Water Quality Assessment Report

North County Corridor New State Route 108 Project

North County Corridor New State Route 108 Project
Stanislaus County, California
DISTRICT 10 – STA – 108
(SR-108 [PM 27.5/44.5], SR-219 [PM 3.7/4.8], SR-120 [PM 6.9-11.6])
EA: 10-0S8000 & Project ID: 1000000263

May 2015

Caltrans

Water Quality Assessment Report

North County Corridor New State Route 108 Project
Stanislaus County, California
DISTRICT 10 – STA – 108
(SR-108 [PM 27.5/44.5], SR-219 [PM 3.7/4.8], SR-120 [PM 6.9-11.6])
EA: 10-0S800 & Project ID: 1000000263

August 2014

STATE OF CALIFORNIA
Department of Transportation

Prepared By: _____ Date: 9/2/14

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Environmental Planner
916-858-0642

Approved By: _____ Date: 9/22/14

Ken Romero
559-445-6417
Caltrans
District 6

The environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried-out by Caltrans under its assumption of responsibility pursuant to 23 USC 326.

Executive Summary

The North County Corridor Transportation Expressway Authority (NCCTEA) proposes to construct the North County Corridor New State Route 108 (NCC) Project (project). For this project, the NCCTEA is represented by California Department of Transportation (Caltrans) District 10, Stanislaus County, and the Cities of Oakdale, Riverbank and Modesto. Caltrans is the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) lead agency for the project.

The project is located in northern Stanislaus County between Tully Road/State Route (SR) 219 at the western terminus to SR-108/SR-120 at the eastern terminus. The purpose of the project is to reduce existing and future traffic congestion in northern Stanislaus County, enhance traffic safety on existing SR-108, support the efficient movement of goods, and improve interregional travel.

The project's study area is generally bounded by SR-120 on the north, Kiernan Avenue/SR219/Claribel Road on the south, Tully Road on the west, and Lancaster Road on the east. Within the limits of the project, the current location of SR-108 is a conventional two-lane, undivided highway with two 12-foot-wide lanes, flanked by 2- to 4-foot-wide non-standard shoulders. This action would relocate existing SR-108 on a new alignment. The total length of the project is approximately 18 miles.

The purpose of the Water Quality Assessment Report (WQAR) is to fulfill the requirements of the NEPA and CEQA, and to provide information, to the extent possible, for National Pollution Discharge Elimination System (NPDES) permitting. The document includes a discussion of the proposed project, the physical setting of the project area, and the regulatory framework with respect to water quality. The document also provides data on surface water, groundwater resources within the project area, and the water quality of these waters. The WQAR describes water quality impairments, beneficial uses, identifies potential water quality impacts/benefits associated with the proposed project, and recommends avoidance and/or minimization measures for potentially adverse impacts.

Construction associated with the NCC will potentially cause erosion contributing sediment that could affect water quality. Construction of the project will also potentially contribute pollutants to groundwater and other adjacent aquatic resources.

The majority of existing SR-108 on-site runoff flows into vegetated ditches/shallow swales, or it sheet flows off the crowned roadway directly onto adjacent parcels. In locations with ditches or swales, the water eventually outlets onto the adjacent parcels or is lost to infiltration and evaporation. Small urban centers in the western portion of the project area have curb and gutter that convey storm runoff to local rock wells for infiltration.

In the proposed condition, each alignment will have roadside ditches paralleling the main roadway corridor, retention basins to store storm water runoff on-site, and cross culverts to maintain existing off-site flow patterns.

The approximate disturbed surface area is 790 acres for Alternative 1A, 982 acres of Alternative 1B, 774 acres of Alternative 2A, and 939 acres for Alternative 2B. The net impervious surface is 179 acres for Alternative 1A, 211 acres of Alternative 1B, 189 acres of Alternative 2A, and 222 acres for Alternative 2.

Regulatory permits under the California Department of Fish and Wildlife Code and the Clean Water Act would be obtained and any further avoidance or minimization measures would be coordinated with the issuing agencies. The proposed project would have permanent and temporary impacts to both waters of the US and state including wetlands, canals, and riparian communities, therefore the following permits would be necessary. The proposed project would require a Section 1602 Streambed Alteration Agreement issued by the California Department of Fish and Wildlife for impacts to waters of the state including riparian communities. A Water Quality Certification (Section 401) and NPDES 402 Permit would be acquired prior to construction. If impacts to waters of the US exceed ½ acre an Individual Permit (Section 404) would be obtained from USACE, if impacts are less than ½ acre a Nationwide Permit for Waters of the U.S. (Section 404) would be acquired prior to construction in compliance with the Clean Water Act. Adherence to the requirements set forth in the permit would also minimize impacts to water quality and aquatic resources.

The risk level for this project has been estimated as a Level 2 with low sediment risk and high receiving water body risk.

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1. INTRODUCTION

The proposed project is located in Caltrans District 10 within portions of the Cities of Oakdale, Riverbank, and Modesto, Stanislaus County, California (see Figures 1 and 2). The North County Corridor New State Route (SR) 108 Project (NCC) will connect SR 219 near Modesto to SR 120 near Oakdale. The proposed project consists of four Build Alternatives (1A, 1B, 2A, and 2B) and the No-Build Alternative (see Figure 3).

1.1 Project Description

Purpose

The purpose of the project is to reduce existing and future traffic congestion in northern Stanislaus County, enhance traffic safety on existing SR-108, and support the efficient movement of goods as follows:

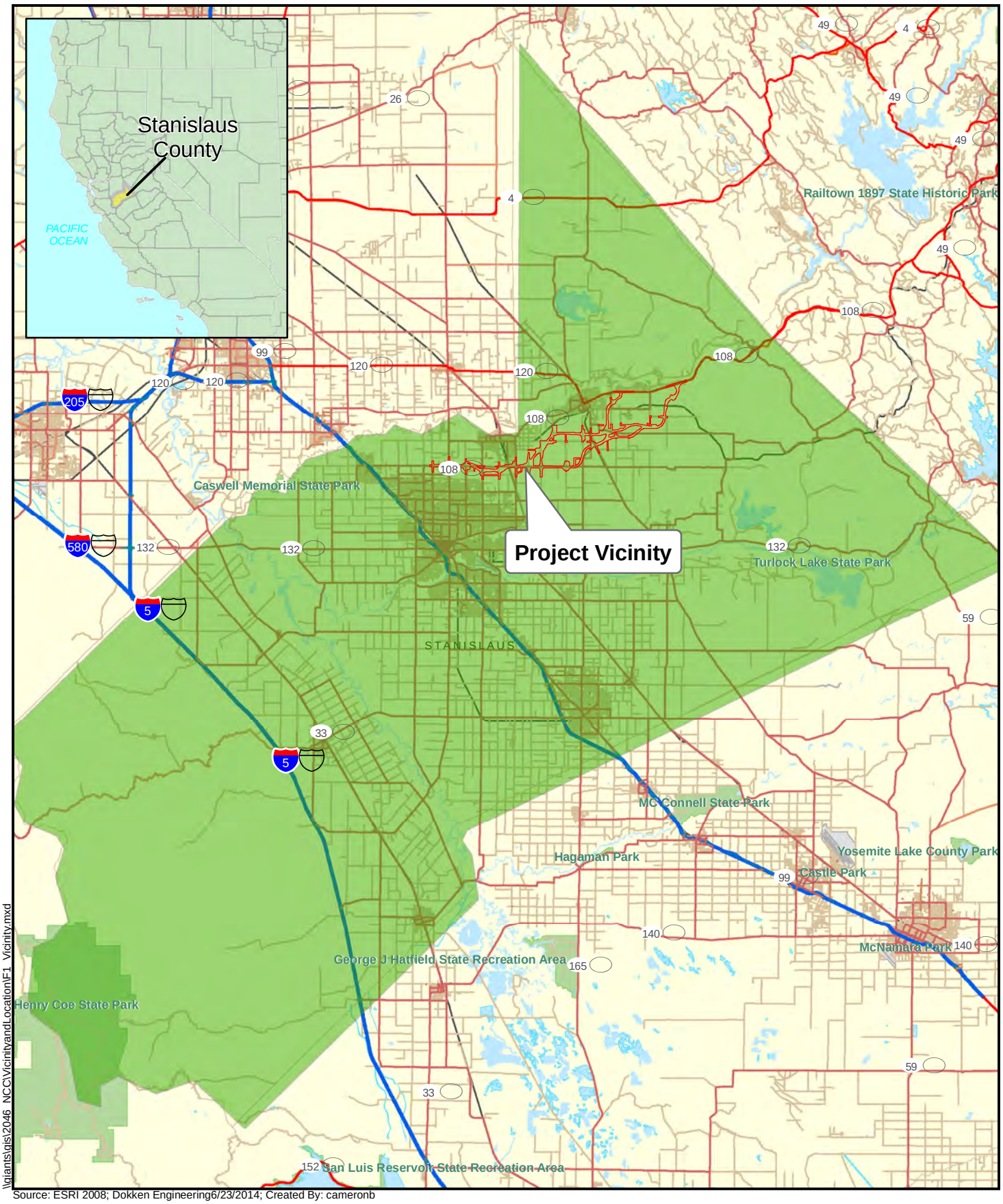
- Reduce existing and future traffic congestion on existing SR-108 and surrounding regional transportation network in northern Stanislaus County and the Cities of Modesto, Riverbank, and Oakdale by providing a new east-west transportation facility;
- Enhance traffic safety on existing SR-108 through the communities of Riverbank and Oakdale by reducing average daily traffic volumes (particularly truck traffic);
- Support efficient movement of goods by providing a new east-west transportation facility that will reduce the number of conflict areas with non-motorized traffic, increase the average operating speeds, and improve travel time reliability; and
- Improve interregional travel by reducing travel times for long distance commuters, recreational traffic, and interregional goods movement.

Need

The current action is needed because:

- Traffic congestion on existing SR-108 will continue to worsen due to projected traffic volume increases;
- Existing accident rates on existing SR-108 are well above the statewide averages for similar facilities;
- Traffic congestion on existing truck routes will continue to inhibit the efficient movement of goods; and
- Existing SR-108 is part of the interregional system and interregional circulation will become increasingly constrained as travel times on existing SR-108 increase substantially with planned residential and employment growth.

Based on population trends and projections as well as the regional countywide traffic model, average daily traffic volumes are projected to increase through the year 2030. Projected growth in the region will continue to constrain east-west travel and the capacity of the region's roadway network (particularly on existing SR-108), which will further contribute to poor local and regional traffic circulation patterns.



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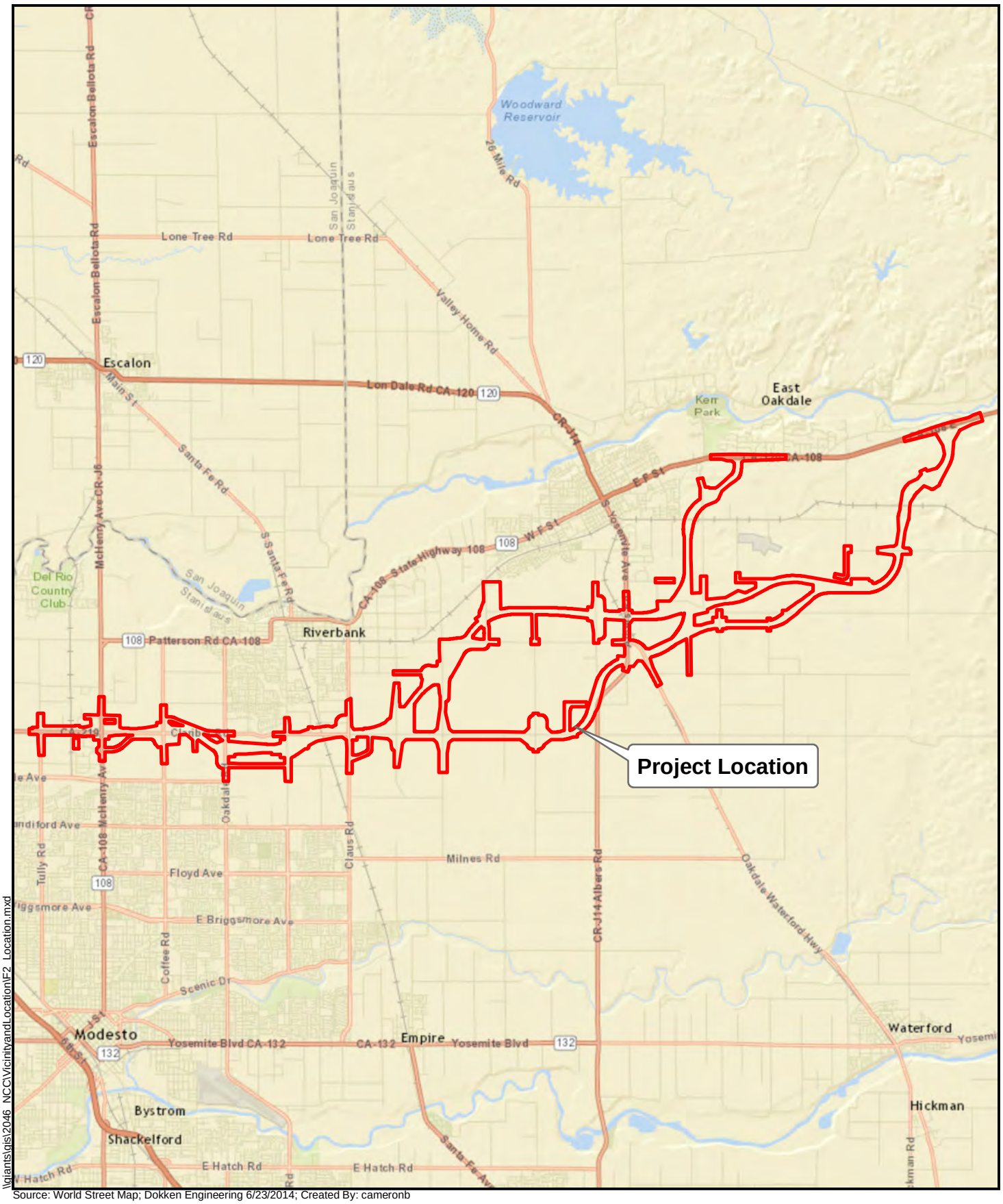
Source: ESRI 2008; Dokken Engineering6/23/2014; Created By: cameronb

0 5 10 Miles

FIGURE 1
Project Vicinity
EA: 10-0S8000, Project ID # 1000000263
North County Corridor State Route 108 Project
Stanislaus County, California



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Source: World Street Map; Dokken Engineering 6/23/2014; Created By: cameronb

0 1 2 3 4 5 Miles

FIGURE 2
Project Location
EA: 10-0S8000, Project ID # 1000000263
North County Corridor State Route 108 Project
Stanislaus County, California

Project Area
Road Outline (edge of pavement)
Bridge
Local Road Access
Railroad
Existing State Route

Canal
Ditch
Perennial Marsh
Pond/Basin
Riparian Scrub
Seasonal Marsh
Seasonal Wetland

Southern Pacific Railroad
Burlington Northern Santa Fe Railroad
Sierra Railroad

Page 14
1A, 2A
Page 9
1B, 2B
Page 11
1A, 1B
Page 12
Page 13
1B
Page 10
1A, 1B, 2A, 2B
Page 2
Page 3
Page 4
2A, 2B
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Page 6
2B
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Page 8

Lancaster Rd
Fogarty Rd
Warnerville Rd
Patterson Rd
Claribel Rd
Wamble Rd
S Stearns Rd
Oakdale-Waterford Highway
Tully Rd
Union Pacific Railroad
McHenry Ave
Coffee Rd
Oakdale Rd
Roselle Ave
Terminal Ave
Claus Rd
Eleanor Ave
Langworth Rd
Bentley Rd
Albers Rd

DIXON LATERAL
GRAVA LATERAL
OID SOUTH MAIN
CRANE LATERAL
RIVERBANK LATERAL
BRICHETTO LATERAL
SOUTH LATERAL
KEARNEY PIPELINE
KEARNEY LATERAL
MOOTZ LATERAL
CLAIRBEL LATERAL
MID MAIN
MID LATERAL NO 9

120
108

V:\2046 NCCWO\Project Area\F3\Page1Build Alternatives.mxd

Source: ESRI Maps Online March 2011; Dokken Engineering 9/2/2014; Created By: carleneg

0 0.5 1 1.5 2 Miles

Segment 1 Segment 2 Segment 3

FIGURE 3
Project Alternatives
Page 1 of 14
EA: 10-0S8000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California

Project Area
Road Outline (edge of pavement)
Bridge
Local Road Access
Railroad
Existing State Route
Canal
Ditch
Perennial Marsh
Pond/Basin
Riparian Scrub
Seasonal Marsh
Seasonal Wetland

1A, 1B, 2A, 2B

UNION PACIFIC RAILROAD

MID LATERAL NO 6

108
219
Kiernan Ave
Charity Way
Bitritto Way
Jerusalem Ct
Tully Rd
Tunson Rd
Pentecost Dr
Stratos Way
McHenry Ave
Claribel Rd
Coffee Rd
E Galaxy Way
Vella Way

Match Line - See Page 3

V:\2046_NCCW\Project Area\F3\Page2Build_Alternatives.mxd

Source: ESRI Maps Online March 2011; Dokken Engineering 9/2/2014; Created By: carleneg

0 500 1,000 1,500 2,000 Feet

FIGURE 3
Build Alternatives
Page 2 of 14
EA: 10-0S8000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California

Project Area
Road Outline (edge of pavement)
Bridge
Local Road Access
Railroad
Existing State Route
Canal
Ditch
Perennial Marsh
Pond/Basin
Riparian Scrub
Seasonal Marsh
Seasonal Wetland

MID LATERAL NO 6

1A, 1B, 2A, 2B

MID CANAL

BURLINGTON NORTHERN SANTA FE

Oakdale Rd

Squire Wells Way

Roselle Ave

Lift Rd

Claribel Rd

Vella Way

Claratina Ave

Plainview Rd

Match Line - See Page 2

Match Line - See Page 4

V:\2046_NCCWQ\Project Area\F3Page3Build_Alternatives.mxd

Source: ESRI Maps Online March 2011; Dokken Engineering 9/2/2014; Created By: carleneg

0 500 1,000 1,500 2,000 Feet

FIGURE 3
Build Alternatives
Page 3 of 14
EA: 10-0S8000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California

Match Line - See Page 10

Match Line - See Page 3

Match Line - See Page 45

Project Area
Road Outline (edge of pavement)
Bridge
Local Road Access
Railroad
Existing State Route
Canal
Ditch
Perennial Marsh
Pond/Basin
Riparian Scrub
Seasonal Marsh
Seasonal Wetland

1A & 1B

1A, 1B, 2A, 2B

2A & 2B

Minniear Ave
Davis Ave
Claus Rd
Eleanor Ave
Langworth Rd
Claribel Rd
Claribel Rd
Claribel Rd
Mc Gee Ave
Langworth Rd
Claus Rd
Plainview Rd
Terminal Ave

MID MAIN

BURLINGTON NORTHERN SANTA FE

V:\2046 NCCW\QProject Area\F3Page4Build Alternatives.mxd

Source: ESRI Maps Online March 2011; Dokken Engineering 9/2/2014; Created By: carleneg

0 500 1,000 1,500 2,000 Feet

FIGURE 3
Build Alternatives
Page 4 of 14
EA: 10-0S8000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California

Project Area
Road Outline (edge of pavement)
Bridge
Local Road Access
Railroad
Existing State Route
Canal
Ditch
Perennial Marsh
Pond/Basin
Riparian Scrub
Seasonal Marsh
Seasonal Wetland

Match Line - See Page 4

Match Line - See Page 6

2A & 2B

Bentley Rd

Albers Rd

Valk Rd

Claribel Rd

V:\2046 NCCW\QProject Area\F3Page5Build Alternatives.mxd

Source: ESRI Maps Online March 2011; Dokken Engineering 9/2/2014; Created By: carleneg

0 500 1,000 1,500 2,000 Feet

FIGURE 3
Build Alternatives
Page 5 of 14
EA: 10-0S8000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California

Match Line - See Page 12 and 13

Match Line - See Page 5

Match Line - See Page 7

1A

1A & 1B

1B

2A

2B

2A & 2B

OID SOUTH MAIN

BRICHETTO LATERAL

CLARIBEL LATERAL

SOUTH LATERAL

Yosemite Ave

Patterson Rd

Albers Rd

Oakdale-Waterford HWY

Alvarado Rd

Bender Rd

Warnerville Rd

Smith Rd

Albers

Valk Rd

Project Area
Road Outline (edge of pavement)
Bridge
Local Road Access
Railroad
Existing State Route

Canal
Ditch
Perennial Marsh
Pond/Basin
Riparian Scrub
Seasonal Marsh
Seasonal Wetland

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Source: ESRI Maps Online March 2011; Dokken Engineering 9/2/2014; Created By: carleneg

0 500 1,000 1,500 2,000 Feet

FIGURE 3
Build Alternatives
Page 6 of 14
EA: 10-0S8000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California

Project Area
Road Outline (edge of pavement)
Bridge
Local Road Access
Railroad
Existing State Route

Canal
Ditch
Perennial Marsh
Pond/Basin
Riparian Scrub
Seasonal Marsh
Seasonal Wetland

OID SOUTH MAIN

1B

Wamble Rd

Fogarty Rd

OID SOUTH MAIN

Match Line - See Page 8

Match Line - See Page 6

2B

KEARNEY LATERAL

Warnerville Rd

Warnerville Rd

Warnerville Rd

Emery Rd

Stoddard Rd

V:\2046_NCCIWQ\Project Area\F3Page7Build_Alternatives.mxd

Source: ESRI Maps Online March 2011; Dokken Engineering 9/2/2014; Created By: carleneg

0 500 1,000 1,500 2,000 Feet

FIGURE 3
Build Alternatives
Page 7 of 14
EA: 10-0S8000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California

Match Line - See Page 9

SIERRA RAILROAD

1B & 2B

OID SOUTH MAIN

Fogarty Rd

Emery Rd

Match Line - See Page 7

Project Area
Road Outline (edge of pavement)
Bridge
Local Road Access
Railroad
Existing State Route

Canal
Ditch
Perennial Marsh
Pond/Basin
Riparian Scrub
Seasonal Marsh
Seasonal Wetland

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Source: ESRI Maps Online March 2011; Dokken Engineering 9/2/2014; Created By: carleneg

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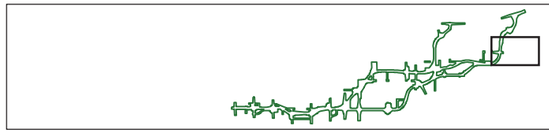

FIGURE 3
Build Alternative
Page 8 of 14
EA: 10-0S8000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California

Project Area
Road Outline (edge of pavement)
Bridge
Local Road Access
Railroad
Existing State Route

Canal
Ditch
Perennial Marsh
Pond/Basin
Riparian Scrub
Seasonal Marsh
Seasonal Wetland

Lancaster Rd
108
120
108
120
1B & 2B
OID SOUTH MAIN

V12046_NCCWQIProjectAreaIF2Page8Build_Alternatives.mxd

Match Line - See Page 8

Source: ESRI Maps Online March 2011; Dokken Engineering 9/2/2014; Created By: carleneg

0 500 1,000 1,500 2,000 Feet

FIGURE 3
Build Alternatives
Page 9 of 14
EA: 10-0S8000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California

Match Line - See Page 11

- Project Area
- Road Outline (edge of pavement)
- Bridge
- Local Road Access
- Railroad
- Existing State Route
- Canal
- Ditch
- Perennial Marsh
- Pond/Basin
- Riparian Scrub
- Seasonal Marsh
- Seasonal Wetland

1A & 1B

RIVERBANK LATERAL

1A & 1B

Crane Rd

Crane Rd

Lexinton Ave

Bentley Rd

Bentley Rd

Langworth Rd

Langworth Rd

Patterson Rd

Patterson Rd

Patterson Rd

Eleanor Ave

Kentucky Ave

Match Line - See Page 12

Match Line - See Page 4

V:\20045 NCC\WQ\Project Area\F3Page10Build Alternatives.mxd

Source: ESRI Maps Online March 2011; Dokken Engineering 9/2/2014; Created By: carleneg

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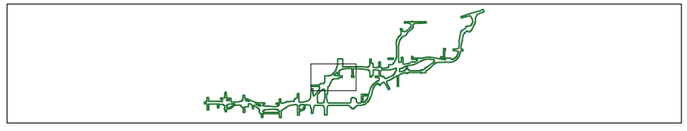

FIGURE 3
Build Alternatives
Page 10 of 14
EA: 10-0S8000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California

V:\2046 NCC\WO\Project Area\F3Page11Build Alternatives.mxd

Match Line - See Page 10

Source: ESRI Maps Online March 2011; Dokken Engineering 9/2/2014; Created By: carleneg

0 500 1,000 1,500 2,000 Feet

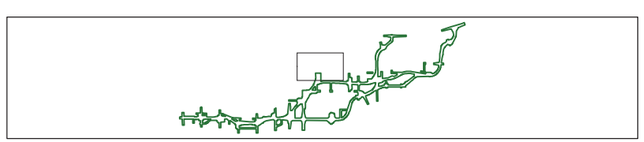

FIGURE 3
Build Alternatives
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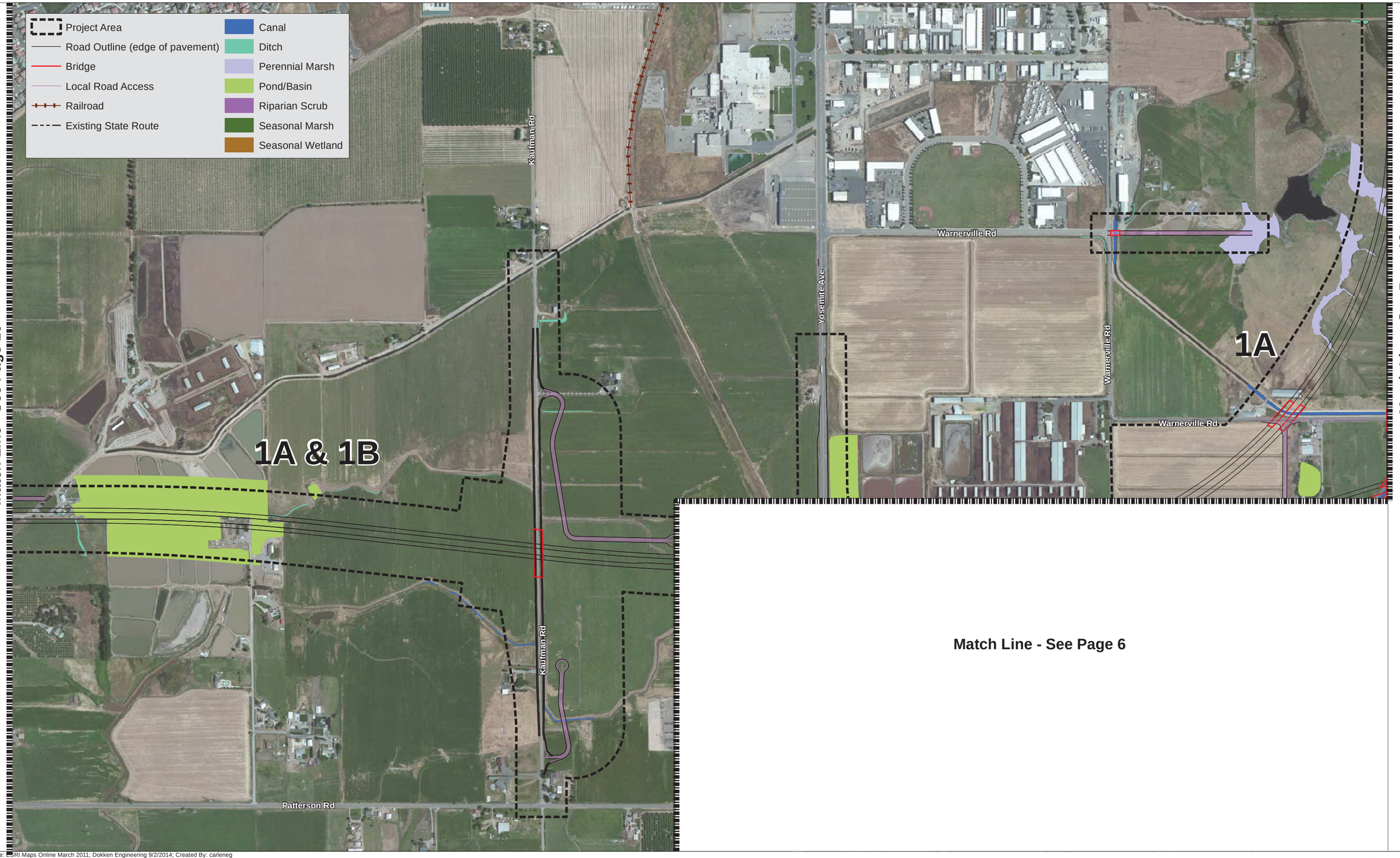
EA: 10-0S8000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California



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Source: ESRI Maps Online March 2011; Dokken Engineering 9/2/2014; Created By: carleneg

0 500 1,000 1,500 2,000 Feet

FIGURE 3
Build Alternatives
Page 12 of 14
EA: 10-088000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California

Match Line - See Page 14

Match Line - See Page 12

Match Line - See Page 6

Match Line - See Page 7

V:\2046_NCCWQ\Project Area\F3\Page13Build_Alternatives.mxd

Source: ESRI Maps Online March 2011; Dokken Engineering 9/2/2014; Created By: carleneg

0 500 1,000 1,500 2,000 Feet

FIGURE 3
Build Alternatives
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EA: 10-0S8000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California

Project Area
Road Outline (edge of pavement)
Bridge
Local Road Access
Railroad
Existing State Route

Canal
Ditch
Perennial Marsh
Pond/Basin
Riparian Scrub
Seasonal Marsh
Seasonal Wetland

Deo Gloria Dr
Atlas Rd
108
108
1A & 2A
Stearns Rd
SIERRA RAILROAD

V:\2046 NCCWO\Project Area\F3Page14Build Alternatives.mxd

Match Line - See Page 13

Source: ESRI Maps Online March 2011; Dokken Engineering 9/2/2014; Created By: carleneg

0 500 1,000 1,500 2,000 Feet

FIGURE 3
Build Alternatives
Page 14 of 14
EA: 10-0S8000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California

Drainage

The majority of existing SR-108 on-site runoff flows into vegetated ditches/shallow swales, or it sheet flows off the crowned roadway directly onto adjacent parcels. In locations with ditches or swales, the water eventually outlets onto the adjacent parcels or is lost to infiltration and evaporation. Small urban centers in the western portion of the project area have curb and gutter that convey storm runoff to local rock wells for infiltration.

In the proposed condition, each alignment will have roadside ditches paralleling the main roadway corridor, retention basins to store storm water runoff on-site, and cross culverts to maintain existing off-site flow patterns.

Cut/Fill Slopes

Generally, all proposed roadway cut or fill slopes and ditch slopes will be 4:1 horizontal:vertical (H:V). In some cases, such as the slopes near the intersections, the roadway fill slopes will be 2H:1V. It is not anticipated that slopes would be steeper than 2H:1V.

Disturbed Surface Area and Net Impervious Surface

The approximate disturbed surface area is 790 acres for Alternative 1A, 982 acres of Alternative 1B, 774 acres of Alternative 2A, and 939 acres for Alternative 2B. The net impervious surface is 179 acres for Alternative 1A, 211 acres of Alternative 1B, 189 acres of Alternative 2A, and 222 acres for Alternative 2.

Access Roads

As the proposed roadway would function as a freeway/expressway with controlled access, new and realigned local access roads are needed to provide continued access to existing properties. This would involve construction of a discontinuous local roadway system which would provide a 12-foot-wide through lane and an 8-foot-wide shoulder, in each direction.

Risk

The risk level for this project has been estimated as a Level 2 with low sediment risk and high receiving water body risk.

1.1.1 No Project Alternative

Under the No-Build Alternative, SR-108 would remain in its existing condition and no improvements would be made. The No-Build Alternative would result in continued deterioration of roadway level of service, increased traffic congestion, reductions in the ability to move goods and services, no improvements in traffic safety.

1.1.2 Build Alternative

The western terminus of all alternatives is at the SR-219 (Kiernan Avenue)/Tully Road intersection. The alternatives proceed to the vicinity of the Claus Road/Claribel Road intersection, where Segment 2 begins and the alternatives separate into two different alignments (A and B). In Segment 2, Alternatives 1A and 1B veer northeast near the Claus Road/Claribel Road intersection and pass through the southern boundary of Oakdale, and Alternatives 2A and 2B continue easterly along Claribel Road and turn northeastward past the intersection of Claribel

Road/Bentley Road. Each of the alternatives then breaks into two possible alignments to their eastern terminus in Segment 3, just past the Oakdale-Waterford Highway. The eastern terminus of Alternatives 1A and 2A end along SR-108/120 just east of the City of Oakdale boundary. Alternatives 1B and 2B end farther east of the Alternatives 1A and 2A terminus, along SR-108/120 in the vicinity of Lancaster Road. The purpose of the project is to reduce existing and future traffic congestion in northern Stanislaus County, enhance traffic safety on existing SR-108, support the efficient movement of goods, and improve interregional travel.

The proposed project improvements include:

- At grade intersections;
- Grade separation structures at major roadway and railway crossings;
- Structures at various waterway crossings, such Modesto Irrigation District (MID) and Oakdale Irrigation District (OID) canals;
- County and City roadway improvements at various locations; and,
- New freeway/expressway controlled access travel lanes.

The four alternatives would consist of two to three 12-foot-wide through lanes with 5-foot to 10-foot-wide left and right shoulders in each direction. The east-bound and west-bound alignments would be separated by a 46 to 70-foot-wide median, including the 5-foot to 19-foot-wide shoulders and 26-foot to 60-foot-wide graded, unpaved median area. Drainage swales would be located along either side of the new roadway.

Up to a 12-foot-wide area would be provided between the right-of-way limit and the edge of pavement to allow for drainage ditches. Where required, turn lanes would provide connections to cross roads. Each of the four build alternatives includes these proposed local access roads which are delineated on Figure 3.

Elevated roadways, separated grade crossings, single point urban interchanges, signalized intersections, and roundabouts would be needed for each of the four alternatives. A Class 2 bike lane would also be constructed within the road shoulder from Claus Road to the eastern terminus at State-Route 108/120.

Various utilities exist throughout the project area that would need to be relocated. These include electric, telephone, water, sewer, and irrigation lines. At the time of this report, the exact locations to which the impacted utilities would be relocated is unknown, but relocation would take place within the currently defined project area.

Permanent right-of-way and temporary construction easements would also be required for the proposed project.

1.2 Approach to Water Quality Assessment

The purpose of the WQAR is to fulfill the requirements of the NEPA and the CEQA, and to provide information, to the extent possible, for NPDES permitting. The document includes a discussion of the proposed project, the physical setting of the project area, and the regulatory framework with respect to water quality; it also provides data on surface water and groundwater resources within the project area and the water quality of these waters, describes water quality impairments and beneficial uses, and identifies potential water quality impacts/benefits associated with the proposed project, and recommends avoidance and/or minimization measures for potentially adverse impacts.

2. REGULATORY SETTING

2.1 Federal Laws and Requirements

Clean Water Act

In 1972 Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source unlawful unless the discharge is in compliance with a NPDES permit. Known today as the Clean Water Act (CWA), Congress has amended it several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. Important CWA sections are:

- Sections 303 and 304 require states to promulgate water quality standards, criteria, and guidelines.

- Section 401 requires an applicant for a federal license or permit to conduct any activity, which may result in a discharge to waters of the U.S., to obtain certification from the State that the discharge will comply with other provisions of the act. (Most frequently required in tandem with a Section 404 permit request. See below).

- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. Regional Water Quality Control Boards (RWQCB) administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and Municipal Separate Storm Sewer Systems (MS4s).

- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

USACE issues two types of 404 permits: Standard and General permits. For General permits there are two types: Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to authorize a variety of minor project activities with no more than minimal effects.

There are also two types of Standard permits: Individual permits and Letters of Permission. Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE's Standard permits. For Standard permits, the USACE decision to approve is based on compliance with U.S. Environmental Protection Agency's (EPA) Section 404 (b)(1) Guidelines (U.S. EPA CFR 40 Part 230), and whether permit approval is in the public interest. The 404(b)(1) Guidelines were developed by the U.S. EPA in conjunction with USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state

that USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA), to the proposed discharge that would have less effects on waters of the U.S., and not have any other significant adverse environmental consequences. Per Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures have been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition, every permit from the USACE, even if not subject to the 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4.

2.2 State Laws and Requirements

Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This Act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the State. It predates the CWA and regulates discharges to waters of the State. Waters of the State include more than just waters of the U.S., like groundwater and surface waters not considered waters of the U.S. Additionally, it prohibits discharges of "waste" as defined and this definition is broader than the CWA definition of "pollutant". Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA, and regulating discharges to ensure compliance with the water quality standards. Details regarding water quality standards in a project area are contained in the applicable RWQCB Basin Plan. In California, Regional Boards designate beneficial uses for all water body segments in their jurisdictions, and then set criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants, which are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-source point controls (NPDES permits or Waste Discharge Requirements), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB adjudicates water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWQCBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

National Pollution Discharge Elimination System (NPDES) Program

Municipal Separate Storm Sewer Systems (MS4)

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water dischargers, including MS4s. The U.S. EPA defines an MS4 as "any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that are designed or used for collecting or conveying storm water." The SWRCB has identified the Department as an owner/operator of an MS4 pursuant to federal regulations. The Department's MS4 permit covers all Department rights-of-way, properties, facilities, and activities in the state. The SWRCB or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted.

The Department's MS4 Permit, currently under revision, contains three basic requirements:

1. The Department must comply with the requirements of the CGP (see below);

2. The Department must implement a year-round program in all parts of the State to effectively control storm water and non-storm water discharges; and

3. The Department storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) Best Management Practices (BMPs) to the Maximum Extent Practicable, and other measures as the SWRCB determines to be necessary to meet the water quality standards.

To comply with the permit, the Department developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within the Department for implementing storm water management procedures and practices as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices the Department uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs. The proposed project will be programmed to follow the guidelines and procedures outlined in the latest SWMP to address storm water runoff.

There are no urban MS4 areas within the project limits.

Construction General Permit

Construction General Permit (Order No. 2009-009-DWQ, as amended by 2010-0014-DWG), adopted on November 16, 2010, became effective on February 14, 2011. The permit regulates storm water discharges from construction sites which result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development. For all projects subject to the CGP, applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP). In accordance with the Department's Standard Specifications, a Water Pollution Control Plan (WPCP) is necessary for projects with DSA less than one acre.

By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least one acre must comply with the provisions of the CGP. Construction activity that results in soil disturbances of less than one acre is subject to this CGP if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop storm water pollution prevention plans; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the CGP.

The CGP separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and pre- and post-construction aquatic biological assessments during specified seasonal windows.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the United States must obtain a 401 Certification, which certifies that the project will be in compliance with State water quality standards. The most common federal permit triggering 401 Certification is a CWA Section 404 permit, issued by USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before USACE issues a 404 permit.

In some cases the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as Waste Discharge Requirements (WDRs) under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

2.3 Regional and Local Requirements

Central Valley Regional Water Quality Control Board Antidegradation Implementation Policy

The antidegradation directives of Section 13000 of the Water Code and State Water Board Resolution No. 68-16 ("Statement of Policy With Respect to Maintaining High Quality Waters in California") require that high quality waters of the State shall be maintained "consistent with the maximum benefit to the people of the State." The Regional Water Board applies these directives when issuing a permit, or in an equivalent process, regarding any discharge of waste which may affect the quality of surface or ground waters in the region.

Implementation of this policy to prevent or minimize surface and ground water degradation is a high priority for the Board. In nearly all cases, preventing pollution before it happens is much more cost-effective than cleaning up pollution after it has occurred. Once degraded, surface water is often difficult to clean up when it has passed downstream. Likewise, cleanup of ground water is costly and lengthy due, in part, to its relatively low assimilative capacity and

inaccessibility. The prevention of degradation is, therefore, an important strategy to meet the policy's objectives.

The Regional Water Board will apply 68-16 in considering whether to allow a certain degree of degradation to occur or remain. In conducting this type of analysis, the Regional Water Board will evaluate the nature of any proposed discharge, existing discharge, or material change therein, that could affect the quality of waters within the region. Any discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State.

Pursuant to this policy, a Report of Waste Discharge, or any other similar technical report required by the Board pursuant to Water Code Section 13267, must include information regarding the nature and extent of the discharge and the potential for the discharge to affect surface or ground water quality in the region. This information must be presented as an analysis of the impacts and potential impacts of the discharge on water quality, as measured by background concentrations and applicable water quality objectives. The extent of information necessary will depend on the specific conditions of the discharge. For example, use of best professional judgment and limited available information may be sufficient to determine that ground or surface water will not be degraded. In addition, the discharger must identify treatment or control measures to be taken to minimize or prevent water quality degradation.

Stanislaus County General Plan

Table 1 lists policies and implementation measures listed in the Stanislaus County General Plan to meet the goal of conserving water resources and protecting water quality in the County.

Table 1: Stanislaus County General Plan: Conservation/Open Space Element

GOAL TWO: CONSERVE WATER RESOURCES AND PROTECT WATER QUALITY IN THE COUNTY.	
Policy Five: **Preserve vegetation to protect waterways from bank erosion and siltation**	*Implementation Measure 1:* Proposals for urbanization in groundwater recharge areas shall be reviewed to ensure that (1) as much water as possible is returned to the recharge area, (2) the development will not cause discharge of materials detrimental to the quality of the water, and (3) the development will not result in significant groundwater overdrafting or deterioration in quality. The Department of Environmental Resources shall require: A. In those areas where groundwaters are susceptible to overdrafting, the project proponent shall perform a hydrogeological analysis and include appropriate mitigation measures in the proposal. B. In those areas where groundwater quality is susceptible to deterioration or is already of reduced quality, the level of wastewater treatment shall be such that it will not cause further quality deterioration.
	Implementation Measure 2: The Department of Environmental Resources shall identify and require control of point sources for pollutants stored, handled or disposed of on the surface of the soil or in the vadose zone that is located in the zone or aeration immediately above the groundwater level. Potential sources of pollutants to the groundwater may also include high densities of individual on-site sewage treatment units and/or the use of community package treatment plants. The Department of Environmental Resources shall require the adoption of groundwater monitoring programs for projects where hydrogeological assessments indicate the potential for groundwater deterioration is likely.
	Implementation Measure 3: Eliminate reliance on dry wells as a means of street drainage in urban areas. Dry wells collect and discharge toxic, hazardous and designated contaminants into aquifers having beneficial uses. New projects shall have storm water disposal systems that: (1) are designed not to pollute receiving surface or groundwaters, and (2) which could be integrated into an area-wide groundwater recharge program whenever feasible.
	Implementation Measure 4: During the project and environmental review process, encourage new development to incorporate water conservation measures to minimize adverse impacts on water supplies. Possible measures include, but are not limited to, low-flow plumbing fixtures, use of

	reclaimed wastewater for landscaping when feasible, and use of drought-tolerant landscaping.
	Implementation Measure 4: Continue to implement the landscape provisions of the Zoning Ordinance, which encourage drought-tolerant landscaping and water-conserving irrigation methods.
	Implementation Measure 5: During the project and environmental review process, encourage new urban development to be served by community wastewater treatment facilities and water systems rather than by package treatment plants or private septic tanks and wells.
Policy Six: **Preserve vegetation to protect waterways from bank erosion and siltation**	*Implementation Measure 1:* Development proposals including or in the vicinity of waterways and/or wetlands shall be closely reviewed to ensure that destruction of riparian habitat and vegetation is minimized. This shall include referral to the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the State Department of Fish and Game.
	Implementation Measure 2: Continue to encourage best management practices for agriculture and coordinate with soil and water conservation efforts of Stanislaus County Farm Bureau, Resource Conservation Districts, the U.S. Soil Conservation Service, and local irrigation districts.
Policy Seven: **New development that does not derive domestic water from pre-existing domestic and public water supply systems shall be required to have a documented water supply that does not adversely impact Stanislaus County water resources.**	*Implementation Measure 1:* Proposals for development to be served by new water supply systems shall be referred to appropriate water districts, irrigation districts, community services districts, the State Water Resources Board and any other appropriate agencies for review and comment.
	Implementation Measure 2: Review all development requests to ensure that sufficient evidence has been provided to document the existence of a water supply sufficient to meet the needs of the project without adversely impacting the quality and quantity of existing local water resources.

3. AFFECTED ENVIRONMENT

3.1 Introduction

The affected environment analysis is a description of the environmental characteristics within the proposed project boundary, such as geography, topography, receiving waterbodies, groundwater conditions, precipitation and climate, flood plain classification, erosion potential, biological, water quality standards, beneficial uses, and available existing water quality data.

3.2 General Setting

3.2.1 Population and Land Use

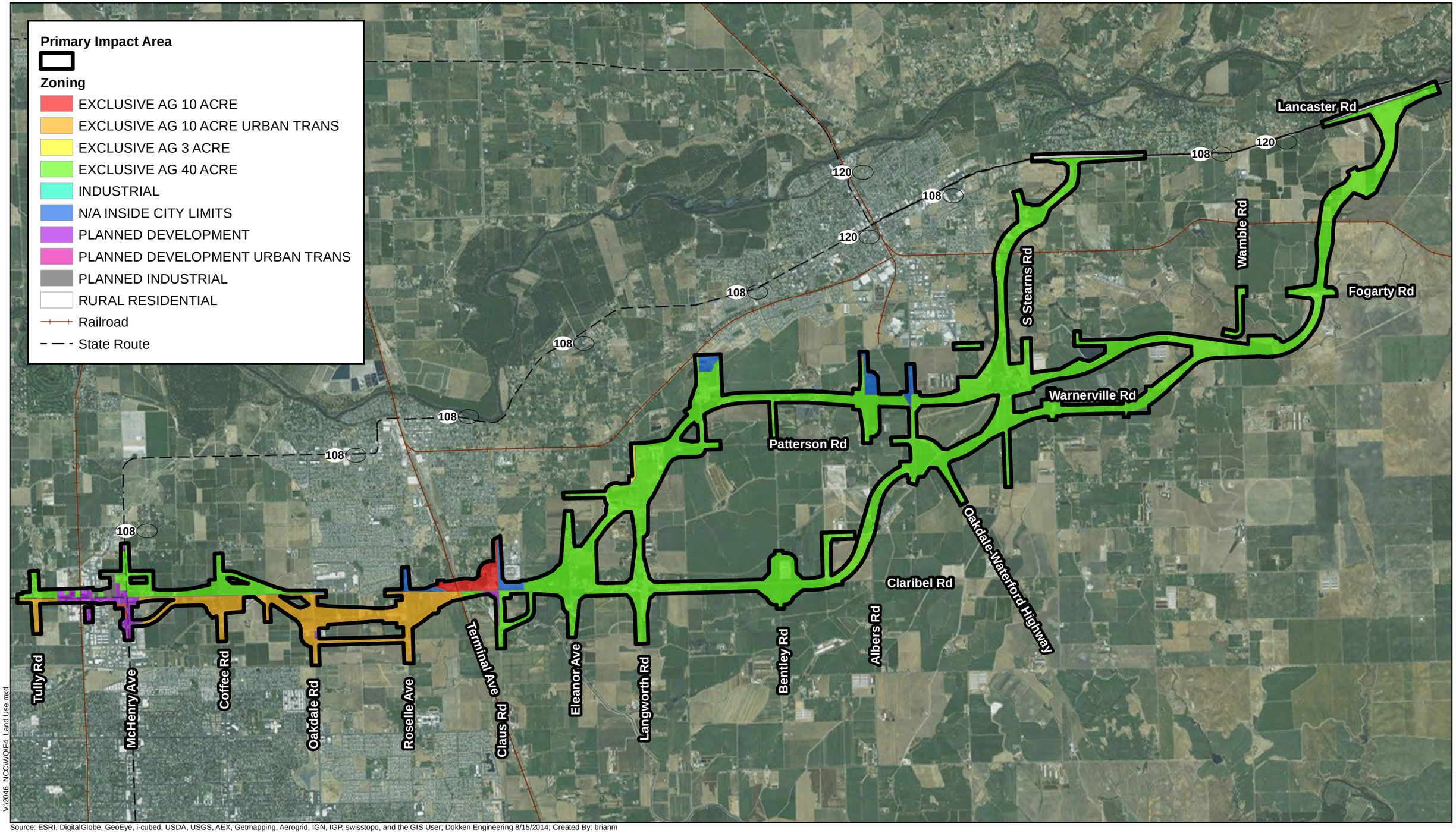
Population

The 2010 U.S. Census indicates that Stanislaus County has a total population of 514,453 which had grown 15.09% since 2000. This population growth rate was much higher than the state average rate of 9.99%. During this period, the City of Modesto had a lower population growth rate of 6.52%, while population in the cities of Riverbank and Oakdale increased by 43.3% and 33.36%, respectively. Population of the County is concentrated in the cities. Areas with the highest population density are found within census tract 3.03 and 3.04 (both in Riverbank), where population density is 5711.1 persons per square and 4953.3 persons per square mile, respectively. Unincorporated areas (census tract 1.02 and 28.02) exhibit the lowest population densities, which is 44.7 and 182.7 persons per square mile, respectively.

Land Use

The area surrounding the North County Corridor New State Route 108 Project is primarily agricultural land, with a small portion of industrial (see Figure 4).

The Project is located within Spheres of Influence of Modesto, Riverbank, and Oakdale. A Sphere of Influence represents unincorporated area outside a city's boundaries that is expected to be annexed, or added, to a city's incorporated area in the next 20 years. Urban Transition is a special designation adopted in the Stanislaus County General Plan to make sure that these unincorporated areas remain consistent with the General Plan of an incorporated city when they are eventually annexed. The Urban Transition designation ensures that land remains in agricultural usage until urban development consistent with a city's general plan designation is approved. A portion of the Project resides within areas designated as Urban Transition.



Source: ESRI, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User; Dokken Engineering 8/15/2014; Created By: brianm

0 1 2 3 4 5 Miles

FIGURE 4
Land Use
EA: 10-0S8000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California

The remaining portions of the Project also lie within mostly unincorporated areas and are designated for Agriculture, Planned Development, and Industrial in the Stanislaus County General Plan. The Planned Development designation is intended for land which, because of demonstrably unique characteristics, may be suitable for a variety of uses without detrimental effects on other property. Land within a Planned Development designation should be zoned as General Agriculture until development occurs.

3.2.2 Topography

The project area is located within the lower San Joaquin Central Valley, which has elevation ranges fluctuating from near sea level to the peaks of nearby foothills at approximately 4,000 feet above mean sea level (amsl). The site topography is relatively flat throughout the western portion of the project and rises gently to the east toward the Sierra Nevada foothills. Ground elevation at the west end of the project near Tully Road is about 95 feet with low relief to Terminal Avenue (BNSF Railroad crossing), which is at about elevation 130 feet. East of Terminal Avenue the topography becomes gently rolling and rises to about elevation 190 feet at Oakdale-Waterford Highway, with increasing relief to about elevation 250 feet near the east end of the Project.

3.2.3 Hydrology

3.2.3.1 Regional Hydrology

The proposed project lies within the designated Riverbank Hydrologic Sub-Area, which lies within the San Joaquin Valley Floor Hydrologic Unit (Department of Conservation, 2014). The Riverbank Sub-Area drains an area of approximately 162,000 acres and contains the four following water bodies: the Lower Stanislaus River (between Goodwin Dam and the San Joaquin River), Dry Creek (a tributary to the Tuolumne River), the Lower Tuolumne River (between Don Pedro Reservoir and the San Joaquin River), and the San Joaquin River (between Tuolumne River and Stanislaus River). Both the Lower Stanislaus River and the Lower Tuolumne River drain to the San Joaquin River, which eventually connects to the San Joaquin Delta and the Pacific Ocean (USGS, 2014).

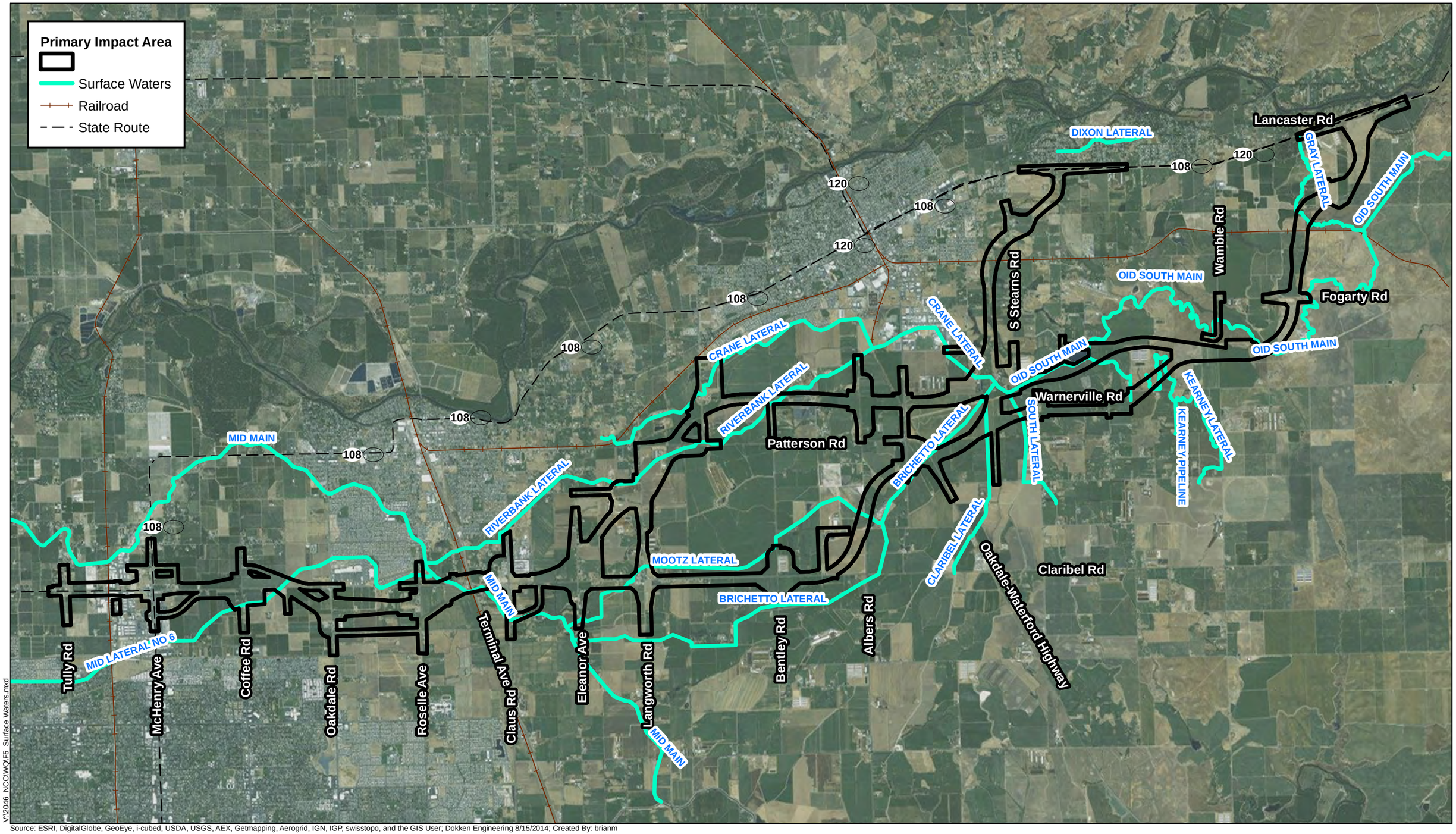
3.2.3.2 Local Hydrology

3.2.3.2.1 Precipitation and Climate

The area is characterized by a Mediterranean-type climate with wet, moderate winters, and hot, dry summers. Annual precipitation ranges from 0.34 inches to 0.89 inches and mainly occurs between November and April. Average annual temperature is 61.7 degrees Fahrenheit (°F) (NOAA, 2014).

3.2.3.2.2 Surface Water Features

Within the project area exists a combination of water features: irrigation canals, drainage ditches, roadside ditches, perennial marshes, seasonal marshes, seasonal wetlands, ponds, and basins (see Figure 5). The irrigation canals are the only water features that potentially outfall to the Lower Stanislaus River or Lower Tuolumne River (via Dry Creek).



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Source: ESRI, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User; Dokken Engineering 8/15/2014; Created By: brianm

0 1 2 3 4 5 Miles

FIGURE 5
Surface Water Features
EA: 10-0S8000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California

The remaining features retain the water and either recharge the groundwater through infiltration or lose it to evaporation. Each water features is discussed below.

Irrigation Canals

Irrigation canals that operate on a gravity flow system and transect the existing roadways are used to provide water to irrigate livestock pastures and agricultural fields. The canals receive water either directly or indirectly from the Lower Stanislaus River, downstream of the Tulloch Reservoir and Goodwin Dam, approximately 10 miles northeast of the eastern extent of the project limits near Wamble Road and SR 108/120.

The majority of the canals convey water back to the Lower Stanislaus River and the remaining canals carry water to Dry Creek, which is a tributary to the Lower Tuolumne River. Most of the major canals are owned and maintained by Modesto Irrigation District (MID) and Oakdale Irrigation District (OID). In areas where the proposed roadway will be crossing an existing canal, a clear span structure will be constructed over the canal as required by MID and OID and the canal will not be impacted. The 14 canals within the project limits are as follows:

- Lateral No. 6
- Modesto Main Canal
- Cavill Drain
- Mootz Drain
- Crane Lateral
- Brichetto Lateral
- Crane Drain
- Mootz Lateral
- Riverbank Lateral
- Claribel Lateral
- South Palmer Lateral
- Oakdale South Main Canal
- West Pump Lateral
- Kearney Lateral

Drainage Ditches

Drainage ditches are used to collect excess irrigation waters from agriculture parcels. The water in these drains is either reclaimed and pumped back into the canals or the water is discharged onto adjacent parcels.

Roadside Ditches

While most of the ditches are unvegetated, some dirt-lined ditches support seasonal wetland type vegetation such as nutsedge and rabbitsfoot grass, and small willows.

Perennial Marshes

Perennial marshes occur primarily in the central and eastern half of the project area. These wetlands contain water most or all of the year. Perennial marshes provide suitable conditions for many plant and wildlife species.

Seasonal Marshes

Seasonal marshes occur adjacent to irrigated pastures and annual grassland in the western and central parts of the project area. These wetlands contain water during the wet season, but are dry at least part of the year. The seasonal marshes in the project area are being further studied to see if they would be considered suitable habitat for vernal pool branchiopods. Seasonal marshes provide suitable conditions for many plant and wildlife species.

Seasonal Wetlands

Seasonal wetlands typically occur in topographically low-lying areas within annual grasslands and ditches. Seasonal wetlands usually flood or are saturated for short periods and do not remain inundated for very long into the growing season. Seasonal wetlands provide suitable conditions for many plant and wildlife species.

Ponds/Basins

This water feature includes natural or created ponds that occur throughout the project area, most of which support wetlands. The ponds that support wetlands tend to be perennial in nature and are generally associated with irrigation and/or stock ponds for cattle.

3.2.3.2.3 Flood Plains

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Stanislaus County shows that the project area is located in Zone X, which is defined as an area that is outside the 0.2% annual chance floodplain.

3.2.3.2.4 Municipal Supply

As stated in Stanislaus County Code, Chapter 9.37 Groundwater Mining And Export Prevention, Section 9.37.020 Findings, groundwater is an essential resource for municipal, industrial and domestic uses within the county. The majority of users within the project area access groundwater through domestic wells. Recharge is dependent on excess flows infiltrating down into the water table.

3.2.3.3.5 Groundwater Hydrology

The project is located in the Modesto subbasin, a subbasin of the San Joaquin Valley Groundwater Basin. The Modesto Subbasin is defined as that area of land lying between the Stanislaus River on the north, the Tuolumne River on the south, the Sierra Nevada Mountain foothills on the east and the San Joaquin River on the west. The surface area of the subbasin is approximately 247,000 acres. Discharges from the subbasin result from well pumping and groundwater seepage to the Tuolumne River. The primary hydrogeologic units in the Modesto subbasin include both consolidated and unconsolidated sedimentary deposits (DWR, 2003).

Within the San Joaquin Valley Groundwater Basin area, both groundwater and surface water are important water sources for both urban and agricultural users. Impacts to water quality result from a variety of factors including runoff during wet weather events, direct discharges associated with industrial and commercial activities, leaking sewer infrastructure, and illegal dumping.

Groundwater data for the project area is available from the Department of Water Resources (DWR) database as well as geotechnical Log of Test Borings (LOTB) completed for the project. This data, presented in Table 2, shows that the regional groundwater table is generally shallower (19 feet below ground surface) at the west end of the project and deeper (92 feet below ground surface) toward the easterly project limits.

Table 2: North County Corridor Groundwater Data

Location	Groundwater Depth (ft) bgs*	Date	Source
Kiernan Avenue/SR 99 interchange	19	1965	LOTB
Hammett/SR 99 interchange	20	1967	LOTB
McHenry/Hetch Hetchy crossing	32	1987	LOTB
North Salida	28	2011	DWR
St. Francis Ave. and Carver Rd.	41	2011	DWR
Claribel Rd. and Coffee Rd.	52	2011	DWR
Claribel Rd bet Coffee & Oakdale	52	2012	A-12-006
Claribel Rd. and Roselle Ave.	62	2011	DWR
Claribel Rd. @ Terminal Ave.	64	2012	A-12-003
Claribel Rd. near Eleanor Ave.	68	2012	A-12-001
Claribel Rd. and McGee Ave.	75	2010	DWR
Patterson Rd. and Crane Rd.	92	2011	DWR

*bgs = below ground surface
Lotb = Log of Test Borings
DWR = California Department of Water Resources
A-12-001 = 2012 BCI borings

Source: Draft Preliminary Geotechnical Design/Materials Report dated May 11, 2012

3.2.4 Geology/Soils

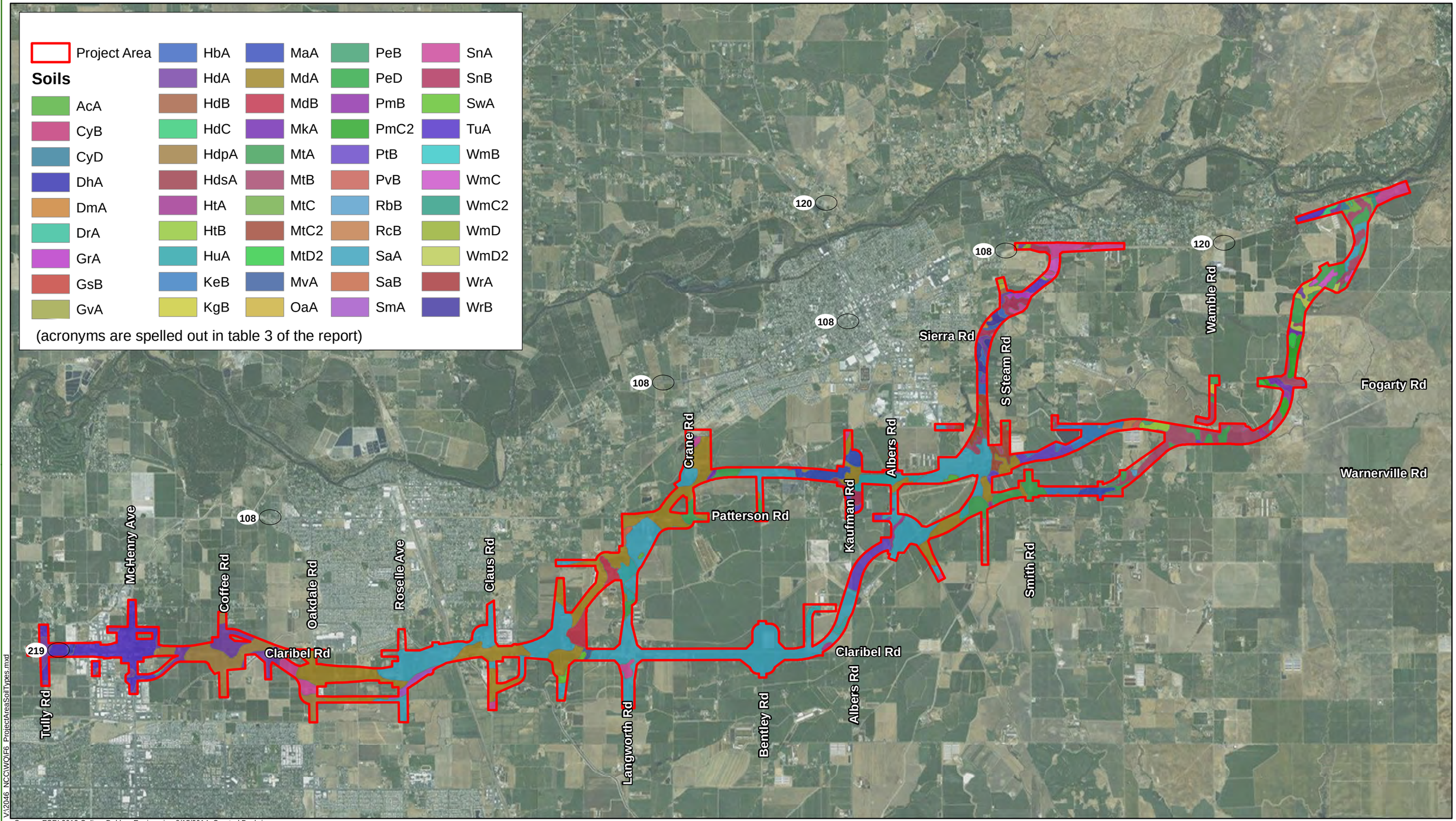
3.2.4.1 Soil Erosion Potential

Based on surveys performed by the Natural Resources Conservation Service (NRCS), there are many soil types within the project area. As shown in Table 3, the approximate percentages of project soils within each Hydrologic Soil Group are as follows: Group A – 12%, Group B – 1%, Group C – 25%, and Group D – 62%. Soils within Hydrologic Soil Groups A and B have low to moderately low runoff potential when thoroughly wet. The areas that are comprised of these soils are near the urban areas at the west and east termini of the project. The majority of the project is comprised of soils within Hydrologic Soil Groups C and D, which have moderately high and high runoff potential when thoroughly wet. Also included in the table are the K Factors which is an erosion factor that indicates the susceptibility of a soil to sheet and rill erosion by water. The estimates are based primarily on percentage of silt, sand, and organic matter. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. Figure 6 displays the various soil types in the project area.

Table 3: North County Corridor New State Route 108 Project Soil Types

Soil Symbol	Soil Name	K Factor	Hydrologic Soil Groups Percentage of Total Project Area (4,468 acres)			
			A	B	C	D
AcA	Alamo Clay	.17				0.2%
CyB/CyD	Corning gravelly sandy loam	.15				< 0.2%
DhA	Delhi sand	.02	0.1%			
DmA/DrA	Dinuba fine sandy loam	.24		0.2%		
GrA/GsB	Greenfield sandy loam	.32	0.4%			
GvA	Greenfield sandy loam, deep over hardpan	.20	0.1%			
HbA	Hanford fine sandy loam	.20	0.7%			
HdA/ HdB/ HdC	Hanford sandy loam	.17	5.0%			
HdpA	Hanford sandy loam, moderately deep over silt	.17			4.9%	
HdsA	Hanford sandy loam, deep over silt	.17	< 0.1%			
HtA/HtB	Hopeton clay loam	.32				1.3%
HuA	Hopeton loam	.37				2.6%
KeB/KgB	Keyes cobbly/gravelly clay loam	.17				2.1%
MaA	Madera loam	.49				1.9%
MdA/MdB	Madera sandy loam	.37				18.0%
MkA	Meikle clay	.28				0.6%
MtA/MtB/MtC/MtC2/MtD2	Montpellier coarse sandy loam	.17			14.9%	
MvA	Montpellier coarse sandy loam, poorly drained variant	.20				0.1%
OaA	Oakdale sandy loam	.24	0.4%			
PeB/PeD	Pentz gravelly loam	.20				0.1%
PmB/PmC2	Pentz loam, moderately deep	.37		1.2%		
PtB	Peters clay	.20				3.1%
PvB	Peters cobbly clay	.10				0.3%
RbB	Raynor cobbly clay	.15			0.1%	
RcB	Redding cobbly loam	.20				0.2%
SaA/SaB	San Joaquin sandy loams	.32				27.9%
SmA	San Joaquin and Madera soils	.37				0.5%
SnA/SnB	Snelling sandy loam	.20			5.2%	
SwA	Snelling sandy loam, poorly drained variant	.24				0.3%
TuA	Tujunga loamy sand	.15	5.9%			
WmB/WmC/ WmC2/WmD/ WmD2	Whitney sandy loams	.24				1.9%
WrA	Whitney and Rocklin sandy loams	.24				< 0.1%
WrB	Whitney and Rocklin sandy loams	.24				0.7%
TOTAL			**12%**	**1%**	**25%**	**62%**

Source: NRCS, 2009



V:\2046 NCCWQIF6 ProjectAreaSoilTypes.mxd

Source: ESRI 2013 Online; Dokken Engineering 8/15/2014; Created By: brianm

0 1 2 3 4 Miles

FIGURE 6
Project Area Soil Types
EA: 10-0S8000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California

3.2.5 Biological Communities

3.2.5.1 Soil Erosion Potential

3.2.5.1.1 Special Status Species

Special status wildlife species that may occur in the project area, or in the vicinity, within wetlands include the Pacific pond turtle, California tiger salamander, western spadefoot toad, vernal pool tadpole shrimp, California linderiella, and vernal pool fairy shrimp.

Pacific pond turtle

The pond turtle is a highly aquatic species, found in ponds, marshes, rivers, streams, and irrigation ditches that typically have rocky or muddy bottoms and support aquatic vegetation. Eggs are laid at upland sites, away from the water, from April through August.

California tiger salamander

California tiger salamander are typically associated with vernal pools or similar habitats consisting of seasonal pools or ponds (including man-made ponds, etc., that dry out in summer) surrounded by grasslands. Depressional aquatic features in the project area that support seasonal inundation including seasonal wetlands, ponds, and basins provide potential aquatic habitat for California tiger salamander.

Western spadefoot toad

Breeding habitat for this species includes temporary pools or ephemeral drainages; breeding occurs from January to May. Water temperatures within these pools must stay between 48° F and 86° F in order to serve as suitable breeding habitat. Seasonal wetlands in the project area provide potential habitat for this species.

Vernal Pool Invertebrates: vernal pool tadpole shrimp, vernal pool fairy shrimp, and the California linderiella fairy shrimp

Vernal pool crustaceans are dependent on the seasonal nature of their habitat, which consists of depressions that become inundated during winter rains and dry up completely by summer. Seasonal wetlands in the project area which exhibit vernal pool characteristics provide potential habitat for these three invertebrate species.

3.2.5.1.2 Stream/Riparian Habitats

Riparian scrub occurs in one location along a concrete canal, adjacent to orchards, near the west end of the BSA. The community consists entirely of dense narrow-leaf willow. Riparian scrub provides suitable nesting habitat for small passerine birds.

3.2.5.1.3 Wetlands

Seasonal Wetlands

According to the United States Code of Federal Regulations (CFR) Title 40, Part 230, entitled *Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material*, special aquatic sites are defined as the following:

- Sanctuaries and refuges
  - Wetlands

- Mud flats
- Vegetated shallows
- Coral reefs
- Riffle and pool complexes

Within the project area, seasonal wetlands were identified. Seasonal wetlands typically occur in topographically depressions within annual grasslands. This community may also occur in shallow ditches. Dominant plant species observed were water starwort, nutsedge, threespike goosegrass, pale spikerush coyote thistle, waxy mannagrass, and velvet grass. Additional species include Italian ryegrass, water primrose, hyssop loosestrife, annual bluegrass, rabbitsfoot grass, buttercup Himalayan blackberry, and fiddledock. Seasonal wetlands do not remain inundated for extended periods during the growing season.

Some seasonal wetlands which exhibit vernal pool characteristics may provide suitable habitat for vernal pool invertebrates including vernal pool tadpole shrimp and vernal pool fairy shrimp. Larger features may provide suitable habitat for California Tiger Salamander and western spadefoot, depending on the duration of inundation.

3.2.5.1.4 Other Aquatic Resources

Perennial Marsh

Perennial marsh occurs primarily in the central and eastern half of the BSA. Dominant plant species include waxy mannagrass, common rush, knotweed, Himalayan blackberry, curly dock, tule, narrowleaf cattail, and broadleaf cattail.

Perennial marsh habitat, with sufficient open water, may provide suitable habitat for Pacific pond turtle. Western yellow billed cuckoo and other bird species may forage in the perennial marsh habitat.

Pond and Basin

- This community consists of natural and created ponds or basins that occur throughout the project area. Some ponds are utilized as detention basins; however many are catfish or other fish-rearing ponds. Dominant vegetation consists of Bermuda grass, ryegrass and knotweed.

- Some ponds within the project area may provide suitable habitat for California Tiger Salamander and Pacific pond turtles. If fish are present, osprey may be observed foraging in this community.

Canal and Ditch

- Canals and ditches occur throughout the project area and include concrete lined canals and dirt lined ditches ranging in width from 2 to 45 ft. The features range from large agricultural irrigation canals to small roadside ditches. The canals and the majority of the ditches are unvegetated; however some dirt lined ditches support seasonal wetland vegetation. Species include nutsedge, rabbitsfoot grass and small willows.

- Most canals and ditches do not provide quality habitat for wildlife species; however, Pacific pond turtles and other aquatic species could utilize the canals and larger ditches.

3.3 Water Quality Objectives/Standards and Beneficial Uses

3.3.1 Surface Water Quality Objectives/standards and Beneficial Uses

As required by the Porter-Cologne Act, the Central Valley RWQCB has developed water quality objectives for waters within their jurisdiction to protect the beneficial uses of those waters and published them in their Basin Plan. The Basin Plan also establishes implementation programs to achieve these water quality objectives and requires monitoring to evaluate the effectiveness of these programs. Water quality objectives must comply with the state antidegradation policy (State Board Resolution No. 68-16), which generally restricts the reduction of water quality of surface or ground waters even though such a reduction in water quality might still allow the protection of the beneficial uses associated with the water prior to the quality reduction. The Central Valley Regional Water Quality Control Board intends to maintain this quality with enforcement of the water quality objectives summarized in Table 4 (Basin Plan, 2011).

Table 4: Central Valley Regional Water Quality Control Board Water Quality Objectives for Inland Surface Waters

Constituent	Water Quality Objective	
Bacteria	In waters designated REC-1, the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 mL, nor shall more than 10 percent of the total number of samples taken during any 30-day period exceed 400/100 mL.	
Biostimulatory Substances	Water shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.	
Chemical Constituents	Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At a minimum, water designated MUN shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in the following provisions of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section Consumer Acceptance Limits) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449. At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain lead in excess of 0.015 mg/l. *(See below for specific chemical constituent objectives for specific water bodies.*	
Chemical Constituents: Boron[1]	APPLICABLE WATER BODY: San Joaquin River, mouth of the Merced River to Vernalis	2.0 mg/L (15 March through 15 September) 0.8 mg/L (monthly mean, 15 March through 15 September) 2.6 mg/L (16 September through 14 March) 1.0 mg/L (monthly mean, 16 September through 14 March)

Constituent	Water Quality Objective	
		1.3 mg/L (monthly mean, critical year)
Chemical Constituents: Molybdenum[1]		0.015 mg/L 0.010 (monthly mean)
Chemical Constituents: Selenium[1]		0.012 mg/L 0.005 mg/L (4-day average)
Color	Waters shall be free of discoloration that causes nuisance or adversely affects beneficial uses.	
Dissolved Oxygen	The monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation. The dissolved oxygen concentrations shall not be reduced below the following minimum levels at any time: • Waters designated WARM 5.0 mg/L • Waters designated COLD 7.0 mg/L • Waters designated SPWN 7.0 mg/L	
Floating Material	Waters shall not contain floating material, including, but not limited to, solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.	
Oil and Grease	Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.	
pH	The pH of water shall not be depressed below 6.5, raised above 8.5.	
Pesticides	• No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. • Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses. • Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency or the Executive Officer. • Pesticide concentrations shall not exceed those allowable by applicable antidegradation policies (see State Water Resources Control Board Resolution No. 68-16 and 40 C.F.R. Section 131.12.). • Pesticide concentrations shall not exceed the lowest levels technically and economically achievable. • Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the Maximum Contaminant Levels set forth in California Code of Regulations, Title 22, Division 4, Chapter 15. • Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of thiobencarb in excess of 1.0 µg/l.	

Constituent	Water Quality Objective	
	For the purposes of this objective, the term pesticide shall include: (1) any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment whatsoever, or (2) any spray adjuvant, or (3) any breakdown products of these materials that threaten beneficial uses. Note that discharges of "inert" ingredients included in pesticide formulations must comply with all applicable water quality objectives. (*Pesticide concentrations shall not exceed the levels identified below for the specific water body as listed in the Basin Plan)*	
Pesticides: Chlorpyrifos	APPLICABLE WATER BODY: San Joaquin River, mouth of the Merced River to Vernalis	0.025 µg/L; 1-hour average (acute) 0.015 µg/L; 4-day average (chronic) Not to be exceeded more than once in a three year period.
Pesticides: Diazinon		0.16 µg/L; 1-hour average (acute) 0.10 µg/L; 4-day average (chronic) Not to be exceeded more than once in a three year period.
Radioactivity	Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life, nor which result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life. At a minimum, waters designated MUN shall not contain concentrations of radionuclides in excess of the maximum contaminant levels specified in Table 4 (MCL Radioactivity) of Section 64443 of Title 22, California Code of Regulations.	
Sediment	The suspended sediment load and suspended sediment discharge rate of waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.	
Settleable Material	Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.	
Suspended Material	Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.	
Tastes and Odors	Waters shall not contain taste- or odor-producing substances in concentrations that cause nuisance, adversely affect beneficial uses, or impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin or to domestic or municipal water supplies.	
Temperature	Elevated temperature wastes shall not cause the temperature of waters designated COLD or WARM to increase by more than 5 degrees Fahrenheit above natural receiving water temperature. In determining compliance with the above limits, the Central Valley Regional Water Quality Control Board may prescribe appropriate averaging periods provided that beneficial uses will be fully protected.	

Constituent	Water Quality Objective
Toxicity	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. Compliance with this objective will be determined by analyses of indicator organisms, species diversity, population density, growth anomalies, biotoxicity tests of appropriate duration, or other methods as specified by the Central Valley Regional Water Quality Control Board.
Turbidity	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits: • Where natural turbidity is less than 1 Nephelometric Turbidity Unit (NTU), controllable factors shall not cause downstream turbidity to exceed 2 • Where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU. • Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent. • Where natural turbidity is equal to or between 50 and 100 NTUs, increases shall not exceed 10 NTUs. • Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent. In determining complieance with the above limits, appropriate averageing periods may be applied provided that beneficial uses will be fully protected.
[1]Selenium, molybdenum, and boron objectives are total concentrations. Source: Sacramento and San Joaquin River Basin Plan, Revised 2011	

The Central Valley Regional Water Quality Control Board assigns beneficial uses for tributary streams based on the uses assigned to the named waterbody that the tributary connects with. Beneficial uses for the water bodies in the project vicinity are as follows:

- Lower Stanislaus River (Goodwin Dam to San Joaquin River): Municipal and Domestic Supply (MUN), Agriculture - Irrigation and Stock Watering (AGR); Industry – Process (PROC), Service Supply (IND), and Power (POW); Recreation - Contact and Canoeing and Rafting (REC-1); Other Noncontact Recreation (REC-2); Warm (WARM) and Cold (COLD) Freshwater Habitat; Cold Migration (MIGR); Warm and Cold Spawning (SPWN); Wildlife Habitat (WILD)

- Lower Tuolumne River (segment from New Don Pedro Reservoir to the San Joaquin River): Municipal and Domestic Supply (MUN), Agriculture - Irrigation and Stock Watering (AGR); Recreation - Contact and Canoeing and Rafting (REC-1); Other Noncontact Recreation (REC-2); Warm (WARM) and Cold (COLD) Freshwater Habitat; Cold Migration (MIGR); Warm and Cold Spawning (SPWN); Wildlife Habitat (WILD)

- San Joaquin River (segment from mouth of Merced River to Vernalis): Municipal and Domestic Supply (MUN), Agriculture - Irrigation and Stock Watering (AGR); Industry – Power (POW); Recreation - Contact and Canoeing and Rafting (REC-1); Other Noncontact Recreation (REC-2); Warm (WARM) Freshwater Habitat; Warm and Cold Migration (MIGR); Warm Spawning (SPWN); Wildlife Habitat (WILD)

3.3.2 Groundwater Quality Objectives/standards and Beneficial Uses

As discussed in Section 3.2.3.3, groundwater varies throughout the project area and can be found at depths ranging from 19 feet to 92 feet. The following objectives in Table 5 apply to all ground waters of the Sacramento and San Joaquin River Basins.

Table 5: Central Valley Regional Water Quality Control Board Water Quality Objectives for Groundwater

Constituent	Water Quality Objective
Bacteria	In ground waters used for domestic or municipal supply (MUN) the most probable number of coliform organisms over any seven-day period shall be less than 2.2/100 ml.
Chemical Constituents	Ground waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At a minimum, ground waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, and Tables 64449-A (Secondary maximum Contaminant Levels-Consumer Acceptance Limits) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of

Constituent	Water Quality Objective
	Section 64449. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain lead in excess of 0.015 mg/L.
Radioactivity	At a minimum, ground waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the maximum contaminant levels (MCLs) specified in Table 4 (MCL Radioactivity) of Section 64443 of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect.
Tastes and Odors	Groundwaters shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses.
Toxicity	Ground waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial use(s). This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.

The Sacramento and San Joaquin River Basin Plan lists beneficial uses of groundwater as designated by the Central Valley Regional Water Quality Control Board. All groundwaters in the Region are considered as suitable or potentially suitable, at a minimum, for municipal and domestic supply (MUN), agricultural supply (AGR), industrial service supply (IND), and industrial process supply (PRO).

3.4 Existing Water Quality

3.4.1 List of Impaired Waters

Under the mandate of Section 303(d) of the Clean Water Act, the State is required to formulate a list of surface water bodies that exceed applicable water quality standards. Subsequently, the State is required to describe the impairment sources and prioritize these water bodies to develop Total Maximum Daily Loads (TMDLs) by the target completion dates. This list was updated in 2008-2010 (SWRCB, 2010) and was approved by the United States Environmental Protection Agency (EPA) in October 2011. See Figure 5 for impaired water bodies in the vicinity of the project area, including the Lower Stanislaus River, Dry Creek (a tributary to the Tuolumne River), the Tuolumne River, and the San Joaquin River. The following tables list information for each of these rivers.

V:\2046 NCCIWQIF7 TMDLs inthe\ProjectVicinity.mxd

Source: World Street Map; Dokken Engineering 8/15/2014; Created By: brianm

FIGURE 7
303 (d) Listed Waters in the Project Vicinity
EA: 10-0S8000, Project ID # 1000000263
North County Corridor New State Route 108 Project
Stanislaus County, California

Lower Stanislaus River

The Lower Stanislaus River, from the Tulloch Reservoir to the San Joaquin River, is listed as impaired under the 303(d) list for Chlorpyrifos, Diazinon, Group A Pesticides, Mercury, temperature, and unknown toxicity (SWRCB, 2010).

Table 6: Lower Stanislaus River

2010 CALIFORNIA 303(d) LIST OF WATER QUALITY FOR STANISLAUS RIVER, LOWER (GOODWIN DAM TO SAN JOAQUIN RIVER)			
Pollutant	Source	First Year Listed	Target Completion Date
Chlorpyrifos	Agriculture	2010	2021
Diazinon	Agriculture	1998	2008
Group A Pesticides	Agriculture	1998	2011
Mercury	Resource Extraction	2002	2020
Temperature, water	Source unknown	2010	2021
Unknown Toxicity	Source unknown	1998	2019
Source: (SWRCB, 2010)			

Chlorpyrifos, diazinon, and Group A Pesticides are all pesticides used for agricultural activities. These pesticides generally reach surface water bodies through storm-water runoff during storm events and subsequent spikes in aquatic toxicity have been associated with such influxes in the San Joaquin River (USGS, 2001).

Higher levels of mercury at the San Joaquin River are attributed to erosion from old mercury mines in the Sierra foothills.

Water temperature and toxicity are the other pollutants with TMDLs at the Lower Stanislaus River. These have largely unknown sources.

Dry Creek

Dry Creek, a tributary to Tuolumne River in Modesto, is listed as impaired under the 303(d) list for Chlorpyrifos, Diazinon, Escherichia coli (E. coli), and unknown toxicity (SWRCB, 2010).

Table 7: Dry Creek

2010 CALIFORNIA 303(d) LIST OF WATER QUALITY FOR DRY CREEK (TRIBUTARY TO TUOLUMNE RIVER AT MODESTO, E. STANISLAUS COUNTY)			
Pollutant	Source	First Year Listed	Target Completion Date
Chlorpyrifos	Agriculture	2010	2021
Diazinon	Agriculture	2010	2010
Escherichia coli (E. coli)	Source unknown	2010	2021
Unknown Toxicity	Source unknown	2010	2021
Source: (SWRCB, 2010)			

Chlorpyrifos and diazinon are pesticides used for agricultural activities. These pesticides generally reach surface water bodies through storm-water runoff during storm events and subsequent spikes in aquatic toxicity have been associated with such influxes in the Lower Tuolumne River (USGS, 2001).

E. coli and toxicity are the other pollutants with TMDLs at Dry Creek. These have largely unknown sources.

Lower Tuolumne River

The Lower Tuolumne River, from the Don Pedro Reservoir to the San Joaquin River, is listed as impaired under the 303(d) list for chlorpyrifos, diazinon, Group A pesticides, mercury, temperature, and unknown toxicity (SWRCB, 2010).

Table 8: Lower Tuolumne River

2010 CALIFORNIA 303(d) LIST OF WATER QUALITY FOR TUOLUMNE RIVER, LOWER (DON PEDRO RESERVOIR TO SAN JOAQUIN RIVER)			
Pollutant	Source	First Year Listed	Target Completion Date
Chlorpyrifos	Agriculture	2010	2021
Diazinon	Agriculture	2002	2010
Group A Pesticides	Agriculture	2006	2011
Mercury	Resource Extraction	2010	2021
Temperature, water	Source unknown	2010	2021
Unknown Toxicity	Source unknown	2006	2022
Source: (SWRCB, 2010)			

Chlorpyrifos, diazinon, and Group A Pesticides are all pesticides used for agricultural activities. These pesticides generally reach surface water bodies through storm-water runoff during storm events and subsequent spikes in aquatic toxicity have been associated with such influxes in the Lower Tuolumne River (USGS, 2001).

Higher levels of mercury at the Lower Tuolumne River are attributed to erosion from old mercury mines in the Sierra foothills.

Water temperature and toxicity area the other pollutants with TMDLs at the Lower Tuolumne River. These have largely unknown sources.

San Joaquin River

The San Joaquin River, from the Tuolomne River to the Stanislaus River, is listed as impaired under the 303 (d) list for Chlorpyrifos, DDT (Dichlorodiphenyltrichloroethane), Diazinon, Electrical Conductivity, Group A Pesticides, Mercury, temperature, and unknown toxicity (SWRCB, 2010).

Table 9: San Joaquin River

2010 CALIFORNIA 303(d) LIST OF WATER QUALITY FOR SAN JOAQUIN RIVER (TUOLUMNE RIVER TO STANISLAUS RIVER)			
Pollutant	Source	First Year Listed	Target Completion Date
Chlorpyrifos	Agriculture	2006	2007
DDT	Agriculture	2006	2011
Diazinon	Agriculture	2006	2007
Electrical Conductivity	Agriculture	1998	2021
Group A Pesticides	Agriculture	1994	2011
Mercury	Resource Extraction	2006	2012
Temperature, water	Source unknown	2010	2021
Unknown Toxicity	Agriculture	1994	2019
Source: (SWRCB, 2010)			

Chlorpyrifos, DDT, diazinon, and Group A Pesticides are all pesticides used for agricultural activities. These pesticides generally reach surface water bodies through storm-water runoff during storm events and subsequent spikes in aquatic toxicity have been associated with such influxes in the San Joaquin River (USGS, 2001). Unknown toxicity in the river is also attributed to agricultural activities.

Higher levels of mercury at the San Joaquin River are attributed to erosion from old mercury mines in the Sierra foothills.

Water temperature is a TMDL at the San Joaquin River with largely unknown sources.

3.4.2 Areas of Special Biological Significance (ASBS)

In an effort to protect and restore ecologically sensitive ecosystems along the coast, California created 34 Areas of Special Biological Significance spanning the length of the coast. This designation was intended to bring special protection to fragile coastal biological communities by strictly limiting or prohibiting discharges of point source waste and requiring non-point source pollution to be controlled to the "extent practicable" before it reaches an Area of Special Biological Significance to preserve natural water quality conditions. According to the map provided by the State Water Resources Control Board (SWRCB 2011b), there are no Areas of Special Biological Significance sites within the project limits.

4. ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

Construction and operation of the NCC has the potential to affect water quality. Best management practices would be evaluated and implemented to address potential impacts during the construction and operational phases. A discussion regarding the potential impacts to water quality, along with the implementation of temporary (i.e., construction phase) and project design features, such as permanent (post construction) best management practices, is provided in the following sections.

4.2 Potential Impacts to Water Quality

4.2.1 Anticipated changes to the Physical/Chemical Characteristics of the Aquatic Environment

4.2.1.1 Substrate

Sediment along the bottoms of the canals, ditches, ponds, marshes, and wetlands is a natural substrate that accumulates as a consequence of erosion and agricultural surface water runoff in the project area. With the implementation of appropriate BMP's during construction as outlined in the SWPPP (see page 73 for SWPPP discussion), in addition to permanent erosion control measures to stabilize fill slopes, the proposed project is not anticipated to alter the existing substrates nor increase the amounts of sediment within the water features adjacent to the project.

4.2.1.2 Currents, Circulation or Drainage Patterns

The proposed project maintains the existing drainage patterns using culverts to convey run-off from off-site areas across the proposed roadway. However, surface flows will be reduced due to the proposed roadway runoff being routed to roadside longitudinal ditches and basins rather than discharged to existing surface waters. In situations where the proposed project will encroach onto currently cultivated and graded parcels, drainage patterns will be restored.

4.2.1.3 Suspended Particulates (Turbidity)

As a result of constructing and maintaining the proposed project, sediment is likely to occur, particularly while the project is constructed. The turbidity in canals and ditches may increase temporarily due to roadway construction and the in-channel work constructing the hydraulic facilities to convey water underneath the proposed roadway. Turbidity in ponds, seasonal wetlands, irrigated wetlands, and perennial marshes may increase due to embankment construction when fill is placed in or near the affected water bodies.

The suspended solids, dissolved solids, and organic pollutants in all surface water bodies could also increase while nearby soils are disturbed and dust is generated. These conditions would likely persist until completion of construction activities and long-term erosion control measures have been implemented.

Water Quality measures listed in Section 5.1 are recommended for inclusion on applicable plans prepared for the project. All BMP's and other measures should be prepared in consultation with the project engineer, Caltrans, the RWQCB, and other regulatory agencies.

4.2.1.4 Oil, Grease and Chemical Pollutants

Runoff generated from the increased impervious surface due to the widening of the travel way and construction of new roadway will be captured and contained in roadside longitudinal ditches and basins and thus, will not impair adjacent water bodies. However, accidental spills of petroleum hydrocarbons (fuels and lubricating oils), sanitary wastes, and or concrete waste are a concern during construction activities. In addition, disturbed soil areas in agricultural areas may cause elevated levels of pesticide pollutants during construction in surface runoff captured by downstream drainage ditches.

4.2.1.5 Erosion and Accretion Patterns

It is not anticipated that the project will cause a change to the erosion and accretion patterns because the proposed project anticipates maintaining the existing drainage patterns. The proposed slopes will be stabilized with appropriate temporary and permanent BMPs. In general, the roadway slopes will be 4H:1V.

4.2.1.6 Aquifer Recharge/Groundwater

No changes to aquifer recharge or groundwater levels are anticipated as a result of the project. During construction, it is anticipated that water needs will be met using water trucks and not groundwater resources.

4.2.2 Anticipated Changes to the Biological Characteristics of the Aquatic Environment

4.2.2.1 Special aquatic sites

As stated previously in Section 3.2.5, the seasonal wetlands identified within the project area are special aquatic sites and are considered suitable habitat for aquatic organisms and wildlife species. Table 10 below summarizes impacts to wetlands for each alternative.

Table 10: Summary of Permanent Impacts to Wetlands (acres)

	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 2B
Wetland Impacts	3.02	3.22	3.00	3.37

During construction of the proposed project, the anticipated permanent changes to the special aquatic sites include the placement of fill material, the disturbance and/or removal of existing vegetation, and encroachment. The temporary changes during construction may include limited to minimal encroachment. Dewatering may occur if water is present during construction of project. After the proposed project is constructed, the increase in impervious surface will cause an increase in storm water discharge which will be contained in basins and will not impact the wetlands adjacent to the project.

4.2.2.2 Habitat for Fish and Other Aquatic Organisms

As stated in Section 3.2.5, the project area contains some seasonal wetlands that can also be characterized as shallow vernal pools and are characteristic of vernal pool invertebrate habitat.

Table 11 below summarizes impacts to habitat for vernal pool invertebrate habitat for Alternative 1B and 2B. No vernal pool habitat will be impacted if either alternative 1A or 2A is selected.

Table 11: Summary of Direct Impacts to Vernal Pool Invertebrates Habitat (acres)

	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 2B
Vernal Pool Invertebrate Habitat Direct Impacts	0.0	0.07	0.0	0.04

4.2.2.3 Wildlife Habitat

Temporary impacts to habitat may include dewatering if water is present during construction of project. Permanent impacts of habitats are listed below for each species.

Pond Turtle

The Pacific pond turtle is a highly aquatic species, found in ponds, marshes, rivers, streams, and irrigation ditches that typically have rocky or muddy bottoms and support aquatic vegetation. Impacts to Pacific pond turtle aquatic habitat (some ponds) would range from 0.29 acres of direct impacts if Alternative 2A is selected to 0.86 acres of direct impacts if Alternative 1B is selected.

Western Spadefoot Toad

Similar to vernal pool invertebrates habitat, vernal pools are characteristic of western spadefoot toad habitat and as such, the impacts are the same as shown in Table 9. No vernal pool habitat will be impacted if either alternative 1A or 2A is selected.

4.2.2.4 Endangered or Threatened Species

California Tiger Salamander

California Tiger Salamander is both State and federally listed as a threatened species.

Depressional aquatic features in the project area that support seasonal inundation including seasonal wetlands, ponds, and basins provide potential aquatic habitat for California Tiger Salamander. Impacts to California Tiger Salamander aquatic habitat for each alternative are summarized in Table 12 below.

Table 12: Summary of Direct Impacts to California Tiger Salamander Habitat (acres)

	Alternative 1A	Alternative 1B	Alternative 2A	Alternative 2B
Aquatic Habitat Impacts	2.69	3.51	3.36	6.69

4.2.3 Anticipated Changes to the Human Use Characteristics of the Aquatic Environment

4.2.3.1 Existing and Potential Water Supplies; Water Conservation

Throughout the project area, domestic wells are used to supply drinking water. The proposed project being a transportation project will not directly result in an increase of need for drinking water and thus, no impact to water supplies is anticipated. Irrigation water provided by the OID and MID for agricultural purposes may be temporarily impacted during construction when new

structures are built to accommodate the roadway. However, full functionality will be restored once construction is complete and no permanent impacts are anticipated.

4.2.3.2 Parks, National and Historic Monuments, National Seashores, Wild and Scenic Rivers, Wilderness Areas, etc.

No parks, national monuments, historic monuments, national seashores, wild and scenic rivers, or wilderness areas will be impacted by the proposed project.

4.2.3.3 Traffic/Transportation Patterns

Automobile traffic that utilizes the existing roadway over locations of canals and ditches may be impacted during construction when hydraulic structures (headwalls, bridges, culverts) are installed as a result of the roadway widening. However, it is anticipated that traffic staging will be employed during construction of these facilities and impacts will be minimal. After construction of the proposed project, it is not anticipated that traffic and transportation patterns will be impacted.

4.2.3.4 Energy Consumption of Generation

No energy consumption or generation uses in the aquatic environment will be impacted by the proposed project during construction or post-construction operation.

4.2.3.5 Navigation

None of the waterbodies within the proposed project are considered navigable. No changes to navigation are anticipated because of construction or long-term operation of the proposed project.

4.2.3.6 Safety

It is not anticipated that the proposed project may cause changes to human safety within the aquatic environment during construction or post-construction.

4.2.4 Short Term Impacts During Construction

4.2.4.1 Physical/Chemical Characteristics of the Aquatic Environment

The activities associated with constructing the components of either Alternative 1A, 1B, 2A, or 2B may include grading, demolition of existing facilities, excavation, concrete and/or asphalt applications, and installation of new facilities. Construction activities such as grading, the demolition of existing facilities, and excavation, could be sources of sediment and may impact adjacent seasonal wetlands or perennial marshes. When sediment enters a receiving water body, it can increase turbidity, smother bottom dwelling organisms, and suppress aquatic vegetation growth. In addition to being a source of sediment, the demolition of existing facilities could be a source of solid waste/trash. When new structures are installed, such as overcrossings, bridges, or headwalls, concrete and/or asphalt applications could be a source of fine sediment, metals, and chemicals that could raise pH levels in adjacent seasonal wetlands or perennial marshes. In order to perform the grading and necessary earthwork, equipment will be used that could be a source of petroleum products and heavy metals if the equipment engines leak. Temporary or portable sanitary facilities may be provided which could be a source of sanitary waste.

Under the Construction General Permit, the proposed project is required to prepare a SWPPP and implement erosion and sediment control BMPs detailed in the SWPPP to be implemented during construction. Construction BMPs will be properly designed, implemented, and maintained, as presented in the Avoidance and Minimization Measures in Section 5, this would minimize/avoid potential effect that may during construction of the proposed project.

4.2.4.2 Biological Characteristics of the Aquatic Environment

The anticipated temporary impacts to the biological characteristics of the aquatic environment include the following:

- Disturbance and encroachment into aquatic habitats such as seasonal wetlands, ponds, and perennial marshes.
- Potential dewatering of aquatic habitats.

4.2.4.3 Human Use Characteristics of the Aquatic Environment

The anticipated temporary impacts to the human use characteristics of the aquatic environment include the following:

- Irrigation water service in canals may be interrupted temporarily during construction of hydraulic facilities (bridges, headwalls, culverts).
- Traffic and transportation patterns for vehicles may be impacted during construction.

4.2.5 Long-Term Impacts During Operation and Maintenance

4.2.5.1 Physical/Chemical Characteristics of the Aquatic Environment

The anticipated long-term impacts to the physical/chemical characteristics of the aquatic environment include the following:

- Potential existence of aquatic organisms and wildlife habitats may be impacted with the reconstruction of the remnants of seasonal wetlands, marshes and ponds.
- Drainage patterns on irrigated parcels being altered to restore agricultural integrity.

4.2.5.2 Biological Characteristics of the Aquatic Environment

The anticipated long-term impacts to the biological characteristics of the aquatic environment include the following:

- Placement of fill material, the disturbance and/or removal of existing vegetation, encroachment in special aquatic sites.
- Wildlife habitat will be impacted through the disturbance and/or removal of existing vegetation (including complete removal and encroachment).

4.2.5.3 Human Use Characteristics of the Aquatic Environment

No long-term impacts to the human use characteristics of the aquatic environment are anticipated.

4.3 Impact Assessment Methodology

The proposed project's alternatives were assessed for their potential impacts to the physical/chemical, biological and human use characteristics in the aquatic environment during construction (short-term) and operation and maintenance (long-term). Alternatives 1A, 1B, 2A, and 2B are essentially the same, and include elevated roadways, separated grade crossings, single point urban interchanges, bridge structures or headwalls at various waterway crossings, and culverts. Table 13 and Table 14 summarize the construction, and operation and maintenance activities that were evaluated for their potential impact on aquatic sites for all alternatives. No unique impacts were identified for any of the alternatives.

Table 13: Summary of Construction (Short-Term) Impacts to the Aquatic Environment

Summary of Impacts
Physical/Chemical Characteristics
• Grading, the demolition of existing facilities, and excavation, could be sources of sediment.
• Demolition of existing facilities could be a source of solid waste/trash.
• Installation of new structures, concrete and/or asphalt applications could be a source of fine sediment, metals, and chemicals.
• Construction equipment engines could be a source of petroleum products and heavy metals.
• Temporary or portable sanitary facilities could be a source of sanitary waste.
Biological Characteristics
• Disturbance and encroachment into aquatic habitats such as seasonal wetlands, ponds, and perennial marshes.
• Potential dewatering of aquatic habitats.
Human Use Characteristics
• Irrigation water service in canals may be interrupted during construction of hydraulic facilities (bridges, headwalls, culverts).
• Traffic and transportation patterns for vehicles may be impacted during construction.

Table 14: Summary of Operation and Maintenance (Long-Term) Impacts to the Aquatic Environment

Summary of Impacts
Physical/Chemical Characteristics
• Potential existence of aquatic organisms and wildlife habitats may be impacted with the reconstruction of the remnants of seasonal wetlands, marshes and ponds.
• Drainage patterns on irrigated parcels being altered to restore agricultural integrity.
Biological Characteristics
• Placement of fill material, the disturbance and/or removal of existing vegetation, encroachment in special aquatic sites.
• Wildlife habitat will be impacted through the disturbance and/or removal of existing vegetation (including complete removal and encroachment).
Human Use Characteristics
• None

The identified construction (short-term) impacts must be addressed in the SWPPP prepared for the proposed project to meet the CGP requirements. Moreover, the temporary erosion and sediment control BMPs detailed in the SWPPP must be implemented during construction per the Caltrans *Storm Water Quality Handbooks: Construction Site Best Management Practices (BMPs) Manual* (March 2003). Construction BMPs will be properly designed, implemented, and maintained, as presented in the Avoidance and Minimization Measures in Section 5, this would minimize/avoid potential effect that may during construction of the proposed project.

Because the proposed project consists of new roadway area, it would result in a permanent increase of impervious surfaces and a permanent increase in runoff and pollutant loading. However, project design implements basins to contain all on-site runoff thus, treatment facilities have not been incorporated into the project.

Regulatory permits under the California Department of Fish and Wildlife Code and the Clean Water Act would be obtained and any further avoidance or minimization measures would be coordinated with the issuing agencies. The proposed project would have permanent and temporary impacts to both waters of the US and state including wetlands, canals, and riparian communities, therefore the following permits would be necessary. The proposed project would require a Section 1602 Streambed Alteration Agreement issued by the California Department of Fish and Wildlife for impacts to waters of the state including riparian communities. A Water Quality Certification (Section 401) and NPDES 402 Permit would be acquired prior to construction. If impacts to waters of the US exceed ½ acre an Individual Permit (Section 404) would be obtained from USACE, if impacts are less than ½ acre a Nationwide Permit for Waters of the U.S. (Section 404) would be acquired prior to construction in compliance with the Clean Water Act. Adherence to the requirements set forth in the permit would also minimize impacts to water quality and aquatic resources.

4.4 Alternative-Specific Impact Analysis

All of the alternatives contain very similar elements and although there may be slight differences in impervious areas, treatment facilities are not being incorporated into the project because the project design will be incorporating basins to contain all on-site runoff. Differences in alternatives are evident in the impacts to aquatic sites as discussed in Section 4.2.2. The temporary impacts during construction and long-term impacts during operation and maintenance previously identified are the same for both alternatives.

4.5 Cumulative Impacts

Although the NCC project adds impervious surface throughout the watershed area, all the on-site runoff is going to be contained within the project area. The project would have 100% containment of all on-site water. Therefore, it is not expected that the NCC project will substantially contribute to cumulative effects to water quality.

5. AVOIDANCE AND MINIMIZATION MEASURES

The project will incorporate the following avoidance and minimization measures.

5.1 Applicable Best Management Practices

Best Management Practices will be incorporated into project design and project management to minimize impacts on the environment including the release of pollutants (oils, fuels, etc.)**:**

WQ-1: The area of construction and disturbance would be limited to as small an area as feasible to reduce erosion and sedimentation.

WQ-2: Measures would be implemented during land-disturbing activities to reduce erosion and sedimentation. These measures may include mulches, soil binders and erosion control blankets, silt fencing, fiber rolls, temporary berms, sediment desilting basins, sediment traps, and check dams.

WQ-3: Existing vegetation would be protected where feasible to reduce erosion and sedimentation.

WQ-4: Vegetation would be preserved by installing temporary fencing, or other protection devices, around areas to be protected.

WQ-5: Exposed soils would be covered by loose bulk materials or other materials to reduce erosion and runoff during rainfall events.

WQ-6: Exposed soils would be stabilized, through watering or other measures, to prevent the movement of dust at the project site caused by wind and construction activities such as traffic and grading activities.

WQ-7: All construction roadway areas would be properly protected to prevent excess erosion, sedimentation, and water pollution.

WQ-8: All vehicle and equipment maintenance procedures would be conducted in an approved location. In the event of an emergency, maintenance would occur away from aquatic resources.

WQ-9: All concrete curing activities would be conducted to minimize spray drift and prevent curing compounds from entering the waterway directly or indirectly.

WQ-10: All construction materials, vehicles, stockpiles, and staging areas would be situated outside of the existing/constructed flow lines as feasible. All stockpiles would be covered, as feasible.

WQ-11: Energy dissipaters and erosion control pads would be provided at the bottom of slope drains.

WQ-12: Other flow conveyance control mechanisms may include earth dikes, swales, or ditches. All erosion control measures and storm water control measures would be properly maintained until the site has returned to a pre-construction state.

WQ-13: All disturbed areas would be restored to pre-construction contours and revegetated, either through hydroseeding or other means, with native exotic species.

WQ-14: All construction materials would be hauled off-site after completion of construction.

5.2 Permits

WQ-15: The proposed project would require a Section 1602 Streambed Alteration Agreement through the California Department of Fish and Wildlife.

WQ-16: The proposed project would require a Water Quality Certification (401) and if impacts to waters of the US exceed one acre an Individual Permit (Section 404) would be obtained from USACE, if impacts are less than one acre a Nationwide Permit for Waters of the U.S. (Section 404) would be acquired prior to construction in compliance with the Clean Water Act.

WQ-17: The proposed project would require a NPDES General Construction Permit for Discharges of storm water associated with construction activities (Construction General Permit 09-2009-DWQ). A SWPPP would also be developed and implemented as part of the Construction General Permit.

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