildings were constructed during the first third of the 20th century when irrigated agriculture dominated Northern Colorado's economy. The buildings within the Weber farm complex also display enough integrity to illustrate the importance of small farms during this period. CDOT has determined that its association with early 20th century farming and high level of physical integrity qualify 5LR10725 as *eligible* to the National Register of Historic Places under Criteria a and c.

Big Thompson Manufacturing Ditch (5LR10726.2): In your June 29 letter you concurred with our evaluation of *not eligible* for a 150-foot segment of the Big Thompson Manufacturing Ditch. As noted above, expansion of the historic boundary of 5LR10725 required a reevaluation and expansion of 5LR10726.2 from 150 to 1,750 feet. The July 2005 survey found no historic associations and little remaining integrity within the extended segment. We have therefore determined that this segment is also *not eligible* to the NRHP. Please see the attached reevaluation form for more detailed information.

We request your concurrence with the determinations of eligibility outlined herein and on the enclosed forms. Your response is necessary for the Federal Highway Administration's compliance with Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's regulations.

Thank you in advance for your prompt attention to this matter. If you require additional information, please contact CDOT Senior Staff Historian Lisa Schoch at (303) 512-4258.

Very truly yours,

for Brad Beckham, Manager
Environmental Programs Branch

Enclosures: Site forms, 5LR10725
Reevaluation form, 5LR10726.2

cc: Carol Parr, CDOT Region 4
Joanna Morsicato, JF Sato and Associates
File/CF/RF

COLORADO
HISTORICAL
SOCIETY

The Colorado History Museum 1300 Broadway Denver, Colorado 80203-2137

August 9, 2005

Brad Beckham
Manager, Environmental Programs Branch
Colorado Department of Transportation
Department of Transportation
Environmental Programs Branch
4201 East Arkansas Avenue
Denver, CO 80222

Re: CDOT Project STA 402A-003, Determination of Eligibility for SH 402 from US 287 to I-25 Larimer CO. (CHS #37440)

Dear Mr. Beckham,

Thank you for your additional information correspondence dated July 27, 2005 and July 29, 2005 regarding the above-mentioned project. We appreciate your staff's efforts in gathering the information.

After review of the additional information, we concur with the evaluation that resource 5LR.10725/Weber House is eligible for the National Register of Historic Places (NRHP). We also concur with the evaluation that resource 5LR.10726.2/lateral segment of the Big Thompson Manufacturing Ditch is not eligible for the NRHP.

We request being involved in the consultation process with the local government, which as stipulated in 36 CFR 800.3 is required to be notified of the undertaking, and with other consulting parties. Additional information provided by the local government or consulting parties might cause our office to re-evaluate our eligibility and potential effect findings

If we may be of further assistance, please contact Amy Pallante, our Section 106 Compliance Coordinator, at (303) 866-4678.

Sincerely,

Mark Wolfe
for Georgianna Contiguglia
State Historic Preservation Officer

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Environmental Programs Branch
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9259

March 10, 2006

Mr. Matt Robenalt
Senior Planner
City of Loveland/Long Range Planning
500 East Third
Loveland, CO 80537

SUBJECT: Additional Site Eligibility Information and Effects Determinations, and Section 4(f) *De Minimis* Notification, CDOT Project STA 402A-003, State Highway 402, US 287 to I-25, Larimer County

Dear Mr. Robenalt:

This letter and the enclosed materials constitute a comment for the project referenced above, which involves improvements to State Highway 402 from US 287 east to Interstate 25 in Larimer County. We initially consulted with your office on eligibility determinations in November 2004 and provided additional information in May 2005. Based on an expansion of the Area of Potential Effects (APE), this submittal is an addendum to the 2004 inventory. Also included herein is notification of Section 4(f) *de minimis* findings for two historic properties associated with this project.

Survey Background and Results

Due to a lack of right-of-entry for large portions of private property along the four-mile SH 402 study corridor, Western Cultural Resources Management, Inc. (WCRM) conducted a partial cultural resources survey of the project area during 2003. As noted above, the initial survey report was submitted for your review in November 2004. Subsequent engineering changes resulted in the expansion of the original APE. In October and November 2005, WCRM conducted Class I and Class III level surveys of the expanded APE, which was revised to include a corridor approximately 250 feet on both sides of SH 402 (and which varied to include entire historic properties, as appropriate).

The additional survey resulted in the reevaluation of three historic irrigation ditch segments and two farms and associated farmsteads (Table 1); fourteen historic resources were newly recorded (Table 2). Please refer to the enclosed report and site forms for additional information.

TABLE 1: REEVALUATED SITES

Site Name	Site Number	NRHP Eligibility Status
1,775-foot segment of Home Supply Ditch	5LR1709.2	Officially not eligible, 6/2/2005
Bentley House	5LR10724	Officially not eligible, 9/30/2004
Weber Farm	5LR10725	Officially eligible under Criteria A and C, 8/9/2005

Site Name	Site Number	NRHP Eligibility Status
655-foot segment of Big Thompson Manufacturing Ditch	5LR10726.1	Officially not eligible, 6/29/2005
2,525-foot segment of Big Thompson Manufacturing Ditch	5LR10726.2	Officially not eligible, 6/2/2005 and 8/9/2005

TABLE 2: NEWLY DOCUMENTED SITES

Site Name	Site Number	NRHP Eligibility Status
Johnston Mountain View Farm	5LR11242	Not eligible
Rak Property	5LR11243	Not eligible
Adel Property	5LR11244	Not eligible
Landers Property	5LR11245	Not eligible
Sykes Property	5LR11246	Not eligible
Propp Farm	5LR11247	Not eligible
Woodridge Property	5LR11248	Not eligible
Weber Farm East	5LR11249	Eligible under Criteria A & C
Kelly Farm West	5LR11250	Not eligible
Kelly Farm East	5LR11251	Not eligible
Lopp Property	5LR11252	Not eligible
Bechtel Property	5LR11253	Not eligible
1,250-foot segment of Conner Ditch	5LR11254.1	Not eligible
Olson Rental Property	5LR11255	Not eligible

CDOT concurs with the existing determination of NRHP eligible for the Weber Farm (5LR10725), and recommends that the Weber Farm East (5LR11249) is also eligible under Criteria A and C. Although the two segments of the Big Thompson Manufacturing Ditch (5LR10726.1 & .2) within the project limits are not eligible, the ditch as a whole (5LR10726) was determined eligible in 2005.

Effects Determination

5LR10275, Weber Farm: Widening SH 402 requires additional right-of-way and a permanent utilities easement from the frontage of the Weber Farm, with an approximate depth of 58 feet for right-of-way (a total of 4 acres) and an additional 25 feet for permanent easement along the entire length of the farm along the highway (an additional 1.4 acres). The proposed alignment veers north as SH 402 heads east past the Big Thompson River, and this reduces the right-of-way easement requirements from the eastern 500 feet of Weber Farm frontage. The right-of-way returns to its 150 foot width in this area. Because of the close proximity of the Big Thompson River on the north side of the highway, there are no other practicable alternatives for highway alignment in this area. The project will require taking the main house and the chicken brooder house from the farm site. Therefore, CDOT has determined there will be an *adverse effect* to 5LR10725.

5LR11249, Weber Farm East: This 2.1-acre farm complex consists of 13 buildings, a feed lot and tilled fields. The Weber Farm East is considered eligible as a good representation of a typical early 20th century

Larimer County farm as well as for its extant architectural features. 5LR11249 abuts the south side of existing SH 402. The only impact to the farm will be the acquisition of a 25-foot permanent utility easement across the front of the property. Except for the loss of a cottonwood tree, which is not considered part of the property's historic landscape, no other physical features will be affected. Utility poles and an existing easement are currently located along the front of the property. CDOT has determined that the project will result in *no adverse effect* to 5LR11249.

Notification of Section 4(f) *De Minimis* Determination

The project has been determined to have no adverse effect to the Weber Farm East (5LR11249) and the Big Thompson Manufacturing Ditch (5LR10726). On June 29, 2005, the SHPO concurred that the entire Big Thompson Manufacturing Ditch is *eligible* to the NRHP; a copy of that letter is included herewith. We recommend that there will be *no adverse effect* to this resource resulting from the project. Based on the no adverse effect findings, FHWA intends to make a *de minimis* finding for the Section 4(f) requirements for these historic sites.

As a local governmental authority with a potential interest in this historic feature, we welcome your comments regarding our determination of eligibility. Should you elect to respond, we request that you do so within 30 days of receipt of this letter. If you have questions or require additional information, please contact CDOT Senior Staff Historian Lisa Schoch at (303) 512-4258.

Very truly yours,

For Brad Beckham, Manager
Environmental Programs Branch

Enclosures

cc: Carol Parr, CDOT Region 4
Joanna Morsicato, J.F. Sato and Associates

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Environmental Programs Branch
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9259

March 10, 2006

Ms. Georgianna Contiguglia
State Historic Preservation Officer
Colorado Historical Society
1300 Broadway
Denver, CO 80203

SUBJECT: Additional Site Eligibility Information and Effects Determinations, and Section 4(f) *De Minimis* Notification, CDOT Project STA 402A-003, State Highway 402, US 287 to I-25, Larimer County

Dear Ms. Contiguglia:

This letter and the enclosed materials constitute a request for concurrence on eligibility and effects for the project referenced above, which involves improvements to State Highway 402 from US 287 east to Interstate 25 in Larimer County. We initially consulted with your staff on eligibility determinations in November 2004 and provided additional information in May 2005. Based on an expansion of the Area of Potential Effects (APE), this submittal is an addendum to the 2004 inventory. Also included herein is notification of Section 4(f) *de minimis* findings for two historic properties associated with this project.

Survey Background and Results

Due to a lack of right-of-entry for large portions of private property along the four-mile SH 402 study corridor, Western Cultural Resources Management, Inc. (WCRM) conducted a partial cultural resources survey of the project area during 2003. As noted above, the initial survey report was submitted for your review in November 2004. Subsequent engineering changes resulted in the expansion of the original APE. In October and November 2005, WCRM conducted Class I and Class III level surveys of the expanded APE, which was revised to include a corridor approximately 250 feet on both sides of SH 402 (and which varied to include entire historic properties, as appropriate).

The additional survey resulted in the reevaluation of three historic irrigation ditch segments and two farms and associated farmsteads (Table 1); fourteen historic resources were newly recorded (Table 2). Please refer to the enclosed report and site forms for additional information.

TABLE 1: REEVALUATED SITES

Site Name	Site Number	NRHP Eligibility Status
1,775-foot segment of Home Supply Ditch	5LR1709.2	Officially not eligible, 6/2/2005
Bentley House	5LR10724	Officially not eligible, 9/30/2004
Weber Farm	5LR10725	Officially eligible under Criteria A and C, 8/9/2005

Site Name	Site Number	NRHP Eligibility Status
655-foot segment of Big Thompson Manufacturing Ditch	5LR10726.1	Officially not eligible, 6/29/2005
2,525-foot segment of Big Thompson Manufacturing Ditch	5LR10726.2	Officially not eligible, 6/2/2005 and 8/9/2005

TABLE 2: NEWLY DOCUMENTED SITES

Site Name	Site Number	NRHP Eligibility Status
Johnston Mountain View Farm	5LR11242	Not eligible
Rak Property	5LR11243	Not eligible
Adel Property	5LR11244	Not eligible
Landers Property	5LR11245	Not eligible
Sykes Property	5LR11246	Not eligible
Propp Farm	5LR11247	Not eligible
Woodridge Property	5LR11248	Not eligible
Weber Farm East	5LR11249	Eligible under Criteria A & C
Kelly Farm West	5LR11250	Not eligible
Kelly Farm East	5LR11251	Not eligible
Lopp Property	5LR11252	Not eligible
Bechtel Property	5LR11253	Not eligible
1,250-foot segment of Conner Ditch	5LR11254.1	Not eligible
Olson Rental Property	5LR11255	Not eligible

CDOT concurs with the existing determination of NRHP eligible for the Weber Farm (5LR10725), and recommends that the Weber Farm East (5LR11249) is also eligible under Criteria A and C. Although the two segments of the Big Thompson Manufacturing Ditch (5LR10726.1 & .2) within the project limits are not eligible, the ditch as a whole (5LR10726) was determined eligible in 2005.

Effects Determination

5LR10275, Weber Farm: Widening SH 402 requires additional right-of-way and a permanent utilities easement from the frontage of the Weber Farm, with an approximate depth of 58 feet for right-of-way (a total of 4 acres) and an additional 25 feet for permanent easement along the entire length of the farm along the highway (an additional 1.4 acres). The proposed alignment veers north as SH 402 heads east past the Big Thompson River, and this reduces the right-of-way easement requirements from the eastern 500 feet of Weber Farm frontage. The right-of-way returns to its 150 foot width in this area. Because of the close proximity of the Big Thompson River on the north side of the highway, there are no other practicable alternatives for highway alignment in this area. The project will require taking the main house and the chicken brooder house from the farm site. Therefore, CDOT has determined there will be an *adverse effect* to 5LR10725.

5LR11249, Weber Farm East: This 2.1-acre farm complex consists of 13 buildings, a feed lot and tilled fields. The Weber Farm East is considered eligible as a good representation of a typical early 20th century

Larimer County farm as well as for its extant architectural features. 5LR11249 abuts the south side of existing SH 402. The only impact to the farm will be the acquisition of a 25-foot permanent utility easement across the front of the property. Except for the loss of a cottonwood tree, which is not considered part of the property's historic landscape, no other physical features will be affected. Utility poles and an existing easement are currently located along the front of the property. CDOT has determined that the project will result in *no adverse effect* to 5LR11249.

Notification of Section 4(f) *De Minimis* Determination

The project has been determined to have no adverse effect to the Weber Farm East (5LR11249) and the Big Thompson Manufacturing Ditch (5LR10726). On June 29, 2005, you concurred that the entire Big Thompson Manufacturing Ditch is *eligible* to the NRHP; a copy of that letter is included herewith. We recommend that there will be *no adverse effect* to this resource resulting from the project. Based on the no adverse effect findings, FHWA intends to make a *de minimis* finding for the Section 4(f) requirements for these historic sites.

We request your concurrence with the determinations of eligibility and effects outlined herein and in the enclosed report. Your response is necessary for the Federal Highway Administration's compliance with Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's regulations. This information has also been sent to the City of Loveland's Long Range Planning Office for review and comment. We will forward their response to you when received.

If you require additional information, please contact CDOT Senior Staff Historian Lisa Schoch at (303) 512-4258.

Very truly yours,

for Brad Beckham, Manager
Environmental Programs Branch

Enclosures

cc: Carol Parr, CDOT Region 4
Joanna Morsicato, J.F. Sato and Associates

COLORADO
HISTORICAL
SOCIETY

The Colorado History Museum 1300 Broadway Denver, Colorado 80203-2137

March 30, 2006

Brad Beckham
Manager, Environmental Programs Branch
Colorado Department of Transportation
Environmental Programs Branch
4201 East Arkansas Avenue
Denver, CO 80222

Re: State Highway 402, US 287 to I-25 and Section 4(f) De Minimis Notification, CDOT Project STA 402A-003, Larimer County, CO. (CHS #37440)

Dear Mr. Beckham,

Thank you for your correspondence dated March 10, 2006 and received by our office on March 15, 2006 regarding the above-mentioned project.

After review of the submitted information, we concur that the resources below are not eligible for the National Register of Historic Places (NRHP). Also included below are specifics comments related to certain National Register criteria.

- 5LR.1709.2/segment of Home Supply Ditch
  We concur that this segment, which is a lateral to the Home Supply Ditch, is not eligible for the NRHP.
- 5LR.11243/Rak Property
  We concur that the property is not eligible under National Register Criterion A for agriculture since the historic use of agriculture has been changed and no agricultural fields appear to be associated with the property. We also concur that the property is not eligible under National Register Criterion C for architecture due to a loss of integrity since the house was moved onto the property from a remote location and then altered to serve as a residence.
- 5LR. 11244/Adel Property
  We concur that the property is not eligible under National Register Criterion A for agriculture since there are no longer any associated agricultural fields. We also concur that the property is not eligible under National Register Criterion C for architecture due to a significant loss of integrity as a result of modern alterations and additions to the house as well as the construction of modern buildings on the site.

- 5LR.11245/Landers Property
  We concur that the property is not eligible under National Register Criterion A for agriculture since there is no associated farm land and many of the agricultural buildings have suffered a significant loss of integrity. Also, several modern additions have been added within the historic setting. However, we do not concur with the evaluation that the property has lost its historic setting due to the construction of I-25. Using the Larimer County Tax Assessor's website to determine distance, the property is approximately a mile and a half from I-25. When evaluating the historic setting of a site, it is more appropriate to evaluate the immediate setting of the property. We concur that the property is not eligible under National Register Criterion C for architecture due to a significant loss of integrity as a result of modern alterations and additions to the buildings.
- 5LR.11246/Sykes Property
  We concur that the property is not eligible under National Register Criterion A for agriculture due to the change of use of the associated agricultural fields and alterations and additions to the buildings. We also concur with the finding that the property is not eligible under National Register Criterion C for architecture due to a significant loss of integrity of the buildings due to alterations and additions.
- 5LR.11248/Woolridge Property
  We concur that the property has suffered a significant loss of integrity due to alterations and construction of modern buildings and can not convey any area of National Register significance.
- 5LR.11252/Lopp House
  We concur that the property is not eligible under National Register Criterion A for agriculture due to the change of use of the associated agricultural fields and alterations and additions to the buildings. We also concur with the finding that the property is not eligible under National Register Criterion C for architecture due to a significant loss of integrity of the buildings due to alterations and additions.
- 5LR.11253/Bechtel Property
  We concur that the property is not eligible under National Register Criterion A for agriculture due to the loss of the main house and associated agricultural fields. We also concur that the property is not eligible under National Register Criterion C for architecture due to the significant loss of integrity due the loss of the main house and poor condition of the outbuildings.
- 5LR.11254.1/segment of Conner Ditch Lateral
- 5LR.11255/Olsen Rental Property
- 5LR.10724/Bentley Property
- 5LR.10726.1/segment Big Thompson Manufacturing Ditch
- 5LR.10726.2/segment Big Thompson Manufacturing Ditch

After review of the submitted information, we concur with the finding of eligible for the NRHP for the properties listed below.

- 5LR.11249/Weber Farm East.
- 5LR.10725/Weber Farm (formally recorded as the Weber House)

After review of the submitted information, we request additional information for the properties listed below.

- 5LR.11242/Johnston Mountain View Farm
  According to the inventory form, the main house was moved, but the form does not state where the property was moved from. Was the main house moved from within its historic setting or from a remote site? We concur that the construction of I-25 does lessen the historic setting. However, the remaining historic setting within the site boundary needs to be addressed. According to the Larimer County Tax Assessor's website, several acres of agricultural land are still associated with the property. Also, the open agricultural field located just west and currently excluded from the proposed site boundary is also under the same ownership as the surveyed property. Even though I-25 is adjacent to the property, was the setting within the site boundary evaluated to determine if the open agricultural land is associated with the property and whether it can support and convey the significance of agriculture for the entire property? In our opinion, the historic setting for the property within the site boundary has not been radically altered by the construction of I-25, as stated in the inventory form.

  In regards to the outbuildings, the Management Data Form states that buildings B2, B4, and B5 have been modified. When the architectural component forms for these buildings were reviewed, it was noted that B2 and B5 have new roofing materials and that the southern façade of B4 has been renovated with new siding in 1964. In our opinion, these changes are minor and do not significantly lessen the historic integrity of these buildings. We agree that these buildings along with the main house may not meet the integrity needed to be eligible under National Register Criterion C for architecture; however, we believe that as a complex with the agricultural fields it could be significant under National Register Criterion A for agriculture. The Management Data Form states that the property is not eligible under National Register Criterion A for agriculture because the "site no longer retains its contextual connections." In order to better understand the proposed justification for the property not being eligible under National Register Criterion A, please clarify the loss of contextual connections and evaluation of integrity under National Register Criterion A.

- 5LR.11246/Sykes Property
  According to the survey form, the site boundary includes only the cluster of buildings and not the open agricultural field located behind the buildings. Is the agricultural field historically associated with the Sykes property? The inventory form states that dates of the additions to the main house are unknown. It is difficult to determine from the pictures, but in your opinion do the additions appear to be modern or occurred during the historic period for the house? The inventory form states that the date is unknown for resource B4; however, does the joining of the buildings appear to have been done during the historic period for the farm?

- 5LR.11247/Propp Farm
  After review of the survey, we concur that the resource does not retain enough significance to meet National Register Criterion C for architecture. However, we request additional information regarding the resource's significance under National Register Criterion A for agriculture. After review of the aerial

photography on the Larimer County Tax Assessor's website, open agricultural fields are located to the east and south of this resource. Was this agricultural land researched to determine if it was historically associated with the property? While the main house has lost architectural integrity due to alterations, it appears that together, the main house, outbuildings, and especially the barn may have the potential to convey significance under National Register Criterion A for agriculture. The inventory form does not specifically state why the property is not significant in agriculture. Please clarify the evaluation of the property under the area of agriculture and why it is not significant.

- 5LR.11250/Kelly Farm West and 5.LR.11251/Kelly Farm East
  Why were these farms broken into a two separate sections? Should the two farms be evaluated as one property? Do the two farms encompass a larger farm complex of one family?

  The Management Data Form for 5LR.11250 states that the property is surrounded by farm land, but no longer part of an active farm and no longer adequately represents a 20th-century Larimer County farm. Does that mean that the agricultural fields no longer convey the historic use of beet farming? How does the farm no longer represent a 20th-century Larimer County farm? The Colorado Plains Historic Context-Post 1900 Agriculture-Sugar Beets context does not describe the character-defining features of a Larimer County farm. What criteria were used to evaluation the property as whether or not it is a good example of a Larimer County farm?

Once we receive the above information, we will be able to continue consultation regarding the National Register eligibility of the identified resources. Once we conclude the consultation regarding the eligibility of these properties, we will then be able to conclude the assessment of effects under Section 106 to those properties.

If we may be of further assistance, please contact Amy Pallante, our Section 106 Compliance Coordinator, at (303) 866-4678.

Sincerely,

Mark Wolfe

for Georgianna Contiguglia
State Historic Preservation Officer

APR 2006
RECEIVED
Environmental
Programs

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Environmental Programs Branch
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9259

DEPARTMENT OF TRANSPORTATION

May 1, 2006

Ms. Georgianna Contiguglia
State Historic Preservation Officer
Colorado Historical Society
1300 Broadway
Denver, CO 80203

SUBJECT: Additional Information Related to Eligibility and Effects, CDOT Project STA 402A-003, State Highway 402, US 287 to I-25

Dear Ms. Contiguglia:

In your correspondence dated March 30, 2006 regarding our findings of eligibility and effects for the project referenced above, you requested additional information for the following properties: Johnson Mountain View Farm (5LR11242), Sykes Property (5LR11246), Propp Farm (5LR11247), Kelly Farm West (5LR11250) and Kelly Farm East (5LR11251).

Johnson Mountain View Farm (5LR11242): You requested data related to (1) where the main house was moved from and a further description of the remaining historic setting within the site boundary; (2) if the site boundary was evaluated to determine if the open land is associated with the Johnson property and whether it can support the significance of agriculture for the entire property; and (3) a further explanation of the loss of contextual connections and evaluation of integrity under NRHP Criterion a.

1. Item #22 of the Historic Architectural Component Form states, "The house was relocated and remodeled in 1964, due to the construction of I-25." Therefore, the house was moved from its original historic setting within the I-25 right-of-way.

2. Item #11 of the Management Data Form, as well as an aerial map provided with the site documentation, indicates that open agricultural land is associated with this property. The site boundary as described and illustrated by the aerial graphic includes two parcels (PIN #8522000008 and #8522000017) both owned by Mountain View Farms, Inc. Thus, all the agricultural fields associated with the property are within the site boundary and have been evaluated to determine if they can support and convey the significance of agriculture.

3. The historical setting for the property within the site boundary was evaluated inclusive of all associated agricultural fields and was found to be not eligible under National Register Criterion a for agriculture, due to the following factors:

a. The main house originally sat within the current I-25 ROW and was moved to its current location in the past 45 years.
b. The current site boundary does not reflect the original boundary as a result of the presence of I-25 and its interchange with SH 402.

c. The site no longer functions in its original capacity as an owner-occupied farm; the domestic buildings are now rentals and absentee lessees farm the land. Key farm buildings (e.g., a barn) are not present.
d. The main house has been remodeled and three other buildings (B2, B4 and B5) have been modified. The construction of I-25 radically altered the setting of one shed (B3). B2 was once a milking parlor and is now vacant; B4, which was originally used for calving, is vacant; and the function of B5 is unknown. Thus, the functional integrity of buildings within the current site boundary has changed.
e. Six modern buildings and nine modern features are within the current site boundary. These buildings have altered the relationships of the original buildings with each other. The present setting and built environment represent the post I-25 period.

Sykes Property (5LR11246): You asked (1) if the agricultural field is historically associated with the Sykes property; (2) if the additions appear to be modern or occurred during the historic period for the house, and (3) if joining of the buildings occurred during the historic period for the farm.

1. The buildings within the site boundary and the open agricultural fields located behind them can no longer be clearly associated to the farm's period of historic significance. The Larimer County Assessor's records indicate that Mr. Sykes sub-divided the property in 2002 as follows: one ownership of 1.85 acres including the land that the main house sits on, a second ownership of 15.24 acres south of the house, and a third ownership of 2.3 acres of commercial land, for a combined total of 19.39 acres. Historically, the acreage of the Sykes property is nowhere near the average 250 to 400 acres for a typical Larimer County farm dating from the first half of the 20th century. Most farms in the area (e.g., the Weber Farm/ Farm/5LR10725) were generally more than 40 acres. Therefore, the acreage of the Sykes property is not generally considered large enough to constitute a historic 20th century Larimer County farm.

a. The Larimer County Assessor's records indicate a remodel of the main house (B1) in 1972 and construction of a warehouse on the parcel's eastern portion in 1997. Mr. Sykes, the current property owner, stated to the field historian that he moved the grain bin after the remodeling in 1972.
b. Mr. Sykes was not forthcoming in providing an exact date of the additions to the B4 complex. Based on general information on the remodeling, the joining of the buildings defining B4 occurred within the past 50 years.

Propp Farm (5LR11247): You inquired about (1) if the agricultural property was researched to determine if it was historically associated with the property; and (2) why 5LR11247 is not significant under Criterion a as an agricultural property.

1. Western Cultural Resource Management's (WCRM) search of records held by the Bureau of Land Management's (BLM) Government Land Office (GLO) indicate that agricultural lands have been historically associated with the property.

2. CDOT does not feel that the agricultural lands together with the remaining farmstead features (i.e., the main house, outbuildings and barn) have the potential to convey significance under Criterion "a" as the farmstead lacks many key buildings and structures, or many of the operational buildings are no longer present and their function has changed. On the Propp Farm, there is no longer a clear association between the surrounding agricultural fields and the remnant farm buildings. Although these lands are part of the same parcel, the farmlands were abandoned at some point and could now be classified as meadows. Finally, 5LR11247 is not a complete example of a Larimer County farm when compared to other properties in the project area previously determined by your office as NRHP eligible (i.e., 5LR10725 and

5LR11249). The use of "complete" in this context is defined as having key buildings and elements of the built environment from the historic period present and intact.

Kelly Farm West (5LR11250) and Kelly Farm East (5LR11251): You asked (1) why the Kelly Farm was broken into two sections, and questioned if the two farms should be evaluated as one property, as they might encompass a larger farm complex; (2) how both properties no longer represent a 20th-century Larimer County farm; and (3) what criteria were used to evaluate the property as to whether or not it is good example of a Larimer County farm.

1. According to a representative of the Kelly Farm Trust, the parcel has one owner (the Kelly Farm Trust), but is currently divided into three rentals. The farmlands are also rented and currently farmed by others. Based on a January 11, 2006 telephone discussion between WCRM and your office, it was determined that since 5LR11250 and 5LR11251 have one owner (Kelly Farm Trust) and they had been separate farms owned by two different families in the past, they should remain as two separate farms.

2. 5LR11250 no longer represents a 20th century Larimer County farm because the farmstead serves as a rental, and although some farm buildings remain, they no longer represent a working farm when compared to other farms in the area (e.g., Weber Farm East). Additionally, some key farm components, including operational buildings such as a barn, are no longer present.

3. There is currently no historic context for Larimer County agriculture. WCRM used the 1984 OAHP research document for the Colorado Plains, the Denver International Airport (DIA) Multiple Property Nomination, and History of Ranching in South Park Nomination form to establish criteria for what constitutes a "Colorado farm." There are Weld County studies that provide examples of eastern Colorado farms (i.e., *Mehls, Steven F. and Carol J., Reconnaissance and Intensive Survey and Context Report of Farming in Weld County, Colorado, Colorado Office of Archaeology and Historic Preservation, Colorado Historical Society, Denver, 1989*). These criteria include:

i. The presence of key buildings or structures or their archaeological remains that define them as an operating unit based on agricultural pursuits. These include domestic buildings (e.g., house, privy, etc.) and operational buildings (e.g., barns, silos, bins, corrals, pins, animal sheds, and poultry houses, etc.).

ii. Landscape features (e.g., fences, windbreaks, shade trees, kitchen garden, flowerbeds, shrubbery, etc.).

iii. Clearly associated farm fields.

iv. Occasional improvements (e.g., additional outbuildings and fencing, shelterbelts, irrigation systems, etc.).

We would also like to bring to your attention changes to the Cultural Resources Inventory and Management Data Form for 5LR11251. On page 16 of the Inventory under 5LR11251, the text reads, "The *site* covers approximately one-half an acre." It should say, "The *farmstead* covers approximately one-half an acre." Under Item #11 on the Management Data Form, the farm dimensions should be 389 meters by 366 meters with an area of 142,374 meters squared, or 35 acres. Please replace both sheets with the enclosed corrected versions.

We request your concurrence with the determinations of eligibility and effects outlined in our original letter, with the supporting documentation contained herein. Your response is necessary for the Federal Highway Administration's compliance with Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's regulations.

If you have questions regarding the information outlined above, please contact CDOT Senior Staff Historian Lisa Schoch at (303) 512-4258.

Very truly yours,

for Brad Beckham, Manager
Environmental Programs Branch

Enclosures

cc: Carol Parr, CDOT Region 4
Joanna Morsicato, J.F. Sato and Associates

COLORADO
HISTORICAL
SOCIETY

The Colorado History Museum 1300 Broadway Denver, Colorado 80203-2137

May 26, 2006

Brad Beckham
Manager, Environmental Programs Branch
Colorado Department of Transportation
Environmental Programs Branch
4201 East Arkansas Avenue
Denver, CO 80222

Re: State Highway 402, US 287 to I-25. (CHS #37440)

Dear Mr. Beckham,

Thank you for your additional information correspondence dated May 1, 2006 and received by our office on May 4, 2006 regarding the above-mentioned project.

After review of the submitted information, we do not concur with the findings of not eligible for the National Register of Historic Places for the resources listed below.

- 5LR.11242/Johnson Mountain View Farm
- 5LR.11247/Propp Farm.

We concur with the findings for the remaining resources addressed in the additional information correspondence.

In order to best address the issues regarding resources 5LR.11242 and 5LR.11247 we would like to request a meeting to with you and the consultant regarding these resources.

We request being involved in the consultation process with the local government, which as stipulated in 36 CFR 800.3 is required to be notified of the undertaking, and with other consulting parties. Additional information provided by the local government or consulting parties might cause our office to re-evaluate our eligibility and potential effect findings.

Please note that our compliance letter does not end the 30-day review period provided to other consulting parties. If we may be of further assistance, please contact Amy Pallante, our Section 106 Compliance Coordinator, at (303) 866-4678.

Sincerely,

Georgianna Contiguglia
State Historic Preservation Officer

MEMORANDUM

DEPARTMENT OF TRANSPORTATION

Environmental Programs Branch
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9259

DOT
DEPARTMENT OF TRANSPORTATION

July 17, 2006

Ms. Amy Pallante
Section 106 Compliance Coordinator
Colorado Historical Society/SHPO
1300 Broadway
Denver, CO 80203-2137

SUBJECT: SH 402 Revisions to Johnson Mountain View Farm (5LR11242) and Propp Farm (5LR11247)

Dear Ms. Pallante:

Enclosed is a revised addendum to a cultural resources inventory and updated site forms for two agricultural properties in State Highway (SH) 402 project area in Larimer County.

These materials are a response to your request for additional information for the Johnson Mountain Valley Farm (5LR11242) and Propp Farm properties (5LR11247) resulting from a meeting with your office on June 19. Please replace your copies of the forms for 5LR11242 and 5LR11247 with the enclosed forms. We also request that you replace the first page of the Management Data Form for Kelly Farm East (5LR11251 with the enclosed sheet. This change reflects a minor revision to the original form.

If you have questions or require additional information, please contact CDOT Assistant Staff Historian Bob Autobee at (303) 757-9758.

Sincerely,

Bob Autobee
Assistant Staff Historian-CDOT

COLORADO
HISTORICAL
SOCIETY

The Colorado History Museum 1300 Broadway Denver, Colorado 80203-2137

July 24, 2006

Brad Beckham
Manager, Environmental Programs Branch
Colorado Department of Transportation
Environmental Programs Branch
4201 East Arkansas Avenue
Denver, CO 80222

Re: State Highway 402, US 287 to I-25. (CHS #37440)

Dear Mr. Beckham,

Thank you for your additional information correspondence dated July 17, 2006 and received by our office on July 19, 2006 regarding the above-mentioned project.

After review of the submitted information, we concur with the findings of eligible for the National Register of Historic Places under National Register Criterion A for the resources listed below.

- 5LR.11242/Johnson Mountain View Farm
- 5LR.11247/Propp Farm.

In our opinion, the c.1925 barn (feature B3) associated with the Propp Farm/resource 5LR.11247 is individually significant under National Register Criterion C for architecture and retains historic integrity. According to the inventory form, the only change to the barn is the removal of some windows. In our opinion, the barn is a good representative example of a method and type of construction as a balloon-framed barn.

We request being involved in the consultation process with the local government, which as stipulated in 36 CFR 800.3 is required to be notified of the undertaking, and with other consulting parties. Additional information provided by the local government or consulting parties might cause our office to re-evaluate our eligibility and potential effect findings.

Please note that our compliance letter does not end the 30-day review period provided to other consulting parties. If we may be of further assistance, please contact Amy Pallante, our Section 106 Compliance Coordinator, at (303) 866-4678.

Sincerely,

Mark Wolfe

for Georgianna Contiguglia
State Historic Preservation Officer

JUL 2006
RECEIVED
Environmental
Programs

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Environmental Programs Branch
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9259

August 15, 2006

Mr. Greg George
Director of Community Services
Loveland Historic Preservation Commission
500 East Third
Loveland, CO 80537

SUBJECT: Additional Effects Determinations and *Section 4(f) De Minimis* Notification, CDOT Project STA 402A-003, State Highway 402 from US 287 to I-25, Larimer County

Dear Mr. George:

This letter and enclosed materials constitutes a request for comment on the project referenced above, which involves improvements to State Highway 402 from US 287 east to Interstate 25 in Larimer County. This request is a follow-up to the State Historic Preservation Officer's (SHPO) July 24, 2006 eligibility concurrence for the Johnson Mountain View Farm (5LR11242) and the Propp Farm (5LR11247). This letter also includes notification of Section 4(f) *de minimis* findings for these two historic properties associated with this project.

EFFECTS DETERMINATIONS

Mountain View Farm (5LR11242): The project will taper SH 402 from four to two lanes at the Interstate 25 interchange adjacent to the Mountain View Farm. The additional proposed right-of-way for SH 402 is 35 feet wide and 1935 feet long. Potential physical improvements will generally remain south of the farm's existing fence line. The shoulder for the expanded SH 402 will end at the current fence; however, fill slopes associated with the construction will intrude further to the north. Possible impacts to features associated with the farm within the expanded right-of-way include: loss of a recently constructed feedlot, location adjacent to the front of the calving shed and loss of a bank of weedy species trees located in front of the house. The field survey revealed an unkempt, dense growth of elms, sumac and juniper. These trees likely planted after the relocation of the house during 1960s and currently provide a visual barrier between the house and SH 402. They do not appear to have been a part of the original historic setting. CDOT has determined there will be *no adverse effect* to 5LR11242 resulting from this project.

Propp Farm (5LR11247): Expansion of SH 402 will move the road's alignment to the north. The only impact to the farm site will be the acquisition of a 25-foot wide by 410-foot long permanent utility easement along the front of the property. Except for the possible loss of several trees associated with placing utilities underground, there will be no other impacts to the Propp Farmstead. The utility poles are currently located in an easement along the front of the property. The trees date from the 1960s and are not part of the historic landscape. CDOT has determined that the project will result in *no adverse effect* to the Propp Farm (5LR11247).

In correspondence dated June 29, 2005, the SHPO concurred that the following properties within the project area are *not eligible*:

- 1,775-foot segment of Home Supply Ditch (5LR1709.2)
- Bentley House (5LR10724)
- Rak Property (5LR11243)
- Adel Property (5LR11244)
- Landers Property (5LR11245)
- Sykes Property (5LR11246)
- Woodridge Property (5LR11248)
- Kelly Farm West (5LR11250)
- Kelly Farm East (5LR11251)
- Lopp Property (5LR11252)
- Bechtel Property (5LR11253)
- 1,250-foot segment of Conner Ditch (5LR11254.1)
- Olson Rental Property (5LR11255)

Notification of Section 4(f) De Minimis Determination

Based on the SHPO's July 24 correspondence, this project will have *no adverse effect* to the NRHP-*eligible* Mountain View Farm (5LR11242) and the Propp Farm (5LR11247). A copy of this concurrence is included with this submission. We recommend there will be *no adverse effect* to these resources resulting from this project. Based on the no adverse effect findings, FHWA intends to make a *de minimis* finding for the Section 4(f) requirements for these historic sites.

As a local governmental organization with a potential interest in this project, we welcome your comments regarding our determination of eligibility. Should you elect to respond, we request that you do so within 30 days of receipt of this letter. If you have questions or require additional information, please contact CDOT Assistant Staff Historian Robert Autobee at (303) 757-9758.

Very truly yours,

Brad Beckham, Manager
Environmental Programs Branch

Enclosures

cc: Carol Parr, CDOT Region 4
Joanna Morsicato, J.F. Sato and Associates

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Environmental Programs Branch
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9259

DOT
DEPARTMENT OF TRANSPORTATION

August 15, 2006

Ms. Georgianna Contiguglia
State Historic Preservation Officer
Colorado Historical Society
1300 Broadway
Denver, CO 80203

SUBJECT: Additional Effects Determinations and *Section 4(f) De Minimis* Notification, CDOT Project STA 402A-003, State Highway 402 from US 287 to I-25, Larimer County

Dear Ms. Contiguglia:

This letter and enclosed materials constitutes a request for concurrence on effects for the project referenced above, which involves improvements to State Highway 402 from US 287 east to Interstate 25 in Larimer County. This request is a follow-up to your July 24, 2006 eligibility concurrence for the Johnson Mountain View Farm (5LR11242) and the Propp Farm (5LR11247). This letter also includes notification of Section 4(f) *de minimis* findings for these two historic properties associated with this project.

EFFECTS DETERMINATIONS

Mountain View Farm (5LR11242): The project will taper SH 402 from four to two lanes at the Interstate 25 interchange adjacent to the Mountain View Farm. The additional proposed right-of-way for SH 402 is 35 feet wide and 1935 feet long. Potential physical improvements will generally remain south of the farm's existing fence line. The shoulder for the expanded SH 402 will end at the current fence; however, fill slopes associated with the construction will intrude further to the north. Possible impacts to features associated with the farm within the expanded right-of-way include: loss of a recently constructed feedlot, location adjacent to the front of the calving shed and loss of a bank of weedy species trees located in front of the house. The field survey revealed an unkempt, dense growth of elms, sumac and juniper. These trees likely planted after the relocation of the house during 1960s and currently provide a visual barrier between the house and SH 402. They do not appear to have been a part of the original historic setting. CDOT has determined there will be *no adverse effect* to 5LR11242 resulting from this project.

Propp Farm (5LR11247): Expansion of SH 402 will move the road's alignment to the north. The only impact to the farm site will be the acquisition of a 25-foot wide by 410-foot long permanent utility easement along the front of the property. Except for the possible loss of several trees associated with placing utilities underground, there will be no other impacts to the Propp Farmstead. The utility poles are currently located in an easement along the front of the property. The trees date from the 1960s and are not part of the historic landscape. CDOT has determined that the project will result in *no adverse effect* to the Propp Farm (5LR11247).

In correspondence dated June 29, 2005, your office concurred that the following properties within the project area are *not eligible*:

- 1,775-foot segment of Home Supply Ditch (5LR1709.2)
- Bentley House (5LR10724)
- Rak Property (5LR11243)
- Adel Property (5LR11244)
- Landers Property (5LR11245)
- Sykes Property (5LR11246)
- Woodridge Property (5LR11248)
- Kelly Farm West (5LR11250)
- Kelly Farm East (5LR11251)
- Lopp Property (5LR11252)
- Bechtel Property (5LR11253)
- 1,250-foot segment of Conner Ditch (5LR11254.1)
- Olson Rental Property (5LR11255)

Notification of Section 4(f) De Minimis Determination

On March 13, 2006, CDOT issued a letter of notification to your office of a Section 4(f) *de minimis* determination for two other properties in the project area – the Weber Farm East (5LR11249) and the Big Thompson Manufacturing Ditch (5LR10726). Based on your July 24 correspondence, this project will have *no adverse effect* to the NRHP-*eligible* Mountain View Farm (5LR11242) and the Propp Farm (5LR11247). A copy of this concurrence is included with this submission. We recommend there will be *no adverse effect* to these resources resulting from this project. Based on the no adverse effect findings, FHWA intends to make a *de minimis* finding for the Section 4(f) requirements for these historic sites.

We hereby request your concurrence with the determinations of eligibility and effects outlined herein and in the enclosed report. Your response is necessary for the Federal Highway Administration's compliance with Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's regulations. This information has also been sent to the City of Loveland's Long Range Planning Office for review and comment. We will forward their response to you once we receive it.

If you require additional information, please contact CDOT Assistant Staff Historian Robert Autobee at (303) 757-9758.

Very truly yours,

Brad Beckham, Manager
Environmental Programs Branch

Enclosures

cc: Carol Parr, CDOT Region 4
Joanna Morsicato, J.F. Sato and Associates

COLORADO
HISTORICAL
SOCIETY

The Colorado History Museum 1300 Broadway Denver, Colorado 80203-2137

August 22, 2006

Brad Beckham
Manager, Environmental Programs Branch
Colorado Department of Transportation
Environmental Programs Branch
4201 East Arkansas Avenue
Denver, CO 80222

Re: State Highway 402, US 287 to I-25. (CHS #37440)

Dear Mr. Beckham,

Thank you for your additional information correspondence dated August 15, 2006 and received by our office on August 16, 2006 regarding the above-mentioned project. After review of the submitted information, we concur with the finding of effects for 5LR.11242/Mountain View Farm and 5LR.11247/Propp Farm.

If unidentified archaeological resources are discovered during construction, work must be interrupted until the resources have been evaluated in terms of the National Register criteria, 36 CRF 60.4, in consultation with this office.

We request being involved in the consultation process with the local government, which as stipulated in 36 CFR 800.3 is required to be notified of the undertaking, and with other consulting parties. Additional information provided by the local government or consulting parties might cause our office to re-evaluate our eligibility and potential effect findings.

Please note that our compliance letter does not end the 30-day review period provided to other consulting parties. If we may be of further assistance, please contact Amy Pallante, our Section 106 Compliance Coordinator, at (303) 866-4678.

Sincerely,

Mark Wolfe

for Georgianna Contiguglia
State Historic Preservation Officer

COLORADO
HISTORICAL
SOCIETY

The Colorado History Museum 1300 Broadway Denver, Colorado 80203-2137

September 13, 2006

Brad Beckham
Manager, Environmental Programs Branch
Colorado Department of Transportation
Environmental Programs Branch
4201 East Arkansas Avenue
Denver, CO 80222

Re: State Highway 402, US 287 to I-25. (CHS #37440)

Dear Mr. Beckham,

On September 7, 2006, our office received an email from your staff requesting additional information regarding the above-mentioned project.

After review of the project files and information provided, we concur with the proposed finding of *no adverse effect* under the National Historic Preservation Act for resources 5LR.11249/Weber Farm East and 5LR.10726/Big Thompson Manufacturing Ditch.

If unidentified archaeological resources are discovered during construction, work must be interrupted until the resources have been evaluated in terms of the National Register criteria, 36 CRF 60.4, in consultation with this office.

We request being involved in the consultation process with the local government, which as stipulated in 36 CFR 800.3 is required to be notified of the undertaking, and with other consulting parties. Additional information provided by the local government or consulting parties might cause our office to re-evaluate our eligibility and potential effect findings.

Please note that our compliance letter does not end the 30-day review period provided to other consulting parties. If we may be of further assistance, please contact Amy Pallante, our Section 106 Compliance Coordinator, at (303) 866-4678.

Sincerely,

Mark Wolfe

for Georgianna Contiguglia
State Historic Preservation Officer

U.S. Department of Transportation
Federal Highway Administration

12300 W. Dakota Ave., Ste. 180
Lakewood, CO 80228

October 19, 2006

Colorado Federal Aid Division

Ms. Carol Legard
Advisory Council on Historic Preservation
1100 Pennsylvania Avenue, NW
Washington, DC 20004

Dear Ms. Legard:

Subject: Documentation for Finding of Adverse Effect, Colorado Department of Transportation Project STA 402A-003, Weber Farm/State Highway 402, Larimer County, Colorado

Transmitted herewith is the Documentation for Finding of Adverse Effect for the Colorado Department of Transportation (CDOT) project referenced above. The Federal Highway Administration (FHWA) and the Colorado State Historic Preservation Officer (SHPO) have agreed that the proposed undertaking will have an Adverse Effect on the Weber Farm (5LR10725), which was determined eligible for listing on the National Register of Historic Places in August 2005.

FHWA is submitting this Documentation for Finding of Adverse Effect pursuant to the Advisory Council regulations, 36 CFR 800.6(a)(1). In accordance with the process set forth in the regulations, mitigation measures have been agreed upon with the SHPO and are outlined in the request for concurrence of effects (Attachment C of the Documentation). Please respond if the Council would like to participate in the consultation between the agencies and the SHPO. If the Council does not respond within 15 days of this request, the agency, in accordance with 36 CFR 800.6(a)(1)(c)(iv), will assume that the Council will not be participating.

If you have questions regarding this project, please contact CDOT Senior Staff Historian Lisa Schoch at (303) 512-4258.

Sincerely yours,

Melinda Castillo
for David A. Nicol, P.E.
Division Administrator

Enclosure: Copy of Documentation of Adverse Effect for CDOT Project STA 402A-003)
cc: Mr. Brad Beckham, Manager Environmental Programs Branch, CDOT
Ms. Lisa Schoch, Environmental Programs Branch, CDOT
Ms. Karla Harding, Region 4 Transportation Director, CDOT
(Attn: Mr. Stan Elmquist, Region Planning & Environmental Manager)
yc: SA 12509/F:mcastillo/Division-ACHP SH 402 letter.

BUCKLE UP AMERICA

MEMORANDUM OF AGREEMENT
BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION
AND THE COLORADO STATE HISTORIC PRESERVATION OFFICER
REGARDING THE WEBER FARM (5LR10725)

COLORADO DEPARTMENT OF TRANSPORTATION PROJECT STA 402A-003, LARIMER COUNTY, COLORADO

WHEREAS, the Federal Highway Administration (FHWA) has determined that Project STA 402A-003 will have an adverse effect on the Weber Farm (5LR10725), which is eligible for listing on the National Register of Historic Places. FHWA has consulted with the Colorado State Historic Preservation Officer (SHPO) pursuant to 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. Section 470f); and

WHEREAS, FHWA has consulted with the Colorado Department of Transportation (CDOT) regarding the effects of the undertaking on historic properties and has invited CDOT to sign this MOA as an invited signatory; and

WHEREAS, in accordance with 36 CFR 800.6(a)(1), FHWA has notified the Advisory Council on Historic Preservation (Council) of its adverse effect determination with specified documentation, and the Council has elected not to participate in the consultation pursuant to 36 CFR 800.6(a)(1)(iii); and

WHEREAS, the historic property that will be affected by the MOA is:

Weber Farm (5LR10725): The Weber Farm and associated farmlands comprise 80 acres. In August 2005, the farm was determined eligible for the NRHP under Criterion A for its association with early 20th century farming in Larimer County. The buildings within the Weber farm complex also display enough integrity to illustrate the importance of small farms during this period and therefore are also eligible under NRHP Criterion C.

NOW, THEREFORE, FHWA and the Colorado SHPO agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

STIPULATIONS

The FHWA shall ensure that the following measures are carried out:

I. MITIGATION

The Weber Farm will be recorded prior to the demolition of the main house and chicken brooder so that there will be a permanent record of its history and present appearance. All documentation must be accepted by the SHPO before construction.

A. ARCHIVAL DOCUMENTATION

CDOT shall ensure that the Weber Farm is documented in accordance with the guidance for Level II documentation found in OAHP Form #1595, *Historical Resource Documentation: Standards for Level I, II, III Documentation*. CDOT shall consult with the SHPO to determine appropriate Level II recordation measures.

1.) CDOT shall ensure that all documentation activities will be performed or directly supervised by architects, historians, photographers and/or other professionals meeting the minimum qualifications in their field as specified in the Secretary of Interior's Professional Qualifications Standards (36 CFR 61, Appendix A).

2.) CDOT shall provide originals of all records resulting from the documentation to the SHPO and a local library or archive designated by the SHPO.

II. DURATION

This agreement will be null and void if its terms are not carried out within five (5) years from the date of its execution. Prior to such time, FHWA may consult with the other signatories to reconsider the terms of the agreement and amend it in accordance with Stipulation IV below.

III. MONITORING AND REPORTING

Each year following the execution of this agreement until it expires or is terminated, FHWA shall provide all parties to this agreement a summary report detailing work undertaken pursuant to its terms. Such report shall include any scheduling changes proposed, any problems encountered, and any disputes and/or objections received in FHWA's efforts to carry out the terms of this agreement. Failure to provide such summary report may be considered noncompliance with the terms of this MOA pursuant to Stipulation V, below.

IV. DISPUTE RESOLUTION

Should any party to this agreement object at any time to actions proposed or the manner in which the terms of this MOA are implemented, FHWA shall consult with the objecting party(ies) to resolve the objection. If FHWA determines, within 30 days, that such objection(s) cannot be resolved, FHWA will:

A. Forward all documentation relevant to the dispute to the Council in accordance with 36 CFR 800.2(b)(2). Upon receipt of adequate documentation, the Council shall review and advise FHWA on the resolution of the objection within 30 days. Any comment provided by the Council, and all comments from the parties to the MOA, will be taken into account by FHWA in reaching a final decision regarding the dispute.

B. If the Council does not provide comments regarding the dispute within 30 days after receipt of adequate documentation, FHWA may render a decision regarding the dispute. In reaching its decision, FHWA will take into account all comments regarding the dispute from the parties to the MOA.

C. FHWA's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged. FHWA will notify all parties of its decision in writing before implementing that portion of the Undertaking subject to dispute under this stipulation. FHWA's decision will be final.

V. AMENDMENTS AND NONCOMPLIANCE

If any signatory to this MOA, including any invited signatory, determines that its terms will not or cannot be carried out or that an amendment to its terms must be made, that party shall immediately consult with the other parties to develop an amendment to this MOA pursuant to 36 CFR 800.6(c)(7) and 800.6(c)(8).

The amendment will be effective on the date a copy signed by all of the original signatories is filed with the Council. If the signatories cannot agree to appropriate terms to amend the MOA, any signatory may terminate the agreement in accordance with Stipulation VI, below.

VI. TERMINATION

If the MOA is not amended following the consultation set out in Stipulation IV above, it may be terminated by any signatory or invited signatory. Within 30 days following termination, the FHWA shall notify the signatories if it will initiate consultation to execute an MOA with the signatories under 36 CFR 800.6(c)(1) or request the comments of the Council under 36 CFR 800.7(a) and proceed accordingly.

Execution of this Memorandum of Agreement by FHWA and Colorado SHPO and the submission of documentation and filing of this document with the Council pursuant to 36 CFR 800.6(b)(1)(iv) prior to FHWA's approval of this undertaking, and implementation of its terms evidence that FHWA has taken into account the effects of this undertaking on historic properties and afforded the Council an opportunity to comment.

SIGNATORIES:

Federal Highway Administration

Michael E Vandehoef — 2-9-07

for David Nicol, P.E., Division Administrator — Date

Colorado State Historic Preservation Officer

Mark Wolfe — 1/23/07

for Georgianna Contiguglia, SHPO — Date

INVITED SIGNATORY:

Colorado Department of Transportation

Jennifer Finch — 1/07/07

for Tom Norton, Executive Director — Date

COLORADO
HISTORICAL
SOCIETY

The Colorado History Museum 1300 Broadway Denver, Colorado 80203-2137

May 7, 2007

Brad Beckham
Manager, Environmental Programs Branch
Colorado Department of Transportation
Environmental Programs Branch
4201 East Arkansas Avenue
Denver, CO 80222

Re: CDOT Project STA 402A-003, State Highway 402 EA, Level II Documentation, Weber Farm. (CHS #37440)

Dear Mr. Beckham,

Thank you for your correspondence dated April 24, 2007 and received by our office on April 26, 2007 regarding the above-mentioned project. After review of the submitted information, we have determined that the documentation meets the Level II requirements.

If we may be of further assistance, please contact Amy Pallante, our Section 106 Compliance Coordinator, at (303) 866-4678.

Sincerely,

Mark Wolfe

For Georgianna Contiguglia
State Historic Preservation Officer

MEMORANDUM

DEPARTMENT OF TRANSPORTATION

4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9011

TO: Carol Parr, Region 3

FROM: Robert Autobee, Staff Historian, Environmental Programs Branch

DATE: May 14, 2007

RE: Historic Clearance — State Highway 402, Level II Documentation, Project STA 402A-003, State Highway 402 EA, Larimer County SA 12509

On May 7, 2007, the State Historic Preservation Officer (SHPO) accepted this office's Level II Documentation of the Weber Farm (5LR10725). There will be an adverse effect to two buildings associated with the farm resulting from improvements to State Highway 402. Attached is a copy of the SHPO's acceptance letter.

The SHPO's decision confirms that CDOT complies with both Section 106 and HABS/HAER Level II Documentation of this historic resource. In November 2006, the Federal Highways Administration (FHWA) concurred with our findings of 4(f) *de minimis* for four other resources associated with this project. The SHPO's concurrence on the Level II documentation means that your office is cleared to proceed with the project. If you have any further questions regarding this process, please contact me at (303) 757-9758.

cc: File/CF

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Environmental Programs Branch
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9259

DOT
DEPARTMENT OF TRANSPORTATION

September 29, 2006

Mr. David A. Nicol, PE
Division Administrator
FHWA - Colorado Division
12300 W. Dakota Avenue, Suite 180
Lakewood, CO 80228

SUBJECT: Finding of Section 4(f) *De Minimis* Impact, Project STA 402A-003, State Highway 402 from US 287 to I-25, Larimer County

Dear Mr. Nicol:

This letter and the attached materials constitute a request for review and concurrence on a finding of *de minimis* impact for the project referenced above, which will improve mobility and safety along four miles of State Highway 402 from US Highway 287 east to I-25 in Larimer County. Four sites in the project area have been determined eligible for listing on the National Register of Historic Places: the Big Thompson Manufacturing Ditch (5LR10726), Weber Farm East (5LR11249); Johnson Mountain View Farm (5LR11242) and Propp Farm (5LR11247).

Project Effects

1) **Big Thompson Manufacturing Ditch (5LR10726):** In the project corridor the ditch is piped underneath SH 402. The project will expand the roadway from two lanes totaling 32 feet in width, to four lanes, a 16-foot median, shoulders, bike lanes and slopes for a total width of 108 feet. The widening will add an extra 76 feet to the existing pipe, which will result in *no adverse effect* to the overall Big Thompson Manufacturing Ditch.

2) **Weber Farm East (5LR11249):** The only impacts to the farm site are the acquisition of a 25-foot permanent utility easement along the front of the property. Except for the loss of a cottonwood tree, which is not considered part of the property's historic landscape, the project will not affect any physical features. Currently, utility poles and an existing easement are in front of the property. CDOT has determined that the project will result in *no adverse effect* to Weber Farm East.

3) **Mountain View Farm (5LR11242):** The project will taper SH 402 from four to two lanes at the I-25 interchange adjacent to the Mountain View Farm. The additional proposed right-of-way for SH 402 is 35 feet wide and 1,935 feet long. Potential physical improvements will remain south of the farm's existing fence line. The shoulder for the expanded SH 402 will end at the current fence; however, fill slopes associated with the construction will intrude further to the north. Possible impacts to the features associated with the farm within the expanded right-of-way include the potential loss of a bank of weedy species trees located at the front of the house within the historic boundary. CDOT has determined that the project will result in *no adverse effect* to the Mountain View Farm.

4) **Propp Farm (5LR11247):** Construction of SH 402 will move the road's alignment to the north. The lone impact to the farm site is the acquisition of a 25-foot wide by 410-foot long permanent utility easement along the front of the property. Except for the possible loss of several trees first planted in the 1960s, there are no planned impacts to the Propp Farmstead. CDOT has determined that the project will result in *no adverse effect*.

Finding of *De Minimis* Impact

The initial Section 106 consultation with the SHPO on eligibility determinations took place in November 2004, with additional information submitted in May 2005. In March 2006, CDOT again provided additional information to the SHPO regarding expansion of the Area of Potential Effects (APE), effects determinations and notification of Section 4(f) *de minimis* findings. In correspondence dated March 30 and September 13, 2006, the SHPO concurred with CDOT's determination that the project would result in no *adverse effect* to the four sites listed above. In correspondence dated March 10, 2006 and August 15, 2006, the Loveland Historic Preservation Commission was afforded an opportunity to comment on the Section 106 findings and was notified of the intent to make a *de minimis* finding for this historic resource. We did not receive a response from the Commission on either of these requests within the 30-day review period. Copies of the pertinent Section 106 correspondence are attached for your review.

Based on the information presented above and on the attached documentation, the effects of the project on the historic properties noted above constitute a *de minimis* impact and the requirements of 23 USC 138 and 49 USC 303 have been satisfied. This finding is considered valid unless new information is obtained or the proposed effects change to the extent that consultation under Section 106 must be reinitiated.

If you concur with this finding, please sign below. If you have questions about the project or the findings, please contact CDOT Assistant Staff Historian Bob Autobee at (303)757-9758.

Very truly yours,

for Brad Beckham, Manager
Environmental Programs Branch

Enclosures: Section 106 correspondence
Site forms
Plan sheets

cc: Carol Parr, Region 4
File/CF/RF

I concur: _____ 11/15/06
(date)

for David A. Nicol, PE
Administrator, Colorado Division
Federal Highway Administration

Appendix B

Wetland Finding Report

Appendix B
Wetland Finding Report
State Highway 402 from US 287 East to the I-25 Interchange
Environmental Assessment
CDOT Project Number STA 402A-003
Larimer County, Colorado

Appendix B. Wetland Finding Report State Highway 402 from US 287 East to the I-25 Interchange Environmental Assessment CDOT Project Number STA 402A-003 Larimer County, Colorado

B.1 Introduction

This wetland finding report has been written in compliance with Executive Order (EO) 11990, *Protection of Wetlands*, and in accordance with 23 CFR 771, 23 CFR 777, and Technical Advisory T6640.8A. These publications mandate that wetlands be avoided wherever possible and impacts minimized to the extent practicable for highway projects. The project (Preferred Alternative) consists of widening a 4-mile segment of State Highway 402 (SH 402) between United States Highway 287 (US 287) and Interstate 25 (I-25) from two lanes to four lanes to improve safety and mobility. SH 402 is located on the east side of Loveland, Colorado, in Larimer County. This wetland finding is part of an Environmental Assessment (EA).

Wetlands and other waters of the US are regulated under Section 404 of the Clean Water Act (CWA) and administered by the US Army Corps of Engineers (USCOE). Regulation is limited to jurisdictional areas defined by USCOE CFR 33, Section 323 guidelines (USCOE-DoD 1996). Past litigation (*Solid Waste Agency of Northern Cook County [SWANCC] versus US Army Corps of Engineers*, No. 99-1178 [January 9, 2001]) has limited jurisdictional wetlands to wetlands that are contiguous with or connected by surface water flow to waters of the US or other navigable waters or their tributaries. Permitting or reporting may be required for any dredge or fill activities that affect these USCOE jurisdictional areas. EO 11990 requires that federal agencies "take action to minimize the destruction, loss or degradation of wetlands."

No exclusion of isolated wetlands is indicated in EO 11990. Further guidance by Federal Highway Administration (FHWA) regulations (CFR 23 Sections 771 and 777) and FHWA Technical Advisory T6640.8A (Section V, G, 12) direct that impacts on wetlands be avoided wherever possible and minimized to the extent practicable for highway construction projects. The Colorado Department of Transportation (CDOT) requires mitigation for all wetlands, including nonjurisdictional wetlands. Proposed legislation (February 27, 2003) that would restore the isolated wetlands to federal jurisdiction has been submitted to the US Senate (S-473) and the US House of Representatives (HR-962).

B.2 Project Background

State Highway 402 (SH 402) is a heavily used two-lane, east-west arterial connecting United States Highway 287 (US 287, also known as Lincoln Avenue) and Interstate 25 (I-25).[1] This 4-mile highway is located south of the city of Loveland in Larimer County, Colorado. SH 402 serves local residents and businesses, and is used as a commuter route to I-25. This Environmental Assessment (EA) encompasses

[1] Subsequent to the 2004 action resulting in this Wetland Finding Report, the area between US 287 and CR 13C is being widened to a four-lane highway by developers in coordination with the city of Loveland and CDOT CDOT under a Categorical Exclusion, dated September 18, 2003, so as not to preclude other potential improvements to the roadway. No wetlands were identified in the area between US 287 and CR 13C, thus no changes were made to this report.

the entire 4-mile length of SH 402. Access to a carpool lot (approximately 88 spaces) located at the southwest quadrant of the SH 402 and I-25 interchange was included as a part of this study. Potential improvements at the I-25 interchange are being addressed under the current *North I-25 Environmental Impact Statement*.

This EA was undertaken to investigate mobility and safety improvements along this corridor. Analysis included assessment of both current travel conditions and projections for 2030 in order to identify and address both current and future needs.

B.3 Project Location

The corridor for the proposed project extends along SH 402 from the US 287 interchange east to I-25 in Loveland, Colorado. The study area is almost entirely on the Loveland 7.5-minute United States Geological Survey (USGS) quadrangle map, with a small eastern portion (0.3 mile) on the Windsor quadrangle map. Legal location is T5N, R69W, Sections 24, 25; R68W, Sections 19, 20, 21, 22, 27, 28, 29, 30 (Figure B-1). Elevation in the corridor ranges from about 4,932 to 4,969 feet above mean sea level.

B.4 Project Description

The proposed SH 402 improvements would widen the existing two-lane highway to four lanes. Because the eastern and western parts of the corridor have different designations and characteristics, two different highway templates were considered:

- an urban cross section from US 287 east to CR 13C with a 150-foot right-of-way
- a rural cross section from CR 13C east to the I-25 interchange with a 135- to 150-foot right-of-way

An urban cross-section has been developed from US 287 east to CR 13C. The design includes:

- 150-foot right-of-way
- 18 to 26 feet set aside for a raised median and left turn lane in the center of the highway
- four 12-foot general-purpose travel lanes (two in each direction)
- two 7-foot bike lanes (one in each direction)
- two 12-foot auxiliary lanes (one in each direction)
- two 6-foot sidewalks separated from the highway by approximately 10 feet (where space permits)
- curb and gutter
- 25-foot utility corridor easement along the south side of the highway

The rural cross section is from CR 13C east to the I-25 interchange. The design features include:

- 135- to 150-foot right-of-way
- four 12-foot general-purpose travel lanes (two in each direction)
- 16-foot painted median that serves as a continuous left turn lane
- two 10-foot shoulders that include a 7-foot bike lane separated from the highway by 3 feet
- 25-foot utility corridor easement on the south side of the highway

B.5 Project Alternatives

The SH 402 project was developed to address mobility and safety concerns about the current highway, including lack of left turn lanes (causing traffic backups behind turning vehicles); unsafe conditions for car breakdowns, pedestrians, and bicyclists because of narrow road shoulders; and uncontrolled access points on the existing highway. The following four action alternatives, along with the No Action Alternative, were studied:

- #1 Hold Centerline: holding the current centerline and widening on both the north and south sides
- #2 Hold North Edge of Right-of-Way: holding the north edge of the right-of-way and widening on the south side
- #3 Hold South Edge of Pavement: holding the south edge of the pavement and widening on the north side
- #4 Meander Alternative: creating a meandering alignment to avoid sensitive sites

The Meander Alternative was identified as the Preferred Alternative because it minimizes impacts on the human and natural environments.

B.6 Wetland Considerations

Section 404 (b)(1) of the CWA provides guidelines to protect aquatic ecosystems, including the precept that dredged or fill material should not be discharged into aquatic ecosystems unless it can be demonstrated that such discharges would not have unacceptable adverse impacts either individually or in combination with known and/or probable impacts of other activities on the aquatic ecosystems of concern. Therefore, no such discharge shall be permitted if a practicable alternative to the preferred action would have less impact on aquatic ecosystems. Part of the screening criteria for alternatives included impacts on wetlands and other waters of the US.

Because most wetlands in the study area are close to the current roadway alignment, total avoidance would not be possible. However, avoiding wetlands to the greatest extent possible in some parts of the project corridor meant that residences would be impacted. To avoid such impacts to the greatest extent possible, the Meander Alternative was identified as the most practicable (and Preferred) alternative.

B.7 Wetlands

Wetland delineations were conducted in accordance with 1987 USCOE guidelines by Loren Hettinger (J.F. Sato and Associates) on August 24 and 25, 2001; October 25, 2001; and March 13, 2003. USCOE and CDOT Region 4 staff inspected wetland delineations on May 19, 2004. A letter regarding concurrence with USCOE on the delineations and mapping is included as Appendix B2 (June 1, 2004).

The study area is part of the plains zone (Weber and Wittmann 2001), but most of the area has been converted to irrigated crop production or residential and commercial developments. The most valuable native habitat that remains in the study area is the riparian or streamside habitat. Dominant native plant species in riparian habitats include peach-leaved willow (*Salix amygdaloides*), sandbar willow (*S. exigua*), plains cottonwood (*Populus deltoides* ssp. *monilifera*), showy milkweed (*Asclepias speciosa*), and Emory sedge (*Carex emoryi*). Native upland prairie plants remain in several lowland pastures toward the eastern end of the study area and include fringed sage (*Artemisia frigida*), Canada wild rye (*Elymus canadensis*),

sand dropseed (*Sporobolus cryptandra*), wild sunflower (*Helianthus annuus*), and rubber rabbitbrush (*Chrysothamnus nauseosus*).

Wetlands were identified and mapped using aerial photograph interpretation and information collected in field surveys when data were obtained to determine wetland boundaries. Aerial photography used for initial wetland identification and to assist with delineations included color photography obtained in 2001 with a 2-foot-pixel resolution and gray-scale photography obtained in 2002 with a 0.5-foot-pixel resolution. Wetlands were mapped in an area approximately 1,600 feet on either side of SH 402. The project location showing the road footprint and wetlands identified are indicated in Figure B-2 through Figure B-5. Field data consisted of recording information on the vegetation, soils, and hydrology of areas that appeared to contain wetland features (see Appendix B1). The type of data taken and methods followed 1987 USCOE delineation guidelines as noted.

Wetlands in the study area consist of Palustrine Emergent Persistent (PEMP) as defined by Cowardin et al. (1979) and one area of Palustrine Forested/Emergent Persistent (PFO/EMP) that occurs along the Big Thompson River (see Figure B-2 through Figure B-5).

The diagnostic plant species of the wetlands in this area included a relatively wide range, depending on site hydrology and using the indicator status developed by Reed (1988).

Legend for all wetland indicator categories (Reed 1988):

UPL	Upland	Occurs in upland sites, 99 percent probability
FACU	Facultative Upland	Occurs in nonwetland sites, 67 to 99 percent probability
FAC	Facultative	Equal probability of occurring in wetland and upland sites
FACW	Facultative Wetland	Occurs in wetlands, 67 to 99 percent probability
OBL	Obligate Wetland	Almost always occurs in wetlands, 99 percent probability
+		Frequency toward the higher end of the probability category
ND	No Designation	No designation

Site 1. This site was initially delineated as a wetland, but subsequent field inspections with Terry McKee of USCOE (May 19, 2004) indicated that hydrology is insufficient to support wetland conditions (see Appendix B2, USCOE letter).

Site 2. This site is located on the Sandra Sparks Olsen Trust property 1.5 miles west of I-25 (see Photograph B-1). Land use includes a livestock-hog farm operation and residence. A cattail marsh is located on the west side of the farm buildings in an old meander channel south of the Big Thompson River on the north side of SH 402. A pond that is located approximately 0.25 mile northwest of SH 402 along the drainage is probably man-made and surrounded by Russian-olive trees. This wetland is classified as Palustrine Emergent (PEM).

Vegetation	Broad-leaved cattail (*Typha latifolia*) – OBL Showy milkweed (*Asclepias speciosa*) – FAC Willowherb (*Epilobium hornemannii*) – FACW Watercress (*Nasturtium officinale*) – OBL Rabbitfootgrass (*Polypogon monspeliensis*) – OBL Spikerush (*Eleocharis palustris*) – OBL Peach-leaved willow (*Salix amygdaloides*) – OBL Russian-olive (*Elaeagnus angustifolia*) – ND
Hydrology	Saturated soils, water table at surface or above in center of the swale.
Soils	Mucky, saturated silt. Dark gray (Munsell 1992 Color Charts; 10 YR 4/1) 4 to 12 inches, black (10 YR 2/1) > 12 inches.
Functions	Groundwater recharge, floodflow alteration, sediment/toxicant retention, production export, wildlife diversity.

Photograph B-1. Looking southwest over Site 2; SH 402 in the distance

Site 3. This site is located approximately 30 yards west of Site 2 (see Photograph B-2). It is a higher terrace of the old meander channel and contains wetlands of wiregrass/Baltic rush and giant wild rye. This wetland is classified as PEM.

Vegetation	Giant wild rye (*Leymus cinereus*) – UPL Longstyle rush (*Juncus longistylis*) – FACW Baltic rush (*Juncus arcticus*) – FACW Showy milkweed (*Asclepias speciosa*) – FAC
Hydrology	Sandy deposits on soil. Likely high water table in spring.
Soils	Brown (7.5 YR 4/3) loamy sand to 4 inches depth, brown sandy silt matrix with frequent reddish-yellow (7.5 YR 6/8) mottles from 4 to 12 inches.
Functions	Groundwater recharge, floodflow alteration, sediment stabilization, production export, wildlife diversity.

Photograph B-2. View north from SH 402 over Sites 2 (cattails) and 3 (wetland species on left edge foreground)

Site **4.** This site is located approximately 1.8 miles west of I-25 on the north side of SH 402 (see Photograph B-3). It is owned by Magpie Petroleum Operations Company and leased for grazing to Jim Wooldridge of Loveland, Colorado. The land consists of irrigated pasture with alkali deposits visible on the soil surface. This wetland is classified as PEM.

Vegetation	Salt-grass (*Distichlis stricta*) – FACW Baltic rush (*Juncus arcticus*) – FACW Longstyle rush (*Juncus longistylis*) – FACW
Hydrology	Periodically flooded through irrigation, and naturally high water table.
Soils	Moist with gleyed conditions below approximately 4 inches.
Functions	Groundwater recharge, floodflow alteration, sediment stabilization.

Photograph B-3. Looking east over Site 4; SH 402 seen at top right of photograph

Irrigation Ditch A. This irrigation ditch crosses SH 402 approximately 0.5 mile west of CR 9E. It contains wetlands of reed canarygrass and Emory sedge in a band 3 feet wide along both banks. This wetland is classified as PEM.

Vegetation	Reed canarygrass (*Phalaroides arundinacea*) – FACW+ Emory sedge (*Carex emoryi*) – OBL
Hydrology	Periodically flooded through irrigation.
Soils	Saturated during irrigation flows.
Functions	Groundwater recharge, floodflow alteration.

Site 5A. This site is near a business and residence owned by Ralph Ollila. It is located between CR 13C and CR 11H (South Boise Avenue) on the north side of SH 402 (see Photograph B-4). The site occurs on the south side of the Big Thompson River on a low terrace. The area exhibiting wetland vegetation extends 3 to 5 feet from the edge of the active channel toward the bank. This wetland is classified as Palustrine Forested/Emergent (PFO/EM).

Vegetation	Plains cottonwood (*Populus deltoides* ssp. *monilifera*) – FAC Reed canarygrass (*Phalaroides arundinacea*) – FACW+ Showy milkweed (*Asclepias speciosa*) – FAC Emory sedge (*Carex emoryi*) – OBL Curly dock (*Rumex crispus*) – FACW Peach-leaved willow (*Salix amygdaloides*) – OBL Sandbar willow (*Salix exigua*) – OBL
Hydrology	At edge of active flow channel, seasonally flooded.
Soils	Saturated at 6 inches deep.
Functions	Groundwater recharge, floodflow alteration, production export, sediment stabilization, aquatic diversity, wildlife diversity, recreation, and uniqueness.

Photograph B-4. View from CR 13C bridge looking east along Big Thompson River; Site 5B (left) and Site 5A (right)

Site 5B. This site is on a lower terrace along the Big Thompson River, similar to and parallel with Site 5A. This wetland is classified as PFO/EM. Site 5B is on the north side of the Big Thompson River and will not be affected by activities on SH 402.

Vegetation	Reed canarygrass (*Phalaroides arundinacea*) – FACW+ Vervain (*Verbena hastata*) – FACW Emory sedge (*Carex emoryi*) – OBL
Hydrology	Seasonally flooded.
Soils	Saturated at 6 inches deep.
Functions	Similar to Site 5A.

Site 6. This site is probably another old meander off the Big Thompson River and is located approximately 1.75 miles east of US 287 and across SH 402 from the Ollila property (Site 5A). This property also displayed a Magpie Petroleum sign and contained a slough area that was ditched to the road, with a culvert that drains the area to the river (see Photograph B-5). This wetland is classified as PEM.

Vegetation	Reed canarygrass (*Phalaroides arundinacea*) – FACW+ Canada thistle (*Breea arvense*) – FACU Broadleaf cattail (*Typha latifolia*) – OBL
Hydrology	Drainage area that is periodically saturated.
Soils	Seasonally saturated soils, with mottles.
Functions	Groundwater recharge, floodflow alteration, sediment stabilization, sediment/ toxicant retention, wildlife habitat.
Soils	Soils very dark gray (5 YR 3/1) below approximately 4 inches, indicating usual saturation; silty clay texture.

Photograph B-5. Looking south from SH 402 right-of-way over a cattail marsh (Site 6)

Function. The wetlands in the study area primarily function as groundwater recharge, flood flow alteration, sediment stabilization and retention, and toxicant retention. These wetlands perform a valuable function in treating runoff from grazing areas, a feedlot, other developed areas (for example, parking lots), and SH 402. The wetlands along the Big Thompson River provide wildlife habitat for a variety of birds, small mammals, mule deer, and white-tailed deer.

Jurisdiction. Most of the wetlands were determined jurisdictional to Section 404 of the CWA in that they are tributaries of or have nexus to waters of the US (for example, the Big Thompson River). The exception is Site 4, which is supported by a seep and not connected to waters of the US, and is, therefore, considered to be an "isolated water" (see USCOE letter, 2004).

B.8 Wetland Impacts

Project Impacts. Based on Geographic Information Systems (GIS) calculations derived from overlaying the proposed highway footprint onto the wetlands map, approximately 0.893 acre of wetlands would be permanently affected by fill actions to expand the roadbed (Table B-1). The construction footprint (toe-of-fill) overlap onto wetlands is shown in Figure B-2 through Figure B-5.

An additional area 5 feet wide at the edge of the cut-and-fill area was included in impact calculations. This area was designated to ensure that permanent impacts are not underestimated.

Of the total, approximately 0.453 acre is considered jurisdictional to Section 404 of the CWA (Sites 2, 3, 5A, and 6 and Irrigation Ditch A). Site 4 (0.440 acre affected) is considered nonjurisdictional.

Table B-1. Permanent and Temporary Wetland Impacts of the Meander Alternative

Wetland Site No.	Permanent Impacts, Acres	Temporary Impacts, Acres
Jurisdictional		
2	0.234	0.03
3	0.124	0.01
Irrigation Ditch A	0.061	<0.01
5A	<0.005	0.01
6	0.029	0.01
Jurisdictional total	**0.453**	**0.06**
Nonjurisdictional		
4	0.440	0.03
Totals	**0.893**	**0.09**

Temporary impacts were identified from an area 10 feet wide along and outside the edge of the area of permanent impacts. This area would be affected by placing/removing silt fencing and wetland exclusion-protection fencing, removal/relocation of fencing and fence posts, and removal/replacement of culverts.

Based on these assumptions, temporary impacts of 0.09 acre from construction activities were estimated to affect wetlands (Table B-1). These impacts are to be reclaimed and revegetated with appropriate wetland species after construction.

Because project impacts on jurisdictional wetlands were calculated to be less than 0.5 acre and affect nontidal and adjacent wetlands, a Nationwide Permit 14 is appropriate for this project (Carey 2004).

Secondary impacts offsite have the potential to affect wetlands during construction activities unless best management practices (BMPs) are implemented and followed. These indirect impacts include disturbance from construction equipment, sedimentation from runoff and erosion from construction areas, and contamination from equipment servicing areas.

Impacts on wetlands were addressed in a _____ 404 permit application submitted to the US Army Corps of Engineers on _____ 2003 (Permit Number _____) by CDOT, Region 4 _____. (To be submitted after EA publication.)

Cumulative Impacts. Project area wetlands have been affected by past activities, such as agricultural development, road construction, and residential and commercial development.

Additional development planned for this area, especially along the western part of the corridor, converts land from agricultural use. Impacts on wetlands and other waters of the US include increased erosion, sedimentation, and rapid runoff from paved and nonvegetated surfaces, leading to stream incision and loss of wetland hydrology, area invasion by weed and nonnative plant species, and increased concentrations of chemicals such as nitrogen, phosphorus, and heavy metal.

Approximately 0.893 acre of wetlands will be permanently affected by fill actions to expand the roadbed, of which 0.453 acre is jurisdictional. An additional area extending 5 feet from the cut-and-fill line has been included to ensure that impacts were not underestimated.

B.9 Mitigation Measures

Project wetland mitigation is proposed at several sites along SH 402 for jurisdictional wetlands (0.453 acre) and at Big Thompson Ponds SWA for nonjurisdictional wetlands (0.440 acre).

B.9.1 SH 402 Sites

Locations. Possible mitigation sites along SH 402 include Sites 2/3 and Site 6, cattail marshes near SH 402 (see Photograph B-2 and Photograph B-5).

Concept. The concept at these sites is to expand the wetlands onto terraces that occur adjacent to the marshes. Approximately 0.453 acre of wetlands is planned for the sites to coincide with losses to 404 jurisdictional wetlands from road construction. The upper terraces of these former meander bends of the river will be lowered approximately 1 foot toward groundwater that occurs in this system. However, the amount of excavation will need to be determined from groundwater observations from wells (PVC perforated pipe). It is recommended that these wells be installed several seasons before construction to ensure that groundwater is available within a depth that is reasonable for excavation. Wells will be installed 2 years prior to design, and data collected each week during the growing season and once every two weeks during the rest of the year. CDOT will approve the number of wells and their locations. The concept includes providing a surface that is slightly drier than the inundated habitat that supports cattails. This will promote more successful competition by the planted species. Cattails species my also be controlled by cutting these plants below water line, thus limiting oxygen availability and killing the plants (Sale and Wetzel 1983). Suggested plant species for this site include arctic rush (*Juncus arcticus*), longstyle rush (*Juncus longistylis*), Emory sedge (*Carex emoryi*), hard stem bulrush *(Schoenoplectus lacustris* ssp. *acutus),* small-winged sedge *(Carex microptera*), and bluejoint reedgrass. A combination of live plantings and seed is recommended for these sites.

Wetland creation could be accomplished at either Sites 2/3 or Site 6. This would extend the terrace that occurs adjacent to the cattail marshes by lowering the ground surface enough to allow wetland plants to root close to the shallow groundwater table. See Figure B-6 and Figure B-7.

B.9.2 Big Thompson Ponds State Wildlife Area (SWA) Mitigation Area

Location. This mitigation site is located approximately 0.75 mile north of SH 402 and 0.25 mile west of I-25 (NE ¼, Section 21, NW ¼, Section 22, R68W, T5N). See Figure B-8.

Concept. The concept for this site consists of a comprehensive plan for wetland development, wetland and riparian habitat enhancement, and upland habitat improvement. Approximately 0.440 acre of wetlands (or equivalent in terms of obtaining wetland mitigation credit for enhancement and improvement measures) may be developed in this area to offset nonjurisdictional impacts. The concept includes reducing spoil areas that were left after gravel mining changing the shoreline at the edges of gravel ponds to increase wetland and habitat diversity. Another mitigation measure that may be considered includes habitat enhancement by removal of weedy species that have invaded the site, including Canada thistle, teasel, and Russian-olive. Possible mitigation ratios include 1:1 for wetland development, 3:1 for riparian habitat enhancement, and 5:1 for weed control.

Wells will be installed 2 years prior to design, and data collected each week during the growing season and once every two weeks during the rest of the year.

As described for the SH 402 sites, the Big Thompson Ponds area may require a set of monitoring wells to accurately determine groundwater elevation and thus the amount of soil that must be removed prior to wetland plantings. CDOT will approve the number of wells, their locations, and the duration of monitoring.

Suggested species for this Big Thompson Ponds SWA site include:

Wetland. Live material will be used to establish wetland communities, including peach-leaved willow, sandbar willow, Emory sedge, wooly sedge, Torrey rush, hard-stemmed bulrush, soft-stemmed bulrush, and bluejoint reedgrass.

Riparian Habitat Enhancement. Weedy species (for example, smaller Russian-olive and teasel) will be removed and replaced with cottonwood, peach-leaved willow, and sandbar willow. Larger Russian-olives should remain to provide wildlife habitat around the ponds and the Big Thompson River.

Noxious Weed Control and Habitat Enhancement. Noxious weed infestations will be treated using FHWA and CDOT standard measures (FHWA Guidance on Invasive Species [1999] and CDOT Integrated Noxious Weed Management Plan 1999–2000 [INWMP]) and planted with wetland and upland species that provide greater habitat function. Suggested species include blue grama, buffalograss, wheatgrass, and saltgrass. *Appendix E* of the SH 402 Environmental Assessment is a project-specific noxious weed management plan and provides additional detailed guidance for weed control activity for this mitigation site.

Possible treatment areas for developing wetlands, enhancing riparian habitats, and controlling weeds are shown in Figure B-8. Photographs of the wetland creation, riparian habitat enhancement, and noxious weed control areas are shown in Photograph B-6, Photograph B-7, and Photograph B-8, respectively.

Photograph B-6. View of upland area in northeast end of Big Thompson Ponds SWA

The location shown in Photograph B-6 is an example of several areas of high ground at this end of the SWA that could be excavated down 1 to 5 feet to bring the surface in closer contact with groundwater. The area could then be planted with species characteristic of palustrine emergent wetland, such as sedges, rushes, and bulrush.

Photograph B-7. Potential location for riparian habitat enhancement at Big Thompson Ponds SWA

As shown in Photograph B-7, weedy species such as Russian-olive could be replaced with native shrubs and trees such as peach-leaved willow and sandbar willow. Additional enhancement of stream banks might also be possible, including removal of debris and armoring of areas where slope failure and bank erosion have been noted by CDOW.

Photograph B-8. One potential integrated weed control area at Big Thompson Ponds SWA

Integrated weed control could reduce or eliminate the current dominance by invasive noxious weed species at this site. Photograph B-8 highlights Russian-olive trees at the SWA's northern parking area, one of many potential areas for integrated weed control.

Indirect Impact Measures. Measures to reduce indirect impacts include keeping siltation fencing and other erosion protection materials in good repair, maintaining perimeter fencing to protect wetlands from construction equipment traffic, and servicing equipment in designated areas at least 100 feet from wetland areas. Sediment basins will be established as part of the highway design for areas with runoff potential. Temporary impacts (such as impacts from replacing culverts and disturbances from placing and removing exclusion fencing, silt fencing, and erosion control material within 10 feet of the edge of fill [toe-of-slope]) will be reclaimed using suggested species (for example, Torrey rush, Baltic rush, small-winged sedge, Emory sedge, and inland saltgrass) from adjacent areas. Soils will be tilled as needed to reduce compaction. Indirect impacts from surface runoff will be controlled using erosion and sediment control measures according to CDOT BMPs, as specified in Specifications No. 107.25 (Water Quality Control) and No. 208 (Erosion Control) from *Standard Specifications for Road and Bridge Construction,* and drainage control studies to determine locations and sizes of detention basins. In addition geotextiles/straw/soil will be applied where feasible to protect wetlands from construction impacts. A stormwater management plan (SWMP) will be developed for use during construction to control accelerated erosion and sedimentation, and contamination from construction equipment. Equipment will only be serviced in designated upland areas to reduce potential impacts on wetlands and drainage areas from fuel, equipment wash, grease, and cleaning agents. Weed control in construction areas must be implemented as part of construction operations.

Functions. Functions will be similar to functions currently being performed by affected wetlands.

Monitoring. CDOT biologists or CDOT-designated contractors will conduct monitoring at SH 402 mitigation sites and at the Big Thompson Ponds mitigation site to ensure that mitigation is successful as required by 404 permit conditions. Plant composition and percent ground cover data will be obtained each growing season, along with groundwater depths. Quantitative data on plant composition and percent ground cover will be obtained each growing season from transects (for example, point-intercept method), with the number of sample points determined from statistical adequacy analyses. Groundwater depths will be measured and recorded each month during the spring to late summer period as part of monitoring activity. Monitoring criteria will be developed in conjunction with USCOE and will likely include a percent foliar cover comparison (for example, 75 percent cover by wetland species) to undisturbed (existing) wetland cover of the sites after several growing seasons. Weed control measures will be implemented as needed to control reinvasions (for example, by Canada thistle) of the sites. Shrub mortality will be monitored using density count data and will also be measured against success criteria designated in the USCOE 404 permit for the project. Should vegetation development at either site fail to meet success criteria, remediation measures to correct problems will be developed by a CDOT landscape architect, or their designated personnel. Because water is available at the mitigation sites and because a near-surface groundwater table also occurs, the likelihood of success is considered high.

Contingency Plans. If the wetland is not developing as planned, remediation measures to correct problems will be indicated. Should wetlands not develop as planned and sites appear to be unsuitable for mitigation measures as designed, other areas near SH 402 would be evaluated for wetland enhancement. Such sites include the Saint Vrain SWA on the Saint Vrain River west of I-25 approximately 14 miles south of the project area. Other sites may occur on private land and may involve further negotiations and expense to modify.

B.10 Conclusions

Based on the above considerations, it is determined that there is no practicable alternative to the proposed new construction, and that the proposed action includes all practicable measures to minimize harm to wetlands. All wetland losses (0.893 acre) will be mitigated with 1:1 replacement.

B.11 References Cited

Adamus, P.R., E.J. Clairain, Jr., R.D. Smith, and R.E. Young. 1987. *Wetland evaluation technique (WET), Vol. II: methodology.* Environmental Laboratory, Waterways Experiment Station, US Army Corps of Engineers, Vicksburg, Mississippi.

Carey, Timothy. 2004. US Army Corps of Engineers, Omaha District. Personal communication with L. Hettinger, JFSA. July 26, 2004.

Colorado Department of Transportation (CDOT). 1999. *Specification for road and bridge construction.*

Cowardin, L. M., V. Carter, F.C. Golett, and E.T. LaRoe. 1979. *Classification of wetlands and deepwater habitats of the United States.* US Fish and Wildlife Service. FWS/OBS-79-31. Washington, DC.

Munsell Soil Color Charts. 1992 ed. Macbeth Div., Kollmorgen Instruments Corp., Newburgh, New York.

Reed, P. B., Jr. 1988. *National list of plant species that occur in wetlands: national summary.* National Wetlands Inventory, US Fish and Wildlife Service, Biol. Rep. 88 (24).

Sale, P.J.M. and R.G Wetzel. 1983. Growth and metabolism of *Typah* species in relation to cutting treatments. Aquatic Botany 15: 321-334.

US Army Corps of Engineers. 1987. *Corps of engineers wetlands delineation manual.* Technical Report Y-87-1. US Army Corps of Engineer Waterways Experiment Station, Vicksburg, Mississippi.

Weber, W. A. and R. C. Wittmann. 2001. *Colorado flora: eastern slope.* University of Colorado Press. Boulder, Colorado.

B.12 SH 402 Study Area Wetland Figures

Figure B-1 State Highway 402 Wetlands

Figure B-2 State Highway 402 Wetland Sites 2 and 3

Figure B-3 State Highway 402 Wetland Site 4

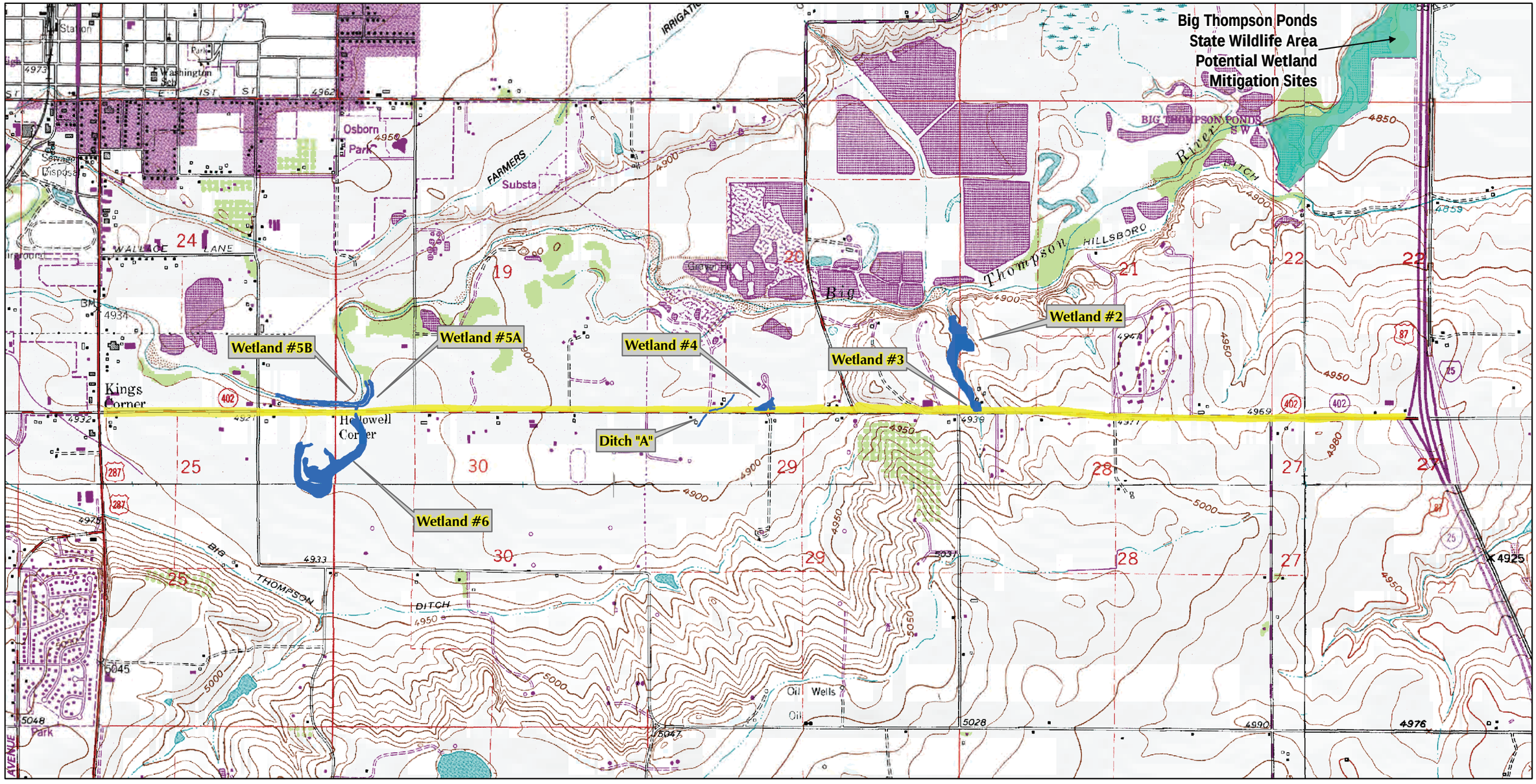
Figure B-4 State Highway 402 Irrigation Ditch “A”

Figure B-5 State Highway 402 Wetland Sites 5 and 6

Figure B-6 State Highway 402 Wetland Sites 2 and 3 Potential Mitigation Areas

Figure B-7 State Highway 402 Wetland Site 6 Potential Mitigation Area

Figure B-8 State Highway 402 Big Thompson Ponds Potential Wetland Mitigation Sites



LEGEND

- Wetlands
- Big Thompson Ponds State Wildlife Area

N
W E
S

0 1,000 2,000 Feet

0 400 800 Meters

SCALE - 1:19,800 or 1" = 1650'

SOURCE: Digital Raster Graphic information provided by the USGS. Parcel information provided by the City of Loveland. Wetlands delineated by JFSA. Map produced April 27, 2004 by JFSA

7.5' Quadrangle maps are the Loveland, Windsor, Berthoud, and Johnstown Quads with a contour interval of 10-feet.

U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

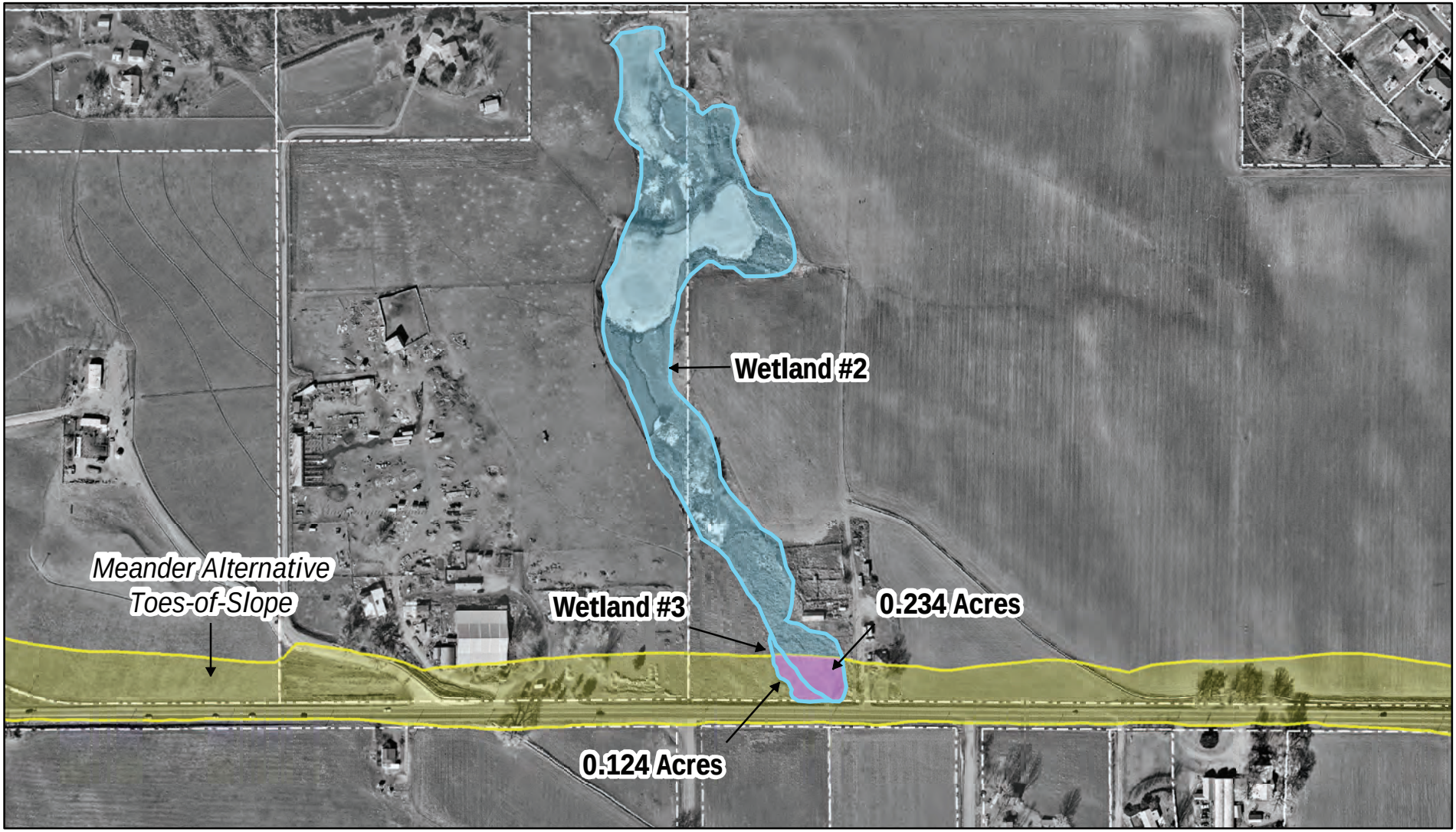
JFS&A J.F. SATO AND ASSOCIATES

DOT SH 402 Environmental Assessment

State Highway 402 EA

Wetlands

FIGURE B-1



LEGEND

- Wetland Boundary
- Wetland Impact
- Meander Alternative Toes-of-Slope Plus 5-Foot Addition

N
W E
S

SCALE - 1:4,200 or 1" = 350'

0 100 200 Meters

0 250 500 Feet

SOURCE: 2000 aerial photography provided by Airphoto USA / KRPS. Land use and parcel information provided by the City of Loveland. Wetland information obtained through field observation and aerial photo interpretation by JFSA. Map produced October 29, 2004 by JFSA.

U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

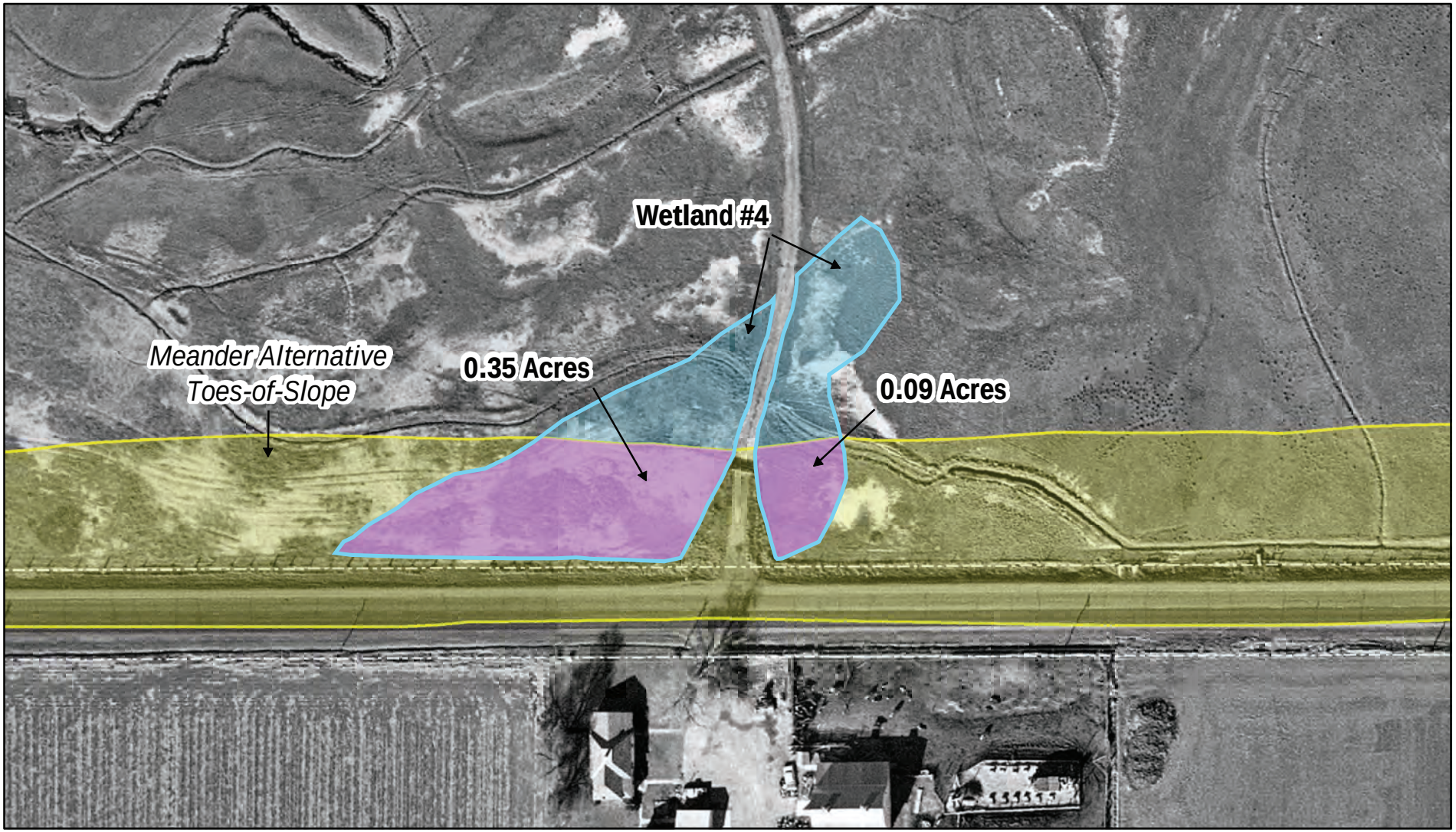
JFS&A J.F. SATO AND ASSOCIATES

DOT SH 402 Environmental Assessment

State Highway 402

Wetland Sites 2 and 3

FIGURE B-2



LEGEND

- Wetland Boundary
- Wetland Impact
- Meander Alternative Toes-of-Slope Plus 5-Foot Addition

N
W E
S

SCALE - 1:1,200 or 1" = 100'

0 25 50 Meters

0 50 100 Feet

SOURCE: 2000 aerial photography provided by Airphoto USA / KRPS. Land use and parcel information provided by the City of Loveland. Wetland information obtained through field observation and aerial photo interpretation by JFSA. Map produced October 29, 2004 by JFSA.

U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

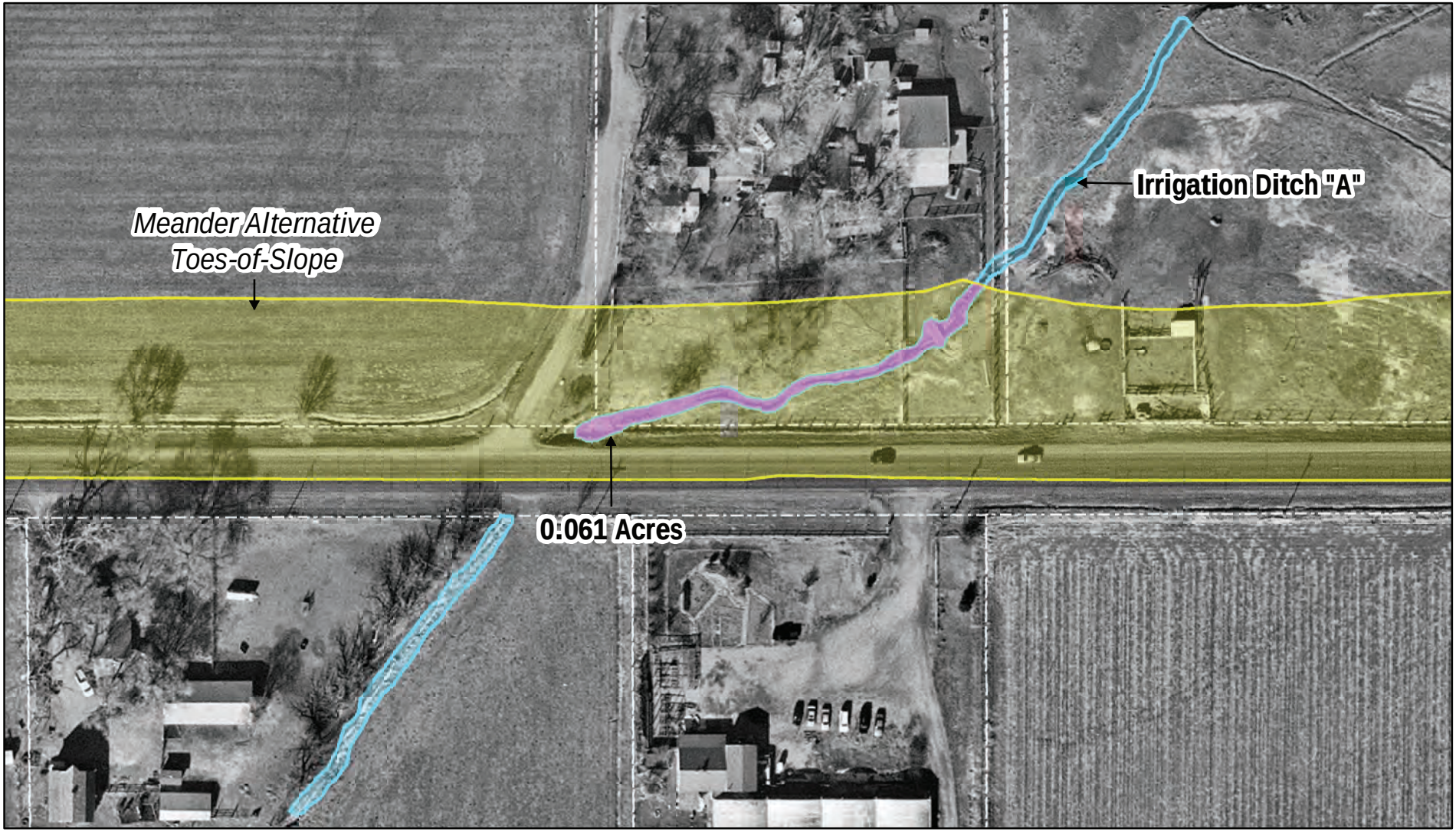
JFS&A J.F. SATO AND ASSOCIATES

DOT SH 402 Environmental Assessment

State Highway 402

Wetland Site 4

FIGURE B3



LEGEND

- Wetland Boundary
- Wetland Impact
- Meander Alternative Toes-of-Slope Plus 5-Foot Addition

N
W E
S

SCALE - 1:1,200 or 1" = 100'

0 25 50 Meters

0 50 100 Feet

SOURCE: 2000 aerial photography provided by Airphoto USA / KRPS. Land use and parcel information provided by the City of Loveland. Wetland information obtained through field observation and aerial photo interpretation by JFSA. Map produced October 29, 2004 by JFSA.

U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

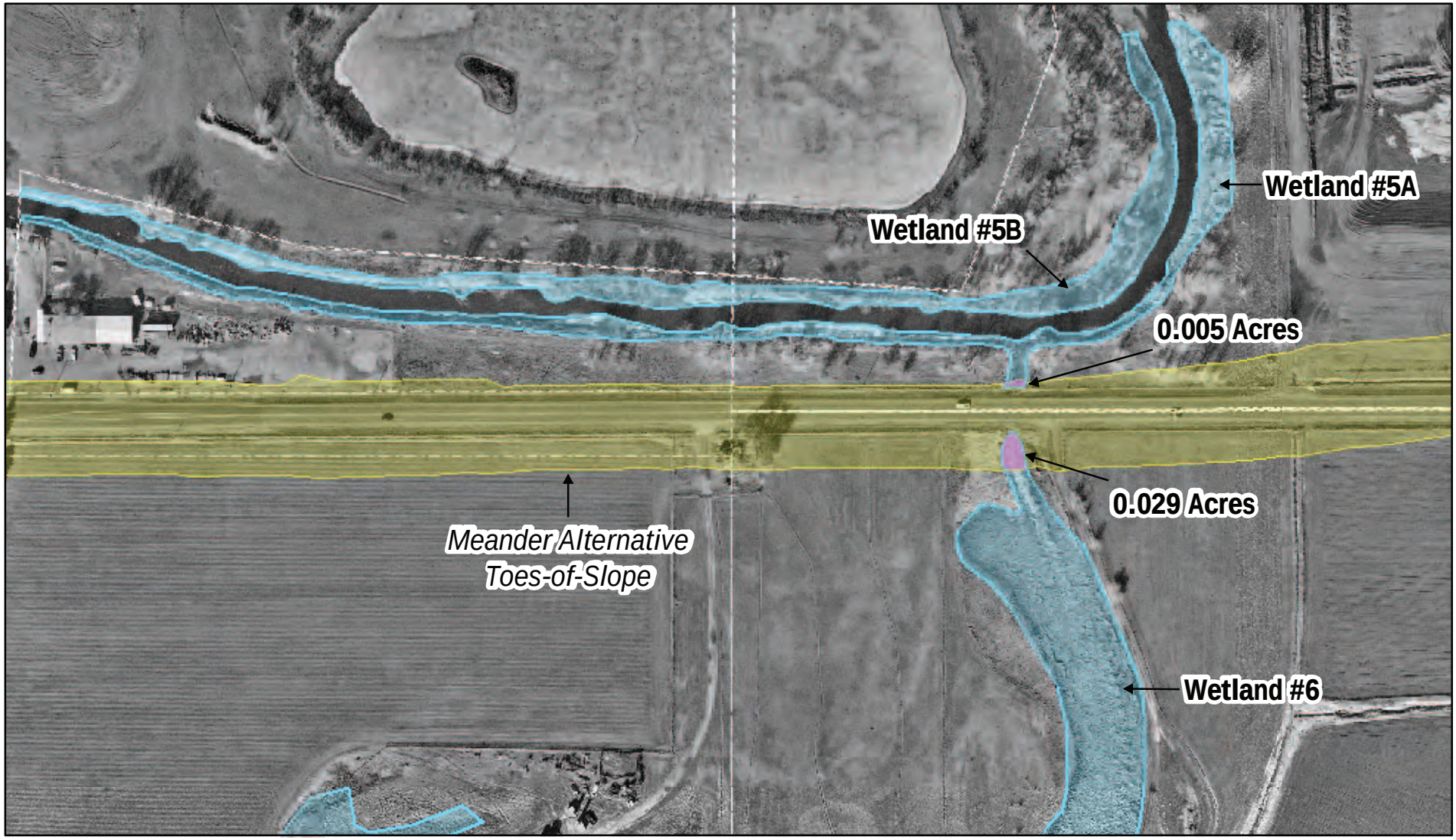
JFS&A J.F. SATO AND ASSOCIATES

DOT SH 402 Environmental Assessment

State Highway 402

Irrigation Ditch "A"

FIGURE B-4



LEGEND

- Wetland Boundary
- Wetland Impact
- Meander Alternative Toes-of-Slope Plus 5-Foot Addition

N
W E
S

SCALE - 1:2,400 or 1" = 200'

0 50 100 Meters

0 100 200 Feet

SOURCE: 2000 aerial photography provided by Airphoto USA / KRPS. Land use and parcel information provided by the City of Loveland. Wetland information obtained through field observation and aerial photo interpretation by JFSA. Map produced October 29, 2004 by JFSA.

U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

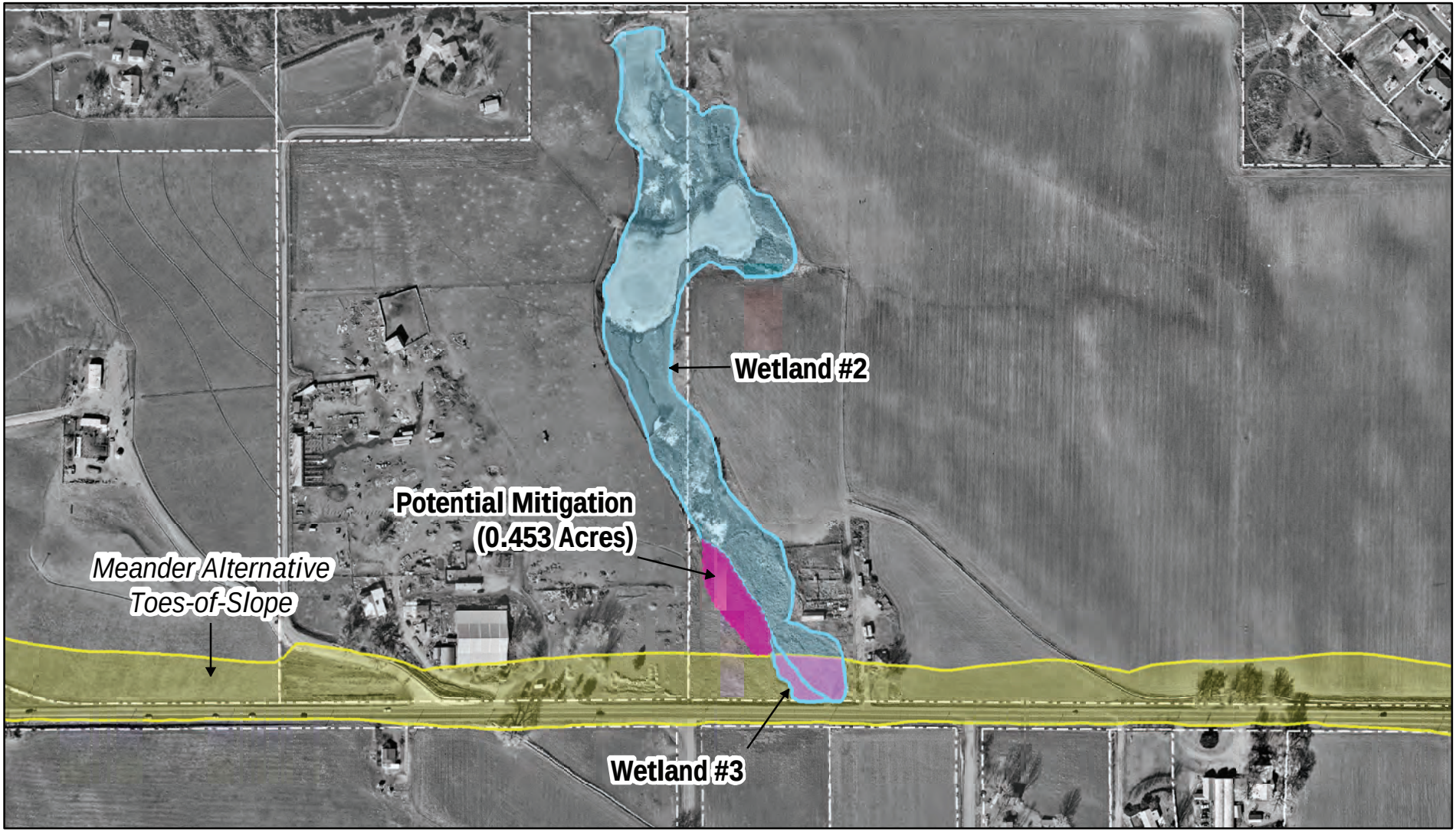
JFS&A J.F. SATO AND ASSOCIATES

DOT SH 402 Environmental Assessment

State Highway 402

Wetland Sites 5 and 6

FIGURE B-5



LEGEND

- Wetland Boundary
- Wetland Impact
- Potential Wetland Mitigation
- Meander Alternative Toes-of-Slope Plus 5-Foot Addition

N
W E
S

SCALE - 1:4,200 or 1" = 350'

0 100 200 Meters

0 250 500 Feet

SOURCE: 2000 aerial photography provided by Airphoto USA / KRPS. Land use and parcel information provided by the City of Loveland. Wetland information obtained through field observation and aerial photo interpretation by JFSA. Map produced October 29, 2004 by JFSA.

U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

JFS&A J.F. SATO AND ASSOCIATES

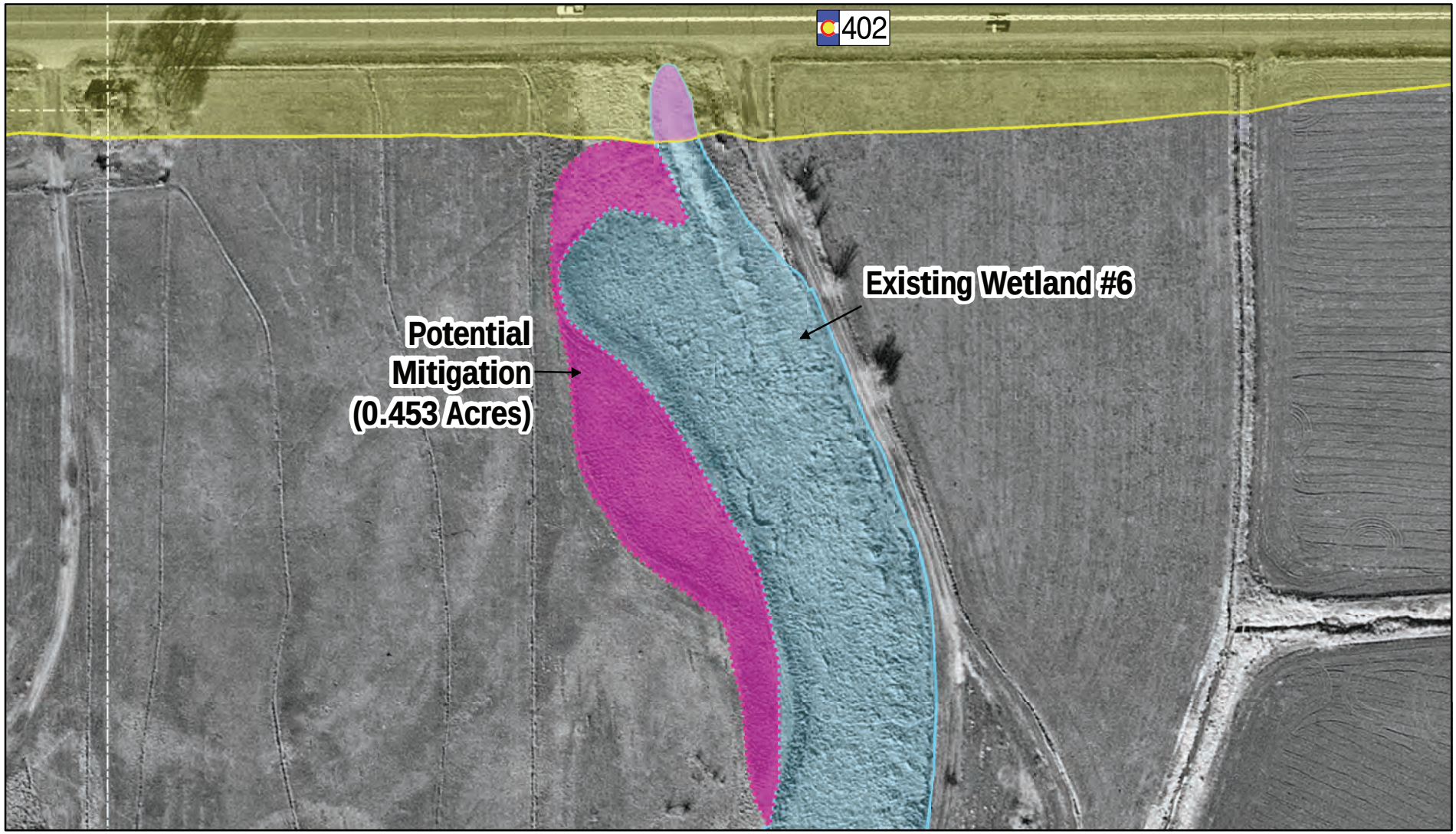
DOT SH 402 Environmental Assessment

State Highway 402

Wetland Sites 2 and 3

Potential Mitigation Areas

FIGURE B-6



LEGEND

- Wetland Boundary
- Wetland Impacts
- Potential Wetland Mitigation Site
- Meander Alternative Toes-of-Slope

N
W E
S

SCALE - 1:1,200 or 1" = 100'

0 50 100 Feet

0 25 50 Meters

SOURCE: 2000 aerial photography provided by Airphoto USA / KRPS. Land use and parcel information provided by the City of Loveland. Wetland information obtained through field observation and aerial photo interpretation by JFSA. Map produced August 1, 2003 by JFSA.

U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

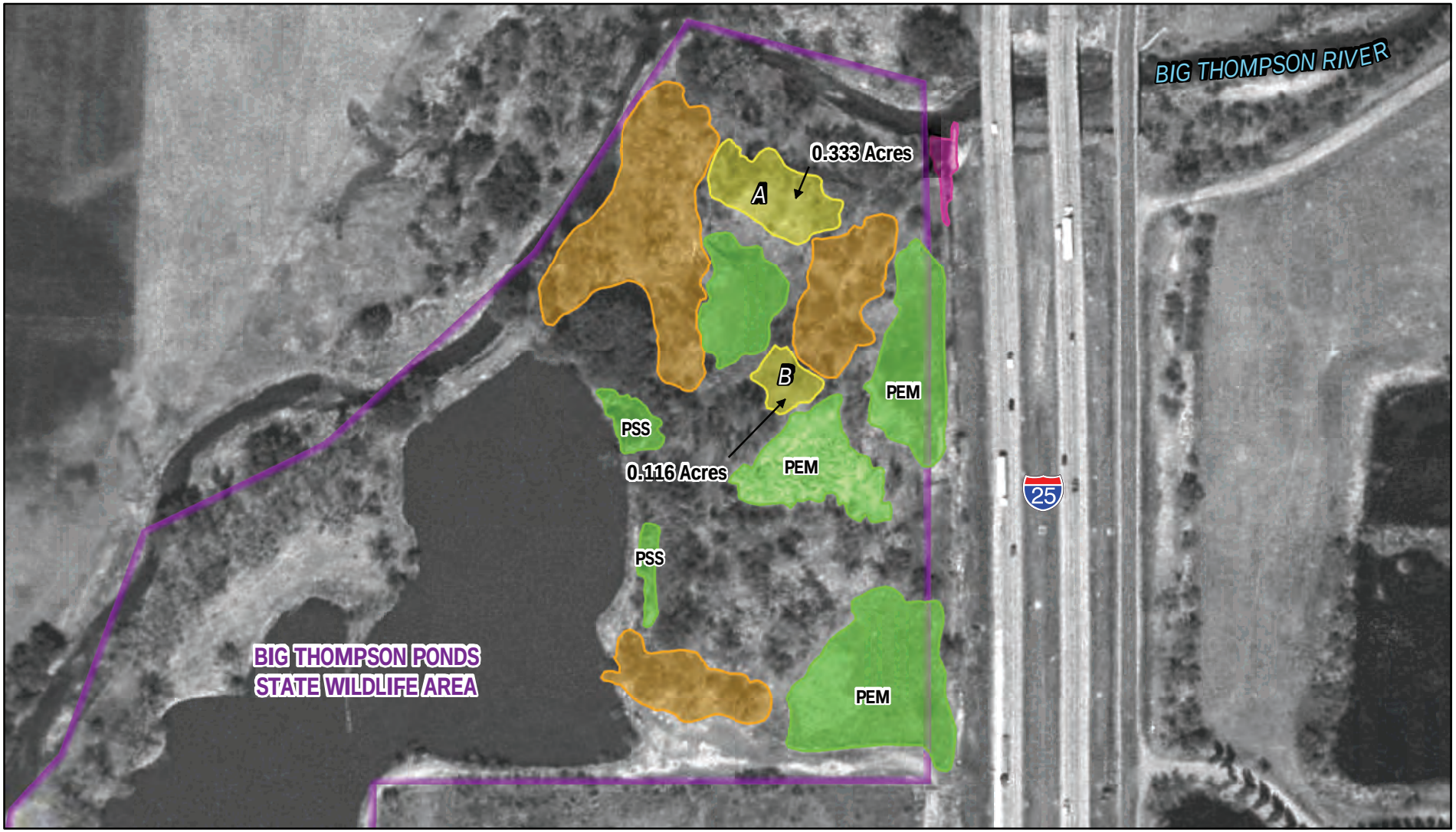
JFS&A J.F. SATO AND ASSOCIATES

DOT SH 402 Environmental Assessment

State Highway 402

Wetland Site 6 Potential Mitigation Area

FIGURE B-7



LEGEND

- Wetland Mitigation Sites
- Existing Wetlands (PSS = Palustrine Scrub Shrub, PEM = Palustrine Emergent)
- Noxious Weed Control Sites
- Riparian Habitat Enhancement

N W E S

SCALE - 1:2,400 or 1" = 200'

0 25 50 Meters

0 100 200 Feet

SOURCE: 2000 aerial photography provided by Airphoto USA / KRPS. Land use and parcel information provided by the City of Loveland. Wetland information obtained through field observation and aerial photo interpretation by JFSA. Map produced October 29, 2004 by JFSA.

U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

JFSA J. F. SATO AND ASSOCIATES

DOT SH 402 Environmental Assessment

State Highway 402
Big Thompson Ponds
Potential Wetland Mitigation Sites

FIGURE B-8

Appendix B1. Field Data Sheets

Adjacent to Big Thompson River

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Site 5A - 5B North Side SH402

Project/Site: CDOT Region 4 Applicant/Owner: Investigator: Hettinger	Date: 8/24/01 County: Larimer State: CO
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation)? (Yes) No Is the area a potential Problem Area? (Yes) No (If needed, explain on reverse.) Note, Wetlands adjacent to Big Thompson R. = Channelized	Community ID: Transect ID: Plot ID: 5A-5B

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Reed Canary	H	FACW	9.		
2. Showy milkweed	H	FAC	10.		
3. Emoryi sedge	H	OBL	11.		
4. Curly DOCK	H	FACW	12.		
5. Peach-leaved willow	T	OBL	13.		
6. Sandbar willow	S	OBL	14.		
7. Vervain (2B)	H	FACW	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks: 3-5' of the lower bank of the river support wetlands - Note areas of concrete rubble etc

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ___ Inundated X Saturated in Upper 12 Inches ___ Water Marks X Drift Lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: 0 - 12 (in.) Depth to Free Water in Pit: ___ (in.) Depth to Saturated Soil: 0 - 12 (in.)	

Remarks: Edge of Active Channel

SOILS SH402 Site SA-5B

Map Unit Name (Series and Phase): Pasli Loam

Drainage Class: Saturated

Field Observations Confirm Mapped Type? Yes No

Taxonomy (Subgroup):

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- X Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- X High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Saturated at surface or within 12"

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)	
Wetland Hydrology Present?	Yes No	
Hydric Soils Present?	Yes No	
Is this Sampling Point Within a Wetland?	Yes No (Circle)	

Remarks: Area of river bank rip-rapped with concrete rubble - other discarded debris —

Approved by HQUSACE 2/92

Flow toward Big Thompson River - N, NE

SH402 #1 (Eaton Property)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: STATE Highway 402 - E. Loveland Applicant/Owner: CDOT - Region 4 Investigator: L. Hettinger	Date: 8/29/01 County: Larimer State: CO
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation)? (Yes) No Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.) Part of pasture	Community ID: ____ Transect ID: ____ Plot ID: #1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Intermed. wheat	h	ND	9.		
2. Canada thistle	h	FACU	10.		
3. Curly dock	h	FACW	11.		
4. Bulrush (S. pallidus)	h	OBL	12.		
5. Redtop (A. gigantea)	h	FACW	13.		
6. Squirreltail	h	ND	14.		
7. Barnyardgrass (Echinochloa C-g)	h	FACW	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 4/7 = 57%

Remarks: FAC Neutral - test

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other X No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ___ Inundated ___ Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits X Drainage Patterns in Wetlands Swale
Field Observations: Depth of Surface Water: — (in.) Depth to Free Water in Pit: — (in.) Depth to Saturated Soil: — (in.)	Secondary Indicators (2 or more required): X Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data (___) FAC-Neutral Test ___ Other (Explain in Remarks)

Remarks: likely offsite water after storms - runoff

SOILS #1 - SH402

Map Unit Name (Series and Phase): Weld Silt-Loam

Drainage Class: Seasonal inund.

Field Observations Confirm Mapped Type? Yes No

Taxonomy (Subgroup): —

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4	A-B	7.5YR 5/4 brown			silty clay
4+	B	5YR 3/1	v. dark gray		silty clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- X Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: FLUCTUATING W.T. indicated

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)	
Wetland Hydrology Present?	Yes No	
Hydric Soils Present?	Yes No	
Is this Sampling Point Within a Wetland?	Yes No (Circle)	

Remarks: Note: Pasturage and some home-site development may have changed hydrology to site (lessened) but wetland characteristics remain.

Approved by HQUSACE 2/92

Flow
To N and
Big Thompson River

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Site 2
Olsen property

Project/Site: STATE Highway 402 - E. Loveland Applicant/Owner: CDOT - Region 4 Investigator: Hettinger	Date: 10-25-01 County: Larimer State: CO
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation)? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.) Note: Driveway and homesite (farmsted) on east side of site.	Community ID: ____ Transect ID: ____ Plot ID: 2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
*1. Cattail (T. latifolia)	H	OBL	9.		
2. Showy milkweed	H	FAC	10.		
3. Willowherb (E. hornemanii)	H	FACW	11.		
4. Watercress (Nasturtium off)	H	OBL	12.		
5. Rabbitfoot grass (Polypogon)	H	OBL	13.		
6. Spikerush (Eleocharis)	H	OBL	14.		
7. Peachleaved willow	T-S	OBL	15.		
8. Russian olive	T-S	ND	16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 7/8 = 88%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ___ Inundated X Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines X Sediment Deposits ___ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: ____ (in.) Depth to Free Water in Pit: ~ 1" (in.) Depth to Saturated Soil: ____ (in.)	

Remarks: Saturated at surface

SOILS

Site 2

Map Unit Name (Series and Phase): SANTANA LOAM

Drainage Class: SATURATED

Field Observations Confirm Mapped Type? Yes No

Taxonomy (Subgroup): –

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4	A0	10YR 4/2-4/1 (dk gray)			Silty
4-12	B	10YR 4/1 (black)			Silty

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- X Sulfidic Odor
- ___ Aquic Moisture Regime
- X Reducing Conditions
- X Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: MUCKY, SATURATED SOIL

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)	
Wetland Hydrology Present?	Yes No	
Hydric Soils Present?	Yes No	Is this Sampling Point Within a Wetland? (Circle) Yes No

Remarks: Appears as old meander channel; now has livestock pond nearby – functions as toxicant retention.

Approved by HQUSACE 2/92

Connected to Wetland #2, Flow toward Big Thompson River

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Site #3

Project/Site: STATE Highway 402 Applicant/Owner: CDOT, Region 4 Investigator: Hettinger	Date: 10/25/01 County: Larimer State: CO
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation)? (Yes) No Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: ____ Transect ID: ____ Plot ID: 3

Some grazing has occurred on this site. It is immediately adjacent to Site 2 (Cattail marsh), but on terrace grading to upland.

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Giant wildrye (Leymus ciner.)	H	UPL	9.		
2. Rush (Juncus longistylis)	H	FACW	10.		
3. Baltic rush	H	FACW	11.		
4. Showy milkweed	H	FAC	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 3/4 = 75%

Remarks: Area grades into upland pasture of giant rye.

~40' of [illegible]

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: ____ (in.)

Depth to Free Water in Pit: ____ (in.)

Depth to Saturated Soil: 2 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- X Sediment Deposits Sandy deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Probably high water table in spring.

SOILS SH 402 Site # 3

Map Unit Name (Series and Phase): SANTANA LOAM

Drainage Class: Mod well - Imperf.

Field Observations Confirm Mapped Type? Yes No

Taxonomy (Subgroup):

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4	AB	7.5YR 4/3 Brown			Sandy Loam
4-12	B	7.5YR 4/3 Brown	7.5YR 6/8 Reddish yellow	Constant	Sandy silt

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors mottles
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- X Other (Explain in Remarks)

Remarks: Scattering of mottles throughout >4"

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)	
Wetland Hydrology Present?	Yes No	
Hydric Soils Present?	Yes No	
Is this Sampling Point Within a Wetland?	Yes No (Circle)	

Remarks:

Approved by HQUSACE 2/92

Isolated Wetland - Seep

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Magpie Petroleum Pasture

Project/Site: SH 402 Site 4 Applicant/Owner: CDOT, Region 4 Investigator: Hettinger	Date: 10-25-01 County: Larimer State: CO
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation)? (Yes) No Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.) Alkali Flats & Seep - (Pasture)	Community ID: Transect ID: Plot ID: 4

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
* 1. Saltgrass (Distichlis)	H	FACW	9.		
2. Baltic rush	H	FACW	10.		
3. Rush (Juncus longistylis)	H	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, (FACW) or FAC (excluding FAC-). 100%

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: 6-12 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- X Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- X Sediment Deposits X Alkali deposits
- X Drainage Patterns in Wetlands ditched

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Lateral ditches across site to help drain it -

SOILS SH402 Site 4

Map Unit Name (Series and Phase): Carusso Clay Loam

Drainage Class: Saturated - Poor

Field Observations Confirm Mapped Type? Yes No

Taxonomy (Subgroup):

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	A-B	7.5YR 3/1 (Black)			Silty Clay
1-10	B	7.5YR 3/1 & 3/2 (Black)			" "

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- X Reducing Conditions
- X Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Soil Moist - Saturated

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No (Circle)
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No

(Circle)

Is this Sampling Point Within a Wetland? Yes No

Remarks: Typical salt grass pasture w/ alkali

Approved by HQUSACE 2/92

Irrigation Ditch "A" unnamed - trans forward by Thompson R.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: STATE Highway 402 Applicant/Owner: CDOT Region 4 Investigator: Hettinger	Date: 5-19-04 County: Larimer State: CO
Do Normal Circumstances exist on the site? Yes (No) Is the site significantly disturbed (Atypical Situation)? (Yes) No Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.) Irrigation Ditch	Community ID: ____ Transect ID: ____ Plot ID: ____

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Carex emoryi	H	FACW	9.		
2. Phalaris arundinacea (Reed canary)	H	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). ____

Remarks: Wetland ~ 3' at edge of flow channel on both banks

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1-2' (in.)

Depth to Free Water in Pit: ____ (in.)

Depth to Saturated Soil: ____ (in.)

Wetland Hydrology Indicators:
Primary Indicators:
X Inundated
___ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Flowing ditch

SOILS

Map Unit Name (Series and Phase): Paoli Loam

Drainage Class: Saturated

Field Observations Confirm Mapped Type? Yes No

Taxonomy (Subgroup):

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2	O	Organic			
2-15	A-B	7.5 2.5/1 YR BLACK		—	Silty
		- 5YR 2.5/1 YR BLACK			

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- X Sulfidic Odor
- X Aquic Moisture Regime
- ___ Reducing Conditions
- X Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: BLACK Mucky Soil at 2" w/ free water in profile

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No (Circle)	
Wetland Hydrology Present?	Yes No	
Hydric Soils Present?	Yes No	
Is this Sampling Point Within a Wetland?	Yes No (Circle)	

Remarks:

Approved by HQUSACE 2/92

Appendix B2. USCOE Letter of Concurrence

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
DENVER REGULATORY OFFICE, 9307 SOUTH WADSWORTH BOULEVARD
LITTLETON, COLORADO 80128-6901

June 1, 2004

Mr. Loren Hettinger
JF Sato and Associates
5898 So. Rapp St.
Littleton, CO 80120

RE: Preliminary and Approved Jurisdictional Determination, Jurisdictional Areas: Wetland 2, 3, 5A, 5B and 6 and Irrigation Ditch A; Non-jurisdictional Areas: Wetland 4 and Dried up Wetland Area 1
Corps File No. 200480260

Dear Mr. Hettinger:

I have reviewed this project located in Sections 20, 21, 24, 25 and 30, T5N, R68W, Larimer County, Colorado on behalf of Colorado Department of Transportation. This review was in accordance with Section 404 of the Clean Water Act under which the U.S. Army Corps of Engineers regulates the discharge of dredged and fill material, and any excavation activities associated with a dredged and fill project, into waters of the United States. Waters of the United States include ephemeral, intermittent and perennial streams, their surface connected wetlands and adjacent wetlands and certain lakes, ponds, irrigation and drainage ditches that have a nexus to interstate commerce. Under the authority of the Clean Water Act, a preliminary jurisdictional determination has determined that wetland 2, 3, 5A, 5B and 6 and irrigation ditch A may be waters of the U.S.

If a proposed activity requires work within the above-described waters of the U.S., a proponent of the project should notify this office for Department of the Army permits. This jurisdictional delineation is valid for a period of five years from the date of this letter unless new information warrants revision of the determination before the expiration date.

Based upon the ruling by the Supreme Court in the matter of Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, No. 99-1178 (January 9, 2001), the Department of the Army's (DA) regulatory authority over isolated, non-navigable, intrastate waters has been eliminated **if** the sole nexus to interstate commerce was use of the waters by migratory birds. It is apparent under the ruling above that the DA does not have the authority to regulate work in isolated wetland 4. This wetland is not waters of the U.S. and therefore non-jurisdictional. No permit or other authorization by the DA is required for work in this wetland. This jurisdictional determination is valid for a period of five years from the date of this letter unless new information warrants revision of the determination before the expiration date.

The attached **Jurisdictional Determination** form provides the basis jurisdiction for isolated wetland 4. If the applicant wishes to appeal this approved jurisdictional determination, the attached **Notification of Administrative Appeal Options** form should be completed and sent to Mr. Mores Bergman at the address noted on the form. This jurisdictional determination is valid for a period of five years from the date of this letter unless new information warrants revision of the determination before the expiration date.

Although a DA permit will not be required for work in isolated wetland 4, this does not eliminate the requirement that you obtain any other applicable Federal, state, tribal or local permits as required. Also, wetland area 1 is not a wetland.

Our office considers your wetlands delineation report and map for this project accurate and acceptable. If you have any questions call me at **(303) 979-4120** and reference **Corps File No. 200480260**.

Sincerely,

Terry McKee

Terry McKee
Natural Resource Specialist

tm

JURISDICTIONAL DETERMINATION Revised 7/9/03
U.S. Army Corps of Engineers, (District)

APPLICANT: CDOT

PROJECT LOCATION/WATERWAY: Larimer Co / jurisdictional areas: wetlands 2, 3, 5A, 5B, 6 and irrigation ditch A; non-jurisdiction areas: dried up wetland 1 and isolated wetland 4

FILE NUMBER: 200480260

PROJECT REVIEW COMPLETED: [x] **Office** **and** [x] **Field**

Jurisdictional Determination (JD): (For sites regulated under 33 CFR 320-330)

[x] Preliminary JD - Based on available information, [x] **(jurisdictional areas)** there appear to be or [ ] there appear to be no "waters of the United States" or "navigable waters of the United States" on the project site. A preliminary JD is not appealable.

[x] Approved JD – [ ] there are or [x] **(non-jurisdictional areas)** there are no "waters of the United States" or "navigable waters of the United States" on the project site. An approved JD is an appealable action (Reference 33 CFR 331).
(Note: JDs prepared by the Environmental Protection Agency are not appealable to the Corps of Engineers)

Basis of Jurisdictional Determination:

Waters defined under 33CFR 328.3(a) as "waters of the United States":

[ ] (1) The presence of waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.
[x] (2) The presence of interstate waters of including interstate wetlands *1.
[ ] (3) The presence of other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could effect interstate commerce including any such waters:
  [ ] (i) which are or could be used by interstate or foreign travelers for recreational or other purposes.
  [ ] (ii) from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
  [ ] (iii) which are or could be used for industrial purposes by industries in interstate commerce.
[ ] (4) Impoundments of waters defined as a Water of the US.
[x] (5) The presence of a tributary to a water identified in (1) – (4) above.
[ ] (6) The presence of territorial seas.
[ ] (7) The presence of wetlands adjacent*2 to interstate or other waters of the US, except for those wetlands adjacent to other wetlands.

Waters defined under 33CFR 329 as "navigable waters of the United States":

[ ] The presence of waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

Rationale for Basis: Wetlands 2, 3 and 6 and irrigation ditch A (intercepts a wetland drainage to the SW of this site) flows to the Big Thompson River that flows to the South Platte River, which is an interstate waters. Wetlands 5A and 5B are connected to the Big Thompson River. Wetland 4 is neither adjacent to nor surface connected to and interstate waters. Wetland area 1 is dried up and is dominated with upland grasses.

Lateral Extent of Jurisdiction: (Reference: 33 CFR 328 and 329)

[x] Ordinary High Water Mark of irrigation ditch A indicated by:
  [x] clear, natural line impressed on the bank
  [ ] the presence of litter and debris
  [ ] changes in the character of soil
  [x] destruction of terrestrial vegetation
  [ ] shelving
  [ ] other: streambed

☐ High Tide Line indicated by:
☐ oil or scum line along shore objects
☐ fine shell or debris deposits (foreshore)
☐ physical markings/characteristics
  ☐ tidal gages
☐ other: _____

[ ] Mean High Water Mark indicated by:
  [ ] survey to available datum; [ ] physical markings; [ ] vegetation lines/changes in vegetation types
☐ In ocean or coastal area, site is within a zone three geographic (nautical) miles seaward of the baseline*3

[x] Wetland, as shown on the attached wetland delineation map and/or in a jurisdictional report prepared by: JF Sato and associates

[ ] **Additional supporting information attached:**

Preparer: Terry McKee Date: June 1, 2004

[1]Wetlands are identified and delineated using the methods and criteria established in the Corps Wetland Delineation Manual (87 Manual) (i.e., occurrence of hydrophytic vegetation, hydric soils and wetland hydrology).
[2]The term "adjacent" means bordering, contiguous, or neighboring. Wetlands separated from other waters of the U.S. by man-made dikes or barriers, natural river berms, beach dunes, and the like are also adjacent.
[3]Baseline is the line on the shore reached by the ordinary low tides from which the distance of three miles is measured.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: CDOT	File Number: 200480260	Date: June 1 04
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an appro JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

Timothy T. Carey
Chief, Denver Regulatory Office
9307 South Wadsworth Boulevard
Littleton, CO 80128
(303) 979-4120

If you only have questions regarding the appeal process you may also contact:

US Army Corps of Engineers
Northwestern Division
Attn: Mores Bergman, Appeal Officer
12565 West Center Road
Omaha, Nebraska 68144-3869
Telephone (402) 697-2533

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

Appendix B3. Mitigation Site Selection Form

Wetland Mitigation Site Selection Form
Colorado Department of Transportation

Attachment to Wetland Finding
For PEM (Marsh) Site Along SH 402

Project Name/No.	SH 402 I-25 to US 287	Subaccount	STA 402A-003	Region	4
Author	Loren Hettinger	Firm	J.F. Sato & Associates	Date	January 21, 2005

Mitigation Options Available	(1) Mitigation bank available? No
	(2) Project impacts in 1°, 2° service area? No
	(3) HUC units N/A
	(4) On-site mitigation available? Yes, in conjunction with cattail marsh expansion along SH 402
	(5) Off-site mitigation available? Yes, wetland development, riparian habitat enhancement, and weed control, Big Thompson State Wildlife Area
	(6) In-lieu fee arrangement available? No In-lieu fee sponsor
	(7) Mitigation ratio(s) other than 1:1 involved? No Ratio(s)

		Impact Site	Mitigation Site
Site Characteristics	(8) Geographic location	Sec. 24,25; T5N, R69W: Sections 19, 20, 21, 22, 27, 28, 29, 30; T5N, R68W	PEM cattail marsh; e.g., NW ¼ Sec 30, and SW ¼ Sec 21; T5N, R68W
	(9) Wetland community type, pct	PFO/PEM (5%) and PEM (95%)	PEM (100%)
	(10) Functions, values	Groundwater recharge, sediment toxicant retention, and wildlife habitat, bank stability	Similar functions/values, except bank stability
	(11) Size of impacts, pct. of total area?	< 1 % of total	N/A

Wildlife/Habitat	(12) T&E species/habitat present?	No	No
	(13) Species? Status?	NA	NA
	(14) Migratory Bird Treaty Act?	Nesting habitat throughout PFO along Big Thompson River wetlands	Nesting in cattail marsh (e.g., red-winged black bird)
	(15) Other wildlife issues?	Other species of the area include raccoon, fox, coyote, white-tailed deer, and various bird species.	Racoon, red-winged black bird, striped skunk
	(16) Status of aquatic resource?	None designated	None designated
	(17) Special aquatic site?	None designated	None designated
	(18) Unique? Quality? Ranking?	Mostly PEM marsh and meadow wetlands that provide flood control/storage and water quality improvement functions. A small amount of PFO (riparian) wetland would be affected, which provides bank stability, as well as a wildlife habitat function.	PEM marsh wetland to provide flood storage and water quality improvement functions.
	(19) Watershed, ecosystem issues?	The watershed has been affected by agricultural development that occurs adjacent to all of the wetlands.	Historical impacts to the mitigation sites are similar to the impact areas.

Other	(20) Likelihood of success?	N/A	The hydrology of the mitigation site will be determined for 2 years prior to construction using wells (PVC pipe) to observe groundwater levels.
	(21) Interagency agreement?	N/A	No other agencies are involved at this mitigation site.
	(22) Project logistics, size/scope?	N/A	While the wetland impacts occur at several locations along SH 402, PEM wetlands are the predominate type. Mitigation objectives are to replace this type.
	(23) Cost considerations?	N/A	Costs will include land purchase outside the ROW, design plan development, excavation, soil preparation, plant material acquisition and planting, and monitoring work to establish a PEM (sedge, rush) wetland.
	(24) Buffer used?	N/A	No

Water Issues	(25) Individual 404 permit condition?	The area required for mitigation is less than the 0.5-acre threshold requiring an Individual 404 permit.
	(26) 404(b)(1) Guidelines?	The guidelines will need to be addressed as part of the mitigation plan design, and must include measures to protect water quality from being degraded during mitigation work, including increased sediment loading.
	(27) NWP gen., reg. conditions?	NWP 27 applies to stream and wetland restoration, and this or other NWPs would be required for the mitigation work at this site.
	(28) Regulatory letters?	COE *Guidance for Wetland and Stream Mitigation and Mitigation Banking in the Omaha District* (2003)
	(29) S.B. 40?	The mitigation measures would not invoke SB 40 criteria.
	(30) Water rights issues?	No additional water would be used that would cause a water rights issue.

NEPA Issues	(31) Cumulative impact issues?	Cumulative impacts were analyzed as part of the EA for the SH 402 project. As the area develops, and more residential and commercial sites are built, wetland areas along SH 402 will likely be affected by increased runoff and recreational use. These increases may affect water quality and habitat usage
	(32) Agency policy, input?	Public meetings part of Environmental Assessment and Public Involvement Program. The impacts and the proposed mitigation have been correlated with the COE.
	(33) Public involvement?	Public involvement occurred throughout the EA process and included discussions of wetland impacts.

(34) **Basis for Decision**

[Describe those factors from the front side that are instrumental in the selection of the chosen mitigation decision.]

The decision to mitigate wetland impacts at this site is based on the concept of expanding an existing wetland site where there is a known water table that supports a marsh.

(35) **Decision**

Based on the parameters mentioned in item 34, this on-site area was selected to mitigate part of the impacts that were predicted from the SH 402 improvement project.

(36) **Contingency Plans**

Other sites that could be considered for mitigation opportunities include the Simpson Ponds SWA, which are north of SH 402 along the Big Thompson River, and the St. Vrain Pond (Barbour Ponds) SWA on the Saint Vrain River approximately 14 miles south of the project area. Comprehensive plans, similar to those developed for the Thompson Pond SWA, that consist of wetland development (expansion), riparian habitat enhancement and weed control are appropriate for both sites.

Wetland Mitigation Site Selection Form
Colorado Department of Transportation

Attachment to Wetland Finding
For Thompson Ponds SWA Site

Project Name/No.	SH 402 I-25 to US 287	Subaccount	STA 402A-003	Region	4
Author	Loren Hettinger	Firm	J.F. Sato & Associates	Date	January 21, 2005

Mitigation Options Available	(1) Mitigation bank available? Yes/No
	(2) Project impacts in 1°, 2° service area?
	(3) HUC units
	(4) On-site mitigation available? Yes, PEM Cattail Marsh Expansion
	(5) Off-site mitigation available? Yes , SWA Mitigation Site
	(6) In-lieu fee arrangement available? No In-lieu fee sponsor N/A
	(7) Mitigation ratio(s) other than 1:1 involved? No Ratio(s)

		Impact Site	Mitigation Site
Site Characteristics	(8) Geographic location	Sec. 24,25; T5N, R69W: Sections 19, 20, 21, 22, 27, 28, 29, 30; T5N, R68W	NE ¼ Sec 21, NW ¼ Sec 22, R68W, T5N
	(9) Wetland community type, pct	PFO/EM (5%) and PEM (95%	PSS/EM, PEM
	(10) Functions, values	Groundwater recharge, sediment toxicant retention, and wildlife habitat, bank stability and flood flow alteration	Increased functional values for wildlife habitat, flood flow alteration and recreation
	(11) Size of impacts, pct. of total area?	< 1 % of total	N/A

Wildlife/Habitat	(12) T&E species/habitat present	Yes/No	No
	(13) Species? Status?	N/A	N/A
	(14) Migratory Bird Treaty Act?	Nesting habitat throughout PFO along Big Thompson River wetlands	Nesting habitat for numerous bird species occurs at this site.
	(15) Other wildlife issues?	Other species of the area include raccoon, fox, coyote, white-tailed deer, and various bird species.	Species of the area include white-tailed deer, coyote, red fox, raccoon, striped skunk, beaver, red-tailed hawk, northern harrier, American kestrel, killdeer, red-winged black bird, and numerous waterfowl, wading and songbird species.
	(16) Status of aquatic resource?	None designated	This site is within a State Wildlife Area that is established to provide habitat for aquatic and upland species.
	(17) Special aquatic site?	None designated	SWA; pond and riverine system
	(18) Unique? Quality? Ranking?	Mostly PEM marsh and meadow wetlands that provide flood control/storage and water quality improvement functions. A small amount of PFO (riparian) wetland would be affected, which provides bank stability, as well as a wildlife habitat function.	The site is composed of ponds surrounded by riparian and marsh habitats that extend to the Big Thompson River. This area provides diverse aquatic and wildlife habitat, flood flow storage-alteration, ground water recharge, and discharge, sediment stabilization, production export, and is valuable for recreation.
	(19) Watershed, ecosystem issues?	The watershed has been affected by agricultural development that occurs adjacent to all of the wetlands.	The SWA originated as gravel mines which exposed the shallow water table. Although a valuable aquatic and wetland system, the area contains patches of weeds, and Russian olive dominates the riparian areas surrounding the ponds.

Other	(20) Likelihood of success?	N/A	Probability of success is rated as high because of the shallow ground water table, and the opportunities to remove weedy species from wetlands, and riparian habitats.
	(21) Interagency agreement?	N/A	Agreement will be needed between CDOT and CDOW.
	(22) Project logistics, size/scope?	N/A	The SH 402 project occurs over a 6-mile distance, and may affect wetlands that are scattered along this corridor at different times during the construction period. This mitigation site, however, is off site, and construction could occur at any time.
	(23) Cost considerations?	N/A	This site is owned by the State, but costs for the mitigation will consist of earthwork, weedy species removal and control, and for plant material and installation. Costs will also be incurred to monitor the mitigation.
	(24) Buffer used?	N/A	No

Water Issues	(25) Individual 404 permit condition?	The area required for mitigation is less than the 0.5-acre threshold requiring an Individual 404 permit.
	(26) 404(b)(1) Guidelines?	The guidelines will need to be addressed as part of the mitigation plan design, and must include measures to protect water quality from being degraded during mitigation work, including increased sediment loading.
	(27) NWP gen., reg. conditions?	NWP 27 applies to stream and wetland restoration, and this or other NWPs would be required for the mitigation work at this site.
	(28) Regulatory letters?	COE *Guidance for Wetland and Stream Mitigation and Mitigation Banking in the Omaha District* (2003).
	(29) S.B. 40?	The mitigation measures would not invoke SB 40 criteria.
	(30) Water rights issues?	No additional usage of water would occur from the mitigation measures that are planned for the ponds. Willows would replace Russian olive trees, and no major change in evapo-transpiration rates are anticipated.

NEPA Issues	(31) Cumulative impact issues?	Cumulative impacts were analyzed as part of the EA for the SH 402 project. As the area develops, and more residential and commercial sites are built, the SWA will be affected by increased runoff and recreational use. These increases may affect water quality and habitat usage.
	(32) Agency policy, input?	The impacts and the proposed mitigation have been correlated with the COE. The mitigation at this site has been coordinated with the CDOW.
	(33) Public involvement?	Public involvement occurred throughout the EA process, and included discussions of wetland impacts.

(34) **Basis for Decision**

[Describe those factors from the front side that are instrumental in the selection of the chosen mitigation decision.]

The decision to mitigate wetland impacts is based on multiple factors. These include the opportunity to enhance the wetland and riparian habitats in conjunction with CDOW needs for the site. The site ownership is secured under the CDOW, which reduces property acquisition costs.

(35) **Decision**

Based on the parameters mentioned in item 34, this offsite area was selected to mitigate part of the impacts that were predicted from the SH 402 improvement project.

(36) **Contingency Plans**

Other sites that could be considered for mitigation opportunities include the Simpson Ponds SWA, which are north of SH 402 along the Big Thompson River, and the St. Vrain Pond (Barbour Ponds) SWA on the Saint Vrain River approximately 14 miles south of the project area. Comprehensive plans, similar to those developed for the Thompson Pond SWA, that consist of wetland development (expansion), riparian habitat enhancement and weed control are appropriate for both sites.

Appendix C

Public Involvement Program

Appendix C. Public Involvement Program

The purposes of the Public Involvement Program (PIP) are to inform the public of the project, obtain input from the public on their concerns and issues, and allow for feedback during the Environmental Assessment process. The SH 402 PIP consisted of agency and public meetings and workshops, as well as the development of factsheets and a mailing list to systematically distribute information to the public and appropriate state, local, and federal agencies. This is a continuing process.

The status of an earlier proposed Categorical Exclusion (CE) is found on page C-2 of this appendix.

Below is a chronology of activities and mailings for the SH 402 project. Copies of the public workshop handouts, the seven project factsheets, and a stakeholder mailing are located in the remainder of the appendix.

Activity	Date
Agency Status Meetings	
#1	October 17, 2001
#2	August 22, 2002
#3	February 12, 2003
Public Workshops	
#1	September 19, 2002
#2	April 15, 2003
Project Factsheets	
#1	October 2001
#2	November 2002
#3	April 2003
#4	July 2003
#5	April 2004
Stakeholder Mailing	April 2004
#6	January 2005
#7	September 2005

Status of Categorical Exclusion (CE)

The half-mile portion of the corridor immediately east of US 287 had been of particular interest to the Colorado Department of Transportation (CDOT) and the city of Loveland due to safety, access, and right-of-way concerns associated with planned urban development. Earlier in SH 402 project development, a categorical exclusion was proposed for the portion of the highway between US 287 and CR 13C (St. Louis Avenue) due to a city of Loveland planned residential development (Waterford Place Apartments). This residential development was approved and has been constructed with proper allowance for future highway right-of-way under a CE dated September 18, 2003.

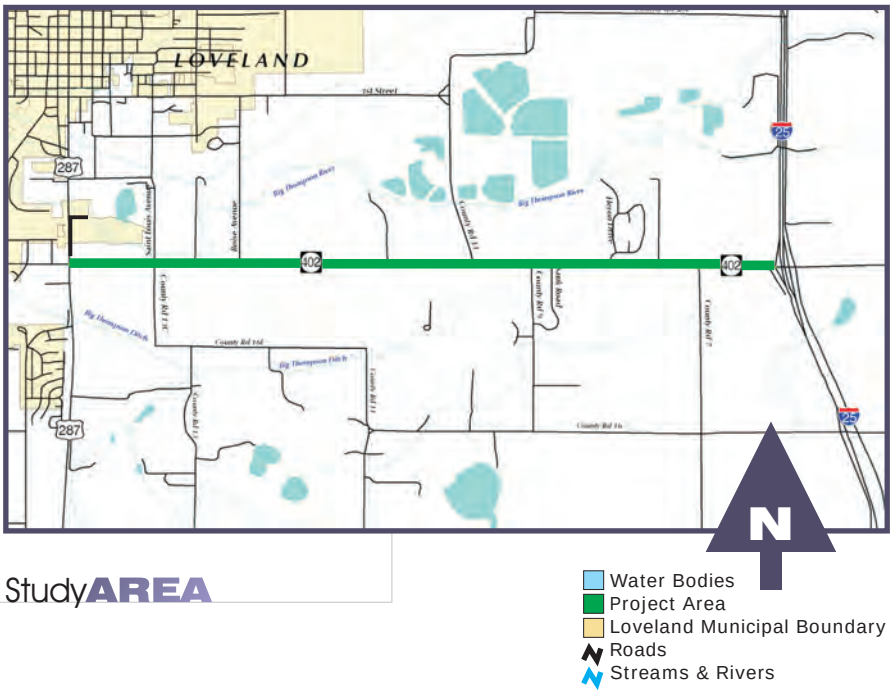
Welcome

Please sign the attendance roster.

Read the handout.

Visit our displays

If you have any questions, please ask one of our CDOT representatives or consultants.



Study**AREA**

If you wish to make a written statement or comment, please fill out the form in the back of this handout. You may also contact our website: www.sh402ea.com to review the project newsletter or e-mail comments.

SH 402

Project**BACKGROUND**

The Federal Highway Administration (FHWA), as the lead agency, and the Colorado Department of Transportation, Region 4 (CDOT) have initiated an Environmental Assessment (EA) to evaluate potential improvements along SH 402 from US 287 east to the I-25 Interchange. As the lead federal agency, FHWA has the authority and responsibility to make the final decisions. CDOT is the applicant and is responsible for the preparation of the EA.

Planning and construction of improvements along the approximately 4-mile stretch of SH 402 have been ranked 10th in the North Front Range (NFR) 2020 Regional Transportation Plan, and the project is currently in the State-wide Transportation Improvement Plan for highway improvements. The EA will identify alternatives to improve mobility and safety, which will include the No Action alternative. Maintaining or improving access to the residences, businesses, and the park-n-Ride within the study area will also be evaluated. CDOT will examine alternatives for the ability to meet these goals now and in 20 years.

EA**PROCESS**

(please refer to graphic on the back of this page)

CDOT is currently in the Alternatives Analysis phase of the project. Public Involvement, however, is ongoing throughout the process to keep interested individuals, groups, and agencies informed about the project and to solicit input at key milestones in the project.

Proposed**ACTION**

The proposed action under study is to evaluate potential improvements along SH 402 from US 287 east to the I-25 Interchange that improve safety and increase capacity. The EA process will evaluate various alternatives, and the No Action alternative, to determine a preferred alternative. The preferred alternative will meet the purpose and need of the project, to improve safety and increase capacity, while:

- **Considering compatibility with local and state plans**
- **Providing on-going coordination with federal, state and county agencies**
- **Protecting or maintaining community values and the environment**
- **Minimizing utility, traffic, and access impacts during construction if an action alternative is the preferred alternative**

The EA will be conducted in compliance with the National Environmental Policy Act (NEPA) and will encourage public involvement throughout the process. CDOT is committed to maintaining the environmental integrity, both natural and human, of the study area.

EA PROCESS

Public Involvement ongoing throughout the project

Public Involvement Program

Scoping and Public Involvement

Scoping is an open public process initiated at the beginning of the EA to help identify the public's concerns and possible solutions. The Public Involvement Program, which is on-going throughout the EA, provides opportunities for public participation in refining the Purpose and Need of the project, the range of alternatives to be considered and the issues to be addressed. CDOT will provide a range of forums to encourage agency and public involvement throughout the EA.

Alternative Analysis

Summer 2002

We are currently here in the process

Alternatives proposed through the scoping process will be screened to determine how well each meets the project's Purpose and Need. Evaluation criteria developed through EA scoping will be used to screen the alternatives. Alternatives examined during the Alternative Analysis stage either will be screened out or advanced to the Environmental Analysis stage of the EA.

Environmental Analysis

Fall-Winter 2002

Alternatives advanced through the Alternative Analysis process will be studied at an appropriate level, relative to the environmental issues and according to the NEPA process.

Preferred Alternative

Winter 2002-03

The alternative that is proposed by the EA as the course of action (this could include a recommendation of "No Action") is the Preferred Alternative. The Preferred Alternative has been selected after having conducted the Alternative and Environmental Analysis.

EA Document Preparation

Spring 2003

The EA Document Preparation will begin at the initiation of the project and will explain the Purpose and Need for the project, Alternative Analysis, Environmental Analysis and the selection of a Preferred Alternative. A 30-day public review and comment period followed by a public hearing is required to conclude the EA. The Federal Highway Administration (FHWA), as Lead Agency may determine a Finding of No Significant Impact (FONSI) based on findings and the recommendations proposed by the EA. A FONSI indicates that the proposed alternative has no significant impact on the environment.

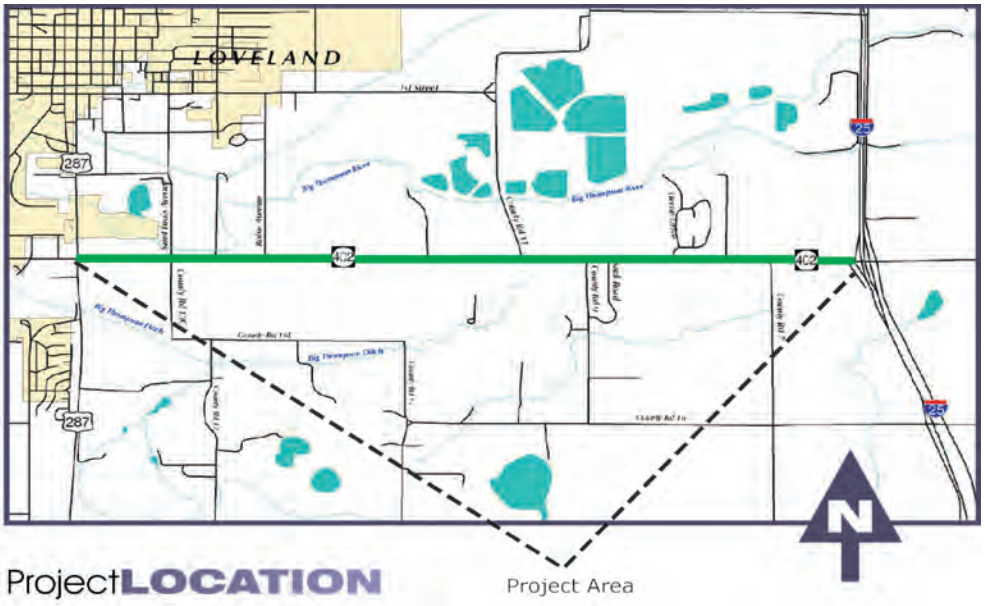
Opportunities for **Public Involvement**

Please feel free to contact;Jeff Manuel, Environmental Unit Manager, (CDOT Region 4) or Michelle Li, Project Manager, (JFSA) with any additional questions or comments you may have regarding this project, or to be added to the mailing list.

Jeff's mailing address is 1420 2nd Street, Greeley, CO 80631, his e-mail is jeff.manuel@dot.state.co.us, and his phone number is (970) 350-2170.

Michelle's mailing address is 5898 S. Rapp Street, Littleton, CO 80120, her e-mail is mli@jfsato.com, and her phone number is (303) 797-1200.

You can also visit the project Web site at www.sh402ea.com.



Project **LOCATION**

Project Overview

- The general plan for SH 402 from US 287 east to the I-25 interchange is to **widen from two to four lanes** thereby providing a **higher level of service** and improving **safety** along this stretch of roadway.
- The project is **ranked 10th in the North Front Range 2020 Regional Transportation Plan** and currently is in the Statewide Transportation Improvement Plan.
- The **City of Loveland 2020 Transportation Plan** shows SH 402 as a four lane facility.

CDOT SH 402 Environmental Assessment

Glossary of Terms

Alternative Analysis – process by which alternatives identified through the scoping process will be screened to determine how well each meets the Purpose and Need as well as criteria related to key issues and concerns associated with the study area.

Average Daily Traffic (ADT) – average two-way traffic, in number of vehicles.

Capacity – maximum rate of flow at which vehicles can traverse a point on one lane of roadway during one hour.

CDOT – Colorado Department of Transportation

Design Hourly Volume – peak hour traffic (rush hour) whether in the morning or afternoon hour.

EA - an Environmental Assessment is a written statement prepared in accordance with NEPA when the level of potential impacts is not clear. The document discloses the effects on the environment that could result from a proposed action (planning or decision making).

FHWA – Federal Highway Administration

FONSI – Finding of No Significant Impact; possible final decision on an EA indicating that the preferred alternative has no significant impacts on the environment that cannot be appropriately mitigated.

LOS – Level of Service is a qualitative measure describing the operational characteristics within a traffic stream, generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.

LOS A – free flow operations
LOS B – reasonably free-flow operations
LOS C – noticeable traffic
LOS D – speeds decline and congestion begins to form
LOS E – maximum service flow (full capacity)
LOS F – heavy congestion, significant delays, stop-and-go-traffic

Mobility – the ability of traffic to move unimpeded through a highway or roadway corridor.

NEPA – National Environmental Policy Act of 1969 is our nation's basic charter for protection of the environment. It establishes policy, sets goals, and provides

the means for carrying out the policy. In accordance with NEPA, all federal agencies must prepare a written statement on the environmental impacts of a proposed action. The provisions to ensure that federal agencies act according to the letter and spirit of NEPA are in the Council on Environmental Quality (CEQ) regulations for implementing NEPA (43 CFR 1500-1508).

No Action Alternative – alternative that represents projected conditions within the study area without the implementation of improvement and that serves as a baseline for the comparison of the build alternatives.

Preferred Alternative – alternative identified through the EA process that is the action recommended to meet the Purpose and Need of the project.

Prime Farmland – soil units that have the best combination of physical and chemical characteristics for producing feed, food, forage, fiber and oilseed crops as identified in accordance with the Farmland Protection Policy Act of 1981.

Purpose and Need – the underlying reason for conducting the studies and analysis; the purpose and need to which the agency is responding by proposing alternative solutions.

Right of Way – a general term denoting land, property, or interest therein, usually in a strip acquired for or devoted to transportation purposes.

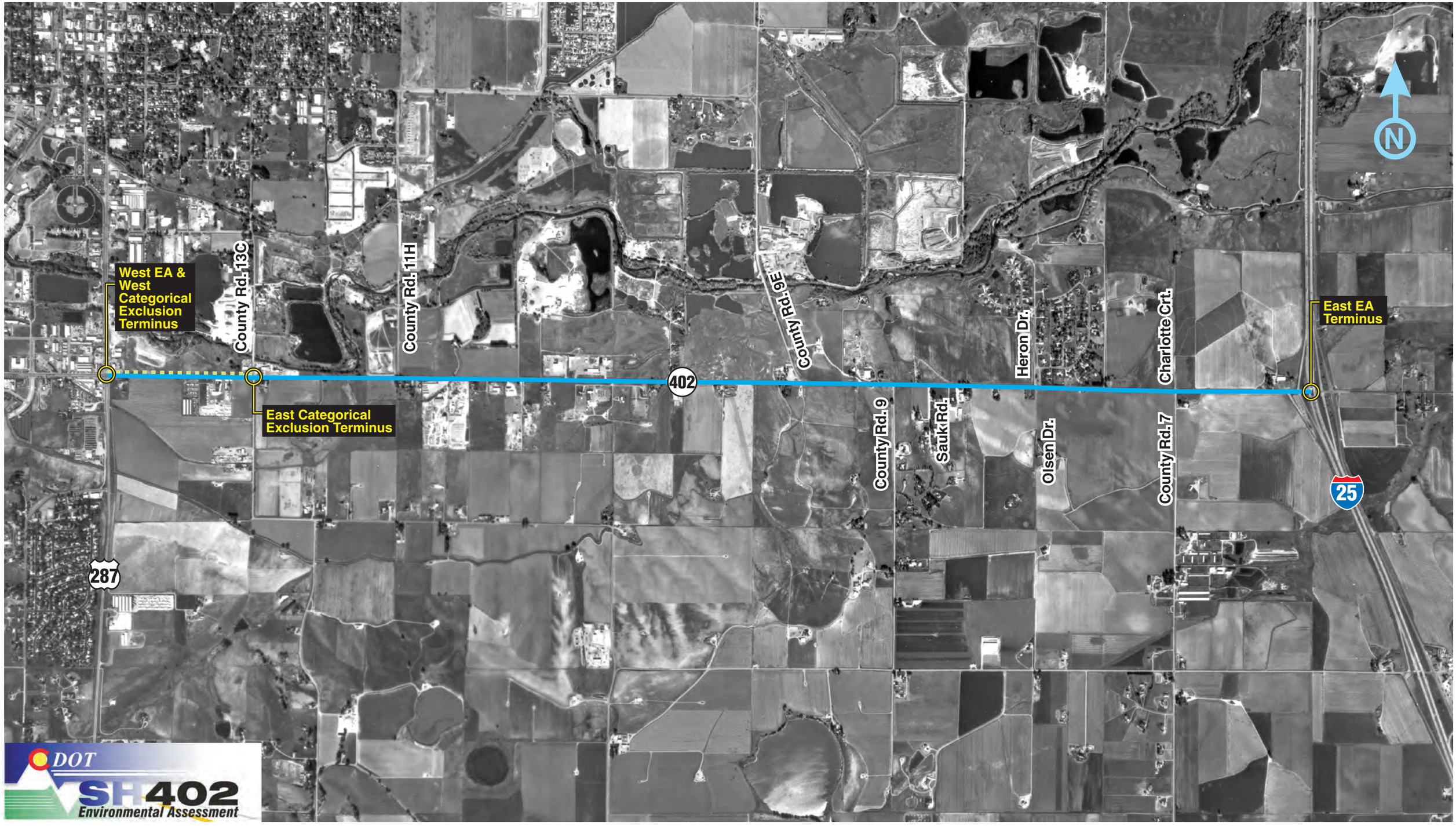
Scoping – an open public process initiated at the beginning of the EA to help identify the public's concerns and recommended solutions.

Screening (alternatives analysis) – A systematic process through which a broad range of alternatives is narrowed down to those that best meet the goals of the project based on the purpose and need of the project and key issues and concerns related to the study area. Alternative(s) that pass through the screening process are taken into environmental assessment to identify a preferred alternative.

Threatened and Endangered Species – endangered species are those that are in danger of becoming extinct; threatened species are those that are in danger of being listed as endangered.

4(f) – publicly owned land including public parks, recreation areas, wildlife/waterfowl refuges or land of a historic site of National, State or local significance.

Study Area


West EA & West Categorical Exclusion Terminus
East Categorical Exclusion Terminus
East EA Terminus
County Rd. 13C
County Rd. 11H
County Rd. 9E
County Rd. 9
Sauk Rd.
Heron Dr.
Olsen Dr.
Charlotte Crt.
County Rd. 7
402
287
25
N
DOT
SH 402
Environmental Assessment

Project Team Contact Information

Please feel free to contact the Project Managers or visit the project website for additional information or to submit your comments.

Jeff Manuel
Environmental Unit Manager
CDOT Region 4
1420 2nd Street, Greeley, CO 80631
(970)350-2170
jeff.manuel@dot.state.co.us

Michelle Li
Project Manager
J. F. Sato and Associates
5898 S. Rapp Street, Littleton, CO 80120
(303)797-1200
mli@jfsato.com

www.sh402ea.com

CDOT SH 402 Environmental Assessment

ENVIRONMENTAL ASSESSMENT
PUBLIC WORKSHOP #1

DATE: SEPTEMBER 19, 2002
TIME: 4:30 PM TO 7:30 PM

LOCATION: **CDOT LOVELAND RESIDENCY**
2207 EAST HIGHWAY 402
LOVELAND, CO

COMMENT SHEET

PLEASE HAND IN THIS SHEET BEFORE YOU LEAVE TODAY

OR MAIL IT TO J.F. Sato & Associates, 5898 S. Rapp Street, Littleton, CO 80120
Attn: Michelle Li, Environmental Services Manager

NO LATER THAN OCTOBER 3, 2002

Your suggestions and/or comments are needed at this time as we go forward to the next stages of this process – the environmental analysis and Environmental Assessment document. Please comment in the space below on: the alternatives under study, the screening criteria, additional information you believe should be considered, or other issues and concerns you believe are important.

Are you a: resident ☐ business owner ☐ commuter ☐ in the project area? Other ☐ ?

WOULD YOU LIKE TO BE ADDED TO OUR PROJECT MAILING LIST? PLEASE FILL IN THE INFORMATION BELOW:

NAME	STREET OR POST OFFICE BOX	TOWN/CITY AND ZIP CODE

OVER FOR ADDITIONAL COMMENTS ☐

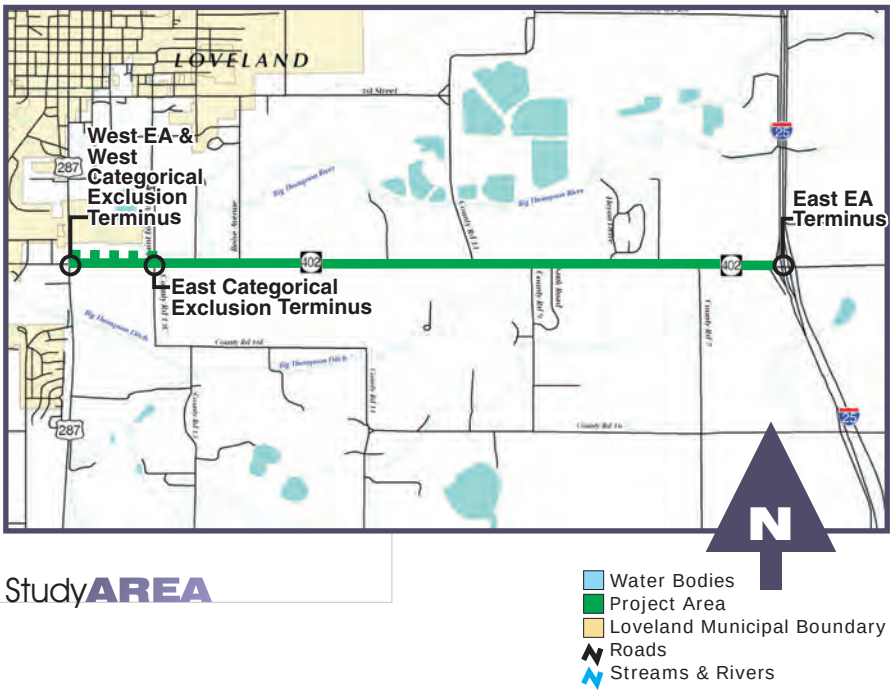
Welcome

Please sign the attendance roster.

Read the handout.

Visit our displays

If you have any questions, please ask one of our project team members.



Study**AREA**

Please make a written statement or comment, and fill out the attached comment sheet.
You may also contact our website: www.sh402ea.com to receive a project update or e-mail comments.

SH 402

Project**BACKGROUND**

The Federal Highway Administration (FHWA), as the lead agency, and the Colorado Department of Transportation, Region 4 (CDOT) have initiated an Environmental Assessment (EA) to evaluate potential improvements along SH 402 from US 287 east to the I-25 Interchange. As the lead federal agency, FHWA has the authority and responsibility to make the final decisions. CDOT is the applicant and is responsible for the preparation of the EA.

Planning and construction of improvements along the approximately 4-mile stretch of SH 402 have been ranked 10th in the North Front Range (NFR) 2020 Regional Transportation Plan, and the project is currently in the State-wide Transportation Improvement Plan for highway improvements. The EA will identify alternatives to improve mobility and safety, which will include the No Action alternative. Maintaining or improving access to the residences, businesses, and the park-n-Ride within the study area will also be evaluated. CDOT will examine alternatives for the ability to meet these goals now and in 20 years.

EA**PROCESS**

(please refer to graphic on the back of this page)

CDOT is currently in the Alternatives Analysis phase of the project. Public Involvement, however, is ongoing throughout the process to keep interested individuals, groups, and agencies informed about the project and to solicit input at key milestones in the project.

Proposed**ACTION**

The proposed action under study is to evaluate potential improvements along SH 402 from US 287 east to the I-25 Interchange that improve safety and increase capacity. The EA process will evaluate various alternatives, and the No Action alternative, to determine a preferred alternative. The preferred alternative will meet the purpose and need of the project, to improve safety and increase capacity, while:

- **Considering compatibility with local and state plans**
- **Providing on-going coordination with federal, state and county agencies**
- **Protecting or maintaining community values and the environment**
- **Minimizing utility, traffic, and access impacts during construction if an action alternative is the preferred alternative**

The EA will be conducted in compliance with the National Environmental Policy Act (NEPA) and will encourage public involvement throughout the process. CDOT is committed to maintaining the environmental integrity, both natural and human, of the study area.

EA PROCESS

Public Involvement ongoing throughout the project

Public Involvement Program

Scoping and Public Involvement

Scoping is an open public process initiated at the beginning of the EA to help identify the public's concerns and possible solutions. The Public Involvement Program, which is on-going throughout the EA, provides opportunities for public participation in refining the Purpose and Need of the project, the range of alternatives to be considered and the issues to be addressed. CDOT will provide a range of forums to encourage agency and public involvement throughout the EA.

Alternative Analysis

Summer 2002

We are currently here in the process

Alternatives proposed through the scoping process will be screened to determine how well each meets the project's Purpose and Need. Evaluation criteria developed through EA scoping will be used to screen the alternatives. Alternatives examined during the Alternative Analysis stage either will be screened out or advanced to the Environmental Analysis stage of the EA.

Environmental Analysis

Fall-Winter 2002

Alternatives advanced through the Alternative Analysis process will be studied at an appropriate level, relative to the environmental issues and according to the NEPA process.

Preferred Alternative

Winter 2002-03

The alternative that is proposed by the EA as the course of action (this could include a recommendation of "No Action") is the Preferred Alternative. The Preferred Alternative has been selected after having conducted the Alternative and Environmental Analysis.

EA Document Preparation

Spring 2003

The EA Document Preparation will begin at the initiation of the project and will explain the Purpose and Need for the project, Alternative Analysis, Environmental Analysis and the selection of a Preferred Alternative. A 30-day public review and comment period followed by a public hearing is required to conclude the EA. The Federal Highway Administration (FHWA), as Lead Agency may determine a Finding of No Significant Impact (FONSI) based on findings and the recommendations proposed by the EA. A FONSI indicates that the proposed alternative has no significant impact on the environment.

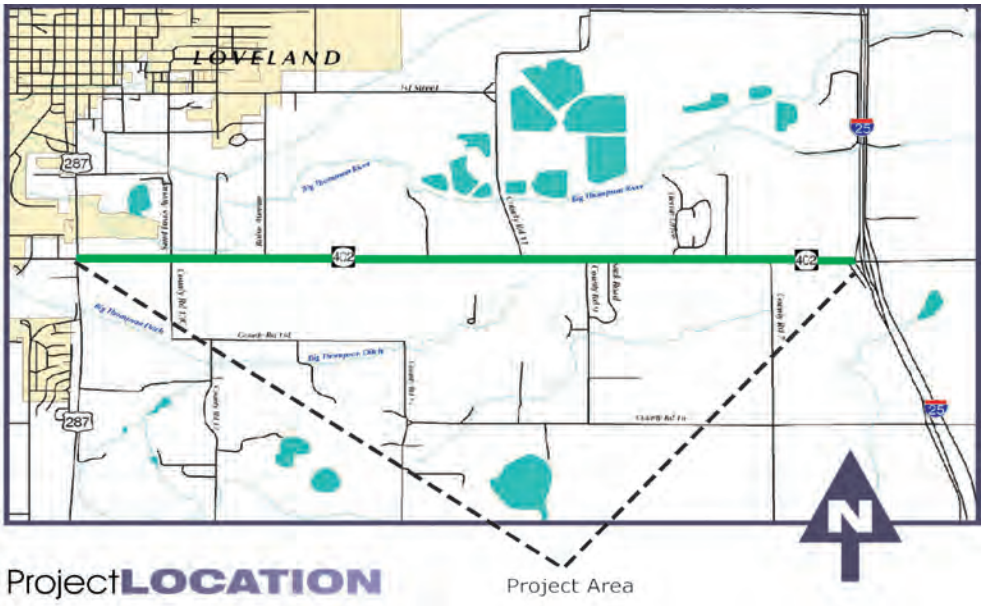
Opportunities for **Public Involvement**

Please feel free to contact;Jeff Manuel, Environmental Unit Manager, (CDOT Region 4) or Michelle Li, Project Manager, (JFSA) with any additional questions or comments you may have regarding this project, or to be added to the mailing list.

Jeff's mailing address is 1420 2nd Street, Greeley, CO 80631, his e-mail is jeff.manuel@dot.state.co.us, and his phone number is (970) 350-2170.

Michelle's mailing address is 5898 S. Rapp Street, Littleton, CO 80120, her e-mail is mli@jfsato.com, and her phone number is (303) 797-1200.

You can also visit the project Web site at www.sh402ea.com.



Project **LOCATION**

Project Overview

- The general plan for SH 402 from US 287 east to the I-25 interchange is to **widen from two to four lanes** thereby providing a **higher level of service** and improving **safety** along this stretch of roadway.
- The project is **ranked 10th in the North Front Range 2020 Regional Transportation Plan** and currently is in the Statewide Transportation Improvement Plan.
- The **City of Loveland 2020 Transportation Plan** shows SH 402 as a four lane facility.

CDOT SH 402 Environmental Assessment

Glossary of Terms

Alternative Analysis – process by which alternatives identified through the scoping process will be screened to determine how well each meets the Purpose and Need as well as criteria related to key issues and concerns associated with the study area.

Average Daily Traffic (ADT) – average two-way traffic, in number of vehicles.

Capacity – maximum rate of flow at which vehicles can traverse a point on one lane of roadway during one hour.

CDOT – Colorado Department of Transportation

Design Hourly Volume – peak hour traffic (rush hour) whether in the morning or afternoon hour.

EA - an Environmental Assessment is a written statement prepared in accordance with NEPA when the level of potential impacts is not clear. The document discloses the effects on the environment that could result from a proposed action (planning or decision making).

FHWA – Federal Highway Administration

FONSI – Finding of No Significant Impact; possible final decision on an EA indicating that the preferred alternative has no significant impacts on the environment that cannot be appropriately mitigated.

LOS – Level of Service is a qualitative measure describing the operational characteristics within a traffic stream, generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.

LOS A – free flow operations
LOS B – reasonably free-flow operations
LOS C – noticeable traffic
LOS D – speeds decline and congestion begins to form
LOS E – maximum service flow (full capacity)
LOS F – heavy congestion, significant delays, stop-and-go-traffic

Mobility – the ability of traffic to move unimpeded through a highway or roadway corridor.

NEPA – National Environmental Policy Act of 1969 is our nation's basic charter for protection of the environment. It establishes policy, sets goals, and provides

the means for carrying out the policy. In accordance with NEPA, all federal agencies must prepare a written statement on the environmental impacts of a proposed action. The provisions to ensure that federal agencies act according to the letter and spirit of NEPA are in the Council on Environmental Quality (CEQ) regulations for implementing NEPA (43 CFR 1500-1508).

No Action Alternative – alternative that represents projected conditions within the study area without the implementation of improvement and that serves as a baseline for the comparison of the build alternatives.

Preferred Alternative – alternative identified through the EA process that is the action recommended to meet the Purpose and Need of the project.

Prime Farmland – soil units that have the best combination of physical and chemical characteristics for producing feed, food, forage, fiber and oilseed crops as identified in accordance with the Farmland Protection Policy Act of 1981.

Purpose and Need – the underlying reason for conducting the studies and analysis; the purpose and need to which the agency is responding by proposing alternative solutions.

Right of Way – a general term denoting land, property, or interest therein, usually in a strip acquired for or devoted to transportation purposes.

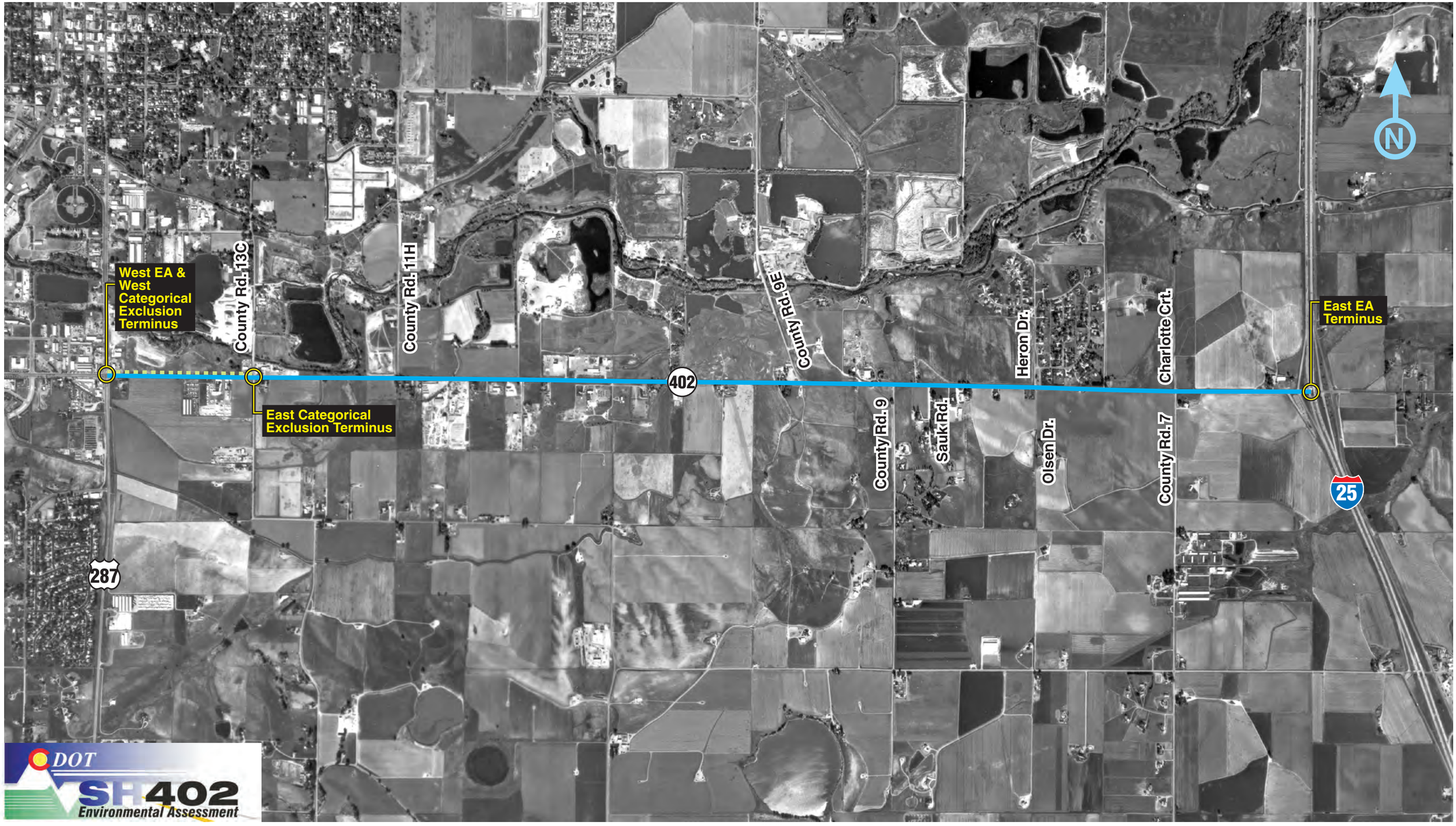
Scoping – an open public process initiated at the beginning of the EA to help identify the public's concerns and recommended solutions.

Screening (alternatives analysis) – A systematic process through which a broad range of alternatives is narrowed down to those that best meet the goals of the project based on the purpose and need of the project and key issues and concerns related to the study area. Alternative(s) that pass through the screening process are taken into environmental assessment to identify a preferred alternative.

Threatened and Endangered Species – endangered species are those that are in danger of becoming extinct; threatened species are those that are in danger of being listed as endangered.

4(f) – publicly owned land including public parks, recreation areas, wildlife/waterfowl refuges or land of a historic site of National, State or local significance.

Study Area


West EA & West Categorical Exclusion Terminus
East Categorical Exclusion Terminus
East EA Terminus
County Rd. 13C
County Rd. 11H
County Rd. 9E
County Rd. 9
Sauk Rd.
Heron Dr.
Olsen Dr.
Charlotte Crt.
County Rd. 7
402
287
25
N
DOT
SH 402
Environmental Assessment

Project Team Contact Information

Please feel free to contact the Project Managers or visit the project website for additional information or to submit your comments.

Jeff Manuel
Environmental Unit Manager
CDOT Region 4
1420 2nd Street, Greeley, CO 80631
(970)350-2170
jeff.manuel@dot.state.co.us

Michelle Li
Project Manager
J. F. Sato and Associates
5898 S. Rapp Street, Littleton, CO 80120
(303)797-1200
mli@jfsato.com

www.sh402ea.com

CDOT SH 402 Environmental Assessment

PUBLIC WORKSHOP #2

DATE: April 15, 2003
TIME: 4:00 TO 7:00 PM
LOCATION: CDOT Loveland Residency, 2207 SH 402, Loveland, CO

COMMENT SHEET

PLEASE HAND IN THIS SHEET BEFORE YOU LEAVE TODAY
OR MAIL POSTAGE PAID TO:
J.F. Sato & Associates, 5898 S. Rapp Street, Littleton, CO 80120
Attn: Michelle Li, Project Manager
OR CALL WITH ANY COMMENTS 303-797-1200

No later than May 1, 2003

Are you a: resident☐ business owner☐ commuter☐ other☐ in the project area?

Did you attend the first SH 402 EA Public Workshop held on September 19, 2002?_____

Have you received the project factsheets in the mail?_____

Do you support the potential widening of SH 402 between US 287 and the I-25 Interchange?
Why or why not? _____
_____
_____
_____

Which alternative do you prefer? Why?_____
_____
_____
_____

Was the material presented tonight helpful and easy to understand? _____

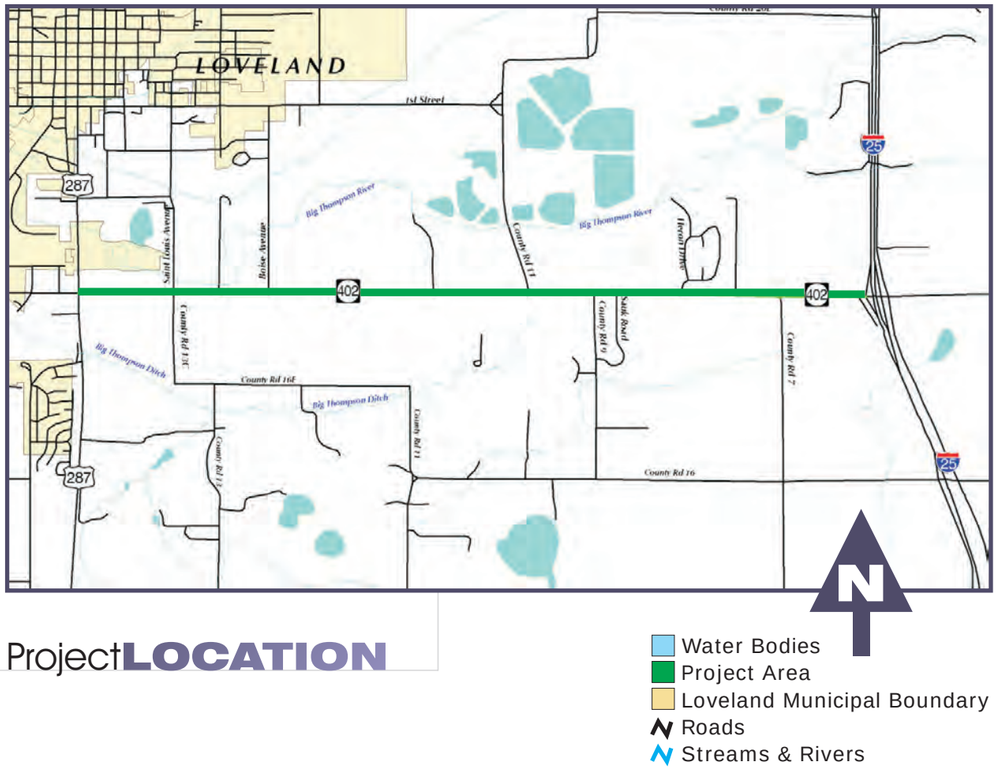
Do you have any suggestions for other ways the project team can relay project information to you?_____

Can you recommend anyone else we need to contact within the project area? _____
_____

WOULD YOU LIKE TO BE ADDED TO OUR PROJECT MAILING LIST? PLEASE FILL IN THE INFORMATION BELOW:

NAME	STREET OR POST OFFICE BOX	TOWN/CITY AND ZIP CODE

OVER FOR ADDITIONAL COMMENTS ☐



Project**LOCATION**

- Water Bodies
- Project Area
- Loveland Municipal Boundary
- Roads
- Streams & Rivers

Colorado Department of Transportation - SH402
C/O J.F. Sato and Associates
5898 South Rapp Street
Littleton, Colorado 80120

PRSRT STD
U.S. POSTAGE
PAID
LITTLETON, CO
PERMIT #545

Carrier Route Rural Route 001

Rural Route Patron
Loveland, CO 80538

DOT

State Highway 402 from US 287 East to the I-25 Interchange

October 2001

SH 402 FACT SHEET #1

This is the first in a series of Fact Sheets to keep you up-to-date regarding the Environmental Assessment (EA) for SH 402 from US 287 to the I-25 Interchange.

The Colorado Department of Transportation (CDOT) has retained J.F. Sato and Associates (JFSA) to perform the EA for SH 402 from US 287 East to the I-25 Interchange.

Project**BACKGROUND**

The Federal Highway Administration (FHWA), as the lead agency, and the Colorado Department of Transportation, Region 4 (CDOT) have initiated an Environmental Assessment (EA) to evaluate potential improvements along SH 402 from US 287 east to the I-25 Interchange. As the lead federal agency, FHWA has the authority and responsibility to make the final decisions. CDOT is the applicant and is responsible for the preparation of the EA.

Planning and construction of improvements along the approximately 4-mile stretch of SH 402 have been ranked 10th in the North Front Range (NFR) 2020 Regional Transportation Plan, and the project is currently in the State-wide Transportation Improvement Plan for highway improvements. The EA will identify alternatives to improve mobility and safety, which will include the No Action alternative. Maintaining or improving access to the residences, businesses, and the park-n-Ride within the study area will also be evaluated. CDOT will examine alternatives for the ability to meet these goals now and in 20 years.

EA**PROCESS**

(please refer to graphic on page 3)

CDOT is currently in the Scoping phase of the project. Scoping is a process conducted early in the project that is open to the public (agencies and general public) to identify the range or "scope" of issues and alternatives to be addressed during the environmental studies and in the EA.

Formal Scoping will conclude in Fall 2001. Public Involvement, however, is ongoing throughout the process to keep interested individuals, groups, and agencies informed about the project and to solicit input at key milestones in the project.

Proposed **Action**

The proposed action under study is to evaluate potential improvements along SH 402 from US 287 east to the I-25 Interchange that improve safety and increase capacity. The EA process will evaluate various alternatives, and the No Action alternative, to determine a preferred alternative. The preferred alternative will meet the purpose and need of the project, to improve safety and increase capacity, while:

- **Considering compatibility with local and state plans**
- **Providing on-going coordination with federal, state and county agencies**
- **Protecting or maintaining community values and the environment**
- **Minimizing utility, traffic, and access impacts during construction if an action alternative is the preferred alternative**

The EA will be conducted in compliance with the National Environmental Policy Act (NEPA) and will encourage public involvement throughout the process. CDOT is committed to maintaining the environmental integrity, both natural and human, of the study area.

Coordination/**Public Involvement**

Coordination of this effort will be through CDOT and its consultant, J.F. Sato and Associates (JFSA).

Future Public Workshops will be advertised, and updates on the status of the EA will be provided through periodic project fact sheets, notices, and the project Web site, www.sh402ea.com, at key milestones during the project.

Your input is essential to the process in order to solicit input and help in issue identification. CDOT is asking for your assistance. Please take a few minutes to answer the postage-paid survey included in this Fact Sheet. If there are any issues pertinent to the study area not listed in the survey, please include them in the comment section. We look forward to hearing from you!

Opportunities for **Public Involvement**

Please feel free to contact;Jeff Manuel, Environmental Unit Manager, CDOT Region 4; Michelle Li, Project Manager, JFSA; or Melanie Pyryt, Public Involvement Manager, JFSA with any additional questions or comments you may have regarding this project, or to be added to the mailing list.

Jeff's mailing address is 1420 2nd Street, Greeley, CO 80631, his e-mail is jeff.manuel@dot.state.co.us, and his phone number is (970) 350-2170.

Michelle's mailing address is 5898 S. Rapp Street, Littleton, CO 80120, her e-mail is mli@jfsato.com, and her phone number is (303) 797-1200.

Melanie's mailing address is 5898 S. Rapp Street, Littleton, CO 80120, her e-mail is mpyryt@jfsato.com, and her phone number is (303) 797-1200.

You can also visit the project Web site at www.sh402ea.com.

EA **PROCESS**

Public Involvement ongoing throughout the project

Public Involvement Program

Scoping and Public Involvement
Fall 2001

We are currently here in the process

Scoping is an open public process initiated at the beginning of the EA to help identify the public's concerns and possible solutions. The Public Involvement Program, which is on-going throughout the EA, provides opportunities for public participation in refining the Purpose and Need of the project, the range of alternatives to be considered and the issues to be addressed. CDOT will provide a range of forums to encourage agency and public involvement throughout the EA.

Alternative Analysis
Mid-Winter 2001

Alternatives proposed through the scoping process will be screened to determine how well each meets the project's Purpose and Need. Evaluation criteria developed through EA scoping will be used to screen the alternatives. Alternatives examined during the Alternative Analysis stage either will be screened out or advanced to the Environmental Analysis stage of the EA.

Environmental Analysis
Winter 2001

Alternatives advanced through the Alternative Analysis process will be studied at an appropriate level, relative to the environmental issues and according to the NEPA process.

Preferred Alternative
Summer 2002

The alternative that is proposed by the EA as the course of action (this could include a recommendation of "No Action") is the Preferred Alternative. The Preferred Alternative has been selected after having conducted the Alternative and Environmental Analysis.

EA Document Preparation
Summer 2002

The EA Document Preparation will begin at the initiation of the project and will explain the Purpose and Need for the project, Alternative Analysis, Environmental Analysis and the selection of a Preferred Alternative. A 30-day public review and comment period followed by a public hearing is required to conclude the EA. The Federal Highway Administration (FHWA), as Lead Agency may determine a Finding of No Significant Impact (FONSI) based on findings and the recommendations proposed by the EA. A FONSI indicates that the proposed alternative has no significant impact on the environment.

Important **CONTACTS**

Project **WEBSITE**
WWW.SH402EA.COM

Public Involvement **MANAGER (JF Sato)**
MPYRYT@JFSATO.COM

Environmental Unit **MANAGER (CDOT)**
JEFF.MANUEL@DOT.STATE.CO.US

Contact**INFORMATION**

Please feel free to contact Jeff Manuel, Environmental Unit Manager, CDOT Region 4, or Michelle Li, Project Manager, JFSA, with any questions or comments you may have regarding this project or to be added to the mailing list.

Jeff's mailing address is 1420 2nd Street, Greeley, CO 80631
jeff.manuel@dot.state.co.us
970.350.2170

Michelle's mailing address is 5898 S. Rapp Street, Littleton, CO 80120
mli@jfsato.com
303.797.1200

Future**PUBLIC INVOLVEMENT OPPORTUNITIES**

Updates on the status of the EA will be provided at key milestones during the project through Factsheets, notices, and the project web site (http://www.sh402ea.com).

Colorado Department of Transportation - SH402
C/O J.F. Sato and Associates
5898 South Rapp Street
Littleton, Colorado 80120

PRSRT STD
U.S. POSTAGE
PAID
LITTLETON, CO
PERMIT #545

ECRWSSRR001

Postal Customer
Loveland, CO 80538

CDOT SH 402 Environmental Assessment

State Highway 402 from US 287 East to the I-25 Interchange
November 2002
FACTSHEET #2

This is the second in a series of Factsheets reporting the status of the SH 402 (from US 287 east to the I-25 Interchange) Environmental Assessment.

This Factsheet provides a summary of the first Public Workshop (held on September 19, 2002) as well as, identifies the alternatives that have gone through alternatives analysis, and the remaining Environmental Assessment schedule.

Project**BACKGROUND**

The Federal Highway Administration (FHWA), as the lead agency, and the Colorado Department of Transportation, Region 4 (CDOT), have been conducting an Environmental Assessment (EA) to evaluate potential transportation improvements along SH 402 from US 287 east to the I-25 Interchange. As the lead federal agency, FHWA has the authority and responsibility to make the final decisions. CDOT is the applicant and is responsible for the environmental assessment process and documentation.

Next**STEPS**

Through scoping and alternative analysis, two alternatives, Meander and No Action, have progressed into the next stage of the study process. During the next step environmental analysis will be conducted on each alternative to determine their impact on air quality, water quality, noise, and other environmental factors.

Project**PURPOSE AND NEED**

The purpose of this project is to improve travel and safety on SH 402 within the study area. The difficulty experienced by drivers making a left turn to or from the roadway contributes to this need. As traffic volumes increase, it can be expected that the current mobility and safety issues will become worse if improvements are not made to the existing roadway.

First Workshop**SUMMARY**

The Public Workshop was held on September 19, 2002 at the CDOT Loveland Residency, located at 2207 East SH 402, Loveland. The Public Workshop was announced through local newspaper ads and invitations sent to those on the mailing list, including local, state and federal agencies and all box holders on the rural routes in the study area.

The purpose of this Public Workshop was to present information and solicit input on the following:

- Project Overview
- Project Process
- Project Schedule
- Potential Alternatives to date
- Screening Criteria

Workshop attendees discuss project

The workshop format encouraged discussion directly with CDOT and project team members about any aspect of the project. Participants were encouraged to identify specific areas that were of interest to them on any of several available maps. Participants wrote their comments on note cards and adhered them to the appropriate display. Displays included information on traffic data, alternative alignments, environmental factors, and screening criteria. Comment sheets were also available for participants to fill out. The project team received several comments commending the level of public involvement.

Approximately fifty people attended the workshop, and about 26 written comments were received. The comments are grouped by topic and summarized on the next page.

Public**WORKSHOP COMMENTS**

No Action Alternative - ***(No improvements will be made to the roadway, however, current maintenance practices will continue)***
No comments were received on this alternative.

Alternative # - ***(Maintain existing centerline, add lanes north and south of existing pavement)***
Comments on this Alternative included concern for saving trees adjacent to SH 402. Comments also concerned the need for more than two lanes at the interchange of SH 402 and I-25. One comment indicated that this Alternative is more fair than the others.

Alternative #2 - ***(Maintain north edge R-O-W and shift roadway south)***
Some comments on this Alternative expressed approval of its ability to maintain the northern right-of-way. Others noted that the alignment would cause relocation of residents and businesses and were, therefore, not in favor of it. There was also one comment concerning its ability to facilitate left turns onto SH 402.

Alternative #3 - ***(Maintain south edge pavement and shift roadway north)***
Comments on this Alternative included the desire to improve the intersection of SH 402 and CR 9 and concern over potential impacts to an irrigation ditch along SH 402.

Alternative #4 - ***(Meander-Shift roadway north with slight meander (shift) at both ends of project)***
Comments on this Alternative included approval for its ability to miss several privately owned structures and trees. It was widely viewed as the best compromise, balancing transportation improvements and minimizing impacts to the human & natural environment. Also, it was mentioned that the intersection with LCR 9 should receive a priority under this alternative. This alternative received the most favorable comments.

Maintain Rural Character
Some attendees noted a desire to maintain the rural character of the area by protecting characteristics such as the Osborn Farm and irrigation ditches adjacent to SH 402.

Safety
Several attendees addressed the issue of safety, including the need for left turn lanes, a wider shoulder, and improved sight distance at intersections.

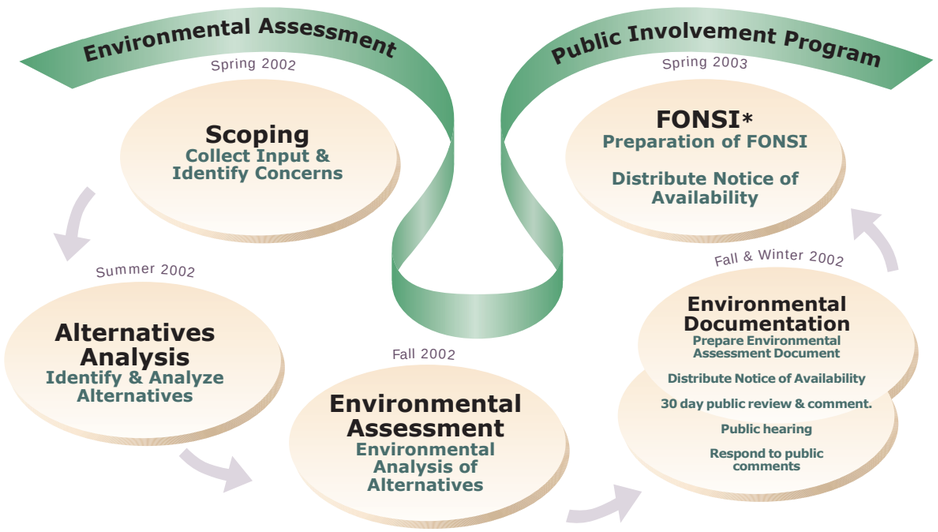
Noise
Some attendees suggested that treatments such as earthen berms or asphalt pavement be used to maintain low noise levels.

Project**STUDY AREA**
Larimer County, Colorado

Use of workshop**COMMENTS**

Both agency and public comments have been compiled and will be reviewed by CDOT and the project team. Where possible, the items raised during the Public Workshop will be incorporated into the conceptual design.

Project**SCHEDULE**



*The FHWA may determine a Finding of No Significant Impact (FONSI) based on the findings and the recommendations proposed by the EA. A FONSI indicates that the proposed alternative has no significant impact on the environment. Relevant comments received during the public review and comment period, and the public hearing, will be taken into consideration as FHWA makes it's decision.

SH 402 **FROM US 287 EAST TO CR 13 (ST. LOUIS AVE.) CATEGORICAL EXCLUSION**

CDOT is performing a Categorical Exclusion (CatEX) for the portion of SH 402 between US 287 and St. Louis Avenue (CR13). The proposed action will address roadway access to adjacent properties and ensure that SH 402 transportation safety and mobility issues are coordinated with the City of Loveland and proposed development projects. A CatEX is a streamlined environmental evaluation process and will identify impacts from the proposed action and mitigation measures required for implementation. CDOT is conducting the CatEX in coordination with FHWA and Loveland so that future development, including the Waterford Development project (which was approved by Loveland), can proceed.

The action is being evaluated as a CatEX since it is not expected to have significant impacts to environmental features and resources such as land use considerations and natural resources. The CatEX is being performed concurrently with the SH 402 EA and will use environmental resource information gathered for the EA. Completion of the CatEX is expected in early 2003. Please contact Amy Baerenklau (J. F. Sato and Associates) at 303-797.1200 or contact her via email at amy@jfsato.com.

State Highway 402 from US 287 East to the I-25 Interchange

April 15, 2003

FACTSHEET #3

This is the third in a series of Factsheets to keep you up-to-date regarding the Environmental Assessment (EA) for SH 402 from US 287 east to the I-25 Interchange. This Factsheet is to notify you of the April 15, 2003 Public Workshop, update you on alternative refinements and solicit your comments.

Project**Background**

The purpose and need of the project is to improve travel and safety on SH 402 between US 287 and the I-25 Interchange. There are two concurrent projects along SH 402 that are being conducted in concert. This factsheet focuses on the stretch of SH 402 between CR 13 and the I-25 interchange that is being evaluated in the EA. The EA is studying improving the safety and mobility of SH 402 by widening the facility from 2 to 4 lanes at a speed limit of 55 mph; this cross section is a rural design that could be modified to an urban section in the future should this be warranted. The EA is being closely coordinated with the Category Exclusion so that the design at CR 13, where the two project areas meet, is compatible.

The portion of SH 402 between US 287 and CR 13 (St. Louis Avenue) is being studied as a categorical exclusion (CE). A CE is a streamlined National Environment Policy Act study conducted when there are no significant human or natural environmental impacts (land use, cultural, ecological, wetlands, hazardous materials, etc...). This study is expected to conclude in the next few months. The City of Loveland and Larimer County have been partners on the project and other government entities as well as the adjacent landowners have been contacted during the CE. This portion of SH 402 is designed to match the City of Loveland's urban roadways with 2 lanes in each direction separated by a raised median. Also included are a detached sidewalk, bike lane, acceleration / deceleration lanes and a left turn lane at the US 287 intersection.

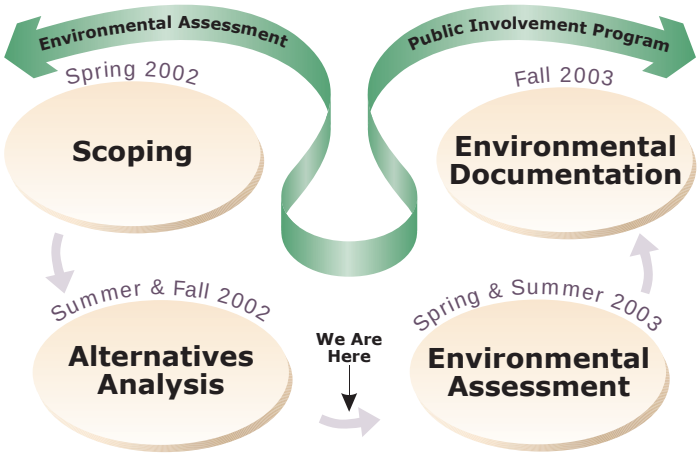
EA**Process**

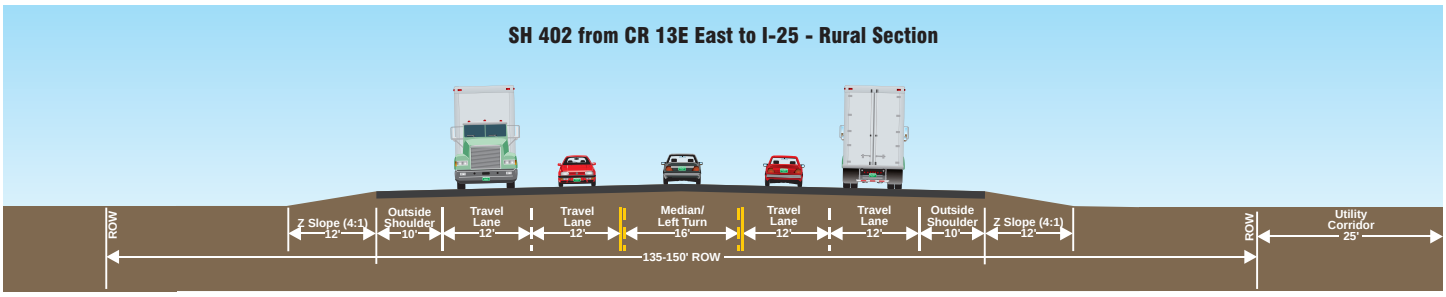
CDOT is currently completing the Alternative Analysis phase of the EA study. During the September 19, 2002 Public Workshop CDOT received valuable comment from the public and agencies about the 4 action alternatives under consideration. All action alternatives widen the facility from 2 to 4 lanes, provide a painted median for left turns between CR 13 and the I-25 Interchange, include a 10 foot bike lane/shoulder and a 25 foot utility corridor on the south side. The alternatives are:

- widen from the centerline to both the north and south
- widen entirely to the north
- widen entirely to the south
- a combination of widening to the north in some areas and to the south in other areas in an effort to minimize the potential impacts to the natural environment and adjacent properties
- No Action-existing facility would remain with current operation and maintenance practices in effect

As a result of the Public Workshop and CDOT review, the Project Team decided to refine the alternatives to further reduce the potential impacts. The initial 4 action alternatives were at a right-of-way (ROW) width of 200', CDOT has reduced this ROW to approximately 150'. This changes the number of residences and businesses that would need to be acquired and limits the amount of natural resources affected (i.e. wetlands, farmlands, and floodplain area).

EA**Process Diagram**





SH 402 from US 287 East to the I-25 Interchange
Environmental Assessment
2nd Public Workshop

Date: Tuesday, April 15, 2003
Between: Drop in any time between 4 and 7 pm
Location: CDOT Loveland Residency
Address: 2207 East Highway 402, Loveland, CO

The purpose of the second Public Workshop is to focus on the EA and provide information on:

- Modified Alternatives & Alternatives' Analysis
- Modified Screening Results
- Recommended Alternatives for further environmental study and provide you with an update on the project schedule.

Contact**INFORMATION**

For additional information please contact either:

Jeff Manuel
970.350.2170
CDOT, R-4
Project Manager
1420 2nd Street, Greeley, CO 80631

Michelle Li
303.797-1200
J. F. Sato and Associates
Project Manager
5898 S. Rapp Street, Littleton, CO 80120

Or e-mail from the project website: www.SH402EA.com

Colorado Department of Transportation - SH402
C/O J.F. Sato and Associates
5898 South Rapp Street
Littleton, Colorado 80120

PRSRT STD
U.S. POSTAGE
PAID
LITTLETON, CO
PERMIT #545

ECRWSSRR001

Postal Customer
Loveland, CO 80538

State Highway 402 from US 287 East to the I-25 Interchange

July 2003

FACTSHEET #4

This is the fourth in a series of Factsheets to keep you up-to-date regarding the Environmental Assessment (EA) for SH 402 from US 287 east to the I-25 Interchange.

Project **Background**

The purpose and need of the project is to improve travel and safety on SH 402 between US 287 and the I-25 Interchange. The EA is studying **improving the safety and mobility** of SH 402 by widening the facility from 2 to 4 lanes at a speed limit of 55 mph; this cross section is a rural design that could be modified to an urban section in the future should this be warranted. A Categorical Exclusion (CE) is being conducted for SH 402 between US 287 and CR 13 this study is also a part of the EA. The cross section for the portion of SH 402 between US 287 and CR 13 is an urban design that has two through travel lanes in each direction as well as acceleration/ deceleration lanes for traffic entering and exiting the road. There will also be a raised median for this section and a left turn lane at the US 287 intersection. Please refer to the cross sections illustrated at the bottom of the page.

Second **Public Workshop**

The second Public Workshop was held on April 15, 2003, at the CDOT Loveland Residency, located at 2207 East SH 402, Loveland. The purpose of this Public Workshop was to present information and solicit input on the following:

- Modified Alternatives & Alternatives Analysis
- Modified Screening Results
- Recommended Alternatives for further environmental study

The workshop format encouraged discussion directly with CDOT and project team members about the project. Participants were encouraged to identify specific areas that were of interest to them on any of several available maps. Displays included traffic data, alternative alignments, environmental factors, and screening criteria. Comment sheets were also available for participants to fill out.

Public **Comments**

Comments from the Workshop included:

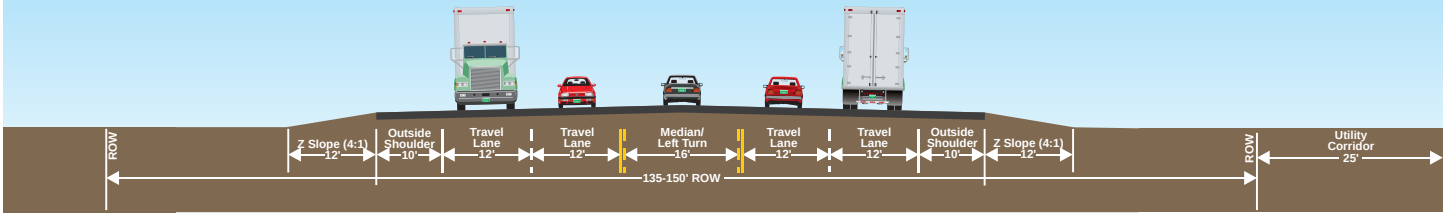
Modified Alternatives & Alternatives Analysis

- **Support for improvements** to the existing SH 402 roadway between US 287 and the I-25 interchange.
- **Reduced the right-of-width from 225' to 150' for all the action alternatives and the resultant lessened impacts**
- Concern over **current safety of the roadway and desire to increase the ease of making left turns support for the meander alternative**
- **Limited number** of comments were received in **support of other alternatives due to direct impacts to property owners adjacent to the corridor**
- Concern regarding the **environmental impacts**, specifically potential for increased noise, traffic, growth, and the need for property to be purchased to construct a wider facility
- Rural character of the area

Comment **Usage**

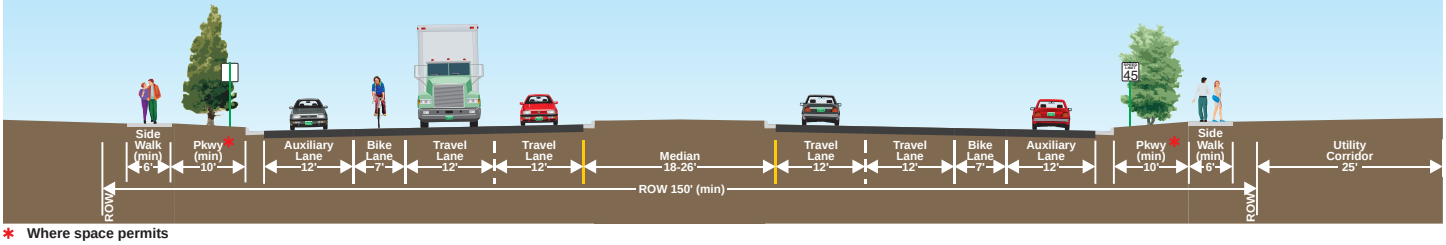
Both agency and public comments have been compiled and will be reviewed by CDOT and the project team. Where possible, the items raised during the Public Workshop will be incorporated into the alternatives' conceptual design.

SH 402 from CR 13E East to I-25 - Rural Section†



† ROW width was narrowed from 225' to 175' to reduce potential impacts

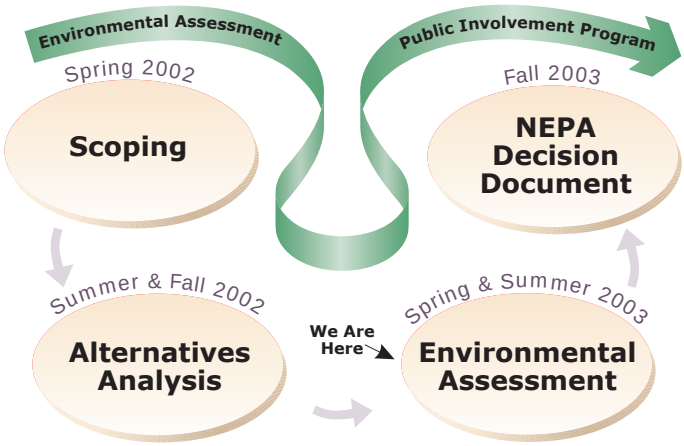
SH 402 from US 287 East to CR 13C - Urban Section



* Where space permits

Next Steps/**Project Schedule**

The Meander Alternative and the No Action Alternative will progress into the next phase of study environmental analysis. These two alternatives will be studied in detail to identify the preferred alternative. The preferred alternative will be the action CDOT recommends to FHWA in the EA document that will be made available for public review for 30 days. During the 30 - day review period, a public hearing will be held to encourage public comment on the study and its recommendation. It is anticipated that the EA document will be completed in the Summer of 2003. FHWA's decision will serve as the direction for potential improvements to SH 402 between US 287 and the I-25 Interchange.



Contact**INFORMATION**

For additional information please contact:

Jeff Manuel
970.350.2170
CDOT, R-4
Project Manager
1420 2nd Street, Greeley, CO 80631

Michelle Li
303.797.1200
J.F. Sato and Associates
Project Manager
5898 South Rapp Street, Littleton, CO 80120

Or e.mail from the project website:
www.SH402EA.com

Colorado Department of Transportation - SH402
C/O J.F. Sato and Associates
5898 South Rapp Street
Littleton, Colorado 80120

PRSRT STD
U.S. POSTAGE
PAID
LITTLETON, CO
PERMIT #545

ECRWSS RR001

Postal Customer
Loveland, CO 80538

April 2004

The Colorado Department of Transportation (CDOT) has been conducting an Environmental Assessment (EA) to find ways to improve safety and travel along SH 402 from US 287 to I-25. Your participation is greatly appreciated.

Colorado Department of Transportation
C/O J.F. Sato and Associates
5898 South Rapp Street
Littleton, CO 80120

What you can look forward to in Fall 2004:

Publication of EA Document • 30-Day Agency and Public Comment Period • Public Hearing

How Will You Know? • Mailings • Newspaper Ads • Website

PRSRT STD
U.S. POSTAGE
PAID
LITTLETON, CO
PERMIT#545

ECRWSS RR001

Postal Customer
Loveland, CO 80538

Project BACKGROUND

Planning and construction of improvements along the stretch of SH 402 between US 287 and I-25 (approximately 4 miles), have been ranked 10th in the North Front Range 2020 Transportation Plan, and the project continues to be included in the state wide Transportation Improvement Plan. An Environmental Assessment process was initiated in the fall of 2001. This study continues to be conducted in close coordination with the Federal Highway Administration (FHWA), Larimer County, and the City of Loveland. The purpose of the project is to provide travel and safety improvements to the existing roadway by widening the facility from 2 to 4 lanes.

Project STATUS

Project Scoping was conducted to collect input and identify concerns associated with the project in spring 2002.

Public Workshops have been held. The first, in September 2002, collected input on alternatives and project screening. The second, in April 2003, collected input on alternatives recommended for further environmental study.

Environmental Assessment (EA) research was conducted in early 2003 into summer 2004. The Meander Alternative and the No Action Alternative continued into this phase of study. These two alternatives have been studied in detail and will lead to identification of the preferred alternative. The preferred alternative will be the action CDOT recommends to FHWA.

A Traffic Update is needed to support local and regional transportation planning efforts. CDOT is currently updating the traffic analysis to reflect anticipated demand in year 2030. Initial results of the traffic analysis indicate the need for improvements west of the SH 402/US 287 intersection, extending approximately 1200 feet, to accommodate through lanes and turn lanes at the intersection.

Public Involvement Opportunities As CDOT moves forward in the study, public input remains important. Your input is taken into consideration throughout the process and in making a final decision.

Future opportunities include:

- A 30-day review and comment period of the EA document
- A Public Hearing

In addition, please feel free to call either Carol or Michelle to discuss the project or to request a one-on-one meeting.

WE LOOK FORWARD TO HEARING FROM YOU.....

EA PROCESS

Public Involvement

- **Scoping** — Fall 2001 - Fall 2002
- **Alternative Analysis** — Fall 2002 - Spring 2003
- **Environmental Analysis** — Spring 2003 - Summer 2004
- WE ARE ARE HERE
- **EA Document** (30-Day Review and Comment) — Fall 2004
- **Public Hearing** — Fall 2004
- **NEPA Decision Document** — Winter 2004

Project CONTACTS

Please contact us if you have questions or to be added to the mailing list.

Carol Parr, CDOT 970.350.2170
Carol.Parr@dot.state.co.us

Michelle Li, JFSA 303.797.1200
Mli@jfsato.com
http://www.sh402ea.com

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION
Region 4
1420 Second Street
Greeley, CO 80631
(970) 350-2170
FAX: (970) 350-2179

Date:

Name
Address

Subject: **SH 402 from US 287 east to the I-25 Interchange Environmental Assessment**

Dear Property Owner/Business Operator:

The Colorado Department of Transportation (CDOT), Region 4 is conducting an Environmental Assessment (EA) to evaluate potential improvements along SH 402 from US 287 east to the I-25 Interchange. The lead agency for the study is the Federal Highway Administration (FHWA) who is responsible for the decision on the Preferred Alternative. This study is being conducted in compliance with the National Environmental Policy Act of 1969 (NEPA) as amended; the Council on Environmental Quality (CEQ) regulations implementing NEPA; FHWA regulations; and other pertinent environmental regulations. A final decision on the Preferred Alternative is anticipated in late 2004.

A traffic update is needed to support local and regional transportation planning efforts. CDOT is currently updating the traffic analysis to reflect anticipated demand in year 2030. Initial results of the traffic analysis indicate the need for improvements west of the SH402/US 287 intersection for approximately 1200 feet.

Potential improvements to the west of US 287 are illustrated on the attached project map. These improvements would require additional right-of-way that may or may not impact your property or the operation of your business.

CDOT would like to extend an invitation to meet with you to discuss the project, alternatives under consideration, potential impact to your property/business, environmental findings to date and upcoming opportunities for public involvement.

Please contact me at (970) 350-2170 or Michelle Li, Project Manager with the consultant team of J.F. Sato & Associates at (303) 797-5050, ext. 1344 to set up a date and time to meet. In the meantime, you will be placed on our project mailing list to receive all future mailings based on the above mailing name and address. If you would like us to use a different mailing address, please let either of us know.

Sincerely,

Carol Parr
Environmental Manager
CDOT, R-4

Attachment: US 287 & SH 402 Intersection – Potential Improvements Map

DOT SH402

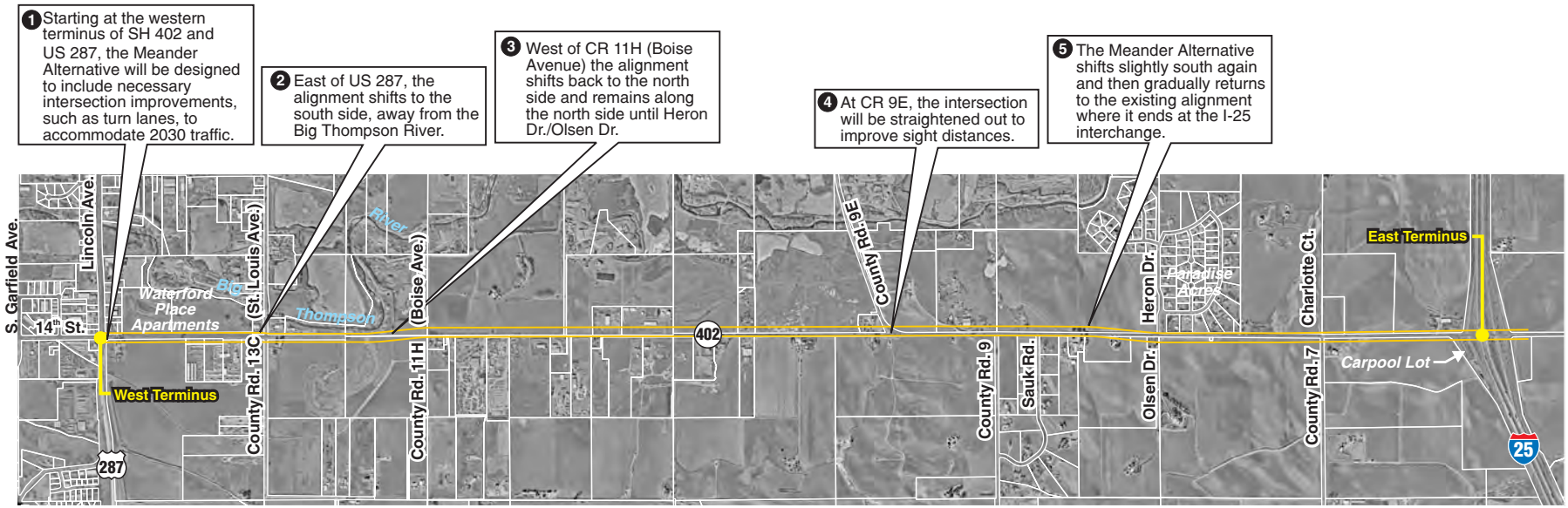
April 2004

US 287 & SH 402 Intersection - Potential Improvements

Making Progress

The Colorado Department of Transportation (CDOT) is completing an environmental assessment (EA) on improving the safety and mobility of **State Highway 402** between US 287 and I-25. The EA compares a **Meander Alternative** and a **No Action Alternative**, and determines impacts on various elements of the human and natural environments for each alternative. **Look for the published document in 2005, and be sure to review and comment on it.**

Meander Alternative



No Action Alternative

As required by the National Environmental Policy Act (NEPA), the No Action Alternative has been considered throughout the EA process as a viable alternative. This alternative would result in no changes to the existing highway.

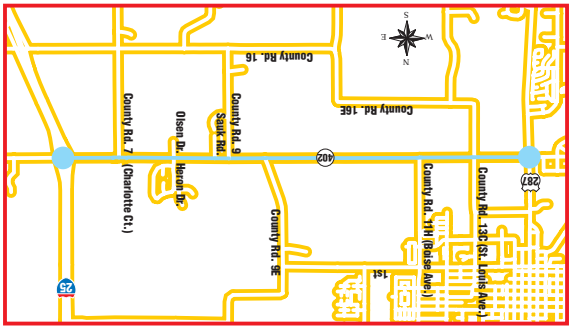
What's Next? - In 2005

- Watch for mailings and newspaper ads on publication of the EA document
- Review and provide comments on the EA document
- Attend the public hearing
- Visit the website for project information

* In addition, please feel free to call either Carol Parr or Michelle Li to discuss the project or to request a one-on-one meeting.

We look forward to your participation!

www.sh402ea.com



SH 402 Project Corridor

DOT SH 402 Environmental Assessment

PRSRT STD
U.S. POSTAGE
PAID
LITTLETON, CO
PERMIT#545

Looking forward to your participation in 2005...

Please see inside for details

Please contact us if you have any questions or to be added to the mailing list.

Carol Parr • CDOT Region 4 • 970-350-2170 • Carol.Parr@dot.state.co.us

Michelle Li • J.F. Sato and Associates • 303-797-5039 • mli@jfsato.com

www.sh402ea.com

DOT SH 402 Environmental Assessment

Fall 2005 Factsheet

Overview

Planning and construction of improvements along the stretch of State Highway 402 between US 287 and I-25 (approximately 4 miles), have been ranked 10th in the North Front Range 2020 Transportation Plan, and the project continues to be included in the Statewide Transportation Improvement Plan (STIP). An Environmental Assessment process was initiated in the fall of 2001. This study continues to be conducted in close coordination with the Federal Highway Administration (FHWA), Larimer County, and the City of Loveland. The purpose of the project is to provide travel and safety improvements to the existing roadway by widening the facility from two to four lanes.

Since We Last Contacted You

The project team has been immersed in the preparation of the EA document. The environmental analysis focused on impacts associated with the No Action Alternative (leaving SH 402 as it currently is) and the Meander Alternative (as illustrated on the back page of this newsletter) and proposed mitigation efforts. The document is nearing completion with the exception of some additional data gathering to be completed this fall. Once this data has been obtained, it will be included in the EA. Due to additional data gathering resulting in Section 106 consultation, the project has been delayed.

Historic Preservation and the SH 402 Project

Section 106 of the National Historic Preservation Act of 1966 requires federal agencies to consider their effects on historic properties during project planning for any federal undertaking or permitted activity. SH 402 is a federal undertaking and as such must comply with this requirement. In addition, CDOT recognizes and values the history of our state.

Early in the SH 402 project development several historic properties were identified. Recent research has indicated that there are additional properties that must be identified and possibly avoided. A historic property is a general term for any building, structure, site, object, or district that is usually more than 50 years old. A team of historians and archaeologists is conducting a more intensive survey of the entire SH 402 project corridor to identify historic properties and to find out if any of them are eligible for listing on the National Register of Historic Places. The State Office of Archeology and Historic Preservation has been working on the project with CDOT.

Section 4(f) of the US Department of Transportation Act of 1966 also identifies special efforts needed to preserve historic sites as well as park and recreation lands, wildlife and waterfowl refuges. At least one Section 4(f) property has been identified that will be impacted by the SH 402 project. The Section 4(f) process will require approximately six months of additional coordination and evaluation efforts. Both of these federal regulations (Section 106 and Section 4(f)) require that projects like SH 402 make every effort to avoid historic sites. If avoidance isn't possible, it is necessary to minimize harm and mitigate impacts to there properties.CDOT is in the process of completing these analyses.

Next Steps*

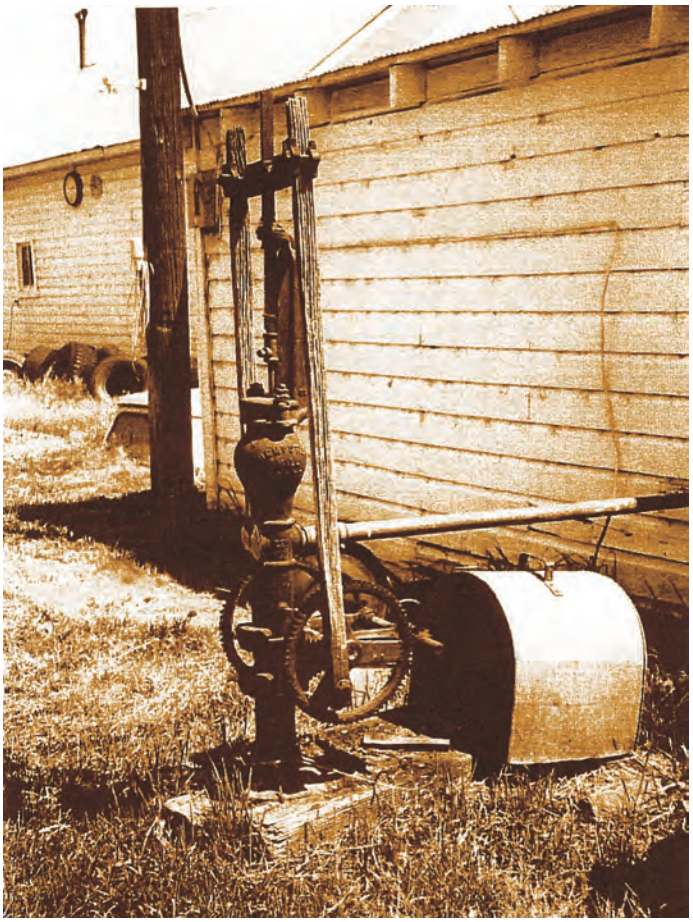
Additional data gathering related to historic properties
Fall 2005

Completion of Study & Release of Environmental Assessment for Public Review and Comment
Spring 2006

Public Hearing
Spring 2006

Decision will be made on whether to proceed with widening
Winter 2006

* Please note that the project schedule has been revised to include a full Section 4(F) Evaluation Process



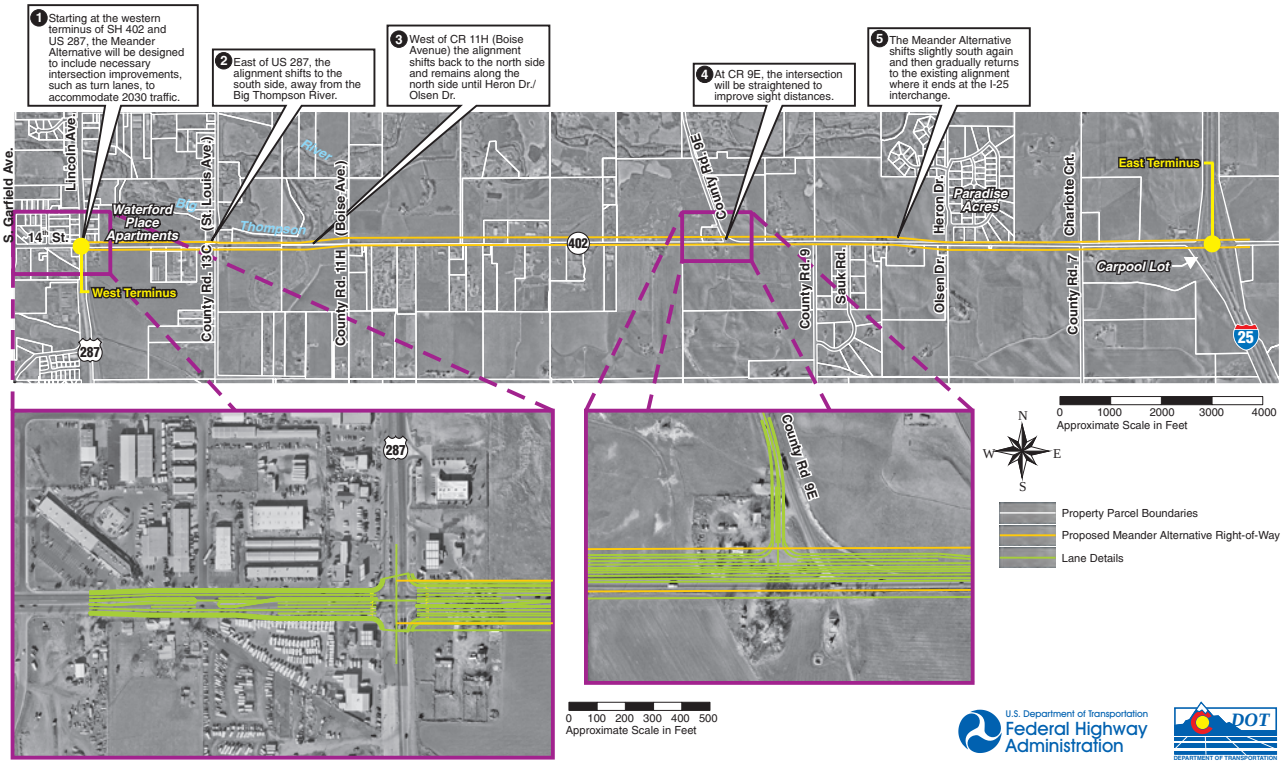
PRSRT STD
U.S. POSTAGE
PAID
LITTLETON, CO
PERMIT#545

DOT SH 402 Environmental Assessment

Historic preservation involves recognizing places from our past that are important to the American people, caring for them, and then using them in ways that enrich all of our lives. (Tandll, H. Ward, et al., A Heritage So Rich)

To learn more about historic preservation and its connection to the SH 402 Project, please look inside.

Alignment of the Meander Alternative



U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

Please contact us if you have any questions or to be added to the mailing list.
Carol Parr • CDOT Region 4 • 970-350-2170 • Carol.Parr@dot.state.co.us
Michelle Li • J.F. Sato and Associates • 303-797-5039 • mli@jfsato.com

For a one-on-one meeting, please contact Dave Martinez, CDOT, (970) 667-4670 x5119. His office is conveniently located at 2207 SH 402.

www.sh402ea.com

Appendix D

Noise Analysis and Abatement Guidelines

COLORADO DEPARTMENT OF TRANSPORTATION

NOISE ANALYSIS AND ABATEMENT GUIDELINES

DECEMBER 1, 2002

COLORADO DEPARTMENT OF TRANSPORTATION

REGION 1	**AURORA**
REGION 2	**PUEBLO**
REGION 3	**GRAND JUNCTION**
REGION 4	**GREELEY**
REGION 5	**DURANGO**
REGION 6	**DENVER**
ENV. PROGRAMS (HQ)	**DENVER**

TABLE OF CONTENTS

1. Introduction 3
2. Applicability and Scope 3
3. Noise Fundamentals and Traffic Noise Impact Criteria 6
4. Highway Traffic Noise Analysis 9
5. Evaluation of Highway Traffic Noise Abatement 15
6. Construction Considerations 24
7. Community Considerations 25
8. NEPA Documentation Requirements 26
9. Extenuating Circumstances 27
Appendix A—Key Definitions 28
Appendix B—Noise Technical Report Requirements 31
Appendix C—Noise Abatement Worksheet 33

1. Introduction

Pursuant to requirements set forth by the Federal Highway Administration (FHWA), the Colorado Department of Transportation (CDOT) Noise Analysis and Abatement Guidelines provide the procedural and technical requirements for the evaluation of highway project traffic noise and consideration of noise mitigation alternatives where noise impacts are identified. The resultant goal of these guidelines is to provide the citizens of the State of Colorado with as compatible a relationship as possible between highway improvements and noise sensitive land uses. CDOT understands the importance of the issue of highway traffic noise and is committed to evaluating traffic noise impacts during the planning, design, and construction of highways and transportation improvements.

The following guidelines are intended to provide a consistent, equitable approach in addressing highway traffic noise and to foster a rational abatement decision-making process for highway projects within the State of Colorado. In addition, the guidelines include the protocol for providing thorough documentation of these activities in technical noise study reports as a part of National Environmental Policy Act (NEPA) documents.

This document supersedes the February 1, 1995 *CDOT Noise Analysis and Abatement Guidelines* for all projects initiated on or after December 1, 2002. Projects initiated prior to December 1, 2002 will remain under the authority of the 1995 guidelines.

These guidelines are based on currently accepted practices and procedures used by Federal and state transportation agencies and will be subject to review every three years. Interim amendments to these guidelines will be made on an as needed basis and will be considered, when approved, to be an integral part of these guidelines. An addendum to these guidelines will subsequently be prepared to document the changes.

2. Applicability and Scope

2.1 Federal Requirements

The 1969 National Environmental Policy Act process provides broad authority and responsibility for evaluating and mitigating adverse environmental effects of transportation projects, including highway traffic noise, but it was not until the Federal-Aid Highway Act of 1970 that FHWA was mandated to develop noise standards for the mitigation of highway traffic noise.

The regulations that govern highway traffic noise for Federal-aid projects are contained in Part 772 of Title 23 of the Code of Federal Regulations (23CFR772). 23CFR772 describes the methods that must be followed in the evaluation and mitigation of highway traffic noise in Federal-aid highway projects. FHWA will not approve the plans and specifications for any federally aided highway project unless the project includes noise abatement measures that are deemed to be feasible

and reasonable to adequately reduce noise impacts. When warranted, noise mitigation is to be considered as an integral component of the total project development process and incorporated as such.

The FHWA document, *Highway Traffic Noise Analysis and Abatement: Policy and Guidance* (1995), calls for each state highway agency to prepare and adopt written guidelines specific to that state which must demonstrate compliance with 23CFR772. State highway agencies are allowed flexibility to establish their own definitions and quantifications of different criteria and decision items that are used in the guidelines to make noise abatement determinations. All highway projects that are developed in conformance with the CDOT guidelines will be deemed to be in conformance with the Federal regulations and with FHWA noise standards.

2.2 State Requirements

In addition to the Federal regulatory requirements, the CDOT guidelines are also required to be in accordance with CDOT Policy Directive 1601, Interchange Approval Process. The 1601 process applies to governmental and quasi-governmental (i.e. E-470, etc.) entity projects which require a new interchange on the system or major modifications to an existing interchange. Included in this process is the provision that potential environmental impacts must be evaluated, including those from projected traffic noise. This requirement broadens the general definition of Type I projects to include not only Federal-aid projects, but also state, local, and public-private partnership projects overseen by CDOT and requiring CDOT approval. The 1601 process also requires compliance with NEPA.

2.3 Project Classification

The following discussion describes which CDOT highway projects require a noise analysis:

2.3.1 Type I Projects

Under 23CFR772, it is mandatory for all states to comply with the regulations for projects that are classified as Type I projects. A Type I project is a project that consists of a **proposed Federal or Federal-aid highway project for the construction of a highway on a new location or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment or increases the number of through traffic lanes.**

The CDOT guidelines are applicable to all Type I projects. Type I projects include, but are not limited to, the following activities:

- Addition of through-travel lane(s) to an existing highway.
- Addition to a highway of continuous acceleration/deceleration lanes that exceed 0.5 miles in total length. This requirement also applies to auxiliary and climbing lanes.

- Additions of new interchanges or alterations of existing interchanges.
- Addition of high-occupancy vehicle (HOV) lanes to existing highways.
- A project which consists of a change in vertical profile of 5 feet or more.
- Alteration of highways such that the horizontal distance between the nearest through centerline of travel and existing sensitive receivers is approximately halved.

In general, actions such as the above are considered to be Type I projects due to capacity increases or alignment changes. In all cases in which a project is identified as Type I, a noise analysis study is required if noise sensitive receivers are present within the project study zone. This study zone is defined as a 500-foot distance in all directions from the proposed edge of traveled way throughout the extents of the project. This 500-foot "halo" defines the extents for the noise analysis and shall include receivers on all sides of the highway.

2.3.2 Type II Projects

CDOT does not currently separately fund a Type II noise program, which is defined in 23CFR772 as projects that provide noise abatement on existing highways, essentially a "retrofit" noise barrier in a location where there will not be any new highway construction.

2.3.3 Other Projects

Additionally, a project that does not meet the Type I project definition must also undergo a noise analysis if there are noise sensitive receivers present and the project itself, through major alteration of the existing terrain, is expected to create a noise impact. An example of this would be a case where, to improve sight distance on a highway, an existing earth berm is flattened, resulting in a direct line-of-sight between the highway and an existing residence. These cases are extremely rare and shall be dealt with on a case-by-case basis.

2.3.4 Non-applicable Projects

Other than the example illustrated above, projects that do not meet the Type I project criteria are not required to undergo noise analysis. Projects and activities such as these include maintenance operations, minor safety improvements, resurfacing or whitetopping projects, and traffic-based operations such as modification of speed limits or traffic control devices.

2.4 Noise Sensitive Receivers

A noise sensitive receiver is any location where highway traffic noise may be detrimental to the enjoyment and functional use of the property. The primary consideration is normally residential areas, however, frequent human use areas such as schools, parks, hotels, and commercial centers are also considered for evaluation.

Normally, these properties are in existence at the time of the project construction, but special provisions apply to undeveloped lands if applicable.

2.4.1 Currently Developed Lands

All existing properties within the study zone are to be considered as existing receivers in the noise analysis. These properties must be classified as to the type of land use and the extent of the activity. As mentioned above, all receivers present within the defined study zone must be included in the analysis.

2.4.2 Planned, Designed, and Programmed Development

Normally, the noise analysis does not consider lands that are not developed, however, noise analysis is required for undeveloped lands for which development is "planned, designed, and programmed" at the time of the analysis (i.e., the noise analyses for the draft NEPA document [EA or draft EIS] and the final NEPA document [CE, FONSI, or final EIS],). This indicates that a definite commitment, with official public knowledge, has been made to develop the property in question and has reached a point where the developer's plans can no longer be changed in a practical manner. Any area which falls under this category must be dealt with in the noise analysis as though the development has already been constructed. The State of Colorado will consider a proposed development as being "planned, designed, and programmed" when a formal building permit has been issued to the developer by the local agency of authority.

2.5 Project Timing

Each state highway agency is required to identify when the public is officially notified of the adoption of a location of a proposed highway project. CDOT, within the scope of these guidelines, defines the "date of public knowledge" as the date in which the final environmental project document (Categorical Exclusion, Finding of No Significant Impact, or Record of Decision) is approved. After this date, CDOT will be responsible for analyzing changes in traffic noise impacts, but will not be required to provide noise abatement for new development which occurs adjacent to the proposed highway project. Decisions concerning such noise abatement are left to the local government agencies and private developers. See Section 7.2 for further discussion concerning noise-compatible land use development.

3. Noise Fundamentals and Traffic Noise Impact Criteria

Sound can be defined as mechanical energy generated by movement or vibration from a source that can be sensed by the ear. Noise, generally, is defined simply as unwanted sound, and is the description usually given to sound that emanates from highway traffic. Each sound (noise) can be expressed in terms of three characteristics: magnitude, frequency, and time element.

The magnitude of a sound event can be measured in terms of its acoustic pressure. Since the range of absolute pressure values can vary over several orders of magnitude, the unit

typically used to describe sound levels is the decibel (dB), which is a relation of the sound pressure level to a standard reference pressure. This ratio is then converted to a more compact logarithmic scale.

Since sound travels in waves, there are also varying frequencies associated with each sound event. The human ear does not respond equally to all frequencies, however, and filtering of these frequencies must be done in order to obtain accurate measurements and descriptions of highway traffic noise, as this noise is comprised of many frequencies. The filtering (weighting of frequencies) of the "A" scale on sound-level meters most closely approximates the average frequency response of the human ear, and is the scale that is used for traffic noise analyses. Decibel units described in this manner are referred to as "A-weighted decibels", or "dBA".

As sound intensity tends to fluctuate with time, a method is required to describe a noise source, such as a highway, in a steady state condition. The descriptor most commonly used in environmental noise analysis is the equivalent steady state sound level, or L_{eq}. This value is representative of the same amount of acoustic energy that is contained in a time-varying sound measurement over a specified period. If that time period is one hour, the value then reflects the hourly equivalent sound level, or $L_{eq}(h)$.

For highway projects that require noise analyses in Colorado, the accepted noise descriptor is the worst-hour $L_{eq}(h)$ for determining existing and future noise levels and impacts. The worst-hour is specified and defined as such to reflect the conditions that will produce the worst traffic noise. In general, this is highest traffic volume traveling at the highest possible speed and reflects Level of Service (LOS) C conditions. If traffic volume continues to increase past these conditions, the traffic is forced to slow down, which in turn decreases the noise levels generated.

A traffic noise impact is considered to occur when any noise sensitive receiver is subjected to either 1) existing or future noise levels that approach or exceed the noise abatement criteria (NAC), or 2) future noise levels that substantially exceed the existing noise levels. Both of the above must be analyzed to adequately assess the noise impact of a proposed project.

When noise sensitive receivers are present and are found, during the course of the analysis, to be impacted under either case, noise mitigation must be considered and evaluated for those receivers under the feasibility and reasonableness factors.

3.1 Approach or Exceed Noise Abatement Criteria

The noise abatement criteria (NAC) are noise levels which are compared to existing or future levels to determine absolute impact. The levels that are specified are based on the certain types of existing activities that are present.

CDOT defines "approach" as noise levels that are 1 dBA less than the NAC specified in 23CFR772. The values shown in Table 1 reflect the values that CDOT considers when evaluating noise levels for each corresponding land use category.

Any receiver that is subjected to noise levels that either currently reach or are predicted to reach the values stated on Table 1 are considered to be impacted by noise. It is important to note that these values do not have to be exceeded to result in an impact, and there is no difference in the severity of the impacts in either case.

Table 1
CDOT Noise Abatement Criteria (NAC)
Based on FHWA Noise Abatement Criteria, 23CFR772

Category	L_{eq}(h), dBA*	Description of Activity Category
A	**56 (Exterior)**	Lands on which **serenity and quiet** are of extraordinary significance and serve an important **public** need and where preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	**66 (Exterior)**	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	**71 (Exterior)**	Developed lands, properties, or activities not included in Categories A or B above
D	**--**	Undeveloped Lands
E	**51 (Interior)**	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

*Hourly A-Weighted Sound Level in Decibels, Reflecting a 1 dBA "Approach" Value Below 23CFR772 Values

The above criteria strikes a balance between noise levels that are desirable and those that are feasible. Numerous approaches were considered in establishing the criteria, to include hearing impairment, annoyance, sleep interference, and speech communication interference. Highway traffic noise levels do not normally reach the levels that result in hearing damage, and what constitutes an "annoyance" or hindrance to sleep is very difficult to quantify on a large scale. Speech impairment, however, was usefully applied as a condition that reflects a compromise between noise levels that are desirable and those that are achievable and was found not to be arbitrary or capricious.

It is very important to understand that the above noise levels are impact criteria only; the absolute threshold levels for which mitigation consideration must take place. There is not a specific absolute noise level that must be mitigated to. When evaluating mitigation, the NAC values are not to be considered as desirable levels for which mitigation must be designed. The overall goal of mitigation is to obtain a substantial noise reduction, which may or may not result in noise levels below the NAC levels.

Most sensitive receivers that will be encountered on highway traffic noise analysis efforts will be categorized as category "B" receivers and are subject to the 66 dBA approach criterion. Category "C" receivers include most commercial and industrial areas, and category "D" describes lands that are undeveloped and development is not planned, designed, and programmed. Category "D" receivers are not subject to an NAC value.

Classification of category "A" receivers should be extremely rare and apply only to extraordinary special public needs where the existing environment is of a serene nature that needs to be preserved to allow the area to continue to serve its purpose. Determination of whether or not a specific receiver qualifies as a category "A" will be made on a case-by-case basis.

When determining impacts, primary consideration is to be given to exterior areas of frequent human use where a lowered noise level will be of benefit. In those cases where there are no exterior activities to be affected by highway traffic noise or where exterior activities are far from or physically shielded from the roadway in a manner that prevents an impact on exterior activities, the interior criterion (category "E") may be used. CDOT will consider interior noise abatement only for severe traffic noise impacts (see Section 5.6) or public-use or non-profit institutional structures (see Section 5.7).

3.2 Substantial Increase over Existing Noise Levels

The second manner in which a noise sensitive receiver can be impacted by highway traffic noise is to be subjected to a substantial increase of the existing noise environment due to a highway project.

CDOT defines that a noise impact occurs if a receiver is to receive an increase in noise levels of at least 10 dBA. This impact criterion takes effect regardless of the absolute noise levels. For example, an increase of noise from 45 to 57 dBA for a category "B" receiver will result in a noise impact, as the noise increase of 12 dBA is greater than the 10 dBA threshold.

A change in noise levels from 62 to 69 dBA would not be an impact under the substantial increase criteria, but would still result in an impact as the approach criteria has been met.

As long as one of the impact criteria is met for a receiver, mitigation must be considered for that receiver. No subjective descriptor terms are used to describe traffic noise impacts, with the exception of a "severe" impact, which is described below.

3.3 Severe Traffic Noise Impacts

A severe noise impact is defined to occur when a receiver is either exposed to absolute exterior noise levels of 75 dBA or greater, or a projected increase of 30 dBA or more over the existing noise levels. Situations such as these are reflective of a condition in which receivers are affected by highway traffic noise to a much greater degree. Special provisions apply to the mitigation considerations for these receivers, which are described in section 5.6.

4. Highway Traffic Noise Analysis

The main purpose of the highway traffic noise analysis is to identify noise sensitive receivers that will be subjected to traffic noise impacts. Any and all receivers that are

identified as impacted must be considered for noise mitigation. The mitigation alternatives must be evaluated under the feasibility and reasonableness criteria. The noise analysis technical report serves as proof that the analysis was performed and provides all necessary documentation as required by the regulations.

As early as is reasonably possible in the process, an initial assessment must be made to determine as to whether or not the project will require a detailed noise analysis. This is best done in conjunction with the environmental scoping of the project.

The analysis consists of two major parts. The first consists of identification of noise sensitive receivers, assessment of the noise levels that these receivers are currently experiencing and are predicted to experience, and a determination of whether or not traffic noise impacts exist. If no traffic noise impacts are found, the analysis is then considered to be complete with no further evaluation required. If traffic noise impacts are expected, then the second part of the analysis, mitigation consideration and evaluation, must be performed. The requirements for the first part of the analysis will be described below, while the mitigation consideration protocol will be discussed in section 5.

Common misunderstandings arise when the subject and requirements of performing noise analyses are discussed. The requirement to perform a noise analysis, in and of itself, does not imply that any other future actions are inevitable. The analysis will identify any noise impacts, which will then be considered for noise mitigation. Noise mitigation will be provided if it is determined to be both feasible and reasonable.

4.1 Identification of Land Uses

The proper identification and quantification of the noise sensitive receivers adjacent to a highway improvement project is essential to the success of the analysis. Each receiver that is present within the extents of the project must be accounted for in accordance with the regulations.

Obviously, a project that does not border any existing or planned, designed, and programmed noise sensitive land use area will not require a noise analysis, nor will any receivers that are outside of the study zone (500 foot “halo” around the extents of work) for the individual project need to be considered.

In general, the primary consideration when considering the presence of noise sensitive receivers are the exterior areas of frequent human use that are adjacent to the individual properties. For single-family residential areas, the consideration point will be the outside area that is immediately facing the highway, which in most cases will be either the front or back yard or porch area. This also applies to special-use and non-residential areas, such as a park playground area or an outdoor restaurant seating area.

When first assessing the site for possible receivers, the different land use categories that are adjacent to the project must be identified. Sites directly adjacent to the highway are considered “first-row” receivers, and will be the main receivers of

interest in the noise analysis. This first row of receivers will be determined by drawing an imaginary line connecting each receiver with direct sight to the highway. Second- and third-row receivers, those which are directly beyond the first row, may also be determined as well, although this may not be necessary in all cases. Receivers beyond the third row are usually not considered, with possible exceptions being any receivers located along the end of a row, to evaluate the end areas of a potential barrier, or a receiver which is located beyond the second row where there are large gaps between structures in the first two rows.

To summarize the land-use activities that are present, list each type and number of receivers identified. This would include the number of existing or planned, designed, and programmed single-family residences, number of multi-family dwellings (i.e. apartment complex units), businesses, and if any other special use buildings or areas exist, such as parks, motels/hotels, or churches. These will be the areas that will be considered in the following phases of the analysis.

For noise modeling purposes in multi-family dwellings, each dwelling (unit) shall be considered as well as any common outdoor use areas. Areas above the ground level, however, are typically not feasible or reasonable to mitigate due to the inability to provide effective and reasonable noise mitigation at those locations. This is primarily due to the excessive barrier heights that will likely be required for mitigation.

4.2 Determination of Existing Noise Levels

The next step in the analysis is to quantify the existing noise environment by determining the noise levels that the identified receivers are currently experiencing. Determination of existing noise levels shall be made by field measurement and use of the Colorado version of the STAMINA 2.0 noise prediction model. Noise modeling of existing conditions is not possible and thus not performed in the case where the project involves the construction of a new highway in a new location, as there is no existing highway contribution to the noise environment.

4.2.1 Field Measurements and Model Validation

The purpose for taking field measurements is to gather data that is used to develop a comparison between those measurements and results obtained with the noise prediction model. This exercise is performed to validate the model so that it can be used with confidence to determine the worst-hour existing noise levels and predict the future noise levels.

Measurements can be taken at any time; however, it is best to measure when traffic is relatively free flowing at or near the posted speed limit. For high-volume roads, a 10-minute sample is usually statistically accurate enough to obtain a good measurement, but sample times of 30 minutes or more may be needed for measurements along lower volume roads. All measurement procedures must be performed in accordance with report FHWA-PD-96-046, Measurement of Highway Related Noise. It is not required to perform

measurements at any or each individual receiver, however, enough representative measurement locations in the project area must be utilized in order to reasonably characterize conditions for the validation effort. Once these data have been collected, each of the locations is then input into the model for comparison purposes.

In order to arrive at a valid comparison between measured and modeled results, traffic and speed data must be collected at the measurement locations at the same time the noise measurements were taken. This will involve actual counting of vehicles, being sure that truck (heavy and light) counts are taken separately, and a determination of the approximate speed that the vehicles were traveling. This speed can be determined by either driving a test vehicle through the traffic stream or by use of a radar gun. Once this data has been collected and normalized to an hourly basis, it is input into the computer model. The collection of relevant data will allow the modeling of the same conditions as was observed during the measurement exercise and does not require the analyst to attempt to measure during the "worst" noise hour. This effort is to be thoroughly documented within the noise study report.

The acceptable range between the actual noise measurements and the modeling results is 3 dBA. If the difference between the measured and predicted levels is not within 3 dBA, an examination of the measured and modeled data shall be performed to determine the reason for the difference. This may require that a second measurement be taken in some instances.

4.2.2 Noise Modeling for Existing Conditions

Unless the project involves the construction of a new highway on a new location, the worst-hour noise levels are determined by the validated computer model.

In selecting model locations, each individual receiver does not have to be modeled separately. A modeling location can be chosen that represents several actual receivers. This is acceptable as long as all the identified sensitive receivers are represented in the analysis. The number of the actual modeling points that are used will vary depending on the nuances of the individual project. For each modeled location, a table that shows the location identification and exactly how many receivers are being represented by that location must be included in the noise study report. These locations are then modeled at a height of 5 feet (1.5 meters) above the ground level elevation to approximate the height of the average human ear. For analysis of areas above the ground level, those locations shall be modeled at a height 5 feet above the elevation level of the use area.

To perform the noise modeling for the existing conditions, the following input data are required:

- Current roadway alignment for all roadways in the immediate area which may contribute to the noise environment.

- Existing traffic volumes, which include a breakdown of numbers of automobiles, medium trucks (2-axle, 6-tire), and heavy trucks (3+ axles) for all roadways.
- Current posted speed limit for all roadways.
- Alpha factors for ground attenuation affects (0.0 for hard ground, 0.5 for soft ground).
- Receiver locations.
- Terrain features, such as natural berms.
- Other features which result in a shielding effect (i.e. buildings).
- Any existing noise barriers present.

To model the worst hour existing condition, the traffic data that shall be used is the highest volume of traffic that can travel at the highest possible speed for the particular roadway, reflecting LOS "C" conditions. This is normally the Design Hour Volume (DHV) of the roadway modeled at the posted speed limit. If the projected traffic volume is less than the LOS "C" volume, those lesser volumes are to be used. Proper documentation of the source of the traffic volumes is required to be included in the noise study.

To provide for a detailed and thorough review of all noise modeling efforts, to include those done to predict the future noise levels as described in section 4.3, the noise study must either include a disk with an electronic copy of the data files or a computer printout of all data generated during the modeling analysis.

4.2.3 Locations With Existing Noise Barriers and Privacy Fences

The situation in which a noise barrier is currently present can create confusion. If a barrier is currently in place, the existing noise model, in order to reflect the existing noise environment, must be made with the barrier in place. This, however, must be a solid barrier designed specifically to abate noise. The noise levels that are then used to depict the existing conditions are those that are generated through the noise analysis with the barrier location included in the model.

Wooden privacy fences, which are not normally constructed to abate noise, are not to be modeled as noise barriers, since they generally do not provide an appreciable amount of noise reduction. These fences cannot normally be considered as noise barriers in that they contain many gaps, each of which results in additional transmission of noise, and are not sufficiently dense to provide negligible noise transmission through them.

When considerations for privacy and other development-related fences are made, consideration shall be given as to whether or not the fence will remain in good condition over the life of the project (20 years for projected future noise levels). If there is a question as to the durability of the fence, it should not be used.

4.3 Prediction of Future Noise Levels

Once the existing noise levels have been determined, the future design-year noise levels for each receiver are calculated. The future model shall reflect conditions 20 years into the future (traffic counts and speeds, roadway alignments, changes to terrain) for the worst-hour noise condition and should include all alternative alignments being considered for the project, to include the "no-action" alternative. For minor projects, there will likely only be one alternative, but in the cases of projects which are either part of an EA or EIS, there may be several alternatives to consider and for which to provide analysis.

The traffic projections that are used must be consistent with the applicable adopted long-range plan traffic model, if available. When a long-range plan traffic study is not available, the best available data shall be used. The traffic volumes used shall be the 20-year design volume at the design speed reflecting up to LOS "C" conditions for the new highway design (similar to the procedure used for modeling existing traffic conditions as per section 4.2.2).

The same traffic noise prediction model that was used in the determination of the existing conditions shall also be used for the future model, with the modeled receivers in the same locations as they were for the existing model, as appropriate. Receivers which are identified as potential ROW takes will not normally need to be included in the future modeling, but do need to be included in the "no-action" case. As was the case in the existing condition evaluation, if a noise barrier is currently present it must also be included in the analysis of the future conditions.

4.4 Determination of Traffic Noise Impacts

The final step in the first part of the noise study is to compare the future predicted noise levels to the applicable noise abatement criteria and to the existing noise levels to determine traffic noise impacts. As discussed earlier, any receiver which either approaches or exceeds the noise abatement criteria under the existing or future conditions or is subjected to a substantial increase in noise levels is considered to be impacted by highway traffic noise. This is to be done for each alternative, including the no-action alternative.

It is important to remember that the determination of traffic impacts only results in consideration of mitigation, which will be performed in the next part of the analysis. It is not a guarantee that mitigation will be provided.

If no traffic noise impacts are identified under the future conditions for any of the proposed alternatives, as defined by the provisions set in these guidelines, the analysis is considered complete and further consideration of mitigation is not required. This determination, if applicable, shall be stated as such in the final noise study report.

5. Evaluation of Highway Traffic Noise Abatement

Any and all receivers which were determined to be impacted in the analysis are evaluated for traffic noise mitigation. This requires that the overall social, economic, and environmental effects of the mitigation be evaluated against the benefits. When determining abatement measures, primary consideration is to be given to exterior areas surrounding residential areas or areas of frequent human use for other uses such as parks and commercial districts where a reduced noise level would be of benefit. All feasible and reasonable mitigation measures are required to be included in the highway project.

It is required that any potential noise abatement measure under consideration is one that provides a substantial reduction of noise levels. This, at the absolute minimum, is a noise reduction of no less than 5 decibels for at least one receiver. It is not considered to be a prudent investment of public funds to consider construction of a noise barrier that will not result in at least a readily perceptible noise reduction.

5.1 Mitigation Options

The following are mitigation measures that may be incorporated in highway projects to reduce traffic noise impacts. Each of these shall be considered and discussed in the noise study report.

- Traffic management measures, such as lane-use restrictions, designated truck routes, and speed limit reductions. Measures such as these may or may not be beneficial or possible given the constraints of the project and the immediate area. While lesser speeds do decrease noise levels, it generally will take a reduction of speed of approximately 20 miles per hour to achieve a readily perceptible (5 dBA) reduction of noise at its source.
- Alteration of horizontal and vertical alignments to reduce noise impacts, where practical.
- Acquisition of undeveloped land for buffer zone creation. While buffer zones are a very good strategy in overall noise compatible land use planning, it is often not a practical solution, due to the high amount of land that must be purchased. In many instances, the existing developments already border the highway.
- Noise insulation of public use or non-profit institutional structures only; private residences may be considered for such abatement only if a severe noise impact exists (see Sections 5.6 and 5.7).
- Construction of noise barriers within highway right-of-way, or acquisition of property rights for construction of noise barriers outside of the highway right-of-way.

Vegetation and pavement are often discussed in regards to noise abatement but are not measures that can be normally be used in lieu of other noise abatement measures:

- Vegetation is only potentially viable as a noise abatement measure if it is 100-200 feet wide, at least 16 feet tall (when considering ground level receivers), and sufficiently dense so that it cannot be seen through. If these conditions can be met, a noise reduction of up to 5 decibels is possible. Vegetation can definitely be of an aesthetic and psychological benefit, and if it is provided it must be made clear that, if it does not meet the above criteria for noise abatement, that it is being provided for visual, privacy, or aesthetic treatment only.
- A topic that has been researched for many years has focused on attempting to reduce the noise emissions that are due to the tire/pavement interaction. While it is accepted that different tires, pavements, and pavement surfacing textures do result in varying noise levels, it is difficult to forecast the overall pavement surface condition 20 years into the future. Due to this fact, and the requirement that noise mitigation must provide a "readily perceptible" reduction in noise levels over a long period of time, the use of different pavement types or surface textures cannot be considered as a noise abatement measure.

5.2 Noise Barriers

The most common noise mitigation measure is the noise barrier, a solid physical structure constructed between the highway and noise sensitive receivers. The barrier works by blocking the path of sound waves from the highway, forcing the sound to travel around or over the barrier. If a noise barrier is tall enough to break the line-of-sight between the highway and the receiver, constructed of sufficiently dense material (4 pounds per square foot minimum density), and does not have any openings or gaps, a noise reduction will be possible that will range from being readily perceptible to less than half as loud (5-15 decibels for most barriers) depending on the height and location of the barrier. **A barrier design must achieve at least a readily perceptible noise reduction (5 decibels) to be considered feasible for construction as a prudent investment of public funds.**

The most common types of noise barriers are earth berms, which is essentially a large natural or man-made earthen mound, and vertical walls, which can be constructed out of a variety of materials, most commonly concrete or masonry block. Berms, while more natural in appearance, do require a great deal of land and a very large footprint. Noise walls require much less space to be constructed, but may be subject to height limits due to structural and aesthetic reasons. Barriers have also been constructed by placing walls on top of berms to create a combination barrier.

More detailed information concerning design, structural, and aesthetic considerations of noise barrier construction at CDOT can be found in the *Noise Guide for Highways*, Volume IX of the *CDOT Design Guide*, August 1996.

5.3 Noise Barrier Acoustical Evaluation

Evaluations of possible noise barriers are to be done using the STAMINA 2.0 model (Colorado version) using the future conditions data. Various locations and

heights of barriers can be input into the model, which will calculate the noise levels with the barrier. The amount of reduction, also known as insertion loss, is defined as the future barrier noise levels subtracted from the future no-barrier condition.

Acoustically, the most effective noise barriers are generally located closest to the source (i.e. highway) or to the receivers. As a result, initial barrier placement should be considered and evaluated for either of these locations. In many cases, however, the CDOT right-of-way line is the best practical location for the barrier. Each possible barrier location shall be considered in the analysis if more than one possible location can be used.

Also to be considered are certain issues such as overall length of barrier, different heights, and compensation for situations that require breaks in the barrier (overlapping barriers). Performing this evaluation is an iterative process, done by altering certain inputs. The best judgment of the noise analyst should be used in all cases to determine which solution is recommended, but more than one option shall always be evaluated to ensure that nothing was missed during the analysis. As always, this process needs to be documented in the noise analysis report.

In a case where a legitimate noise barrier is already present, the first evaluation that needs to be made is what alterations can be done to the existing barrier to provide an additional substantial reduction of noise levels over what the barrier is already providing, if necessary. This option will then need to be evaluated under the feasibility and reasonableness guidelines. If the current barrier is still able to function properly as a noise barrier, as will likely be the case for a concrete or masonry barrier, it will not likely be feasible or reasonable to achieve an additional substantial noise reduction. If, however, the existing barrier poses functionality or maintenance problems, it can be replaced in-kind as a part of the Type I highway project. Cases such as these are common where older, wooden noise barriers have been installed. Decisions concerning these situations will be made on a case-by-case basis.

As noise mitigation measures other than the construction of noise barriers are not usually practical, the following discussions concerning feasibility and reasonableness are presented in the context of considering noise barriers and noise barrier construction.

5.4 Feasibility

Feasibility deals with physical considerations and concerns with the construction of an acoustically effective noise barrier at a particular site and project.

5.4.1 Noise Reduction

The major feasibility criterion that is to be considered is to whether or not a substantial noise reduction can be obtained based on constraints that are inherent to the individual project. If a substantial reduction cannot be provided a noise barrier is not feasible and will not be recommended for inclusion in the project.

CDOT defines a substantial reduction goal as a barrier that is predicted to reduce noise levels to at least one adjacent front row receiver by at least 10 dBA. The initial barrier evaluation shall be performed to determine what will be required to achieve a 10 dBA reduction. If the barrier's height that is required for this reduction is found to be 25 feet or greater, then it can be considered not feasible and the barrier evaluation will take place at a lower height. Each barrier that is evaluated shall also be evaluated under the reasonableness criteria.

It is desired that barriers be optimized in terms of overall reduction (height) and cost-benefit, which is one of the factors for reasonableness. In this case, it is desired that a point be identified where a potential noise barrier provides the best balance between cost and benefit. This is not a trivial task, as the benefit versus cost relationship is not linear and a point of diminishing returns will be reached. An iterative process, however, can result in a barrier that will be optimal within the scope of the reduction goal (10 dBA or greater), and the minimum reduction required (5 dBA). **In any case, no barrier shall be deemed feasible if an absolute minimum reduction of 5 dBA cannot be achieved for at least one front-row receiver.**

A benefited receiver is one, impacted or not, which receives at least 3 dBA of noise reduction, corresponding to at least a perceptible benefit. This is reduction that is based on the addition of the noise barrier only, which is only considered after any shielding affects, such as for rows of buildings, are taken into account.

The overall noise environment should also be considered in whether or not a noise barrier will be feasible. If the area in question is one where aircraft or rail activity exists, a barrier that only mitigates highway noise might not be enough to reduce the overall background levels appreciably. In those cases, it would not normally be feasible to construct a highway traffic noise barrier. Other considerations that need to be taken into account are situations where a barrier will shield a main highway, but not a frontage road. In these cases, the overall noise environment shall be the basis for the determination if a substantial noise reduction is possible, not just the reduction to the mitigated source.

5.4.2 Safety and Maintenance Considerations

As is the case with any structure, there are obvious engineering, safety and maintenance issues that must be considered to determine its constructability, and thus, be a feasible proposition. If any of these issues are significant enough to cause a fatal flaw condition, then the barrier can be deemed not feasible. Examples of situations which can be considered fatal flaws include, but are not limited to, the following:

- Excessive reduction of sight distance.
- Creation of a continuous shadowing condition that may cause excessive icing of driving lanes through the winter months.

- Inability to provide for adequate snow/debris removal.

5.4.3 Constructability

If reliable and common engineering practices could be employed to construct a noise barrier, then that barrier is considered to be a feasible proposition. Other factors that are sometimes considered concurrently, such as costs, are to be evaluated separately under the reasonableness criteria described in section 5.5.

If it is obvious that the constructability of a noise barrier due to site limitations or engineering considerations is not possible without major modifications to the site or technological efforts, the barrier can be considered not to be feasible and no further analysis is required, however, this should only be used for situations that are very clear. If it may be possible that a barrier(s) can be constructed, the evaluation with the computer model will take place in order to determine if a substantial reduction can take place. Decisions such as these shall be thoroughly documented and justified in the noise study report.

A very common issue to consider in this case is the ability to construct a continuous barrier for the entire length of the impacted area. An effective noise barrier cannot be built if breaks for driveways, sidewalks, streets, utilities, drainage facilities or streams are needed, as these breaks drastically reduce the barrier's performance. One possible solution in a case such as this is to consider overlapping the barriers.

5.4.4 Berms

Most of the above feasibility discussions have focused on the construction of noise barrier walls. Berms, however, can be considered as an alternative to walls where possible, as they are generally more aesthetically pleasing and have a more natural appearance. Limitations with berms do need to be considered in the feasibility evaluation, as they do require a much larger footprint. Ideally, this will be enough of a footprint to provide no steeper than a 3:1 slope.

5.4.5 Considerations for Parallel Barriers

Due to multiple sound reflections, performance degradation of parallel barriers needs to be investigated if the width-to-height ratio is less than 10:1 (distance between the barriers is less than 10 times the height of the barriers) or if the barriers are closer together than 200 feet. In these cases, if it is found that the overall noise reduction has decreased, steps need to be taken to reduce this degradation. Possible solutions include raising the height of the barriers to overcome the degradation or investigating the use of absorptive treatments on either or both barriers to reduce the reflections. In these cases, retaining walls, if they are present, should be treated as barriers in the analysis.

If all noise barriers that have been evaluated for a particular project are deemed not to be feasible (i.e. no barrier can be constructed that will result in a 5 dBA reduction to at least one receiver), the reasonableness criteria are not assessed and the noise

analysis is considered complete. This decision is to be discussed and documented in the noise study report.

5.5 Reasonableness

The reasonableness determination is a more subjective process than what is done to determine feasibility. It implies that common sense and good judgment have been used in the consideration of noise abatement. The process for evaluating the reasonableness of abatement is meant to be flexible enough to meet individual situations but able to be applied in as consistent and uniform a manner as possible on a statewide basis. The main consideration in this evaluation is whether or not the barrier is a practical solution for a certain situation.

The FHWA regulations are meant to give the states flexibility in complying with the requirements of 23CFR772, and many of the criteria that are to be considered are based on a range of possible solutions, many of which are to be determined by the individual states. While the determination of impacts is fairly standard and must be done by all states, the evaluation of any potential mitigation does not contain any mandates as to when mitigation is to be provided, other than after a determination of feasibility and reasonableness. In this determination, there is only one "absolute" criterion that is considered by CDOT in these guidelines: Even if a barrier meets all feasibility requirements and is deemed to be reasonable, it will not be built if the majority of the affected property owners do not want it to be built. A property is considered to be "affected" if it is predicted to receive at least a 3 dBA benefit from the barrier (i.e. is considered to be a "benefited" receiver).

The final determination of reasonableness of noise mitigation will be made only after a careful and thorough consideration of a wide range of criteria. The following are the criteria that will be considered by CDOT in its noise abatement evaluation. **None of the following reasonableness factors by itself shall be sole grounds for acceptance or rejection of mitigation.**

Each reasonableness factor discussed below will have one of four possible values:

- EXTREMELY REASONABLE – The proposed mitigation can be accomplished through minimal financial or social costs, or reflects a situation which warrants high consideration for mitigation.
- REASONABLE – The proposed mitigation can be accomplished through acceptable financial or social costs, or reflects a situation which warrants greater consideration for mitigation.
- MARGINALLY REASONABLE – The proposed mitigation can be accomplished through moderate financial or social costs, or reflects a situation that is moderately warranted for mitigation consideration.
- UNREASONABLE – The proposed mitigation cannot be accomplished without excessive financial or social costs, or reflects a situation in which mitigation consideration should be minimal at best.

5.5.1 Cost Benefit Index

In consideration of the cost of each potential noise barrier segment, the barrier benefit index shall be evaluated based on an estimate of cost per receiver per decibel of reduction. This will determine the "cost-reasonableness" of the abatement.

The cost benefit index, calculated as a ratio, is not intended to function as an accurate itemization of all of the different costs that are prevalent in the construction of a noise barrier, but rather to determine a consistent level of consideration that will be used for all CDOT noise abatement evaluations under these guidelines.

EXTREMELY REASONABLE: Less than $3000/receiver/decibel
REASONABLE: $3000-$3750/receiver/decibel
MARGINALLY REASONABLE: $3750-$4000/receiver/decibel
UNREASONABLE: More than $4000/receiver/decibel

This value will be determined by dividing the approximate cost of the barrier (length * height * unit cost) by the total decibel reduction that is predicted to occur. For evaluation purposes, the unit cost that will be used for this cost calculation will be a typical cost of $30 per exposed square foot, which will approximate all costs in construction of a standard concrete/masonry barrier that does not require special site considerations. If berms are possible and are potentially feasible, use the unit cost of $10 per square yard of earth for the berm portion of the calculation.

The total decibel reduction is the cumulative sum of all of the decibel reductions projected for each receiver that receives at least a 3 dBA benefit directly due to the noise barrier (all benefited or affected receivers).

For example, consider a barrier 10 feet high and 1000 feet long to protect a development of 16 homes. If 6 receivers are predicted to receive a 5 dBA benefit and 10 are predicted to receive a 7 dBA benefit, the cost benefit index value will be calculated as follows:

Cost = (10 ft. ht.) * (1000 ft. l.) * ($30/sq. ft) = $300000;
Benefit = (6 rec. * 5 dBA) + (10 rec. * 7 dBA) = 100 total dBA reduction;
Cost-Reasonableness Value = $300000/100 dBA = $3000/receiver/decibel.

This barrier would be considered REASONABLE.

As mentioned earlier, receiver points that were used in the modeling usually represent several actual receivers. It is very important to properly quantify these receivers to obtain an accurate count of the benefits achieved to be used for the

calculation. For the calculation, each benefited individual residence, business, etc. is to be counted as one receiver. For multi-family residences, each unit adjacent to the highway should count as one receiver. If the multi-family structure is predicted to receive an overall benefit of 8 dBA, for example, but there are 4 separate units, then an overall benefit of 32 dBA (4*8) must be used in the calculation.

In many cases, the number of receivers and their locations are not easily defined. The noise analyst in this case must use good judgment in determining these values, with the overall social benefit being the primary consideration in this evaluation. Special use facilities, such as parks and churches, should be handled with the same consideration and judgment on a case-by-case basis.

5.5.2 Build Noise Level

The future projected noise levels with the completion of the project should, on average, be at least 66 dBA for consideration of noise mitigation for the front row receivers.

EXTREMELY REASONABLE: Design-year noise levels 70 dBA or more
REASONABLE: Noise levels of 66-70 dBA
MARGINALLY REASONABLE: Noise levels 63-66 dBA
UNREASONABLE: Levels less than 63 dBA

This criterion gives greater consideration to areas which are or will be subjected to a higher absolute level of noise.

5.5.3 Impacted Persons' Desires

The opinions and desires of the impacted community should be of primary importance in the evaluation of reasonableness of a noise barrier. At least 50% of the affected property owners should want the noise barrier.

EXTREMELY REASONABLE: More than 75% in support
REASONABLE: 50-75% supportive
MARGINALLY REASONABLE: 25-50% supportive
UNREASONABLE: Less than 25% supportive

These values are normally based on residential areas, as normally mitigation for commercial and special-use areas by themselves are not reasonable. The percentages are to be based on the properties that benefit from the noise barrier (i.e. receive at least a 3 dBA benefit). In all cases, each individual property owner or their official designee or representative shall be the party to be consulted in this manner.

5.5.4 Development Type

The mixture of development types plays a major role in determining the reasonableness of mitigation. To be considered, the amount of residential

development should be at least 75% of the overall development in the area around the project.

EXTREMELY REASONABLE: Greater than 75% residential
REASONABLE: 50-75% residential
MARGINALLY REASONABLE: 25-50% residential
UNREASONABLE: Less than 25% residential

In general, the term "residential" as described above also includes other category "B" type development, such as parks, churches, hospitals, hotels, etc.

5.5.5 Development Existence

To be fully considered for a reasonable project, the majority of the development in the area of a highway improvement should have been in existence for at least 15 years before the consideration of the project.

EXTREMELY REASONABLE: Greater than 75% of properties at least 15 years old
REASONABLE: 50-75% at least 15 years old
MARGINALLY REASONABLE: 25-50% at least 15 years old
UNREASONABLE: Less than 25% at least 15 years old

The spirit of this criterion is to give greater consideration to long-term residents.

5.5.6 Build Noise Level vs. Existing Noise Level

The future build noise levels over the existing levels will be more of an issue if there is to be a readily perceptible increase with the completion of the project.

EXTREMELY REASONABLE: Greater than a 10 dBA increase
REASONABLE: 5-10 dBA increase
MARGINALLY REASONABLE: 0-5 dBA increase
UNREASONABLE: A project that will result in a decrease in projected noise levels.

This criterion allows greater consideration for projects that receive a perceptible increase in noise levels. In any case, this criterion is to still give consideration and not dismiss a potential barrier just because the project is not contributing any additional noise, especially if the overall noise levels are projected to be very high (70 dBA or greater).

Upon review of these criteria, the decision that is made should be well documented in the noise study report. To aid in this documentation, completion of CDOT form 1209 is required and is to be included within the noise study report (see Appendix C for a copy of the form). This form is to be filled out for each barrier segment or each distinct area of the project that were evaluated in the analysis.

5.6 Special Considerations for Severe Impacts

If a private-use residential property is determined to be severely impacted by noise (75 dBA exterior levels or a 30 dBA or more increase in noise levels), then extra-ordinary abatement measures may be considered if no other possible abatement is determined to be feasible and reasonable. One such method that can be used in these cases is noise insulation of the structure, which can include such measures as sealing windows and doors, filling voids in the structure, installation of an air-conditioning system, or other use of noise-absorbing material.

The consideration of extraordinary abatement measures in the case of severe highway traffic noise impacts can be made on a case-by-case basis and is not a mandatory requirement at this time.

5.7 Special Considerations for Non-Profits

Public use or nonprofit institutional structures, such as churches and schools, may be considered for noise insulation in accordance with 23CFR772.13.c(6). This evaluation is strictly voluntary and can be made on a case-by-case basis. Care must be taken in this evaluation as to the condition of the structure, its current amenities, and overall use characteristics to be sure that any proposals consider fully the implications of providing the abatement. One such case is for a facility which is not subjected to high interior noise levels unless the windows are open, but must remain open for the purposes of ventilation, and thus, provide proper use and enjoyment of the facility. Any decisions in this regard must be thoroughly and completely documented in the text of the noise report.

6. Construction Considerations

The approach to this discussion should be general in scope and consider the temporary nature of construction activities. Included should be the types of activities that are expected to be performed and the equipment that will be used. If desired, noise levels that are associated with these activities can be researched through product or process literature and presented in the report. Computerized prediction models have been developed for the calculation of noise from construction but are very sophisticated and require a great deal of input. As a result, use of these models to analyze construction noise is not required.

6.1 Noise

No detailed analysis or mitigation measures are required, but the noise analysis should at least identify low-cost, common sense mitigation measures that can be included on the project. Examples are limitations of work to daytime (or specified) hours, ensuring that equipment utilized properly maintained mufflers, modification of backup alarm systems, location of haul roads, and public outreach. This may be more of an issue when dealing with large, complex projects in major urban areas. In these cases, a more detailed discussion of the impacts and mitigation measures is necessary.

6.2 Vibration

A vibration analysis is generally not necessary for construction activities unless there are vibration-sensitive businesses in the area. Before construction begins, each vibration-sensitive area must be identified and a temporary vibration mitigation plan be developed.

6.3 Local Ordinances

Some entities have passed local noise ordinances which may restrict the amount of noise that can be emitted from a construction operation during certain hours or in certain areas (i.e. residential neighborhoods). In all cases, these noise ordinances must be obeyed unless a variance has been requested from and approved by the local agency of authority. This is something that may be needed if the work is envisioned to be very extensive or lengthy in nature.

7. Community Considerations

7.1 Public Involvement

Decisions concerning noise abatement should include involvement from the public, in particular the citizens who reside or perform business adjacent to the proposed noise barrier. For every project that a noise barrier is recommended, the affected residents' input shall be solicited. The affected residents include everyone who is shown, through the noise analysis, to receive a noise reduction from the proposed barrier. This will almost always include all first row property owners, and may include those in the second and third rows as well. These are the opinions that must be given the most consideration, but all members of the community at large should be able to provide their input as well.

Education should also be provided to members of the general public within the scope of public meetings and publications that describe noise, noise-related impacts, traffic noise mitigation, and enforcement issues. Various publications are available on the FHWA web site (http://www.fhwa.dot.gov/environment/noise.htm) that explain many of these concepts.

7.2 Coordination with Local Agencies

Upon completion of the noise study technical report, information shall be provided to local government agencies within whose jurisdiction the highway project is located as to the implications of the project on that particular local community in the future. The overall goal of this effort will be to prevent future traffic noise impacts on currently undeveloped lands and to attempt to promote noise compatible land use planning.

Proper noise compatible land use planning is very likely the best approach in dealing with the issue of highway traffic noise. The premise is very simple: Refrain from placing noise sensitive developments adjacent to highways. In reality, this is very difficult to do. As the jurisdiction over most of the land in these cases

belongs to local governments, it is up to them to determine what activities to pursue in consideration of the best interests of their citizens. While the State of Colorado encourages local governments to plan their developments in such a manner to minimize the impacts of highway traffic noise, such as the creation of buffer zones or placing less sensitive developments such as office buildings near the highway, there are no mandates currently in effect that prohibit noise sensitive development adjacent to highways.

Information shall be provided to the local officials as to the best estimation of future noise levels at various distances away from the centerline of the project for both un-developed and developed lands. In particular, the distance estimate of the projected 66 dBA contour (category "B" approach criterion) should be emphasized. The noise study report should be forwarded to the local authorities, as well as any other explanation or information that will aid the local officials in planning for future traffic noise impacts, such as the FHWA publications "The Audible Landscape: A Manual for Highway Noise and Land Use" and "Guidelines for Considering Noise in Land Use Planning and Control". Upon request, CDOT will provide additional available material and technical support and guidance which may be of assistance.

8. NEPA Documentation Requirements

For each and every Type I project, regardless of which level of documentation (CE, EA, EIS) is being used for that particular project, a detailed noise study report will be required to be submitted for CDOT review and comment. This finalized report will be submitted and included with all project information and documentation.

8.1 Categorical Exclusions

For Categorical Exclusion projects, there is usually no published environmental document. Rather, CDOT Form 128 is used to document the environmental clearances, to include noise. Completion of the detailed noise technical report, which has addressed the comments and concerns of the CDOT environmental review process, will suffice as far as project clearance documentation is concerned. The date that the noise analysis has been accepted will be noted on the 128.

8.2 Environmental Assessments and Environmental Impact Statements

Environmental Assessments and Environmental Impact Statements, within the body of the document, will provide a summary of the noise technical report. In particular, this summary will include the impacts that are expected and an evaluation of any potential mitigation measures. Although at the early stages of the environmental analysis and documentation effort final design information is not available, every effort must be made to make an initial determination of impacts and evaluation of mitigation measures, even if final decisions will not be made until the design process for the project.

Before the adoption of the final Environmental Impact Statement or Finding of No Significant Impact, noise abatement measures which are reasonable and feasible and are likely to be incorporated into the project and noise impacts for which no apparent solution is available must be identified. This information must be included in the final environmental document. The purpose of this requirement is that the intentions concerning noise abatement must be made as early as possible in the process. If it is determined that mitigation cannot be provided, the decision must be thoroughly documented with strong supporting evidence provided.

The noise study report shall be available for review within the technical appendix section of the environmental document. The noise study report must be finalized and approved before the environmental documents are approved and signed.

9. Extenuating Circumstances

It is virtually impossible to address every single special consideration that may arise in a specific highway project and its corresponding noise analysis. When circumstances arise such that unusual or unique considerations must be made that are not explicitly covered under these guidelines, decisions will be made in accordance with the spirit of the FHWA regulations and the CDOT guidelines. It is desired that this decision be made via collaboration between CDOT regional environmental personnel, the environmental consultant responsible for the noise analysis, the CDOT noise specialist, and, for Federal-aid projects, FHWA Division office staff. Unusual and unique circumstances will be considered on an individual project basis and the decision-making process must be fully documented in the noise technical report.

Appendix A—Key Definitions

23CFR772—Title 23, Code of Federal Regulations, Part 772 (The FHWA Noise Standard).

ADT—Average Daily Traffic.

Abatement—Measures used to substantially reduce traffic noise levels.

Approach—Noise levels which are within 1 dBA of the Noise Abatement Criteria for a corresponding land use category.

Automobiles—All vehicles with 2 axles and 4 tires. Includes passenger cars, vans, and light panel and pick-up trucks.

Background Noise—The total of all noise in a system or situation, independent of the presence of the desired signal (ambient noise).

Benefited Receiver—Any receiver which is predicted to receive at least a 3 dBA reduction in noise as a result of a noise abatement measure. Also referred to as "affected".

Berm—An earthen mound constructed for use as a noise barrier.

CDOT—Colorado Department of Transportation.

CDOT Form 1209—Noise abatement worksheet to be filled out for each noise analysis for CDOT projects.

Cost Benefit Index—A value used to determine the cost-reasonableness of noise abatement based on an average barrier cost per unit area.

Date of Public Knowledge—The date of approval of the appropriate environmental document for a highway project (CE, FONSI, ROD).

Decibel—The basic unit for measuring the difference of sound pressure levels of a sound event from a reference pressure. To approximate the range of frequencies of sound most audible to the human ear, an "A-weighting" factor is applied. Sound levels are usually reported in A-weighted decibels, abbreviated dBA.

DHV—Design Hour Volume; the traffic count determined to reflect the "worst-hour" noise conditions.

Design Year—The future year used to estimate the probable traffic volume for which a highway is designed (usually 20 years from start of construction). This year is used as the basis for calculating the predicted future (20-year) noise levels.

Existing Noise Levels—The level of noise measured or modeled at a receiver for the pre-construction condition of the highway project area.

FHWA—Federal Highway Administration.

Heavy Trucks—Any vehicle with three or more axles.

Impacted Receivers—Any receiver which, under future conditions, is either subjected to noise levels that approach or exceed the noise abatement criteria or a substantial increase in noise levels.

Insertion Loss—The predicted reduction in noise levels resulting from implementation of noise abatement measures.

Leq(h)—Hourly Equivalent Noise Level; the equivalent steady-state sound level that contains the same amount of acoustic energy as the time-varying sound level over a one hour period; the noise descriptor that is used for all traffic noise analyses for CDOT projects.

Loudness—The perceived assessment of the intensity of sound/noise.

Medium Trucks—Any vehicle with 2 axles and 6 tires.

NEPA—National Environmental Policy Act.

Noise—Unwanted sound; any sound that is generally considered annoying or offensive.

Noise Abatement Criteria (NAC)—Absolute noise levels that are used to determine when a noise impact occurs (if approached or exceeded).

Noise Barrier—A solid structure constructed between a noise source and noise impacted receivers to serve to abate the highway traffic noise.

Parallel Barriers—Two barriers which face each other on opposite sides of a highway.

Planned, Designed, and Programmed—Development on currently undeveloped land that has secured a formal building permit.

Predicted Noise Levels—Post-construction noise levels as determined via use of a traffic noise prediction model for the design year.

Privacy Fence—Fences constructed on private property or edges of development that are primarily used to separate individual lots from a roadway, and not constructed for noise abatement purposes.

Receiver—Any location of an outdoor area where frequent human activity occurs that may be impacted by highway traffic noise and may benefit from reduced noise levels.

Severe Noise Impact—A situation where predicted noise levels are 75 dBA or higher or an increase of 30 dBA over existing levels is predicted as a result of a highway project.

Shielding—Noise reduction attributable to any structures or terrain features which are located between a noise source and receiver.

Sound—Mechanical energy produced by pressure fluctuations in a medium (air, water, etc.) that travels in waves and can be detected by the human ear.

Substantial Increase—When the predicted noise levels increase by 10 dBA or more over the existing noise levels as a result of a highway project.

Substantial Noise Reduction—A noise level reduction of at least five decibels through noise abatement efforts.

Substantial Noise Reduction Goal—It shall be the goal of CDOT to achieve a feasible and reasonable reduction of at least ten decibels through noise abatement efforts.

STAMINA—Current FHWA approved traffic noise prediction model for use on CDOT projects. Uses Colorado vehicle emission levels as approved in 1995.

Study Zone—A 500 foot "halo" around the extents of a project which must be considered in the noise analysis. Measured from the edge of the traveled way, not the highway centerline.

Traffic Noise Impacts—Impacts which occur when the predicted traffic noise levels approach or exceed the noise abatement criteria or when the predicted traffic noise levels substantially exceed the existing noise levels.

Type I Projects—A proposed Federal or Federal-aid highway project for the construction of a highway on new location or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment or increases the number of through traffic lanes.

Type II Projects—A proposed Federal or Federal-aid highway project for noise abatement on an existing highway. No formal Type II program currently exists in Colorado.

Undeveloped Lands—Lands on which exist no current human activity areas or are not currently planned, designed, and programmed for future development.

Worst Traffic Noise Condition—Traffic conditions that yield the highest absolute noise levels by consisting of the highest volume of traffic traveling at the highest possible speed. This is the hourly condition that is to be input into the model and normally reflects LOS "C" conditions. In general, this is the roadway design hour traffic volume at the posted speed limit.

Appendix B—Noise Technical Report Requirements

The purpose of the noise technical report is to provide complete documentation of a highway traffic noise analysis.

The noise analysis shall include the following steps for each alternative under detailed study, to include the "no-action" alternative:

- Identification of existing activities (receivers), developed lands, and undeveloped lands for which development is planned, designed, and programmed,
- Determination of existing noise levels,
- Prediction of future noise levels,
- Identification of traffic noise impacts, and, if necessary,
- Documentation of the evaluation of noise abatement measures.

Within the body of the report, the above steps taken shall be documented in a manner which allows clear comprehension to the reader of what analysis was done and its underlying reasoning.

The noise report shall include the following (this does not necessarily have to be in the following order and can be included as appendices where appropriate):

- **Introduction and Study Area.** Describe in detail the project that is being proposed and the study zone that is being considered.
- **Noise Basics and Applicable Guidelines.** Describe general sound and noise terminology and the guidelines and regulations that are being adhered to in the development of the noise analysis.
- **Measurement Procedures.** Describe where and when noise measurements were taken and report the results. List in a table each measurement location and the corresponding results. Not every receiver needs to be measured individually, but enough locations are required in representative points throughout the project. Collect traffic data during the measurements to be used in the validation step.
- **Measurement/Model Comparison (Validation).** Compare the measurement results with the results obtained using the computer model. Report this data in tabular form as well. In general, agreement within 3 dBA will be acceptable. If the difference for any locations is more than 3 dBA, an explanation must be provided as to the reasons for the difference. This may require that the field measurements be repeated.
- **Model Input Data.** Describe the data that is to be included in the modeling of the existing and future conditions. Include and quantify all receivers which are within the study zone of the project. Include and describe which roadways, terrain features, buildings, and ground conditions are present. Describe in detail which traffic data is to be used for the modeling, to include the speeds. Generally, this will be the design hour volume for the roadway, which reflects Level of Service "C" volumes, at the posted or future design speed limit. If the design year

traffic projections do not meet the LOS "C" conditions, use those values (do not model to the capacity of the highway unless the traffic is projected to meet that capacity). Be sure to obtain as accurate a split as possible on medium truck and heavy truck volumes.

- **Modeling.** For all receivers, model the noise levels for the existing, all future alternatives being considered, and the future no-action alternative. List all data in tabular form for easy comparison. All receivers shall be identified with an address, business name, or location in addition to whatever modeling convention is used (i.e. R1-1200 Oak Street) and to which land-use category they were classified. If any modeled receivers represent more than one actual receiver, that information also needs to be included (R1, 1200 Oak Street, Category B, 5 residences) as well.
- **Mitigation Analysis and Evaluation.** If noise impacts are identified, mitigation must be evaluated under the feasibility and reasonableness guidelines. Evaluate abatement first to attempt to achieve a 10 dBA reduction for at least one receiver (CDOT goal), then, if necessary, evaluate different abatement strategies in an iterative process down to 5 dBA (minimum reduction). At least two barrier placements and heights should be analyzed unless it is very obvious that only one location/height will be possible. The goal of this effort is to attempt to "optimize" the barrier given the feasibility and reasonableness factors.
- **Mitigation Recommendation.** Explain in detail the final recommendations concerning noise mitigation. This information will also be used in the environmental document, if applicable.
- **Construction Noise.** A brief discussion of the implications of construction noise and typical mitigation measures that can be used is also required.
- **Maps.** To aid in visualization of the project, maps should be included as appendices to the noise study report that locate the project, modeled receivers, measurement locations, and barrier locations.
- **CDOT Form 1209.** A copy of the CDOT Noise Abatement Worksheet should be filled out and attached as an appendix as well. Fill out one form for each barrier segment or project area analyzed.
- **Noise Modeling Data.** A copy of the input and output data can either be included in the appendix, or preferably, submitted with the report on floppy disks or CD.

Appendix C—Noise Abatement Worksheet

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION

Instructions: ***To complete this form refer to CDOT Noise Analysis Guidelines***

Project #	Project code (SA#)	STIP #	Project Location:

A. FEASIBILITY:

1. Can a continuous noise barrier or berm be constructed?. . . . . ❒ YES ❒ NO
2. Can a substantial noise reduction be achieved by constructing a noise barrier or berm?…
   10 dBA: ❒ YES ❒ NO 7-10 dBA: ❒ YES ❒ NO 5-7 dBA: ❒ YES ❒ NO
3. Are there any "fatal flaw" safety or maintenance issues involving the proposed noise barrier or berm?. . . . . ❒ YES ❒ NO

B. REASONABLENESS:

	EXTREMELY REASONABLE	REASONABLE	MARGINALLY REASONABLE	UNREASONABLE
1. Cost Benefit Index (per receiver per dBA). .	❒ Less than $3000	❒ $3000-$3750	❒ $3750-$4000	❒ More than $4000
2. Average Build Noise Level	❒ 70 dBA or More	❒ 66 - 70 dBA	❒ 63 - 66 dBA	❒ Less than 63 dBA
3. Impacted persons' desires	❒ More than 75%	❒ 50% - 75%	❒ 25% - 50%	❒ Less than 25%
4. Development Type (Category B*)	❒ More than 75%	❒ 50% - 75%	❒ 25% - 50%	❒ Less than 25%
5. Development Existence (15 years or more) .	❒ More than 75%	❒ 50% - 75%	❒ 25% - 50%	❒ Less than 25%
6. Build Noise Level vs. Existing Noise Level .	❒ Greater than 10 dBA	❒ 5 - 10 dBA	❒ 0 - 5 dBA	❒ Noise Level Decrease

***Category B – Residential, School, Hospital, Park, Picnic/Active Sports Area, Motel, Church, Library**

C. INSULATION CONSIDERATION:

1. Are normal noise abatement measures physically infeasible or economically unreasonable?. . . . . ❒ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to public or non-profit buildings?. . . . . .. ❒ YES ❒ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?. . . . . ❒ YES ❒ NO
3. a. Is private residential property affected by a 30 dB(A) or more noise level increase?. . . . . ❒ YES ❒ NO
   b. Are private residences impacted by 75 dB(A) or more?. . . . . ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

E. DECISION:

1. Are noise mitigation measures feasible?. . . . . ❒ YES ❒ NO
2. Are noise mitigation measures reasonable?. . . . . ❒ YES ❒ NO
3. Is insulation of buildings both feasible and reasonable?. . . . . ❒ YES ❒ NO
4. Shall noise mitigation measures be provided?. . . . . ❒ YES ❒ NO

F. DECISION DESCRIPTION AND JUSTIFICATION

Completed by:	**Date:**

Appendix E

Noxious Weed Management Plan

Appendix E. Noxious Weed Management Plan

E.1 Introduction and Regulations

This Weed Management Plan (Plan) has been prepared to support the State Highway 402 (SH 402) improvement project and to comply with procedures outlined in Federal Highway Administration (FHWA) *Guidance on Invasive Species* (1999), the Colorado Department of Transportation's (CDOT) *Integrated Noxious Weed Management Plan* 1999–2000 (INWMP), and other federal, state, and local regulations. As outlined in FHWA guidelines, this Plan:

- identifies the noxious weeds present in the project area
- outlines measures to prevent, control, and monitor weed spread
- makes recommendations for reclamation of disturbed areas

The intent of the Plan is to address the elimination or control of existing noxious weed species and to prevent the introduction and spread of existing weeds as a result of project implementation.

This Plan will be finalized before the start of construction activities. It includes results of the project area weed inventory and mapping conducted on October 1, 2004. This Plan incorporates the goals and objectives outlined in CDOT's INWMP for Maintenance Section 1, which includes the project area, summarized as:

- Comply with the Laws, Rules, and Regulations pertaining to the management of noxious weeds.
- Communicate and cooperate with CDOT personnel, the private sector, adjacent landowners, and other governmental agencies to ensure the success of control efforts.
- Educate all CDOT maintenance personnel about the noxious weeds in Section 1.
- Map all right-of-ways on state highways, interstates, and US highways in Section 1.
- Evaluate the integrated weed management plan program for Section 1.

The Larimer County Weed Control District's stated goals include:

- Enforce the Weed Act of Colorado.
- Assist landowners with any weed problems:
  - Develop a vegetation management plan for their property.
  - Identify plants on their property.
  - Make recommendations about the proper herbicide for their property.
- Promote an educational and informational program on vegetation management.
- Control noxious weeds on county property and county roadsides.

Plan implementation includes working with landowners to develop individual weed management plans for private properties, and monitoring of actions (control methods) to help bring them into compliance.

E.2 Project Area Overview

SH 402 is a heavily used two-lane, east-west arterial connecting United States Highway 287 (US 287, also known as Lincoln Avenue) and Interstate 25 (I-25).[1] This 4-mile highway is located south of the city of Loveland in Larimer County, Colorado. SH 402 serves local residents and businesses and is used as a commuter route to I-25. Access to a carpool lot (approximately 88 spaces) at the southwest quadrant of the SH 402 and I-25 interchange was included as part of this study.

The purpose of this project is to improve mobility and safety along the existing SH 402 from the US 287 intersection east to the I-25 interchange. The need for this project is to accommodate 2030 travel demand. The existing two-lane highway's substandard design includes no turn lanes, narrow shoulders, and poor sight distances (how far ahead a driver can see from the road), resulting in mobility and safety concerns.

Although current land use is chiefly rural agricultural, dispersed low-density residential areas also exist (including the residential subdivision Paradise Acres). Paradise Acres is located on the north side of SH 402, with access from Heron Drive/Olsen Drive. The Waterford Place Apartments are located in the northeast quadrant of the intersection of SH 402 and US 287.

Businesses in the corridor include gas stations, storage warehouses, a greenhouse, a landscaping center, and a feed yard. Public facilities include Larimer County's maintenance facility, the CDOT Region 4 Loveland Residency (on the north side of SH 402), and a carpool lot on the southwest corner near the I-25 interchange. Most of these properties are oriented toward the highway, with direct access and little definition of highway edge (that is, no sidewalks and little landscaping).

Permanent impacts are expected for five types of upland vegetation/land cover identified in the project area:

- croplands (13.7 acres)
- pasturelands (7.9 acres)
- prairie (0.3 acre)
- forest/woodland (0.6 acre)
- disturbed/reclaimed lands (3.7 acres)

The total acreage of permanent impacts equals 27.09 acres. This does not include 33.6 acres of developed/disturbed land cover type that will also be permanently impacted.

In addition, three wetland categories totaling 0.893 acre were determined to exist in the project area:

- palustrine forested/emergent
- palustrine emergent
- Nonjurisdictional palustrine emergent

[1] Subsequent to the 2004 actions resulting in this report, the area between US 287 and CR 13C is being widened to a four-lane highway by developers in coordination with the city of Loveland and CDOT under a Categorical Exclusion, dated September 18, 2003, so as not to preclude other potential improvements to the roadway. Permanent acreage impacts identified in this report do not reflect the development that has already occurred. Noxious weeds remaining after development between US 287 and CR 13C will be managed per Section E.4 through Section E.6 of this report.

E.3 Weed Species Present

A weed inventory was conducted within the 4-mile long right-of-way for SH 402 on October 1, 2004. Table E-1 lists noxious weeds observed in the right-of-way. Figure E-1 depicts weed locations observed and mapped by CDOT and J.F. Sato and Associates.

Table E-1. Noxious Weed Species Observed in the SH 402 Project Area

Common Name	Scientific Name	Larimer County Weed List[a]	CDOT Weed List[b]	State Noxious Weed List[a]
Quackgrass	*Elytrigia repens*			B
Russian-olive	*Elaeagnus angustifolia*		X	B
Musk thistle	*Carduus nutans* ssp. *macrolepis*	X	X	B
Canada thistle	*Breea arvense*	X	X	B
Puncturevine	*Tribulus terrestris*			C
Field bindweed	*Convolvulus arvensis*			C

Taxonomy follows Colorado Flora: Eastern Slope, *Weber and Wittmann, 2001.*

[a] *From Colorado Department of Agriculture Plant Industry Noxious Weeds website, including 2003 Revised Rules Pertaining to the Administration and Enforcement of the Colorado Noxious Weed Act (8 CCR 1203-19), accessed November 12, 2003; includes county lists. State management plans include the following designations: A = species to be eradicated, B = stop continued spread, and C = species left to local jurisdictions and use of integrated weed management controls supported.*

[b] *From CDOT Noxious Weed Mapping Project June 2004.*

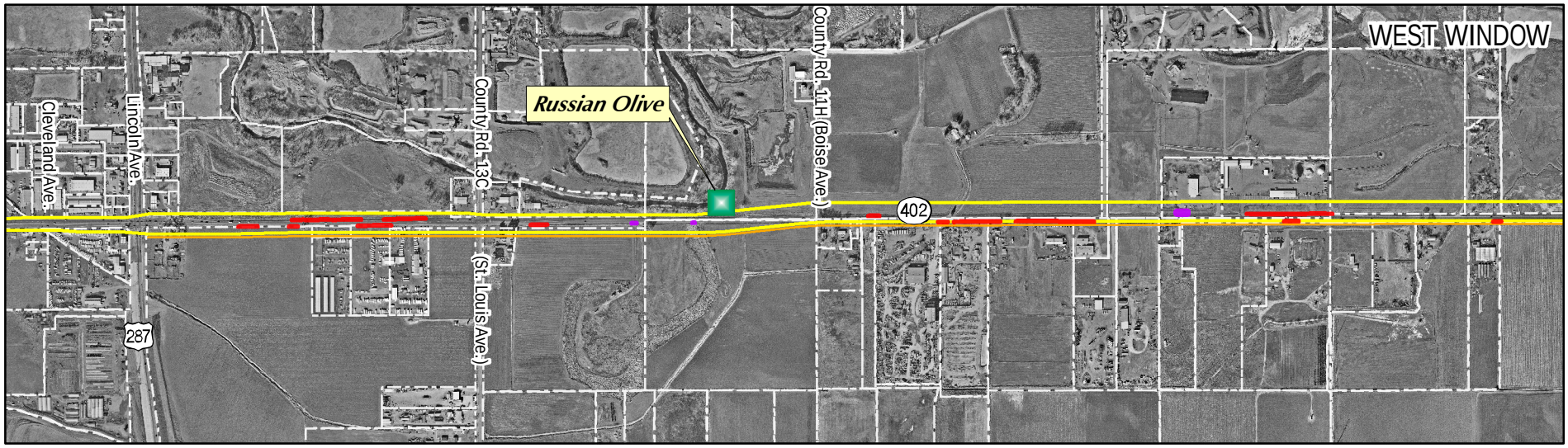
In the SH 402 project area, weed infestations are primarily associated with disturbances along roadsides, irrigation ditches, and other areas of human development. Areas with the potential to spread weeds would be along the new road edge and along smaller roads that may be disturbed for access road construction and equipment access, and at the gravel quarry (if used for equipment staging or storage).

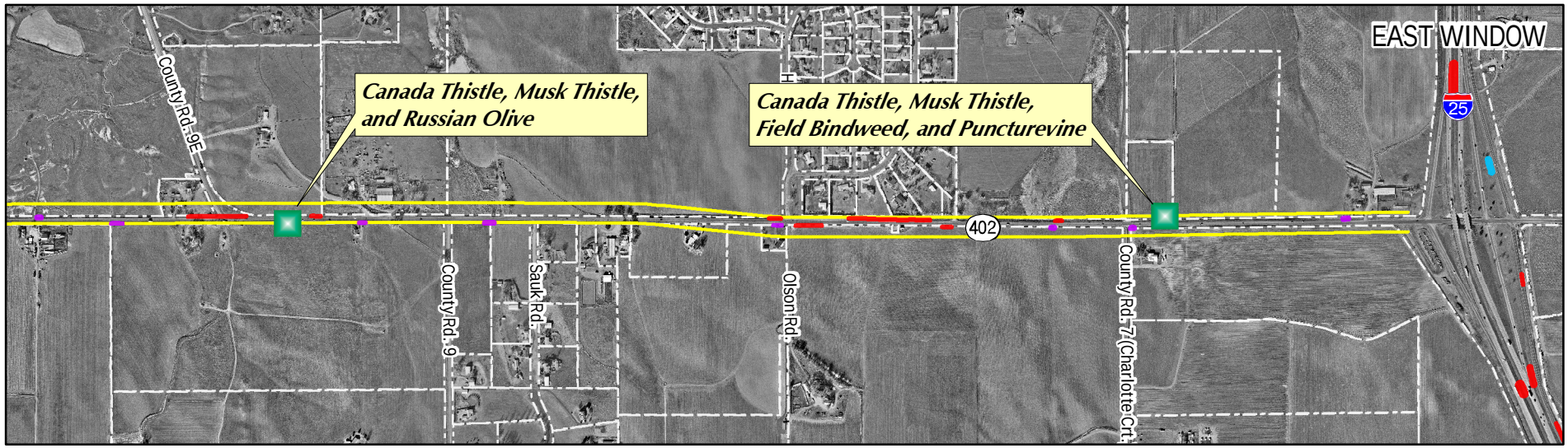
E.4 Weed Management

E.4.1 Measures to Prevent Spread

Components of this Plan include Best Management Practices (BMPs) outlined in CDOT's *Standard Specifications for Road and Bridge Construction* (SSRBC 1999). Following the practices listed below during construction would minimize new infestations and the spread of current weed populations:

- SSRBC Section 217 specifies application of appropriate herbicides by commercial pesticide applicators licensed by the Colorado Department of Agriculture, correct timing of spraying, and appropriate methods used around wetland areas.
- Inspection of contractors' vehicles before arrival at construction site to ensure that they are free of soil, seeds, plant parts, and debris capable of transporting noxious weeds onto the site.
- Where possible, removal and storage of topsoil determined to be free from weeds, for use in revegetation efforts. No importation of topsoil onto the site.
- Certification of mulch as weed-free under the Colorado Department of Agriculture *Weed Free Forage Certification Program*; inspection as regulated by the *Weed Free Forage Act*, CRS Title 35, Article 27.5; and placement of seed/plants at the appropriate season specified in the contract (SSRBC Section 212).





LEGEND

- Property Parcel Boundaries
- Proposed Meander Alternative Right-of-Way
- CDOT Noxious Weed Survey - Canada Thistle
- CDOT Noxious Weed Survey - Field Bindweed
- CDOT Noxious Weed Survey - Musk Thistle
- JFSA Noxious Weed Survey Locations

N W E S

SCALE - 1:14,700
or 1" = 1,225'

0 500 1,000 Feet

SOURCE: 2001 1/2-foot resolution aerial photography. Land use and parcel information provided by the City of Loveland. Map produced October 26, 2004 by JFSA.

U.S. Department of Transportation Federal Highway Administration

DOT DEPARTMENT OF TRANSPORTATION

JFS&A J.F. SATO AND ASSOCIATES

DOT SH 402 Environmental Assessment

State Highway 402

Noxious Weed Locations

FIGURE E-1

- Appropriate care of revegetated plants for three years after planting is finished to ensure establishment of plant material and verify that no new weed infestations have occurred.
- No mowing or cutting weeds when seeds are ready to disperse.

Contractors will need to take special care to prevent weed spread by construction equipment. Several CDOT BMPs focus on preventing weed introduction in mulches, seed, and other plant materials used in reclamation. The following measures are designed to reduce direct and indirect impacts on vegetation and control soil erosion and noxious weeds:

- Specification 207 covers salvaging and stockpiling topsoils for reuse in reclamation. No imported topsoil will be allowed. Topsoil heavily infested with noxious weeds will be removed from the site or buried under a minimum of 5 feet of fill.
- Specification 208 directs contractors to permanently stabilize (that is, cover disturbed areas with final seed and mulch as indicated in plans) each 17-acre increment of the project immediately when grading of that section is finished.
- Specifications 208 and 216 cover other mechanical erosion prevention methods (besides seeding, for example) and include use of soil retention blankets, placement of bales in drainages, use of silt fence, berms/diversions, slope drains, storm drain protection, check dams, channel stabilization, sediment traps or basins, and sandbag barriers.
- Specification 212 covers seeding.
- Specification 213 covers mulching seeded and other bare soil areas.
- Specification 214 covers planting.
- Specification 217 covers herbicide treatments, if needed, for weed control.

The approach to weed control recommended by the Colorado Natural Areas Program (CNAP) is use of multiple management techniques and a monitoring plan to evaluate progress in meeting objectives (CNAP 2000). Integrated weed management attempts to address the ultimate causes of infestations instead of focusing only on weed control. The advantages of this approach are that it:

- is species-specific
- is site-specific
- exploits weed weaknesses
- is practical
- poses minimal risk to organisms and their habitats

E.4.2 Controls

Noxious weed control methods recommended by CNAP and applicable to weeds identified in the project area are summarized in Table E-2. Control is usually improved with a combination of methods; in particular, seeding after removal techniques or herbicide application. Special care must be taken for weeds near water or water tables, and several products listed must not be used in these cases (Curtail, Transline, Clarity). All label directions must be followed and herbicides must be applied by a licensed applicator.

Table E-2. Recommended Control Techniques

Weed Species	Chemical[a]	Mechanical[b]	Biological	Cultural[c]
Quackgrass[d]	Spot-treat with RoundUp (foliar)	Dig out grass plant and reseed with desirable.	None available	Maintain dense stand of lawn or native grasses.
Russian-olive[e]	Pathfinder II or Garlon4 (basal or stump); Escort, RoundUp, Garlon 3A or 4 (foliar application)	Cutting, girdling, burning with removal of material; spray stump; hand-pull sprouts.	None available	Prevent seed dispersal.
Musk thistle[d]	2,4-D, Curtail, RoundUp Ultra, or Redeem R&P (foliar)	Dig, mow, pull rosette during growing season, spray regrowth.	Weevils (*Rhinocyllus conicus, Trichosirocalus horridus*) or beetles (*Cassida rubiginosa*)	Keep plant from seeding.
Canada thistle	Tordon, Curtail, Telar, Transline, Redeem, RoundUp, or Vanquish/Clarity (foliar)	Mow each month of growing season plus herbicide in fall.	Gall fly (*Urophora cardui*)	Reduce the spread of Canada thistle seeds by always purchasing weed-free seeds. Quickly eliminate new seedlings before they have a chance to form a well-developed root system.
Puncturevine	Picloram or dicamba, 2,4-D, or glyphosate, applied to seedlings	Can be controlled by digging, hand-pulling, or tilling infestations before flowering and seed production.	Two insects: *Microlarinus lareynii*, a stem-boring weevil, and *M. lypriformus*, a fruit-boring weevil.	Prevent establishment of new infestations by minimizing disturbance and seed dispersal, eliminating seed production, and maintaining healthy native communities.
Field bindweed	Picloram or dicamba, 2,4-D, or glyphosate. Best when applied during early flowering and under dry soil conditions.	Cutting, mowing, and hand-pulling have little effect.	Little evidence of good biological control agent	Maintain a healthy cover of perennial plants to discourage field bindweed establishment.

[a] *All label directions must be followed for individual chemicals. Timing of chemical treatments with growth stage is of the utmost importance. All brand names are registered trademarks.*

[b] *Mowing must be carefully timed to achieve results, always before the flowering period.*

[c] *Reseeding may have to be timed according to specific chemicals used (for example, areas sprayed with glyphostae-based chemicals such as RoundUp can be reseeded 14 days after treatment; others may require a longer waiting period). Follow label directions.*

[d] *Colorado State University (CSU) Cooperative Extension recommends using a nonionic surfactant with chemicals.*

[e] *A combination of online sources was compiled.*

E.5 Monitoring

Monitoring is an essential component of a weed control program to determine the effectiveness of control techniques. By repeatedly collecting and evaluating information from the treated area, progress can be measured and techniques adjusted if necessary to meet objectives. Monitoring what does and does not work can save the project money by eliminating ineffective techniques (CNAP 2000). Factors that should be considered when developing a monitoring program include:

- Keep it simple.
- Match the effort to the degree of risk involved (that is, Colorado Top Ten noxious weeds are more important to keep under control than low-priority species).
- Monitor over the long term.
- Keep cause and effect in mind when interpreting results (that is, compare similar situations with differing treatments when possible to determine why a treatment did or did not work).

Weed infestations in the project area should be documented with GPS mapping before construction. To track effectiveness, monitoring methods should include collecting these data again after construction, when revegetation and landscaping are complete, and after weed control treatments. Photographs taken at project implementation and yearly (from the same locations at the same time of year) can be useful in documenting the extent of and change in infestations. These photo points should be mapped with photo direction so that subsequent yearly replications will portray the same scene and comparisons can be made.

E.6 Revegetation Commitments and Recommendations

CDOT BMPs will be used for reclamation and revegetation. CDOT will reclaim areas disturbed for construction, staging, and storage activities using:

- landscape material consistent with current settings (pasture, riparian, shrubland, woodland, CDOT right-of-way)
- weed-free mulches certified by the Colorado Department of Agriculture *Weed Free Forage Certification Program* and in compliance with the *Weed Free Forage Act*, Title 35, Article 27.5, CRS, on newly planted areas to retain moisture and retard weed infestations
- BMPs according to CDOT standards to reduce soil erosion losses, including the use of erosion control blankets on steep slopes and channels, surface roughening, and using bales, silt fences, diversions, and check dams
- BMPs according to CDOT standards to reduce sediment transport including use of weed-free hay or straw bales, brush barriers, temporary berms, temporary slope drains, outlet protection, silt fences, check dams, and sediment traps and basins
- techniques that stabilize open soil surfaces larger than 17 acres, such as using mulch and mulch tackifiers for temporary erosion control when seeding cannot occur due to seasonal constraints after ground clearing and grading
- monitoring revegetated areas to prevent establishment of new weed invasions

The best reclamation success would be achieved by including native species from woody, herbaceous, and grass families wherever feasible. It is generally recommended to plant native grass and forb seeds in the fall when seed spread occurs naturally.

Bare soil must not be allowed to remain unvegetated for long because seeds from weedy species may move in via several vectors (including wind, people, equipment and animals) and become established. For slopes 2 ½:1 and steeper a soil retention blanket will be installed to increase planting success and decrease erosion.

Revegetation success increases dramatically if care is provided for two years after planting. Care should include regular watering of trees and shrubs, staking of trees to resist windthrow, and mulching to minimize moisture losses, reduce rapid temperature fluctuations, and curtail weed invasions.

E.7 References

Colorado Department of Transportation. 2000. *Integrated Noxious Weed Management Plan 1999–2000.*

—. 2004. CDOT Noxious Weed Mapping Data. http://www.dot.state.co.us/App_DTD_DataAccess/GeoData/index.cfm?fuseaction=StatewideDataset&menuType=GeoData.

Colorado Executive Order D 006 99. 1999. *Development and Implementation of Noxious Weed Management Programs.* July 19.

Colorado Natural Areas Program, Colorado State Parks, Colorado Department of Natural Resources, Division of Plant Industry, Colorado Department of Agriculture. 2000. *Creating an Integrated Weed Management Plan*.

Colorado State University Cooperative Extension. *Noxious Weed Management* brochure.

Colorado Weed Management Act. 2000. Title 35 Article 5.5 101-119, C.R.S.

Federal Highway Administration. 1999. *Guidance on Invasive Species*. August 10. Online at: http://www.fhwa.dot.gov/environment/inv_guid.htm.

Larimer County. 2004. Weeds Regulated by Larimer County. List includes eight noxious weeds, and two on their Watch List. http://www.co.larimer.co.us/depts/pubwor/weeds/district.htm.

Weber, W.A., and R.C. Wittmann. 2001. *Colorado flora: eastern slope.* University of Colorado Press. Boulder, Colorado.

Appendix F

Air Quality Technical Memorandum

Appendix F
Air Quality Technical Memorandum
For Mobile Source Air Toxics
SH 402 from US 287 East to the I-25 Interchange
Project Number STA 402A-003
Larimer County, Colorado

Appendix F: Technical Memorandum For Mobile Source Air Toxics Environmental Assessment SH 402 from US 287 East to the I-25 Interchange Project Number STA 402A-003 Larimer County, Colorado

F.1 Background Project Information

No air quality issues have been identified for the operational aspects of the SH 402 project. Similar travel demand and vehicle miles traveled are anticipated with the No Action Alternative or the Meander Alternative. Level of Service (LOS) for 2030 is expected to be LOS F under the No Action Alternative for both through traffic and intersections and is expected to improve under the Meander Alternative to LOS C for through traffic and a range of LOS A to D for intersections.

F.2 Mobile Source Air Toxics

The Federal Highway Administration (FHWA) Air Toxic Interim Guidance (February 3, 2006) is used for analysis of mobile source air toxics (MSATs) for highway projects. The following discussion is in accordance with the interim guidance.

In addition to the "criteria" air pollutants for which there are National Ambient Air Quality Standards (NAAQS), Environmental Protection Agency (EPA) also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (such as airplanes), area sources (such as dry cleaners), and stationary sources (such as factories or refineries).

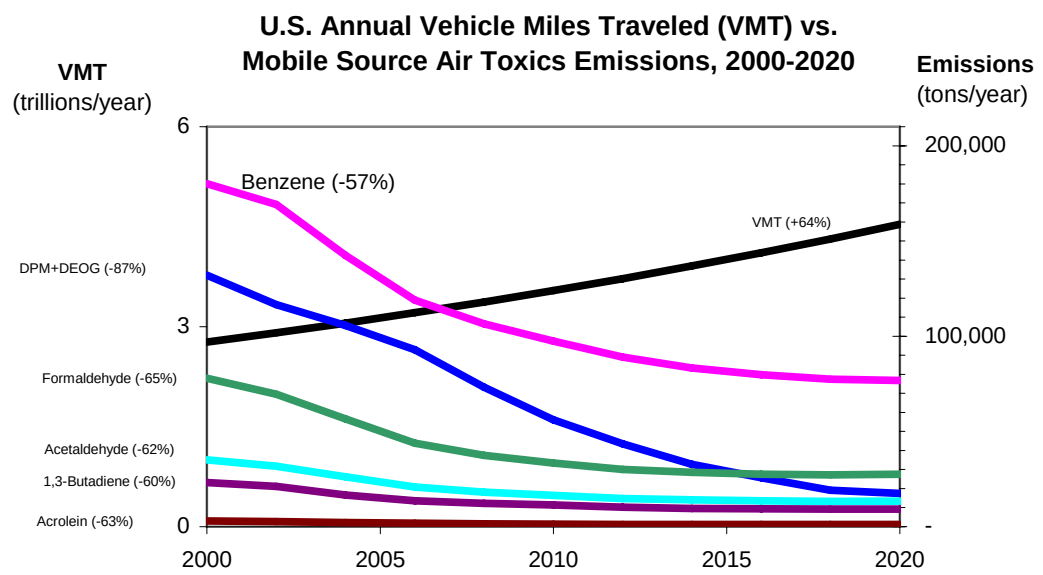
MSATs are a subset of the 188 air toxics defined by the Clean Air Act. MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted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

EPA is the lead federal agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources, 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in vehicle miles traveled (VMT), these programs will reduce on-highway emissions of benzene, formaldehyde,

1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent, as shown in Exhibit F-1.

As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary six MSATs.

Exhibit F-1
Graph of VMT versus MSAT Emissions



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: *Highway Statistics 2000*, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM + DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.

F.2.1 Unavailable or Incomplete Information for Project-Specific MSAT Impact Analysis

This EA includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable prediction of the project-specific health impacts of the emission changes associated with the alternatives in this EA. Due to these limitations, the following discussion is included in accordance with Council on Environmental Quality (CEQ) regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information.

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling to estimate ambient concentrations resulting from the estimated emissions, exposure modeling to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

Emissions

The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE6.2 is a trip-based model; emission factors are projected based on a typical trip of 7.5 miles and on average speeds for this typical trip. This means that MOBILE6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects; it cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

These deficiencies compromise the capability of MOBILE6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends and performing relative analyses among alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

Dispersion

The tools to predict how MSATs disperse are also limited. EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The National Cooperative Highway Research Program (NCHRP) is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

Exposure Levels and Health Effects

Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts among alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be

useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

F.2.2 Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs

Research into the health impacts of MSATs is ongoing. For different emission types, a variety of studies show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or state level.

EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database Weight of Evidence Characterization summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- Benzene is characterized as a known human carcinogen.
- The potential carcinogenicity of acrolein cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- Formaldehyde is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- 1,3-butadiene is characterized as carcinogenic to humans by inhalation.
- Acetaldehyde is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- Diesel exhaust (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.

  Diesel exhaust also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

Other studies have addressed MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to

research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes—particularly respiratory problems.[1] Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable the performance of a more comprehensive evaluation of the health impacts specific to this project.

F.2.3 Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of Impacts Based upon Theoretical Approaches or Research Methods Generally Accepted in the Scientific Community

Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow reasonable predictions of relative emissions changes among alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

F.3 Project-Level MSAT Discussion

In this document, FHWA has provided a qualitative analysis of MSAT emissions relative to the alternatives and has acknowledged that the No Action and Meander Alternatives may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. This can give a basis for identifying and comparing the potential differences among MSAT emissions—if any—from the No Action and Meander Alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm.

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

F.3.1 Applicability of MSATs to the SH 402 Project Corridor

Although the difference in 2030 ADT for the No Action and Meander Alternatives was not calculated, vehicle miles traveled (VMT) for the Meander Alternative is expected to be slightly higher for the Meander Alternative than that for the No Action Alternative because the additional capacity increases the efficiency of the highway and attracts some rerouted trips from elsewhere in the transportation network. Typically, the amount of MSATs emitted would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each alternative.

The increase in VMT would lead to slightly higher MSAT emissions for the Meander Alternative along the highway corridor, together with a corresponding decrease in MSAT emissions along other routes as user habits change. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds. According to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs, except diesel particulate matter, decrease as speed increases.

For SH 402, it is possible that the congestion relief and associated increases in speed as a result of the additional capacity (laneage) will have more of an effect on reducing emissions than the offset due to an increase in VMT. In the case of the proposed improvements, increased capacity will mean the difference between a design year (2030) LOS F for the No Action Alternative for both intersection and through traffic versus a range of LOS A to D for the Meander Alternative intersection traffic and LOS C for through traffic. The extent to which speed-related emissions decrease will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

The additional travel lanes contemplated as part of the Meander Alternative will have the effect of moving some traffic closer to nearby homes and businesses; therefore, there may be localized areas where ambient concentrations of MSATs could be slightly higher under the Meander Alternative than under the No Action Alternative. However, as discussed above, the magnitude and the duration of these potential increases compared to the No Action Alternative cannot be accurately quantified due to the inherent deficiencies of current models. In sum, if the highway is widened and, as a result, moves closer to receptors, the localized level of MSAT emissions for the Meander Alternative could be higher relative to the No Action Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than those of today.

F.3.2 National Control Programs Will Reduce MSAT Emissions by 2030 Regardless of SH 402 Project

Regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 56 to 81 percent between 2005 and 2030. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

F.4 References Cited

Clagget, Michael, and Miller, Terry L. *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm.

Clean Air Act. 1970 as amended 1977.42 USC 7401 et seq. 40 CFR Section 202(l).

Council on Environmental Quality regulations 40 CFR 1502.22(b)

Environmental Law Institute. 2005. *NEPA's Uncertainty in the Federal Legal Scheme Controlling Air Pollution from Motor Vehicles,* 35 ELR 10273 with health studies cited therein.

Environmental Protection Agency. 2000. *Control of Emissions of Hazardous Air Pollutants from Motor Vehicles and Motor Vehicle Fuels.* Document No. EPA420-R-00-023. December.

—. Integrated Risk Information System (IRIS). Online at: www.epa.gov/iris.

—. 2001. Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. 66 FR 17229. March 29.

Federal Highway Administration. 2006. *Interim Guidance on Air Toxic Analysis in NEPA Documents.* February 3.

Sierra Club. 2004. *Highway Health Hazards*, summarizing 24 Studies on the Relationship between Health and Air Quality.

South Coast Air Quality Management District. 2000. *Multiple Air Toxic Exposure Study-II*.

This page intentionally left blank.