

Oct. 4, 2017

The Arizona Department of Transportation welcomes your review of and input about this Environmental Assessment. ADOT is providing a 30-day public review process in accordance with the National Environmental Policy Act (NEPA), beginning Oct. 4, 2017 and closing on December 14, 2017. Note - the comment period was extended due to the date of Public Hearing scheduled on November 29, 2017.

Oral translation of this document, in part or in full, is available at no cost during the 30-day timeframe noted above. For assistance, please contact Michele E. Beggs at 928.681.6054 or email mbeggs@azdot.gov.

4 de Octubre de 2017

El Departamento de Transporte de Arizona agradece que revise esta Evaluación Ambiental y aporte sus comentarios. De acuerdo a la ley de Política Ambiental Nacional (NEPA), ADOT está proporcionando un proceso de revisión pública de 30 días iniciando el 4 de Octubre de 2017 y terminando el 14 de Diciembre de 2017.

La traducción oral de este documento, en parte o en su totalidad, está disponible sin costo durante el plazo de 30 días antes mencionado. Para obtener ayuda, comuníquese con Michele E. Beggs al 928.681.6054 o envíe un correo electrónico a mbeggs@azdot.gov.

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Draft Environmental Assessment

Volume I

Virgin River Bridge No. 1 (STR # 1089)

015-A(216)S

015 MO 008 H8760 01C

October 2017



Photo by Scott Williams, ADOT Northcentral District



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Draft Environmental Assessment
for
Virgin River Bridge #1 (STR #1089)

015-A(216)S
015 MO 008 H8760 01C

Prepared for:
Arizona Department of Transportation
&
Federal Highway Administration



October 2017

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ARIZONA DEPARTMENT OF TRANSPORTATION

Infrastructure Delivery and Operations Division

Environmental Planning

1611 West Jackson Street

Phoenix, Arizona 85007

Draft Environmental Assessment

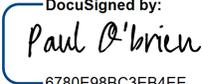
Virgin River Bridge #1 (STR #1089)

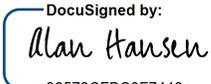
Mohave County, Arizona

Federal No. 015-A(216)S

ADOT Project No. 015 MO 008 H8760 01C

October 2017

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Arizona Department of Transportation

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Karla S. Petty
Arizona Division Administrator
Federal Highway Administration

This environmental assessment has been prepared in accordance with provisions and requirements of Title 23 Code of Federal Regulations Part 771, relating to the implementation of the National Environmental Policy Act of 1969.

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Environmental Planning

1611 West Jackson Street

Phoenix, Arizona 85007

**Draft Environmental Assessment
Virgin River Bridge #1 (STR #1089)
Mohave County, Arizona**

Federal No. 015-A(216)S

ADOT Project No. 015 MO 008 H8760 01C

October 2017

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Arizona Division Administrator
Federal Highway Administration

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List of Acronyms

AASHTO	American Association of State Highway and Transportation Officials
ACEC	area of critical environmental concern
ACHP	Advisory Council on Historic Preservation
ACS	Archaeological Consulting Services
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADT	average daily traffic
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
AMC	Arada fine sand
APE	area of potential effects
ASM	Arizona State Museum
ASTM	American Society for Testing and Materials
AWLW	Arizona Wildlife Linkages Workshop
AZ	Arizona
AZPDES	Arizona Pollutant Discharge Elimination System
BE	Biological Evaluation
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMD	Bard very gravelly fine sandy loam
BMP	best management practice
BO	Biological Opinion
Bridge No. 1	Virgin River Bridge No. 1
CAA	Clean Air Act of 1970
CANAMEX	Canada to Mexico
CDP	Census Designated Places
census	United States Census Bureau
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CH ₄	methane
CO	carbon monoxide
CO ₂	carbon dioxide

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Corps	United States Army Corps of Engineers
CR	County Road
CWA	Clean Water Act of 1972
dB	decibel
dba	A-weighted decibel
Department	Arizona Department of Transportation
EA	Environmental Assessment
Engineer	Arizona Department of Transportation Northcentral District Engineer
EPA	United States Environmental Protection Agency
ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act of 1973
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FY	fiscal year
HDMS	Heritage Data Management System
HED	Highway Easement Deed
I-15	Interstate 15
ISA	initial site assessment
JD	jurisdictional delineation
KOP	key observation points
L_{aeq1h}	one-hour a-weighted energy equivalent sound level
LEDPA	Least Environmentally Damaging Practicable Alternative
LEIS	Legislative Environmental Impact Statement
LOS	level of service
MAP-21	Moving Ahead for Progress in the 21st Century Act
MBTA	Migratory Bird Treaty Act of 1918
Mesquite	City of Mesquite, Nevada
MP	milepost
mph	miles per hour
MSA	Metropolitan Statistical Area
MSAT	Mobile Source Air Toxics
N/A	not applicable

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N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NAFTA	North American Free Trade Agreement
NE	northeast
NEPA	National Environmental Policy Act of 1969
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act of 1966
NI	not impacted/affected
NO ₂	nitrogen dioxide
NO _x	nitrogen oxide
NP	not present
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory
NS	no standard
NV	Nevada
O ₃	ozone
P.L.	Public Law
PA	Programmatic Agreement
Pb	lead
PISA	preliminary initial site assessment
PM ₁₀	particulate matter less than or equal to 10 microns in diameter
PM _{2.5}	particulate matter less than or equal to 2.5 microns in diameter
PMDR	Plateau Mountain Desert Research
ppm	parts per million
Qd	dune sand and sheet deposits
Qgo	older alluvial terrace deposits
Qgy	young alluvial deposits
Qs	stream channel deposits
Qtt	travertine deposits
RE	Riverwash
RMP	Resource Management Plan

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RMZ	recreation management zones
ROW	right-of-way
RV	recreational vehicle
SE	southeast
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO ₂	sulfur dioxide
SR	State Route
St. George	City of St. George, Utah
STIP	State Transportation Improvement Program
SW	southwest
SWPPP	Storm Water Pollution Prevention Plan
TCE	Temporary Construction Easement
TI	Traffic Interchange
Tmc	Muddy Creek formations
TnA	Toquop fine sand
U.S.	United States
U.S.C.	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UT	Utah
Vd	Vinton fine sandy loam
VMT	vehicle miles traveled
VOC	volatile organic compounds
vpd	vehicles per day
VRM	visual resource management
W	Water
Waters	Waters of the United States
µg/m ³	micrograms per cubic meter
°F	degrees Fahrenheit

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Mitigation Measures

The following mitigation measures and commitments are not subject to change without the prior written approval of the Federal Highway Administration.

Design Responsibilities

1. Prior to commencement of ground-disturbing or clearing activities, the Arizona Department of Transportation Engineer, Environmental Engineering Specialist, the contractor, the Environmental Planning representative, and the Bureau of Land Management Authorized Officer (435.688.3323) or his/her designee would walk the site and agree on the designated project area (refer to pages 112).
2. Prior to commencement of ground-disturbing or clearing activities, the Arizona Department of Transportation Engineer would ensure that the designated project area has been clearly marked. The contractor would not conduct any activities outside of the designated project area without the approval of the Arizona Department of Transportation Engineer and Environmental Planning (refer to page 112, 182, and 189).
3. During final design, Bureau of Land Management would be provided an opportunity to review the plans and materials to be used to verify they are consistent with the visual requirements for the corridor (refer to page 113).
4. During final design, the Mohave County Flood Control District floodplain manager (928.757.0925) would be provided an opportunity to review and comment on the design plans (refer to page 127).
5. The Arizona Department of Transportation would prepare and submit an application to the United States Army Corps of Engineers for a Clean Water Act Section 404 permit for the project (refer to page 136).

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6. No work would occur within jurisdictional Waters of the United States until the appropriate Clean Water Act Section 404 permit and Section 401 Water Quality Certification are obtained. The permits would be obtained during final design (refer to page 136).
7. All disturbed soils outside the active stream channel that would not be landscaped or otherwise permanently stabilized by construction would be seeded using an approved seed mix developed for this project (refer to page 136).

Roadside Development Responsibility

8. Protected native plants within the project limits would be impacted by this project; therefore, the Arizona Department of Transportation Roadside Development Section would determine if Arizona Department of Agriculture notification is needed. If notification is needed, the Arizona Department of Transportation Roadside Development Section would send the notification at least 60 calendar days prior to the start of geotechnical or project construction activities (refer to page 163).

Northcentral District Responsibilities

9. The Arizona Department of Transportation would place variable message signs on northbound I-15 before the Pioneer/Sandhill Boulevard exit and before the Beaver Dam/Littlefield exit, and on southbound I-15 before the Black Rock Road exit and before the Cedar Pocket exit. The signs would warn motorists of anticipated construction delays and other messages as required. (refer to page 68).

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10. Any surface or sub-surface archaeological, historical, or paleontological remains discovered on Bureau of Land Management land during preparation or actual work would be left intact. All work in the area would stop immediately and the Bureau of Land Management Authorized Officer (435.688.3323) would be notified. Commencement of work would be allowed upon clearance by the Bureau of Land Management Authorized Officer in consultation with the BLM Arizona Strip Field Office Archaeologist (refer to page 75).

11. If, in connection with this work, any human remains, funerary objects, sacred objects, or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (Public Law 101-601; 104 Statute 3048; 25 United States Code 3001) are discovered, the contractor would do the following immediately: 1) stop operations in the area of the discovery, 2) protect the remains and objects, and 3) notify the Bureau of Land Management Authorized Officer (435.688.3323). The contractor would continue to protect the area of the discovery until notified by the Bureau of Land Management Authorized Officer that operations may resume (refer to page 75).

12. During final design, the District would coordinate relocation of utilities with the affected utility companies (refer to page 99).

13. If service disruption would be required for utility relocation, the District would coordinate with the utility companies to ensure customers are notified 14 days prior to service disruption (refer to page 99).

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14. Prior to commencement of ground-disturbing or clearing activities, the Arizona Department of Transportation Engineer, Environmental Engineering Specialist, the contractor, the Environmental Planning representative, and the Bureau of Land Management Authorized Officer (435.688.3323) or his/her designee would walk the site and agree on the designated project area (refer to pages 112).
15. Prior to commencement of ground-disturbing or clearing activities, the Arizona Department of Transportation Engineer would ensure that the designated project area has been clearly marked. The contractor would not conduct any activities outside of the designated project area without the approval of the Arizona Department of Transportation Engineer and the Environmental Planning representative (refer to pages 112, 182, and 189).
16. No work would occur within jurisdictional Waters of the United States until the appropriate Clean Water Act Section 404 permit and Section 401 Water Quality Certification are obtained. The permits would be obtained during final design (refer to page 136).
17. The Arizona Department of Transportation would arrange for preconstruction environmental awareness training for all Arizona Department of Transportation and contractor personnel working in the project area. The training would include information on wetlands, Virgin River chub, woundfin, Virgin spinedace, southwestern willow flycatcher, Yuma clapper rail, yellow-billed cuckoo, California condor, and Mojave desert tortoise (refer to page 159).

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18. At least 30 business days prior to project construction, the Arizona Department of Transportation Engineer would contact the Environmental Planning Biologist (602.712.6819 or 602.712.7767) to arrange for a qualified biologist to conduct a visual preconstruction survey of the underside of the bridge to look for bats potentially roosting on the bridge structure. The biologist would provide a memo with results of the preconstruction survey, and a follow-up memo(s) after any additional surveys/monitoring required, to the Environmental Planning Biologist (refer to page 162).
19. If bats are found present roosting under the bridge, at least 15 business days prior to project construction, the Arizona Department of Transportation Engineer would contact the Environmental Planning Biologist (602.712.6819 or 602.712.7767) to arrange for a qualified biologist to assist the contractor with installing exclusionary measures to crevices and other areas beneath Virgin River Bridge No. 1 that could potentially be used by bats. Exclusionary measures must be kept in place and in proper working order until work is completed on the bridge (refer to page 163).
20. No striping obliteration, milling activities, striping removal, cattle guard work, or bridge work would occur until the Lead-Based Paint Removal and Abatement Plan is approved by the Arizona Department of Transportation Environmental Planning hazardous materials coordinator and implemented (refer to page 194).
21. The Engineer, in association with the contractor, would complete the National Emission Standard for Hazardous Air Pollutants documentation and submit it to the Arizona Department of Transportation Environmental Planning hazardous materials coordinator (602.920.3882 or 602.712.7767) for review 5 (five) working days prior to being submitted to the regulatory agency (refer to page 195).

*Virgin River Bridge #1 (STR #1089)***Communications Section Responsibilities**

22. The Arizona Department of Transportation Communications Section would communicate traffic control measures with the public, local officials, Mohave County, the Nevada and Utah departments of transportation, and the media prior to and during construction activities. Communication may include, but would not be limited to, media alerts, direct mailings to area businesses and property owners, information on freeway variable message signs, and paid newspaper notices (refer to page 67).
23. The Arizona Department of Transportation Communications Section would maintain the project website throughout construction to include project updates and lane closure information (refer to page 67).
24. The Arizona Department of Transportation Communications Section would contact local emergency services (i.e., hospital, fire, and police) at least 14 calendar days in advance of lane closures so that they can arrange for alternate travel routes (refer to page 68).
25. The Arizona Department of Transportation Communications Section would provide a translation of project information to any person requesting assistance. Assistance can be obtained by contacting the Communications Section at 928.681.6054 (refer to page 68).

Contractor Responsibilities

26. The contractor would maintain all right-of-way or easement fencing throughout construction. If any existing right-of-way or easement fencing must be removed during construction, the contractor would install temporary fencing to prevent livestock from entering the highway right-of-way or easement area (refer to page 47 and 53).

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27. Within 48 hours prior to the start of construction, the contractor would obtain current fire restriction information from the Bureau of Land Management Arizona Strip District Office (435.688.3200) and would follow standard fire prevention methods throughout construction (refer to page 47).
28. At least 60 calendar days prior to construction, the contractor would notify river runners and the boating public of any temporary closure in the vicinity of Bridge No. 1 at I-15 milepost 9.15 by contacting the Bureau of Land Management Arizona Strip Field Office (435.688.3200), the Virgin River Program (435.673.3617), the Virgin River Runners Coalition (www.virginriver.org), the St. George Public Information Office (435.627.4005), and the Mesquite Public Information Office (702.346.5295, ext. 2100) (refer to page 53).
29. At least 30 calendar days prior to construction, the contractor would provide river closure information and post river closure information or temporary signs in the following locations:
- On the information kiosk at Bloomington Park, 760 Man of War Road, adjacent to the Man of War Bridge in St. George, Utah;
 - On Virgin River Bridge No. 2 at Interstate 15 milepost 13.2 visible to river users; and
 - On the information kiosks at the Virgin River Canyon Recreation Area (refer to page 53).
30. The contractor would provide lane closure information to the Arizona Department of Transportation Communications Section at least 21 calendar days in advance of lane closures (refer to page 68).

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31. Any surface or sub-surface archaeological, historical, or paleontological remains discovered on Bureau of Land Management land during preparation or actual work would be left intact. All work in the area would stop immediately and the Bureau of Land Management Authorized Officer (435.688.3323) would be notified. Commencement of work would be allowed upon clearance by the Bureau of Land Management Authorized Officer in consultation with the BLM Arizona Strip Field Office Archaeologist (refer to page 75).
32. If, in connection with this work, any human remains, funerary objects, sacred objects, or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (Public Law 101-601; 104 Statute 3048; 25 United States Code 3001) are discovered, the contractor would do the following immediately: 1) stop operations in the area of the discovery, 2) protect the remains and objects, and 3) notify the Bureau of Land Management Authorized Officer (435.688.3323). The contractor would continue to protect the area of the discovery until notified by the Bureau of Land Management Authorized Officer that operations may resume (refer to page 75).
33. The contractor would contact the Arizona Department of Transportation Historic Preservation Team (602.712.8636 or 602.712.7767) at least 10 (ten) business days prior to the start of ground-disturbing activities to arrange for a qualified archaeologist to flag avoidance areas (refer to page 75).
34. The contractor would avoid all flagged and/or otherwise designated sensitive resource areas within or adjacent to the project area (refer to page 76).
35. All project-related activities on County Road 91 would be limited to the road prism (refer to page 76).

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36. In order to minimize emissions generated by traffic during construction, traffic disruption would be limited, especially during peak travel periods (refer to page 92).
37. The contractor would comply with all state and local air quality and dust control rules, regulations and ordinances which apply to any work performed pursuant to the contract (refer to page 92).
38. The contractor would ensure all exhaust systems on equipment would be in good working order. Properly designed engine enclosures and intake silencers would be used where appropriate (refer to page 97).
39. Prior to commencement of ground-disturbing or clearing activities, the Arizona Department of Transportation Engineer, Environmental Engineering Specialist, the contractor, the Environmental Planning representative, and the Bureau of Land Management Authorized Officer (435.688.3323) or his/her designee would walk the site and agree on the designated project area (refer to page 112).
40. Prior to commencement of ground-disturbing or clearing activities, the Arizona Department of Transportation Engineer would ensure that the designated project area has been clearly marked. The contractor would not conduct any activities outside of the designated project area without the approval of the Arizona Department of Transportation Engineer and the Environmental Planning (refer to pages 112, 182, and 189).
41. No blasting would occur for any portion of the project (refer to pages 112).
42. The contractor would round and blend new slopes to mimic the existing contours and to highlight natural formations (refer to page 112).
43. The contractor would restore disturbed areas to existing elevations, topography, and landforms (refer to page 112).

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44. At the intersections of cuts and natural grades, the contractor would adjust slopes to flow into each other or transition with the natural ground surfaces without noticeable breaks (refer to page 112).
45. All temporary construction fills, including, but not limited to, crane pads, the temporary bridge, and cofferdams would be removed in their entirety and affected areas would be returned to preconstruction elevations (refer to page 112).
46. All unnecessary roads would be reclaimed and closed immediately upon termination of the project. Recontouring all cut slopes to approximately the original contour would be required. Reclaimed roads would be barricaded or signed to protect them, until reclamation is achieved. All existing roads that require upgrading would be reclaimed to their original dimensions upon completion of the project. Exceptions would be approved in writing by the Bureau of Land Management Authorized Officer (refer to page 112).
47. Reclamation of all surface disturbances would be initiated upon completion of activities and the approval of the Bureau of Land Management Arizona Strip Field Office (435.688.3200). Reclamation of disturbed areas would, to the extent practicable, include contouring disturbances to blend with the surrounding terrain, replacement of soil, smoothing and blending the original surface colors to minimize impacts to visual resources, and re-seeding the disturbed areas with an approved seed mix developed for this project (refer to pages 113, 183, and 189).
48. Construction and reclamation activities would be designed to minimize long-term impacts to natural lines, form, textures, and color contrast. Reclamation methods would avoid disturbing more area or exposing greater color contrast than occurred during construction of the project (refer to page 113).

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49. The limits of clearing would be irregular and straight clearing lines would be avoided by varying the width of the area to be cleared or by leaving selected clumps of vegetation near the edge of the clearing limit. Vegetation outside of the specified clearing limits would be preserved and protected (refer to page 113).
50. The contractor would seed areas of cut and fill upon construction completion with an approved seed mix developed for this project (refer to page 114).
51. The contractor would mark the 100-year floodplain with lathes and flagging prior to commencement of any construction or ground-disturbing activities (refer to page 127).
52. Concrete, grout, cement mortar, solid and source site materials, and hazardous materials (including petroleum materials) would be stored in the staging area and outside of the 100-year floodplain. Refueling equipment both in and out of the 100-year floodplain and containment of chemicals and construction materials would be addressed in the Spill Prevention, Containment, and Countermeasures Plan for work and staging areas (refer to page 128).
53. Material would be stored or stockpiled outside of the 100-year floodplain, if possible. Any material stored or stockpiled within the 100-year floodplain would be protected using best management practices to prevent it from entering the flowing river channel (refer to page 128).
54. Excess materials resulting from the construction of the temporary cofferdams, new pier foundations, or drilled shafts would be removed from the 100-year floodplain within 10 calendar days of generation. Any material temporarily stored in the floodplain would be surrounded with best management practice-approved sediment control devices to prevent the material from entering the river channel in the case of rain or high flows (refer to page 128).

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55. All temporary construction, borrow areas, and fills within the 100-year floodplain would be removed in their entirety, and the affected areas would be returned to preconstruction elevations (refer to page 128).
56. No work would occur within jurisdictional Waters of the United States until the appropriate Clean Water Act Section 404 permit and Section 401 Water Quality Certification are obtained. The permits would be obtained during final design (refer to page 136).
57. All disturbed soils outside the active stream channel that would not be landscaped or otherwise permanently stabilized by construction would be seeded using an approved seed mix developed for this project (refer to page 136).
58. Water would not be withdrawn from the Virgin River for construction purposes (refer to page 159).
59. No vegetation clearing would occur during the migratory bird breeding season (March 1-August 31). During the non-breeding season (September 1-February 28) vegetation removal is not subject to this restriction (refer to page 159).
60. Prior to initial ground disturbing construction or geotechnical activities, a biologist holding the proper handling permits from the U.S. Fish and Wildlife Service would conduct a survey for the presence of Mojave desert tortoises or active tortoise burrows (refer to page 159).
61. Construction staging areas would be fenced in accordance with U.S. Fish and Wildlife Service desert tortoise exclusionary fencing protocols. The contractor would inspect and maintain the fencing daily (refer to page 160).

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62. If any Mojave desert tortoises are encountered during construction or geotechnical activities, established protocols, as provided in the environmental training, would be followed to ensure the animal is not touched, harassed or moved. The desert tortoise would be allowed to leave the area on its own or an on-call biologist holding the proper United States Fish and Wildlife Service permits would be called to assess the situation (refer to page 160).
63. Temporary access routes created during project construction would be modified as necessary to prevent further use. Closure of access routes can be achieved by ripping, barricading, posting the route as closed, and/or seeding and planting using an approved mix developed for this project (refer to page 160).
64. After completion of the project, trenches, pits, and other features in which tortoises can be entrapped or entangled, would be filled in, covered, or otherwise modified so they are no longer a hazard to desert tortoises (refer to page 160).
65. After project completion, measures would be taken to facilitate restoration. Restoration techniques would be tailored to the characteristics of the site and the nature of project impacts. Techniques may include removal of equipment and debris, recontouring; and seeding, hydro seeding, planting, transplanting native species. Revegetation would include the planting of nursery stock or tall pot trees or shrubs, and chemical or natural fertilizers may be used during revegetation efforts (refer to page 160).
66. Listed fish species and native frogs would be removed from the project area prior to any in-water work activities. Fish exclusion activities would be performed under the direction of a biologist holding a permit for recovery of Virgin River chub and woundfin and would be relocated per the plan developed in coordination with United States Fish and Wildlife Service and Arizona Game and Fish Department (refer to page 160).

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67. No work would be allowed in flowing surface water unless fish exclusion measures are in place and functioning (refer to page 161).
68. All concrete would be poured in dry conditions or within confined waters not being dewatered into surface waters of the Virgin River. Concrete would be allowed to cure for at least 24 hours before contact with surface water of the Virgin River is allowed (refer to page 161).
69. The contractor would stop work immediately and inform the Engineer if surface flows enter the in-water work area at any time following the initial isolation or diversion activities. The Engineer would arrange for fish and native frog exclusion and relocation per the United States Fish and Wildlife Service-approved plan before allowing work to commence again (refer to page 161).
70. A containment system would be developed to minimize debris and construction materials from inadvertently dropping into the Virgin River or the 100-year flood plain (refer to page 161).
71. Prior to initial ground disturbing, construction or geotechnical activities, a biologist would conduct a survey for the presence of silverleaf sunray plants (refer to page 161).
72. Any silverleaf sunray plants identified in the preconstruction survey would be fenced off and avoided throughout the project duration. During preconstruction surveys, if any silverleaf sunray plants are discovered, ADOT would coordinate with BLM at that time (refer to page 161).
73. The project area would be kept clean and no trash would be stored onsite (refer to page 161).
74. All disturbed soils not paved that would not be landscaped or otherwise permanently stabilized by construction would be seeded using an approved seed mix developed for this project (refer to page 161).
75. Prior to the start of ground-disturbing activities, the contractor would arrange for and perform the control of noxious and invasive species in the project area (refer to page 162).

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76. The contractor would develop a Noxious and Invasive Plant Species Treatment and Control Plan in accordance with the requirements in the contract documents. Plants to be controlled would include those listed in the State and Federal Noxious Weed and the State Invasive Species list in accordance with State and Federal Laws and Executive Orders. The plan and associated treatments would include all areas within the project right of way and easements as shown on the project plans. The treatment and control plan would be submitted to the Engineer for the Arizona Department of Transportation Construction Professional Landscape Architect for review and approval prior to implementation by the contractor (refer to page 162).
77. To prevent the introduction of invasive species seeds, the contractor would wash all earth moving and hauling equipment at the equipment storage facility. The equipment would be free of all attached plant/vegetation and soil/mud debris prior to entering the project area (refer to page 162).
78. To prevent invasive species seeds from leaving the project area, the contractor would inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the project area (refer to page 162).
79. If bats are found present roosting under the bridge, at least 15 business days prior to project construction, the Arizona Department of Transportation Engineer would contact the Environmental Planning Biologist (602.712.6819 or 602.712.7767) to arrange for a qualified biologist to assist the contractor with installing exclusionary measures to crevices and other areas beneath Virgin River Bridge No. 1 that could potentially be used by bats. Exclusionary measures must be kept in place and in proper working order until work is completed on the bridge (refer to page 163).

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80. If bats are found present roosting under the bridge, the contractor, with the assistance of a qualified biologist, would install bat exclusionary measures to crevices and other areas beneath Bridge No. 1 that could potentially be used by bats. Exclusionary measures must be kept in place and in proper working order until work is completed on the bridges (refer to page 163).
81. Following completion of the work on Virgin River Bridge No. 1, the contractor would remove all bat exclusionary measures to the satisfaction of the Arizona Department of Transportation Engineer (refer to page 163).
82. The contractor would not cause injury or death to swallows, including eggs and nestlings, and would avoid work within 100 feet of nesting swallows from February 1 to August 30 of any calendar year. If work would occur within 100 feet of nesting swallows between February 1 and August 30, the contractor would adhere to the following:
- The contractor would completely remove all existing swallow nests within 100 feet of the project area after August 30 but prior to February 1 to prevent swallows from reusing those nests (refer to page 164).
 - The contractor would implement exclusionary measures to prevent swallows from building new nests within 100 feet of the project area. Exclusionary measures would be implemented in all areas where swallows are likely to nest, and may include (a) continually removing nesting materials during early nest construction when eggs or nestlings are not present, (b) installing exclusionary netting (wire or plastic mesh 0.75 inch or less in diameter), (c) installing deterrent spike strips, and/or (d) applying an appropriate bird exclusion liquid or gel (per manufacturer's instructions) (refer to page 164).

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- The contractor would not disturb any active swallow nests (completed or partially completed nests that contain eggs or nestlings). If any active nest is discovered within 100 feet of construction activities, work would stop and the Arizona Department of Transportation Environmental Planning Biologist would be contacted (602.712. 6819 or 602.712.7767) to evaluate the potential for disturbance of nests (refer to page 164).
- The contractor would monitor and maintain the effectiveness of exclusionary measures used. Netting would be maintained such that it remains in place without any loose areas or openings that could trap and/or entangle birds. Spike strips would be maintained such that they remain in place. Exclusion liquid or gel would be reapplied as often as necessary to remain effective (per manufacturer's instructions) (refer to page 164).

83. All surface-disturbing activities on slopes greater than 15 percent would include measures to stabilize soils and control surface water runoff (refer to page 183).

84. For milling activities, the roadway surface preceding the milling machine would be kept sufficiently wet so as to prevent the generation of any visible fugitive dust particles, but not so wet as to cause excess runoff from the roadway surface onto the roadway shoulder (refer to page 193).

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85. An approved contractor would develop and implement a Lead-Based Paint Removal and Abatement Plan for the removal of the lead-based paint, Toxicity Characteristic Leaching Procedure testing of the generated waste stream, and proper disposal of the waste stream derived from the removal of the silver/orange paint on Bridge No. 1, silver/orange cattle guard paint on Anasazi Drive, and orange/white paint on the downdrain on I-15 at approximately milepost 9.70 within the project limits. The contractor would select a lead abatement contractor that meets the qualification requirements specified within the special provisions and as approved by the Engineer. The contractor would follow all applicable federal, state, and local codes and regulations, including Arizona Department of Transportation Standard Specifications for Road and Bridge Construction (2008 Edition), related to the treatment and handling of lead-based paint (refer to page 193).
86. The contractor would submit a Lead-Based Paint Removal and Abatement Plan for the removal of silver/orange paint on Bridge No. 1, silver/orange cattle guard paint on Anasazi Drive, and orange/white paint on the downdrain on I-15 at approximately milepost 9.70 within the project limits to the Engineer and the Arizona Department of Transportation Environmental Planning hazardous materials coordinator (602.920.3882 or 602.712.7767) for review and approval at least 10 (ten) working days prior to striping obliteration, milling activities, striping removal, cattle guard work, or bridge work (refer to page 194).
87. No striping obliteration, milling activities, striping removal, cattle guard work, or bridge work would occur until the Lead-Based Paint Removal and Abatement Plan is approved by the Arizona Department of Transportation Environmental Planning hazardous materials coordinator and implemented (refer to page 194).

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88. Visible fugitive dust emissions from paint removal would be controlled through wet or dry (e.g., vacuum) means during the removal process. If the liquid waste stream generated by a waterblasting obliteration method passes the Toxicity Characteristic Leaching Process analysis, it may be used as a dust palliative or for compaction on the project. If the water is not used on the project, it would be properly disposed of in accordance with all applicable federal, state, and local regulations (refer to page 194).
89. The yellow and white striping paint on I-15 northbound, yellow and white striping paint on Anasazi Drive, and the white striping paint on I-15 southbound contains lead; therefore the contractor would notify their employees prior to any disturbance where lead is present in the paint below the 0.5 percent U.S. Department of Housing and Urban Development/ U.S. Environmental Protection Agency action levels, but above the U.S. Department of Labor Occupational Safety and Health Administration detection level. As part of the notification, the contractor would make the U.S. Department of Labor Occupational Safety and Health Administration publication_number_3142-12R_2004_Lead_in_Construction (<http://www.osha.gov/Publications/osha3142.pdf>) available to workers. (refer to page 194).
90. The contractor would not utilize any abrasive tools or methods for the removal of the cattle guards that would disturb the lead-based paint. This includes, but is not limited to, sawing, grinding, sanding, or heating. Woven straps (not linked chains) may be used to lift the cattle guard grate from the frame (refer to page 195).
91. The contractor cannot start work associated with Virgin River Bridge No. 1 until 10 (ten) working days have passed since the submittal of the National Emission Standard for Hazardous Air Pollutants notification to the regulatory agency (refer to page 195).

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92. The Engineer, in association with the contractor, would complete the National Emission Standard for Hazardous Air Pollutants documentation and submit it to the Arizona Department of Transportation Environmental Planning hazardous materials coordinator (602.920.3882 or 602.712.7767) for review 5 (five) working days prior to being submitted to the regulatory agency (refer to page 195).
93. The contractor would complete a National Emissions Standards for Hazardous Air Pollutants notification for work associated with Virgin River Bridge Number 1 and submit it to the Engineer for review (refer to page 195).
94. After Engineer approval, the notification would be submitted to the Arizona Department of Transportation Environmental Planning hazardous materials coordinator (602.920.3882 or 602.712.7767) for a 5 (five) working-day review and approval. Upon approval by the Arizona Department of Transportation Environmental Planning hazardous materials coordinator, the contractor would file the notification with the Arizona Department of Environmental Quality at least 10 (ten) working days prior to demolition/renovation associated with Virgin River Bridge No. 1 (refer to page 195).

*Virgin River Bridge #1 (STR #1089)***Standard Specifications Included as Mitigation Measures**

95. According to the Arizona Department of Transportation's *Standard Specifications for Road and Bridge Construction*, Section 107 Legal Relations and Responsibility to Public, Subsection 05 Archaeological Features, "When archaeological, historical or paleontological features are encountered or discovered during any activity related to the construction of the project, the contractor shall stop work immediately at that location and shall take all reasonable steps to secure the preservation of those features and notify the Engineer. The Engineer will direct how to protect the features. The contractor shall not resume work until it is so directed by the Engineer" (ADOT 2008). The Arizona Department of Transportation Engineer would, in turn, notify both the Bureau of Land Management Archaeologist at 435.688.3262 and the Arizona Department of Transportation Environmental Planning Group, Historic Preservation Team, at 602.712.8636 or 602.712.7767 immediately, to make arrangements for proper treatment of those resources (refer to page 76).
96. According to the Arizona Department of Transportation's *Standard Specifications for Road and Bridge Construction*, Section 107 Legal Relations and Responsibility to Public, Subsection 07 Sanitary, Health, and Safety Provisions, "During construction operations, should material be encountered which the contractor believes to be hazardous or contaminated, the contractor would immediately do the following: (1) stop work and remove all workers within the contaminated areas, (2) barricade the area and provide traffic control, if necessary, to prohibit unauthorized entry, and (3) notify the Engineer" (ADOT 2008). The Arizona Department of Transportation Engineer would arrange for proper assessment, treatment, or disposal of those materials. Such locations would be investigated and proper action implemented prior to the continuation of work in that location (refer to page 196).

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1 Introduction

1.1 Explanation of an Environmental Assessment

This Draft Environmental Assessment (EA) for the Virgin River Bridge Number 1 (Bridge No. 1) was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) with the Federal Highway Administration (FHWA) acting as the lead federal agency. The Arizona Department of Transportation (ADOT) participated with FHWA as a joint lead agency in the planning, preparation, and review of all technical and environmental documents. For the preparation of the EA, the Bureau of Land Management (BLM) and the National Park Service (NPS) each accepted FHWA's invitation to be a cooperating agency. BLM's Arizona Strip Field Office is the underlying land manager of the Interstate 15 (I-15) corridor throughout much of Arizona, including a portion of the study area. NPS administers the Nationwide Rivers Inventory (NRI), which includes the Virgin River, and is intended to help protect the "outstandingly remarkable" natural and cultural values of free-flowing rivers. However, BLM – not NPS – has the decision-making authority over this portion of the Virgin River.

According to Council on Environmental Quality (CEQ) regulation (40 Code of Federal Regulations [CFR] 1508.9), the basic function of an EA is to describe the need for a proposed action, the alternatives for implementing or constructing a proposed action, and the environmental impacts of a proposed action and its alternatives. The EA also provides a listing of agencies and persons consulted. This document serves as a tool for FHWA and ADOT in the identification of potentially significant impacts to social, economic, and environmental resources, in addition to identifying measures that can mitigate these impacts.

The goal of the Draft EA is to assist decision makers in reaching informed decisions about the project and to disclose to the public the relative impact of the project. As part of this process, the Draft EA is prepared in order to solicit comments about the proposed action from interested citizens, organizations,

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tribes, and agencies. Public involvement is integral to the EA process, with input gathered through public scoping, outreach, and public hearings. Public and agency participation in the process is summarized in the document.

If, after reading the Draft EA, readers wish to comment, they are encouraged to be as specific as possible and to address the contents of the Draft EA and/or the merits of the alternatives presented. Substantive comments received will be considered in preparation of the Final EA. If, after reviewing the Final EA, FHWA determines that this project would not have a significant impact on the environment, a Finding of No Significant Impact (FONSI) will be issued. It is important to note that issuance of a FONSI does not constitute final project approval. The project would be subject to other reviews and approvals before any construction activity begins.

1.2 Location

I-15 traverses the northwest corner of Arizona (Figure 1), passing between the walls of the Virgin River Gorge, traversing the Virgin Valley, and crossing over the Virgin River via eight bridges at seven locations. According to the ADOT Bridge Inventory, Bridge No. 1 is located at milepost (MP) 9.55¹, approximately 0.5 mile east of the unincorporated communities of Beaver Dam and Littlefield in Mohave County, Arizona (Figure 2). Bridge No. 1 is approximately 10 miles northeast of Mesquite, Nevada (Mesquite), and 28 miles southwest of St. George, Utah (St. George). The land within the project limits is primarily private with small areas managed by BLM west and south of the bridge.

The proposed bridge project area is located along I-15 between MP 8.57 and MP 9.84, for a total length of 1.27 mile. The project area includes the I-15 roadway as well as the area under the bridge, access roads, and staging areas. Access to the river would be from a route located north of I-15 and east of the

¹ The ADOT Bridge Inventory indicates this bridge is located at MP 9.55; but based on the current roadway MP markers, it is located at approximately MP 9.20. Graphics included herein are based on Geographic Information System data and therefore will depict the MP 9.20 location.

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river, via a combination of existing and newly constructed roads in previously disturbed areas (Figure 2). Proposed staging areas are located east of County Road (CR) 91 south of I-15 (two areas), one on each side of I-15 within the I-15 right-of-way (ROW) east of the Virgin River; and one along the northern access road just east of the Virgin River (Figure 2).

For the purposes of this EA, the term “project area” refers to the construction footprint of the proposed bridge project, including staging areas and access routes. The term “study area” encompasses the I-15 corridor and adjacent areas within the Virgin River and the unincorporated communities of Littlefield and Beaver Dam.

1.3 Project Background and Overview

I-15 is an important trucking route and provides vital international, national, regional and local connections. Spanning approximately 1,500 miles from the United States (U.S.)/Canadian border in Montana to San Diego, California (Figure 3), I-15 comprises the majority of the CANMEX corridor, a road that extends from Canada to Mexico and forms an important North American Free Trade Agreement (NAFTA) corridor. The CANAMEX corridor within Arizona south of the project area has been designated as Interstate 11. On a local level, I-15 provides the primary access between local communities in southern Nevada, southwestern Utah, and northwestern Arizona.

Originally constructed in 1964, Bridge No. 1 is a four-lane structure that carries northbound and southbound traffic on I-15. Since 2003, ADOT’s Bridge Group has been preparing rehabilitation plans for most of the Virgin River bridges, including Bridge No. 1. Meanwhile, periodic maintenance and preservation projects, including the replacement of the concrete deck and barriers in 1985, have extended the life of Bridge No. 1. In May 2011, FHWA conducted a review of the eight I-15 structures crossing the Virgin River. This review concluded that Bridge No. 1 is structurally deficient according to the National Bridge Inspection Standards (FHWA 2011a).

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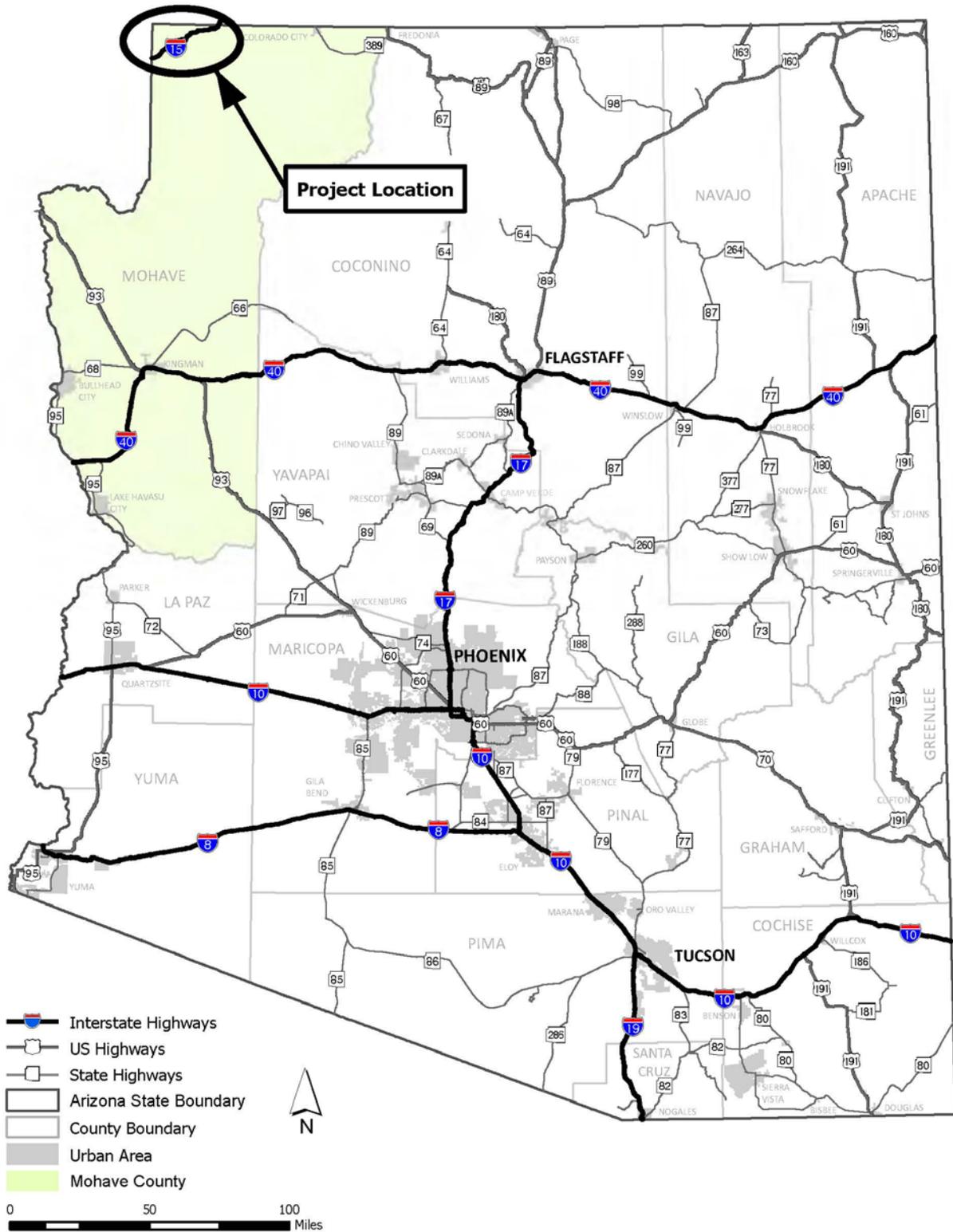


Figure 1. State Map

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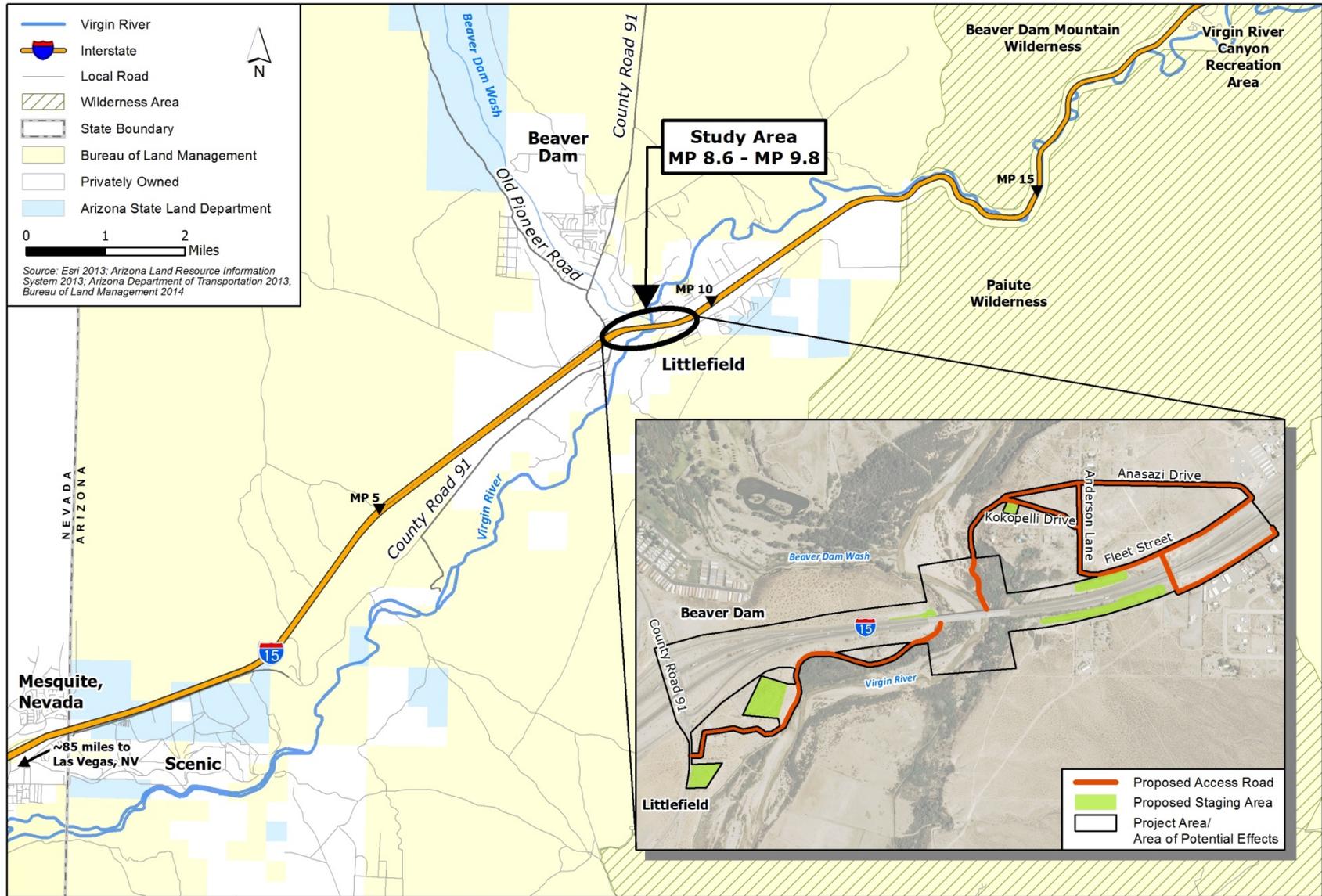


Figure 2. Vicinity Map

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Figure 3. International Importance of Interstate 15

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In 2012, ADOT prepared an initial feasibility report to identify and evaluate future construction projects along the entire length of I-15 in Arizona (from MP 0.0 to MP 29.40). In addition to bridge rehabilitation, the study identified needs, including wider shoulders and climbing lanes.

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2 Purpose and Need

2.1 Project Need

Age, increased truck use, weather, and de-icing salts have all contributed to heavy wear on the I-15 roadway and the eight Virgin River bridges within Arizona. FHWA identified the need to repair all of the bridges within this segment. Because the structural assessment of Bridge No. 1 identified it as structurally deficient, ADOT has prioritized efforts to rehabilitate this structure. Based on an assessment of past, current, and forecasted conditions of I-15 and Bridge No. 1 within the study area, the following issues surrounding the bridge have been identified as warranting a need for action: repairing structural deficiencies, the ability to accommodate high volumes of truck traffic, the need to support interstate and regional travel, and controlling unauthorized use of the ROW. Each issue is discussed in further detail below.

The purpose of the proposed project is to maintain I-15 as a regional traffic corridor for the long-term by remedying the Bridge No. 1 structural deficiencies so that I-15 can continue to accommodate truck traffic and serve as a regional traffic corridor that facilitates the movement of people, goods, and services while minimizing maintenance requirements. This action would help ADOT meet its long-range goal of maintaining I-15 as an essential trade and truck route linking Nevada, Arizona, and Utah.

2.1.1 Structural Deficiencies

Bridge No. 1 does not meet current structural and design standards and is showing signs of wear, ranging from erosion around the pier foundations to the bridge deck joints having localized failure.

Bridge No. 1 was designed in accordance with the specifications and standards available during the 1960s and is at the end of its 50-year design life. Multiple cracks have initiated and propagated in the steel girders and the welds between the steel girders and the bracings of the superstructure (the part of a bridge supported by the piers and abutments). The number and length of cracks is increasing, which is

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indicative of the structural members of Bridge No. 1 reaching a stage of rapid deterioration. ADOT currently performs maintenance activities to repair the structure to keep it in working order. The repairs prolong the function of the bridge but are not a long-term solution as the number and size of the necessary repairs continue to increase. A long-term solution that increases the structural life of the bridge and minimizes the frequent and extensive repairs is needed.

According to ADOT's bridge assessment, the sufficiency rating of Bridge No. 1 is lower than every other structure in the corridor with the exception of Bridge No. 6, for which rehabilitation was just completed in 2016. This highlights the critical importance of addressing this structure's deficiencies in the near term. Most critically, the superstructure of Bridge No. 1 is listed in poor condition and in need of replacement or full rehabilitation (ADOT 2014a). If the superstructure for Bridge No. 1 is not rehabilitated, a weight restriction on the structure will be required. It is assumed that the weight restriction would divert up to 20 percent of truck traffic (approximately 900 to 1,100 trucks per day) to other routes (see Section 2.1.2).

In addition to the superstructure deficiencies, shoulders along I-15 in the study corridor are inadequate. Through most of study area and for the full length of Bridge No. 1, shoulder widths are only 2-feet wide; however, current minimum design standards on a highway such as I-15 require 10-foot shoulders with 2 feet of additional "shy" separation from the adjacent bridge and safety barriers, for a total of 12-foot-wide shoulders. In addition, interstate standards recommend the 12-foot shoulder particularly when a heavy volume of truck traffic occurs, which is the case with I-15 with trucks comprising nearly 30 percent of the traffic. Currently, with the 2-foot shoulders, trucks or other vehicles have inadequate room to pull out of the travel lanes onto the shoulder during an emergency. To bring Bridge No. 1 to current standards wider shoulders are required.

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The bridge hydraulic analysis that was conducted included an evaluation of scour² vulnerability to determine if the bridge could fail during river flows up to the 500-year event, which was determined to be 68,000 cubic feet per second. The analysis determined that Piers 1 and 2³ of the existing bridge have soil resistance issues and scour concerns, and unless soil resistance is increased, scour countermeasures would not solve the deficiencies. Pier 4 was found to be scour vulnerable, although the soil resistance deficiencies associated with Piers 3 and 4 could be helped with the use of scour countermeasures (ADOT 2016). The Virgin River Feasibility Study (ADOT 2015) recommended that bridge foundations be bolstered to address scour concerns. To increase the structural life of the bridge, the scour vulnerability of the bridge piers needs to be addressed.

2.1.2 Truck Traffic

The Arizona segment of I-15 experiences traffic volumes from 19,296 to 23,634 vehicles per day (vpd), of which 23 percent is truck traffic (ADOT 2012b). Of these trucks, 20 percent are permit freight trucks, defined as trucks over 80,000 pounds and/or trucks with loads outside the specific envelope dimensions. Based on Highway Performance Monitoring System data, 221 million vehicle miles are travelled on the Arizona stretch of this interstate each year. Approximately 1.4 million trucks account for over 46 million of the 221 million miles travelled (ADOT 2014a).

I-15 is geographically isolated from other highways in Arizona, and is the only road in the state that allows triple-trailer trucks. Routes that can accommodate wide-load, heavy-weight, and triple-trailer trucks are limited, so if Bridge No. 1 continues to deteriorate and weight restrictions are imposed, these trucks could be diverted 223 miles or more, resulting in delays of about four hours per truck. Using

² "Scour" in this document is the removal of sediment such as sand and gravel from around bridge abutments or piers. Scour, caused by swiftly moving water, can scoop out scour holes, compromising the integrity of a structure.

³ The bridge piers are numbered 1 to 4 from the west to the east, with Pier 1 being the westernmost pier and Pier 4 being the easternmost.

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FHWA's delay cost of \$26.70/hour, the freight delays could cost truckers between \$35.1 million and \$42.9 million per year (FHWA 2009b).

The interstate is four-lanes wide and is designed to accommodate traffic at speeds of 55 to 75 miles per hour (mph). As trucks climb hills, they lose speed, and faster vehicles must either pass or wait behind the trucks if the option of changing lanes is unavailable. Thus, truck traffic results in slower speeds for motorists and often impedes the free flow of traffic. Traffic congestion, commonly expressed in term of Level of Service (LOS), varies from free flow conditions at the speed limit (LOS A) to stable flow but where the operation of individual users becomes significantly affected by interactions with others in the traffic stream (LOS C). While the traffic flow may be inconvenient to some users, the LOS range meets the recommended design LOS standards set forth of ADOT's *Roadway Design Guidelines* for controlled-access rural highways.

2.1.3 Interstate and Regional Travel

I-15 is a major transcontinental north-south highway that extends more than 1,470 miles through the states of California, Nevada, Arizona, Utah, Idaho, and Montana. The corridor is further linked with the Midwest through connections with I-40, I-70, I-80, and I-90 (see Figure 3). Maintaining this route in good condition for all traffic is critical to the nation's economic competitiveness and the movement of people, goods, and services through the region. Rehabilitating Bridge No. 1 would preserve the connectivity of this important and strategic corridor for all traffic.

The Virgin River communities of Scenic, Beaver Dam, and Littlefield in Arizona are small and relatively isolated from the rest of the state, owing to their location in the Arizona Strip and northwest of Grand Canyon National Park. Travel to other towns within Arizona requires crossing through either Nevada or Utah, or traversing unpaved roads to Arizona State Route (SR) 389 (see Figure 1). These rural communities have limited neighborhood, commercial, and emergency services and rely on I-15 for

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access to services and centers for economic activity, including Mesquite and St. George. In addition, the corridor is heavily used for recreational travel and also provides access to the St. George Municipal Airport (Figure 8 on page 57). Residents of Mesquite and St. George use I-15 for frequent interstate trips between Nevada and Utah, including those who commute between states to work. Lastly, the economies of Mesquite and St. George are supported by businesses that cater to interstate truck traffic and motorists passing through the study area.

2.1.4 Maintenance and Liability Considerations

“Little Jamaica,” located within the ADOT ROW southeast of the existing bridge, is a pool that recreationalists created by redirecting water from a spring and impounding it with sandbags. The pool is accessed either from the river or from private property at the top of the bluff southwest of the bridge.

“Little Jamaica” is an unauthorized use within the ADOT ROW, in that ADOT did not approve the construction, does not operate or support it, and did not provide access. It is intermittently removed by ADOT maintenance, but is then rebuilt by recreationalists. The use of “Little Jamaica” results in trespassing associated with parking on adjacent private property and accessing the site. Trash, human waste, and other waste products are regularly left in the ADOT ROW surrounding this feature, resulting in a maintenance burden for ADOT. The steep rocky slopes that can be difficult to traverse, no monitoring of water quality, and potential drowning risks are a liability to ADOT. There is a long-term need for ADOT to minimize its maintenance responsibilities and liability risks in this location.

2.2 Conformance with Regulations, Land Use Plans, and Other Plans

Land within the study area is primarily privately owned, with dispersed areas of public land under the jurisdiction of BLM. Within the portions of the project area under the management of BLM, ADOT holds

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a highway easement deed (HED) to maintain and operate I-15.⁴ The HED conveys rights from the BLM (through FHWA) to the State Transportation Agency (ADOT) to be used for the intended project purpose. It does not convey fee simple rights and is therefore considered an easement, hence the name. The term “easement” in this document refers to the highway easement deed. The Proposed Action conforms to the BLM management objectives and decisions that govern land use in the study area, as outlined in the *Arizona Strip Field Office Record of Decision and Approved Resource Management Plan* (BLM 2008a). Land use on private land in the project vicinity is directed by the *Mohave County, Arizona General Plan* (Mohave County 2010) and the *Virgin River Communities Area Plan* (Mohave County 1998). The Proposed Action is consistent with these plans.

The project is consistent with the 2012 Moving Ahead for Progress in the 21st Century Act (MAP-21) in that it would improve infrastructure condition and the efficiency of freight movement. The project, as identified in ADOT’s 2015-2019 5-year State Transportation Improvement Plan (STIP), includes \$2.5 million for design, and another \$33 million for construction (FHWA 2014a).

2.3 Summary

Bridge No. 1 is an important connection providing international, national, regional, and local access, and serves a large number of trucks. Age, weather, de-icing chemicals, heavy use, and scour have resulted in structural deficiencies of Bridge No. 1. In addition, the bridge does not meet current design standards due to inadequate shoulder widths. Repair and maintenance cannot keep pace with the rate of deterioration, and weight restrictions on Bridge No. 1 that would require up to 20 percent of the truck

⁴ BLM and ADOT/FHWA have different definitions of the term “easement.” For ADOT/FHWA, a road is within ROW when it crosses land owned in fee by ADOT/FHWA. When a road crosses land managed by other agencies, the road is within an easement. In this case specifically, a Highway Easement Deed allows I-15 to cross BLM land. BLM, on the other hand, describes the road as being within a ROW. In contract, BLM acquires easements in order to use the land of another for a special purpose or access. ROWs are granted by the BLM to others for various purposes, which include easements, leases, permits, or licenses to occupy, use, or traverse public lands. While the BLM identifies the I-15 corridor as a ROW where it crosses BLM land, for the purposes of this document, the ADOT/FHWA term “easement” will be used for areas that cross BLM land, and ROW will be used to describe where I-15 crosses land owned by ADOT.

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traffic to detour from I-15 due to structural deficiencies will become necessary if improvements are not completed. Given the vital importance of this corridor through the geographically isolated area and its importance for truck movement, rehabilitating Bridge No. 1 and avoiding weight restrictions and long truck detours would allow interstate commerce to continue unencumbered through the Virgin Valley.

Improvements on Bridge No. 1 are consistent with Mohave County, ADOT, and BLM plans for the area.

In addition, the proposed improvements are consistent with MAP-21 and are included in the current 5-year STIP.

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3 Alternatives

3.1 Alternatives Developed and Screening Process

The development and screening of alternatives was conducted in accordance with FHWA policies regarding the NEPA process (23 CFR 771.105) and incorporated input from FHWA and ADOT technical staff; BLM and NPS representatives; the public; and other federal, state, and local agencies. The alternatives “step” in the EA process involves the identification of potential alternatives, development of multidisciplinary evaluation/screening criteria for alternatives screening, and the act of screening alternatives. This step is done to identify which alternatives should be carried forward for detailed study and which alternatives should be eliminated from further consideration in the EA. Screening uses established criteria to systematically identify alternatives that should be studied in detail in the environmental document.

3.1.1 Establishment of Screening Criteria

A multidisciplinary set of evaluation criteria that considered both environmental and socioeconomic resources was developed to screen alternatives. Screening criteria included topography, vegetation and wildlife, water resources, Wild and Scenic Rivers, land ownership/jurisdiction, visual resources, ROW needs, cultural resources, Section 4(f) resources, constructability, structural characteristics, estimated cost, and whether the alternative meets the purpose and need of the project. Based on the finding of the screening process, each alternative was either moved forward or eliminated from further analysis.

3.1.2 Alternatives Considered

The project team developed several bridge design alternatives for consideration in the EA that were included in the screening process. Since the bridge is an integral component to the existing I-15 facility, alternative locations would not meet the purpose and need for the project and were not evaluated. The alternatives considered included the following:

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- ▶ Deck Replacement
- ▶ Superstructure Replacement (i.e., the parts of Bridge No. 1 that sit on the piers and abutments, including the deck, girders, median, and barriers)
- ▶ Bridge Widening and Rehabilitation
- ▶ Bridge Reconstruction in Place
- ▶ Full Bridge Replacement on an Adjacent New Alignment
- ▶ No Build

Figure 4 provides a visual representation of the bridge components involved in the design alternatives under consideration.

In addition to the bridge design alternatives, alternatives for accessing the river for construction were considered. Access alternatives include:

- ▶ Northeast (NE) Fleet Street Access Alternative
- ▶ NE Anasazi Drive Access Alternative
- ▶ NE Anderson Lane Access Alternative
- ▶ Southwest (SW) CR 91 Access Alternative
- ▶ Southeast (SE) Access Alternative

All NE access alternatives include the use of Farm Road and an underpass at I-15 to reach the north side of the Interstate.

Two alternatives were considered for the permanent removal of “Little Jamaica” and measures to prevent the future diversion of spring water and reconstruction of the pool. These alternatives include:

- ▶ Boulder placement to remove “Little Jamaica”
- ▶ Fencing to remove “Little Jamaica”

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Table 1 briefly describes the alternatives considered, features of the alternative, and the results of the screening process. Figures 5 and 6 depict the access alternatives.

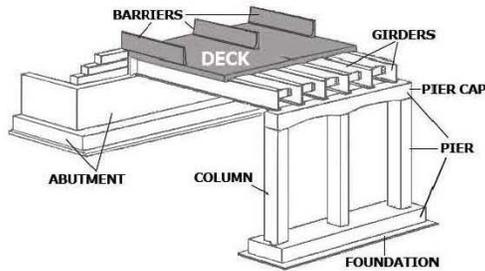
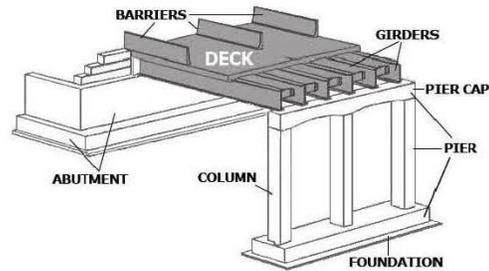
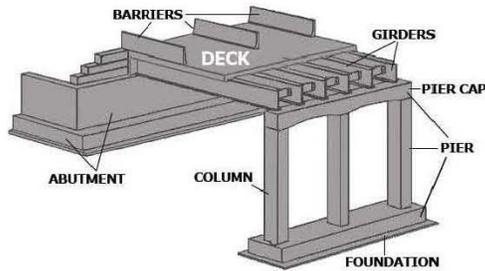
In summary, application of the screening process resulted in the elimination of the Deck Replacement, Superstructure Replacement, and Full Bridge Replacement on a New Alignment alternatives from further consideration. The Bridge Widening and Rehabilitation Alternative and Bridge Reconstruction in Place Alternative were carried forward into detailed study in this Draft EA and are hereinafter referred to as Alternative 1 and Alternative 2, respectively. Access alternatives located northeast and southwest of the bridge were carried forward while the access alternative southeast of the bridge was eliminated due to constructability issues in accessing the river bottom, particularly with heavy equipment. Due to the steep cliffs northwest of the bridge, access from this direction is not feasible so no alternative was considered. Both alternatives for the removal of "Little Jamaica" were carried forward. A summary of the screening results for each alternative in Table 1 presents the rationale for either eliminating an alternative from further consideration or carrying it forward into detailed study.

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Deck Replacement**Superstructure Replacement****Widening and Rehabilitation/Bridge Reconstruction in Place**

Note: These illustrations are typical bridge components, and are not actual drawings of Bridge No. 1. The shaded portions indicate which components would be included in the construction of each design alternative. For example, the Deck Replacement alternative would involve construction only on the bridge deck and side and median barriers, whereas the Widening and Reconstruction and Bridge Reconstruction in Place alternatives would involve construction on every part of Bridge No. 1.

Figure 4. Proposed Construction within the Study Area

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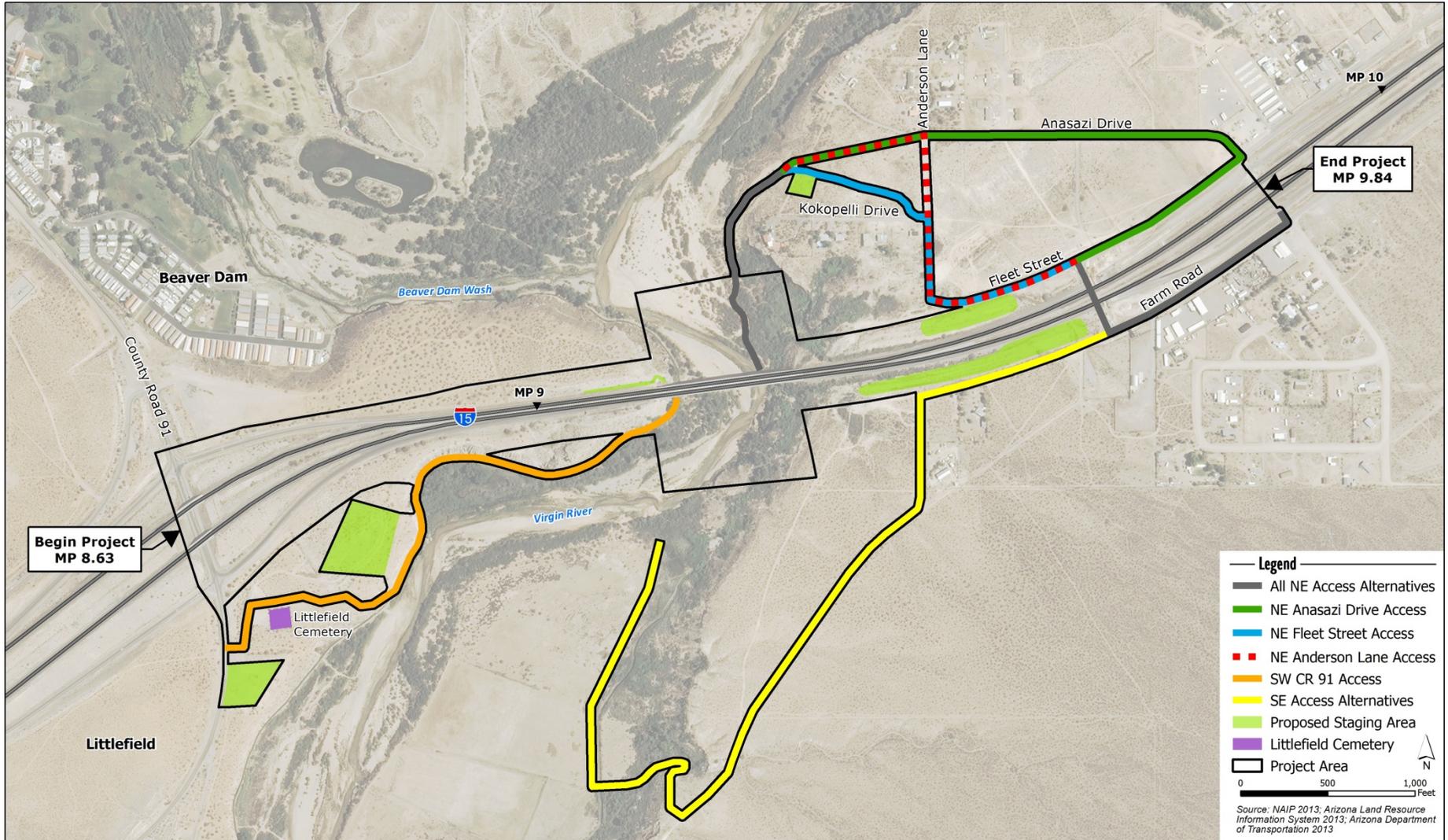


Figure 5. Access Route Alternatives

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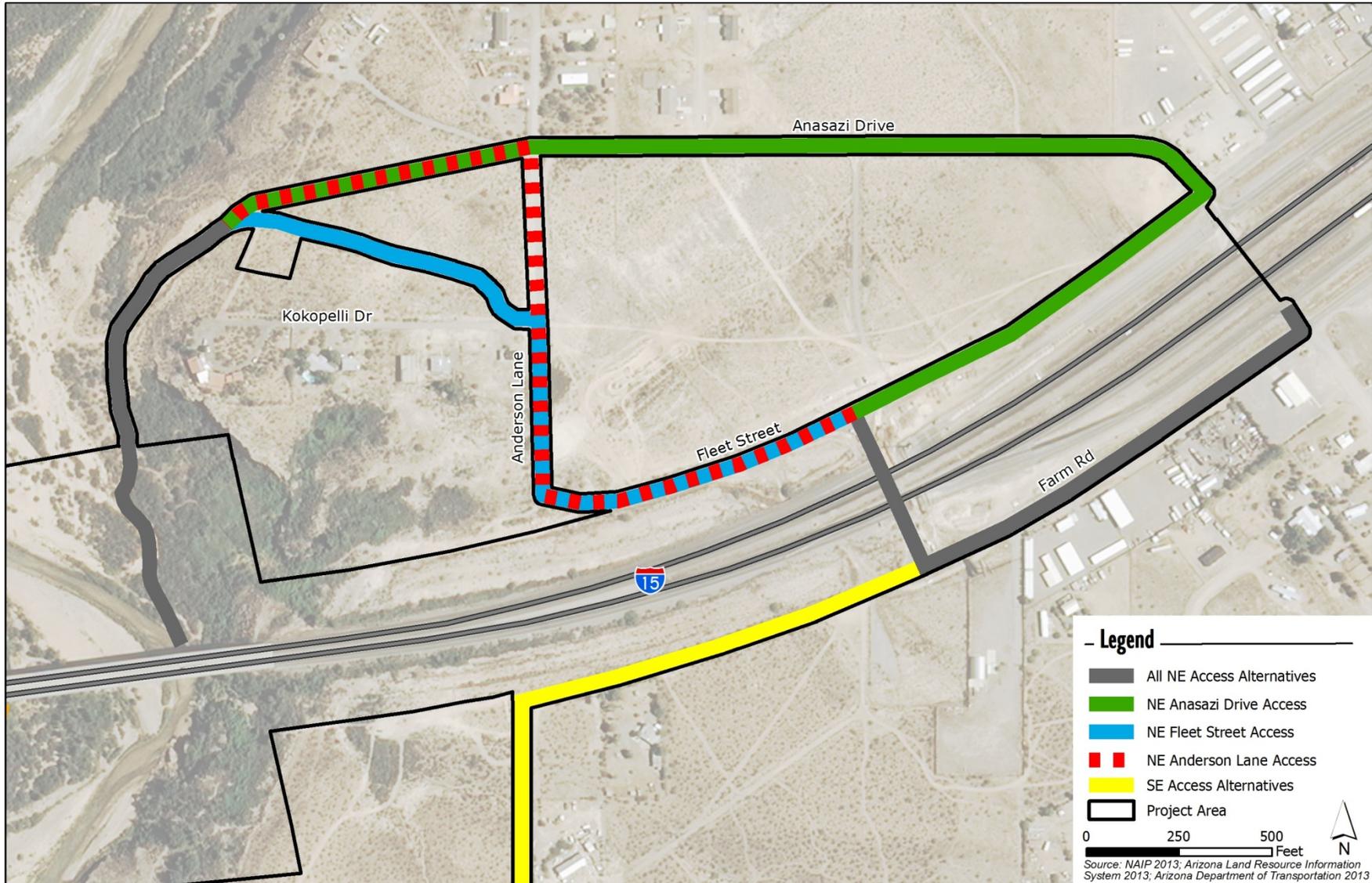


Figure 6. Northeast Access Route Alternatives

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Table 1. Alternative Screening Results Summary

Alternative	Description/Features	Screening Results
Deck Replacement	<ul style="list-style-type: none"> Remove and replace existing deck, median, and exterior barriers 	<p>Eliminated:</p> <p>The <i>Arizona Bridge Inspection Review, Interstate 15 Virgin River Bridges</i> found the bridge deck to be in "fair" condition, even though the overall structure was determined structurally deficient with a "low" sufficiency rating (FHWA 2011a). While replacing the deck may remedy issues with the roadway surface or barriers, this alternative would not meet the purpose of and need for the project because it would not remedy the structural deficiencies and would likely still require a weight restriction on Bridge No. 1, effectively cutting off I-15 as a viable route for up to 20 percent of current truck traffic. Wider shoulders would not be accommodated, and scour vulnerabilities would persist. This alternative would potentially result in the least impact on environmental resources, such as threatened and endangered species, designated critical habitat, and water resources. However, because this alternative does not meet the purpose of and need for the project, it was eliminated from further study.</p>
Superstructure Replacement	<ul style="list-style-type: none"> Remove and replace existing deck, median, and exterior barriers Remove and replace existing girders 	<p>Eliminated:</p> <p>The <i>Arizona Bridge Inspection Review, Interstate 15 Virgin River Bridges</i> found the superstructure to be in "poor" condition, which was a primary factor in Bridge No. 1's eligibility for FHWA's Highway Bridge Program (FHWA 2011a). Replacing the superstructure would remedy the majority of the identified structural deficiencies, but would not accommodate shoulder widening throughout the study area and thus would fail to meet current roadway standards and would not correct scour vulnerability. This alternative would potentially result in fewer impacts to environmental resources such as threatened and endangered species, designated critical habitat, and water resources, as compared to the other alternatives that involve more construction within the river. However, because this alternative does not fully meet the purpose of and need for the project (shoulder width improvements), it was eliminated from further study.</p>

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Alternative	Description/Features	Screening Results
Bridge Widening and Rehabilitation	<ul style="list-style-type: none"> • Widen abutments and new bridge deck • Replace existing girders and add new girders to support wider bridge deck • Widen roadway approaches to match wider bridge width • Construct a scour floor 	<p><u>Carried forward for further study:</u></p> <p>The features of this alternative would have several advantages:</p> <ul style="list-style-type: none"> • Remedy structural deficiencies in the superstructure and substructure • Mitigate existing erosion concerns and install erosion protection around the piers • Prevent weight restrictions on Bridge No. 1, which would maintain I-15 as a vital corridor and essential trade route that links Arizona, Nevada, and Utah with the western U.S. and Canada (ADOT 2012b) • Maintain the critical movement of people, goods, and services through the inter-state communities • Increase shoulder width to meet current design standards (American Association of State Highway and Transportation Officials [AASHTO] 2004) <p>The disadvantages of this alternative would be the potential impacts to threatened and endangered species and designated critical habitat, temporary restrictions on recreation, and temporary construction within the 100-year floodplain and jurisdictional boundaries of the Virgin River. The rehabilitated bridge would have a 50-year structural life, which is shorter than alternatives that replace the entire structure. However, because of the advantages listed above that fully meet the purpose of and need for the project, the alternative is carried forward for detailed study in the EA.</p>
Bridge Reconstruction in Place	<ul style="list-style-type: none"> • Replace all components of the existing bridge by reconstructing half the bridge at a time in its existing location • Widen roadway approaches to match the new bridge width 	<p><u>Carried forward for further study:</u></p> <p>The features of this alternative would have several advantages:</p> <ul style="list-style-type: none"> • Remedy all structural deficiencies in the bridge • Result in a 75-year structural life • Reduce maintenance costs and eliminate scour concerns • Prevent weight restrictions on Bridge No. 1, which would maintain I-15 as a vital corridor and essential trade route that links Arizona, Nevada, and Utah with the western U.S. and Canada (ADOT 2012b) • Maintain the critical movement of people, goods, and services through the inter-state communities • Increase shoulder width to meet current design standards (AASHTO 2004) <p>The disadvantages of this alternative would include temporary restrictions on recreation; temporary construction within the 100-year floodplain and jurisdictional boundaries of the Virgin River; and higher cost (approximately \$6 million) than rehabilitating the bridge, although the higher construction costs would be somewhat offset by reduced maintenance costs. Since the advantages listed above fully meet the purpose of and need for the project, the alternative is carried forward for detailed study in the EA.</p>

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Alternative	Description/Features	Screening Results
Full Bridge Replacement on New Alignment	<ul style="list-style-type: none"> • Replace existing bridge with two new bridges • Widen roadway approaches to match the width of the new bridges • Options for concrete or steel • Options for a retaining wall or laying the hillside back northwest of the bridge 	<p>Eliminated:</p> <p>The features of this alternative would have several advantages:</p> <ul style="list-style-type: none"> • Remedy all structural deficiencies • Result in a 75-year structural life • Reduce maintenance costs and eliminate scour concerns • Prevent weight restrictions on Bridge No. 1, which would maintain I-15 as a vital corridor and essential trade route that links Arizona, Nevada, and Utah with the western U.S. and Canada (ADOT 2012b) • Maintain the critical movement of people, goods, and services through the inter-state communities • Increase shoulder width to meet current design standards (AASHTO 2004) <p>The retaining wall option for stabilizing the hillside northwest of the bridge would reduce potential impacts to cultural resources compared to the hillside layback option that would mitigate impacts to the extent possible but would adversely affect the site.</p> <p>The disadvantages of this alternative would include the potential impacts on threatened and endangered species and designated critical habitat, cultural resources, temporary restrictions on recreation, and temporary construction within the 100-year floodplain and jurisdictional boundaries of the Virgin River. In addition, this alternative would cost in excess of \$9.2 million more than the Widening and Rehabilitation alternative. Due to the potential for greater impacts and the increased cost, this alternative was eliminated from further consideration.</p>
NE Fleet Street Access Alternative	<ul style="list-style-type: none"> • Access the river via Fleet Street west to Anderson Lane then via existing dirt road north of Kokopelli Drive that connects to an existing dirt road into the river. 	<p>Carried forward for further study:</p> <ul style="list-style-type: none"> • This northern access is the most direct option. • Majority of the route would use existing graded, gravel roads that are wide enough or would be widened where needed to accommodate construction vehicles. • Approximately 0.40 mile of the route would be along an existing dirt trail that would need to be improved (from just north of Kokopelli Drive to the river). • This alternative would bisect a privately-owned parcel.

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Alternative	Description/Features	Screening Results
NE Anasazi Drive Access Alternative	<ul style="list-style-type: none"> Access the river via Fleet Street east to Anasazi Drive; at Anderson Lane, a new route would be constructed to the southwest that would connect with the existing dirt road into the river. 	<p><u>Carried forward for further study:</u></p> <ul style="list-style-type: none"> Option identified during the scoping process. This option is approximately 0.25 mile longer than the Fleet Street Alternative. Majority of the route would use existing graded, gravel roads that are wide enough or would be widened where needed to accommodate construction vehicles. Approximately 0.15 mile of the route (from Anderson Lane to the existing trail down to the river) would need to be constructed – no road currently present. The existing trail accessing the river bottom would require improvements to accommodate construction vehicles. This alternative would go around the outer edge of the privately owned parcel that is bisected in the Fleet Street Alternative.
NE Anderson Lane Access Alternative	<ul style="list-style-type: none"> Access via Fleet Street west to Anderson Lane north to Anasazi Drive; a new route would be constructed to the southwest that would connect with the existing dirt road into the river. 	<p><u>Carried forward for further study:</u></p> <ul style="list-style-type: none"> This option is approximately 0.1 mile longer than the Fleet Street Alternative. Majority of the route would use existing graded, gravel roads that are wide enough to accommodate construction vehicles. Approximately 0.25 mile of the route (from Anderson Lane to the road down to the river) would need to be constructed – no dirt road currently present. The existing trail accessing the river bottom would require improvements to accommodate construction vehicles. This alternative would go around the outer edge of the privately owned parcel that is bisected in the Fleet Street Alternative.
SW CR 91 Access Alternative	<ul style="list-style-type: none"> Access via CR 91 south of the I-15 interchange for approximately 0.1 mile, then east along an existing gravel road (from CR 91 to cemetery) and existing dirt road north of the cemetery and along the plateau and into the river. 	<p><u>Modified option carried forward for further study:</u></p> <ul style="list-style-type: none"> Would use existing roads. Would avoid the cemetery. Would require BLM approvals as approximately 0.25 mile of existing dirt road on the plateau is on BLM land. <p>The existing road is too narrow for use by construction equipment, and widening the road is not feasible without extensive earthwork to remove large sections of the hillside above the existing trail. This alternative would only be used by standard pickup trucks or other smaller vehicles such as off-highway vehicles.</p>

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Alternative	Description/Features	Screening Results
SE Access Alternative	<ul style="list-style-type: none"> Farm Road west for approximately 0.2 mile to an existing dirt road to the south then southwest to an S-curve through a wash crossing then back north, across the Virgin River and either along the road on the plateau or within the floodplain to the bridge. 	<p>Eliminated:</p> <ul style="list-style-type: none"> Would result in greater impacts to spring and water resources. Would require extensive road improvements to accommodate large equipment within wetland/seep area Route is 2.5 times longer than the southwestern alternative and would require either widening the road across the plateau (not feasible) or constructing approximately 1 mile of road in the regulatory floodway and/or 100-year floodplain. Would require a temporary bridge to access the underside of Bridge No.1. Would require BLM approvals because approximately 0.5 mile of existing and newly constructed dirt road would be on BLM-managed land.
Boulder placement to remove "Little Jamaica"	<ul style="list-style-type: none"> Remove water diversion and sandbags retaining water Place boulders along the hillside to prevent future rebuilding of the feature Place No Trespassing signs 	<p>Carried forward for further study:</p> <ul style="list-style-type: none"> Would deter re-diverting the water and provide a more natural appearance than fabricated materials Would allow the spring to resume its natural path along the hillside to the river Boulders would be of sufficient size to allow water to flow around them and to be too heavy for the public to move <p>One disadvantage of this alternative is that finding a local source of boulders that are sufficiently sized and would fit the landscape aesthetically could be difficult. Further, the cost of moving the boulders to the project area could be substantial and would increase with distance between the source and the project area.</p>

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Alternative	Description/Features	Screening Results
Fencing to remove "Little Jamaica"	<ul style="list-style-type: none"> • Remove water diversion and sandbags retaining water • Fence the area around the pool and portions of the hillside to prevent future rebuilding of the feature • Fencing would be similar to metal pool fencing and would be colored to blend with the surrounding landscape • Place No Trespassing signs 	<p><u>Carried forward for further study:</u></p> <ul style="list-style-type: none"> • Would allow the spring to resume its natural path along the hillside to the river • Fence would prevent people from disturbing the enclosed area, allowing it to naturally revegetate. The vegetation, in time, would grow through/around portions of the fence which would help the fence blend with the hillside <p>The disadvantages of this alternative include the potential for the fence to be vandalized and the need to maintain the fence, gates, and locks. People wishing to re-establish "Little Jamaica" may climb or damage the fence to gain entry to the area, despite the posting of no trespassing signs. Vandalism or weather-related damage would require ADOT to monitor the enclosure and make repairs as needed. This would create an expense that would be difficult to budget for and would require time and resources to monitor and implement. The fence would create a new man-made visual element to the project area.</p>
No Build	<ul style="list-style-type: none"> • No construction on I-15 or rehabilitation of Bridge No. 1 • Normal and required maintenance along I-15 and on Bridge No. 1 would occur, as needed 	<p><u>Carried forward for comparative analysis:</u></p> <p>The No Build Alternative would result in fewer natural and cultural impacts, as only those associated with normal and required maintenance would occur. Relying solely on periodic maintenance would result in the following disadvantages:</p> <ul style="list-style-type: none"> • Current deterioration in the superstructure would continue. • Based on bridge inspections, a weight restriction would likely be placed on Bridge No. 1 in the future, effectively cutting off I-15 as a viable route for up to 20 percent of current truck traffic. • The use of I-15 as a vital trade and truck route would be compromised. <p>This alternative would not address the structural and design deficiencies of the superstructure and scour vulnerability and, therefore, would not meet the purpose of and need for the project. In addition, this alternative would not remove "Little Jamaica." While this alternative would not satisfy purpose and need, it is carried forward for comparative analysis as required under NEPA.</p>

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3.2 Alternatives Considered but Eliminated from Further Study

Three bridge alternatives (deck replacement, superstructure replacement, and full bridge replacement on new alignment) and two access alternatives (the northwest and southeast routes) were eliminated from further study. As described in Table 1, the deck replacement and superstructure replacement alternatives were eliminated because they would not meet the purpose and need for the project. The deck replacement option would not repair the components of the bridge that are identified as having a “low” sufficiency rating (FHWA 2011a) and a weight restriction would be required on the bridge in the near future that would necessitate the re-routing of approximately 20 percent of the truck traffic that uses I-15 in Arizona. The superstructure replacement would correct the sufficiency issues by replacing the girders, but the bridge would not be widened and would continue to have undersized shoulders, which does not meet current standards for the road. Scour issues would not be resolved. The full bridge replacement on new alignment alternative would meet the purpose and need, but would adversely affect cultural resources and endangered species habitat and would cost more than \$9 million more for construction than other options. For these reasons, the deck replacement, superstructure replacement, and full bridge replacement on new alignment alternatives were eliminated from further study.

The SE Access Alternative is 2.5 times as long as the other alternatives, much of which is on BLM land. Further, this access would cross additional waters, seeps, and wetlands, require the bridging of the Virgin River, and require approximately a mile of road to be constructed within the 100-year floodplain and floodway. Based on the greater level of impact that would occur with this access route, it was eliminated from further study.

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3.3 Alternatives Considered for Further Study

This section describes the features of the alternatives analyzed in this environmental document, including the No Build Alternative or No Action Alternative⁵, as required by NEPA. While two approaches to correcting bridge deficiencies are evaluated, many components of these two alternatives are identical. The descriptions of Alternative 1 – Bridge Widening and Rehabilitation and Alternative 2 – Bridge Reconstruction in Place are presented followed by the components that are common to both of these build alternatives. Then, a description of Alternative 3 – No Build Alternative is provided.

3.3.1 Alternative 1 – Bridge Widening and Rehabilitation

Alternative 1 – Bridge Widening and Rehabilitation Alternative was carried forward for detailed study. In addition, the three northeastern access alternatives, a modified version of the southwest access alternative, and both alternatives for removing “Little Jamaica” were carried forward. Collectively, the bridge widening and rehabilitation, access alternatives, and removal of “Little Jamaica” comprise Alternative 1. The following list provides a general summary of the construction activities required for Alternative 1. Expanded descriptions of the proposed construction activities follow the list.

- ▶ Investigating geotechnical conditions
- ▶ Establishing temporary access to the river bottom for construction, which may include:
 - Using at least one of the three northeastern access alternatives and the modified version of the southwest access alternative as described in Table 1
 - Improving the access roads (grading, adding base material) to allow safe passage with cranes and other construction equipment

⁵ As specified in the CEQ regulations on implementing NEPA, when assessing environmental impacts, alternatives analysis shall “include the alternative of no action” (40 CFR 1502.14[d]). In accordance with FHWA and ADOT guidelines for preparing an EA, the “No Build Alternative” represents the alternative of no action, also commonly called the “No Action Alternative.”

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- Constructing access roads and project area within portions of the Virgin River 100-year floodplain
- Constructing a temporary bridge across the Virgin River low-flow channel to allow construction personnel to cross the river
- Constructing cofferdams or diversion barriers as needed
- Constructing temporary crane pads beneath the bridge and using a crane to place the new girders and for other bridge construction activities
- ▶ Constructing a new column upstream and downstream of each existing pier to support the widened deck
- ▶ Widening and strengthening all abutments, piers, and foundations, as necessary
- ▶ Constructing a new scour floor to protect the existing piers from scouring
- ▶ Widening the bridge deck to provide shoulders that meet current design criteria (4-foot inside shoulders and 12-foot outside shoulders)
- ▶ Widening the I-15 roadway approaches to match the new bridge width
- ▶ Removing and replacing existing bridge deck, girders, median barriers, and exterior barriers
- ▶ Adding new weathered steel girders to support the wider bridge deck
- ▶ Constructing a new bridge deck and barriers
- ▶ Constructing a bridge drainage containment system that would include:
 - Collecting stormwater from the bridge deck via pipes located under the bridge deck on each side of the bridge to carry water off the bridge to the west
 - Constructing a pipe under I-15 to convey the water from the north side of the bridge to the southern roadside ditch
 - Clearing the existing roadside ditch and retention pond located south of the bridge
 - Releasing the bridge stormwater into the roadside ditch

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- ▶ Removing sandbags and obstructions directing and collecting the flow of a spring locally known as “Little Jamaica”
- ▶ Employing best management practices (BMPs)
- ▶ Signing and striping, as necessary

Geotechnical Investigations

Prior to bridge or highway construction, a geotechnical investigation would be performed to collect subsurface data at the bridge location to support development of geotechnical engineering recommendations for the proposed bridge improvements. With selection of Alternative 1, the geotechnical investigation would be expected to start in fiscal year (FY) 2019, with an approximate duration of one month. The following activities are anticipated to be included.

- ▶ Conducting geologic reconnaissance and surface geologic mapping of project area
- ▶ Establishing geophysical survey lines
- ▶ Drilling approximately 35 test borings with casing advancer (in soil) and triple-tube coring (in rock) methods to depths of 10 to 80 feet below existing site grades
- ▶ Plugging the test holes with either native materials or a cement/bentonite mixture and capping them as needed with small amounts of concrete
- ▶ Obtaining soil samples for laboratory investigations to inform fertilizer and soil amendments needed during revegetation of the site

The geologic reconnaissance and geophysical survey would not result in ground disturbance. However, transporting the drill rig to access the boring locations under the bridge and to maneuver around each boring location would require ground disturbance and vegetation removal. Boring locations adjacent to I-15 would be accessed directly from the outside travel lanes. Boring locations within the Virgin River

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floodplain would be accessed either from the bridge using single-lane closure or by the identified access routes (see following subsection). Up to 2 acres of total ground disturbance would likely be required to accommodate all boring locations. This assumes each of the 35 borings would require about 1,600 square feet for equipment maneuvering. In accordance with Clean Water Act (CWA) permit requirements, the drill rig would be placed on rubber mats for any borings done within wetland areas or adjacent to streams. All geotechnical investigation activities would avoid springs, seeps, and the low-flow channel. No borings would exceed 80 feet in depth. Assuming an 8-inch boring diameter and 35 borings plugged and capped with a cement/bentonite mixture, approximately 12 square feet of permanent impacts would be expected. The location and final number of borings would be determined during final design.

Temporary Access and Equipment in the Floodplain

All equipment needed to operate in the floodplain, such as cranes, excavators, drill rigs, and manlifts, would access the river from one of three access routes located northeast of the bridge (see Figure 6):

- ▶ Fleet Street Access Alternative
- ▶ Anasazi Drive Access Alternative
- ▶ Anderson Lane Access Alternative

The selected access route would make use of existing roads where present and would clear, grade, and likely widen new access routes prior to work on Bridge No. 1. It is likely that temporary fill would be placed to create a consistent width and gentle slope down into the bottom of the river corridor.

Equipment would operate and maneuver beneath Bridge No. 1 to access all the piers. Approximately 17.0 acres of the floodplain adjacent to the low-flow channel would be graded or otherwise disturbed during construction. The contractor would implement BMPs in conjunction with the access routes and riverbed project area to keep foreign material from entering the Virgin River.

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To protect the free-flowing nature of the Virgin River through the project area, no temporary culverts or other drainage structures may be installed in the low-flow channel. Therefore, a temporary bridge would likely be constructed in the floodplain such that it would sit above the river channel and maintain typical flows. It is anticipated that fill, such as rip-rap, would be placed on both sides of the low-flow channel as part of the temporary abutments. The abutments would likely require drilled shafts up to 20 feet deep to remain stable. As part of the BMPs, this fill would be contained to prevent debris from entering the river during high flows. Depending on the location of the temporary bridge, up to two temporary piers may be constructed within the low-flow channel. The temporary bridge would clear span the active stream channel, and would be constructed such that it could be picked up by a crane and moved to higher ground in the event of high flows. If temporary piers are required, water diversions such as cofferdams, casings, or similar methods would be constructed in the low-flow channel to provide a dry project area. Once construction is complete, all temporary pier material and water diversions in their entirety would be removed from the low-flow channel.

Placing the new girders may require a crane. However, operating a traditional crane from on top of Bridge No. 1 is not feasible due to the weight of the girders. Consequently, either a gantry crane, which distributes the weight over two points of contact, would be constructed over the top of the bridge, or the cranes would operate in the floodplain below the bridge. With the latter option, at least two temporary crane pads would be constructed and fortified to prevent debris from breaking off and entering the river during high flows. While the crane pads may be constructed within dry areas of the jurisdictional limits and/or the 100-year floodplain of the Virgin River, no crane pad construction would occur within the low-flow channel.

All temporary construction and fills, including crane pads, the temporary bridge, access road improvements, and any diversion structures, would be completely removed following construction, and

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the affected areas would be returned to preconstruction elevations. Temporary construction and equipment access within the 100-year floodplain is anticipated to last for the duration of the project, which is 24 months.

The mitigation measures associated with Alternative 1 include BMPs to protect water quality by controlling dust and spills, and preventing construction and other materials from entering the water. Examples of potential BMPs are: (1) constructing a temporary sediment basin or filter to reduce sediment from entering the water, (2) installing sediment fences between areas of disturbance and all moving or standing water, and (3) regularly inspecting sediment fences to maintain proper function.

Piers and Cofferdams/Barriers

The existing bridge is supported by four piers running west to east underneath Bridge No. 1, all of which are within the 100-year floodplain. Pier 1 is farthest west and Pier 4 is farthest east. Pier 3 lies closest to (but outside of) the current low-flow channel, with the river flowing to its east. Prior to reconstructing and widening the bridge deck, two new columns would be constructed at each pier, one upstream and one downstream of the existing pier, to support the added width and increase the load-bearing capability of Bridge No. 1. The existing pier caps would be widened after the new columns are complete.

The addition of columns and foundation work would extend up to 30 feet upstream and downstream from the existing piers, and would use mechanical excavation equipment such as track-excavators and a backhoe-mounted hoe-ram. No blasting would occur on this, or any, phase of construction. However, minor rock removal using jackhammers or drills may be required to construct the additional columns at Piers 1 and 4. If the foundation area requires additional anchoring, anchors would be drilled into the rock and tied to the foundations to secure the wider footings.

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A scour floor would be constructed to prevent future scouring of the existing piers. Material under the bridge would be excavated to prepare for the construction of a new scour floor, which would extend approximately 70 feet upstream and 70 feet downstream of the bridge as well as under the bridge, and would extend from bank to bank. Once completed, the native material would be replaced within the river bottom, replicating the existing elevations.

The current low-flow channel occurs between Piers 3 and 4. Pier 3 and potentially Pier 4 construction would require cofferdams – or some other type of concrete barrier – to be constructed around the foundation to maintain an adequately sized, dry work area during higher flows. To the extent feasible, pier construction would be phased to occur when flows are lower and the area around the pier is dry. If cofferdams or barriers are necessary, they would be constructed to provide an approximately 20-foot perimeter around the north, east, and south sides of the new, wider pier footprint. The area inside the dams would be dewatered and the dams strengthened to prevent any debris from breaking off and flowing downstream. The river water would be screened and filtered as it is pumped out of the dry work area and returned to the river channel. Because the dams would be pervious to some degree and groundwater could infiltrate the dry work area, dewatering would occur throughout the duration of cofferdam use.

The BMPs discussed in the Temporary Access description would also apply to pier construction. In addition, any native material(s) excavated from the floodplain would be temporarily contained so it cannot enter the river and flow downstream. Excess materials resulting from the construction of the new pier foundations or drilled shafts would be used for fills in other parts of the project or would become the property of the contractor and removed from the floodplain and disposed of properly outside of the Virgin River corridor. Disturbed areas within the floodplain would be returned to

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preconstruction elevations. Construction within the low-flow channel, such as the use of the cofferdams, could last the duration of construction, or about 24 months.

Bridge Deck, Girders, and Barriers

After the new columns are constructed and the piers are reinforced, the work on the existing deck, girders, median barriers, and exterior barriers would start. The bridge rehabilitation would be phased to allow traffic to be maintained throughout. During rehabilitation, new girders would be installed to support the wider deck. The abutments at each end of Bridge No. 1 would also be widened to support the wider bridge deck. A new bridge deck and concrete barriers would then be constructed. Ultimately, the new bridge deck would be restriped to provide two 12-foot travel lanes in each direction, with inside and outside shoulders widened.

A containment system would be employed to prevent dust, chemicals, oils, construction materials, and debris from falling into the low-flow channel or the 100-year floodplain below Bridge No. 1. The BMPs discussed in the Temporary Access description would also apply to construction on and around the bridge deck.

Roadway and Ancillary Construction

The existing I-15 roadway would be widened and restriped to match the width and lane configuration of the bridge, and then taper gradually back to the existing width by MP 8.57 west of Bridge No. 1 and at MP 9.84 east of the bridge. Some rock adjacent to I-15 west of Bridge No. 1 would need to be removed to accommodate the wider shoulders. No blasting would be required. Finally, existing guardrail/barrier would be removed and replaced, and signing and striping would be removed, replaced, or installed as necessary.

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Six potential staging areas have been proposed as shown on Figure 5:

- ▶ South of the Littlefield Traffic Interchange (TI) (at CR 91)
- ▶ Southeast of the Littlefield TI on the east side of CR 91
- ▶ East of Bridge No. 1, north of I-15
- ▶ East of Bridge No. 1, south of I-15
- ▶ West of Anderson Lane and north of Kokopelli Drive
- ▶ West of Bridge No. 1, north of I-15 within the highly disturbed area adjacent to the roadway

Closed portions of the I-15 roadway would also be used as a staging area. The staging areas would be considered part of the regulated project area and, therefore, would be subject to BMPs to control dust and spills, including a temporary containment system that includes a berm or excavated ditches to impound potential leaks or spills. Contractor offices, parking for privately owned vehicles, and materials and equipment not scheduled for imminent use would likely be staged south or southeast of the Littlefield TI.

Temporary construction easements (TCEs) would be required for project construction, but no new permanent easements or new ROW would be required for operation. Vegetation removal or disturbance would occur due to geotechnical testing, project construction, access, and equipment maneuvering. Vegetation removal or disturbance would be restricted to areas within the existing ADOT easement or TCEs. The total disturbance from geotechnical testing, access, grading, temporary structures, bridge construction, roadway widening, and staging areas would be approximately 105 acres. The amount of vegetation that would potentially be disturbed and/or removed would be approximately 28 acres, within both the floodplain and adjacent upland areas.

During construction, the diversion directing the water towards the pool and the sandbags creating "Little Jamaica" would be removed, and the spring water would be allowed to resume its natural path to

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the river. This would restore the potential for wetland vegetation growth along the spring's natural course. Once the diversion and sandbags are removed, ADOT would prevent the reestablishment of the pool by either fencing the pool and a portion of the hillside or placing boulders along the hillside to prevent the redirection of the water. The final approach would be determined during design.

The fencing option would include a 12-foot tall steel picket fence with 4-inch spaced bars (similar to a pool fence) with gates at the top and bottom of the enclosure to allow maintenance access. The fence would be erected around an area that encapsulates the spring limits but would not interfere with bridge maintenance requirements. It is anticipated that the fence would be located above the ordinary high water mark of the Virgin River and would not affect the drainage flows of either the spring or the River. Signs indicating that it is a protected natural resource area and no entry is permitted would be placed on the fence.

Alternatively, large boulders would be placed along the natural flow of the spring to the river. The boulders would be sufficiently sized to not be removable and to allow for water to pass under and between the rocks. Boulders would be located outside the ordinary high water mark of the Virgin river and would not inhibit the flow of either the spring or the river.

Traffic Control

Traffic during construction would be managed in accordance with detailed traffic control plans adhering to the procedures and guidelines specified in the *Traffic Control Manual for Highway Construction and Maintenance* (ADOT 1989) and the *Manual for Uniform Traffic Control Devices* (FHWA 2009a). The final construction phasing and traffic control plans would be prepared during final design, anticipated in FY 2017. The I-15 Littlefield and Desert Springs TIs connect to the proposed access roads to the Virgin River corridor and the construction and staging areas. Therefore, the contractor would use I-15 and the access roads to enter and exit the area under the bridge.

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To provide an adequate area to maneuver, traffic approaching Bridge No. 1 would be reduced to at least one 13-foot-wide travel lane in each direction throughout construction, with concrete traffic control barriers to separate the travel lanes. It is likely that the traffic control barriers would extend up to 0.50 mile north and south of the project limits. The travel lanes would shift on Bridge No. 1 to accommodate various construction phases. Traffic would be limited to one half of the bridge, while the other half of the bridge is reconstructed. Next, the traffic would be shifted to the new portion of the bridge while the remaining half of the bridge is reconstructed. Once complete, both sides of the bridge would be reopened to traffic. The available lane width during construction would accommodate some wide-load or oversize vehicles through the project area, but certain oversized loads may be escorted by a pilot car across Bridge No. 1 during non-peak times or may elect to take an alternative route.

Because the girders would be suspended from cranes and directed toward the widened bridge, their stability is susceptible to wind, weather, and other factors. Therefore, traffic may be temporarily slowed or stopped when the new girders are installed, as needed for the safety of the travelling public.

Best Management Practices

The mitigation measures associated with construction include BMPs to protect water quality by controlling dust and spills, and preventing construction and other materials from entering the water. Examples of potential BMPs include but are not limited to: (1) constructing a temporary sediment basin or filter to reduce sediment from entering the water, (2) installing sediment fences between areas of disturbance and all live waters, (3) regularly inspecting sediment fences to maintain proper function, and (4) constructing a containment system to prevent dust, chemicals, oils, construction materials, and debris from falling into the low-flow channel or the 100-year floodplain below Bridge No. 1, and (5) returning all disturbed areas within the floodplain to their preconstruction conditions.

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3.3.2 Alternative 2 – Bridge Reconstruction in Place

Alternative 2 includes fully reconstructing all parts of Bridge No. 1 in its existing location. The majority of the elements described for Alternative 1 would be the same for Alternative 2. The common elements are listed below and detailed descriptions are provided in the previous Alternative 1 section.

- ▶ Investigating geotechnical conditions
- ▶ Establishing temporary access to the river bottom for construction, which may include:
 - Using at least one of the three northeastern access alternatives and the modified version of the southwest access alternative as described in Table 1
 - Improving the access roads (grading, adding base material) to allow safe passage with cranes and other construction equipment
 - Constructing access roads within portions of the Virgin River 100-year floodplain
 - Constructing a temporary bridge across the Virgin River low-flow channel to allow construction personnel to cross the river
 - Constructing cofferdams or diversion barriers as needed
 - Constructing temporary crane pads beneath the bridge and using a crane to place the new girders and for other bridge construction
- ▶ Widening the bridge deck to provide shoulders that meet current design criteria (4-foot inside shoulders and 12-foot outside shoulders)
- ▶ Widening the I-15 roadway approaches to match the new bridge width
- ▶ Constructing a bridge drainage containment system that would include:
 - Collecting stormwater from the bridge deck via pipes located under the bridge deck on each side of the bridge to carry water off the bridge to the west
 - Constructing a pipe under I-15 to convey the water from the north side of the bridge to the southern roadside ditch

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- Clearing the existing roadside ditch and retention pond located south of the bridge
- Releasing the bridge stormwater into the roadside ditch
- ▶ Removing sandbags and obstructions directing and collecting the flow of a spring creating a pool locally known as “Little Jamaica” and fencing or placing boulders outside the floodplain to prevent its re-establishment
- ▶ Employing BMPs
- ▶ Signing and striping, as necessary

The elements that are different between the two alternatives include:

- ▶ Where Alternative 1 would require the construction of a scour floor to prevent further destabilization of the existing piers, Alternative 2 would be constructed with footings that would extend to bedrock or sufficiently deep as to be unsusceptible to scour. No scour floor would be needed.
- ▶ Under Alternative 2, two new piers would be constructed to replace each of the existing piers, where Alternative 1 would retain the existing piers and add a column on each side.
- ▶ Alternative 2 would require the demolition of the existing piers and removal of the material from the project area. It is anticipated that the piers would be cut and removed in pieces. The foundations, below the grade of the river bottom, would remain in place.
- ▶ Alternative 2 would require less routine maintenance and would have a longer structural life than Alternative 1 because the entire bridge would be new and the existing piers would not be reused.

3.3.3 Alternative 3 – No Build Alternative

The No Build Alternative would retain the existing deck, superstructure, and substructure of Bridge No. 1 and would not widen the bridge to meet current design criteria. The No Build Alternative would include

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regular maintenance of the existing bridge deck and other “spot” repairs as needed, such as pavement resurfacing. However, maintenance and other minor projects would not remedy the structural deficiencies described in Chapter 2, *Purpose and Need*. The bridge would also continue to be susceptible to scour as the existing foundations are too shallow. Based on biennial inspections of the bridge structure and the rate of deterioration this has been occurring, this alternative would likely result in a weight restriction being placed on Bridge No. 1 in the future, effectively cutting off I-15 as a viable route for up to 20 percent of current truck traffic and causing heavy vehicles to seek alternate routes. The No Build Alternative does not preclude rehabilitating Bridge No. 1 in the future.

3.4 General Project Schedule

Preliminary project design began in summer 2012. Construction is projected to begin in FY 2019, with an anticipated duration of 24 months. This schedule assumes a phased construction approach, constructing half the bridge at a time so that traffic in both directions can be maintained throughout the project.

The estimated total cost of the project would be approximately \$42.45 million for Alternative 1 and \$48.55 million for Alternative 2. Because no new easement or ROW would be required for project construction or operation, no ROW costs would be associated with the project. The project is included in the *2016 – 2020 Five-Year Transportation Facilities Construction Program*.

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4 Affected Environment, Environmental Consequences, and Mitigation Measures

This section describes the social, economic, and environmental setting of the study area, and identifies the potential environmental consequences and associated mitigation measures for the considered alternatives. The associated technical reports and memoranda are available for review at ADOT's Environmental Planning, 1611 West Jackson Street, Phoenix, Arizona 85007, with the exception of the cultural resource technical reports. Because of the confidential nature of the material they contain, cultural resource technical reports are available to qualified professionals by request through the ADOT Environmental Planning's Historic Preservation Team, 1611 West Jackson Street, Phoenix, Arizona 85007, phone 602.712.8636 or 602.712.7767.

4.1 Resources Eliminated from Detailed Study

Table 2, Summary of Resources Eliminated from Detailed Study, includes the rationale and source citations (where applicable) for eliminating environmental resource categories from detailed study in this EA.

Table 2. Summary of Resources Eliminated from Detailed Study

Resource	Determination ^a	Rationale for Determination
Wilderness	NP	No designated wilderness areas are located in the study area (BLM 2008a).
Areas Managed to Maintain Wilderness Characteristics	NP	No areas managed to maintain wilderness characteristics are located in the study area (BLM 2008a)
Native American Religious Concerns	NP	Eleven Tribes were included in the National Historic Preservation Act (NHPA) Section 106 consultation process (Appendix A, <i>Cultural Consultation Letters</i>). No Native American religious concerns were brought forward during the consultation process.
Outstanding Arizona Waters	NP	The Virgin River is not an Outstanding Arizona Water (Arizona Department of Environmental Quality [ADEQ] 2008).
Sole Source Aquifer	NP	The study area is not located in a sole source aquifer (U.S. Environmental Protection Agency [EPA] 2012).

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Table 2. Summary of Resources Eliminated from Detailed Study

Resource	Determination ^a	Rationale for Determination
Livestock Grazing	NI	The study area is bordered on the south by the Littlefield Community grazing allotment (BLM 2008b). All construction activities would remain within the ADOT easement/ROW and within identified access routes and staging areas. Access to the bridge from south of I-15 would use existing roads within the Littlefield Community grazing allotment. Neither Alternative 1 nor Alternative 2 would affect grazing, access to grazing allotments, or other permitted livestock grazing activities.
Woodland/Forestry	NP	The study area is largely rocky and contains sparse vegetation consisting of shrubs, scattered trees, and grasses/weeds. Therefore, woodland/forestry resources are not present in the study area. The project doesn't cross National Forest land and BLM has not designated the area for the management of these resources.
Mineral Resources/ Energy Production	NP	I-15 crosses a gypsum industrial mineral district east of the study area; however, no mining or resource extraction occurs in the study area (Arizona Geological Survey 2011).
Fuels/Fire Management	NI	The study area is located in an identified fire management area; however, no impacts are anticipated if standard fire prevention methods are used during construction (BLM 2008c).
Wild Horses and Burros	NP	The study area is not located in a herd management area (BLM 2011).
Section 6(f) Resources	NP	No properties funded, developed, or acquired with grants from the Land and Water Conservation Fund program are located in the study area (NPS 2012).
National Natural Landmarks	NP	No National Natural Landmarks are in the study area (NPS 2014).
Paleontology	NP	The rock units in the Virgin River Valley are considered to have low sensitivity with respect to paleontological resources. Vertebrate fossils and significant invertebrate or plant fossils are not known to exist in the study area (BLM 2007).

^a NP = not present in the area that would be affected by Alternative 1 or Alternative 2; NI = present, but not affected to a degree that would require detailed analysis.

4.1.1 BLM Mitigation Measures

None of the resources eliminated from detailed study would be affected by project construction or operation. However, during coordination with BLM, the following mitigation measures were requested to avoid potential impacts to livestock grazing and fire management during construction:

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- ▶ The contractor would maintain all right-of-way or easement fencing throughout construction. If any existing right-of-way or easement fencing must be removed during construction, the contractor would install temporary fencing to prevent livestock from entering the highway right-of-way or easement area.
- ▶ Within 48 hours prior to the start of construction, the contractor would obtain current fire restriction information from the Bureau of Land Management Arizona Strip District Office (435.688.3200) and would follow standard fire prevention methods throughout construction.

4.2 Land Use and Jurisdiction

4.2.1 Affected Environment

Privately-owned land and public land under the jurisdiction of BLM occur within the study area. East of the bridge, ADOT ROW extends 400 feet, 200 feet on each side of the I-15 centerline. On the west side of the bridge, ADOT holds a 400-foot-wide HED across BLM land to maintain and operate I-15.

The land surrounding the study area includes a mix of rural development and areas designated for preservation of recreational and habitat components. Preservation, protection, and enhancement of the study area's natural and scenic qualities are addressed in the policies and plans that govern land use in the study area. Policies governing land use in parts of the study area also include managing development in order to accommodate growth while protecting and enhancing recreational opportunities that help drive visitation to the area.

Existing Land Use

The project area is located between the developed portions of the rural communities of Beaver Dam and Littlefield. In addition to the I-15 transportation corridor, land uses in the project vicinity include residential, commercial, and light industrial uses; recreation uses, such as tubing and playing within the Virgin River where it flows underneath Bridge No. 1, also occur. Agriculture occurs south of the bridge

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and canals providing water to the fields cross under the western end Bridge No. 1. Livestock grazing occurs within the Littlefield Community allotment located south of I-15. The Littlefield Community Cemetery is located just east of CR 91 south of I-15.

“Little Jamaica,” located within the ADOT ROW southeast of the existing bridge. The pool is accessed either from the river or from private property at the top of the bluff. This feature has gained popularity in recent years due to postings on social media and coverage in local newspapers, both of which have provided directions to “Little Jamaica.” Despite this feature’s popularity, it is an unauthorized use within the ADOT ROW. It is intermittently removed by ADOT maintenance, but is then rebuilt by recreationalists. The use of “Little Jamaica” results in trespassing associated with parking on adjacent private property and accessing the site. Trash, human waste, and other waste products are regularly left in the ADOT ROW surrounding this feature, resulting in a routine maintenance burden for ADOT. Patrolling the site and responding to incidents at “Little Jamaica” is an additional responsibility placed on the Arizona Department of Public Safety and the Mohave County Sheriff’s Department.

Planned Use

The Mohave County General Plan shows the study area as being within the Outlying Communities land use category, specifically identified as Virgin River Community (Mohave County 2010). The stated intent for this use category is to “allow these distinct communities to continue developing according to their current growth patterns.” The Virgin River Communities Area Plan (Mohave County 1998) states that the current land use category that is applicable to the study area is rural, because the area lacks land use densities and core commercial developments that would justify an urban or suburban designation. Land within the study area is zoned primarily for single-family residential purposes, ranch houses, manufactured homes, and recreational vehicle (RV) parks. Commercial zoning is present along CR 91 at the western limit of the project.

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BLM manages land under its jurisdiction for various uses, which can include grazing, recreation, and minerals. BLM land within the study area carries several designations that guide or restrict use and development, based on congressional designation and BLM's land use planning process. The specific land designations assigned within the study area are shown on Table 3, which also illustrates the rural nature of the area.

Table 3. BLM Land Use Designations with the Study Area

Designation	Management Purpose	Relative Size		Managed Features
		Acres	% in Study Area	
Arizona Strip ERMA	Receives only basic custodial recreation management aimed at visitor health and safety, user conflicts, or resource protection areas	1.785 million	0.0001%	Recreation Niche: None Managed Uses: Custodial management regarding visitor health and safety, user conflict, and resource protection issues.
Virgin River Corridor ACEC	Highlights specific resources where special management measures are needed to prevent irreparable damage	8,075	0.001%	Specific Resource Values: Virgin River fish species, desert tortoise, riparian, scenic, Wild and Scenic River (recreational) qualities
Motorways RMZ	Interpretive respites for travelers at pullout sites along primary highways	2,710	0.003%	Recreation Niche: Viewing nature and roadside exhibits Desired Future Conditions: Safe day-use opportunities for access to geologic and riparian resource and educational recreation
Virgin River RMZ	Provides for a particular recreation niche within the overall recreational management area	2,110	0.004%	Recreation Niche: whitewater and climbing adventures Desired Future Conditions: opportunities for social and family affiliation through whitewater boating, water play, and challenging rock climbing

Notes: % = percent; ACEC = area of critical environmental concern; ERMA = extensive recreation management area; RMZ = recreation management zone. Source: BLM 2008a.

The study area is located within an Extensive Recreation Management Area (ERMA) and includes approximately 6.5 acres within an area of critical environmental concern (ACEC) and two recreation management zones (RMZs) (Figure 7). In addition, the study area is also within an area designated as a Rural Travel Management Area (BLM 2007). However, BLM indicated during coordination of this project

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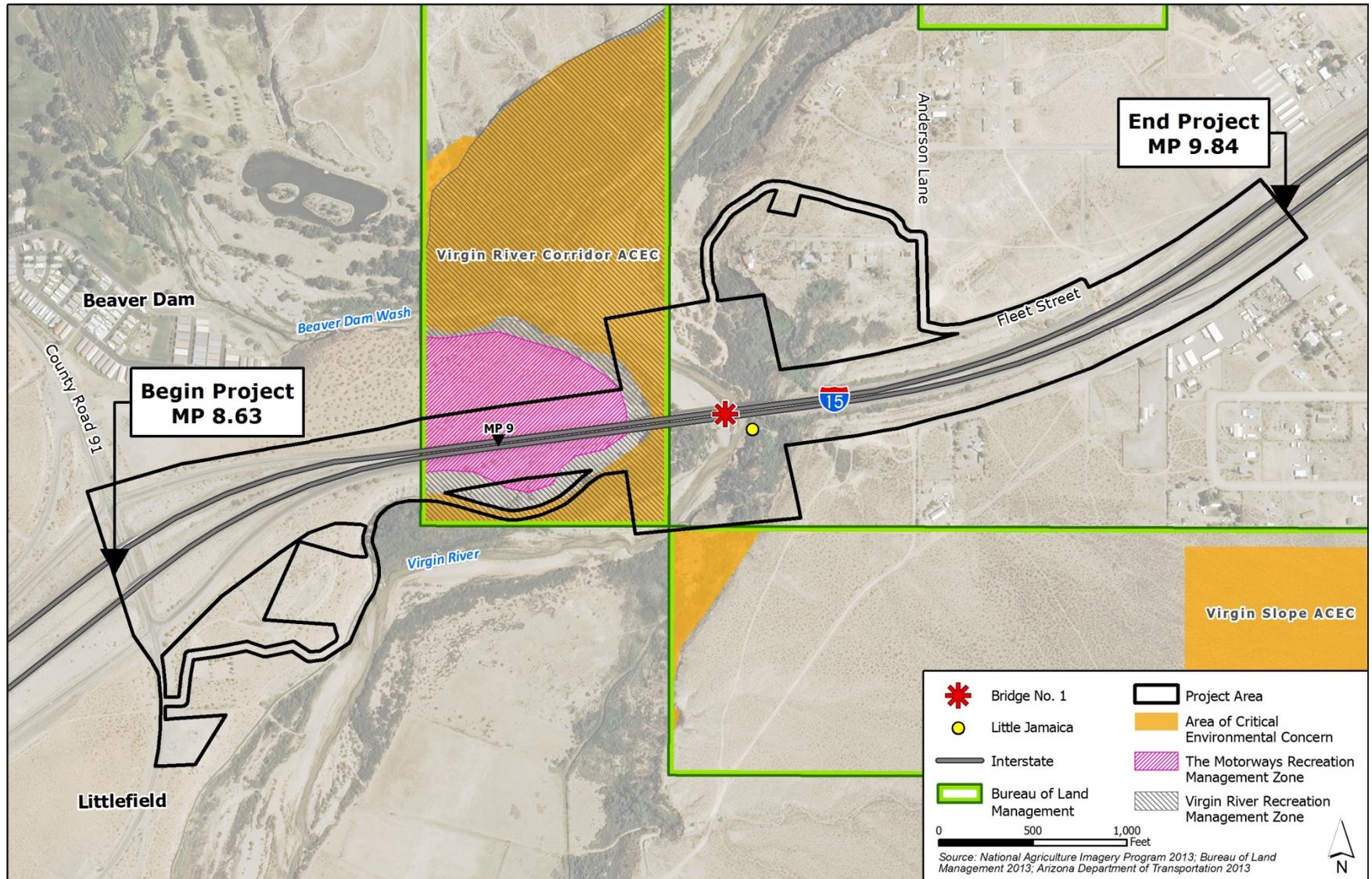


Figure 7. Land Use Designations in the Project Area

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that the primary use designation of the bridge and I-15 easement is a transportation corridor and for consideration of wildlife; the area is not managed as a recreational corridor (JJasper [BLM] to JWennes [ADOT] 02/22/2016).

4.2.2 Environmental Consequences

Alternative 1 – Bridge Widening and Rehabilitation

Temporary access roads and construction staging areas would cause short-term changes in land use; however, no change in jurisdiction would result. In addition, there would be no impacts to the policies and plans that govern land uses in the study area, and the communities of Littlefield and Beaver Dam would continue to be managed in accordance with *The Virgin River Communities Area Plan* (Mohave County 1998) and the *Mohave County, Arizona General Plan* (Mohave County 2010).

Land within the ADOT ROW and easement would continue to be used for transportation and recreation in the long term. There would be short-term impacts to river users because rafters, kayakers, and other recreationists would be restricted from using the Virgin River in the vicinity of Bridge No. 1 during construction.

Tourists visiting “Little Jamaica” often park within private property at the end of Farm Road, which adversely affects the property owner. “Little Jamaica” is adjacent to private property with no party responsible for creating or maintaining a safe trail, which results in an undesirable safety liability. The use of the ROW in this unauthorized manner also results in an undesirable burden on ADOT to remove trash and other wastes from the ROW, and adversely affects the State by necessitating additional maintenance activities. While there are both benefits and adversities associated with the presence of “Little Jamaica,” overall the removal of this feature is not anticipated to result in a significant land use or recreation impact.

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With respect to the BLM land use designations, the bullets below discuss how Alternative 1 conforms to each of the BLM management strategies that govern land use in the study area.

- ▶ **Arizona Strip ERMA.** I-15 is part of the existing infrastructure within the ERMA. Construction would not affect the custodial management of resources within the ERMA. Alternative 1 does not conflict with the ERMA management strategy.
- ▶ **Virgin River Corridor ACEC.** I-15 is part of the existing infrastructure within the ACEC. Construction would introduce short-term impacts to some of the specific resource values managed in the ACEC (see Table 3); however, coordination with affected resource agencies such as BLM, NPS, U.S. Fish and Wildlife Service (USFWS), and the Arizona Game and Fish Department (AGFD) has resulted in mitigation measures to minimize these impacts (see Section 4.8, *Visual Resources*, 4.11 *Biological Resources* and Section 4.12 *Wild and Scenic Rivers* for additional discussion).
- ▶ **Motorways RMZ.** Alternative 1 would not interfere with interpretive respites for travelers at existing pullout sites along primary highways (i.e., I-15 and CR 91). Continued operation of I-15 under Alternative 1 would provide ongoing opportunities to the motoring public for viewing nature. Therefore, Alternative 1 conforms to the RMZ management strategy.
- ▶ **Virgin River RMZ.** Continued operation of I-15 under Alternative 1 would afford access to recreational uses including whitewater boating, water play, and rock climbing. However, access beneath Bridge No. 1 would be prohibited within the project area during construction; impacts to river users would persist for approximately two years during bridge construction, but existing use patterns would be restored following construction. The remaining recreational opportunities within the Virgin River RMZ would be available to visitors. Alternative 1 conforms to the RMZ management strategy.

*Virgin River Bridge #1 (STR #1089)***Alternative 2 – Bridge Reconstruction in Place**

The impacts anticipated for Alternative 2 would be the same as described for Alternative 1.

Alternative 3 – No Build Alternative

Under the No Build Alternative, there would be no change in land use or impact on the policies and plans that govern land uses in the study area. Recreation within the area would continue. The No Build Alternative would pose no challenges to the preservation, protection, or enhancement of the study area's natural, recreational, or scenic qualities. While "Little Jamaica" would not be removed as part of this action, regular maintenance activities within the ADOT ROW would potentially continue to remove the pool intermittently.

4.2.3 Mitigation Measures

The following mitigation measures are recommended to minimize impacts to land use in the study area:

- ▶ The contractor would maintain all right-of-way or easement fencing throughout construction. If any existing right-of-way or easement fencing must be removed during construction, the contractor would install temporary fencing to prevent livestock from entering the highway right-of-way or easement area.
- ▶ At least 60 calendar days prior to construction, the contractor would notify river runners and the boating public of any temporary closure in the vicinity of Bridge No. 1 at I-15 milepost 9.15 by contacting the Bureau of Land Management Arizona Strip Field Office (435.688.3200), the Virgin River Program (435.673.3617), the Virgin River Runners Coalition (www.virginriver.org), the St. George Public Information Office (435.627.4005), and the Mesquite Public Information Office (702.346.5295, ext. 2100).
- ▶ At least 30 calendar prior to construction, the contractor would provide river closure information and post river closure information or temporary signs in the following locations:

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- On the information kiosk at Bloomington Park, 760 Man of War Road, adjacent to the Man of War Bridge in St. George, Utah;
- On Virgin River Bridge No. 2 at I-15 MP 13.2 visible to river users; and
- On the information kiosks at the Virgin River Canyon Recreation Area.

4.2.4 Conclusion

Alternative 1 and Alternative 2 would not permanently affect land use or jurisdiction in the study area, but would result in a short-term impact on river users because rafters, kayakers, and other recreationists would be restricted from using the Virgin River in the vicinity of Bridge No. 1 during construction. Alternatives 1 and 2 would be consistent with the land use strategies in *The Virgin River Communities Area Plan* (Mohave County 1998), the *Mohave County, Arizona General Plan* (Mohave County 2010), and the Arizona Strip Field Office Resource Management Plan (RMP) (BLM 2008a). “Little Jamaica” would be removed, the natural water course restored, and the area either fenced or protected by boulders under these alternatives. This would improve public safety because access to this feature is steep and can be wet and slippery and the water quality is not monitored to verify it is safe for human exposure. In addition, removing “Little Jamaica” would minimize the number of cars parked on private land or randomly along or near the highway. While removing access to the dammed spring would result in a long-term loss of a recreational opportunity, the use is unauthorized and a trespass on ADOT’s controlled-access ROW.

The No Build Alternative would not result in any land use impacts, would conform to all Mohave County and BLM land use and management strategies, and would not eliminate the use of “Little Jamaica.” However, ADOT may still periodically remove the sandbags as part of ROW maintenance under the No Build Alternative.

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4.3 Socioeconomic Considerations

4.3.1 Affected Environment

With limited neighborhood, commercial, and emergency services of their own, the communities of Beaver Dam, Littlefield, and nearby Scenic rely heavily on the public services, shopping areas, and other places of social and commercial activity in Mesquite and St. George (Figure 8). I-15 provides access to these services and amenities for these three communities, in addition to access to the St. George Municipal Airport for the local and regional population. Residents of Mesquite and St. George also use I-15 for frequent interstate trips between Nevada and Utah for work, shopping, medical care, and other services.

Beyond local and regional users, this segment of I-15 also experiences heavy recreational traveler and tourist use, particularly on weekends, holidays, and during the summer months. Tourists from California and other western states travel on I-15 through the study area to access Zion National Park and other scenic and recreational areas in southern Utah and northern Arizona.

Emergency and Other Public Services

The Beaver Dam-Littlefield Fire District provides fire protection for the study area. The district has fire stations located in Littlefield, Desert Springs (Beaver Dam's easternmost neighborhood), and Scenic, and the district boundaries cover the entire length of I-15 within Arizona (Ojeda 2012). The fire district is also the designated ground basic life support provider for the study area, providing ambulance service within their district boundaries (Arizona Department of Health Services 2014).

Mesa View Regional Hospital in Mesquite is the nearest hospital to the Arizona Strip communities and is the typical destination for an ambulance trip from these communities. Additionally, fire district personnel contact Mercy Air Ambulance when air evacuation is required (Jackson 2012). Mercy Air

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helicopters land at one of several designated points along I-15, where they meet the fire district ambulance and airlift the patient to Mesa View Regional Hospital.

The Beaver Dam Substation of the Mohave County Sheriff's Office provides law enforcement and safety services for the study area. The Arizona Department of Public Safety provides highway patrol and other law enforcement services to the study area from its District 1 office in Kingman, Arizona, approximately 195 miles away by car.

The communities of Beaver Dam and Littlefield share a post office, three public schools, and numerous places of worship. No other public services are located within the study area. Figure 8 depicts the community and public services in and around the study area.

Population Growth

The project area is located within two U.S. Census (census) designated places (CDPs): Littlefield CDP and Beaver Dam CDP. These CDPs are located within Census Tract 9501 which encompasses 5,060 square miles within the northwestern corner of Arizona (Figure 8). Scenic, which is located just east of Mesquite, is also located within Census Tract 9501. Table 4 lists the population statistics for all applicable geographical areas in the study area.

Census Tract 9501 experienced a robust increase in population between 2000 and 2010 as compared to Mohave County overall and St. George. Despite the growth in Census Tract 9501, the communities of Scenic, Beaver Dam, and Littlefield remain sparsely populated compared to the neighboring cities of Mesquite and St. George.

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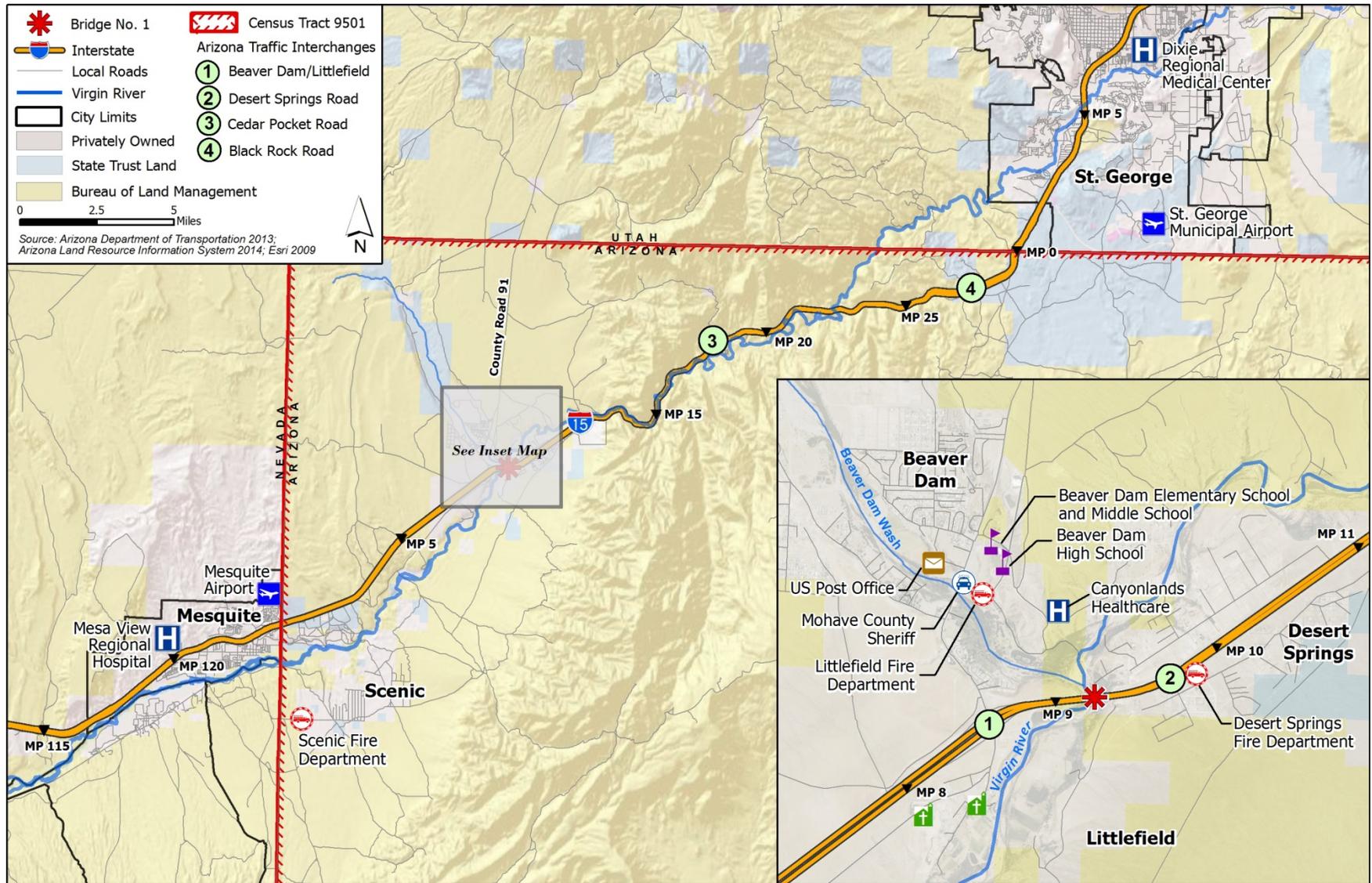


Figure 8. Community and Public Services in the Study Area

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Table 4. Study Area Population Change between 2000 and 2010

Jurisdiction / Location	2000 Population ^a	2010 Population	Percent Change
Littlefield CDP	N/A	308	N/A
Beaver Dam CDP	N/A	1,962	N/A
Scenic CDP	N/A	1,643	N/A
Census Tract 9501 (includes Littlefield, Beaver Dam, and Scenic CDPs)	6,221	10,851	74.43%
Mesquite, Nevada	9,389	15,276	62.70%
St. George, Utah	49,663	72,897	46.78%
Mohave County, Arizona	155,032	200,186	29.13%

Notes: % = percent; CDP = census designated place; N/A = not applicable.

^a The Scenic, Beaver Dam, and Littlefield CDPs were not established at the time of the 2000 Census; therefore, population change from 2000 to 2010 could not be tracked at this level.

Source: Census 2010.

Race and Ethnicity

Census 2010 demographic data are summarized in Table 5 and Table 6, and presented in detail in Appendix B, Detailed Demographic Data for the Project Area and Region. A discussion of these data is presented in the next section, *Title VI and Environmental Justice*.

Title VI and Environmental Justice

Title VI of the Civil Rights Act of 1964 and related statutes ensure that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance because of race, color, national origin, age, sex, or disability.

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs that programs, policies, and activities not have a disproportionately high and adverse human health and environmental effect on minority and low-income populations. The rights of women, the elderly, and low-income populations are protected under related statutes. A comparison of disabled, low-income, elderly, female head-of-household, and minority population percentages among the communities within the project area (Littlefield and Beaver Dam) and those of

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Table 5. Demographic Characteristics in the Project Area and Region

Location	Total Population	White	African American	American Indian	Asian	Pacific Islander	Other Race	Two or More Races	Hispanic ^a
Littlefield CDP	308	69.12%	0.00%	3.90%	2.60%	0.00%	20.78%	3.57%	35.70%
Beaver Dam CDP	1,962	80.40%	0.36%	1.17%	0.31%	0.01%	15.55%	2.04%	26.80%
Project Area Total	2,270	78.94%	0.31%	1.54%	0.62%	0.09%	16.26%	2.25%	27.97%
Scenic CDP	1,643	65.19%	0.00%	0.97%	0.24%	0.00%	31.71%	1.83%	41.51%
Mesquite, NV	15,276	83.51%	0.96%	0.94%	1.79%	0.22%	10.57%	2.02%	23.95%
St. George, UT	72,897	87.20%	0.73%	1.54%	0.80%	1.02%	6.11%	2.61%	12.76%
Mohave County, AZ	200,196	86.86%	0.94%	2.25%	1.05%	0.17%	5.99%	2.74%	14.70%
Regional Total^b	290,002	86.64%	0.88%	1.99%	1.02%	0.38%	6.41%	2.67%	14.90%

^a "Hispanic" refers to ethnicity and is derived from the total population, not as a separate race (i.e., it is calculated differently from the other columns in this table).

^b Regional Total includes Scenic CDP, Mesquite, Mohave County, and St. George data.

= number, % = percent, CDP = census designated place; AZ = Arizona; NV = Nevada; UT=Utah.

Mohave County data includes Beaver Dam, Littlefield, and Scenic CDPs.

Shading represents demographic characteristics where the total for the project area is greater than the regional total.

Source: Census 2010.

Table 6. Minority, Age, Poverty, and Female Head of Household Populations in the Project Area and Region

Area	Total Population	Total Minority ^a		Ages 60 and Older		Disabled		Total Poverty	Below Poverty Level (Estimated)		Households	Female Head of Household w/Children under 18 years	
		# ^b	%	#	%	#	%		#	%		#	%
Littlefield CDP	308	134	43.51	80	25.97	17	5.52	245	37	15.1	109	6	5.5
Beaver Dam CDP	1,962	579	29.51	756	38.53	7	0.36	977	420	43.0	814	32	3.9
Project Area Total	2,270	713	31.41	836	36.83	24	1.06	1,222	457	37.40	923	38	4.12
Scenic CDP	1,643	723	44.00	541	32.93	22	1.34	1,154	198	17.2	618	13	2.1
Mohave County, AZ ^c	200,186	40,808	20.39	63,165	31.55	17,073	8.53	194,383	36,155	18.6	82,539	4,404	5.3
Mesquite City, NV	15,276	4,380	28.67	5,963	39.04	708	4.63	15,232	2,304	15.1	6,378	267	4.2
St. George City, UT	72,897	13,175	18.07	17,415	23.89	3,122	4.28	72,305	10,783	14.9	25,520	1,348	5.3
Regional Total^d	290,002	59,086	20.37	87,084	30.03	20,925	7.22	283,074	49,440	17.47	115,055	6,032	5.24

^a Total Minority is composed of all people who consider themselves non-white racially plus those who consider themselves white Hispanic.

^b # = number, % = percent, CDP = census designated place; AZ = Arizona; NV = Nevada; UT=Utah.

^c Mohave County data includes Beaver Dam, Littlefield, and Scenic CDPs.

^d Total of Mesquite, Mohave County, and St. George data.

Shading represents demographic characteristics where the total for the project area is greater than the regional total.

Source: Census 2010. 2012 American Community Survey

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the larger area including Mohave County, Scenic, Mesquite, and St. George is summarized in Tables 5 and 6 and is presented in detail in Appendix B.

For the purpose of completing both the Title VI and the Environmental Justice evaluations, a comparison of the project area to the population characteristics of a larger region surrounding the study area (e.g., the county and state in which the study area is located) is made. For this analysis, the Beaver Dam and Littlefield CDPs were combined to characterize the project area, and represent the populations likely to experience the most effects from rehabilitating or reconstructing Bridge No. 1. Owing to the area's isolation from the rest of Arizona, population data for Mohave County, Arizona, and the nearby communities of Mesquite, Scenic, and St. George were used to provide a regional population of comparison. The communities of the project area were then compared to the regional population to determine the presence or absence of protected populations (see Table 6). Based on census demographic data, the communities in the project area have a higher representation of protected categories than the regional population of comparison for people who identified as being (1) of some other race, (2) of Hispanic/Latino ethnicity, (3) over 60 years of age, and (4) below the poverty level (i.e., low-income populations). The minority populations are protected under both Title VI and Environmental Justice and the poverty populations is protected under the Environmental Justice Executive Order.

In compliance with Executive Order 13166, Census data were consulted to identify the English-speaking capabilities of those within the project area (represented by the Beaver Dam CDP and Littlefield CDP). Table 7 summarizes the English language proficiency. The percentage of people who speak English less than "very well" is small, totaling 47 individuals or 2.47 percent of the population in the project area as a whole. Based on these numbers, translation of documentation is not warranted. However, any person who would like translation of project information may request assistance by contacting the ADOT Civil Rights Office at 602.712.8946.

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Table 7. Population Who Speak English Less Than “Very Well” within the Project Vicinity

Location	Population (total)	Speak English less than “very well” (percent)	Speak English less than “very well” (number)
Beaver Dam CDP	1,643	1.34	22
Littlefield CDP	262	9.80	25
Total	1,905	2.47	47

Source: Census 2014

Business Types and Distribution

As a major transcontinental, north-south highway extending more than 1,470 miles through California, Nevada, Arizona, Utah, Idaho, and Montana, I-15 links the region through connections with I-40, I-70, I-80, and I-90 (see Figure 3). Within this larger context, I-15 supports economic activity in the study area, as many residents of the Arizona Strip communities, Mesquite, and St. George commute over 30 miles each way along I-15 to get to work or for other activities.

Notable businesses in Scenic, Beaver Dam, and Littlefield include the Scenic General Store, 365 Self Storage, Mesquite Motocross Park, Northern Arizona Regional Health Center, Beaver Dam Station (filling station, bar, and delicatessen), Beaver Dam Bar, Wally’s Auto Repair, Coyote Motorsports, Desert Springs Storage, and Historic Beaver Dam Lodge Golf Course. The Desert Skies RV Resort and associated Palms Golf Course are located immediately east of the Nevada border.

The economies of Mesquite and St. George are supported, in part, by businesses that provide services to interstate truck traffic passing through the study area. Major employers in the St. George area include Intermountain Health Care, Dixie College, SkyWest Airlines, and a Walmart distribution center. Mesquite is home to several casinos and public golf courses, with the Clark County school district and Walmart being the next largest employers.

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Travel and Commute Data

Based on Highway Performance Monitoring System data, of the 221 million vehicle miles travelled on the Arizona stretch of I-15 each year, over 46 million truck miles are tallied by approximately 1.4 million trucks (ADOT 2014a).

As of 2000 (the most recent year for which the Bureau of Transportation Statistics has published commute data), 640 St. George residents worked in a state other than Utah, very likely traveling I-15 to Arizona and southern Nevada (USDOT 2015). Meanwhile, another 399 people from other states commuted into St. George. Therefore, 1,039 workers traveled between St. George and another state to go to or from work, most likely traveling on I-15 to do this (St. George 2006). Similar data are not available for Mesquite or the Arizona Strip communities; although, it is likely that the majority of Arizona residents who travel outside of their town to work use I-15 as part of their commute.

4.3.2 Environmental Consequences

Alternative 1 – Bridge Widening and Rehabilitation

Although located in the immediate vicinity of Littlefield and Beaver Dam, Alternative 1 would not directly affect businesses or community and public services because the project would occur primarily within existing ADOT ROW or easement and along access routes comprised of existing roads and undeveloped areas of private property. Alternative 1 would not require any new ROW or result in any residential relocations, business displacements, or permanent changes in access. There would be no long-term socioeconomic impacts.

The use of “Little Jamaica” and other river-based activities may generate some tourism within the project area and related economic benefits. River-based activities, such as rafting or fishing, would not be allowed in the project area during the construction phase, but would continue to be allowed along other portions of the river outside of the project area. The effects on local businesses would be

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negligible and likely more than offset by the business generated by construction workers. With the permanent removal of "Little Jamaica," the recreational use of the pool would stop, but the activity within the river bottom would likely continue unchanged from current conditions upon completion of construction. Some recreational users of "Little Jamaica" may purchase goods or services in Littlefield of Beaver Dam; however, because the area is very rural and the recreational use is typically no longer than a day, it is equally likely that visitors bring the necessary food and items with them. Removal of "Little Jamaica" would not result in a noticeable impact on income generated in the Littlefield and Beaver Dam area.

During construction, temporary traffic control would result in delays and slower speeds on I-15 through the area. Construction activities associated with Alternative 1 would be conducted in phases to maintain through traffic during construction and would last approximately two years. Throughout the construction period, traffic on I-15 would be maintained in each direction with the exception of short time periods where full closure may be needed to set girders. No detours would be required for the majority of I-15 motorists, although alternative routes may voluntarily be taken. Trucks wider than 10 feet may be escorted over the bridge during off-peak traffic hours or may elect to take an alternative route. Delays during past projects on I-15 in this segment have lasted several hours during peak travel times and on weekends. Existing traffic patterns would resume immediately following construction. To minimize impacts from delays, ADOT would maintain project and construction updates on the project website and would post at least two variable message boards on either side of the project area alerting motorists of anticipated delays.

Emergency service providers could experience delays in arriving at an emergency due to construction-related activities. However, continued access to the existing interchanges in the project vicinity would

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help minimize delays when redirection of travel is necessary. Emergency service providers would be notified in advance of lane closures to arrange for alternate routes where possible.

Overall, Alternative 1 would result in a moderate adverse short-term impact on the movement of people, goods, and services, including emergency services, through the study area due to intermittent lane closures and lane shifts necessary to reconstruct Bridge No. 1. Once construction is completed, the traffic movements would return to normal and would be improved as the widened bridge would accommodate suitable shoulder widths for traffic to flow past disabled vehicles. No permanent changes in access would occur.

Title VI and Environmental Justice

Protected populations within the study area include minority, Hispanic/Latino, and low-income populations who regularly use I-15 to access jobs, shopping, medical care, and public and community services. During construction, residents would experience temporary delays and slower speeds along I-15. However, at least one travel lane in each direction would remain open at all times with the exception of short time periods where full closures may be needed to set girders. Upon the completion of the project, all motorists traveling the project corridor would benefit equally from the continuing availability of I-15 to provide access. Traffic delays and slower speeds would be borne equally by all motorists on I-15; therefore, all population segments, including minority and low-income populations, would be affected to the same degree by Alternative 1. As such, these temporary impacts would not fall disproportionately on minority and low-income populations, and no Environmental Justice impacts would occur.

Staging and access routes would use public and privately-owned roads. Access and staging locations were selected based on proximity to the project and available space, and placed in areas that would minimize overall impacts to natural resources and the public. ADOT would coordinate with private land

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owners and negotiate acceptable terms for any access route or staging area located on private property prior to any entry to these properties. No disproportionate adverse impact is anticipated.

During the scoping process for this project, an effort to solicit project-related concerns from the public residing adjacent to the project area, including access routes and staging areas was undertaken in two mailings (see Section 5.2.1). Input from this process identified concerns about potential conflict with development projects that would be on-going in the vicinity of the access routes, as well as noise, dust, and locations of access routes within private property. The project team will continue to coordinate with the concerned public to avoid conflicts and work with adjacent land owners to minimize any disruption or impacts due to the project.

ADOT is committed to providing services without discrimination of race, color, sex, national origin, age, disability, income status, or proficiency with the English language. While minority populations and populations protected by Title VI are relatively small in the study area, ADOT will accommodate persons who request applicable services so that no member of the public is denied an opportunity to participate in the process. No disproportionate impact on Environmental Justice or Title VI populations was identified in association with Alternative 1.

Neighborhood Continuity and Community Cohesion

Construction and project-related work would be limited to the bridge and I-15 adjacent to the bridge, the river below the bridge, access routes, and staging areas. Since traffic would be maintained throughout construction for passenger vehicles and the majority of trucks and no changes in access would be required, Alternative 1 would not result in any impacts to neighborhood continuity or community cohesion.

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Within the Arizona Strip communities, Alternative 1 would not affect the ability of residents to move in established patterns to access local schools, churches, public services, parks, shopping areas, or other social settings, nor would it create physical barriers to movement within the community. Alternative 1 would not hinder access by these communities to Mesquite, the nearest city. However, travel to and from St. George would likely be affected by construction delays associated with Bridge No. 1. Delay notifications would be strategically posted outside the project area, and construction updates would be posted on the project website to allow residents to adjust their travel plans as necessary. Alternative 1 would result in minor impacts.

Alternative 2 – Bridge Reconstruction in Place

The impacts to emergency services, businesses, and neighborhood continuity and community cohesion anticipated to occur under Alternative 2 would be the same as described for Alternative 1. Like Alternative 1, Alternative 2 would not result in any disproportionate adverse impacts to any protected population. ADOT will accommodate persons with rights in accordance with regulations pertaining to Environmental Justice or Title VI, as described under Alternative 1. No disproportionate impacts to Environmental Justice or Title VI populations would occur.

Alternative 3 – No Build Alternative

The No Build Alternative would have a minimal direct short-term impact on most vehicle traffic and people living in the study area. Access would be maintained, and delays associated with periodic maintenance work to keep the aging facility operational would occur. It is expected that without the proposed improvements, a weight restriction would likely be placed on Bridge No. 1 because of its structural deficiencies and rapid state of deterioration. The exact timing of potential restrictions on the structure is dependent on inspections. Such a restriction would divert up to 20 percent of truck traffic to other routes, potentially creating congestion on the alternate routes and increasing travel time for

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truckers. Based on the average daily truck traffic of between 4,500 and 5,500 trucks, approximately 900 to 1,100 trucks would be diverted each day. Wide-load, heavy-weight, and triple-trailer trucks are limited in which highways they can travel and could be diverted 223 miles or more. This would create delays of about four hours per truck. Using FHWA's delay cost of \$26.70/hour, the freight delays under the No Build Alternative could cost truckers between \$35.1 million and \$42.9 million per year (FHWA 2009b). These impacts would adversely affect the movement of goods within the study area, as well as for regional and cross-country traffic and the trucking industry. It is assumed that these expenses would, at least in part, be passed on to the end consumer of the goods carried in the trucks. No disproportionate impacts to minorities or low income populations would occur. ADOT will accommodate persons with rights in accordance with regulations pertaining to Environmental Justice or Title VI, as described under Alternative 1. No disproportionate impacts to Environmental Justice or Title VI populations would occur.

4.3.3 Mitigation Measures

The following mitigation measures are recommended to minimize impacts on social and economic considerations in the study area:

- ▶ The Arizona Department of Transportation Communications Section would communicate traffic control measures with the public, local officials, Mohave County, the Nevada and Utah departments of transportation, and the media prior to and during construction activities. Communication may include, but would not be limited to, media alerts, direct mailings to area businesses and property owners, information on freeway variable message signs, and paid newspaper notices.
- ▶ The Arizona Department of Transportation Communications Section would maintain the project website throughout construction to include project updates and lane closure information.

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- ▶ The Arizona Department of Transportation Communications Section would contact local emergency services (i.e., hospital, fire, and police) at least 14 calendar days in advance of lane closures so that they can arrange for alternate travel routes.
- ▶ Arizona Department of Transportation would place variable message signs on northbound I-15 before the Pioneer/Sandhill Boulevard exit and before the Beaver Dam/Littlefield exit, and on southbound I-15 before the Black Rock Road exit and before the Cedar Pocket exit. The signs would warn motorists of anticipated construction delays and other messages as required.
- ▶ The contractor would provide lane closure information to the Arizona Department of Transportation Communications Section at least 21 calendar days in advance of lane closures.
- ▶ The Arizona Department of Transportation Communications Section would provide a translation of project information to any person requesting assistance. Assistance can be obtained by contacting the Communications Section at 928.681.6054.

4.3.4 Conclusion

Neither Alternative 1 nor Alternative 2 would result in any permanent residential relocations, business displacements, or changes in access. Both of these alternatives would result in the permanent removal of "Little Jamaica," which would have both beneficial and adverse impacts by eliminating the safety, trespass, and trash removal issues, but also removing the recreational feature and the potential for minor localized economic benefits from its users. Temporary impacts associated with bridge construction would result from lane closures and slower speeds through the study area, which would potentially cause traffic delays. Travel between Mesquite and St. George and access to St. George via Arizona would likely be affected by construction delays. Because of limited services available to the Littlefield and Beaver Dam community residents, access to Mesquite and St. George is vital. Traffic delays and slower speeds would be borne equally by all motorists on I-15; therefore, all population

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segments, including minority and low-income populations, would be affected to the same degree by Alternative 1 and Alternative 2. English proficiency is sufficient within the project area and does not warrant additional measures to ensure meaningful access to project information. However, ADOT will accommodate persons who request applicable services so that no member of the public is denied an opportunity to participate in the process. No disproportionate impacts on Environmental Justice or Title VI populations would occur under any of the Alternatives. During construction, delay notifications would be strategically placed, and construction updates would be posted on the project website to allow motorists to adjust their travel plans as necessary.

Alternative 3, the No Build Alternative, would result in intermittent traffic delays through this segment of I-15 during maintenance projects that would be necessary to keep Bridge No. 1 serviceable. A diversion of truck traffic because of weight restrictions would cost truckers between \$35.1 million and \$42.9 million per year (FHWA 2009b). Under this alternative, any potential economic benefits associated with “Little Jamaica” would remain unchanged and there would be no Title VI or Environmental Justice concerns.

4.4 Cultural Resources

4.4.1 Regulatory Framework

National Historic Preservation Act

Section 106 of the NHPA of 1966, as amended, and NEPA require federal agencies to take the effects of their undertakings on historic properties into account and afford the State Historic Preservation Office (SHPO) and other consulting parties an opportunity to comment on such undertakings. To comply with these laws, an assessment of cultural resources was completed for this EA. Regulations for Protection of Historic Properties (36 CFR 800) implement Section 106 of the NHPA. These regulations define a process for federal agencies to follow during the planning and implementation of federal projects.

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Historic properties include prehistoric and historic districts, sites, buildings, structures, or objects included in, or eligible for, inclusion in the National Register of Historic Places (NRHP). Historic properties may be eligible for inclusion in the NRHP if they possess integrity of location, design, setting, materials, workmanship, feeling, and association, and meet at least one of the following criteria:

- ▶ Criterion A – property is associated with events that have made a significant contribution to the broad patterns of history.
- ▶ Criterion B – property is associated with the lives of a person or persons significant in the past.
- ▶ Criterion C – property embodies distinctive characteristics of a type, period, or method of construction that represent the work of a master, that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.
- ▶ Criterion D – property yields, or may be likely to yield, information important in prehistory or history.

Properties may be of local, state, or national importance. Typically, historic properties are at least 50 years old, but younger properties may be considered for inclusion if they are of exceptional significance.

4.4.2 Affected Environment

The area of potential effects (APE) for this evaluation is the project area identified in Figure 2. The APE includes the project area, which is inclusive of the area under and around the bridge, staging and stockpiling areas, and the access routes. The existing I-15 easement and ROW were previously surveyed by ADOT (Rosenberg 1985), Plateau Mountain Desert Research (PMDR, Spalding 1998), and Logan Simpson Design Inc. (Hill and Fahrni 2014) in conjunction with separate undertakings. All three surveys were found to meet current survey protocols and sufficiency standards.

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The ADOT results are reported in *Cultural Resources Inventory Report for Project IR-15-1-134, Littlefield Access Ramp* (Rosenberg 1985). The ADOT survey examined the portion of the current APE within the I-15 ROW between MP 9.80 and MP 9.84 and resulted in negative findings.

The PMDR results are reported in *A Cultural Resources Survey of the Interstate 15 North-East and South-West Bound Lanes Right-of-Way, Milepost 7.94 and 13.12, Mohave County, Arizona* (Spalding 1998). The PMDR survey examined the I-15 ROW and easement within the current APE from MP 8.63 to MP 9.84 and resulted in the identification of one site, AZ A:1:11 (Arizona State Museum [ASM]), a prehistoric Virgin Anasazi habitation.

The Logan Simpson results are reported in *A Class III Cultural Resources Survey of 583.44 Acres along Interstate 15 between the Nevada State Line (Milepost 0.00) and Milepost 12.50 near Littlefield, Mohave County, Arizona* (Hill and Fahrni 2014). The Logan Simpson survey examined the I-15 ROW from MP 8.63 to MP 9.84 and resulted in the relocation and expansion of site boundaries for AZ A:1:11 (ASM).

An examination of the *Arizona State Highway System Bridge Record* (ADOT 2015) indicates that Bridge No. 1 was constructed in 1964, which makes it more than 50 years old. It was not examined and evaluated for NRHP inclusion as part of the *Arizona State Historic Bridge Inventory* (FraserDesign 2008). Although it was not evaluated, Bridge No. 1, as well as the portion of I-15 within the APE, are exempt from consideration as historic properties under Section 106 of the NHPA as a result of a rule adopted by the Advisory Council on Historic Preservation in 2005 titled, *Section 106 Exemption Regarding Effects to the Interstate Highway System*.

The proposed TCEs within the APE were evaluated during a Class III cultural resources survey for this project by Jacobs Engineering Group Inc. (Jacobs). The Class III results are provided in *A Class III Cultural Resources Survey of Approximately 53.0 Acres for the Virgin River Bridge No. 1 Rehabilitation Project*

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Between Mileposts 8.63 and 9.84 along Interstate 15, Mohave County, Arizona (Touchin 2014). The survey did not examine the 600-foot-long segment of CR 91 because only the paved roadway would be used to reach TCEs, and no ground disturbing activities would be undertaken. Archival research completed by Jacobs indicated that four archaeological sites had been previously identified within the APE: AZ A:1:11 (ASM), AZ A:1:82 (BLM), AZ A:1:86 (ASM), and NA9209. In addition, a subsequent survey of the southwestern and the three northeastern access routes were evaluated. The results are reported in *A Class III Cultural Resources Addendum Survey for Additional Access Routes for the Virgin River Bridge No. 1 Rehabilitation Project, Littlefield, Mohave County, Arizona (Luhnow 2015)*. No resources were identified in this second survey.

Site AZ A:1:11 (ASM), a habitation, was originally recorded in 1965, during highway salvage work and the portion within the highway prism was destroyed. It was not evaluated for inclusion in the NRHP at the time it was originally recorded. PDMR re-recorded the site during a cultural resources survey of I-15. Although the site was excavated, abundant artifacts, features, and a possible unexcavated structure are still present. In discussing previous excavations at the site, 81 trenches were placed on the north side of the site and resulted in the identification of 21 pit houses, 22 storage cists, 4 isolated hearths, 3 nebulous features, 14 human burials, 1 dog burial, and 3 areas of bedrock mortars; one of the bedrock mortars was associated with petroglyphs (Spalding 1998). The site was determined eligible for inclusion in the NRHP under Criterion D (Miller [SHPO] to Lindauer [ADOT], 12/03/1998). Subsequent investigations relocated the site and expanded the boundary to the west (Hill and Fahrni 2014) and this work was confirmed by Jacobs in a survey completed for this project (Touchin 2014).

Site AZ A:1:82 (BLM), a prehistoric habitation, was also relocated by Jacobs. The site had not been previously evaluated for NRHP significance. Based on the results of the Jacobs survey, it is recommended eligible for inclusion in the NRHP under Criterion D.

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Site AZ A:1:86 (ASM), a previously recorded historic alignment of U.S. 91, is currently in use as Mohave CR 91. This site is recommended eligible overall for inclusion in the NRHP under Criterion D; however, this segment is recommended as non-contributing to the site's overall eligibility (Hill and Fahrni 2014).

Site NA9209, a prehistoric Virgin Anasazi habitation, was not relocated by Jacobs (Touchin 2014). The plotted location of the site is within the current Virgin River riverbed, which has been subject to flooding, erosion, and channel shifts. It is unlikely that any cultural resources in the vicinity would be intact since the area is very disturbed.

4.4.3 Environmental Consequences

Alternative 1 – Bridge Widening and Rehabilitation

Alternative 1 would have no adverse effect on known cultural resources in the APE. Those portions of AZ A:1:11 (ASM) located within and adjacent to the highway easement are heavily disturbed. These heavily disturbed areas vary from approximately 22 feet to 80 feet north and south of the existing edge of pavement. In communications with the BLM and ADOT, those portions of the site that are not heavily disturbed and are within the highway easement would be flagged for avoidance prior to commencement of construction. In addition, the southern boundary of the site would be flagged for avoidance in its entirety prior to the commencement of construction. Similarly, AZ A:1:82 (BLM) would be flagged with a 100-foot avoidance buffer in its entirety prior to commencement of construction. The ADOT Project Manager (Wallace [ADOT] to Touchin [Jacobs], 02/13/2015) and ADOT Northcentral District (Nelson [ADOT] to Zimmerman [ADOT], 02/26/2015) have provided written commitment for the flagging and avoidance of AZ A:1:11 (ASM) and AZ A:1:82 (BLM) during construction.

Within the APE, AZ A:1:86 (ASM) is recommended as a non-contributing segment. This site would not be affected since no construction would occur on the roadway itself. As a result, no further cultural resource work is recommended for this site.

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NA9209 was not relocated by the Class III fieldwork. Its plotted location within the current Virgin River channel makes it unlikely that intact cultural deposits exist at this location. As a result, no further cultural resource work is recommended for this site.

Initial consultation was initiated on 03/04/2015. Concurrences that the project would have no adverse effect on the site were received from SHPO (03/09/2015), BLM (03/09/2015), Hopi Tribe (03/13/2015), and Moapa Band of Paiutes (03/25/2015). Continuing consultation for the inclusion of the northern access routes was initiated on 10/05/2015. Concurrences were received from SHPO (10/07/2015), BLM (10/15/2015), and Hopi Tribe (10/08/2015). A list of all of the Section 106 consulting parties, concurrence dates, and copies of the cultural consultation letters are presented in Appendix A, *Cultural Consultation Letters*.

Alternative 2 – Bridge Reconstruction in Place

Impacts associated with the construction of Alternative 2 would be the same as those described for Alternative 1. As with Alternative 1, cultural sites would be flagged and avoided during construction. No adverse effects to cultural resources are anticipated.

The development of Alternative 2 occurred after the initial consultation addressing Alternative 1 was conducted. Review of Alternative 2 was conducted under the *Programmatic Agreement Pursuant to Section 106 of the National Historic Preservation Act Regarding Implementation of Federal-Aid Transportation Projects in the state of Arizona* (PA), executed 12/16/2015. Because the APE for Alternative 2 is the same as Alternative 1 and the “no adverse effect” finding would continue to be applicable, this meets the conditions of Stipulation XI.A.1 of the PA; no further cultural consultation is required.

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Alternative 3 – No Build Alternative

Under the No Build Alternative, no construction would occur in the project area, and no impacts to cultural resources or historic properties would occur.

4.4.4 Mitigation Measures

The following mitigation measures are recommended to minimize impacts to archaeological or historical resources in the study area:

- ▶ Any surface or sub-surface archaeological, historical, or paleontological remains discovered on Bureau of Land Management land during preparation or actual work would be left intact. All work in the area would stop immediately and the Bureau of Land Management Authorized Officer (435.688.3323) would be notified. Commencement of work would be allowed upon clearance by the Bureau of Land Management Authorized Officer in consultation with the BLM Arizona Strip Field Office Archaeologist.
- ▶ If, in connection with this work, any human remains, funerary objects, sacred objects, or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (Public Law 101-601; 104 Statute 3048; 25 United States Code 3001) are discovered, the contractor would do the following immediately: 1) stop operations in the area of the discovery, 2) protect the remains and objects, and 3) notify the Bureau of Land Management Authorized Officer (435.688.3323). The contractor would continue to protect the area of the discovery until notified by the Bureau of Land Management Authorized Officer that operations may resume.
- ▶ The contractor would contact the Arizona Department of Transportation Historic Preservation Team (602.712.8636 or 602.712.7767) at least 10 (ten) business days prior to the start of ground-disturbing activities to arrange for a qualified archaeologist to flag avoidance areas.

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- ▶ The contractor would avoid all flagged and/or otherwise designated sensitive resource areas within or adjacent to the project area.
- ▶ All project-related activities on County Road 91 would be limited to the road prism.
- ▶ According to the Arizona Department of Transportation's *Standard Specifications for Road and Bridge Construction*, Section 107 Legal Relations and Responsibility to Public, Subsection 05 Archaeological Features, "When archaeological, historical or paleontological features are encountered or discovered during any activity related to the construction of the project, the contractor shall stop work immediately at that location and shall take all reasonable steps to secure the preservation of those features and notify the Engineer. The Engineer will direct how to protect the features. The contractor shall not resume work until it is so directed by the Engineer" (ADOT 2008). The Arizona Department of Transportation Engineer would, in turn, notify both the Bureau of Land Management Archaeologist at 435.688.3262 and the Arizona Department of Transportation Environmental Planning Group, Historic Preservation Team, at 602.712.8636 or 602.712.7767 immediately, to make arrangements for proper treatment of those resources.

4.4.5 Conclusion

The entire APE has been surveyed for cultural resources. Two sites that are eligible for inclusion on the NRHP occur within and adjacent to the project area and would be flagged for avoidance under both Alternative 1 and Alternative 2. With avoidance of the known sites, none of the alternatives evaluated would have an adverse effect on any known archaeological or historical resources in the APE.

Consultation with the SHPO, BLM, tribes, and other consulting parties resulted in concurrence with this finding of no adverse effect (see Appendix A).

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4.5 Section 4(f) Resources

Section 4(f) of the US Department of Transportation Act of 1966, as amended, states that FHWA "...may approve a transportation program or project ...requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if (1) there is no prudent and feasible alternative to using that land; and (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use" (49 USC 303[c]).

A "use" of a Section 4(f) resource, as defined in 23 CFR 774, occurs: 1) when land is permanently incorporated into a transportation facility; 2) when there is a temporary occupancy of land that is adverse in terms of the statute's preservationist purposes; or 3) when there is a constructive use of the Section 4(f) resource. A constructive use of a Section 4(f) resource occurs when the transportation project does not incorporate land from a Section 4(f) resource, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired.

4.5.1 Affected Environment

No designated public parks or wildlife and waterfowl refuge of national, state, or local significance occur within the project area or within 0.25 mile of the project area. As identified in Section 4.2.1, portions of the project area occur within a BLM RMZ (BLM 2008a). However, BLM indicated during coordination of this project that the primary function of the bridge and I-15 ROW (including the project area) is a transportation corridor. The project area is not managed primarily for recreation (JJasper [BLM] to JWennes [ADOT] 02/22/2016) and consequently is not afforded protection under Section 4(f).

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As identified in Section 4.4, portions of an archaeological site (Site AZ A:1:11 [ASM]) occur within and adjacent to I-15 easement. This site has been determined eligible for inclusion in the NRHP under Criterion D, potential to yield information. Site AZ A:1:11 has been subject to previous disturbance and data recovery within the current APE, and FHWA has determined that it has minimal value for preservation in place. All work would be limited to the I-15 roadway and disturbed shoulder areas, and as a result, those portions of the site that retain integrity and information potential would be avoided by construction. To ensure no inadvertent disturbance of the site, the area outside of the disturbed shoulder would be flagged for avoidance. The site is not subject to adverse auditory or atmospheric effects. Section 106 consultation for this undertaking resulted in a finding that Site AZ A:1:11 would not be adversely affected by project activities. Archaeological sites that derive their significance primarily from what can be learned by data recovery and have minimal value for preservation in place are exceptions to the requirement for Section 4(f) approval (23 CFR § 774.13(b)). This exception applies to Site AZ A:1:11. As required under Section 4(f)⁶, the officials with jurisdiction over the site (in this case, SHPO and BLM) were notified of FHWA's finding that Site AZ A:1:11 is excepted from the requirement for approval under Section 4(f) and did not object to that finding (Appendix C).

The Old Spanish Trail and Jedidiah Smith Trail are identified as crossing the study area. The Old Spanish Trail is a National Historic Trail, and the Jedidiah Smith Trail is an historic trail. It is difficult to determine the actual location of the trails as there is not a distinct, visible path for either. The official designations have them crossing the projects just west of the Bridge No. 1. Since the project would not change the

⁶ 23 CFR 774.17 reads: "Official(s) with jurisdiction. (1) In the case of historic properties, the official with jurisdiction is the SHPO for the State wherein the property is located or, if the property is located on tribal land, the Tribal Historic Preservation Office. If the property is located on tribal land but the Indian tribe has not assumed the responsibilities of the SHPO as provided for in the National Historic Preservation Act, then a representative designated by such Indian tribe shall be recognized as an official with jurisdiction in addition to the SHPO. When the Advisory Council on Historic Preservation (ACHP) is involved in a consultation concerning a property under Section 106 of the NHPA, the ACHP is also an official with jurisdiction over that resource for purposes of this part. When the Section 4(f) property is a National Historic Landmark, the National Park Service is also an official with jurisdiction over that resource for purposes of this part."

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use or character of the project area; there is no physical trail, marker, or associated features that could be affected; and none of the historically significant sections of the trails occurs in or near the study area, there would be no impact to either of these trails (Memorandum from GLunhow [Jacobs] to JWennes [ADOT] 09/13/2017, Appendix A). National Historic Trails are not afforded protection under Section 4(f) unless the land or site is deemed to be of historical significance. According to National Park Service, the portions of the trails within the study area are not identified as “high potential segments” (JJensen [NPS] to GLunhow [Jacobs] on 09/01/2017).

4.5.2 Environmental Consequences

Alternative 1 – Bridge Widening and Rehabilitation

No resources afforded protection under Section 4(f) occur within the project area. Therefore, no impact on Section 4(f) resources would occur.

Alternative 2 – Bridge Reconstruction in Place

No resources afforded protection under Section 4(f) occur within the project area. Therefore, no impact on Section 4(f) resources would occur.

Alternative 3 – No Build Alternative

No resources afforded protection under Section 4(f) occur within the project area. Therefore, no impact on Section 4(f) resources would occur.

4.5.3 Mitigation Measures

No mitigation is required.

4.5.4 Conclusion

No designated public parks or wildlife and waterfowl refuge of national, State, or local significance occur within the project area or within 0.25 mile of the project area. One cultural resource site

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(Site AZ A:1:11 [ASM]) is recommended eligible under Criterion D, occurs within the project area but would be avoided by construction. Section 106 consultation for this undertaking resulted in a finding that Site AZ A:1:11 would not be adversely affected by project activities. Archaeological sites that derive their significance primarily from what can be learned by data recovery and have minimal value for preservation in place are exceptions to the requirement for Section 4(f) approval (23 CFR § 774.13(b)). This exception applies to Site AZ A:1:11. The officials with jurisdiction over the site (SHPO and BLM) were notified of FHWA's finding that Site AZ A:1:11 is excepted from the requirement for approval under Section 4(f) and did not object to that finding. The Old Spanish National Historic Trail and the Jedidiah Smith Historic trail alignments cross the project area just west of Bridge No. 1. Neither of the trails has a distinct, visible path, marker, or associated features that could be affected by the project. The project would not modify the use or character of the area. No impact to either trail would occur. National Historic Trails are not afforded protection under Section 4(f) unless the land or site is deemed to be of historical significance. According to National Park Service, the portions of the trails within the study area are not identified as "high potential segments" (JJensen [NPS] to GLuhnow [Jacobs] on 09/01/2017). Thus no Section 4(f) resources occur within the project area.

4.6 Air Quality Analysis

4.6.1 Affected Environment

Air Quality Standards

The Federal Clean Air Act (CAA) of 1970 was the first comprehensive legislation aimed at reducing levels of air pollution throughout the country. The 1970 law required the EPA to establish National Ambient Air Quality Standards (NAAQS), which set maximum allowable concentrations for seven criteria pollutants: carbon monoxide (CO), ozone (O₃), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter less

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than or equal to 2.5 microns in diameter and less than or equal to 10 microns in diameter (PM_{2.5} and PM₁₀), and lead (Pb) (Table 8).

Table 8. National Ambient Air Quality Standards

Pollutant	Averaging Time	Primary Standard	Secondary Standard
Carbon monoxide (CO)	1-hour	35 ppm	NS
	8-hour	9 ppm	NS
Nitrogen dioxide (NO ₂)	1-hour	0.1 ppm	NS
	Annual	0.053 ppm	0.053 ppm
Ozone (O ₃)	8-hour (1997 standard)	0.08 ppm ^a	0.08 ppm
	8-hour (2008 standard)	0.075 ppm ^a	0.075 ppm
Particulate matter (PM ₁₀)	24-hour	150 µg/m ³	150 µg/m ³
Fine particulate matter (PM _{2.5})	24-hour	35 µg/m ³	35 µg/m ³
	Annual	12 µg/m ³	15 µg/m ³
Sulfur dioxide (SO ₂)	1-hour	0.075 ppm	NS
	3-hour	NS	0.5 ppm
Lead (Pb)	Rolling 3-month average (2008 standard)	0.15 µg/m ³	0.15 µg/m ³
	Quarterly	1.5 µg/m ³	1.5 µg/m ³

Notes: µg/m³ = micrograms per cubic meter; NS = no standard; PPM = parts per million.

^a Based on a 3-year average of the fourth highest concentration.

Source: 40 CFR 50.

The EPA is required to periodically review the NAAQS and modify each of the standards as necessary.

The EPA recently modified the NAAQS for O₃ based on new studies that showed a lower level was needed to protect public health. The EPA also regulates air toxics. Most air toxics originate from human-made sources including vehicles, airplanes, dry-cleaning equipment, factories, and refineries. Pollutants typically associated with vehicle traffic are CO, O₃, nitrogen oxides (NO_x), PM_{2.5}, and PM₁₀.

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The CAA Amendments of 1990 authorized the EPA to designate areas that do not meet the NAAQS as nonattainment areas and to classify them according to their degree of severity. For locations designated as nonattainment areas, the State Implementation Plan (SIP) must outline actions required to achieve compliance with the NAAQS. Projects in designated nonattainment areas must demonstrate conformance with the SIP and STIP. Alternative 1 is included in the Arizona FY 2015-2019 STIP (FHWA 2014a). Attainment status indicates that air quality in an area meets the NAAQS for a criteria pollutant. Currently, the study area is in attainment with NAAQS for all seven criteria pollutants, as it is located in a region that has a very low population and the region is predominantly public land under the jurisdiction of BLM.

The Lake Havasu City-Kingman Metropolitan Statistical Area (MSA) is the closest MSA to the study area with sufficient population to require an air quality monitoring station for criteria pollutants. A station at the U.S. Post Office Building in Bullhead City, located approximately 125 miles southwest of the study area, monitors ambient PM₁₀ concentrations (ADEQ 2013). The Meadview monitoring station, located approximately 60 miles south of the study area where the Grand Canyon meets Lake Mead, monitors regional haze as part of the Interagency Monitoring of Protected Visual Environments program.

Mobile Source Air Toxics

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

Mobile source air toxics (MSATs) are a subset of the 188 air toxics defined under the CAA. MSATs are emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted into the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air

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toxics also result from engine wear or from impurities in oil or gasoline. Of the 21 MSATs, a subset of seven compounds has been designated by the EPA as priority MSATs. These are acrolein; benzene; 1,3-butadiene; diesel particulate matter plus diesel exhaust organic gases (diesel particulate emissions); formaldehyde; naphthalene; and polycyclic organic matter.

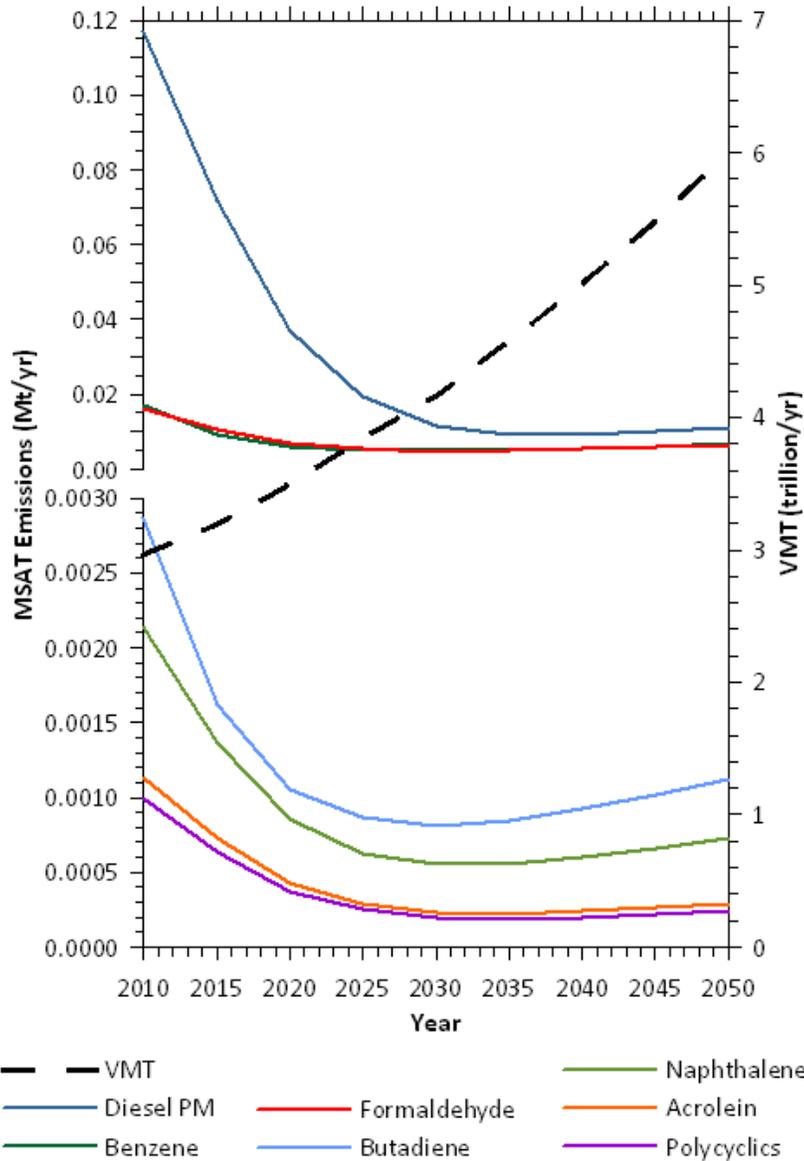
The EPA is the lead federal agency for administering the CAA and has certain responsibilities regarding the health effects of MSATs. The EPA has examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline program, its national low emission vehicle standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy-duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. According to an FHWA analysis using the EPA MOVES2010b model, even if vehicle activity (VMT) increases by 102 percent as assumed, a combined reduction of 83 percent in the total annual emission rate for the priority MSATs is projected from 2010 to 2050 (Figure 9). This is because future reductions realized by new cleaner burning vehicles operating on reformulated fuels would replace older vehicles and are anticipated to significantly offset future increases in emissions associated with a larger fleet size and increased VMT (FHWA 2012).

In February 2007, the U.S. EPA issued a final rule to reduce hazardous air pollutants from mobile sources. The final standards lower emissions of benzene and other air toxics in three ways: (1) by lowering the benzene content in gasoline, (2) by reducing exhaust emissions from passenger vehicles operated at cold temperatures, and (3) by reducing emissions that evaporate from, and permeate through, portable fuel containers.

Beginning in 2011, EPA began requiring refiners to meet an annual average gasoline benzene content of 0.62 percent by volume on all gasoline (the national benzene content of gasoline today is about 1.0 percent by volume) under this rule. In addition, EPA has adopted new standards to reduce non-

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methane hydrocarbon exhaust emissions from new gasoline-fueled passenger vehicles at colder temperatures below 75 degrees Fahrenheit (°F). Non-methane hydrocarbons include many MSATs, such as benzene. Finally, the February 2007 rule establishes standards that would limit hydrocarbon emissions that evaporate or permeate through portable fuel containers, such as gas cans.



Source: FHWA 2012.

Figure 9. National MSAT Emission Trends 1999-2050 for Vehicles Operating on Roadways Using EPA's MOBILE 6.2 Model

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EPA expects that the new fuel benzene standard and hydrocarbon standards for vehicles and gas cans would together reduce total emissions of MSATs by 330,000 tons in 2030, including 61,000 tons of benzene. As a result of this rule, new passenger vehicles would emit 45 percent less benzene; gas cans would emit 78 percent less benzene; and gasoline would have 38 percent less benzene overall. In addition, the hydrocarbon reductions from the vehicle and gas can standards would reduce volatile organic compound (VOC) emissions (which are precursors to ozone and can be precursors to PM_{2.5}) by over 1 million tons in 2030. The vehicle standards would reduce direct PM_{2.5} emissions by 19,000 tons in 2030 and could also reduce secondary formations of PM_{2.5}. Once the regulation is fully implemented, EPA estimates that these PM reductions would prevent nearly 900 premature deaths annually.

Greenhouse Gases

Greenhouse gases trap the sun's energy in the earth's atmosphere by absorbing and reflecting some of it to earth rather than allowing the energy to escape back to space. This is called the "greenhouse effect." Without the greenhouse effect, the earth would be too cold to support life. Natural cycles of warming and cooling have occurred throughout the earth's history.

However, increased levels of greenhouse gases in the atmosphere from human activities may have intensified the greenhouse effect beyond what can be attributed to these natural cycles, leading to increases in the average global temperature. Combustion of fossil fuels is a primary source of greenhouse gases, including CO₂, methane (CH₄), and nitrous oxide (N₂O). The emission of fluorinated gases from industrial processes is also a major human-made contributor to greenhouse gases.

- ▶ CO₂ enters the atmosphere through burning fossil fuels (coal, natural gas, and oil), solid waste, trees, and wood products. It also enters the atmosphere as a result of certain chemical reactions (e.g., manufacturing of cement). CO₂ is removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.

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- ▶ CH₄ is emitted during the production and transport of coal, natural gas, and oil. CH₄ emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- ▶ N₂O is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- ▶ Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for stratospheric O₃-depleting substances (e.g., chlorofluorocarbons, hydrochloro-fluorocarbons, and halons). These gases are typically emitted in smaller quantities, but because they are potent greenhouse gasses, they are sometimes referred to as high global warming potential gases.

The transportation sector accounts for approximately 26 percent of human-caused greenhouse gases emissions in the United States (EPA 2016). On a global scale, 14 percent of 2010 global greenhouse gas emissions were generated by burning fossil fuels associated with transportation (EPA 2016). These estimates do not include emissions from the production of fuel and vehicles and the construction and maintenance of infrastructure.

Changes in temperature and weather patterns resulting from systems such as the greenhouse effect are known as climate change. While difficult to predict with certainty, the consequences of climate change can be very serious. The four primary ways to reduce greenhouse gas emissions from transportation are to:

- ▶ **Improve System and Operational Efficiencies.** Traffic flow improvements can be achieved through intelligent transportation systems, route optimization, congestion pricing, and enhanced intermodal links and system connectivity. Operational efficiencies can be achieved

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through improving vehicle maintenance and reducing idling of freight vehicles, which, for example, can be done by installing auxiliary power units and truck-stop electrification systems to save fuel and reduce emissions.

- ▶ **Reduce Growth of VMT.** Implementing land-use strategies that help to concentrate development can lessen the need to drive. The number of vehicle trips can also be reduced by providing high-occupancy-vehicle lanes, transit options, and pedestrian and bicycle facilities and by promoting travel demand management programs and telecommuting. Pricing mechanisms, such as road pricing and mileage-based car insurance, can also motivate people to drive less. While these strategies can be effective in more densely populated urban and suburban areas, their effectiveness in rural areas, such as the Arizona Strip, would have limited to no effect.
- ▶ **Transition to Lower-Greenhouse Gas Fuels.** Gasoline and diesel can be replaced with fuel such as biodiesel and natural gas, which can emit fewer greenhouse gases over their lifecycle from production to final use.
- ▶ **Improve Vehicle Technologies.** The development of more fuel-efficient vehicles can be promoted through policy decisions, tax credit programs, and fee rebates.

From a policy standpoint, FHWA's current approach on the issue of global warming is as follows: to date, no national standards have been established regarding greenhouse gases, nor has EPA established criteria or thresholds for greenhouse gas emissions. On April 2, 2007, the Supreme Court issued a decision in *Massachusetts et al. v. Environmental Protection Agency et al.* that the EPA does have authority under the CAA to establish motor vehicle emissions standards for carbon dioxide emissions. The EPA is currently determining the implications to national policies and programs as a result of the Supreme Court decision. However, the Court's decision did not have any direct implications on requirements for developing transportation projects.

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FHWA does not believe it is informative at this point to consider greenhouse gas emissions in an EA. The climate impacts of carbon dioxide emissions are global in nature. Analyzing how alternatives evaluated in an EA might vary in their relatively small contribution to a global problem would not better inform decisions. Furthermore, due to the interactions between elements of the transportation system as a whole, emissions analyses would be less informative than analyses conducted at regional, state, or national levels. Because of these concerns, FHWA concludes that this EA cannot usefully evaluate carbon dioxide emissions in the same way that it addresses other vehicle emissions.

FHWA is actively engaged in many other activities with the Department of Transportation Center for Climate Change to develop strategies to reduce transportation's contribution to greenhouse gases—particularly carbon dioxide emissions—and to assess the risks to transportation systems and services from climate change. FHWA will continue to pursue these efforts as productive steps to address this important issue. FHWA will review and update its approach to climate change at both the project and policy level as more information emerges and as policies and legal requirements evolve.

Transportation Conformity

As described in 40 CFR 93.116(a), all FHWA projects must have a project-level conformity determination in nonattainment and maintenance areas. The study area is located in an attainment area for all seven criteria pollutants for which the EPA has established NAAQS. Furthermore, 40 CFR 93.126 includes “widening of narrow pavements or reconstructing bridges (no additional travel lanes)” in a list of projects that are exempt from a conformity determination. Therefore, a demonstration of transportation conformity is not required.

4.6.2 Environmental Consequences

Although technical shortcomings of emission and dispersion models have been reduced with the release of the MOVES model, uncertain science with respect to health effects prevent meaningful and reliable

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estimates of MSAT emissions and related impacts (see Appendix D, *Methodology Limitations for Assessing Health Impacts of Mobile Source Air Toxics*). However, future MSAT emission levels for this project can be qualitatively assessed (although a qualitative analysis cannot identify and measure health impacts) and can provide a basis for identifying and comparing the potential differences in MSAT emissions, if any, between alternatives.

The qualitative assessment presented below is derived in part from a study conducted by the FHWA titled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives* (Claggett and Miller 2006). For each alternative analyzed in the EA, the amount of MSATs emitted would be proportional to the VMT, assuming that other variables, such as fleet mix, would be the same for each alternative. VMT projections are the product of project-specific average daily traffic (ADT) volumes and distances. Current estimated ADT for I-15 at Bridge No. 1 is 19,296 vpd, with 23 percent of this being truck traffic. Projected ADT for 2040 is 34,169 (ADOT 2012b). Despite the approximate 73 percent increase in traffic volumes, I-15 in the study area would continue to operate at a LOS B, which is a stable flow traffic condition.

Alternative 1 – Bridge Widening and Rehabilitation

The purpose of this project is to repair structural deficiencies and widen the shoulders of Bridge No. 1 by constructing a new, wider superstructure and additional piers to support the larger structure. This project has been determined to generate minimal air quality impacts for CAA criteria pollutants and has not been linked with any special MSAT concerns. As such, this project would not result in changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause an increase in MSAT impacts of the project from that of the No-Build Alternative.

Moreover, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national

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trends with EPA's MOVES model forecasts a combined reduction of over 80 percent in the total annual emission rate for the priority MSAT from 2010 to 2050 while vehicle-miles of travel are projected to increase by over 100 percent. This would both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project.

Traffic would be shifted to one side of Bridge No. 1 during construction, which would increase vehicle delays and could generate a temporary increase in MSAT emissions. Project-level assessments that render a decision to pursue construction emission mitigation would benefit from a number of technologies and operational practices that should help lower short-term MSATs.

Construction mitigation would include strategies that reduce engine activity or reduce emissions per unit of operating time. ADOT's Standard Specifications for Road and Bridge Construction, Section 104 Scope of Work, Subsection 08 Prevention of Air and Noise Pollution, include ways to reduce or redirect work and maintain traffic during construction (ADOT 2008). Also, technological adjustments to equipment, such as off-road dump trucks and bulldozers, are appropriate strategies to reduce construction emissions. The technological fixes include particulate matter traps, oxidation catalysts, and other devices that provide an after-treatment of exhaust emissions. The use of clean fuels, such as ultra-low sulfur diesel, is also a very cost-effective strategy.

Some temporary emissions would occur from the operation of construction equipment, use of unpaved access roads, and the slower traffic speeds associated with the project. However, this localized condition would be discontinued when the construction is completed. Short-term impacts due to particulate matter or dust emissions that may occur during the construction phase would be reduced through the use of standard practices such as watering or other dust control measures.

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Alternative 2 – Bridge Reconstruction in Place

Impacts associated with Alternative 2 would be the same as described under Alternative 1. As with Alternative 1, Alternative 2 would result in minor, localized increases in vehicle emissions during construction compared to existing conditions due to slower traffic and the operation of construction equipment. Once construction is complete, these temporary impacts would no longer occur. No long-term impacts would occur.

Alternative 3 – No Build Alternative

Under the No Build Alternative, the widening of Bridge No. 1 deck and roadway approaches would not occur, and roadway capacity would remain unchanged. VMT on I-15 is expected to increase due to a projected increase in ADT through 2040 in the study area. However, similar VMT estimates and MSAT emissions compared to Alternative 1 would be expected to occur. Any increases in MSAT emissions for the No Build Alternative compared to existing levels would be offset by EPA regulations for vehicle engines and fuels, which are anticipated to cause future regional MSAT emissions to decline substantially. In addition, temporary emissions from the operation of construction equipment and the slower traffic speeds associated with the project would not occur.

If the Bridge No. 1 is not repaired, weight restrictions would be implemented that would require up to 20 percent of the truck traffic to take alternate routes. While this would reduce vehicle emissions within the project area, trucks using alternate routes may emit pollutants within the same air basin. If the alternate routes are longer, which is likely, diesel emissions may increase, resulting in a minor long-term adverse impact on air quality.

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4.6.3 Mitigation Measures

The following preliminary mitigation measures are recommended to minimize impacts to air quality:

- ▶ In order to minimize emissions generated by traffic during construction, traffic disruption would be limited, especially during peak travel periods.
- ▶ The contractor would comply with all state and local air quality and dust control rules, regulations and ordinances which apply to any work performed pursuant to the contract.

4.6.4 Conclusion

The study area is in attainment of all seven criteria pollutants for which EPA has established NAAQS. Furthermore, 40 CFR 93.126 includes “widening of narrow pavements or reconstructing bridges (no additional travel lanes)” in a list of projects that are exempt from a conformity determination.

Alternative 1 would not result in the construction of additional travel lanes and would meet the intent of this exemption. Therefore, a demonstration of transportation conformity is not required.

The increase in future MSATs over existing levels would be identical for Alternative 1, Alternative 2, and the No Build Alternative. Any increases in MSAT emissions for the three alternatives compared to existing levels would be offset by EPA regulations for vehicle engines and fuels, which are anticipated to cause future regional MSAT emissions to decline substantially.

One of the greenhouse gas-reducing strategies currently available is improved operational efficiency of the Interstate. Alternative 1 and Alternative 2 may help reduce greenhouse gas emissions through improved operational efficiencies for traffic crossing Bridge No. 1, whereas the No Build Alternative would eventually require trucks to take longer alternate routes, which would result in increased greenhouse gas emissions over existing conditions. Some temporary emissions would occur from the operation of construction equipment and the slower traffic speeds. However, this localized condition

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would be discontinued when construction is complete. Short-term impacts due to particulate matter or dust emissions would be reduced through the use of standard practices.

4.7 Noise Analysis

4.7.1 Affected Environment

Sound is created when an object vibrates and radiates part of its energy as acoustic pressure or waves through a medium, such as air, water, or a solid object. Sound levels are expressed in units called decibels (dB). Noise is generally defined as any loud or undesired sound, also expressed in dB. Since the human ear does not respond equally to all frequencies (or pitches), measured noise levels in dB at standard frequency bands are often adjusted or weighted to correspond to the frequency response of human hearing and the human perception of loudness. The weighted sound level corresponding to the human ear is designated as the "A"-weighted sound in decibels (dBA).

The ability of an average individual to perceive changes in noise levels is well documented. Changes in noise levels of 3 dBA would be barely perceived by most listeners, whereas a 10-dBA change (generally, a doubling of noise levels) would be noticed by most listeners. Most noise criteria are based upon the general principle that a perceptible noise change is likely to cause annoyance wherever it intrudes upon the existing noise from all other sources. (Annoyance depends upon the noise that exists before the introduction of a new sound.) Typical sound levels experienced by people range from about 40 dBA, the daytime level in a typical quiet living room, to 85 dBA, the approximate level occurring near the sidewalk adjacent to heavy traffic.

To assess impacts from a proposed action, noise-sensitive land uses and activities in the vicinity of transportation projects must first be identified. Anticipated changes in noise levels for sensitive areas must be identified during design hour conditions when the noise levels are expected to be the highest.

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Table 9 displays the FHWA Noise Abatement Criteria (NAC) for varying land activity categories as presented in *Procedures for the Abatement of Highway Traffic and Construction Noise* (FHWA 2011b).

Table 9. Federal Highway Administration Noise Abatement Criteria

Activity Category	L_{Aeq1h}^a (dBA)	Activity Description
A	57 (Exterior)	Land on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 (Exterior)	Residential
C	67 (Exterior)	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio structures, recording studios, schools, and television studios
E	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in categories A–D or F
F	—	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	—	Undeveloped lands that are not permitted

Notes: Activity categories B, C, and E include undeveloped lands permitted for each activity category.

dBA = A-weighted decibels.

^a L_{Aeq1h} is the one hour equivalent in A-weighted decibels, which is the logarithmic average of noise over a 1-hour period.

Sources: FHWA 2011b; 23 CFR 772.

The criteria specify noise levels considered to be the upper levels of acceptability for outdoor and certain indoor activities. ADOT also adopted a *Noise Abatement Policy*, which indicates that a traffic noise impact occurs under either of the following conditions:

- ▶ When the predicted level approaches or exceeds FHWA’s NAC. “Approaches” is defined as within 3 dBA of the NAC, or greater than 64 dBA for one-hour, A-weighted energy equivalent sound level (L_{Aeq1h}) for residential areas, schools, and parks; or
- ▶ When the predicted level substantially exceeds the existing noise level. “Substantial” is defined as 15 dBA or greater (ADOT 2011).

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If an impact is predicted, then FHWA's procedures and ADOT policy indicate that abatement mitigation is to be considered. Noise abatement measures must be both reasonable and feasible.

The study area is located in remote northwest Arizona, and it experiences relatively low ambient noise levels consistent with open lands and rural development. I-15 is the primary noise generator, producing highway traffic noise within the study area. I-15 bisects two rural communities, Littlefield and Beaver Dam, which includes uses grouped in Categories B, C, D, and E. The closest Category B (residential) use is a single-family home located approximately 750 feet north of the project area along East Kokopeli Drive.

The Virgin River is used by recreationalists including kayakers and rafters as well as people hiking, wading, etc. Such use is infrequent and largely confined to periods of higher flows in the spring. This area is appropriately described under Activity Category C.

4.7.2 Environmental Consequences

Under 23 CFR 772.5, a project is categorized as Type I, Type II, or Type III, with a traffic noise analysis being required for all Type I projects. A Type I project would include construction of a highway on a new location; substantial physical alteration of the highway horizontal or vertical alignment; addition of new through lanes, high-occupancy-vehicle lanes, or auxiliary lanes; the addition or relocation of interchange lanes or ramps; restriping of existing pavement for the purpose of adding a through-traffic lane or auxiliary lane; or the addition of a new or substantial alteration of a weigh stations, rest stops, ride share lots, or toll plazas.

Type II projects are for noise abatement of an existing facility. Type III projects do not meet the classifications of Type I or Type II projects and do not require a noise analysis (23 CFR 772.7[f]). This project would widen the bridge deck to accommodate inside and outside shoulders and does not

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include any of the previously listed attributes for Type I or II projects. Therefore, this project is a Type III project, and a traffic noise analysis is not required.

Construction noise lasts for the duration of the construction contract, and it is usually limited to daylight hours when most human activity occurs. Construction activities are generally of a short-term nature, and depending on the nature of construction operations, could last from seconds (e.g., a truck passing a customer) to months (e.g., constructing a bridge). Construction noise also is intermittent and depends on the type of operation, location, and function of the equipment, and the equipment usage cycle.

Alternative 1 – Bridge Widening and Rehabilitation

Under Alternative 1, Activity Category A, B, C, D, and E noise-sensitive land uses within the study area would not experience any additional long-term traffic noise impacts. Construction would result in minor intermittent increases in noise along the northeast access routes due to increased traffic on the exiting and/or newly constructed access roads. These impacts would occur primarily during daylight hours. Use of the access road would be heaviest when the construction equipment is initially brought into the project area and again when it is removed. Once down in the floodplain it is anticipated to remain for the duration of its use. Contractor pickup trucks may make several trips along the access road per day when construction is active. This increased traffic along the access route would result in a negligible, intermittent impact that would cease at the end of construction. The increase in noise would not result in noise levels at the residential receivers to approach the Category B noise threshold.

Alternative 2 – Bridge Reconstruction in Place

Alternative 2 impacts are the same as described for Alternative 1. No long-term noise impacts would occur and construction (short-term) impacts would be minor and intermittent as described above.

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Alternative 3 – No Build Alternative

Under the No Build Alternative, no bridge construction would occur, but occasional maintenance projects would take place to keep Bridge No. 1 serviceable. Maintenance noise would be negligible. Minor decreases in traffic noise would potentially occur within the project area if a weight limit on the bridge was instituted.

4.7.3 Mitigation Measures

BLM's objectives for managing noise as outlined in the Arizona Strip Field Office RMP, are to preserve or protect natural quiet and natural sounds, where practicable (BLM 2008a). Therefore, the following mitigation measures are recommended to minimize construction noise:

- ▶ The contractor would ensure all exhaust systems on equipment would be in good working order. Properly designed engine enclosures and intake silencers would be used where appropriate.

4.7.4 Conclusion

Alternative 1 and Alternative 2 are Type III projects and do not require a traffic noise analysis in accordance with 23 CFR 772.7(f). Noise-sensitive land uses, as defined by 23 CFR 772.11(c)(2) and listed in Table 9, include Activity Categories A, B, C, D, and E. No additional long-term traffic noise impacts to these land uses would occur under Alternative 1 or Alternative 2.

Construction activities would temporarily increase noise levels in the study area; however, measures to reduce construction-related noise would contribute to quieter construction conditions than if no measures were implemented.

Negligible amounts of noise would be generated during intermittent maintenance activities, which would keep I-15 and Bridge No. 1 serviceable under the No Build Alternative. Minor long-term decreases

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in noise would potentially occur if a weight restriction on the bridge required some truck traffic to use alternate routes away from the project area.

4.8 Utilities

4.8.1 Affected Environment

Utilities occur within the Bridge No. 1 project limits, and some utilities are attached to the bridge structure. Utilities identified in the project area are provided in Table 10.

Table 10. Utilities Occurring in the Project Area

Facility Owner	Facility Type
ADOT	Road Weather Information System, Variable Message Sign, lighting, traffic signals, culvert/storm drain
Baja Broadband	Cable television, communications, fiber optic, telecom
Rio Virgin Telephone Company	Coaxial, fiber optic
Dixie Escalante Rural Electric	Electric
DS Water Company	Water
Virgin River Domestic Water Improvement District	Sewer

4.8.2 Environmental Consequences

Alternative 1

Construction of Alternative 1 is anticipated to require the relocation of utilities, which could include underground electric and communication lines; buried telephone cables; and water, sewer, drainage, and fiber optic lines. The need to relocate utilities would be further examined during the design phase of the project. During this examination, it would be determined who would perform the needed relocation, how any affected users would be contacted, and if on BLM land, what action(s) the BLM may need to take to authorize the relocation. The preparation and use of the access routes is not anticipated to affect utilities. No adverse impact on utilities or utility customers is anticipated to occur.

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Alternative 2 – Bridge Reconstruction in Place

Impacts associated with Alternative 2 would be the same as described for Alternative 1. Relocations are anticipated to be needed, but no impact to the utilities' customers is anticipated.

Alternative 3 – No Build Alternative

Under the No Build Alternative, maintenance projects could require adjusting utilities attached to the bridge if in conflict with future maintenance projects. Any adjustments would be coordinated with the utility companies and the BLM (if relocation on BLM land is necessary). No impact on utilities would occur.

4.8.3 Mitigation Measures

The following mitigation measures are recommended to minimize impacts to Utilities and the BLM in the study area:

- ▶ During final design, the District would coordinate relocation of utilities with the affected utility companies and, when applicable, with the BLM.
- ▶ If service disruption would be required for utility relocation, the District would coordinate with the utility companies to ensure customers are notified 14 days prior to service disruption.

4.8.4 Conclusion

Selection of Alternative 1 or Alternative 2 would require utility relocations. During the design process, ADOT would further investigate utility involvement, verify the need for relocation, and coordinate the accommodation of utilities with the proposed improvements. No relocation of utilities would likely be required under the No Build Alternative.

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4.9 Visual Resources

4.9.1 Regulatory Background

A visual assessment was conducted in accordance with the following FHWA and BLM guidance:

- ▶ U.S. Department of Transportation Order 5610.1c establishing general requirements for environmental impacts
- ▶ 23 CFR 771, Environmental Impact and Related Procedures
- ▶ FHWA's *Visual Impacts Assessment for Highway Projects* (FHWA 1988)
- ▶ BLM Handbook H8431-1, Visual Resource Contrast Rating

Relevant local and regional planning documents that apply to the study area include BLM's Arizona Strip Field Office RMP (BLM 2008a), *The Virgin River Communities Area Plan* (Mohave County 1998), and *Mohave County, Arizona General Plan* (Mohave County 2010). While I-15 is not a designated Arizona scenic road or byway, Mohave County identifies I-15 as a scenic route in its general plan. One of the stated goals is to preserve, protect, and enhance scenic routes via policies that guide roadway design toward minimizing impacts on natural topographic features.

BLM manages scenic values through the Visual Resource Management (VRM) System which provides classifications and objectives that dictate the level of visual change allowed for a given area. Land under BLM jurisdiction is designated one of the following four VRM management classes:

- ▶ **Class I:** The objective of this class is to preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention.
- ▶ **Class II:** The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low.

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- ▶ **Class III:** The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.
- ▶ **Class IV:** The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.

As the underlying land manager in portions of the study area, BLM must concur with an analysis of potential project impacts.

The FHWA method of visual resource analysis consists of assessing changes in visual quality based on three primary criteria:

- ▶ **Vividness** is the visual power or memorability of landscape components as they combine in distinctive visual patterns.
- ▶ **Intactness** is the visual integrity of the natural and man-built landscape and its freedom from encroaching elements.
- ▶ **Unity** is the visual coherence and compositional harmony of the landscape considered as a whole.

For roadway and bridge construction projects, visual resources are considered from the vantage point of user groups likely to be in the study area. This approach typically results in two perspectives: (1) the motorists' view from the roadway and (2) the view of the roadway from surrounding areas. Visual resources and effects to these resources are defined by identifying key views and considering community goals and preferences as evidenced in the applicable planning documents.

4.9.2 Affected Environment

Since portions of the study area are under the jurisdiction of BLM, both the FHWA and BLM visual impact methods were used to evaluate changes to the visual character. Per the FHWA indices of

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vividness, intactness, and unity, the overall visual quality rating of the existing condition in the study area is considered “moderate/average.” BLM areas adjacent to or near the I-15 corridor are managed as VRM Class II and Class III (Figure 10). Five key observation points (KOPs) were identified from which to evaluate the existing visual character, as shown on Figure 10 and in the Figure 11 photographs. The KOPs represent views experienced by motorists, recreational river users, and residents.

The visual characteristics from the perspective of the residences northeast of and overlooking the bridge are varied. Hills and vegetation are predominant in the foreground, while the midground view is partially dominated by the bridge and the bluffs adjacent to the western edge of the bridge, along with the river and associated floodplain. Background views include the receding Virgin Mountains. Residential viewers’ attention is primarily drawn to the interesting contrast of the river, the vegetation on the river floodplain, and the reddish colors on the bluffs, which have a moderate level of intactness. The man-made features of the road and transmission line structures detract from the view of the natural landscape in the midground, but the river floodplain continues to dominate the view overall. Vegetation consists of grasses and shrubs throughout the river floodplain, with some large cottonwood trees in the far midground. The overall visual quality rating for this viewpoint is Moderate/Average.

The visual character of the study area from the motorist’s perspective consists primarily of open views with widely scattered rural development north and south of I-15 and rolling hills leading to mountains in the background. The visual character of the study area from the river user’s perspective primarily consists of views of the winding river corridor, which is generally wide, with intermittent bluffs and open desert, and shrubs, cattails, reeds, and grasses along the banks of the river that appear in occasional dense patches, alternately obscuring and revealing the floodplain banks and walls and the piers of the bridge. The study area landscape consists of warm temperate desert land, and vegetation is generally

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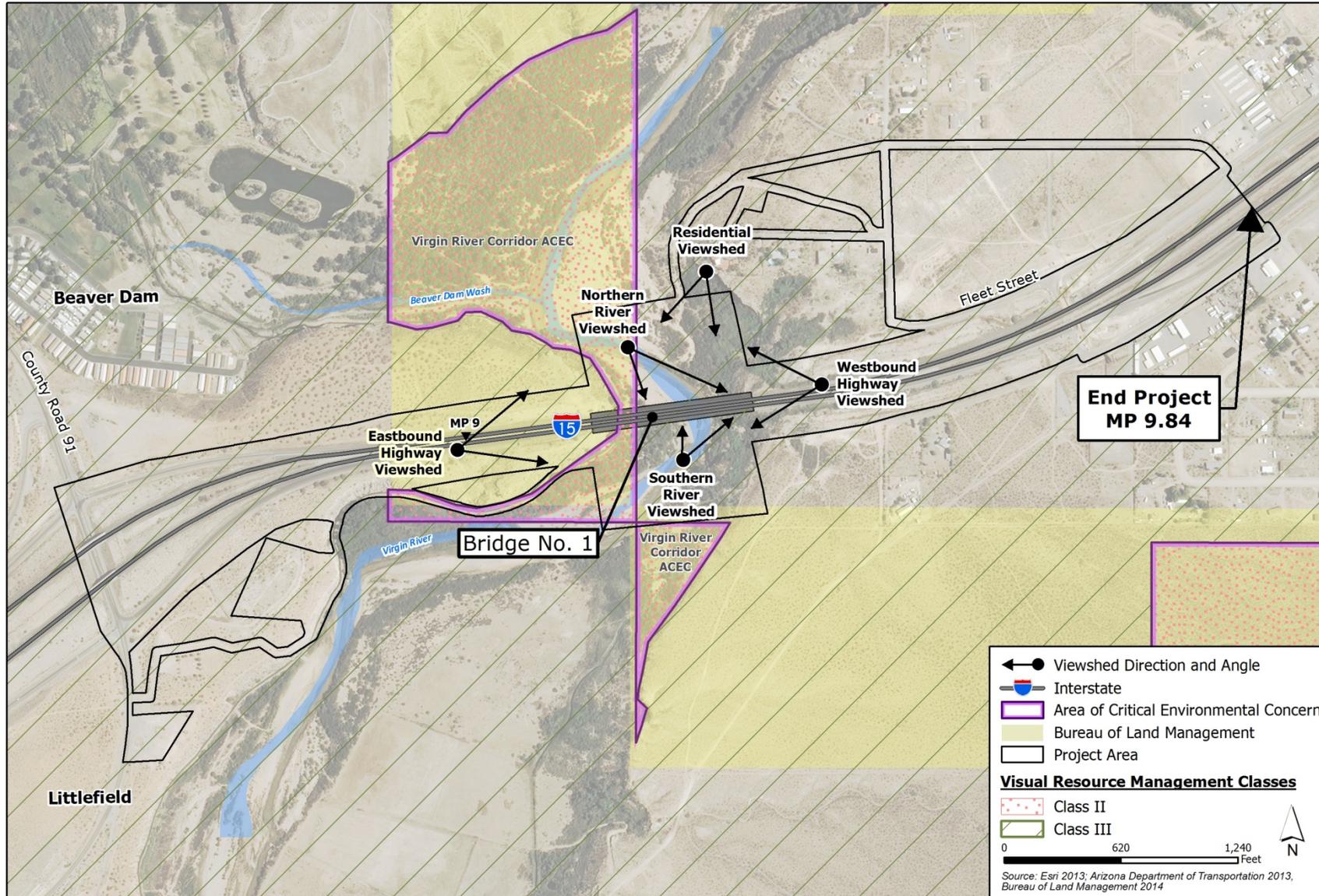


Figure 10. Key Observation Point Locations and Visual Resource Management Classes

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Looking toward Bridge No. 1 from residents' perspective



From I-15 southbound from motorists' perspective



From I-15 northbound from motorists' perspective



South along the Virgin River from the recreationalists' perspective

Figure 11. Five Key Observation Points

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North along the Virgin River from the recreationalists' perspective

Figure 11. Five Key Observation Points (continued)

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widespread along the river. Views of the Virgin River and the associated floodplain are limited and brief in duration for highway travelers.

For recreational river users, the underside of the bridge structure is visible, and the floodplain walls and hillsides are partially visible from this viewpoint. Shrubs, cattails, reeds, and grasses along the banks of the river appear in occasional dense patches, alternately obscuring and revealing the floodplain banks and walls and the piers of the bridge. The surrounding hills are somewhat obstructed by the bridge and the bridge piers. "Little Jamaica" is visible from the river. Above the walls of the floodplain in the background are the Virgin Mountains. Background views for recreationalists on the river are constrained because the river rounds a curve as it passes underneath the bridge. Overall, the combined natural and man-made view has visual integrity because the bridge structure is neutrally colored and blends well with the natural landscape. The bridge structure itself, however, is large and dominant and disrupts the overall visual coherence of the area. Approximately 60 percent of this view is dominated by the bridge. Water levels in the river vary depending upon time of year and rainfall, which may reduce or increase the visual dominance of the bridge in the foreground. However, while the bridge structure is a visually intrusive feature, it is generally unified and intact. The overall visual quality rating for this view is considered Moderate/Average. The BLM concurred with the characterization of the project area via e-mail (JJasper [BLM] to JWennes [ADOT] on 02/04/2016).

4.9.3 Environmental Consequences

Alternative 1 – Bridge Widening and Rehabilitation

Under Alternative 1, both temporary and long-term impacts would occur that would affect the visual setting of the project area. Temporary impacts include the removal of vegetation within the 105 acre area, constructing/improving access roads and staging areas, and the presence of construction equipment and supplies. Following construction, access roads, staging area, and the disturbed area

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under the bridge would be restored to pre-construction elevations and all disturbed areas except the active river channel would be reseeded and stabilized. Because these impacts would be temporary and would revert over time to their pre-construction condition, these temporary impacts are not included in the evaluation of impacts to visual resources.

Under Alternative 1, the bridge would remain as the dominant visual feature. Bridge construction would use similar concrete forms, textures, and colors to the existing structure. The primary elements of Alternative 1 that could introduce long-term changes to the visual setting are:

- ▶ Widening Bridge No. 1 approximately 30 feet
- ▶ Constructing new columns on each side (upstream and downstream) of each set of piers
- ▶ Replacing the existing girders with new weathered steel girders
- ▶ Widening the roadway approaches up to 30 feet
- ▶ Removing "Little Jamaica," and either fencing the area and posting no trespassing signs or placing large boulders around the spring to reduce diversion of the water to create a pool

The new columns that would be constructed under Alternative 1 would introduce a new architectural element to the bridge but would be constructed of concrete and similar to the existing colors and textures of the bridge. This alternative would also use weathered steel girders, which would be visible on the sides and under the bridge. While the color would create some contrast with the color of the concrete, the weathered steel is consistent with the reddish-brown slopes and hills in the area so would blend with the surrounding areas. Weathered steel is less reflective than other steel options, minimizing the potential for glare.

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Under Alternative 1, the proposed changes to the bridge would not attract attention because the visual difference between the existing and proposed structure would be minimal. In addition, the basic elements, including the vividness of the surrounding landscape, would remain intact and continue to dominate the motorists' and river users' view. Like the existing bridge, the widened bridge would be visible to river users for only a short period of time as they approach and pass beneath Bridge No. 1 because curves in the river and the intervening hillsides obscure both upstream and downstream views of the structure. The widening of I-15 would result in a roadway with a slightly stronger presence; the natural landforms would still be interrupted by the human-made elements of the roadway, but the degree of visual cohesion would be similar to existing conditions. The degree of contrast the reconstructed bridge would have with the surrounding landscape would be comparable to existing conditions. The visual contrast of the concrete would diminish over the first year following construction as the new concrete weathers to similar colors and appearance as the existing concrete. The weathered steel portions of the structure, while different in color from the existing bridge, would blend well with the color of the surrounding landscape. Overall, Alternative 1 would have little effect on the vividness, intactness, and unity of the area and would result in a minor visual impact.

The removal of "Little Jamaica" would be evident to recreationalists from the river bottom. Once the sandbags and water diversions are removed, either the area would be fenced with a 12-foot steel fence and posted with no trespassing signs or boulders would be placed around the spring, as needed, to prevent diverting the water. The fence would be designed to blend with the surrounding area, but would introduce a new constructed visual element. This would result in a minor long-term adverse impact. As vegetation re-establishes, the fencing would be less prominent but would likely always be visible. The removal of the constructed pool and the return of natural flows to the hillside vegetation

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would result in more vigorous vegetation growth and may screen the fence from some views.

Alternatively, large boulders would be placed near the spring outfall to prevent the diversion and collection of the water and allow it to flow naturally downslope to the river. The boulders would be evident but would be of a natural material and irregular in shape and size. As with the fencing approach, allowing the water to flow down the slope would result in more vigorous vegetation growth. In time, vegetation growth around and within cracks of the boulders would minimize the visual contrast. Overall, either approach would ultimately enhance the vividness, intactness, and unity of the area. Visual changes associated with the removal of "Little Jamaica" would be balanced by the benefit that removing this use would likely reduce the amount of use of this particular area, including a reduction in damage to the natural environment and the deposition of trash and waste. The removal of "Little Jamaica" would likely result in fewer users coming to and lingering in the area, which would reduce the frequency and duration of the view of both the bridge and either the fencing or boulders.

BLM Visual Resource Management Objectives

Alternative 1 would be consistent with BLM's VRM Class II and Class III objectives for the study area. The level of change in color, line, form, and texture as a result of the widened bridge and roadway as compared to the existing landscape, roadway, and bridge would be very low. The Class II guidelines indicate that changes from construction may be seen but should not attract attention of the casual observer, and Class III guidelines allow for moderate changes to the characteristic landscape. The wider bridge, new columns, weathered steel, and roadway approaches are not expected to attract more attention than the existing bridge, piers, and roadway do currently. Because Alternative 1 would have only minor impacts on the visual character of the landscape from current conditions, it would be consistent with both BLM's Class II objective (retain the existing character of the landscape) and Class III objective (partially retain the existing character of the landscape) for the project area.

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Short-term visual impacts and contrast from construction would result in more pronounced temporary visual effects. However, disturbed areas would be reseeded and vegetation would eventually appear similar to the current state. Landforms within the project area would be restored to their pre-construction elevations, and landforms around the project area would remain unchanged. The use of weathered steel girders on Bridge No. 1 would create a minor amount of visual contrast within the bridge structure compared to current conditions. The impact would be minor given that only a small portion of the bridge would be of weathered steel, and the color is consistent with the colors naturally occurring in the project area. A benefit of weathered steel is that it minimizes the potential for glare due to sun reflecting off the metal. Over time, those who view the bridge regularly would cease to notice the visual difference. Those unfamiliar with the area would not be aware of the change. BLM concurred with the visual analysis that assessed Alternative 1 on 02/04/2016. Subsequently a decision to use weathered steel was made. ADOT coordinated this change with BLM on 02/28/2017 and 03/06/2017. BLM did not express concern at the use of this material (JJasper [BLM] to JWennes [ADOT] 02/28/2017 and 03/06/2017).

The removal of the pool and associated water diversions comprising "Little Jamaica" and the return of natural spring flows reaching the vegetation on the hillside would result in more vigorous localized vegetation growth which would improve the color, form, and texture of the hillside to which the water flow is restored. If "Little Jamaica" is fenced, it would introduce a new, linear built feature that is not consistent with the more organic form of the adjacent areas but is consistent with the linear features of the bridge. The fence and no trespassing signs would be noticeable from the river bottom. While visible, vegetation would re-establish which would minimize the effect. The fencing would be of a color that would minimize contrast with the surrounding area. The addition of the fencing with no trespassing signs is anticipated to result in a minor change in color, line, form, and texture that would decrease somewhat with time. The use of boulders would introduce an organic form that is varied in color, line,

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form, and texture. In time, the boulders would blend more naturally with the hillside as vegetation becomes established between and around the boulders. Either option would likely minimize the level of use of this area, which would likely reduce the amount of trash and hillslope damage, benefitting the visual character of the area. This portion of the project is within ADOT-owned ROW.

Alternative 2 – Bridge Reconstruction in Place

Where Alternative 1 would include new columns that would introduce a new shape to the project area, Alternative 2 would replicate the existing pier shape, texture, and appearance and would be architecturally closer to the existing visual conditions. Ultimately, two piers would replace each of the existing piers. Like Alternative 1, Alternative 2 would be constructed of a combination of concrete and weathered steel. All other impacts described in Alternative 1 would be the same for Alternative 2. Alternative 2 would retain the existing character of the landscape compared to current conditions and would therefore be consistent with both BLM's Class II and the less restrictive Class III VRM objectives for the project area. ADOT coordinated with BLM regarding the visual changes associated with Alternative 2 (JJasper [BLM] to JWennes [ADOT] 02/28/2017 and 03/06/2017). BLM had no concerns.

Alternative 3 – No Build Alternative

Under the No Build Alternative, the existing visual character of the study area would remain unchanged because Bridge No. 1 and roadway approaches would not be widened or reconstructed and no access road improvements would be constructed.

4.9.4 Mitigation Measures

Mitigation strategies would be set during final design and implemented during construction to minimize visual impacts that may result from Alternative 1 or Alternative 2. Some of the mitigation measures are derived from BLM's RMP (BLM 2008a) or were developed during agency coordination with BLM.

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General

- ▶ Prior to commencement of ground-disturbing or clearing activities, the Arizona Department of Transportation Engineer, Environmental Engineering Specialist, the contractor, the Environmental Planning representative, and the Bureau of Land Management Authorized Officer (435.688.3323) or his/her designee would walk the site and agree on the designated project area.
- ▶ Prior to commencement of ground-disturbing or clearing activities, the Arizona Department of Transportation Engineer would ensure that the designated project area has been clearly marked. The contractor would not conduct any activities outside of the designated project area without the approval of the Arizona Department of Transportation Engineer and Environmental Planning.

Landforms

- ▶ No blasting would occur for any portion of the project.
- ▶ The contractor would round and blend new slopes to mimic the existing contours and to highlight natural formations.
- ▶ The contractor would restore disturbed areas to existing elevations, topography, and landforms.
- ▶ At the intersections of cuts and natural grades, the contractor would adjust slopes to flow into each other or transition with the natural ground surfaces without noticeable breaks.
- ▶ All temporary construction fills, including, but not limited to, crane pads, the temporary bridge, and cofferdams would be removed in their entirety and affected areas would be returned to preconstruction elevations.
- ▶ All unnecessary roads would be reclaimed and closed upon termination of the project. Recontouring all cut slopes to approximately the original contour would be required. Reclaimed

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roads would be barricaded or signed to protect them until reclamation is achieved. All existing roads that require upgrading would be reclaimed to their original dimensions upon completion of the project. Exceptions would be approved in writing by the Bureau of Land Management Authorized Officer.

- ▶ Reclamation of all surface disturbances would be initiated upon completion of activities and the approval of the Bureau of Land Management Arizona Strip Field Office (435.688.3200).
Reclamation of disturbed areas would, to the extent practicable, include contouring disturbances to blend with the surrounding terrain, replacement of soil, smoothing and blending the original surface colors to minimize impacts to visual resources, and re-seeding the disturbed areas in accordance with an approved seed mix developed for this project.
- ▶ Construction and reclamation activities would be designed to minimize long-term impacts to natural lines, form, textures, and color contrast. Reclamation methods would avoid disturbing more area or exposing greater color contrast than occurred during construction of the project.

Structures

- ▶ During final design, Bureau of Land Management would be provided an opportunity to review the plans and materials to be used to verify they are consistent with the visual requirements for the corridor.

Vegetation

- ▶ The limits of clearing would be irregular and straight clearing lines would be avoided by varying the width of the area to be cleared or by leaving selected clumps of vegetation near the edge of the clearing limit. Vegetation outside of the specified clearing limits would be preserved and protected.

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- ▶ The contractor would seed areas of cut and fill upon construction completion with an approved seed mix developed for this project.

4.9.5 Conclusion

This analysis was undertaken to evaluate potential impacts to visual resources from construction on Bridge No. 1. Because land in the study area includes land under the jurisdiction of BLM, this analysis used both FHWA and BLM visual impact methods.

Ultimately, the bridge construction and associated access to the river bottom would not change the existing visual character of the study area. Bridge construction would result in similar style, scale, and materials as the current bridge. I-15 is already a major aspect of the landscape in the area. The wider bridge, roadway approaches, and slightly taller outside barriers common to Alternative 1 and Alternative 2 would not appreciably increase the interstate's degree of dominance in the landscape as a whole. Alternative 1 would introduce new columns on each side of the existing piers and Alternative 2 would replace each of the existing piers with two new piers that match the existing shape. Both Alternative 1 and Alternative 2 would use concrete and weathered steel girders on the bridge. The new bridge materials would temporarily and slightly increase the degree of contrast with the surrounding landscape, but would be similar in color to the surrounding landscape and would weather and patina over time. These changes would result in minor visual impacts. The visual change associated with improving the existing roads used for access would be negligible. The construction of a new fence around "Little Jamaica" along with no trespassing signs would introduce a new visual element that would be in contrast with the natural areas. The fence would be designed to blend with the surrounding area. While the fence would be visible it would become less prominent as vegetation re-establishes and matures in the area. The use of boulders would be evident but would be of a natural material and irregular in shape and size. The removal of the "Little Jamaica" pool and restoring the natural water flow

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along the hillside would enhance the vegetation growth that receives the water, which would result in a beneficial effect on the visual character of that portion of the project area whether fence or boulders are used.

The identified viewer groups—interstate travelers, recreational river users, and nearby residents — would observe any changes to landforms, lines, colors, textures, and structures. However, the project-related changes would not appreciably affect their viewing experience because mitigation measures would be implemented to minimize visual impacts, and the geologic features and topography of the Virgin River would continue as the premier aspect of the landscape in the study area. Since Alternative 1 and Alternative 2 would have only minor impacts on the visual character of the landscape from current conditions, it would be consistent with both BLM’s Class II objective (retain the existing character of the landscape) and Class III objective (partially retain the existing character of the landscape) for the project area.

The No Build Alternative would not affect the existing visual setting and characteristics of the area. No visual impact would occur.

4.10 Drainage and Floodplain Considerations

This section identifies drainage and floodplain issues to be considered when evaluating impacts resulting from the proposed project. This analysis includes applicable drainage patterns such as surface water and groundwater as well as floodplain issues. Surface water includes water present above the soil surface such as rivers, streams, lakes, pools, and stormwater runoff. Groundwater is water that flows below the ground surface. Groundwater may be collected by underground wells or other facilities constructed for collecting water or for monitoring water quality.

*Virgin River Bridge #1 (STR #1089)***4.10.1 Regulatory Framework*****Executive Order 11988***

Executive Order 11988, *Floodplain Management*, requires that impacts to floodplains be evaluated for all federal actions. This Executive Order also directs agencies to reduce impacts to floodplains, minimize flood risks on human safety and wellbeing, and restore and preserve floodplain values. Floodplains are delineated and managed by the Federal Emergency Management Agency (FEMA). A floodplain is generally level land subject to periodic flooding from an adjacent body of water.

Federal Highway Administration

Federal FHWA floodplain regulations are contained in 23 CFR 650 Subpart A. FHWA requires that if any impacts to floodplains cannot be designed to meet FEMA standards and criteria, then coordination with FEMA is mandatory (FHWA 2014c). Local agencies may act on behalf of FEMA to administer floodplain management regulations; however, FEMA is ultimately responsible for floodplain management. The study area floodplain is under the jurisdiction of Mohave County, Arizona; coordination with the Mohave County Floodplain Administrator during the EA process and final design would assist ADOT in complying with applicable floodplain regulations.

Federal Emergency Management Administration

A 100-year flood is a storm having a 1 percent chance of being exceeded in magnitude in any given year. The 100-year floodplain includes areas adjoining a water body that are inundated by water during a 100-year flood. The floodway is the area within the floodplain where the water is likely to be the deepest and fastest; this area should be kept free of obstructions to allow 100-year floodwaters to move downstream without increasing the water surface elevation more than 1 foot. FEMA Flood Insurance Rate Maps (FIRMs) depict the delineated 100-year floodplain.

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The 100-year floodplain is divided into flood zones, including:

- ▶ **Zone A:** Areas subject to inundation by 100-year floods that have been identified through qualitative methodologies. No base flood elevations have been determined.
- ▶ **Zone AE:** Areas subject to inundation by 100-year floods that have been identified through quantitative methodologies. Base flood elevations have been determined.
- ▶ **Zone AH:** Areas subject to inundation by 100-year shallow floods where ponding occurs and flood depths are between 1 and 3 feet deep. Base flood elevations have been determined.
- ▶ **Zone AO:** Areas subject to inundation by 100-year shallow floods typified by sheet flow on sloping terrain with flood depths of between 1 and 3 feet. Base flood elevations have been determined.

Mohave County Flood Control District

The Mohave County Flood Control Ordinance identifies local floodplain regulations pertinent to this project. Written authorization would not be required from the Mohave County Floodplain Board, nor would the Floodplain Board prohibit the construction of bridges, culverts, dikes, and other structures necessary for the construction of public highways, roads, and streets intersecting or crossing waterways. Non-residential structures within floodplains must be able to resist the forces of floodwater and must not float. The storage of materials and equipment that could be damaged by flooding or injurious to human, animal, or plant life in time of flooding is prohibited in floodplains, and allowable storage of materials and equipment must meet Mohave County requirements. Mohave County would review structures within floodplains to ensure that Mohave County requirements are met and that structures would not cause flood-related erosion hazards or aggravate existing flood hazards (Mohave County 2000).

*Virgin River Bridge #1 (STR #1089)***4.10.2 Affected Environment**

The Virgin River flows generally southwest from its headwaters in southwestern Utah through Arizona and Nevada to the Colorado River. Its confluence with the Colorado River is approximately 70 river-miles downstream of the study area (including the 30-mile Overton Arm of Lake Mead). The confluence of the Virgin River with Beaver Dam Wash is located adjacent to the project area to the north. The Arizona Department of Water Resources (ADWR) categorizes the Virgin River as perennial (ADWR 2011). However, site reconnaissance and historic stream gauge data indicate that the river channel does dry up on occasion.

Water in the Virgin River is derived from rainfall and snowmelt runoff as well as from groundwater entering via seeps and springs. Water from snowmelt and rain comprises the largest percentage of streamflow and causes the highest monthly flows to occur in January through March, while most low-flow periods occur from June through October (ADWR 2009). Historically, the Virgin River surface flow has disappeared into the riverbed north of the Arizona border, but reappeared approximately 5.0 river-miles upstream of Littlefield from eight springs that flow into the river (ADWR 2011). In recent years, effluent has been released from the St. George, Utah wastewater treatment plant into the Virgin River upstream of the Arizona border, resulting in water flowing in the Arizona segment of the river throughout most of the year. Some of the river between the Arizona border and Littlefield is dry during periods of low flow except for sporadic, short segments of semi-permanent or permanent water in areas where bedrock is near the surface. However, the river is perennial through the project area.

The spring flow located southeast of the bridge has been diverted by recreationalists to flow over a rocky hillslope creating a waterfall and is then collected in a pool constructed of sandbags placed around an area of exposed bedrock, creating "Little Jamaica." Eventually, the water in the pool overtops the sandbags and continues its flow downslope to the river.

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The U.S. Geological Survey (USGS) maintains a gauging station approximately 0.4 river-miles downstream from Bridge No. 1. This gauging station measures several parameters, including peak, periodic, and daily flows. Periodic measurements have been taken approximately every month since October 1929. These data reinforce the historic patterns of higher flows in the winter and spring and lighter flows in the summer and fall. The mean monthly flow in the Virgin River ranges from 109 cubic feet per second (cfs) in July to 420 cfs in May (USGS 2014). In contrast, the peak annual streamflow exceeded 20,000 cfs eight times since October 1929: approximately 22,000 cfs in March 1938; approximately 35,200 cfs in December 1967; approximately 21,400 cfs in January 1969; approximately 22,000 cfs in March 1978; approximately 61,000 cfs in January 1989; approximately 20,500 cfs in March 1995; approximately 37,000 cfs in January 2005; and approximately 31,000 cfs in December 2011 (USGS 2014).

According to FEMA FIRM No. 04015C0093G (effective 11/18/2009), the study area includes the Virgin River and associated 100-year (Zone AE) and 500-year (Zone X) floodplains (FEMA 2014). The Zone AE 100-year flood elevation at the bridge location is approximately 1,797 feet above mean sea level. The FIRM also identifies the floodway. Where the river passes under Bridge No. 1, the entire area designated as Zone AE is also designated as the floodway. Figure 12 illustrates the 100-year flood class with respect to a cross-section of the Virgin River and I-15 infrastructure. Areas adjacent to the river are included in the 100-year floodplain, and the remainder of the ADOT ROW/easement is considered part of the 500-year floodplain (FEMA 2014).

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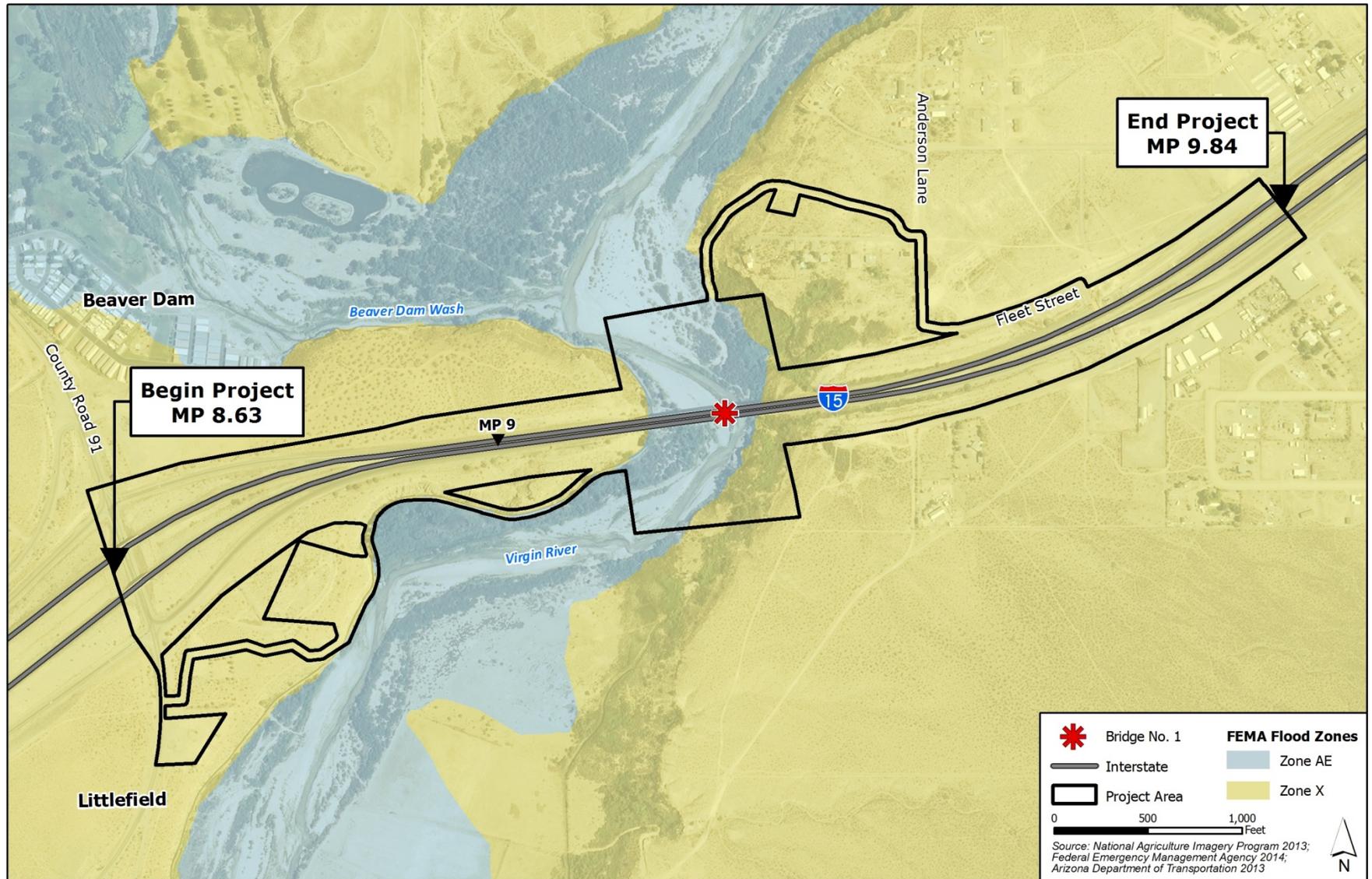


Figure 12. Federal Emergency Management Agency Flood Classifications in the Study Area

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4.10.3 Environmental Consequences

Impacts on floodplains typically occur when the topography within a floodplain is substantially modified, or encroached upon, by either placement or removal of materials within the floodplain. Significant impacts relevant to federally funded or approved highway projects as defined in 23 CFR 650.105(q) would occur when highway encroachment would involve one or more of the following construction or flood-related impacts:

- ▶ Significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community's only evacuation route;
- ▶ A significant risk (defined as the consequences associated with the probability of flooding attributable to the encroachment by the project); or
- ▶ A significant adverse impact on natural and beneficial floodplain values.

The following discussion identifies the temporary and permanent effects to aspects of the drainage regime and the 100-year floodplain of the Virgin River within the study area, followed by mitigation measures proposed to minimize those impacts.

Alternative 1 – Bridge Widening and Rehabilitation

Alternative 1 would result in construction in the vicinity of Bridge No. 1 and adjacent upland areas and would not affect the source or composition of flows within the Virgin River. No water would be drawn from the Virgin River for construction purposes, nor would any impoundments be installed that would affect upstream or downstream flows. A coffer dam or similar approach would be used, if needed, to create a dry work area around Piers 3 and 4, but water would be deflected and not impounded. Once construction is complete, the dry work areas would be restored to their preconstruction condition. During construction, the impoundment and associated diversions creating "Little Jamaica" would be removed and the spring water would follow its natural path down the hillside to the river bottom. To

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prevent the re-establishment of "Little Jamaica," the area would either be fenced to prevent access or large boulders would be positioned to reduce the opportunities to divert the water. The fencing would be designed to allow water to flow downslope uninhibited. Similarly, boulders would be large and would not be placed directly in the flow path of the spring but would inhibit the redirection of the spring flow. This would allow the water to return to its natural course. No net change in water volume reaching the Virgin River is anticipated, and no changes to the Virgin River flow regimes or bank stability are anticipated to occur.

In addition, Alternative 1 would modify drainage from the seeps and springs above the river in conflict with the I-15 roadway widening and convey them to the river bottom. Overall, while some modification and restoration of drainage and surface water movement would occur, there would be no net change in the volume of spring/roadside drainage water that reaches the river and no changes within the floodplain due to spring or roadside drainage flow. The action would have only minor impact on drainage or surface water and no impact on groundwater levels or quality in the study area.

Alternative 1 would result in temporary and permanent impacts within the 100-year floodplain of the Virgin River. The construction of temporary coffer dams and permanent columns on each side of the existing piers would increase the impediments to water flow in the river both temporarily and over the long-term and result in slightly increased water levels upstream of the bridge as water backs up behind the piers. Accordingly, Alternative 1 would be subject to additional hydraulic studies and assessments during the final design process to ensure floodplain encroachments would be minimized to the extent practicable. Water levels are anticipated to increase by less than 1 foot.

Approximately 17.0 acres of the floodplain adjacent to the low-flow channel would be temporarily affected during construction of the access roads, temporary bridge, crane pads, and cofferdams or similar methods to create dry work areas; during implementation of BMPs, such as installing sediment

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fencing, settling basins, and flagging of the maximum disturbance area; and from equipment use in the river bottom. Figure 13 shows the extent of disturbance within the floodplain. Temporary construction and equipment access within the 100-year floodplain is anticipated to last for the duration of construction, which is approximately 24 months.

During the construction of the scour floor, the entire area under the bridge from bank to bank including the low-flow channel and floodplain would be affected. The concrete scour floor slab would be constructed below the existing elevation of the river bottom and would extend 70 feet upstream and 70 feet downstream of the bridge as well as under the bridge. Once constructed, the river bottom would be restored to its pre-construction elevations. The low-flow channel would be avoided during all other construction activities.

Impacts within the 17.0-acre portion of the floodplain would include:

- ▶ Grading the lower portion of the access roads as well as the river bottom to prepare for the temporary bridge and crane pads;
- ▶ Excavating native material to construct the dry work area within the cofferdams;
- ▶ Excavating native material to construct the scour floor;
- ▶ Containing and storing excavated material to prevent contamination and/or dispersal;
- ▶ Placing fill materials, such as rip rap, concrete, steel, sandbags, and sediment fencing to support and construct the temporary bridge, crane pads, cofferdams, and BMPs; and
- ▶ Disturbing the floodplain from equipment maneuvering.

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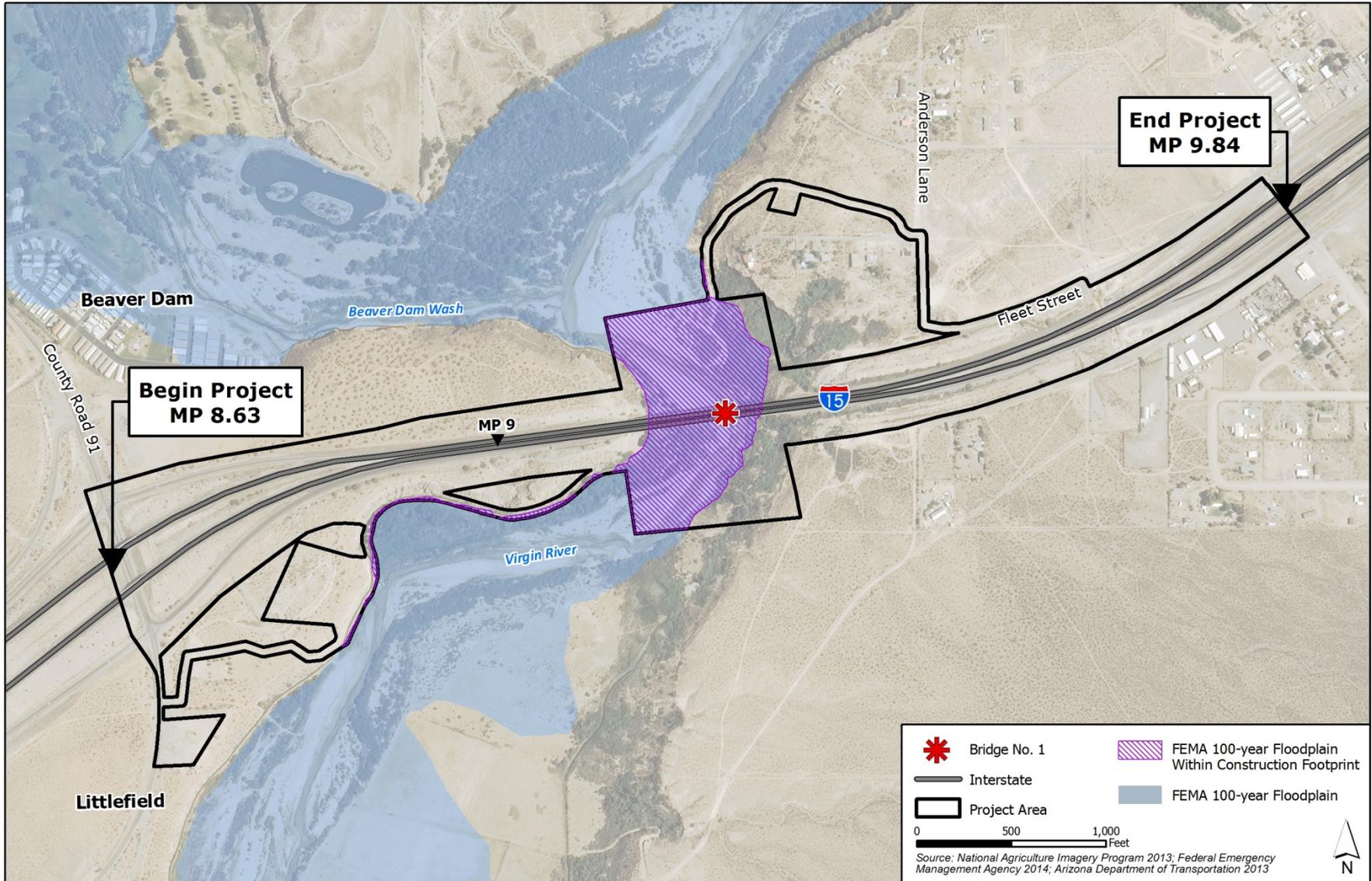


Figure 13. 100-year Floodplain

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Excavated material could be temporarily stored for up to 10 calendar days within the Virgin River floodplain in accordance with the Mohave County Flood Control Ordinance and would be contained to prevent contamination or dispersal (Mohave County 2000). Any material temporarily stored in the floodplain would be surrounded with approved sediment control devices to prevent the material from entering the river channel in the case of rain or high flows, and all excess materials become the property of the contractor and would be disposed of properly outside of the Virgin River corridor. Once work within the floodplain is complete, all temporary construction material and fills, including, but not limited to, crane pads, temporary bridge, cofferdams, and associated water protection features used as component of BMPs, would be removed in their entirety and the affected areas returned to preconstruction elevations.

Permanent impacts to the Virgin River 100-year floodplain associated with Alternative 1 would result from adding new columns, widening the foundation of each pier to encompass the new columns, and constructing a scour floor. Widening of the piers and additions of a new column on two sides of the existing columns to support the widened bridge would occur at all four piers on Bridge No 1. All of the new columns would be in line with the existing piers, and the column widths would be no wider than the existing columns. Because the pier frames are aligned with the flow, the cross-section area or face of the pier that is perpendicular to the flow would not change. Therefore, permanent impacts to the overall flow characteristics, including the 100-year flood elevation, would be negligible. The scour floor would be located below the grade of the river and would have no impact on the flow characteristics or 100-year flood elevation.

Alternative 1 would be designed in a manner that Bridge No. 1:

- ▶ Would not constitute a hazardous or incompatible use of floodplains

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- ▶ Would avoid substantial floodplain encroachment by maintaining the existing width of structures in-line with flows in the Virgin River
- ▶ Would not result in a greater than a 1-foot rise in base flood elevations
- ▶ Would be consistent with FEMA, ADOT, and Mohave County regulations regarding roadway construction in floodplains

The design team would coordinate with the Mohave County Floodplain Manager to ensure these design objectives are met. Overall, Alternative 1 is not anticipated to pose or cause:

- ▶ Significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community's only evacuation route
- ▶ A significant risk (defined as the consequences associated with the probability of flooding attributable to the encroachment by the project)
- ▶ A significant adverse impact on natural and beneficial floodplain values

Alternative 2 – Bridge Reconstruction in Place

Alternative 2 would require construction of two new piers for each existing pier. The new piers would be placed at a slight offset from the existing piers for constructability reasons. Once the new piers are constructed the existing piers would be removed to a level below the river bottom. Overall, the new piers would have a slightly greater impact on upstream water elevations than Alternative 1 due to the addition of a second set of piers. Alternative 2 would be subject to additional hydraulic studies and assessments during the final design process to ensure floodplain encroachments would be minimized to the extent practicable. Increases in upstream water levels are anticipated to be less than 1 foot. Like Alternative 1, Alternative 2 would affect up to 17.0-acres of the floodplain to accommodate:

- ▶ Grading the lower portion of the access roads as well as the river bottom to prepare for the temporary bridge and crane pads;

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- ▶ Excavating native material to construct the dry work area within the cofferdams;
- ▶ Containing and storing excavated material to prevent contamination and/or dispersal;
- ▶ Placing fill materials, such as rip rap, concrete, steel, sandbags, and sediment fencing to support and construct the temporary bridge, crane pads, cofferdams, and BMPs; and
- ▶ Disturbing the floodplain from equipment maneuvering.

The impacts associated with the removal of “Little Jamaica” and modifications to springs and roadside drainage due to widening the approaches on I-15 under Alternative 2 would be the same as described for Alternative 1.

Unlike Alternative 1, no scour floor would be required for Alternative 2 since the new piers would either be constructed to bedrock or to a sufficient depth as to not be susceptible to scour.

Alternative 2 would be subject to additional hydraulic studies and assessments during the final design process to ensure floodplain encroachments would be minimized to the extent practicable.

Alternative 3 – No Build Alternative

Under the No Build Alternative, no construction would occur in the 100-year floodplain, and accordingly, no new impacts to the 100-year floodplain would occur. The 100-year flood elevation would be subject to the natural forces of deposition and erosion caused by the flows within the Virgin River.

4.10.4 Mitigation Measures

The following mitigation measures are recommended to minimize impacts to the Virgin River floodplain:

- ▶ During final design, the Mohave County Flood Control District floodplain manager (928.757.0925) would be provided an opportunity to review and comment on the design plans.
- ▶ The contractor would mark the 100-year floodplain with lathes and flagging prior to commencement of any construction or ground-disturbing activities.

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- ▶ Concrete, grout, cement mortar, solid and source site materials, and hazardous materials (including petroleum materials) would be stored in the staging area and outside of the 100-year floodplain. Refueling equipment both in and out of the 100-year floodplain and containment of chemicals and construction materials would be addressed in the Spill Prevention, Containment, and Countermeasures Plan for work and staging areas.
- ▶ Material would be stored or stockpiled outside of the 100-year floodplain, if possible. Any material stored or stockpiled within the 100-year floodplain would be protected using best management practices to prevent it from entering the flowing river channel.
- ▶ Excess materials resulting from the construction of the temporary cofferdams, new pier foundations, or drilled shafts would be removed from the 100-year floodplain within 10 calendar days of generation. Any material temporarily stored in the floodplain would be surrounded with best management practice-approved sediment control devices to prevent the material from entering the river channel in the case of rain or high flows.
- ▶ All temporary construction, borrow areas, and fills within the 100-year floodplain would be removed in their entirety, and the affected areas would be returned to preconstruction elevations.

4.10.5 Conclusion

Both Alternative 1 and Alternative 2 would modify surface water movement and drainage due to construction associated with widening I-15 and removing the diversions that create “Little Jamaica,” but these changes are not anticipated to have an adverse effect on surface water, drainage, or groundwater in the study area. Both Alternative 1 and Alternative 2 would result in temporary and permanent impacts within the 100-year floodplain. Temporary impacts, while lasting for approximately two years, would be conducted in accordance with FEMA and the Mohave County Flood Control District

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regulations. Temporary impacts would be minimized by the removal of all temporary construction and fills and the return of affected areas to preconstruction conditions.

The increased volume of constructing additional piers within the 100-year floodplain would result in permanent impacts. However, these impacts would be minimized by maintaining the existing width of bridge piers and columns in-line with flows in the Virgin River. Therefore, Alternative 1 would result in negligible impacts to the base flood elevation. Alternative 2 would construct two new piers for each existing pier and the existing piers would be removed. This would result in a minor impact on upstream water elevations. The Mohave County Flood Control District floodplain manager would be provided opportunities to provide feedback on the design. With the interagency coordination and the development and implementation of mitigation measures described above, Alternative 1 and Alternative 2 are consistent with applicable federal, state, and local regulations.

Under the No Build Alternative, while no impacts would occur from construction, the 100-year floodplain would still be subject to the natural forces of deposition and erosion.

4.11 Section 404, 402, and 401 of the Clean Water Act and National Pollutant Discharge Elimination System

4.11.1 Regulatory Framework

The CWA is the primary federal statute governing discharge of pollutants into Waters of the United States (Waters), which, in Arizona, include perennial and ephemeral watercourses and their tributaries and adjacent wetlands. The principal goal of the CWA is to establish water quality standards to restore and maintain the chemical, physical, and biological integrity of the nation's Waters by preventing point (concentrated output) and nonpoint (widely scattered output) pollution sources.

Section 401 of the CWA requires any applicant requesting a federal permit or license for activities that may result in discharge into Waters to first obtain a Section 401 certification from the state in which the

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discharge originates. The Section 401 certification verifies the prospective permits comply with the state's applicable effluent limitations and water quality standards. Federal permits or licenses are not issued until the Section 401 certification is obtained. ADEQ is responsible for issuing the Section 401 certification for the Virgin River within Arizona. If a project meets criteria for conditional Section 401 certification, notification to the ADEQ is not required. However, if a project does not meet criteria for conditional certification, such as projects occurring within 0.25 mile of unique or impaired waters, an individual Section 401 certification application to the ADEQ is required.

Section 402 of the CWA formed the National Pollutant Discharge Elimination System (NPDES), which regulates pollutant discharges, including stormwater, into Waters. An NPDES permit sets specific discharge limits for point-source pollutants into Waters and outlines special conditions and requirements for a particular project to reduce impacts to water quality. In 2002, the EPA authorized the ADEQ to administer the NPDES program at the state level, called the Arizona Pollutant Discharge Elimination System (AZPDES). AZPDES permits require that the project be designed to protect Waters, that erosion control BMPs be implemented, and that a Storm Water Pollution Prevention Plan (SWPPP) be prepared for construction activities exceeding 1.0 acre of ground disturbance.

Section 404 of the CWA regulates the discharge of earthen fill, concrete, and other construction materials into Waters, and authorizes the U.S. Army Corps of Engineers (Corps) to issue permits regulating the discharge of dredge or fill material into Waters. The limits of Waters are defined through a preliminary or approved jurisdictional delineation (JD) accepted by the Corps. A preliminary JD assumes all drainages within a given area are subject to the jurisdiction of the Corps. An approved JD requires that all ephemeral drainages display a significant nexus to the downstream traditional navigable water, which for this project is the Colorado River, located approximately 71 river-miles downstream of the study area. The most common types of Section 404 permits for transportation

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projects are (1) Nationwide Permit No. 14 (Linear Transportation Projects), which authorizes projects with less than 0.5 acre of permanent loss to Waters with no impacts to special aquatic areas such as wetlands, and (2) Individual Permits, which are required for projects that affect more than 0.5 acre of Waters or cause impacts to jurisdictional wetlands. An Individual Permit requires mitigation to minimize or offset the impacts to Waters with no net loss of functions and values of the water resource. During the development of an Individual Permit, alternatives are evaluated, and the least environmentally damaging practicable alternative (LEDPA) to achieve the project's purpose is typically selected.

4.11.2 Affected Environment

The quality of the Virgin River is classified as impaired for selenium, suspended sediment concentration, and E. coli downstream from its confluence with Beaver Dam Wash, approximately 1,000 river-feet north of Bridge No. 1, and the impaired reach extends south through and beyond the project area. Currently, Bridge No. 1 drains directly to the river.

Both Waters and wetlands occur within the project area. A JD and a wetland determination were conducted in June 2014 to determine the type and extent of Waters. Approximately 104 acres were surveyed for Waters, and the JD identified three drainages within the project area that are Waters and two unnamed ephemeral washes that are not considered Waters. The delineation included approximately 6.06 acres of "open water" (perennial streams exhibiting the physical characteristics of Waters) within the Virgin River and two tributaries, 4.17 acres of "other waters" (areas with an ordinary high water mark that are not open waters or wetlands, but instead flow ephemerally or intermittently) within the Virgin River. Drainage and flow characteristics of the Virgin River are discussed above in Section 4.9, *Drainage and Floodplain Considerations*.

To address the potential for wetlands, the June 2014 site visit included a survey and analysis of hydrological characteristics, soil sampling, and a limited survey of wetland vegetation. The wetland

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delineation survey identified approximately 23.47 acres of wetlands along both banks of the river, both upstream and downstream of Bridge No. 1 (Figure 14).

4.11.3 Environmental Consequences

Alternative 1 – Bridge Widening and Rehabilitation

Alternative 1 would include the discharge of dredged or fill material within the Virgin River. Temporary impacts would include the construction and equipment maneuvering within the ordinary high water mark shown on Figure 14. Preliminary estimates indicate temporary impacts would potentially occur within approximately 27 acres of Waters and 6 acres of wetlands. Permanent impacts would include the addition of new columns to each pier, restoring the flow of the natural spring southeast of the bridge to the wetlands in and near the river bottom, the addition of the scour floor, and the permanent elimination of “Little Jamaica.” Piping the spring to the river bottom was considered, but the high calcium content of the water would eventually obstruct the pipe with mineral deposits and would not be a practical long-term solution. Removing obstructions and redirecting the flow of the spring would benefit the vegetation on the hillside and wetlands located along its natural flow path. Final impact calculations would be completed during final design. Based on the estimated amount of disturbance to Waters and wetlands, a Section 404 Individual Permit would be required. Typically, the permit application would be submitted and permit issued prior to the finalization of the EA. However, the Corps determined that the project may be reviewed for permit after ADOT has hired the Construction Manager at Risk and project design has reached the 60 percent design stage in order to provide sufficient information to evaluate the project (corresponded between Sallie Diebolt [Corps] and Karla Petty [FHWA], Appendix C, *Agency Correspondence*).

The project area under the Bridge No. 1 is anticipated to require approximately 100 feet north and 100 feet south of the ADOT ROW to accommodate access, maneuvering equipment, and work on the

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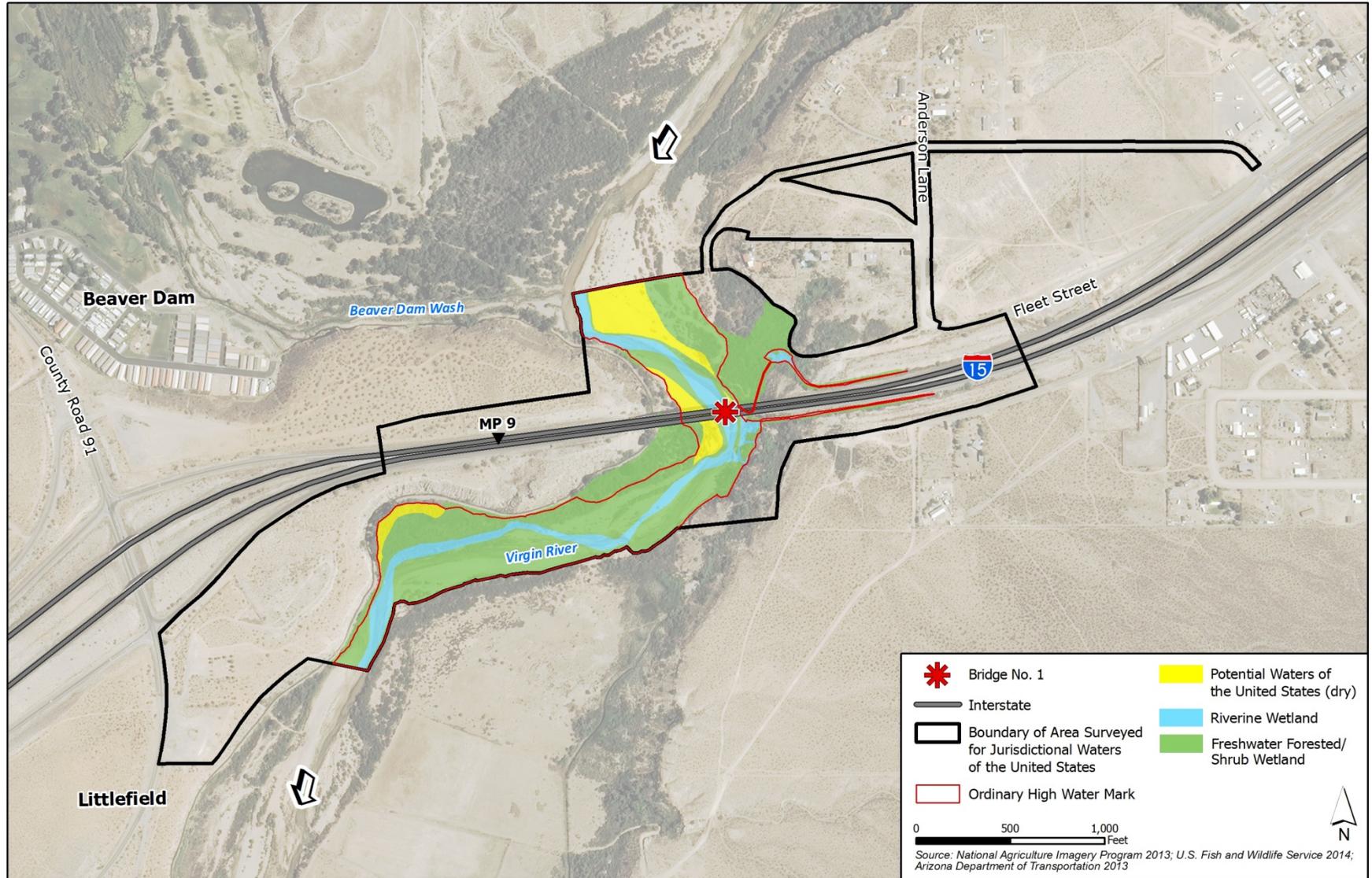


Figure 14. Waters of the U.S. within the Project Area

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bridge. It is assumed for worst-case-scenario purposes that the entire project area would be temporarily disturbed.

The three northeastern access alternatives (Fleet Street, Anasazi Drive, and Anderson Lane) are similar in that the alternatives use various existing roads and a common road from the top of the bluff to the river bottom, but vary in how the connection from Anderson Road to the road to the river is made.

There are no Waters in the area through which the access road connection would be made or along the existing roads that would be used for access. Only the road that would be improved from the top of the bluff to the river bottom north of the bridge and east of the river that is common to all the alternatives would affect Waters or wetlands. Therefore, all three access road alternatives would impact Waters equally. The amount of that impact is dependent on the ultimate design of the road that would be improved from the top of the bluff to the river bottom. Based on a rough estimate, approximately 0.36 acre of potential wetlands would be temporarily disturbed, of which, approximately 0.15 acre consists of an existing dirt road.

Access from the southwest via CR 91 would require the improvement of the existing road that runs along the bluff for approximately 0.5 mile. This road is narrow and would require extensive widening to accommodate cranes and other large construction equipment. Improvement of the road to accommodate the construction equipment was identified as not being feasible since it would require either constructing into the potential wetlands or extensive earthwork to remove the adjacent hillside to create room for the road. While it was eliminated from use as a construction equipment road, it may be used by either pickup truck or off-road vehicles for access between the bridge and staging areas during construction. Improvements to the existing road would be constructed, but would not result in any impacts to wetlands or Waters beyond those that would already occur under the bridge.

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It is anticipated that the disturbed area immediately adjacent to I-15 in the northwest quadrant would be used for potential staging and work on I-15 as needed. Staging would also occur east of CR 91 and north of Kokopelli Drive. No Waters or wetlands occur in any of these staging areas, so no impact would occur. Staging areas identified east of Bridge No. 1 on both sides of I-15 occur near springs. These springs and associated vegetation would be avoided and omitted from use as these staging areas. No impact on wetlands or Waters is anticipated as a result of using these staging areas.

Construction under Alternative 1 would disturb more than 1.0 acre of land and could release increased pollutants into the Virgin River watershed because of construction activities. During final design, drainage options for Bridge No. 1 would be evaluated. Once reconstructed, drainage from the bridge would be conveyed off the bridge and treated in some form before being discharged. An AZPDES construction general permit would be required for Alternative 1. The general permit for construction would require the preparation and implementation of a SWPPP, which calls for the use of effective BMPs on the construction site to control and prevent pollution in storm event runoff from discharging into water bodies. This permit also would incorporate temporary and permanent erosion control measures.

Alternative 2 – Bridge Reconstruction in Place

Impacts associated with Alternative 2 would be very similar to those described for Alternative 1. Preliminary estimates indicate temporary impacts would potentially occur within approximately 27 acres of Waters and 6 acres of wetlands. Permanent impacts to Waters associated with Alternative 2 would include constructing new piers, removing existing piers, and restoring the flow of the natural spring southeast of the bridge (“Little Jamaica”) to its natural course. No scour floor would be required for Alternative 2, which would reduce the permanent footprint compared to Alternative 1. All other impacts, SWPPP requirements, and the implementation of BMPs described for Alternative 1 would be

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the same for Alternative 2. Final impact calculations for impacts to Waters would be completed during final design, but like Alternative 1, the project is anticipated to require a Section 404 Individual Permit.

Alternative 3 – No Build Alternative

Under the No Build Alternative, construction impacts would not occur. Section 401/404 and AZPDES permits and planning would be undertaken when needed to address maintenance activities. Potential impacts to Waters would be permitted, minimized, and as a result would be minor.

4.11.4 Mitigation Measures

The following mitigation measures, along with several of the mitigation measures specified in Section 4.10, Drainage and Floodplain Considerations, are recommended to minimize impacts to Waters, including discharge of fill, impacts to water quality, and discharge of stormwater/pollutants:

- ▶ The Arizona Department of Transportation would prepare and submit an application to the United States Army Corps of Engineers for a Clean Water Act Section 404 permit for the project.
- ▶ No work would occur within jurisdictional Waters of the United States until the appropriate Clean Water Act Section 404 permit and Section 401 Water Quality Certification are obtained. The permits would be obtained during final design.
- ▶ All disturbed soils outside the active stream channel that would not be landscaped or otherwise permanently stabilized by construction would be seeded using an approved seed mix developed for this project.

4.11.5 Conclusion

Preliminary estimates indicate that both Alternative 1 and Alternative 2 would temporarily impact approximately 27 acres of Waters and 6 acres of wetlands. Because Alternative 1 would require a scour floor, permanent impacts would be slightly larger than Alternative 2. Final impact calculations for

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impacts to Waters would be completed during final design; however, based on these preliminary estimates and the fact that wetlands would be affected, both Alternative 1 and Alternative 2 would require a Section 404 Individual Permit, Section 401 Individual Water Certification, and an AZPDES construction general permit and the preparation and implementation of a SWPPP for compliance with Section 402 of the CWA. Efforts would be made during design to minimize impacts to Waters to the extent possible.

Under the No Build Alternative, only maintenance activities would be completed. Project-related impacts to water resources would be addressed on a project-by-project basis and impacts would be negligible.

4.12 Biological Resources

4.12.1 Affected Environment

The study area is located in warm temperate desertland areas within the Mojave desertscrub biotic community at elevations that range from approximately 1,780 to 1,920 feet above mean sea level (Turner 1982; Brown et al. 2007). Two vegetation communities occur in the project area: (1) riparian habitat and (2) Mojave desertscrub habitat in drier upland sites away from the Virgin River. Upland habitats in the project area are typical of the creosotebush association of the Mojave desertscrub. The project area is currently managed for natural areas, including the BLM's Virgin River Corridor ACEC for Mojave desert tortoise in the river bottom and fish species within the river, dispersed recreation, cattle grazing, and rural development. The majority of the disturbance in the project area derives from construction and maintenance of I-15 and Bridge No. 1, but also includes agricultural uses and rural development, including residential, commercial, light industrial uses, associated roadways, and recreational activities.

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The riparian vegetation is patchy and diverse and occurs within the floodplain, intermixed with open water and sandbars, as well as above the floodplain in spring and seep areas. Riparian vegetation includes salt cedar (*Tamarix chinensis*), willow (*Salix* sp.), and Fremont cottonwood (*Populus fremontii*). Most salt cedar in the project area were defoliated by the tamarisk leaf beetle (*Diorhabda carinulata*; released in 2001). However, these salt cedar were green and appeared healthy during the site visit on 06/12/2014. Moreover, salt cedar does not usually die from a single defoliation by the tamarisk beetles, but repeated defoliation can lead to severe dieback and death of the tree within several years. Biological control by the tamarisk leaf beetle does not eradicate salt cedar but has the potential to suppress salt cedar populations by 75 to 85 percent, after which the two species usually reach equilibrium at lower levels.

The Mojave desertscrub habitat consists of a low to moderate density of various perennial plants that include creosote-bush (*Larrea tridentata*), cheesebush (*Hymenoclea salsola*), saltbush (*Atriplex* sp.), white bursage (*Ambrosia dumosa*), Mormon tea (*Ephedra* sp.), snakeweed (*Gutierrezia sarothrae*), Mojave prickly pear (*Opuntia erinacea*), silver cholla (*Cylindropuntia echinocarpa*), rabbitbrush (*Chrysothamnus* sp.), jimsonweed (*Datura* sp.), and desert straw (*Stephanomeria pauciflora*).

Threatened and Endangered Species

Threatened and endangered species are recognized by federal and state agencies as being in danger of extinction or being sufficiently compromised to potentially become endangered throughout all or part of their range. The Endangered Species Act ([ESA], 7 United States Code [U.S.C.] 136; 16 U.S.C. 460 et seq.) mandates a nationwide program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. Specifically, federally-listed species are protected under Section 7 of the ESA, which directs all federal agencies to use their existing authority to conserve threatened and endangered species.

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The USFWS list of endangered, threatened, proposed, and candidate species for the project area was discussed with USFWS and AGFD and subsequently evaluated in a Biological Evaluation (BE) and BE addendum. Detailed descriptions of each species, potential impacts, and a summary of the agency coordination conducted for the BE and addendum are included in Appendix E, *Biological Evaluation and Coordination*. Table 11 lists the species that have the potential to occur in the project area based on a field survey, habitat evaluation, and coordination with USFWS and AGFD. USFWS issued a Biological Opinion (BO) on 08/08/2017 concurring with the findings presented in the BE (Appendix E).

Table 11. Federally Protected Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Status
California condor	<i>Gymnogyps californianus</i>	Nonessential Experimental, Endangered, MBTA
Mojave desert tortoise	<i>Gopherus agassizii</i>	Threatened
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered, MBTA
Virgin River chub	<i>Gila seminuda</i>	Endangered
Virgin spinedace	<i>Lepidomeda mollispinis mollispinis</i>	Conservation Agreement
Woundfin	<i>Plagopterus argentissimus</i>	Endangered
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Threatened, MBTA
Yuma clapper rail	<i>Rallus longirostris yumanensis</i>	Endangered, MBTA

Notes: MBTA = Migratory Bird Treaty Act.

According to USFWS, recent telemetry data suggests that California condors have not been documented in or near the project area recently (Spangle 2014). If condors were present, the project area would only be suitable as foraging habitat.

The Mojave desert tortoise inhabits flats and slopes in Mojave desertscrub and in sandy-gravelly soils where sparse cover allows growth of herbaceous plants (USFWS 1994). The project area includes upland desertscrub habitat that may be suitable for Mojave desert tortoise. Roughly 15 acres of suitable habitat occur in undeveloped upland areas of the project limits (SSpangle [USFWS] to EPhoebus [Jacobs]),

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07/31/2014). However, habitat in the project area has been previously and is continuously disturbed by I-15 and associated roadway activities as well as recreation, resulting in the habitat within the project area providing little value to the tortoise. The Heritage Data Management System (HDMS) search indicated that Mojave desert tortoises are known to occur within 3 miles of the project limits (AGFD 2014b), and individual Mojave desert tortoises have been documented in the project area.

The southwestern willow flycatcher inhabits dense riparian vegetation, often associated with open water or moist soils (AGFD 2002). Roughly 1.3 acres of potentially suitable southwestern willow flycatcher habitat that includes primarily salt cedar forest occurs within the project limits. AGFD conducted protocol surveys in Beaver Dam Wash and along the Virgin River between Littlefield and approximately 0.25 mile north of Bridge No. 1 from 1994-1998 and from 2000-2006 (Sogge et al. 2010). These surveys resulted in the observation of one bird in 1997; one resident adult in 2001; one migrant in 2003; and three resident adults, one nesting pair, and two nests in 2004 (Ellis et al. 2008). Flycatcher surveys conducted by the U.S. Bureau of Reclamation downstream of Bridge No. 1 near Littlefield and at the confluence of the Virgin River and Beaver Dam Wash were conducted in 2003-2005 and in 2007. Sightings, including three breeding adults in 2004 and two males in 2005, were all made near the confluence of Beaver Dam Wash (McLeod, et al. 2008). U.S. Bureau of Reclamation surveys from 2007-2010 on Beaver Dam Wash upstream of CR 91 bridge north of Bridge No. 1 observed an unpaired resident male in 2007; a single adult in 2008; four resident breeding adults in 2009; and three resident breeding adults in 2010 (McLeod and Pellegrini 2013). Due to understory removal from recent floods, the habitat within the project area appears to be unsuitable for southwestern willow flycatcher nesting; however, potentially suitable migratory stopover and foraging habitat is present (USFWS 2011a).

Two listed fish species, Virgin River chub and woundfin, and a species under a Conservation Agreement, the Virgin spinedace, are native to the Virgin River. Surveys were conducted near the Beaver Dam Wash

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and CR 91 bridge (about 1 mile northwest of Bridge No. 1) during August 2010, as part of a program to monitor impacts of construction activities to endangered species of fish. During this effort, four individuals of Virgin spinedace were captured, but no Virgin River chub or woundfin were observed (Liebfried 2011). Long-term monitoring of native fish (from 1996 to 2012) has also occurred from near the project area in the lower Virgin River Gorge downstream into Nevada (Golden and Holden 2004; referenced in Kegeries and Albrecht 2012). Results from more recent surveys (2009 to 2012) indicate that Virgin River chub were present at most sites, and two woundfin and one Virgin spinedace were captured in the Beaver Dam Wash segment of the Virgin River (Figure 2—Project Vicinity) during one sampling period (Kegeries and Albrecht 2012). The most recent surveys, in June and August 2012, sampled several reaches of the Virgin River from the Lower Gorge to Halfway Wash in Nevada. Relative to the project area, the closest current records for Virgin River chub in the Virgin River are from the June 2012 surveys at the Beaver Dam Wash site. Woundfin were captured within the project in 2011 and 2012. No Virgin spinedace were captured during these sampling efforts (B. Wooldridge, USFWS, email to K. Gade, ADOT, October 9, 2012).

The yellow-billed cuckoo inhabits large blocks of dense riparian vegetation (e.g., 325-foot-wide and 200-acre contiguous extent) usually with a cottonwood-willow component below 6,600 feet above mean sea level (USFWS 2014). Roughly 1.3 acres of potentially suitable foraging habitat for the yellow-billed cuckoo occurs within the project limits. Surveys within the project area identified two yellow-billed cuckoos in 2000 (Johnson et al. 2007) and one in 2014 (S. Langston, BLM, pers. comm. to T. McCarthy, Archaeological Consulting Services, 08/29/ 2014). No yellow-billed cuckoos were observed in surveys conducted from 2006 – 2010 (Johnson et al. 2007; McLeod and Pellegrini 2013).

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Federally designated critical habitat occurs in the project area for the Virgin River chub, the woundfin, and the southwestern willow flycatcher (Figure 15). Federally proposed critical habitat occurs in the project area for the yellow-billed cuckoo (refer to Figure 5 in Appendix C of the BE).

The Yuma clapper rail inhabits freshwater or brackish marshes under 4,500 feet in elevation with a wet substrate that supports their preferred habitat of cattail and giant bulrush (*Scirpus californicus*) stands of moderate to high density adjacent to shorelines along the Colorado River. Common reed marshes are mainly inhabited by Yuma clapper rails where they are bordered or mixed with cattail; salt cedar can form part of the cover used by Yuma clapper rails when associated with cattail marshes (AGFD 2001a). Yuma clapper rails have not been observed in the project area since 2000 (USFWS 2006).

BLM Sensitive Species

Species listed as sensitive by BLM are usually rare within at least a portion of their range, and many are protected under certain state and/or federal laws. Per BLM Manual Section 6840, species designated as sensitive must be native species found on BLM-administered lands for which BLM has the capability to significantly affect the conservation status of the species through management, and either:

- ▶ there is information that a species has recently undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range; or
- ▶ the species depends on ecological refugia or specialized or unique habitats on BLM-administered lands, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk. (BLM Instruction Memorandum No AZ-IM-2017-009).

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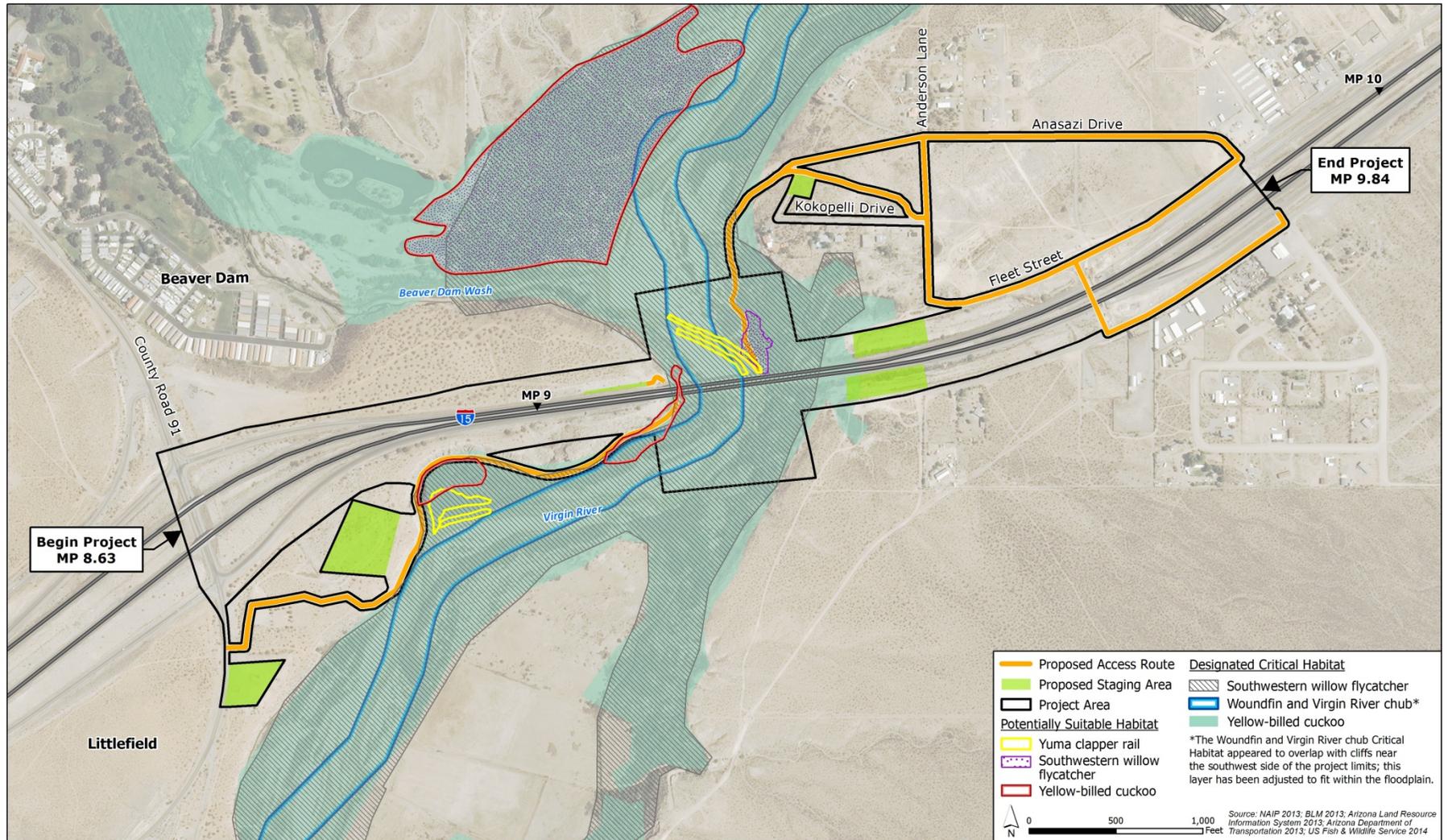


Figure 15. Suitable and Critical Habitat in the Project Area

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All federally-designated candidate species, proposed species, and delisted species in the five years following delisting are included as BLM sensitive species. The list of sensitive species with potential to occur in the project area was reviewed and discussed with BLM biologists. Table 12 shows the BLM sensitive species that have the potential to occur in the project area based on field survey, habitat evaluation, and coordination with BLM.

Table 12. BLM Sensitive Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Status
Allen's big-eared bat	<i>Idionycteris phyllotis</i>	BLM Sensitive
American peregrine falcon	<i>Falco peregrinus anatum</i>	BLM Sensitive, MBTA
California leaf-nosed bat	<i>Macrotus californicus</i>	BLM Sensitive
Desert springsnail	<i>Pyrgulopsis deserta</i>	BLM Sensitive
Desert sucker	<i>Catostomus clarki</i>	BLM Sensitive
Flannelmouth sucker	<i>Catostomus latipinnis</i>	BLM Sensitive
Golden eagle	<i>Aquila chrysaetos</i>	BLM Sensitive, MBTA, BGEPA
Silverleaf sunray	<i>Enceliopsis argophylla</i>	BLM Sensitive
Speckled dace	<i>Rhinichthys osculus</i>	BLM Sensitive
Spotted bat	<i>Euderma maculatum</i>	BLM Sensitive
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	BLM Sensitive

Notes: MBTA = Migratory Bird Treaty Act; BGEPA = Bald and Golden Eagle Protection Act.

Allen's big-eared bats roost in caves, cliff faces, and abandoned mineshafts (AGFD 2001b; Solvesky and Chambers 2009). Maternal colonies can also roost in ponderosa pine snags and under sloughing bark (Solvesky and Chambers 2009). Allen's big-eared bats are known to occur in the project area near mature trees and standing water (S. Langston, BLM, pers. comm. to T. McCarthy, Archaeological Consulting Services, 09/30/2014). They are not known to use bridges as roosting habitat.

American peregrine falcons have been sighted by BLM personnel within the project area; however, no known nesting occurs within the project area, with the nearest eyrie occurring at least 3.5 miles away

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(S. Langston, BLM, pers. comm. to T. McCarthy, Archaeological Consulting Services, 08/29/2014). No evidence of falcons or white-washed cliff ledges that typify a falcon eyrie was observed during a survey of surrounding habitats. Individual birds have been seen using the area during migration, likely drawn in by the rock pigeons that roost on the bridge and the nearby cliffs (S. Langston, BLM, pers. comm. to T. McCarthy, Archaeological Consulting Services [ACS], August 29, 2014).

The California leaf-nosed bat is found primarily in Sonoran desertscrub roosting in mines, caves, and rock shelters (AGFD 2001c). They have been found in Arizona roosting under bridges with open, cave-like ends that provide shelter from heat and aridity (Davis and Cockrum 1963; Harris 2014). They can utilize a variety of bridges as night roosts, but only some bridge types have been used as day roosts (Dudek 2012; Davis and Cockrum 1963). California leaf-nosed bats are known to have occurred in the project area (S. Langston, BLM, pers. comm. to T. McCarthy, Archaeological Consulting Services, 09/30/2014). However, the closest record dates back to 1945. Bridge No. 1 could provide night roosting or less-likely day roosting habitat for the California leaf-nosed bat. These bats are not expected to occur under the bridge because of the high availability of suitable roosting habitat in adjacent areas of the project vicinity. Nighttime roosting under the bridge is possible

The known distribution of the desert springsnail is restricted to the Virgin River drainage from near St. George to below the Virgin River Gorge near Littlefield. The distribution appears to consist of isolated populations that inhabit springs that flow into the Virgin River (AGFD 2004). The HDMS search indicated that desert springsnails are known to occur within 3 miles of the project limits (AGFD 2014b). The nearest known population of desert springsnails is about 3 river-miles upstream of the project limits, near the mouth of the Virgin River Gorge (S. Langston, BLM, pers. comm. to T. McCarthy, Archaeological Consulting Services, 08/29/2014). Seeps observed within the project limits have been compromised by disturbance, leaving only marginal habitat available for the desert springsnail. No

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record of the species leads to the assumption that they are not present in the project area. It is assumed that populations present near Bridge No. 1 would have been previously identified given the excellent access to this area.

Three BLM sensitive fish species, the desert sucker, the flannelmouth sucker, and the speckled dace, have been recorded within 3.0 miles of the project area (AGFD 2014b). Surveys were conducted near the CR 91 Beaver Dam Wash bridge (about 1 mile northwest of Bridge No. 1) during August 2010 did not identify any desert suckers, flannelmouth suckers, but speckled dace were the most common native species captured (Liebfried 2011). More recent surveys (2009-2012) in the lower Virgin River Gorge to Nevada did identify both desert and flannelmouth suckers at most sampling sites (Kegeries and Albrecht 2012). The closest observation all three fish varieties occurred in June 2012 in the Beaver Dam Wash segment of the Virgin River. It is assumed that these fish occur in the project area.

The BLM and AGFD monitor habitat use and nesting activities by golden eagles in the Virgin River Gorge area. The nearest golden eagle nest is at least 3.5 miles away from the project area (S. Langston, BLM, pers. comm. to T. McCarthy, ACS, August 29, 2014). Additionally, no golden eagles or large stick nests were observed in surrounding areas during the site visit.

The silverleaf sunray has a restricted distribution in southern Nevada, southwestern Utah, and northwestern Arizona, including near the Virgin River in the Virgin River Gorge. This plant species occurs in various habitats that include dry slopes, gravelly slopes, sandy washes, and clay and gypsum cliffs. No formal surveys for silverleaf sunrays are known to have been conducted in or near the project area. The HDMS search indicated that silverleaf sunrays are not known to occur within 3 miles of the project limits (AGFD 2014b), and no silverleaf sunray individuals were observed during the site visit.

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Habitat for the spotted bat ranges from low desert in southwestern Arizona to high desert and riparian habitats in northwestern Arizona and Utah (AGFD 2003a). Spotted bat roosting is believed to occur singly in crevices and cracks in cliff faces; they are not known to roost underneath bridges. Spotted bats have been observed approximately 0.8 mile west of Bridge No. 1 within Mojave desertscrub habitat (S. Langston, BLM, pers. comm. to T. McCarthy, Archaeological Consulting Services, 09/30/2014).

Habitat for the Townsend's big-eared occurs in habitats that include desertscrub, oak woodland, oak-pine, pinyon-juniper, and coniferous forests, and they are known to forage in cottonwood riparian gallery forests (AGFD 2003b; BLM 2009). They have also been known to use bridge structures for roosting; they have been found roosting in the open between bridge beams, preferring sheltered parts of the bridge darkened by thick vegetation bordering the sides (Keeley and Tuttle 1999). These bats typically hang from open ceilings and do not use cracks or crevices. No formal surveys are known for this species, but BLM has record of this species occurring approximately 0.4 mile northwest of Bridge No. 1 near mature trees and standing water at the confluence of Beaver Dam Wash with the Virgin River (S. Langston, BLM, pers. comm. to T. McCarthy, Archaeological Consulting Services, 09/30/2014).

Native Plants

Mojave prickly pear, silver cholla, and honey mesquite (*Prosopis velutina*) are protected native plants found in the project area. Arizona Native Plant Law applies to all state and private lands. While no state land is in the project area, native plants occurring on private land in the project area require that the Arizona Department of Agriculture be notified prior to their removal. Arizona Native Plant Law does not apply on federal lands, such as the BLM land within the project area.

Invasive Species

Executive Order 13112 on invasive species (02/03/1999) defines invasive species as "alien species whose introduction does or is likely to cause economic or environmental harm..." Projects that occur on federal

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lands or that are federally funded must prevent, control, and monitor invasive species and restore native species and habitat that have been invaded. Invasive species identified in the project area include: common reed (*Phragmites australis*), Bermudagrass (*Cynodon dactylon*), and red shiner (*Cyprinella lutrensis*), black bullhead (*Ameiurus melas*), channel catfish (*Ictalurus punctatus*), and largemouth bass (*Micropterus salmonoides*) (USFWS 2008). No state-listed noxious weeds have been identified within the project area (RGuevara [ADOT] to EPhoebus [Jacobs] 03/12/2015).

Wildlife and Habitat Connectivity

The Arizona Wildlife Linkages Workgroup (AWLW) is a cooperative effort among ADOT, USFWS, BLM, AGFD, and several other federal and state agencies, academic institutions, and conservation organizations. This workgroup identified 152 potential linkage zones in Arizona that are important to wildlife. The AWLW located two potential wildlife linkage zones within the project vicinity: the Beaver Dam Slope–Virgin Slope linkage to the west and the Beaver Dam–Virgin Mountains linkage to the east (AWLW 2006). The Beaver Dam Slope–Virgin Slope linkage runs from the Nevada-Arizona border to roughly MP 8.20 (about 0.50 mile west of the project limits), and the Beaver Dam–Virgin Mountains linkage runs from roughly MP 12.15 (about 2.4 miles northeast of the project limits) to near the Utah border at roughly MP 29.40 (AGFD 2014a; AWLW 2006). Although both wildlife linkage zones lie outside of the project limits, the presence of the floodplains along the Virgin River and its confluence with Beaver Dam Wash make the area around Bridge No. 1 a natural wildlife corridor.

The AWLW also ranked linkages within Arizona by scoring each potential linkage zone in two dimensions: (1) biological value versus (2) threat and opportunity. The highest priority linkages were determined to be those that were the most biologically important that also had the highest associated threat. Twenty-eight linkages were categorized in the highest priority group, indicating that these linkages were in the highest need for more detailed planning and conservation actions prior to any

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roadway development or expansion. Early consideration of these linkages creates the opportunity to resolve environmental issues pertaining to wildlife connectivity and wildlife-vehicle collisions while reducing development costs for the project. One of the two linkage zones in the project vicinity, the Beaver Dam-Virgin Mountains linkage zone, was categorized in the highest priority group (AWLW 2006).

Riparian Areas and Wetlands

Riparian areas are transitional zones between land and water, typically consisting of strips of vegetation adjacent to streams, rivers, lakes, and other waterbodies. They can provide important fish and wildlife habitat, including habitat for species such as Virgin River fish, southwestern willow flycatcher, yellow-billed cuckoo, Yuma clapper rail, and other species that occur in the Virgin River corridor, and can increase the overall quality of the adjacent water resource. These areas are prone to scour due to seasonal flooding.

The riparian vegetation in the project area is patchy and diverse and occurs within the floodplain, intermixed with open water and sandbars, as well as above the floodplain in spring and seep areas. Directly adjacent to the low-flow channel of the Virgin River throughout the project area is a narrow band of vegetation consisting of narrowleaf willow (*Salix exigua*), cattail (*Typha* spp.), and occasionally young salt cedar and common reed. The seep areas contain extensive walls of common maidenhair (*Adiantum capillus-veneris*) growing on the cliffs with seaside brookweed (*Samolus parviflorus*), yerba mansa (*Anemopsis californica*), salt heliotrophe (*Heliotropium curassavicum*), cattail, velvet ash (*Fraxinus velutina*), and annual rabbitsfoot grass (*Polypogon monspeliensis*). Adjacent to the seep areas, there are monotypic patches of canyon grape (*Vitis arizonica*), and a large expanse of common reed at the base of the seep just northeast of the bridge.

Just west of the large common reed stand is a mature band of salt cedar, approximately 180 feet wide in one area. A thin band of young to mature Fremont cottonwood trees occurs directly underneath the

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bridge on the western side of the river with salt cedar, common reed, and an occasional Goodding's willow (*Salix gooddingii*) in the understory. Another larger grove of mature cottonwoods with little understory occurs south (approximately 0.25 mile) of Bridge No. 1 and adjacent to northwestern side of the bridge at the cliff base. Just south of this cottonwood grove is a large cattail marsh, apparently fed by a cold-water underground seep. This marsh exhibited recent signs of beaver (*Castor canadensis*) activity and contained additional species of wetland plants such as watercress (*Nasturtium officinale*), alkali Indian paintbrush (*Castilleja minor*), and water speedwell (*Veronica anagallis-aquatica*).

A wetland delineation was conducted in June 2014 to identify the location of wetlands within the project area. Seven plant communities covering 23.47 acres within the wetland survey area were determined to have all three wetland characteristics, including hydrophytic vegetation, hydric soils, and wetland hydrology. The wetland patches are located within the Virgin River 100-year floodplain and adjacent to the perennial streams that flow adjacent to I-15. The Corps approved the findings of the wetland delineation on 10/08/2015. Drainage characteristics of the Virgin River, including wetlands within the project area, are discussed above in Section 4.9, *Drainage and Floodplain Considerations*, and Section 4.10, *Section 404 and 401 of the Clean Water Act and National Pollutant Discharge Elimination System*.

4.12.2 Environmental Consequences

Alternative 1 – Bridge Widening and Rehabilitation

Threatened and Endangered Species

California Condor: Construction activities over the approximately two-year time period are likely to generate refuse that could potentially attract condors to the project area. However, the contractor would be required to clean the construction site each day to reduce the potential for condors to visit the

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site. Alternative 1 would not directly affect condor foraging; thus, Alternative 1 would have no effect on the California condor or its habitat.

Mojave desert tortoise: Direct effects could include injury or death to Mojave desert tortoise individuals either by direct collision or from collapse of underground burrows due to soil compaction. Mitigation measures including pre-construction surveys to make sure no tortoise are present, and installation and maintenance of tortoise fencing to inhibit tortoise access to the project area during the life of the project would ensure that there are no additional impacts to the tortoise. The project may affect but is unlikely to adversely affect the Mojave desert tortoise. The BO concurred with this finding stating that conservation and protection measures, including tortoise awareness training, exclusionary fencing, and re-contouring of the construction footprint to prevent tortoise entrapments would ensure any effects to the tortoise are insignificant.

Southwestern willow flycatcher: Roughly 1.3 acres of potentially suitable southwestern willow flycatcher habitat that includes primarily salt cedar forest occurs within the project limits that could be temporarily disturbed or removed due to geotechnical investigation or construction activities. Direct impacts to southwestern willow flycatcher individuals during tree removal would likely be avoided since vegetation removal would be restricted to outside of the MBTA nesting season (1 March to 31 August). The project may affect and is likely to adversely affect the southwestern willow flycatcher.

In addition, the Virgin River and its 100-year floodplain, which includes portions of the project area, is designated critical habitat for the southwestern willow flycatcher. Alternative 1 would temporarily remove approximately 1.3 acres of salt cedar and cottonwood habitat, resulting in direct impacts to southwestern willow flycatcher critical habitat. The project may affect and is likely to adversely affect critical habitat of the southwestern willow flycatcher.

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Virgin River chub and woundfin and Virgin spinedace: Construction would occur within the low-flow channel of the river due to the construction of coffer dams and the scour floor. The construction of the scour floor would require that the channel be relocated temporarily during construction of part of the floor and then returned to its preconstruction location when the floor is complete. Relocation of the channel would potentially result in the trapping of fish within the abandoned bypass channel if they should enter the project area during construction of the scour floor. Fish exclusionary measures such as a block net would be used to inhibit fish from entering the construction area, and fish within the construction area would be relocated by a qualified biologist. The project area would be monitored for the presence of fish during dewatering, and any fish found within the construction areas would be removed and relocated. Nonnative species would be humanely euthanized. Once the diversion is complete, the block nets would be removed. If surface water enters the construction area, work would stop immediately and qualified biologists would assess whether fish have entered the work area. Due to the construction within the river channel, individual fish may suffer harm or mortality, which are potential direct effects on these species.

The BE prepared for this project determined that Alternative 1 may affect and would likely adversely affect all three of these fish species. The project area contains critical habitat for the woundfin and the Virgin River chub. Because construction would result in localized erosion and increased sedimentation, impacts to this critical habitat are anticipated. However, no long-term changes in water quality are expected.

Yellow-billed cuckoo: Roughly 1.3 acres of potentially suitable foraging habitat for the yellow-billed cuckoo occur within the project limits that could be temporarily disturbed due to geotechnical investigation or construction activities. Unlike the southwestern willow flycatcher where breeding habitat would also be affected, the habitat patches of cottonwood trees are considered too small to

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provide breeding habitat for the yellow-billed cuckoo. The permanent or temporary disturbance of 1.3 acres of cottonwoods, willows, and tamarisk during the geotechnical investigation or construction could temporarily remove potentially suitable areas available for foraging. As outlined in the Biological Opinion issued by the USFWS on 08/03/2017, the project is not expected to adversely affect the western yellow-billed cuckoo because:

- ▶ Habitat within the project limits is considered to be marginally suitable for breeding; thus any direct or indirect effects to breeding cuckoos are unlikely and discountable.
- ▶ Use of the area by migrants and foraging birds would be temporarily disrupted during construction but cuckoos could move into the more suitable habitat within 0.25 mile of the project limits, at the confluence of Beaver Dam Wash.
- ▶ The 1.3 acres of cottonwoods, willows, and tamarisk that would be removed during the project would recover naturally or be restored during revegetation efforts after construction, and short-term effects would be insignificant.
- ▶ Permanent and temporary effects to 1.3 acres of proposed critical habitat would be small compared to proposed critical habitat range-wide (546,335 acres) and within the Virgin 1 Critical Habitat Unit (11,266 acres); thus, proposed critical habitat would remain functional to serve the intended conservation role for the cuckoo.

For these reasons, the project may affect but is unlikely to adversely affect the yellow-billed cuckoo.

In addition, the Virgin River and its 100-year floodplain, which includes portions of the project limits, is proposed critical habitat for the yellow-billed cuckoo. Alternative 1 would temporarily remove approximately 1 acre of cottonwood gallery forests, resulting in direct impacts to yellow-billed cuckoo

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critical habitat. The project may affect but is unlikely to adversely affect proposed yellow-billed cuckoo critical habitat.

Yuma clapper rail: Less than 1 acre of narrow bands of cattail habitat would likely be disturbed during geotechnical investigation and temporary construction activities; these areas would be expected to reestablish in a manner similar to its response to flood events. Due to the minimal amount of habitat being affected, its inadequacy for use in nesting, the highly disturbed area in which this habitat is located, and number of years since the last rail was observed in the project area, no direct effects to the Yuma clapper rail are anticipated. The project would have no effect on the Yuma clapper rail or its habitat.

BLM Sensitive Species

Allen's big-eared bat: Allen's big-eared bats are not known to use bridges as roosting habitat, and no other roosting habitat occurs in the project area. This species is known to utilize habitat such as that found within the project area for nocturnal foraging; however, no nighttime work is anticipated for this project except for the temporary setting of girders. Bats in the area may avoid foraging near the construction activity; however, there is abundant alternative foraging habitat along the river corridor for individuals to use during this project activity. Therefore, no direct impacts to Allen's big-eared bats are anticipated. Alternative 1 may impact individual Allen's big-eared bats, but it is not likely to result in a trend toward federal listing or loss of viability.

American peregrine falcons: Alternative 1 may temporarily affect foraging in the project area which would result in an indirect effect on the American peregrine falcon. Therefore, this project may impact individual American peregrine falcons, but it is not likely to result in a trend toward federal listing or loss of viability.

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California leaf-nosed bat: The project is not expected to disturb nocturnal California leaf-nosed bat activities as project construction would be restricted to daytime hours except for the temporary setting of girders. Bats in the area may avoid foraging near the construction activity during this night work; however, there is abundant alternative foraging habitat along the river corridor for individuals to use. Direct impacts to California leaf-nosed bats are, therefore, possible, but not likely. Alternative 1 may impact individual California leaf-nosed bats, but is not likely to result in a trend toward federal listing or loss of viability.

Desert springsnail: Harm or mortality could occur to desert springsnail individuals should they occur in these seeps and the surrounding vegetation at the time of construction. However, due to the highly disturbed area around these springs, including habitat modification from sandbagging spring edges to hold standing water for recreational use, this species is not assumed present. Direct effects are, therefore, possible, but not likely as a result due to this project. Therefore, the project may impact individual desert springsnails, but is not likely to result in a trend toward federal listing or loss of viability.

Desert sucker, the flannelmouth sucker, and the speckled dace: Three BLM sensitive fish species, the desert sucker, the flannelmouth sucker, and the speckled dace, have been recorded within 3.0 miles of the project area. Because Alternative 1 would occur within the low-flow channel of the river, individual fish may suffer harm or mortality, which are potential direct effects on these species. Fish exclusionary measures previously described would reduce the potential for these three species to become stranded within the dewatered construction area. The BE determined that, for each of these BLM sensitive fish species, construction of Alternative 1 may affect individual fish, but is not likely to result in a trend toward federal listing or loss of viability.

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Golden eagles: The project area would only potentially be used as foraging habitat by golden eagles.

Foraging by golden eagles is not associated with water, but rather involves hunting terrestrial animals in open country. Construction activities associated with Alternative 1 would be localized along the Virgin River and access roads, such that it would not affect foraging by golden eagles. Alternative 1 would have no impact on the golden eagle.

Silverleaf sunray: Alternative 1 would disturb approximately 15 acres of upland desertscrub habitat.

Construction activities within upland areas could directly impact individuals of this species that may be within the project limits. Thus, Alternative 1 could have a direct effect on the silverleaf sunray. However, no individuals have been identified within 3 miles of the project area according to AGFD. If during preconstruction surveys a plant is identified on BLM land, ADOT would coordinate with BLM on the treatment of the plant. It is anticipated that any plant would be fenced and avoided.

Spotted bat: The spotted bat is known to occur in the project area (S. Langston, BLM, pers. comm. to T. McCarthy, Archaeological Consulting Services, 09/30/2014). Brief nighttime work is expected during the temporary setting of girders. Bats in the area may avoid foraging near the construction activity during this night work; however, there is abundant alternative foraging habitat along the river corridor for individuals to use. Direct impacts to spotted bats are, therefore, possible, but not likely. Alternative 1 may impact individual spotted bats, but is not likely to result in a trend toward federal listing or loss of viability.

Townsend's big-eared bat: Bridge No. 1 could provide roosting habitat for the Townsend's big-eared bat. However, no evidence of roosting bats was observed during daytime field reconnaissance.

Preconstruction bat surveys would be conducted prior to bridge construction. Brief nighttime work is expected during the temporary setting of girders. Bats in the area may avoid foraging near the construction activity during this night work; however, there is abundant alternative foraging habitat

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along the river corridor for individuals to use. Direct impacts to Townsend's big-eared bats are, therefore, possible, but not likely.

Native Plants

Native plants would be removed from private property for the improvement of access roads, staging areas, and bridge construction. In accordance with the Arizona Native Plant Law, a mitigation measure would require the ADOT Roadside Development Section to determine whether the Arizona Department of Agriculture would need to be notified, and, if so, to send the notification at least 60 days prior to the start of construction.

Invasive Species

ADOT and the contractor would implement mitigation measures to minimize the introduction and spread of invasive species, such as developing a Noxious and Invasive Plant Species Treatment and Control Plan, washing contractor vehicles prior to entering the construction site, and reseeding with an approved seed mix developed for this project for reclamation. All the invasive species mitigation measures are presented in the *Biological Resources, Mitigation* section below.

Wildlife and Habitat Connectivity

Because both wildlife linkage zones in the project vicinity lie outside of the project area, no accommodations are necessary for species identified as using either of these linkage zones. However, because the floodplains along the Virgin River and its confluence with Beaver Dam Wash make a natural wildlife corridor within the project area and through the project limits, animals may be found migrating through the project limits. Activities within the river channel from Alternative 1 may disrupt habitat connectivity and daily activity patterns temporarily for these animals in order to avoid construction activities for the duration of the project.

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Riparian Areas and Wetlands

Alternative 1 would have a minor, temporary impact on the riparian values of the Virgin River due to potential removal of riparian habitat resulting from temporary construction within and adjacent to the floodplain. Approximately 19 acres of riparian vegetation (both within and above the floodplain) would be disturbed as a result of Alternative 1. The majority of this disturbance would be temporary.

Permanent impacts would occur from construction of the bridge abutments; the footprint of these impacts would be determined during final design of Bridge No. 1 but would likely only require the removal of a few young cottonwood trees. Once construction is complete, the contractor would seed temporarily disturbed areas using a seed mix approved for this project, and over time, riparian values would reestablish. Therefore, Alternative 1 would have minor impacts that would be localized and would not impact the overall riparian values of the Virgin River. Potential impacts to wetlands are discussed above in Section 4.10, *Section 404 and 401 of the Clean Water Act and National Pollutant Discharge Elimination System*.

Alternative 2 – Bridge Reconstruction in Place

Impacts to vegetation (including native plants and invasive species), biological species (including those listed under the ESA and by BLM), habitat/critical habitat, and habitat connectivity would be essentially the same under Alternative 2 as described above for Alternative 1. Given that Alternative 2 would not include a scour floor, the low flow channel would not need to be redirected and returned during construction, and consequently the potential impacts to the listed fish species would be less than described for Alternative 1. While every effort would be made to avoid disturbance of the low flow channel, given the nature of construction, some disturbance could potentially occur, so the impacts as described in Alternative 1, while less in intensity, would be the same for Alternative 2.

*Virgin River Bridge #1 (STR #1089)***Alternative 3 – No Build Alternative**

Under the No Build Alternative, only maintenance activities would occur. These activities would be assessed project-by-project for impacts to biological resources or designated critical habitat, and addressed appropriately with mitigation if needed. The No Build Alternative is not anticipated to result in any adverse impacts to riparian areas or water quality within the project area.

4.12.3 Mitigation Measures

The following additional mitigation measures would minimize impacts to biological species and designated critical habitat. Further, because the designated and proposed critical habitats for the Virgin River chub, woundfin, southwestern willow flycatcher, and yellow-billed cuckoo coincides mostly with the 100-year floodplain, the mitigation measures found in Section 4.9, *Drainage and Floodplain Considerations, Mitigation Measures*, would also minimize impacts to biological resources.

- ▶ Arizona Department of Transportation would arrange for preconstruction environmental awareness training for all Arizona Department of Transportation and contractor personnel working in the project area. The training would include information on wetlands, Virgin River chub, woundfin, Virgin spinedace, southwestern willow flycatcher, Yuma clapper rail, yellow-billed cuckoo, California condor, and Mojave desert tortoise.
- ▶ Water would not be withdrawn from the Virgin River for construction purposes.
- ▶ No vegetation clearing would occur during the migratory bird breeding season (March 1-August 31). During the non-breeding season (September 1-February 28) vegetation removal is not subject to this restriction.
- ▶ Prior to initial ground disturbing construction or geotechnical activities, a biologist holding the proper handling permits from the U.S. Fish and Wildlife Service would conduct a survey for the presence of Mojave desert tortoises or active tortoise burrows.

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- ▶ Construction staging areas would be fenced in accordance with U.S. Fish and Wildlife Service desert tortoise exclusionary fencing protocols. The contractor would inspect and maintain the fencing daily.
- ▶ If any Mojave desert tortoises are encountered during construction or geotechnical activities, established protocols, as provided in the environmental training, would be followed to ensure the animal is not touched, harassed or moved. The desert tortoise would be allowed to leave the area on its own or an on-call biologist holding the proper United States Fish and Wildlife Service permits would be called to assess the situation.
- ▶ Temporary access routes created during project construction would be modified as necessary to prevent further use. Closure of access routes can be achieved by ripping, barricading, posting the route as closed, and/or seeding and planting with a seed mix and with plant species mix approved for this project.
- ▶ After completion of the project, trenches, pits, and other features in which tortoises can be entrapped or entangled, would be filled in, covered, or otherwise modified so they are no longer a hazard to desert tortoises.
- ▶ After project completion, measures would be taken to facilitate restoration. Restoration techniques would be tailored to the characteristics of the site and the nature of project impacts. Techniques may include removal of equipment and debris, recontouring; and seeding, hydro seeding, planting, transplanting native species. Revegetation would include the planting of nursery stock or tall pot trees or shrubs, and chemical or natural fertilizers may be used during revegetation efforts.
- ▶ Listed fish species and native frogs would be removed from the project area prior to any in-water work activities. Fish exclusion activities would be performed under the direction of a

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biologist holding a permit for recovery of Virgin River chub and woundfin and would be relocated per the plan developed in coordination with United States Fish and Wildlife Service and Arizona Game and Fish Department.

- ▶ No work would be allowed in flowing surface water unless fish exclusion measures are in place and functioning.
- ▶ All concrete would be poured in dry conditions or within confined waters not being dewatered into surface waters of the Virgin River. Concrete would be allowed to cure for at least 24 hours before contact with surface water of the Virgin River is allowed.
- ▶ The contractor would stop work immediately and inform the Engineer if surface flows enter the in-water work area at any time following the initial isolation or diversion activities. The Engineer would arrange for fish and native frog exclusion and relocation per the U.S. Fish and Wildlife Service-approved plan before allowing work to commence again.
- ▶ A containment system would be developed to minimize debris and construction materials from inadvertently dropping into the Virgin River or the 100-year flood plain.
- ▶ Prior to initial ground disturbing, construction or geotechnical activities, a biologist would conduct a survey for the presence of silverleaf sunray plants.
- ▶ Any silverleaf sunray plants identified in the preconstruction survey would be fenced off and avoided throughout the project duration. During preconstruction surveys, if any silverleaf sunray plants are discovered, ADOT would coordinate with BLM at that time.
- ▶ The project area would be kept clean, and no trash would be stored onsite.
- ▶ All disturbed soils not paved that would not be landscaped or otherwise permanently stabilized by construction would be seeded using an approved seed mix developed for this project.

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- ▶ Prior to the start of ground-disturbing activities, the contractor would arrange for and perform the control of noxious and invasive species in the project area.
- ▶ The contractor would develop a Noxious and Invasive Plant Species Treatment and Control Plan in accordance with the requirements in the contract documents. Plants to be controlled would include those listed in the State and Federal Noxious Weed and the State Invasive Species list in accordance with State and Federal Laws and Executive Orders. The plan and associated treatments would include all areas within the project right of way and easements as shown on the project plans. The treatment and control plan would be submitted to the Engineer for the Arizona Department of Transportation Construction Professional Landscape Architect for review and approval prior to implementation by the contractor.
- ▶ To prevent the introduction of invasive species seeds, the contractor would wash all earthmoving and hauling equipment at the storage facility. The equipment would be free of all attached plant/vegetation and soil/mud debris prior to entering the project area.
- ▶ To prevent invasive species seeds from leaving the project area, the contractor would inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the project area.
- ▶ At least 30 business days prior to project construction, the Arizona Department of Transportation Engineer would contact the Environmental Planning Biologist (602.712.6819 or 602.712.7767) to arrange for a qualified biologist to conduct a visual preconstruction survey of the underside of the bridge to look for bats potentially roosting on the bridge structure. The biologist would provide a memo with results of the preconstruction survey, and a follow-up memo(s) after any additional surveys/monitoring required, to the Environmental Planning Biologist.

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- ▶ If bats are found present roosting under the bridge, at least 15 business days prior to project construction, the Arizona Department of Transportation Engineer would contact the Environmental Planning Biologist (602.712.6819 or 602.712.7767) to arrange for a qualified biologist to assist the contractor with installing exclusionary measures to crevices and other areas beneath Virgin River Bridge No. 1 that could potentially be used by bats. Exclusionary measures must be kept in place and in proper working order until work is completed on the bridge.
- ▶ If bats are found present roosting under the bridge, the contractor, with the assistance of a qualified biologist, would install bat exclusionary measures to crevices and other areas beneath Bridge No. 1 that could potentially be used by bats. Exclusionary measures must be kept in place and in proper working order until work is completed on the bridges.
- ▶ Following completion of the work on Virgin River Bridge No. 1, the contractor would remove all bat exclusionary measures to the satisfaction of the Arizona Department of Transportation Engineer.
- ▶ Protected native plants within the project limits would be impacted by this project; therefore, the Arizona Department of Transportation Roadside Development Section would determine if Arizona Department of Agriculture notification is needed. If notification is needed, the Arizona Department of Transportation Roadside Development Section would send the notification at least 60 calendar days prior to the start of geotechnical or project construction activities.
- ▶ The contractor would not cause injury or death to swallows, including eggs and nestlings, and would avoid work within 100 feet of nesting swallows from February 1 to August 30 of any calendar year. If work would occur within 100 feet of nesting swallows between February 1 and August 30, the contractor would adhere to the following:

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- The contractor would completely remove all existing swallow nests within 100 feet of the project area after August 30 but prior to February 1 to prevent swallows from reusing those nests.
- The contractor would implement exclusionary measures to prevent swallows from building new nests within 100 feet of the project area. Exclusionary measures would be implemented in all areas where swallows are likely to nest, and may include (a) continually removing nesting materials during early nest construction when eggs or nestlings are not present, (b) installing exclusionary netting (wire or plastic mesh 0.75 inch or less in diameter), (c) installing deterrent spike strips, and/or (d) applying an appropriate bird exclusion liquid or gel (per manufacturer's instructions).
- The contractor would not disturb any active swallow nests (completed or partially completed nests that contain eggs or nestlings). If any active nest is discovered within 100 feet of construction activities, work would stop and the Arizona Department of Transportation Environmental Planning Biologist would be contacted (602.712. 6819 or 602.712.7767) to evaluate the potential for disturbance of nests.
- The contractor would monitor and maintain the effectiveness of exclusionary measures used. Netting would be maintained such that it remains in place without any loose areas or openings that could trap and/or entangle birds. Spike strips would be maintained such that they remain in place. Exclusion liquid or gel would be reapplied as often as necessary to remain effective (per manufacturer's instructions).

4.12.4 Conclusion

The implementation of either Alternative 1 or Alternative 2 could disturb approximately 15 acres of upland desertscrub habitat, approximately 19 acres of vegetated riparian habitat (both within and above

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the floodplain), and approximately 9 acres of non-vegetated habitat within the floodplain (sandbars and open water). This project would potentially affect federally listed species (Mojave desert tortoise, southwestern willow flycatcher, Virgin River chub, woundfin, yellow-billed cuckoo, and Virgin spinedace), and ten BLM sensitive species (Allen's big-eared bat, American peregrine falcon, California leaf-nosed bat, desert springsnail, desert sucker, flannelmouth sucker, speckled dace, silverleaf sunray, spotted bat, and Townsend's big-eared bat). In addition, constructing either Alternative 1 or Alternative 2 would affect proposed or designated critical habitat for four species: the southwestern willow flycatcher, the Virgin River chub, the woundfin, and the yellow-billed cuckoo. The impacts would be mitigated through implementation of mitigation measures. Section 7 consultation with the USFWS is ongoing. Mitigation measures may change once consultation is finalized.

The No Build Alternative would not result in project-related impacts to biological resources or designated critical habitat.

4.13 Wild and Scenic Rivers

4.13.1 Regulatory Framework

When Congress passed the Wild and Scenic Rivers Act of 1968, it directed federal agencies to consider potential national wild, scenic, and recreational rivers during their planning efforts (Public Law [P.L.] 90-542). The legislation states:

That certain selected rivers of the [U.S.] which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, would be preserved in free-flowing condition, and that they and their immediate environments would be protected for the benefit and enjoyment of present and future generations (P.L. 90-542).

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Wild and Scenic Rivers may be administered by BLM, U.S. Forest Service, NPS, or USFWS. These federal agencies have the opportunity to nominate potentially eligible river segments according to one of the following three classifications:

- ▶ “Wild” river areas are those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.
- ▶ “Scenic” river areas are those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely undeveloped, but accessible in places by roads.
- ▶ “Recreational” river areas are those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past (16 U.S.C. 1273[b]).

4.13.2 Affected Environment

The Virgin River was not identified as a Wild and Scenic River in the original legislation, nor has it been added to the National Wild and Scenic Rivers System or congressionally approved as a study river in the interim (National Wild and Scenic Rivers System 2014). However, BLM determined the stretch of the Virgin River located in the study area, Segment 4, to be suitable for inclusion in the National Wild and Scenic Rivers System as recreational (BLM 1994).

The BLM’s eligibility and suitability determinations were documented in both a legislative Environmental Impact Statement solely addressing recommended rivers (BLM 1994) and in BLM’s most recent RMP (BLM 2008a). BLM recommended the section of the Virgin River within the project area as suitable because of its free-flowing nature and outstandingly remarkable fishery and wildlife habitat values. Fish include the woundfin minnow, Virgin River chub, and Virgin spinedace. Habitat areas include the river

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itself, along with the associated riparian areas, cottonwood galleries, salt cedar corridors, and upland areas that provide food and shelter for a variety of birds, leopard frogs, mule deer, desert tortoises, and more (see Section 4.12 for additional information). Although Congress has not yet acted on a recommendation, BLM is responsible for proper stewardship of the river, including maintaining its free-flowing character and the outstandingly remarkable values that make it suitable for designation.

With congressional approval of the recommended Virgin River segments still pending, the reach of the Virgin River within the study area is considered an agency-identified study river, rather than being congressionally authorized. Statutory protection differs between the two categories, where “a river identified for study through agency planning process is not protected under the Act. Rather, protection of its free flow, water quality, and [outstandingly remarkable values] occurs through other agency authorities” (Interagency Wild and Scenic Rivers Coordinating Council 1999). To support the mandate for federal agencies to consider impacts on potential Wild and Scenic Rivers, the NRI catalogues:

Rivers and river segments that appear to meet minimum [Wild and Scenic Rivers] Act eligibility requirements based on their free-flowing status and resource values, and which are therefore afforded some protection from the adverse impacts of federal projects until such time as they can be studied in detail (Interagency Wild and Scenic Rivers Coordinating Council 1999).

The NRI is maintained and administered by NPS. Since 1979, through a 1980 President’s CEQ Memorandum for the Heads of Agencies, federal agencies have been required to consider avoidance or mitigation of adverse effects to NRI-listed segments.

The Virgin River was listed in the NRI in 1982 and 1983 based on the following outstandingly remarkable values: scenery, fishery, wildlife, and “other values.” “Other values” indicate that assessments of other

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river-related values may be developed (NPS 2010). During coordination with BLM and NPS in September 2012, NPS stated that BLM's evaluation criteria and management decisions would take precedence over the NRI criteria because BLM's analysis was more detailed than the NRI. The BLM Wild and Scenic Rivers Legislative Environmental Impact Statement (LEIS) did not identify scenery as being an outstandingly remarkable value for the project area (within Segment 4). Therefore, impacts to the following outstandingly remarkable values, as detailed by BLM in the Arizona Statewide Wild and Scenic Rivers LEIS (1994), are evaluated in the next section: fishery and wildlife habitat values.

Within the study area, the majority of the area under Bridge No. 1 and much of the study area both upstream and downstream is located on ADOT- or privately-owned land (see Figure 6). Approximately 5 acres within the project area that are located within the Virgin River north, south, and immediately east of the bluff on the western side of the bridge are under BLM jurisdiction. This includes a small area under the far western portion of the bridge, the area of the Beaver Dam Wash and Virgin River confluence, and a limited area south of the bluff that would include portions of the southwestern access route. The easement across BLM land was established for the transportation corridor; while other designations may overlap the easement, the primary purpose and use is to accommodate the bridge and highway. BLM does not have authority over the non-federal portions of the river, and the Wild and Scenic Rivers management protection does not apply to the non-federal land (BLM 1994).

4.13.3 Environmental Consequences

Because the Virgin River has been recommended by BLM as suitable for inclusion in the National Wild and Scenic Rivers System, the agency's management policies apply to federally managed portions of the Virgin River within the study area (BLM 2012). The boundary of the agency-identified study extends to a minimum of 0.25 mile from the river's ordinary high water mark, and the boundary may include adjacent areas as needed to protect outstandingly remarkable values. Because only congressionally

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authorized rivers are protected by the act, BLM uses appropriate management actions to protect the river's outstandingly remarkable values in the BLM-designated wild, scenic, and recreational segments of the Virgin River within its jurisdiction.

The Virgin River within the project area is listed on the NRI. Therefore, FHWA "must seek to avoid or mitigate actions that would adversely affect" the river's outstandingly remarkable values that qualify it for the NRI (NPS 2010). According to the NRI listing, the outstandingly remarkable values of the Virgin River within the project area include the scenic, fishery, wildlife, and other values of the unique riparian corridor.

Ultimately, a determination of impacts would hinge on whether an alternative would diminish the characteristics that qualify the Virgin River as suitable for inclusion in the national system. This would involve assessing effects to the river's free-flowing character, as well as its outstandingly remarkable values within the federal jurisdiction. BLM's RMP has classified the severity of changes that could enhance or diminish outstandingly remarkable values or the free-flowing character as follows:

- ▶ **Negligible:** The change would be so small that it would not be of any measurable or perceptible consequence.
- ▶ **Minor:** The change would be small and, if measurable, would be localized and not affect eligibility or suitability determinations.
- ▶ **Moderate:** The change would be measurable, but localized, with adverse impacts readily mitigated so not to threaten eligibility or suitability determinations.
- ▶ **Major:** The change would be measurable and widespread, with adverse impacts potentially threatening eligibility or suitability determinations (BLM 2008a).

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Alternative 1 – Bridge Widening and Rehabilitation

It is anticipated that the majority of the construction conducted for this project would occur in areas that are not under BLM management, and thus technically not subject to the requirements that govern Wild and Scenic Rivers. As stated in the LEIS (BLM 1994), “The Bureau of Land Management has no authority over nonfederal land and only can address the public land it administers. In wild and scenic river administration, the management protection would be applied to the entire river study area except for the private or state lands.” NPS has the authority to consult on best practices to protect resources on NRI reaches, regardless of ownership. The CEQ Memorandum states “each agency is responsible for studying, developing, and describing all reasonable alternatives before acting, and for avoiding and mitigating adverse effects on rivers identified in the Inventory.”

Free-Flowing Character

Alternative 1 would have minor short-term and long-term impacts on the free-flowing character of the Virgin River. Minor, temporary impacts on the existing free-flowing character of the Virgin River resulting from construction would potentially include temporary cofferdams, casings, or similar approaches around Piers 3 and 4 to create dry work areas in the active stream channel that would be in place for the duration of work within the river bottom. The dry work areas would temporarily affect the free-flow condition for a small portion of the river. In addition, a scour floor would be constructed from bank to bank. Any flowing water would have to be temporarily diverted to a different portion of the existing river bottom while the floor is constructed, then would be relocated to its previous location following scour floor construction. Following construction all waste materials and equipment would be removed from the channel and disturbed areas would be returned to their preconstruction elevations. Waste materials from the project become the contractor’s property and must be disposed of in compliance with federal, state, and local laws. To protect the free-flowing nature of the Virgin River to

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the extent possible, no temporary culverts or other drainage structures would be installed in the active stream channel. The temporary bridge required for equipment access would clear span the active stream channel, and would be constructed such that it could be picked up and moved in the event of high flows. Ultimately, any temporary impediments to free-flow during construction would be small and localized, and would not affect eligibility or suitability determinations.

Alternative 1 would have minor, long-term impacts on the existing free-flowing character of the Virgin River. Depending on the water level, the existing Pier 3 sits either in the Virgin River or immediately adjacent to the active stream channel and can be an existing obstruction in the river. The existing piers would be widened upstream and downstream with an additional column on each side of the piers. The extent of obstruction caused by bridge piers in a river depends on geometric shape, position in the stream, flow rate, and the amount of channel blockage. The new pier would have many of the same characteristics as the existing pier and would be designed to minimize streamflow deflection that could affect scour and deposition around Pier 3. However, as a result of the addition of two columns at each pier, streamflow would be deflected slightly more than under the existing conditions. The construction of a scour floor would eliminate scour concerns. Upstream levels could increase slightly and downstream levels would likewise decrease slightly. The degree of change would be determined during the development of the design and associated hydraulic studies, which also would consider pier design effects on river recreation. Any hydraulic effects would be localized, would dissipate quickly upstream and downstream, and would not adversely affect the river's Wild and Scenic River eligibility or cause it to fail to meet the suitability requirements.

Fishery/Aquatic Values

Alternative 1 would have a moderate, temporary impact on the aquatic values of the Virgin River due to potential short-term effects on endangered fish species and associated critical habitat resulting from

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construction of widen bridge piers, columns, and a scour floor, and temporary construction activities within the floodplain that result in disturbances in the river. In consultation with USFWS, mitigation measures have been developed to minimize impacts on the Virgin River fish species, and no permanent adverse modification to critical habitat would occur. If an incidental take would exceed what is permitted by the Biological Opinion, consultation with USFWS would be reinitiated. Potential effects to endangered fish species would be temporary, approximately 3 months in duration for work within the active stream channel and 24 month in duration for work in critical habitat. Once construction is complete, the contractor would return the floodplain to its existing elevations, and aquatic values would return to existing conditions in time. Because mitigation measures would minimize impacts to Virgin River fishes and the temporary disturbance would not change or modify BLM's management of the study area, Alternative 1 would conform to the Wild and Scenic River management strategies for the Virgin River. Overall, Alternative 1 would have moderate, localized impacts that would be mitigated such that it would not diminish the aquatic habitat and fishery values of the Virgin River.

Wildlife Habitat/Riparian Values

Alternative 1 would have a minor, temporary impact on the riparian areas and habitat of the Virgin River due to potential removal of riparian vegetation resulting from construction within and adjacent to the floodplain. Riparian vegetation in the study area adjacent to the low flow channel mostly consists of saltcedar, narrowleaf willow, cottonwood trees, cattails, and bulrushes. Riparian areas can provide habitat value for Virgin River fish species, southwestern willow flycatcher, yellow-billed cuckoo, and other species that occur in the Virgin River corridor. However, the riparian vegetation within the project area is patchy and scattered. During construction of improvements at Bridge No. 1, scour floor, and the access roads, some riparian habitat would be removed. Once construction is complete, the contractor would seed disturbed areas using an approved seed mix developed for this project, and over time,

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riparian values would return to existing conditions (see Section 4.12 for additional discussion on biology, wildlife, and riparian habitat). Riparian vegetation would be anticipated to respond to construction impacts similarly to its response to a flood. Because mitigation measures would minimize impacts to riparian habitat and the temporary disturbance would not change or modify BLM's management of the study area, Alternative 1 would conform to the Wild and Scenic River management strategies for the Virgin River. Alternative 1 would have minor impacts that would be localized and would not affect the overall riparian and habitat values of this segment of the Virgin River.

Scenic Values

Alternative 1 would have minor impacts on the scenic values of the Virgin River. As discussed in Section 4.9, *Visual Resources*, the bridge rehabilitation would not change the existing visual character of the study area because the proposed construction would use similar concrete forms, textures, and colors to the existing structure. I-15 is already a major (but not dominant) aspect of the landscape in the corridor, and the wider bridge, piers, and roadway approaches would not appreciably increase the interstate's degree of dominance in the landscape as a whole. The removal of "Little Jamaica" would result in the addition of either boulders or fencing on the hillside, which would become less evident as vegetation is restored. Mitigation measures would be implemented to minimize visual impacts.

Alternative 1 would have minor visual impacts that would be localized and would not impact the overall scenic values of this segment of the Virgin River.

Alternative 2 – Bridge Reconstruction in Place

Compared to Alternative 1, Alternative 2 would have similar but reduced impacts on the free-flowing, aquatic values, and values that contribute to the Wild and Scenic River eligibility of this reach of the Virgin River. As with Alternative 1, only the far western edge of the project is under BLM jurisdiction.

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Free-flowing Character

Alternative 2 would have similar impacts to the free flowing character of the river during construction but the impacts would be less than Alternative 1. Alternative 2 would require the temporary use of cofferdams or other methods to create a dry work area during construction. During this time, the river would continue to be free flowing, but water would be deflected from the dry work area. This would result in a short-term minor impact on the free flowing nature of the river. No scour floor would be constructed.

Alternative 2 would construct two new piers for each existing pier, and the existing piers would be removed. The new piers would be designed to minimize the overall obstruction to the water flow compared to existing conditions. Upstream levels could increase slightly and downstream levels would likewise decrease slightly. The degree of change would be determined during the development of the design and associated hydraulic studies, which also would consider pier design effects on river recreation. Any hydraulic effects would be localized, would dissipate quickly upstream and downstream. Alternative 2 would not adversely affect the river's Wild and Scenic River eligibility or cause it to fail to meet the suitability requirements.

Fishery/Aquatic Values

The impacts to endangered fish and aquatic values associated with Alternative 2 would be similar to but less than those described for Alternative 1 since Alternative 2 does not include a scour floor. Potential effects on endangered fish species would be temporary, approximately 3 months in duration for work within the active stream channel and 24 months in duration for work in critical habitat. Overall, Alternative 2 would have moderate, local impacts that would be mitigated such that it would not diminish the fishery and aquatic values of this segment of the Virgin River.

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Wildlife Habitat/Riparian Values

Impacts to riparian values for Alternative 2 would be the same as for described for Alternative 1.

Riparian vegetation would be anticipated to respond to construction impacts similarly to its response to a flood. Because mitigation measures would minimize impacts to riparian habitat and the temporary disturbance would not change or modify BLM's management of the study area, Alternative 2 would conform to the Wild and Scenic River management strategies for the Virgin River. Alternative 2 would have minor impacts that would be localized and would not affect the overall riparian and habitat values of this segment of the Virgin River.

Scenic Values

Impacts on the scenic value of the Virgin River for Alternative 2 would be essentially the same as described for Alternative 1. As discussed in Section 4.9, *Visual Resources*, the bridge rehabilitation would not change the existing visual character of the study area because the proposed construction would use similar concrete forms, textures, and colors to the existing structure. I-15 is already a major (but not dominant) aspect of the landscape in the corridor, and the wider bridge, piers, and roadway approaches would not appreciably increase the interstate's degree of dominance in the landscape as a whole. The removal of "Little Jamaica" would result in the addition of either boulders or fencing on the hillside, which would become less evident as vegetation is restored. Mitigation measures would be implemented to minimize visual impacts. Alternative 1 would have minor visual impacts that would be localized and would not impact the overall scenic values of this segment of the Virgin River.

Alternative 3 – No Build Alternative

Under the No Build Alternative, no construction would occur. The existing piers have a minor effect on the free-flowing character of the river, and the bridge and piers have a minor impact on the scenic

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outstandingly remarkable value of the Virgin River. Under the No Build Alternative, no changes to the free-flowing nature or the outstandingly remarkable values of the Virgin River would occur.

4.13.4 Mitigation Measures

The complete lists of mitigation measures to minimize impacts to aquatic and riparian resources and scenic values are presented in Section 4.9, *Visual Resources*, and Section 4.12, *Biological Resources*.

4.13.5 Conclusion

Alternative 1 and Alternative 2 would conform to the Wild and Scenic River management strategies for the Virgin River. Construction practices and design elements described above would minimize impacts on the free-flowing characteristics of the Virgin River and outstandingly remarkable values. Alternative 1 and Alternative 2 would have short-term minor impacts on the scenic and wildlife habitat/riparian values and moderate impacts on the fishery/aquatic values of the reach.

In the long-term, Alternatives 1 and 2 would have a minor impact on the free-flowing character of the Virgin River and on the outstandingly remarkable scenic, fishery/aquatic, wildlife habitat/riparian values as a result of the proposed improvements. Mitigation measures would minimize impacts to these values. Overall, they would have a minor impact that would be localized.

The No Build Alternative would continue to have a minor impact on the free-flowing character and scenic value in the project area that would be comparable to Alternatives 1 and 2. The No Build Alternative would have no impact on the remaining outstandingly remarkable values.

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4.14 Soils and Geologic Resources

4.14.1 Background

Geologic formations that are unstable or erode easily, extreme topography, and faults or areas of seismic activity may affect construction or require special materials or engineering. Soil features that may affect construction include soil erodibility and permeability.

No active mining claims occur in the study area (BLM 2007). There is direct evidence of a moderate potential for gas or oil to occur within the study area and indirect evidence of a moderate potential for placer gold to be present (BLM 2007). An evaluation of geologic resources and soils include both impacts to such resources from the project, as well as implications for construction from such resources.

There are no federal or state laws that apply specifically to geologic or soil resources, although some local agencies may have restrictions regarding building on certain types of soils, such as expanding soils. Geologic resources in the Virgin River corridor are protected based on the BLM's recommendation of the Virgin River as suitable for inclusion in the National Wild and Scenic Rivers System because BLM identifies geologic values as contributing directly to the river's eligibility (BLM 2007). Therefore, the agency's management policies apply to geologic resources within the study area.

4.14.2 Affected Environment

The study area is approximately 3 miles west of the Virgin River Gorge in the Mesquite Basin, part of the Basin and Range province, which is bounded by the Grand Wash Cliffs and Virgin Mountains to the east and the Mogollon Rim to the southeast (Faulds et al. 2008). This province was subjected to extension that thinned and cracked the crust as it was pulled apart and as a result the province is characterized by roughly parallel, north/south running faults and linear mountain ranges separated by relatively broad and flat valleys (USGS 2000). The Virgin River separates the two mountain ranges adjacent to the study area: the Beaver Dam Mountains to the northeast and the Virgin Mountains to the southeast. Locally,

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the Virgin River flows through a shallow valley cut into relatively young alluvial deposits that extend from the Virgin and Beaver Dam mountain ranges, forming the gently sloping land that characterizes the area. The roughly north/south running Piedmont Fault separates the Virgin and Beaver Dam mountains from the Mesquite Basin, and although the fault is mostly buried by alluvial deposits, it can be observed as small fault scarps in the alluvial fans along the lower slopes of the Virgin Mountains (USGS 2000).

Geology in the study area is characterized by deposits of sedimentary rocks (mainly unconsolidated or weakly consolidated, interlensing layers of clay, silt, sand and pebble to gravel alluvium as well as calcium carbonate deposits) ranging in age from approximately 0 to 5.3 million years, spanning the Holocene, Pleistocene, Pliocene, and Miocene epochs of the Cenozoic Era (USGS 2000). As is characteristic of the Basin and Range province, these alluvial deposits can be relatively shallow to thousands of feet deep.

In the study area, stream-channel alluvium (Qs) comprises unconsolidated, unsorted, interlensing clay, silt, sand, and pebble to boulder gravel. Travertine deposits (Qtt) comprise gray, porous, thin-bedded, freshwater, calcium carbonate deposits including silt, sand, pebbles, and cobbles derived from sheetwash erosion of pediment calcrete and young alluvial fan sediments. Dune sand and sheet deposits (Qd) comprise white, very fine to fine grained small dunes and well sorted sand sheets. Young alluvial deposits (Qgy) comprise unconsolidated to partly consolidated, light brown, pale-red, and gray silt, sand, and pebble to boulder gravel composed equally of well-rounded, limestone, and sandstone, dominated by clasts of metamorphic and igneous rock types from west of the Virgin Mountains. Older alluvial terrace deposits (Qgo) form terraces of 80 to 300 feet above stream-channel deposits (Qs) along the Virgin River and Beaver Dam Wash and comprise igneous and metamorphic clasts commonly cemented by calcite and gypsum. Qs deposits often merge with and are covered by local talus or young alluvial fan deposits. The Muddy Creek Formation (Tmc) comprises dark-gray to brown, cliff-forming conglomerate,

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gravel, and sandstone, which are poorly sorted, and moderately well bedded with clasts composed of reddish-brown, brown, red, grayish-green, and light-green, well-rounded rhyolite, black schist, gneiss, gabbro, diorite red pegmatite, granite, white quartz, gray limestone and dolomite, red sandstone, and dark-gray basalt, and calcite cement and may comprise boulders as large as 16 inches in diameter (USGS 2000).

Substrate in and immediately adjacent to the project area consists of gravelly, sandy soils with bedrock at least 6 feet deep with the exception of east of the river where it can be as shallow as 1 foot under the soil (Natural Resources Conservation Service [NRCS] 2013). The soil survey for the study area yielded nine soil types: (1) Arada fine sand, 2 to 8 percent slopes (54.9 percent), (2) Arada fine sand, hardpan variant, 2 to 8 percent slopes (0.1 percent), (3) Bard very gravelly fine sandy loam, 2 to 15 percent slope, (4) Bitter Spring-Arizo association, moderately sloping (0.5 percent), (5) Gila loam, no slope noted (1.0 percent), (6) Riverwash, no slope noted (6.2 percent), (7) Toquop fine sand, 0 to 2 percent slope (10.3 percent), (8) Vinton fine sandy loam, no slope noted (14.6 percent), (9) Water (5.4 percent) (NRCS 2013). The soil survey data is designed to address a larger geographic area rather than providing site-specific data. The study area is heavily disturbed by construction and maintenance of I-15 and recreation. Past disturbance has likely altered the soils in the study area. Biotic soil crusts are very unlikely to be present.

The Gila loam and Riverwash units are rated as having "very limited" suitability for road and street construction, and the Bard, Toquop, and Vinton units are rated as having "somewhat limited" suitability for road and street construction and the remaining units are not rated for road and street construction suitability (NRCS 2012b). Soil suitability ratings are based on the soil properties that affect the ease of excavation and grading, as well as the capacity of the soil to support roadway infrastructure. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan,

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hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the roadway infrastructure-supporting capacity are soil strength, subsidence, shrink-swell potential, the potential for frost action, depth to a water table, and ponding. Earth fissures and subsidence do not occur in the study area (Conway 2012). The closest fault line and fault zone that cross I-15 are both outside of the project area near MP 12.50 (Arizona Geological Survey 1972).

In 2013, a study identifying the potential for naturally occurring asbestos to be present in the soils was published in the *Soil Science Society of America Journal* (Buck et al. 2013). This study noted that the asbestos could affect human health if the fibers become disturbed and airborne. Disturbances could include actions such as driving on dirt roads, construction activities, or windblown dust. Asbestos is found as a natural component of some rocks and soils. Samples taken in southern Nevada and northwestern Arizona indicated that naturally occurring asbestos was present in Miocene granitoid plutons and large alluvial deposits eroded from them (Buck et al. 2013). Alluvial deposits are abundant in the project area but no granitic plutons occur within and adjacent to the project area (Arizona Geological Society 2000). Based on the findings of the Buck study and the geology of the project area, the potential for naturally occurring asbestos in the project area is low. Dust control measures implemented during construction would be sufficient to minimize any potential naturally occurring asbestos.

4.14.3 Environmental Consequences

Alternative 1 – Bridge Widening and Rehabilitation

Alternative 1 would not involve any blasting or removal of the geologic features in the project area.

Some minor rock removal would be required to widen the roadway shoulders just west of Bridge No. 1, material would be removed to construct the new pier columns and the scour floor that is needed to

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protect the existing piers, and minor grading of access roads would be required. The drilled shafts beneath each new column would bore into the existing bedrock or to sufficient depths as to not be scour susceptible, but would not change the type of rock deposit, formations, or geology in the study area. The piers would be constructed to accommodate the structural characteristics of the existing geology, which is generally suitable for such construction with no special measures taken. Furthermore, underground structures (such as pier footings) that are not visible aboveground can result in potential impacts on geology. If the foundation area requires additional anchoring, anchors would be drilled into the rock and tied to the foundations to secure the wider footings. These actions would not influence geology beyond the areas of drilling or earthmoving necessary to construct Alternative 1. Therefore, Alternative 1 would not affect geologic resources in the study area. A discussion of the impacts to visual aspects of the geologic features in the study area can be found in Section 4.8, *Visual Resources*.

Potential impacts to soils from grading, earthmoving, and other disturbance would occur adjacent to the roadway approaches, within designated staging areas, along the access paths at the northeast and southwest quadrants of Bridge No. 1, adjacent to the existing abutments and piers, and in the floodplain to construct the scour floor and maneuver during construction. The total disturbance from access, grading, temporary structures, bridge and scour floor construction, roadway widening, and ditch maintenance, including the existing roadway and bridge, would be approximately 105 acres. This acreage includes the existing road and the river bottom that is subject to regular disturbance due to river dynamics. Any fill used for construction would be acquired from an ADOT-approved source, and if imported into the river bottom, would be removed after construction. While Alternative 1 would result in soil disturbance, it is not anticipated that it would substantially change the character of these previously disturbed areas. All disturbed soils outside the active flow channel that would not be landscaped or otherwise permanently stabilized by construction would be reseeded using an approved seed mix developed for this project. Alternative 1 would temporarily affect soils within the construction

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footprint. In addition, the geology and soils in the study area would continue to be subject to natural forces, such as flows within the Virgin River and erosion from wind, rain, and runoff.

As discussed above, soils that are “very limited” in their capacity to support roadway infrastructure could affect construction techniques or materials, and may also result in high maintenance roads. To address potential issues caused by “very limited” soils in the study area, ADOT would complete a geotechnical investigation to confirm soil properties and incorporate the geotechnical findings into the final design. Findings would also inform the appropriate fertilizer or amendment treatment that would facilitate revegetation after construction.

Alternative 2 – Bridge Reconstruction in Place

The impacts associated with Alternative 2 would be the same as described above for Alternative 1 with the exception that Alternative 2 would not include the scour floor and thus would have a smaller permanent footprint on the river bottom.

Alternative 3 – No Build Alternative

Under the No Build Alternative, no construction would occur. Therefore, no impacts to geologic resources or soils would occur. The geology and soils in the study area would continue to be subject to natural forces, such as flows within the Virgin River and erosion from wind, rain, and runoff.

4.14.4 Mitigation Measures

The following mitigation measures are recommended to minimize impacts to soil disturbance during construction:

- ▶ Prior to commencement of ground-disturbing or clearing activities, the Arizona Department of Transportation Engineer would ensure that the designated project area has been clearly marked. The contractor would not conduct any activities outside of the designated project area

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without the approval of the Arizona Department of Transportation Engineer and Environmental Planning.

- ▶ All surface-disturbing activities on slopes greater than 15 percent would include measures to stabilize soils and control surface water runoff.
- ▶ Reclamation of all surface disturbances would be initiated upon completion of activities and the approval of the Bureau of Land Management Arizona Strip Field Office (435.688.3200).

Reclamation of disturbed areas would, to the extent practicable, include contouring disturbances to blend with the surrounding terrain, replacement of soil, smoothing and blending the original surface colors to minimize impacts to visual resources, and re-seeding the disturbed areas with an approved seed mix developed for this project.

4.14.5 Conclusion

Alternative 1 and Alternative 2 would not affect mineral resources, geology, or geologic resources in the study area, and the existing geology is generally suitable for road and bridge construction. Some soils within the area, however, are “very limited” in their suitability for road construction. Therefore, ADOT would undertake a geotechnical investigation and incorporate the findings into the final design.

Approximately 105 acres of soil disturbance would occur. However, the area has been previously disturbed, and the project-related grading, earthmoving, and other disturbance would not substantially change the character of the area. Soils within the construction footprint would be stabilized following construction. Alternative 1 and Alternative 2 would result in a temporary, minor impact on soils in addition to natural forces, such as flows within the Virgin River and erosion from wind, rain, and runoff.

Under the No Build Alternative, geologic resources and soils would be subject only to natural forces, such as flows within the Virgin River and erosion from wind, rain, and runoff.

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4.15 Farmlands of Statewide Importance

4.15.1 Regulatory Framework

This section addresses compliance with the Farmland Protection Policy Act (FPPA) regulations (7 CFR 658), which is required because federal funds would be used to construct this project. The FPPA requires identification of proposed actions that would affect land classified as prime or unique farmland before federal agency approval of any activity that would convert such farmland to other uses, including converting farmland to ROW for transportation improvements.

NRCS, part of the U.S. Department of Agriculture (USDA), administers the FPPA as it relates to protection of farmland. Congress passed the FPPA because of a substantial decrease in the amount of open farmland. Under the FPPA, the Secretary of Agriculture is required to set criteria to identify and take into account the potential effects of federal agency activities on the preservation of farmland. FPPA regulations (7 CFR 658.5) establish the criteria for such evaluation, with an emphasis on urban aspects of proposed programs. In Title 7 CFR 658.3, it is stated that the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses would be minimized. In Title 7 CFR 658.4, it is stated that federal programs would be administered in a manner that, as practicable, would be compatible with state, local government, and private programs and policies to protect farmland. It requires identification of proposed federal actions that would affect any land classified as prime or unique farmland and the consideration of alternative actions. Pursuant to the FPPA, farmland includes:

Prime – Land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion, as determined by the Secretary of

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Agriculture. Prime farmland includes land that possesses the above characteristics but is being used currently to produce livestock and timber (7 U.S.C. 4201[c][1][A]).

Unique – Land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, fruits, and vegetables. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated and managed according to acceptable farming methods. (7 U.S.C. 4201[c][1][B]).

Other – This encompasses farmland, other than prime or unique farmland, that is of statewide or local importance for the production of food, feed, fiber, forage, or oilseed crops, as determined by the appropriate State or unit of local government agency or agencies, and that the Secretary of Agriculture determines should be considered as farmland for the purposes of this chapter. (7 U.S.C. 4201[c][1][C]).

In the FPPA regulations (7 CFR 658.2–658.3), a description of land not subject to (i.e., it is not protected by) provisions of the FPPA is provided and includes land that: (1) receives a combined score of less than 160 points from the land evaluation and site assessment criteria, (2) is identified as an urbanized area on U.S. Census Bureau maps, (3) is designated as an urban area and shown as a tint overprint on U.S. Geological Survey topographical maps, (4) is shown as white (not farmland) on U.S. Department of Agriculture Important Farmland Maps, (5) is shown as urban-built-up on U.S. Department of Agriculture Important Farmland Maps (according to guidance of the National Resources Inventory, areas 10 acres or larger without structures are not considered urban-built-up and are subject to the FPPA), (6) is used for national defense purposes, or (7) is privately owned or no federal funds or technical assistance are used.

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4.15.2 Affected Environment

Current NRCS soil survey data were used to identify soil types that support Prime and Unique Farmland. NRCS-designated Farmlands of Statewide Importance underlies approximately 76 percent of the proposed project area. The land beneath Bridge No. 1 west of the Virgin River is not Prime Farmland, while the strip of bottom land east of the river—approximately 25 percent of the project limits under the bridge is Farmlands of Statewide Importance (Figure 16). Table 13 presents the amount of NRCS-designated farmland within the project limits. A full report on Farmlands of Statewide Importance is provided in Appendix F.

Table 13. Farmland Ratings by Soil Type

Farmland Classifications – Virgin River Area, Nevada and Arizona (NV608)			
Soil Unit	Soil Unit Name	Rating	Percent of the Project Area
AMC	Arada fine sand, 2 to 8 percent slopes	Farmland of Statewide Importance	67.7
BMD	Bard very gravelly fine sandy loam, 2 to 15 percent slopes	Not prime farmland	7.4
Re	Riverwash	Not prime farmland	2.2
TnA	Toquop fine sand, 0 to 2 percent slopes	Farmland of Statewide Importance	8.2
Vd	Vinton fine sandy loam	Not prime farmland	11.1
W	Water	Not prime farmland	3.5
Total			100.0

NRCS Web Soil Survey, 3/17/2015

While almost 76 percent of the project limits contain soils that qualify as Farmlands of Statewide Importance, aerial photography indicates that none of this land appears to be actively farmed. A review of readily available data, including the current Virgin River Communities Area Plan (Mohave County 1998), indicates that the NRCS-designated farmland located within the project limits have no land use designations and are, therefore, not committed to urban development or dedicated to water storage (Mohave County 2010). Active agriculture does occur south of the project area. An irrigation ditch that provides water to these plots is located under the western side of Bridge No. 1.

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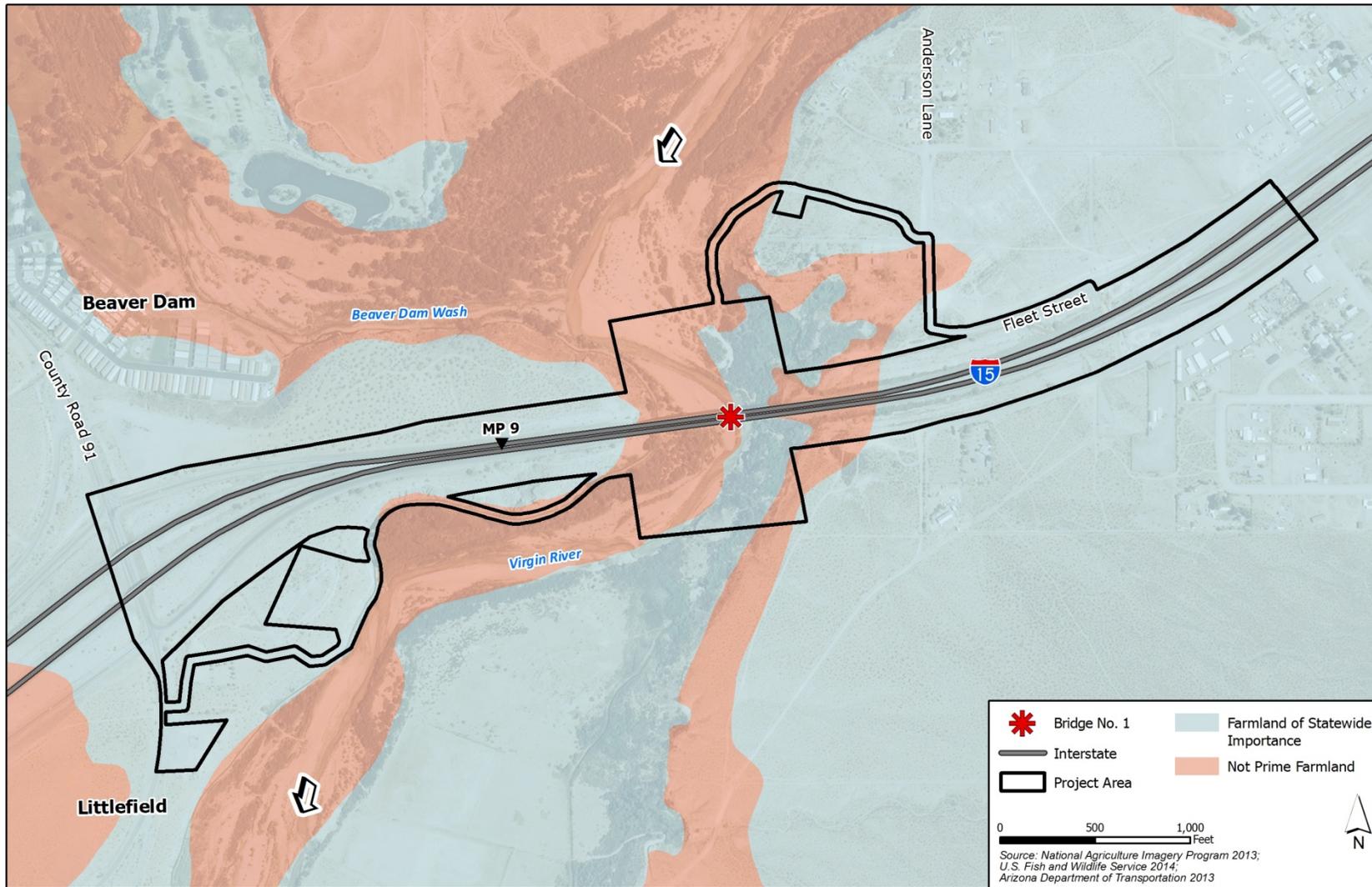


Figure 16. Farmland of Statewide Importance

*Virgin River Bridge #1 (STR #1089)***4.15.3 Environmental Consequences*****Alternative 1 – Bridge Widening and Rehabilitation***

Alternative 1 would require the conversion of a small amount (less than 1 acre) of land with soils characteristic of Farmland of Statewide Importance to widen the roadway approaches to match the new bridge width. However, this area is within the existing I-15 ROW/easement and the primary use is for the interstate highway. Most of the construction activity associated with Alternative 1 would take place on existing dirt roads or within the river channel. A segment of new access road between Anderson Lane and the road to the river would potentially be constructed if the Anderson Lane access alternative is selected. This would construct a new, temporary road within Farmland of Statewide Importance which shows no sign of current or historic cultivation. Staging areas planned for Alternative 1 are also located on Farmlands of Statewide Importance in some cases. Potential staging areas are not currently in agricultural production. Impacts for access roads and staging areas would affect approximately 8 acres of Farmland of Statewide Importance; this impact would be temporary, and the farmland would be returned to its former, undeveloped state after construction has been completed, and reseeded. The irrigation ditch that is located under the western side of Bridge No. 1 would remain in service during and after construction; therefore there would be no impact to the farmland located south of the project area that is dependent on the ditch. Alternative 1 would result in a temporary, minor impact on Farmlands of Statewide Importance but would not result in the permanent conversion of this resource to other uses.

Alternative 2 – Bridge Reconstruction in Place

Impacts that would potentially occur under Alternative 2 would be the same as described above for Alternative 1.

*Virgin River Bridge #1 (STR #1089)***Alternative 3 – No Build Alternative**

Under the No Build Alternative, no construction would occur. Therefore, no impacts to Prime and Unique Farmlands or Farmlands of Statewide Importance would occur.

4.15.4 Mitigation Measures

The following mitigation measures are recommended to minimize impacts to Farmlands of Statewide Importance in the study area:

- ▶ Prior to commencement of ground-disturbing or clearing activities, the Arizona Department of Transportation Engineer would ensure that the designated project area has been clearly marked. The contractor would not conduct any activities outside of the designated project area without the approval of the Arizona Department of Transportation Engineer and Environmental Planning.
- ▶ Reclamation of all surface disturbances would be initiated immediately upon completion of activities and the approval of the Bureau of Land Management Arizona Strip Field Office (435.688.3200). Reclamation of disturbed areas would, to the extent practicable, include contouring disturbances to blend with the surrounding terrain, replacement of soil, smoothing and blending the original surface colors to minimize impacts to visual resources, and re-seeding the disturbed areas with an approved seed mix developed for this project.

4.15.5 Conclusion

Alternative 1 and Alternative 2 would require permanent conversion of a small amount (less than 1 acre) of land designated as Farmland of Statewide Importance in the study area. However, the land is within the existing I-15 ROW/easement and thus is committed to the transportation corridor. Approximately 8 acres of temporary disturbance to areas designated as Farmland of Statewide Importance would occur

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associated with staging areas and potential development of an access road between Anderson Lane and the river access. Areas of temporary disturbance are not currently in agricultural production and would be returned to their undeveloped state and reseeded once construction is complete. Therefore, Alternative 1 and Alternative 2 would both result in a temporary, minor impact on Farmlands of Statewide Importance. The No Build Alternative would not result in any impacts to prime or unique farmlands or Farmlands of Statewide Importance.

4.16 Hazardous Materials

Hazardous materials and hazardous waste sites pose a threat to any infrastructure project, beginning with ownership liability concerns and ending with construction safety concerns. The EPA's 2002 Brownfields Act identified the steps of all appropriate inquiry for investigating hazardous materials sites, and the American Society for Testing and Materials International (ASTM) E1527-05 standard was written to provide a set of guidelines for the assessment of properties and the qualifications of environmental professionals engaged to perform the analysis (ASTM 2006). FHWA has adopted a step-wise approach to hazardous materials site analysis that conforms to the ASTM series of standards governing Phase I-type site investigations.

ADOT uses a preliminary initial site assessment (PISA) as an early comparative tool for projects with multiple possible alternatives. The PISA includes a review of regulatory history of sites within the study area and a limited field review by the environmental professional as defined by the ASTM. The PISA is not fully ASTM-compliant, but provides elements of the ASTM scope that provide the study team with adequate information to compare potential alternatives for fatal flaws or hazardous materials issues that may be sufficiently large to provide a basis of preference for one alternative over another. If an alternative with hazardous materials issues is selected for further analysis, an initial site assessment (ISA) may be performed to assess specific sites of potential concern within the study area in more detail.

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The ISA conforms to the ASTM E1527-13 standard and includes site-specific analysis with interviews and historic waste-stream data analysis.

The goals of the hazardous materials Phase I equivalent ISA are to provide adequate information for the project owner to move forward with property acquisitions and to develop management strategies for sites that have been identified with hazardous materials and/or hazardous-waste issues.

4.16.1 Affected Environment

Available records from federal and state databases were reviewed in January 2015 and revisited in November 2015 and March 2017 to identify potential sites of hazardous contamination near or within the study area. No potential hazardous material sites were identified within a 1.0-mile radius of the study area by any of these federal or state databases (Archaeological Consulting Services [ACS] 2015a).

Under 40 CFR 61, Subpart M, and 40 CFR 763, Subpart E, any material or product which contains greater than 1 percent asbestos is considered an asbestos-containing material. Under Section 302(c) of the Lead-Poisoning Prevention Act (42 U.S.C. 4822[c]) and Section 401(9) of the Toxic Substances Control Act (15 U.S.C. 2681[9]), lead-based paint is defined as paint with lead levels equal to or greater than 1.0 milligrams per square centimeter or 0.5 percent by weight. The definition has been expanded to include varnish, shellac, and other coatings.

The study area has been surveyed for asbestos-containing materials and lead-based paint on three occasions. The results of the three surveys are as follows and included in the project *Asbestos and Lead-Based Paint Sampling and Analysis* (ACS 2015b):

- ▶ Lead at a level of 10 percent/100,000 ppm (i.e., greater than 0.5 percent by weight) was detected in the following paint samples: silver/orange paint on Bridge No. 1, silver/orange cattle

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guard paint on Anasazi Drive, and orange/white paint on the downdrain on I-15 at approximately MP 9.70.

- ▶ Lead at a level greater than 10 milligram/kilogram (but less than 0.5 percent by weight) was detected in the yellow and white striping paint on I-15 northbound, yellow and white striping paint on Anasazi Drive, and the white striping paint on I-15 southbound.
- ▶ No asbestos-containing material was identified.

Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP) regulates the release of asbestos as an air toxic as a provision (Section 112) of the Clean Air Act. This regulation protects the public from exposure to airborne contaminants that are known to be hazardous to human health. ADOT requires that NESHAP compliance be completed for all projects that modify load-bearing structures, regardless of whether asbestos is present.

4.16.2 Environmental Consequences

Alternative 1 – Bridge Widening and Rehabilitation

Regulated action levels of lead-based paint are present in the study area, but no other readily apparent hazardous materials concerns were identified. As such, no further hazardous materials assessments are required. Accordingly, the mitigation measures identified below are to be implemented as part of Alternative 1 in accordance with ADOT requirements to address the lead-based paint action levels and NESHAP requirements. With the implementation of the mitigation, no impact associated with hazardous materials is anticipated to occur due to the implementation of Alternative 1.

Alternative 2 – Bridge Reconstruction in Place

Potential impacts associated with Alternative 2 would be the same as described for Alternative 1. The same mitigation measures would also apply.

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Alternative 3 – No Build Alternative

The No Build Alternative would not involve any demolition or disturbance of known hazardous materials sites or the known lead-based paint action levels discussed above. Therefore, there would be no hazardous materials impacts as a result of the No Build Alternative.

4.16.3 Mitigation Measures

The following mitigation measures are recommended to minimize impacts from hazardous materials:

General

- ▶ For milling activities, the roadway surface preceding the milling machine would be kept sufficiently wet so as to prevent the generation of any visible fugitive dust particles, but not so wet as to cause excess runoff from the roadway surface onto the roadway shoulder.

Lead-based Paint

- ▶ An approved contractor would develop and implement a Lead-Based Paint Removal and Abatement Plan for the removal of the lead-based paint, Toxicity Characteristic Leaching Procedure testing of the generated waste stream, and proper disposal of the waste stream derived from the removal of the silver/orange paint on Bridge No. 1, silver/orange cattle guard paint on Anasazi Drive, and orange/white paint on the downdrain on I-15 at approximately milepost 9.70 within the project limits. The contractor would select a lead abatement contractor that meets the qualification requirements specified within the special provisions and as approved by the Engineer. The contractor would follow all applicable federal, state, and local codes and regulations, including Arizona Department of Transportation Standard Specifications for Road and Bridge Construction (2008 Edition), related to the treatment and handling of lead-based paint.

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- ▶ The contractor would submit a Lead-Based Paint Removal and Abatement Plan for the removal of silver/orange paint on Bridge No. 1, silver/orange cattle guard paint on Anasazi Drive, and orange/white paint on the downdrain on I-15 at approximately milepost 9.70 within the project limits to the Engineer and the Arizona Department of Transportation Environmental Planning hazardous materials coordinator (602.920.3882 or 602.712.7767) for review and approval at least 10 (ten) working days prior to striping obliteration, milling activities, striping removal, cattle guard work, or bridge work.
- ▶ No striping obliteration, milling activities, striping removal, cattle guard work, or bridge work would occur until the Lead-Based Paint Removal and Abatement Plan is approved by the Arizona Department of Transportation Environmental Planning hazardous materials coordinator and implemented.
- ▶ Visible fugitive dust emissions from paint removal would be controlled through wet or dry (e.g., vacuum) means during the removal process. If the liquid waste stream generated by a waterblasting obliteration method passes the Toxicity Characteristic Leaching Process analysis, it may be used as a dust palliative or for compaction on the project. If the water is not used on the project, it would be properly disposed of in accordance with all applicable federal, state, and local regulations.
- ▶ The yellow and white striping paint on I-15 northbound, yellow and white striping paint on Anasazi Drive, and the white striping paint on I-15 southbound contains lead; therefore the contractor would notify their employees prior to any disturbance where lead is present in the paint below the 0.5 percent U.S. Department of Housing and Urban Development/
U.S. Environmental Protection Agency action levels, but above the U.S. Department of Labor Occupational Safety and Health Administration detection level. As part of the notification, the contractor would make the U.S. Department of Labor Occupational Safety and Health

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Administration publication_number_3142-12R_2004_Lead_in_Construction

(<http://www.osha.gov/Publications/osha3142.pdf>) available to workers.

- ▶ The contractor would not utilize any abrasive tools or methods for the removal of the cattle guards that would disturb the lead-based paint. This includes, but is not limited to, sawing, grinding, sanding, or heating. Woven straps (not linked chains) may be used to lift the cattle guard grate from the frame.

NESHAP Requirements

- ▶ The contractor cannot start work associated with Virgin River Bridge No. 1 until 10 (ten) working days have passed since the submittal of the National Emission Standard for Hazardous Air Pollutants notification to the regulatory agency.
- ▶ The Engineer, in association with the contractor, would complete the National Emission Standard for Hazardous Air Pollutants documentation and submit it to the Arizona Department of Transportation Environmental Planning hazardous materials coordinator (602.920.3882 or 602.712.7767) for review 5 (five) working days prior to being submitted to the regulatory agency.
- ▶ The contractor would complete a National Emissions Standards for Hazardous Air Pollutants notification for work associated with Virgin River Bridge No. 1 and submit it to the Engineer for review.
- ▶ After Engineer approval, the notification would be submitted to the Arizona Department of Transportation Environmental Planning hazardous materials coordinator (602.920.3882 or 602.712.7767) for a 5 (five) working-day review and approval. Upon approval by the Arizona Department of Transportation Environmental Planning hazardous materials coordinator, the contractor would file the notification with the Arizona Department of Environmental Quality at

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least 10 (ten) working days prior to demolition/renovation associated with Virgin River Bridge

No. 1.

- ▶ According to the Arizona Department of Transportation's *Standard Specifications for Road and Bridge Construction*, Section 107 Legal Relations and Responsibility to Public, Subsection 07 Sanitary, Health, and Safety Provisions, "During construction operations, should material be encountered which the contractor believes to be hazardous or contaminated, the contractor would immediately do the following: (1) stop work and remove all workers within the contaminated areas, (2) barricade the area and provide traffic control, if necessary, to prohibit unauthorized entry, and (3) notify the Engineer" (ADOT 2008). The Arizona Department of Transportation Engineer would arrange for proper assessment, treatment, or disposal of those materials. Such locations would be investigated and proper action implemented prior to the continuation of work in that location.

4.16.4 Conclusion

Lead-based paint was detected on I-15, Bridge No. 1 and Anasazi Drive. The mitigation measures identified above would address potential lead-based paint-related impacts under both Alternative 1 and Alternative 2. No other readily apparent hazardous materials concerns are present in the study area. Therefore, no further hazardous materials assessment or mitigation measures are required.

Because there would be no construction associated with the No Build Alternative, no impacts from hazardous materials would occur within the study area.

4.17 Material Sources and Waste Materials

4.17.1 Affected Environment

The potential for the use of additional materials from off-site sources and the potential to generate excessive fill material are evaluated in this section. It would be the responsibility of the contractor to

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identify any needed material sources or waste disposal sites and to provide the environmental documentation regarding their potential use, as specified in ADOT's *Standard Specifications for Road and Bridge Construction* (ADOT 2008).

ADOT maintains a list of material sources that have previously completed the ADOT environmental analysis process. An updated environmental analysis would be submitted for ADOT approval to use one of these sources. Alternatively, a contractor can propose and evaluate a new source. Excess materials would be disposed of consistent with federal, state, and local regulations, and materials from off-site sources would be approved prior to use. Approximately 35 ADOT-approved material source facilities are located in Mohave County.

4.17.2 Environmental Consequences

Alternative 1 – Bridge Widening and Rehabilitation

Use of material sources outside the Virgin River corridor would likely be necessary to provide fill for grading the access paths and for road shoulder work. Native materials would be used when possible. Waste materials may be generated from cofferdam excavation, pier rehabilitation, removal of loose rock, and any potential cuts made in the grading of the access routes.

Alternative 1 would be designed to balance borrow and waste material requirements to the maximum extent possible. The access routes would be cleared and graded prior to work on Bridge No. 1. In conjunction with the access route grading, the contractor would implement measures and BMPs to control sediment to keep any foreign materials from entering the Virgin River.

Because equipment and vehicles may not drive through the Virgin River, a temporary bridge would be constructed in the floodplain such that it would sit above the river channel and maintain typical flows. Fill would be placed where needed to match the elevation between the river and of the bottom of the

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access road. Similarly, elevated crane pads would be constructed. In compliance with BMPs, fill would be contained to prevent debris from entering the river during high flows.

The construction of Piers 3 and 4 would most likely require cofferdams to be constructed around the foundations to maintain an adequately sized, dry work area. Excavated material could be temporarily stored for up to 10 calendar days within the Virgin River floodplain in accordance with the Mohave County Flood Control Ordinance, Section 3.7.2.1 and would be contained to prevent contamination or dispersal (Mohave County 2000). Any material temporarily stored in the floodplain would be surrounded with approved sediment control devices to prevent the material from entering the river channel in the case of rain or high flows.

Fill placed within the 100-year floodplain would be native material. All materials required for temporary or permanent fills would be acquired from approved sources. No water for dust suppression or other construction purposes would be withdrawn from the Virgin River. All waste materials would be removed from the Virgin River corridor and disposed of off-site in accordance with federal, state, and local regulations. No waste would be disposed of on BLM land.

If any excavated material is contaminated and needs to be disposed of, that material would be replaced by additional fill. The contractor would be responsible for using approved sites to dispose of excess waste material and construction debris, as well as for disposal of contaminated material in accordance with federal, state, and local laws and regulations. Potential impacts due to borrow or waste disposal needs for Alternative 1 would be negligible.

Alternative 2 – Bridge Reconstruction in Place

Impacts associated with Alternative 2 would be the same as those described for Alternative 1.

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Alternative 3 – No Build Alternative

The No Build Alternative would not require the use of materials sources or waste sites.

4.17.3 Mitigation Measures

No mitigation is required.

4.17.4 Conclusion

Alternative 1 and Alternative 2 would be designed to balance borrow and waste material requirements within construction segments to the maximum extent possible. All materials required for temporary or permanent fills would be acquired from approved sources. Fill placed within the 100-year floodplain would be native material. No water for dust suppression or other construction purposes would be withdrawn from the Virgin River. All waste materials would be disposed of outside the Virgin River in accordance with federal, state, and local regulations. No waste would be disposed of on BLM land. The No Build Alternative would not require the use of borrow material or waste sites.

4.18 Secondary Impacts

4.18.1 Regulatory Basis and Analysis Method

Secondary impacts (sometimes referred to as indirect impacts) are defined in CEQ guidelines as:

Those impacts that are caused by an action that occur later in time, or are farther removed in distance but are still reasonably foreseeable. Secondary impacts may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (40 CFR 1508.8).

FHWA has provided interim guidance on secondary and cumulative impact analysis (FHWA 2003) that supplements CEQ guidance (CEQ 1997). Using both together, two primary guidance principles were

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followed: (1) focus on the effects and resources within the context of the alternatives, and (2) present a concise list of issues that have relevance to the effects of the alternatives or eventual project decision.

Using the FHWA guidance, it was determined that secondary impacts to certain resources would not occur, including those resources eliminated from further study in Table 2. Table 14 identifies the resources addressed in detail in Section 4, *Affected Environment, Environmental Consequences, and Mitigation Measures* and the reasons why secondary impact analysis would not be required.

Table 14. Resources Not Considered for Secondary Impact Analysis

Resource	Rationale
Land Use	<p>Alternatives 1 and 2 and the No Build Alternative are located in a minimally developed, rural area and are consistent with management plans addressing use of the Virgin River Corridor. None of the alternatives would add capacity to I-15, induce growth, increase accessibility to lands that currently cannot be accessed for development, or change the anticipated population density or growth rate of the nearby communities. Therefore, no secondary impacts would occur.</p> <p>While Alternatives 1 and 2 would remove the water impoundment ("Little Jamaica") that is used for recreation located southeast of Bridge No. 1, this is an unapproved use within the ADOT ROW. Recreation would continue to be available in other areas along the Virgin River and within the project area after construction is complete.</p>
Farmland of Statewide Importance	<p>None of the alternatives would add capacity to I-15, increase accessibility to lands that are currently inaccessible for development, or change the anticipated population density or growth rate of the nearby communities. Therefore, no alternative would indirectly result in the conversion of farmland of statewide importance to other uses; no secondary impacts are anticipated.</p>
Utilities	<p>Utilities present within the study area would be relocated onto the rehabilitated bridge following construction. No additional utilities would be relocated on the bridge due to Alternative 1, Alternative 2, or the No Build alternative; therefore, no secondary impacts are expected.</p>
Cultural Resources	<p>None of the alternatives would change patterns, rates, or intensity of development, and would not increase accessibility to any known culturally sensitive areas. Therefore, none of the alternatives would result in secondary impacts that could affect cultural resources.</p>
Section 4(f) Resources	<p>None of the alternatives would change patterns, rates, or intensity of development, and would not increase accessibility to any known culturally sensitive areas, significant recreational/park areas, or wildlife/waterfowl refuges. Therefore, the alternatives would not result in secondary impacts that could affect Section 4(f) resources.</p>
Air Quality	<p>The study area is located within an attainment area, and neither Alternatives 1 nor 2 would change traffic or land use patterns that would result in secondary impacts to air quality. The No Build alternative would result in a weight restriction that would require up to 20 percent of the truck traffic to be re-routed. The routes would be longer which would result in an increase in emissions, but they would be widely distributed and have a negligible impact on localized or regional air quality.</p>

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Table 14. Resources Not Considered for Secondary Impact Analysis

Resource	Rationale
Noise	Alternatives 1 and 2 would not change traffic or land use patterns that would result in secondary noise impacts. The No Build alternative would likely result in a decrease in noise in the project area and a slight increase in noise along alternate routes due to approximately 20 percent of truck traffic being re-routed due to weight limits on Bridge No. 1. Since the re-routed trucks would be intermittent and distributed over different routes, increases in noise would be negligible.
Visual Resources	Alternatives 1 and 2 and the No Build Alternative are consistent with VRM class objectives, and would not induce growth or otherwise change the visual character of the Virgin River corridor or result in secondary visual impacts.
Wild and Scenic Rivers	Alternatives 1 and 2 and the No Build Alternative would conform to the Wild and Scenic River management strategies for the Virgin River. Under both Alternatives 1 and 2, direct effects would be localized and would dissipate quickly upstream and downstream. The area would be temporarily closed to recreational use within the project area but would reopen following construction. No construction would occur under the No Build Alternative. The alternatives would not precipitate a change in land use, regulation, or environmental change that would jeopardize the outstandingly remarkable values within the project area over time. There would be no secondary effects occurring further upstream or downstream from Bridge No. 1 or occurring later in time that would affect eligibility or suitability determinations of the Virgin River.
Soils and Geologic Resources	Alternatives 1 and 2 would disturb soils in the immediate study area, which could contribute to erosion during and after construction but mitigation measures discussed in Section 4.13.4, <i>Soils and Geological Resources Mitigation Measures</i> as well as some of the measures in Sections 4.9.4, <i>Drainage and Floodplain Considerations Mitigation Measures</i> , Section 4.10.4, <i>Section 404 and 401 of the Clean Water Act and National Pollutant Discharge Elimination System Mitigation Measures</i> , and Section 4.11.4, <i>Biological Resources Mitigation Measures</i> would stabilize soils and minimize the potential for erosion. Under the No Build Alternative, no construction would occur. No secondary impacts to soils or geologic resources would occur.
Hazardous Materials	Alternatives 1 and 2 would require the disturbance of regulated levels of lead-based paint. However, ADOT has committed to development of removal and disposal plans to ensure that the materials are disposed of in accordance with state and federal laws; removal, handling, and disposal of hazardous materials would not result in secondary impacts. No disturbance or generation of regulated materials would occur under the No Build Alternative.
Material Sources and Waste Materials	ADOT has approved 35 potential material sites in Mohave County, and there are no environmental conditions at these sites that would be indirectly affected by import/export of materials for Alternatives 1 or 2 in accordance with federal, state, and local regulations. Waste material generated during construction would become the property and responsibility of the contractor to remove and dispose of the materials in a manner that conforms to federal, state, and local regulations. No material would be wasted on BLM land. The construction of either alternative would not result in any secondary impacts associated with materials sources or waste. No materials or waste disposal would be needed under the No Build Alternative.

To address the potential impact severity, classifications in accordance with the FHWA guidance are presented in Table 15.

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Table 15. Secondary Impact Severity Classifications

Impact Category	Impact Classification	Description
Type	Neutral, Positive, or Negative	Compares the final condition of a given resource to its existing condition (assumes the expected impact occurs). Impacts on personal property are considered adverse.
Severity	Negligible, Minor, Moderate, or Substantial	Considers the relative contribution of a proposed action to a given impact.
Duration	Temporary or Permanent	Permanent is assumed unless otherwise noted.

Sources: FHWA 1992; 2003.

4.18.2 Environmental Consequences

Table 16 presents the critical issues warranting secondary impact analysis.

Table 16. Secondary Impact Matrix

Resource	Cause ^a	Reasonably Foreseeable Impact	Impact Classification ^b
Water Resources (including drainage, floodplains, and Waters)	<ul style="list-style-type: none"> • Sedimentation • Changes to stream flow • Possible contamination from construction 	<p>With the No Build Alternative, the bridge would continue to be susceptible to scour because the existing foundations are too shallow. While temporary improvements could be employed as part of ongoing maintenance, the problem would not be resolved, resulting in ongoing turbidity that would contribute to downstream sedimentation.</p>	Negative/ Moderate/ Long-term
		<p>Alternatives 1 and 2 would potentially result in secondary impacts to water resources due to construction activities and disturbance of the river bottom. The indirect effects resulting from this work may include: erosion and scouring of areas disturbed/destabilized as a result of construction activities that would increase sediment discharge into the river; potential changes to the stream flow and associated hydrologic processes; debris inadvertently falling into the river and being carried downstream; and potential spills of oil, fuel, and other materials into the river that would be carried downstream. These potential indirect effects would be temporary during construction, and the active stream channel and floodplain would be restored following construction.</p>	Negative/ Moderate/ Temporary
		<p>Under Alternative 1, a new column would be constructed both upstream and downstream of each existing pier. The columns would result in a negligible long-term increase in water elevation upstream of the bridge. For Alternative 2, two new piers would be constructed to ultimately replace the existing piers. While under construction, both the new piers and the existing piers would be present. The additional structures within the floodplain would have a negligible effect on upstream flooding by restricting the natural flow of the river. Once the existing piers are removed, this impact would be reduced, but there would continue to be a negligible increase in upstream water elevations due to the addition of the second set of piers.</p>	Negative/ Negligible/ Long-term

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Table 16. Secondary Impact Matrix

Resource	Cause ^a	Reasonably Foreseeable Impact	Impact Classification ^b
Water Resources (including drainage, floodplains, and Waters (Cont.))		Development of a SWPPP and compliance with Sections 401, 402, and 404 of the CWA would ensure that Alternatives 1 and 2 would not affect downstream water quality. Neither Alternative 1 nor 2 would change traffic or land use patterns that would potentially result in additional secondary impacts to water resources. No indirect impacts on water resources are anticipated to occur as a result of removing "Little Jamaica"	Neutral/ Short-term
Biological Resources	<ul style="list-style-type: none"> • Sedimentation • Increased vegetation growth • Removal of habitat 	<p>The No Build Alternative would result in ongoing, long-term sedimentation of downstream water from unresolved scour activity at the bridge. This could affect fish species. Because the No Build Alternative would not disturb vegetation, change stream flow patterns, or introduce additional noise; no other secondary impacts would be anticipated.</p> <p>Minor, beneficial indirect impacts on hillside vegetation would likely occur as a result of removing the water diversion creating "Little Jamaica." and allowing the water to resume its natural course which would likely include less rocky areas that could support vegetation. No other secondary impacts on biological species due to the removal of "Little Jamaica" are anticipated to occur.</p> <p>Mojave desert tortoise: Alternatives 1 and 2 would temporarily remove currently available suitable foraging, breeding, and migrating habitat due to the improvement and use of access roads, staging areas, or other areas of disturbance within the roughly 15 acres of suitable habitat for the duration of the project. The establishment of invasive species would degrade the quality of the habitat. While the re-establishment of tortoise habitat would take multiple years, habitat in the project area has been previously and is continuously disturbed by I-15 and associated roadway activities as well as recreation, resulting in the habitat within the project area providing little value to the tortoise.</p>	<p>Negative/ Minor/ Temporary</p> <p>Positive/ Minor/ Long-term</p> <p>Negative/ Minor/ Temporary and Long-term</p>

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Table 16. Secondary Impact Matrix

Resource	Cause ^a	Reasonably Foreseeable Impact	Impact Classification ^b
Biological Resources (cont'd)	<ul style="list-style-type: none"> • Vegetation removal • Noise generation and activity • Temporary changes in stream flow 	<p>Southwestern willow flycatcher: Indirect impacts under Alternatives 1 and 2 would include (1) removal of about 1.3 acres of potential southwestern willow flycatcher migratory stopover and foraging habitat, (2) noise and high levels of activity by vehicles and equipment over the two year construction period, and (3) temporary, localized changes in the stream flow and path. Since vegetation would re-establish and noise and levels and river flows would return to current levels following construction, the impacts would all be temporary. While temporary construction areas would be reclaimed following construction, the vegetation in the habitat to be removed is of relatively small stature and would take a few years to replenish. The river provides is a highly dynamic system, and its replacement would largely be driven by flood cycles. The loss of large cottonwood trees would be long term.</p> <p>Yellow-billed cuckoo: impacts associated with both Alternatives 1 and 2 would include (1) removal of approximately 1.3 acre of cottonwood gallery forest that occur within the project limits, (2) noise and high levels of activity by vehicles and equipment over the two-year construction period, and (3) temporary, localized changes in the stream flow and path. Since vegetation would re-establish and noise and levels and river flows would return to current levels following construction, the impacts would all be temporary. While temporary construction areas would be reclaimed following construction, the vegetation in the habitat to be removed is of relatively small stature and would take a few years to replenish. It is a highly dynamic system, and its replacement would largely be driven by flood cycles. The loss of large cottonwood trees would be long term.</p> <p>No indirect impacts to southwestern willow flycatcher designated critical habitat or yellow-billed cuckoo potential critical habitat is anticipated..</p>	<p>Negative/ Minor/ Temporary and Long-term</p> <p>Negative/ Minor/ Temporary and Long-term</p>
	<ul style="list-style-type: none"> • Disturbance of vegetation near seeps • Water contamination or interruption • Erosion 	<p>Desert springsnail: construction activities associated with both Alternatives 1 and 2 near the seeps would potentially affect the habitat components and subsequently the springsnail. No long-term secondary impacts are anticipated.</p>	<p>Negative/ Minor/ Temporary</p>
	<ul style="list-style-type: none"> • Sedimentation • Changes to stream flow • Possible contamination from construction 	<p>Protected fish species: Alternatives 1 and 2 may affect endangered fish species and critical habitat. The indirect effects described above (water resources) could contribute to a loss of riparian vegetation, changes to the stream flow and associated hydrologic processes, and debris could damage the fish barrier downstream that prevents upstream movement of non-native fish. In consultation with USFWS, mitigation measures have been developed to minimize impacts on the Virgin River fish species, and no adverse modification to critical habitat would occur. If an incidental take would exceed what is permitted by the Biological Opinion, consultation with USFWS would be reinitiated. Neither Alternative 1 nor 2 would result in any secondary impacts related to changes in traffic or land use patterns that would contribute to habitat fragmentation, increased stormwater runoff, or increased water consumption. No long-term secondary impacts are anticipated.</p>	<p>Negative/ Moderate/ Temporary</p>

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Table 16. Secondary Impact Matrix

Resource	Cause ^a	Reasonably Foreseeable Impact	Impact Classification ^b
Biological Resources (cont'd)	<ul style="list-style-type: none"> Noise and activity 	Peregrine falcons: removal of riparian habitat and noise and activity associated with both Alternatives 1 and 2 would likely scare off ducks and other bird species resulting in temporary restrictions on foraging. No long-term secondary impacts are anticipated.	Negative/Minor/Temporary
	<ul style="list-style-type: none"> Soil disturbance 	Silverleaf sunray: Soil disturbances associated with both Alternatives 1 and 2 would change the baseline conditions within the project area that are necessary for potential colonization, thereby interfering with reproduction resulting in a long-term indirect impact. Since the area is already disturbed, this impact is likely to result in only a minor change. No temporary indirect impacts are anticipated.	Negative/Minor/Long-term
	<ul style="list-style-type: none"> Erosion Activity Vegetation removal 	Native plants: vegetation removal and construction activities associated with both Alternatives 1 and 2 would destabilize the soil leaving it prone to erosion, which can result in the exposure of roots on native plants. No long-term secondary impacts are anticipated.	Negative/Minor/Temporary
	<ul style="list-style-type: none"> Vegetation removal Reduction of insects Noise 	Bats: modifications to the bridge and removal of vegetation associated with both Alternatives 1 and 2 would increase noise during construction and reduce sub-optimal roosting habitat. In addition, removal of vegetation would result in a minor decrease in insect prey species. No long-term secondary impacts are anticipated.	Negative/Minor/Temporary
Social and Economic Conditions	<ul style="list-style-type: none"> Decrease in demand for trucking-related services Increase in cost of shipping goods that would be passed to consumers 	<p>The No Build Alternative would result in a minor adverse economic impact to the communities along the I-15 corridor from Mesquite to St. George due to a 20 percent reduction in demand for trucking-related sales and services that would result from truck detours required to comply with weight restrictions on Bridge No. 1. The truck detours would have a moderate impact on trucks that routinely use I-15 in Arizona costing up to \$35 million to \$43 million to travel the longer routes. Increases in the cost of goods could result if the increased freight costs are passed onto the consumer.</p> <p>The removal of "Little Jamaica" under Alternative 1 and Alternative 2 could result in a negligible reduction in demand for services in Littlefield/Beaver Dam if alternative areas along the river are selected for recreation. This would be a long-term impact.</p>	Negative/Moderate/Long-term

Notes:

^a Cause" represents indirect causes from Alternatives 1 and 2 that would contribute to the reasonably foreseeable impact.^b Impact Classification corresponds to classification system presented in Table 15.

Secondary effects on water and biological resources associated with both Alternatives 1 and 2 would potentially result from soil disturbance resulting in erosion and sedimentation, inadvertent water contamination, vegetation removal resulting in disturbance to seeps and habitat, and activity that would result in noise and general disturbance. Disturbed soil and subsequent erosion can result in the inadvertent introduction of sediment into the river or other surface waters, resulting in water contamination. Vegetation removal, erosion, and sedimentation associated with the project can all

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contribute to secondary impacts to seeps and habitats by changing their primary habitat constituents, soil holding capabilities, and filtering capabilities. Construction activities would result in the generation of noise, vibration, and general disturbance that would adversely affect many species that may customarily visit, use, or live in the project vicinity. Mitigation measures developed in consultation with BLM, NPS, USFWS, and the Corps would help minimize or avoid potential secondary effects.

For both Alternatives 1 and 2, once construction is complete, the active stream channel and floodplain would be restored to minimize the potential for long-term secondary effects and reseeded would help re-establish the area to pre-construction conditions. The majority of the secondary impacts identified in association with both of these alternatives would be temporary in duration and, with the implementation of mitigation measures, are anticipated to be minor in intensity (see Table 16). The long-term secondary impact resulting from changes in upstream flood potential would be negligible; studies would be conducted during final design and used to minimize impacts during the development of the final design.

Secondary effects resulting from the No Build Alternative would be related to the long-term potential for truck detours that may be necessary to comply with weight restrictions on Bridge No. 1. This detour would indirectly affect the economies of the I-15 corridor communities between Mesquite and St. George due to a 20 percent decrease the number of truck drivers that would potentially make trucking-related purchases or receive services. Since many trucks likely continue on to larger communities such as Mesquite and St. George, this impact is anticipated to be minor. The weight restrictions on Bridge No. 1 that would require trucks to take an alternate route would have a moderate impact on the trucking industry, costing \$35 million to \$43 million to travel the longer routes. These increases in the cost of shipping would likely be passed along to the consumer, resulting in a minor increase in the cost of goods.

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4.18.3 Mitigation Measures

Additional mitigation measures beyond those described in Section 4.9, *Drainage and Floodplain Considerations*, Section 4.10, *Section 404 and 401 of the Clean Water Act and National Pollutant Discharge Elimination System*, and Section 4.11, *Biological Resources* are not warranted.

4.18.4 Conclusion

Alternative 1 and Alternative 2 would result in secondary impacts to water resources, soils, and biological species due to the erosion in disturbed areas and the removal of vegetation. Water resources would be affected by the potential for increased sediment loads, inadvertent spill of pollutants or foreign materials, and changes in the hydrology. Biological species would be affected by the changes to water quality and flow, as well as the removal of vegetation, introduction of noise and activity, and erosion and disturbed soils. No additional mitigation beyond those measures already described in Section 4.9, *Drainage and Floodplain Considerations*, Section 4.10, *Section 404 and 401 of the Clean Water Act and National Pollutant Discharge Elimination System*, and Section 4.11, *Biological Resources* would be necessary to minimize or avoid potential secondary effects.

Secondary effects associated with the implementation of No-Build Alternative would be associated with the long-term detour of truck traffic that would affect the truck industry and associated sales and services within the study area.

4.19 Cumulative Impacts

4.19.1 Regulatory Basis and Analysis Modeling

Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7).

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The CEQ regulations also require a discussion of cumulative actions and connected actions in the scope of the environmental review. These terms are defined as follows:

- ▶ Cumulative actions are those “which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same [environmental review]” (40 CFR 1508.25(a)(2)).
- ▶ Connected actions are those that are closely related. “Actions are connected if they:
(i) automatically trigger other actions which may require environmental review; (ii) cannot or would not proceed unless other actions are taken previously or simultaneously; or (iii) are interdependent parts of a larger action and depend on that larger action for their justification” (40 CFR 1508.25(a)(1)).

The analysis was prepared using:

- ▶ *Position Paper: Secondary and Cumulative Impact Assessment in the Highway Project Development Process* (USDOT 1992)
- ▶ *Interim Guidance: Questions and Answers Regarding Indirect and Cumulative Impact Considerations in the NEPA Process* (FHWA 2003)
- ▶ *Considering Cumulative Impacts under the National Environmental Policy Act* (CEQ 1997)

Factors contributing to the cumulative impact analyses were:

- ▶ Identification of environmental resources that would be directly affected by the alternatives.
- ▶ The area in which effects of the alternatives would occur.
- ▶ Impacts that would occur from the alternatives.
- ▶ Other past, present, and reasonably foreseeable future actions that have, had, or could be expected to affect the same area.

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- ▶ Expected impacts from the other actions.
- ▶ The overall expected impact if the individual impacts were allowed to accumulate.

The region of influence use for this cumulative effect analysis includes the I-15 corridor in Arizona. The timeframe for the analysis considers the actions that have taken place since the construction of I-15 through the Virgin Valley and Virgin River Gorge and extends out 30 years, the window for which other I-15 roadway or bridge projects are planned.

4.19.2 Contributing Actions

Past Actions

Infrastructure and Urban Development

ADOT constructed I-15 through the Virgin River Gorge between 1964 and 1973, and has maintained the interstate, including adding traffic interchanges since. Recent actions include:

- ▶ 2012 – Pavement removal and replacement project between MP 13.00 and the Utah state line (MP 0.00) (H8435)
- ▶ 2013 – Bridge rehabilitation and girder crack repair on Bridge No. 7
- ▶ 2013 – Improvements to the abutment expansion joints, crack and spall repair, and drainage and guardrail improvements at the Farm Road TI (MP 9.59)
- ▶ 2016 – Rehabilitation of Bridge No. 6 within the Virgin River Gorge (MP 15.58)
- ▶ 2016 -2017 – Nevada State Line to MP 13 Pavement Rehabilitation Project (H8672)

Before I-15 was completed in 1973, the Virgin River Gorge was inaccessible to traffic. Vehicles traveling between Nevada and Utah had to use a longer U.S. 91 route. Since the opening of I-15 in 1973 very minimal development has occurred within the gorge or Virgin Valley. The largest communities on either end of I-15 in Arizona include Mesquite and St. George. Changes came to Mesquite after the completion

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of I-15 in the 1970s, but most of the major growth occurred beginning in 1990, when several large resorts and master planned communities were developed. From 2000 to 2010, the population increased from 9,389 to 15,274 (City of Mesquite 2012). St. George is the largest city in Washington County, Utah. In 2010, 138,748 persons lived in Washington County, an increase of 88,194 people since 1970 (Utah Governor's Office of Planning and Budget 2012).

Utility extensions just outside the ADOT ROW fence line on the bluff northwest of Virgin River Bridge No. 1 were completed for the Dixie Escalante Rural Electric Association and the Rio Virgin Reliance Connects projects.

Land Management

Much of the Virgin River in Arizona is located on public land managed by BLM. Since the 1970s, conservation plans have been developed to protect the unique geologic, scenic, and ecological resources within the gorge located east of the project area. These plans and designations have included the Paiute Primitive Area (1975), the Virgin River Scenic Withdrawal (1972), recommendation for wilderness designation (1980), Paiute and Beaver Dam Mountains wilderness designation (1984), *Final Wilderness Management Plan* (1990), and Arizona Strip Field Office RMP (BLM 2008a).

Resource Management

The Virgin River chub was listed as endangered under the ESA in 1989 (USFWS 1989). The woundfin was listed as endangered under the ESA in 1970 (USFWS 1970). In 2000, USFWS designated critical habitat for both fish species, which included an 87.5-mile section of the Virgin River and its associated 100-year floodplain (USFWS 2000). Current threats to Virgin River fishes include modification and reduction of habitat, water withdrawal, increased temperature, salinity, turbidity, disease, floods, toxic spills, and competition with non-native fish (USFWS 1989; AGFD 2000). Since 1979, several recovery plans have

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been developed by the USFWS to identify reasonable actions to recover the species. In 2002, a multi-agency cooperative program called The Virgin River Recovery Program was established to implement conservation agreements and, in a holistic, ecosystem-based manner, coordinate and manage competing uses of land and water resources throughout the Virgin River Basin (Utah Department of Natural Resources 2002).

A number of projects have been implemented to protect the Virgin River's water quality, quantity, and habitat. These projects include red shiner eradication, installation of Washington Fields Diversion fish screens, fish population monitoring, removal of tamarisk, watershed planning, implementation of the Santa Clara Pipeline to protect year-round water flows, removal of the Schroeder Reservoir in Beaver Dam Wash in 2005, installation of fish passages in La Verkin Creek, installation of fish barrier in the Virgin River Gorge in 2009, and implementation of a pumping system for the Virgin River in 2009 that allows extra water to be released during low river flows. These measures have improved conditions, and are expected to continue to improve conditions; however, population growth and the associated demand on water would continue to put pressure on the river.

Present and Future Actions

- ▶ Resource management activities related to the Virgin River are on-going and are expected to continue until the endangered Virgin River fish populations are no longer threatened.
- ▶ Continued private development is anticipated in Mesquite, St. George, and to a lesser extent in Scenic, Littlefield, and Beaver Dam. The population of Washington County, Utah, is projected to more than double by 2040 (Utah Governor's Office of Planning and Budget 2012). Mesquite projects that its population will nearly double by 2035 (Mesquite 2012). The Arizona Strip communities have experienced minimal population growth, and no major developments are planned.

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- ▶ Continued recreational activities within the Virgin River in the project area primarily in the spring and summer months are anticipated to occur until construction commences and resume following construction.
- ▶ ADOT has plans for several pavement and bridge projects along the Arizona portion of I-15 over the next several years. Currently, southbound deck joint improvement projects for Bridges 2, 4 and 5 are being undertaken; future actions include bridge deck rehabilitation, underpass widening, pavement removal and replacement, shoulder widening, rockfall containment, and new climbing lane construction.

The No Build Alternative would not contribute to any cumulative impacts and the discussion below focuses on the cumulative impacts of Alternative 1 and Alternative 2. Certain resources were excluded from detailed analysis because it was determined that Alternative 1 and Alternative 2 would not contribute to a cumulative impact. Those resources that Alternative 1 and Alternative 2 (1) would not affect or (2) would affect to a negligible degree that would not contribute to cumulative impacts are described in Table 17.

Table 17. Resources Not Considered for Cumulative Impact Analysis

Resource	Rationale
Land Use	The study area is located in a minimally developed rural area. No major developments are proposed in the nearby communities. Alternatives 1 and 2 are consistent with management plans that ensure the long-term protection of the Virgin River corridor and would have no direct or secondary impacts on approved land use beyond temporary restrictions for recreational river use during construction. While recreation within the project area would be limited, the balance of the river is available. Alternatives 1 and 2 would not contribute to cumulative land use impacts.
Farmland of Statewide Importance	Neither Alternative 1 nor 2 would adversely affect farmlands in production or with the potential to be in production. Further, neither alternative would add capacity to I-15, increase accessibility to lands that currently cannot be accessed for development, or change the anticipated population density or growth rate of the nearby communities. Alternatives 1 and 2 would not contribute to cumulative impacts to Farmland of Statewide Importance.

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Table 17. Resources Not Considered for Cumulative Impact Analysis

Resource	Rationale
Utilities	Utilities present within the study area would be relocated onto the rehabilitated bridge following construction. No additional utilities would be relocated on the bridge as part of this project; no cumulative impacts are expected.
Social and Economic Conditions	Alternatives 1 and 2 would maintain the existing economic conditions associated with mobility along the I-15 corridor and would not directly or indirectly affect any communities along the I-15 corridor beyond traffic delays during construction. Consequently, the contribution of Alternative 1 or 2 to cumulative socioeconomic impacts would be negligible. While the No Build Alternative would have a minor indirect impact on trucking-related sales and services in the project vicinity, no other changes that would affect these businesses were identified. Thus no cumulative impact is anticipated.
Cultural Resources	Alternatives 1 and 2 would have no adverse effect on the historic significance of I-15 or indirect effects. Consequently, these alternatives would not contribute to cumulative impacts.
Section 4(f) Resources	There would be no use of any resources afforded protection under Section 4(f). Therefore, no impacts to Section 4(f) resources would occur. Because there are no direct or secondary impacts, neither Alternative 1 nor 2 would contribute to cumulative impacts.
Air Quality	The study area is in attainment for all criteria pollutants. Alternatives 1 and 2 would not result in increased traffic volumes that could degrade air quality. Short-term construction emissions combined with other reasonably foreseeable projects would not result in any exceedances of NAAQS. Consequently, the contribution of Alternatives 1 or 2 to cumulative air quality impacts would be negligible.
Noise	Neither Alternative 1 nor 2 would result in long-term direct or secondary noise impacts and, therefore, would not contribute to any cumulative noise impacts.
Visual Resources	Alternatives 1 and 2 would result in minor direct visual impacts in the study area that would be mitigated. Plans for development within this area are limited, and actions taken within BLM land would be subject to visual resources management direction contained within the BLM's RMP. Conformance with the RMP would protect visual resources within the Virgin River corridor and prevent adverse cumulative impacts from other reasonably foreseeable future actions (BLM 2008c). The construction of a fence around "Little Jamaica" within the ADOT-owned ROW would introduce a new built feature to the area. Materials would be selected to blend with the surrounding environment. Alternatively, boulders may be used to prevent the diversion or damming of the water. As vegetation re-establishes, the fence or boulders would be less prominent. No other notable past, present, or future visual changes were identified. Thus the cumulative changes associated with the bridge construction and fencing of "Little Jamaica" would be minor.
Wild and Scenic Rivers	Alternatives 1 and 2 would have a temporary minor impact on the free-flowing character of the Virgin River and a moderate impact on the aquatic and riparian values. However, these direct effects would primarily be located within the non-federal portion of the river, would be localized, and would dissipate with distance from the project area. Alternatives 1 and 2 would conform to the Wild and Scenic River management strategies for the Virgin River. Therefore, neither Alternative 1 nor Alternative 2 is anticipated to contribute to cumulative impacts that would affect Wild and Scenic River eligibility or suitability determinations for the Virgin River. The RMP river management strategies and management employed by the Virgin River Recovery Program would also prevent adverse cumulative impacts from other reasonably foreseeable future actions.

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Table 17. Resources Not Considered for Cumulative Impact Analysis

Resource	Rationale
Soils and Geologic Resources	Alternatives 1 and 2 would result in negligible direct impacts to geology and soils in the study area and moderate secondary impacts due to potential for erosion and sedimentation which can be mitigated. Overall, neither Alternative 1 nor Alternative 2 would substantially contribute to cumulative geology and soils impacts. Further, the management actions identified by BLM in its RMP would prevent the contributions of other reasonably foreseeable projects or actions to cumulative impacts.
Hazardous Materials	Alternatives 1 and 2 would result in the disturbance of regulated levels of lead-based paint. However, ADOT has committed to development of disposal plans to ensure that the materials are disposed of in accordance with state and federal laws and disposal would not result in secondary impacts. Consequently, the contribution of Alternative 1 or 2 to cumulative hazardous materials impacts would be negligible. Further, federal regulations have in the past and would continue in the future to minimize the contribution of other projects.
Material Sources and Waste Materials	Cuts and fills required for construction would be balanced to the extent possible, and materials would be obtained from or disposed at ADOT-approved facilities. The construction of Alternative 1 or Alternative 2 would have a negligible contribution to cumulative impacts. Earthwork would be a common occurrence associated with ongoing development in Washington County, St. George, and Mesquite. However, material sources are readily available, and no adverse cumulative impacts are anticipated.

4.19.3 Environmental Consequences

To assess cumulative impacts warranting analyses, the impact severity classification presented in Table 15 was used in accordance with FHWA guidance. Critical issues warranting cumulative impact analysis include water resources and biological resources (Table 18).

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Table 18. Cumulative Impact Matrix

Resource	Build Alternative Impact	Reasonably Foreseeable Impacts from Past, Present, and Future Actions	Impact Classification ^a
Water Resources	<ul style="list-style-type: none"> • Sedimentation • Changes to stream flow • Possible contamination from construction 	<ul style="list-style-type: none"> • Alteration of natural drainage features from upstream urban-growth-related construction activities • Increased surface runoff from new development • Implementation of conservation agreements by the Virgin River Recovery Program to manage competing uses of land and water resources throughout the Virgin River Basin • Implementation of BLM RMP management actions to protect the free flow character of the river and to preserve ecological values 	Negative/ Moderate/ Temporary
Biological Resources	<ul style="list-style-type: none"> • Construction activities leading to loss of riparian habitat and disruptions to the Virgin River • Sedimentation • Changes to stream flow • Possible contamination from construction 	<ul style="list-style-type: none"> • Modification and reduction of habitat • Increased temperature, salinity, and turbidity • Competition with non-native fish • Floods, toxic spills • Disease and parasites (may have adverse effects when coupled with other threats and stress factors) • Upstream uses, such as agriculture or effluent discharges from the St. George wastewater treatment plant resulting in a reduction of water quality which in turn affects critical habitat. • Implementation of conservation agreements by the Virgin River Recovery Program to manage competing uses of land and water resources throughout the Virgin River Basin • Implementation of BLM RMP management actions to protect the free flow character of the river and to preserve ecological values. 	Negative/ Moderate/ Temporary

Notes:

^a Impact Classification corresponds to classification system presented in Table 15.**Water Resources**

Water resources within the study area have been influenced by past construction activities associated with I-15 and upstream development in Washington County, Utah. Impacts on water resources from these types of activities are expected to continue to occur in the foreseeable future. This would potentially lead to a cumulative decrease in water quality due to increasing impervious surfaces that

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would lead to increased turbidity, sedimentation, and pollutant loading into the Virgin River watershed. However, the Virgin River Recovery Program is also anticipated to continue to coordinate and manage competing uses of land and water resources throughout the Virgin River Basin to promote conservation of water resources in the Virgin River. Additionally, BLM is expected to continue to implement management actions to protect the free-flowing character of the river and to preserve ecological values.

The selection of Alternative 1 or Alternative 2, and other I-15 bridge rehabilitation projects would affect water resources due to construction in the river bottom and within the floodplain. Potential impacts associated with this ground disturbance would include erosion and scouring that would increase sediment discharge into the river; potential changes to the stream flow and associated hydrologic processes; debris falling inadvertently into the river and being carried downstream; and potential spills of oil, fuel, and other materials into the river. These effects would be temporary during construction, and the active stream channel and floodplain would be restored to pre-construction conditions once the project is complete. Over time as soils settle and vegetation reestablishes, the intensity of these impacts would decrease. Further, development of a SWPPP and compliance with Sections 401, 402, and 404 of the Clean Water Act would ensure that the projects would not affect downstream water quality in the Virgin River. After mitigation, the contribution to the cumulative impacts on water resources from the bridge rehabilitation projects would be minor. Additionally, the continued management of the river by the Virgin River Recovery Program and BLM is anticipated to result in beneficial cumulative impacts that would restore the health of the resource over time. While the new columns and scour floor associated with Alternative 1 or the new piers associated with Alternative 2 would permanently be located within the floodplain, these features would be designed to minimize the impact on the drainage capabilities of the system. Aside from other past and potential bridge improvements, no construction within the river is anticipated. Any cumulative impact resulting from these improvements would be negligible.

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Biological Resources

The cumulative effects to biological resources are closely tied to the water resources discussion above since the Virgin River provides habitat for the endangered and sensitive Virgin River fish species, as well as birds and other species that are dependent on wetland and riparian vegetation for habitat. Habitat for Virgin River fish has been affected by past construction activities associated with I-15 and upstream development in Washington County that has influenced the temperature, salinity, turbidity, disease, floods, toxic spills, and competition with non-native fish as well as habitat and foraging for bird species including the southwestern willow flycatcher and the yellow-billed cuckoo. Impacts on the Virgin River from these types of activities are expected to continue to occur in the foreseeable future. The cumulative impact would result in a potential decrease in the quality and quantity of available habitat for Virgin River fish. However, the Virgin River Recovery Program is also anticipated to continue to coordinate and manage competing uses of land and water resources throughout the Virgin River Basin to promote conservation of the Virgin River ecosystem. Additionally, BLM is expected to continue to implement management actions to protect the free flow character of the river and to preserve ecological values.

Construction activities associated with Alternative 1 or Alternative 2 would temporarily result in loss of riparian habitat and disruptions to the Virgin River, including sedimentation, minor changes to stream flow, and possible contamination from construction. These effects would be temporary, and the active stream channel and floodplain would be restored following construction. Reseeding would help re-establish vegetation following construction. The implementation of mitigation measures developed in consultation with USFWS would minimize potential impacts on Virgin River fish. After mitigation, the contribution to the cumulative impacts on biological resources due to implementation of Alternative 1 or Alternative 2 would be minor. Additionally, the continued management of the river by the Virgin River Recovery Program and BLM is working to restore the health of the resource over time, which is

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anticipated to result in beneficial cumulative impact. As discussed above, a number of projects have been implemented to restore the health of the Virgin River and its habitat. Monitoring of spinedace and woundfin has shown recent improvements in the populations and an increase in native reproduction despite drought conditions in 2007. These improvements are anticipated to continue over time, although regional population growth and development will continue to put pressure on the resource (Meismer 2012; Virgin River Program 2012).

4.19.4 Mitigation Measures

No additional mitigation beyond the mitigation proposed in Section 4.9, *Drainage and Floodplain Considerations*, Section 4.10, *Section 404 and 401 of the Clean Water Act and National Pollutant Discharge Elimination System*, and Section 4.11, *Biological Resources* is necessary. The continued management of the river by the Virgin River Recovery Program and BLM is anticipated to improve the health of the resource over time.

4.19.5 Conclusion

Bridge construction associated with Alternative 1 or Alternative 2 would result in temporary contributions to the cumulative impacts of past, present, and reasonably foreseeable future actions on biological and water resources. BMPs and mitigation measures developed for this project would minimize these contributions. Further, continued management of the river by the Virgin River Recovery Program and BLM is anticipated to restore the health of the resource over time. The magnitude of potential contributions would be less than significant.

4.20 Impacts Summary

Alternative 1 and Alternative 2 would meet the purpose and need of the project and would have minor adverse impacts on the human environment and moderate adverse impacts on the physical and natural environments (Table 19). Overall, impacts anticipated to occur under Alternative 2 would be less than

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those identified for Alternative 1 because Alternative 2 would not require the construction of the concrete scour floor. In addition, the life of the bridge following construction would be 25 years longer for Alternative 2 than for Alternative 1 and Alternative 2 would require less routine maintenance than Alternative 1. For these reasons, Alternative 2 has been identified as the Preferred Alternative.

While the No Build Alternative would not cause project-related impacts, it could cost the trucking industry up to \$42.9 million per year if weight restrictions are placed on Bridge No. 1 and compromise I-15's role as a vital local, regional, and international corridor. The implementation of Alternative 1 or Alternative 2 would contribute to minor indirect and cumulative impacts that would be temporary due to the extensive BMPs and mitigation measures developed during coordination with BLM, NPS, USFWS, and AGFD. Potential impacts from the alternatives carried forward for further study are compared in Table 19.

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Table 19. Impact Summary

Resource/ Environmental Consideration	Summary of Context and Intensity ^a			Mitigation Proposed ^b
	Alternative 1 Bridge Widening and Rehabilitation	Alternative 2 Bridge Reconstruction in Place	No Build Alternative	
Land Use	Conforms to each of the BLM management strategies and local plans that govern land use in the study area. Temporary impacts to recreational users of the Virgin River corridor during construction, and long-term impacts to recreational users of the unauthorized water feature known as "Little Jamaica."	Conforms to each of the BLM management strategies and local plans that govern land use in the study area. Temporary impacts to recreational users of the Virgin River corridor during construction, and long-term impacts to recreational users of the unauthorized water feature known as "Little Jamaica."	No project-related impacts	Yes
Social Conditions	No permanent social or economic impacts, such as residential relocations, business displacements, or changes in access. Temporary traffic delays through the area during construction that could affect motorists and emergency service providers. No Title VI or Environmental Justice impacts. Short-term (river closure) and long-term (removal of "Little Jamaica") would have a minor adverse impact on recreation.	No permanent social or economic impacts, such as residential relocations, business displacements, or changes in access. Temporary traffic delays through the area during construction that could affect motorists and emergency service providers. No Title VI or Environmental Justice impacts. Short-term (river closure) and long-term (removal of "Little Jamaica") would have a minor adverse impact on recreation.	Adverse future impacts to the movement of people, goods, and services for the communities surrounding the study area. Freight delays resulting from weight restrictions could cost between \$35.1 million and \$42.9 million per year. "Little Jamaica" would continue to be removed intermittently as part of regular ADOT maintenance.	Yes
Cultural Resources	No adverse effects on any archaeological or historical resources. Sites for avoidance would be flagged.	No adverse effects on any archaeological or historical resources. Sites for avoidance would be flagged.	No adverse effects on any archaeological or historical resources.	Yes
Section 4(f)	No use would occur.	No use would occur.	No use would occur	No
Air Quality	No change in air quality attainment status. Construction-related activities would cause temporary increases in particulate matter emissions.	No change in air quality attainment status. Construction-related activities would cause temporary increases in particulate matter emissions.	No change in air quality attainment status.	Yes
Noise	Construction-related activities would cause minor increases in noise levels. No long-term increases in traffic noise.	Construction-related activities would cause minor increases in noise levels. No long-term increases in traffic noise.	No project-related impacts	Yes

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Resource/ Environmental Consideration	Summary of Context and Intensity ^a			Mitigation Proposed ^b
	Alternative 1 Bridge Widening and Rehabilitation	Alternative 2 Bridge Reconstruction in Place	No Build Alternative	
Visual Resources	Bridge rehabilitation would not change the existing visual character of the study area because the proposed construction would result in comparable style, scale, and materials as the current bridge. Bridge materials would be concrete with weathered steel girders. Weathered steel would be less reflective than other steel options and would blend with the colors in the surrounding landscape. Short-term impacts would result during construction due to the presence of equipment and materials. Fencing with no trespassing signs or the placement of boulders at the location of "Little Jamaica" would result in a long-term adverse visual impact. The impact would reduce as new vegetation becomes established but would remain visible. Impacts would be further balanced by the removal of the pool and a potential reduction in trash and heavy use.	Bridge reconstruction would not change the existing visual character of the study area because the proposed construction would result in comparable style, scale, and materials as the current bridge. Bridge materials would be concrete with weathered steel girders. Weathered steel would be less reflective than other steel options and would blend with the colors in the surrounding landscape. Short-term impacts would result during construction due to the presence of equipment and materials. Fencing with no trespassing signs or the placement of boulders at the location of "Little Jamaica" would result in a long-term adverse visual impact. The impact would reduce as new vegetation becomes established but would remain visible. Impacts would be further balanced by the removal of the pool and a potential reduction in trash and heavy use.	No project-related impacts	Yes
Drainage and Floodplains	No impacts to drainage or groundwater, but temporary and permanent impacts within the 100-year floodplain. Impacts to the base flood elevation would be negligible.	No impacts to drainage or groundwater, but temporary and permanent impacts within the 100-year floodplain. Impacts to the base flood elevation would be negligible.	No project-related impacts	Yes
Waters of the U.S.	Section 401, 402, and 404 permits would be required to address impacts of fill placed in Waters.	Section 401, 402, and 404 permits would be required to address impacts of fill placed in Waters.	No project-related impacts	Yes

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Resource/ Environmental Consideration	Summary of Context and Intensity ^a			Mitigation Proposed ^b
	Alternative 1 Bridge Widening and Rehabilitation	Alternative 2 Bridge Reconstruction in Place	No Build Alternative	
Biological Resources	Construction activities would disturb 104 acres and affect six Virgin River fish species, two of which are endangered. Additionally, the project would affect critical habitat for three species; however, no long-term adverse modification to critical habitat would occur. If an incidental take would exceed what is permitted by the Biological Opinion, consultation with USFWS would be reinitiated.	Construction activities would disturb 104 acres and affect six Virgin River fish species, two of which are endangered. Additionally, the project would affect critical habitat for three species; however, no long-term adverse modification to critical habitat would occur. If an incidental take would exceed what is permitted by the Biological Opinion, consultation with USFWS would be reinitiated.	No project-related impacts	Yes
Wild and Scenic Rivers	Most of the project area is outside federal jurisdiction. The project conforms to the Wild and Scenic River management strategies for the Virgin River. Minor, temporary impacts to the free-flowing character and the scenic and riparian values. Long-term, minimal impacts to the free-flowing character and scenic values. Temporary impacts to recreational use of the river within the project area during construction.	Most of the project area is outside federal jurisdiction. The project conforms to the Wild and Scenic River management strategies for the Virgin River. Minor, temporary impacts to the free-flowing character and the scenic and riparian values. Long-term, minimal impacts to the free-flowing character and scenic values. Temporary impacts to recreational use of the river within the project area during construction.	No project-related impacts	No
Soils and Geologic Resources	Minor, temporary impacts to soils. No project-related impacts to geologic resources.	Minor, temporary impacts to soils. No project-related impacts to geologic resources.	No project-related impacts	Yes
Hazardous Materials	Lead-based paint would be disturbed during construction.	Lead-based paint would be disturbed during construction.	No project-related impacts	Yes
Material Sources and Waste Materials	Requires minimal import or export of fill material. Volumes to be determined during final design.	Requires minimal import or export of fill material. Volumes to be determined during final design.	No project-related impacts	Yes

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Resource/ Environmental Consideration	Summary of Context and Intensity ^a			Mitigation Proposed ^b
	Alternative 1 Bridge Widening and Rehabilitation	Alternative 2 Bridge Reconstruction in Place	No Build Alternative	
Secondary Impacts	Construction impacts on water resources upstream (increased water levels) and downstream (turbidity and/or sedimentation) .	Construction impacts on water resources upstream (increased water levels) and downstream (turbidity and/or sedimentation)	Minor impact on trucking-related sales and services in the project vicinity.	No
Cumulative Impacts	Negligible contribution to cumulative impacts on water and biological resources.	Negligible contribution to cumulative impacts on water and biological resources.	No project-related impacts	No

Notes: BLM = Bureau of Land Management; U.S. = United States.

^a Assessment is without mitigation in place; the information in this table is a summary only and is not intended to be comprehensive; the reader is referred to the appropriate sections of Section 4, *Affected Environment, Environmental Consequences, and Mitigation Measures*, for a detailed description of potential impacts shown above.

^b Mitigation proposed includes required permits, certifications, standard design requirements, and other mitigation. The reader is referred to the Mitigation Measures list at the beginning of the Draft EA and in appropriate sections of Section 4, *Affected Environment, Environmental Consequences, and Mitigation Measures*, for detailed description of mitigation.

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5 Public Involvement and Project Coordination

To give all stakeholders ample opportunity to provide comments and be involved in the project decision-making process, public involvement and agency coordination were conducted at various stages during the preparation of this EA. These efforts have consisted of public and agency scoping and project coordination meetings with various stakeholders.

5.1 Agency Scoping

ADOT and FHWA sent scoping letters to 46 representatives of 28 potentially affected agencies and organizations in July 2014. USFWS, AGFD, Nevada Department of Transportation, Utah Department of Transportation, and Mohave County commented on the project. Five comments were received during agency scoping. Each of the agency comments and ADOT responses are included in the Scoping Summary Report in Appendix G. Comments reflected concern about:

- ▶ Receiving information and a need for coordination during project development and construction
- ▶ Truck detour
- ▶ Traffic flow and roadway access
- ▶ The need for tribal consultation
- ▶ Environmental concerns including a need for conservation measures, wildlife and wildlife habitats, native plant conservation, and invasive species mitigation

5.2 Public Involvement

5.2.1 Public Scoping

During the initial scoping process, the study team prepared and distributed a newsletter, which was mailed the week of 10/09/2014, to approximately 45,000 property owners, occupants, and businesses in the vicinities of Littlefield and Beaver Dam, Arizona; Mesquite, Nevada; and St. George, Utah. The

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newsletter was also distributed electronically by ADOT via eGov Delivery to more than 4,000 subscribers. The deadline for responses from the public was 11/28/2014. A news release on 10/14/2014 was also distributed to provide information on the project, including a link to the newsletter. Information regarding the project has been maintained on the ADOT I-15 website at azdot.gov/I-15bridge1. Finally, on 07/02/2015 ADOT and FHWA distributed scoping letters to 32 adjacent land owners and 3 agencies providing information on the proposed access routes that may be used for reconstruction of Bridge No. 1. Comments were taken by means of written comments via mail, e-mail, and fax. During the 2014 comment period, telephone comments were taken as well.

A total of 110 comments were received during the 2014 comment period, and an additional 5 comments were received during the 2015 comment period. Comments were received stating general support for bridge construction as well as expressions that the project is not needed. Specific comments reflected concern about:

- ▶ Construction details such as hours of work, lighting, staging areas, lane closures and traffic management, methods of construction, avoidance of irrigation ditches and utilities, and opportunities for providing materials or storage areas.
- ▶ Minimizing impacts by using the smallest construction footprint possible, expediting the construction schedule, and the use of alternate access roads during construction.
- ▶ Environmental concerns were expressed including concern about noise, vibration, water features and erosion, both the protection of and request for the removal of "Little Jamaica," wildlife and habitat impacts, and impacts to recreation.

The public scoping process, comments, and responses are documented in the Scoping Summary Report in Appendix G.

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5.2.2 Public Hearing

A public hearing for this project is planned pending FHWA acceptance of this Draft EA. Outreach for the public hearing would follow Americans with Disabilities Act requirements by providing a meeting location at a handicap-accessible facility and by providing notices in alternative formats. A summary of public comments received following the distribution of this Draft EA during the public comment period, and ADOT's responses to those comments will be provided in the Final EA.

5.3 Cooperating Agency Contributors

Table 20 lists BLM and NPS personnel who contributed to the preparation of this EA.

Table 20. List of Cooperating Agency Contributors

Name	Agency/Organization	Title
Lorraine Christian	BLM Arizona Strip Field Office	Field Manager
Amanda Harrington	BLM Arizona Strip Field Office	Program Lead for Lands/Realty/Geology/Soils; Assistant Field Manager
Laurie Ford (transferred)	BLM Arizona Strip Field Office	Team Lead, Lands/Geological Sciences
Theresa Burke (transferred)	BLM Arizona Strip Field Office	Team Lead, Lands/Geological Sciences
Jon Jasper	BLM Arizona Strip Field Office	Outdoor Recreation Planner/Visual Resources
Marissa Monger (transferred)	BLM Arizona Strip Field Office	Realty Specialist
Diana Hawks (retired)	BLM Arizona Strip Field Office	Visual Resources
Brian McMullen	BLM Arizona Strip Field Office	Soil, Water, Air resources
Shawn Langston	BLM Arizona Strip Field Office	Wildlife Biologist
John Herron (retired)	BLM Arizona Strip Field Office	Archaeologist
Jeff Young	BLM Arizona Strip Field Office	Program Lead for Wildlife/Special Status Animals
David Van Alfen	Interim BLM Arizona Strip Field Office	Archaeology
Attila Bality	National Park Service Rivers and Trails Program	Resource Management Specialist

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All notices and disclosures will be sent to you electronically

Unless you tell us otherwise in accordance with the procedures described herein, we will provide electronically to you through your DocuSign user account all required notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you during the course of our relationship with you. To reduce the chance of you inadvertently not receiving any notice or disclosure, we prefer to provide all of the required notices and disclosures to you by the same method and to the same address that you have given us. Thus, you can receive all the disclosures and notices electronically or in paper format through the paper mail delivery system. If you do not agree with this process, please let us know as described below. Please also see the paragraph immediately above that describes the consequences of your electing not to receive delivery of the notices and disclosures electronically from us.

How to contact Arizona Dept of Transportation:

You may contact us to let us know of your changes as to how we may contact you electronically, to request paper copies of certain information from us, and to withdraw your prior consent to receive notices and disclosures electronically as follows:

To contact us by email send messages to: djohnson2@azdot.gov

To advise Arizona Dept of Transportation of your new e-mail address

To let us know of a change in your e-mail address where we should send notices and disclosures electronically to you, you must send an email message to us at djohnson2@azdot.gov and in the body of such request you must state: your previous e-mail address, your new e-mail address. We do not require any other information from you to change your email address..

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- i. decline to sign a document from within your DocuSign account, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;
- ii. send us an e-mail to djohnson2@azdot.gov and in the body of such request you must state your e-mail, full name, IS Postal Address, telephone number, and account number. We do not need any other information from you to withdraw consent.. The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process..

Required hardware and software

Operating Systems:	Windows2000? or WindowsXP?
Browsers (for SENDERS):	Internet Explorer 6.0? or above
Browsers (for SIGNERS):	Internet Explorer 6.0?, Mozilla FireFox 1.0, NetScape 7.2 (or above)
Email:	Access to a valid email account
Screen Resolution:	800 x 600 minimum
Enabled Security Settings:	<ul style="list-style-type: none"> •Allow per session cookies •Users accessing the internet behind a Proxy Server must enable HTTP 1.1 settings via proxy connection

** These minimum requirements are subject to change. If these requirements change, we will provide you with an email message at the email address we have on file for you at that time providing you with the revised hardware and software requirements, at which time you will have the right to withdraw your consent.

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To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please verify that you were able to read this electronic disclosure and that you also were able to print on paper or electronically save this page for your future reference and access or that you were able to e-mail this disclosure and consent to an address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format on the terms and conditions described above, please let us know by clicking the 'I agree' button below.

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Signing Complete	Security Checked	10/4/2017 6:51:37 AM
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From time to time, Arizona Dept of Transportation (we, us or Company) may be required by law to provide to you certain written notices or disclosures. Described below are the terms and conditions for providing to you such notices and disclosures electronically through your DocuSign, Inc. (DocuSign) Express user account. Please read the information below carefully and thoroughly, and if you can access this information electronically to your satisfaction and agree to these terms and conditions, please confirm your agreement by clicking the 'I agree' button at the bottom of this document.

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If you decide to receive notices and disclosures from us electronically, you may at any time change your mind and tell us that thereafter you want to receive required notices and disclosures only in paper format. How you must inform us of your decision to receive future notices and disclosure in paper format and withdraw your consent to receive notices and disclosures electronically is described below.

Consequences of changing your mind

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All notices and disclosures will be sent to you electronically

Unless you tell us otherwise in accordance with the procedures described herein, we will provide electronically to you through your DocuSign user account all required notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you during the course of our relationship with you. To reduce the chance of you inadvertently not receiving any notice or disclosure, we prefer to provide all of the required notices and disclosures to you by the same method and to the same address that you have given us. Thus, you can receive all the disclosures and notices electronically or in paper format through the paper mail delivery system. If you do not agree with this process, please let us know as described below. Please also see the paragraph immediately above that describes the consequences of your electing not to receive delivery of the notices and disclosures electronically from us.

How to contact Arizona Dept of Transportation:

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To contact us by email send messages to: djohnson2@azdot.gov

To advise Arizona Dept of Transportation of your new e-mail address

To let us know of a change in your e-mail address where we should send notices and disclosures electronically to you, you must send an email message to us at djohnson2@azdot.gov and in the body of such request you must state: your previous e-mail address, your new e-mail address. We do not require any other information from you to change your email address..

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To withdraw your consent with Arizona Dept of Transportation

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- i. decline to sign a document from within your DocuSign account, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;
- ii. send us an e-mail to djohnson2@azdot.gov and in the body of such request you must state your e-mail, full name, IS Postal Address, telephone number, and account number. We do not need any other information from you to withdraw consent.. The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process..

Required hardware and software

Operating Systems:	Windows2000? or WindowsXP?
Browsers (for SENDERS):	Internet Explorer 6.0? or above
Browsers (for SIGNERS):	Internet Explorer 6.0?, Mozilla FireFox 1.0, NetScape 7.2 (or above)
Email:	Access to a valid email account
Screen Resolution:	800 x 600 minimum
Enabled Security Settings:	<ul style="list-style-type: none"> •Allow per session cookies •Users accessing the internet behind a Proxy Server must enable HTTP 1.1 settings via proxy connection

** These minimum requirements are subject to change. If these requirements change, we will provide you with an email message at the email address we have on file for you at that time providing you with the revised hardware and software requirements, at which time you will have the right to withdraw your consent.

Acknowledging your access and consent to receive materials electronically

To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please verify that you were able to read this electronic disclosure and that you also were able to print on paper or electronically save this page for your future reference and access or that you were able to e-mail this disclosure and consent to an address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format on the terms and conditions described above, please let us know by clicking the 'I agree' button below.

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