Chapter 3. Summary of Impacts, Mitigation Measures, and Permit Requirements

3.1 What are the impacts of the Proposed Action, and how will they be mitigated?

The EA analyzed impacts of the Proposed Action and No Action in detail, and identified no significant adverse impacts to the environment resulting from the Proposed Action with the mitigation included in **Table 3-1**. As summarized here, the Proposed Action provides a number of benefits and results in minor and moderate adverse impacts resulting in the finding of no significant impacts. Most of the minor and moderate adverse impacts occur during the construction period and can be mitigated effectively using best management practices (BMPs).

The Proposed Action has a number of permanent transportation benefits, including improving safety, reducing congestion, and providing more reliable travel times for local residents, corridor visitors, interstate travelers, and emergency responders. The project is expected to reduce crashes between 20 and 35 percent compared to the No Action. The project is expected to reduce the average travel time between Georgetown and the top of Floyd Hill by approximately 26 minutes over the No Action during peak travel periods in 2035. The managed lane will maintain free-flow traffic speeds during peak periods of congestion, providing a reliable travel time choice. Improved travel conditions provide other localized social and economic benefits by providing safer travel conditions for Idaho Springs residents commuting, shopping, or visiting Evergreen or Denver. Improving traffic flows also benefits air quality because emissions of two criteria pollutants (oxides of nitrogen [NO_x] and carbon monoxide [CO]) and mobile source air toxics (MSATs) are reduced when congestion (and vehicle idling) is reduced.

The Proposed Action includes a number of features that will permanently improve environmental conditions in the project area. Sediment control and spill containment features will be constructed to reduce sediment and pollutant loads entering Clear Creek and improve water quality. Wildlife crossings under I-70 will be improved at the new Hidden Valley Bridge and a culvert west of the tunnels, and trees will be removed to improve wildlife visibility and reduce potential for wildlife-vehicle crashes. A barbed wire fence west of the tunnel will be replaced with more wildlife-friendly fencing to reduce animal entrapment. A noise barrier will be constructed near the west end of the tunnel portal to reduce traffic noise impacts along the Scott Lancaster Memorial Trail. Restoration of the detour route and construction access road will permanently enhance Clear Creek County's Greenway recreation resources along old US 40 (game check area) and along Clear Creek north of the Doghouse Rail Bridge.

Some minor to moderate adverse impacts will result from the Proposed Action, and mitigation measures have been included to further minimize effects. The Proposed Action results in an adverse effect to one historic property, the Twin Tunnels (5CC1189.3). Enlarging the eastbound bore of the Twin Tunnels and removing and replacing its portal face adversely affects the historic characteristics of the tunnel, including its design, material, workmanship, and feeling. As mitigation, CDOT will document the tunnel's history and create interpretive and educational materials celebrating the tunnel's historic importance (see Programmatic Agreement supplement in the electronic appendix). Highway users and recreationalists will experience minor to moderate visual impacts from the Proposed Action's new walls, signs, and expanded highway footprint. Where possible, the design of the Proposed Action has been modified to lessen the height of retaining walls and consolidate highway signs. The Proposed Action also integrates design principles of the I-70 Mountain Corridor Aesthetic Guidance, which defines aesthetics and identifies specific design treatments to lessen the visual impacts of the highway on its surroundings. Recreational resources will be affected by the removal of one of seven boating accesses to river activities on Clear Creek and minor reduction of parking at the Kermitts Trailhead. These impacts have a minor effect on Clear Creek recreational activities overall and no effect on planned recreational improvements for the Clear Creek County Greenway. Finally, the Proposed Action will permanently convert approximately 6 acres of terrestrial wildlife habitat to transportation use. Nearly all (98 percent) of the habitat lost is degraded, disturbed roadside habitat that has minimal wildlife value.

Construction activities, including preparation and operation of the I-70 detour and construction access road, will result in a number of impacts, most of which occur only during the construction period and can be minimized by employing BMPs. Traffic delays, changes in accesses, and dust, noise, and vibration from

construction and blasting activities will adversely affect social and economic resources, recreation resources, wildlife, water quality, and air quality. Detour operations and I-70 closures will increase emergency response times, increase travel time on I-70, and potentially reduce traveler recreation and patronage at local businesses, especially during peak travel periods. Although recreational access to trails, fishing, and rafting will be maintained, recreationalists may experience delays or may avoid the area during construction. CDOT and the contractor will implement a comprehensive public information plan to disseminate construction information, notify highway users about closures and delays, and provide clear signage or other information about how travelers can access local businesses and destinations. Economic impacts to Idaho Springs may also be offset by increased construction spending and patronage to local businesses. Wildlife also will be displaced by noise and construction activity, and some increased mortality of wildlife may occur as habitat is disturbed. Colorado Parks and Wildlife (CPW) will place salt blocks on the north side of I-70 to encourage big horn sheep to stay away from the tunnels during blasting. If an increase in animal-vehicle collisions is observed, additional fencing may be installed to keep wildlife out of the construction area. Construction in or near Clear Creek, including retaining wall construction bridge construction and demolition, and installation and use of the construction access road will disturb riparian areas and increase the potential for soil erosion and sedimentation within Clear Creek. Sedimentation and in-stream work could affect water quality and aquatic habitat. The contractor will obtain and follow stipulations of required water quality permits and BMPs to minimize effects on Clear Creek. The Colorado Parks and Wildlife (CPW) will conduct surveys of trout spawning areas in the fall of 2012. Prior to conducting construction activities near Clear Creek, CDOT, in coordination with CPW, will evaluate potential impacts associated with construction activities in and around Clear Creek and implement appropriate mitigation or BMPs to reduce impacts to trout species and habitat during construction. In addition, as part of its Intergovernmental Agreement with Clear Creek County, CDOT has committed to stream enhancements upstream of Hidden Valley that will permanently improve aquatic habitat, including spawning areas, in the Twin Tunnels area after construction is complete.

Table 3-1 provides a detailed list of mitigation commitments that will be implemented to minimize impacts identified as part of the Proposed Action. Mitigation measures for the construction access road included in the Portal to Portal Companion Report have been integrated into **Table 3-1**. The table summarizes the activities that trigger mitigation, along with the location where the activity occurs and the impact that the activity causes. The additional information about the triggering activities provides flexibility for the contractor or CDOT to modify the activity and further avoid impacts. If the impact is avoided, the mitigation would not be required. For example, mitigations 55 through 58 apply to nighttime construction activities. If the contractor does not conduct nighttime construction, the mitigations would not be required or implemented. **Table 3-1** is based on the list of mitigation commitments included in Appendix A of the EA and has been revised to include updates, clarifications, and additional commitments resulting from the review of comments received on the EA. CDOT will use **Table 3-1** to track mitigation commitments through the design and construction of the Proposed Action.

Table 3-1. Summary of Impacts and Committed Mitigation Measures

Mitigation Commitment #	Mitigation Category	Activity Triggering Mitigation	Location of Activity Triggering Mitigation	Impact from NEPA Document	Commitment From Mitigation Table In Source Document	Responsible Agency[1]	Life Cycle Phase[2] Mitigation to be Implemented	Source Document of Mitigation Commitment and Page Number
1	Air Quality	Increase in I-70 future traffic volumes.	Within Twin Tunnels project area.	Re-entrained road dust (PM_{10}) will increase as traffic volumes continue to increase (compared to both existing conditions and the No Action).	In the I-70 Twin Tunnels area, CDOT will continue its ongoing practice of minimizing the use of road sanding as safety permits.	CDOT	Operations, Maintenance, and Monitoring	Twin Tunnels Environmental Assessment Page 3.8-6
2	Air Quality	Increase in I-70 future traffic volumes.	Within Twin Tunnels project area.	Re-entrained road dust (PM_{10}) will increase as traffic volumes continue to increase (compared to both existing conditions and the No Action).	When road closures occur, CDOT maintenance crews will clean the roadway if it can be safely performed in conjunction with the other activities at the site. CDOT will station and maintain a street sweeper at its Hidden Valley maintenance yard for this purpose.	CDOT	Operations, Maintenance, and Monitoring	Twin Tunnels Environmental Assessment Page 3.8-6
3	Air Quality	Increased maintenance activities to control re-entrained dust.	Within Twin Tunnels project area.	Increased maintenance operations (to control re-entrained road dust due to increased traffic volumes) could increase trackout and dust generation by maintenance vehicles.	CDOT has a maintenance yard north of I-70 at the Hidden Valley Interchange (Exit 243) and will implement measures to minimize any trackout by CDOT vehicles at that location.	CDOT	Operations, Maintenance, and Monitoring	Twin Tunnels Environmental Assessment Page 3.8-6
4	Air Quality	Operation of eastbound I-70 detour during construction.	CR 314 between the Doghouse Rail Bridge and Hidden Valley interchange.	Increased dust closer to nearby residences and immediately adjacent to a temporary shared use path.	Review the detour route and utilize BMPs to minimize opportunities for fugitive dust to reach the roadway.	CDOT	Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.8-7
5	Air Quality	Operation of eastbound I-70 detour during construction.	CR 314 between the Doghouse Rail Bridge and Hidden Valley interchange.	Increased dust closer to nearby residences and immediately adjacent to a temporary shared use path.	Ensure that roadside soils are stabilized and that the detour route is swept prior to opening CR 314 for detour use.	Contractor	Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.8-7
6	Air Quality	Construction activities involving earth moving and storage of fill and rock products.	Within Twin Tunnels project area.	Increase in fugitive dust emissions near earth moving activities.	Prepare and implement a fugitive dust control plan that includes wetting of disturbed areas.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.8-7 and Twin Tunnels Portal to Portal Access Road Companion Report Page 7-2
7	Air Quality	Construction activities involving earth moving and storage of fill and rock products.	Within Twin Tunnels project area.	Potential disturbance of mine tailings and release of dust that could contain contaminants within the project area.	Complete a project-specific Materials Management Plan (MMP) and Health and Safety Plan (HSP) that detail site-specific standard operating procedures regarding dust from mine tailings that could be disturbed during construction.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.8-7
8	Air Quality	Construction activities involving earth moving and storage of fill and rock products.	Within Twin Tunnels project area.	Potential disturbance of mine tailings and release of dust that could contain contaminants within the project area.	Implement dust suppression BMPs to prevent potential mine wastes from being exposed in the air.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.8-7
9	Air Quality	Construction activities involving earth moving and storage of fill and rock products.	Within Twin Tunnels project area.	Potential disturbance of mine tailings and release of dust that could contain contaminants within the project area.	Minimize construction activities in or near known tailing areas.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.8-7
10	Air Quality	Commuting of construction workers.	Within Twin Tunnels project area.	Localized increase of vehicle emissions from workers commuting to project site.	Prepare a plan indicating where construction workers will park their personal vehicles and how they will shuttle or otherwise efficiently be transported to and from the work site to begin and end their shifts.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.8-7
11	Air Quality	Tunnel blasting operations.	Twin Tunnels eastbound bore.	Increased risk of exposure to dust emissions to nearby residents and recreational users from blasting activities.	In accordance with Colorado Air Quality Regulation No. 1 (5CCR1001-3), use all available practical methods that are technically feasible and economically reasonable in order to minimize fugitive dust emissions from blasting activities.	Contractor	Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.8-7
12	Air Quality	Tunnel blasting operations.	Twin Tunnels eastbound bore.	Increased risk of exposure to dust emissions by nearby residents and recreational users from blasting activities.	CDOT will conduct PM_{10} monitoring to assess the impacts of tunnel excavation, using the data for adaptive mitigation. The PM_{10} monitors will be set up some months ahead of tunnel blasting to facilitate monitoring protocol establishment, equipment testing, and acquire short term baseline data. The monitoring will be geared toward PM_{10} levels during blasting activities, not U.S. Department of Labor Occupational Safety and Health Administration-level of EPA long-term targets. The monitoring will provide a concentration alert threshold that will immediately trigger additional implementation of construction BMPs to address dust. Tunnel boring activities will not be halted for alerts. Once the tunnel bore is completed, the monitoring will cease. The Twin Tunnels EA Air Quality Technical Memorandum, included as an electronic attachment to the FONSI, provides additional detail about PM_{10} monitoring during construction.	CDOT	Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.8-7

[1] CDOT is ultimately responsible for fulfilling all mitigation commitments and monitoring construction progress to ensure that the contractor completes activities listed as contractor responsibilities.

[2] CDOT describes its projects in five Life Cycle phases: Planning; Project Development (NEPA); Project Design; Project Construction; and Operations, Maintenance, and Monitoring. For this project, CDOT is using a Construction Manager/General Contractor project delivery method, which divides Project Construction into packages that can be implemented independently. This table uses "packages" to distinguish timing of construction activities and mitigation for the three and construction sequences: preparation (Package 1), eastbound tunnel and I-70 construction (Package 2), and restoration (Package 3). The term "pre-construction" is used to distinguish activities that occur before physical construction (e.g., ground disturbance) activities.

Table 3-1. Summary of Impacts and Committed Mitigation Measures

Mitigation Commitment #	Mitigation Category	Activity Triggering Mitigation	Location of Activity Triggering Mitigation	Impact from NEPA Document	Commitment From Mitigation Table In Source Document	Responsible Agency[1]	Life Cycle Phase[2] Mitigation to be Implemented	Source Document of Mitigation Commitment and Page Number
13	Air Quality	Construction of Portal to Portal Construction Access Road.	Along the construction access road.	Increase in fugitive dust emissions along construction access road.	The contractor will prepare and implement a fugitive dust control plan that includes regular watering of the road surface to minimize fugitive dust.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Portal to Portal Access Road Companion Report Pages 3-1 and 7-2
14	Aquatic Resources	Use of hazardous materials during construction	Within Twin Tunnels project area.	Hazardous materials used during construction may spill and be carried into Clear Creek, degrading water quality and aquatic resource habitat.	Complete a project-specific Materials Management Plan (MMP) that details standard operating procedures regarding the management of hazardous materials that may be required to be used during construction.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.11-4 and Page 3.18-5
15	Aquatic Resources	Transportation of hazardous materials through the project area.	Within Twin Tunnels project area.	Hazardous materials transported along I-70 may spill and be carried into Clear Creek, degrading water quality and aquatic resource habitat.	Hazardous spill containment structure locations have been identified and the feasibility of BMPs will be evaluated to assess their potential effectiveness in reducing hazardous waste discharge to Clear Creek.	CDOT	Final Design and Operations, Maintenance, and Monitoring	Twin Tunnels Environmental Assessment Page 3.11-4
16	Aquatic Resources	Operation and maintenance of additional roadway lane.	Within Twin Tunnels project area.	Potential degradation of water quality and aquatic habitat due to increased runoff and sediment into Clear Creek.	Three different drainage inlet sediment trap concept designs have been developed to accommodate various drainage conditions anticipated for the Proposed Action. These traps will be installed as part of the drainage system in locations where surface water is discharged to Clear Creek. Locations for surface sediment basins have also been identified in the plan and will be constructed as part of the drainage system.	CDOT	Project Design and Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.11-4
17	Aquatic Resources	Construction equipment entering Clear Creek	Within Twin Tunnels project area.	Introduction of undesirable or nuisance species such as mud snails, zebra/quagga mussels, and whirling disease from contaminated construction equipment entering Clear Creek.	The contractor will remove all mud, plans and debris from the equipment (tracks, turrets, buckets, drags, teeth, etc.) and steam pressure wash equipment that has been previously used in another stream, river, lake, reservoir, pond or wetland to meet the "certified clean" standard and kill any undesirable or nuisance species.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels FONSI, page 4-5
18	Aquatic Resources	Retaining wall construction during brown trout spawning (October through June).	Areas adjacent to and immediately upstream from brown trout redds.	Sedimentation from erosion of disturbed soils covering eggs incubating in the stream substrate.	CPW will conduct a spawning survey in fall 2012 prior to construction to identify locations of active brown trout spawning near retaining wall construction. If spawning occurs adjacent to retaining wall construction, the contractor will implement appropriate BMPs, in coordination with and as approved by CPW and CDOT, to minimize impacts. Implementation of the planned stream enhancement outlined in the Intergovernmental Agreement between CDOT and Clear Creek County will permanently improve spawning areas in the Twin Tunnels project area after construction is complete.	CDOT/CPW/ Contractor	Project Construction (Pre-Construction, Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.11-4
19	Aquatic Resources	Retaining wall construction during brown trout spawning (October through June).	Areas adjacent to and immediately upstream from brown trout redds.	Sedimentation from erosion of disturbed soils covering eggs incubating in the stream substrate.	Erosion control BMPs will be established at each retaining wall location to avoid or minimize sedimentation within Clear Creek.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.11-4
20	Aquatic Resources	Construction of stream crossings during brown trout spawning (October through June).	Adjacent to I-70 bridge over Clear Creek west of Hidden Valley Interchange.	Potential disturbance of brown trout spawning areas during installation and removal of temporary stream crossings.	CPW will conduct a spawning survey in fall 2012 prior to construction to identify locations of active brown trout spawning. Based on the results of the survey, the contractor will implement appropriate BMPs, in coordination with and as approved by CPW and CDOT, to minimize impacts to spawning areas along Clear Creek throughout the construction area. A preliminary survey conducted in September 2012 indicated that the stream crossing area does not contain suitable conditions for spawning. CDOT will coordinate with CPW regarding placement and timing of installation and removal of stream crossings. Implementation of the planned stream enhancement outlined in the Intergovernmental Agreement between CDOT and Clear Creek County will permanently improve spawning areas in the Twin Tunnels project area after construction is complete.	CPW/CDOT/ Contractor	Project Construction (Pre-Construction, Package 1, Package 2, and Package 3)	Twin Tunnels FONSI Page 4-5
21	Aquatic Resources	Runoff from construction.	Within Twin Tunnels study area.	Impacts to aquatic resources as a result of sedimentation from erosion, degrading water quality.	Implement appropriate BMPs for erosion and sediment control according to the *CDOT Erosion Control and Storm Water Quality Guide* (CDOT, 2002), develop a stormwater management plan (which includes water quality monitoring by the construction contractor to ensure effectiveness of temporary construction BMPs), and implement and monitor any project-specific BMPs recommended by CPW to reduce impacts of sedimentation to aquatic resources during construction.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.11-4

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Mitigation Commitment #	Mitigation Category	Activity Triggering Mitigation	Location of Activity Triggering Mitigation	Impact from NEPA Document	Commitment From Mitigation Table In Source Document	Responsible Agency[1]	Life Cycle Phase[2] Mitigation to be Implemented	Source Document of Mitigation Commitment and Page Number
22	Aquatic Resources	Construction and operation of Portal to Portal Construction Access Road during brown trout spawning (October through June).	Along the construction access road between the eastbound tunnel entrance and exit, adjacent to Clear Creek.	Sedimentation from erosion of disturbed soils covering eggs incubating in the stream substrate.	CPW will conduct a spawning survey in fall 2012 prior to construction to identify locations of active brown trout spawning. If spawning occurs adjacent to the construction access road, the contractor will implement appropriate BMPs, in coordination with and as approved by CPW and CDOT, to minimize sedimentation impacts during construction. Implementation of the planned stream enhancement outlined in the Intergovernmental Agreement between CDOT and Clear Creek County will permanently improve spawning areas in the Twin Tunnels project area after construction is complete.	CDOT/CPW/ Contractor	Project Construction (Pre-Construction, Package 1, Package 2, and Package 3)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-4
23	Aquatic Resources	Construction and operation of Portal to Portal Construction Access Road during brown trout spawning (October through June).	Along the construction access road between the eastbound tunnel entrance and exit, adjacent to Clear Creek.	Sedimentation from erosion of disturbed soils covering eggs incubating in the stream substrate.	The contractor will implement appropriate BMPs for erosion and sediment control according to the *CDOT Erosion Control and Storm Water Quality Guide* (CDOT, 2002), develop a stormwater management plan (which includes water quality monitoring by the construction contractor to ensure effectiveness of temporary construction BMPs), and implement any project-specific BMPs recommended by CPW to reduce impacts of sedimentation to aquatic resources during construction. Implementation of the planned stream enhancement outlined in the Intergovernmental Agreement between CDOT and Clear Creek County will permanently improve spawning areas in the Twin Tunnels project area after construction is complete.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-4
24	Aquatic Resources	Construction and operation of Portal to Portal Construction Access Road during brown trout spawning (October through June).	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Loss of mature riparian vegetation and associated shading and fish food source.	The contractor will water newly planted trees and shrubs by truck. CDOT will require a 2- to 5-year establishment warranty or incentive specification of the contractor to ensure successful establishment of newly planted trees.	Contractor/ CDOT	Project Construction (Package 3) and Operations, Maintenance, and Monitoring	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-4
25	Aquatic Resources	Removal of mature riparian vegetation for construction and operation of the Portal to Portal Construction Access Road.	Between old US 40 and I-70 east of eastbound tunnel portal, adjacent to Clear Creek.	Loss of mature riparian vegetation and associated shading and fish food source.	Riparian trees and shrubs removed will be replaced as stipulated in CDOT's *Guidelines for Senate Bill 40 Wildlife Certification*, which states that trees removed during construction, whether native or non-native, shall be replaced with a goal of 1:1 replacement based on a stem count of all trees with diameter at breast height of 2 inches or greater. Shrubs removed during construction, whether native or non-native, will be replaced based on their pre-construction areal coverage. In all cases, all such trees and shrubs will be replaced with native species. Because the impacted area contains older trees (60 years old or older), CDOT has committed to additional riparian habitat restoration, as described in the Intergovernmental Agreement between CDOT and Clear Creek County.	CDOT/ Contractor	Project Construction (Package 1 and Package 3)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-4
26	Aquatic Resources	Removal of mature riparian vegetation for construction and operation of Portal to Portal Construction Access Road.	Between old US 40 and I-70 east of eastbound tunnel portal, adjacent to Clear Creek.	Loss of mature riparian vegetation and associated shading and fish food source.	Loss of riparian vegetation will be offset by the creation of 34,400 square feet of riparian habitat connected to the natural function of the creek. The existing riparian area is elevated above Clear Creek with drainage from the Twin Tunnels being a major water source for the area. The new riparian habitat will be created by regrading and lowering the existing manmade bench that is currently elevated as much as 6 to 8 feet above the creek. This will effectively return the area to natural riparian conditions. The regrading effort for riparian habitat mitigation will include the reconstruction of the natural terraces that are associated with western rivers and streams. Each terrace supports a different native ecosystem based on its relative relationship to the water table. The revegetation effort will be focused on re-establishing the different and unique ecosystems. All large trees, measured at 2 inches or more (in caliper) measured 4 feet above ground level, will be replaced at a minimum of one for one. Long pole plantings will be used. The final vegetation mitigation ratio will be determined through subsequent discussions with CPW and Clear Creek County.	CDOT/ Contractor	Project Construction (Package 3)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-4

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27	Energy	Ongoing road maintenance.	Twin Tunnels project area.	Fuel consumption and greenhouse gas (GHG) emissions due to maintenance vehicles and equipment from routine maintenance of I-70.	For ongoing road maintenance, CDOT will keep maintenance equipment well maintained and use cleaner fuels, such as low-sulfur diesel, when possible.	CDOT	Operations, Maintenance, and Monitoring	Twin Tunnels Environmental Assessment Page 3.19-5
28	Energy	Ongoing road maintenance.	Twin Tunnels project area.	Fuel consumption and GHG emissions due to idling vehicles delayed by maintenance activities conducted during peak travel periods.	CDOT will conduct maintenance activities (such as, roadway sweeping) during off-peak periods when feasible to reduce potential for idling vehicles caused by delays from CDOT maintenance operations.	CDOT	Operations, Maintenance, and Monitoring	Twin Tunnels Environmental Assessment Page 3.19-5 and 3.19-6
29	Energy	Operation of construction equipment.	Twin Tunnels project area and staging areas.	Fuel consumption and GHG emissions.	Use the cleanest fuels available at the time (for example, low-sulfur fuel or biodiesel) in construction equipment and construction vehicles to reduce GHG emissions. Use fuel-efficient construction vehicles (for example, hybrid technologies) when possible.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.19-5
30	Energy	Operation of construction equipment.	Twin Tunnels project area and staging areas.	Fuel consumption and GHG emissions due to poorly performing construction equipment.	Keep construction equipment well maintained.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.19-5
31	Energy	Operation of construction equipment.	Twin Tunnels project area and staging areas.	Fuel consumption and GHG emissions due to idling of construction equipment.	Prepare and implement a plan to minimize the idling of construction equipment.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.19-5
32	Energy	Commuting of construction workers.	Twin Tunnels project area and staging areas.	Increase in vehicle miles traveled (VMT) due to workers commuting to construction staging areas.	Prepare a plan indicating where construction workers will park their personal vehicles and how they will shuttle or otherwise efficiently be transported to and from the work site to begin and end their shifts.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.19-5
33	Energy	Construction equipment travelling between project area and staging areas.	Twin Tunnels project area and staging areas.	Fuel consumption due to construction equipment VMT.	Staging areas will be located as close as possible to the project area.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.19-5
34	Energy	Traffic management during construction.	I-70 approaching Twin Tunnels project area from east or west.	Fuel consumption and GHG emissions due to idling vehicles delayed on I-70 due to construction.	Implement traffic management techniques that minimize motorist delays and vehicle idling (see mitigation measures in the Transportation Mitigation Category).	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.19-6
35	Energy	Road maintenance during construction.	Within Twin Tunnels project area.	Fuel consumption and GHG emissions due to idling vehicles delayed by maintenance activities.	Conduct maintenance activities (such as, roadway sweeping) during periods of re#27 asduced traffic volumes when feasible to reduce idling vehicles.	CDOT	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.19-5 and 3.19-6
36	Geology	Construction of new rock cuts and widened tunnel portals.	New rock cuts along I-70 and CR 314.	Public safety risk due to potential rockfall hazards of new rock cuts or tunnel blasting. Large failures can cause road closures and increased maintenance.	Prior to blasting, the rock mass will be evaluated for the likelihood of rockfall occurring, and permanent rockfall mitigation will be implemented during construction and in the design of the new portals to reduce construction risks.	CDOT/ Contractor	Project Design and Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.17-5
37	Geology	Construction of new rock cuts.	New rock cuts along I-70 and CR 314.	Public safety risk due to potential rockfall hazards during construction. Large failures during construction can cause road closures and extra maintenance.	Implement temporary construction BMPs to minimize rockfall potential.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.17-6
38	Geology	New rock cuts and widened tunnel portals.	New rock cuts along I-70 and CR 314.	New cut slope areas increase risks of rockfall, increase public safety risk, and introduce potential for large failures that cause road closures and increased maintenance.	Use proven techniques (such as rockfall catchments, mesh, cable netting, fences, scaling, and blasting) to address rockfall from new cut slope areas.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.17-5
39	Geology	Tunnel portal excavation and construction of new slopes and new retaining walls.	Excavations at proposed fill walls, temporary median walls, tiered cut wall along CR 314, and the Twin Tunnels portals. Fill slopes occur throughout the study area.	Erosion can increase sediment transport through stormwater runoff into Clear Creek.	Manage erosion and surface water away from water sources and ensure that appropriate, temporary BMPs are in place to prevent migration of sediment from waste piles, slopes, and excavations.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.17-6
40	Historic Resources	Tunnel expansion.	Twin Tunnels eastbound bore.	Adverse effect to and Section 4(f) use of the Twin Tunnels historic property.	Fulfill stipulations of the Twin Tunnels project supplement to the I-70 Mountain Corridor Section 106 Programmatic Agreement. Stipulations include archival documentation and interpretive mitigation in the form of a historical film and signage.	CDOT	Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.6-5

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Mitigation Commitment #	Mitigation Category	Activity Triggering Mitigation	Location of Activity Triggering Mitigation	Impact from NEPA Document	Commitment From Mitigation Table In Source Document	Responsible Agency[1]	Life Cycle Phase[2] Mitigation to be Implemented	Source Document of Mitigation Commitment and Page Number
41	Historic Resources	Ground-disturbing construction activities that result in unexpected discovery of cultural remains that could have historic significance or be important to Native American tribes.	Within Twin Tunnels project area.	Inadvertent damage to historic properties that are unexpectedly discovered during construction.	Follow Section 107.23 of CDOT's Standard Specifications for Road and Bridge Construction for procedures regarding unexpected discoveries during construction.	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.6-5
42	Historic Resources	Ground-disturbing construction activities that result in unexpected discovery of cultural remains that could have historic significance or be important to Native American tribes.	Within Twin Tunnels project area.	Inadvertent damage to historic properties that are unexpectedly discovered during construction.	Follow process outlined in 36 CFR 800.12 regarding Section 106 compliance during emergency situations.	CDOT	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.6-5
43	Historic Resources	Construction on I-70 and detour route.	CR 314 along detour route.	Damage to locally important sites.	Ahead of any construction activity, walk through project area with Clear Creek County historian(s) to review construction footprint in relation to sites identified as locally important to determine if these sites have potential to be disturbed during construction.	CDOT	Project Construction (Package 1)	Twin Tunnels Environmental Assessment Page 3.6-5
44	Historic Resources	Construction on I-70 and detour route.	CR 314 along detour route.	Damage to locally important sites.	If located within or adjacent to the construction footprint, fence locally important sites to protect them from construction damage.	Contractor	Project Construction (Package 1)	Twin Tunnels Environmental Assessment Page 3.6-5
45	Land Use and Right-of-Way	Property acquisition.	Chain station reconstruction west of Twin Tunnels.	Acquisition of undevelopable property.	Comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.	CDOT	Project Construction (Package 1)	Twin Tunnels Environmental Assessment Page 3.4-6
46	Land Use and Right-of-Way	Operation of detour on CR 314.	CR 314 between Doghouse Rail Bridge and Hidden Valley Interchange.	Loss of local access for local travelers on CR 314.	Provide a detailed construction and detour plan to residents and business owners in the surrounding area as far in advance as possible.	Contractor	Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.4-6
47	Land Use and Right-of-Way	Operation of detour on CR 314.	CR 314 between Doghouse Rail Bridge and Hidden Valley Interchange.	Loss of local access for local travelers on CR 314.	Provide safe, effective, well-placed, and highly visible directional signage for access to properties along CR 314 during the detour.	Contractor	Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.4-6
48	Land Use and Right-of-Way	Temporary Easement for Portal to Portal Construction Access Road.	Clear Creek County-owned property south of Twin Tunnels.	Temporary easement required for property access.	Comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.	CDOT	Project Construction (Package 1)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-1
49	Land Use and Right-of-Way	Construction and operation of Portal to Portal Construction Access Road.	Clear Creek County-owned property south of Twin Tunnels.	Potential damage to septic system.	The extent of the septic system will be determined prior to construction activities; if system is located within the Portal to Portal Construction Access Road alignment, it will be bridged with crane mats or a steel plate will be installed to avoid damage to the septic tanks and pump station.	Contractor	Project Construction (Pre-Construction)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-1
50	Land Use and Right-of-Way	Construction and operation of Portal to Portal Construction Access Road.	Clear Creek County-owned property south of Twin Tunnels.	Potential damage to septic system, pump stations, leach field, household wells, and structures on property.	Pre- and post-construction inspection of the septic system facilities, household wells, and residential structure(s) will be performed. Any damage identified during the post-construction inspection will be repaired at the expense of the contractor.	Contractor	Project Construction (Pre-Construction and Package 2)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-1
51	Land Use and Right-of-Way	Construction and operation of Portal to Portal Construction Access Road.	Clear Creek County-owned property south of Twin Tunnels.	Potential damage to septic system, pump station, leach field, household well, and structures on property.	High-visibility markings will be used to identify septic system facilities, household wells, and residential structures, where needed. Any property damages shall be repaired at the expense of the contractor.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-1
52	Land Use and Right-of-Way	Construction and operation of Portal to Portal Construction Access Road.	Clear Creek County-owned property south of Twin Tunnels.	Loss of mature riparian vegetation and associated shading and fish food source.	The temporary easement will include a 2- to 5-year agreement for right-of-entry to the property for the continued care, repair, and replacement of newly planted vegetation associated with riparian habitat mitigation.	CDOT	Project Construction (Package 1, Package 2, Package 3) and Operations, Maintenance, and Monitoring	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-1
53	Noise	Capacity Improvements that meet the definition of a Type I Project.	I-70 adjacent to Scott Lancaster Bridge.	Continued traffic noise levels in exceedance of CDOT noise abatement criteria.	Construct a noise barrier, in accordance with CDOT Noise Analysis and Abatement Guidelines, proceeding west from the west portal of the eastbound tunnel to reduce noise levels at the Scott Lancaster Bridge.	CDOT/ Contractor	Project Construction (Package 2 or Package 3)	Twin Tunnels Environmental Assessment Page 3.9-6
54	Noise	Nighttime construction.	Adjacent to residential receptors at Hidden Valley and west tunnel portal.	Nighttime construction noise at residential receptors.	Limit night work to areas away from residences at Hidden Valley and west portal when feasible.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.9-6

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55	Noise	Nighttime construction.	Adjacent to residential receptors at Hidden Valley and west tunnel portal.	Nighttime construction noise at residential receptors.	Use well-maintained equipment, particularly with respect to mufflers.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.9-6
56	Noise	Nighttime construction.	Adjacent to residential receptors at Hidden Valley and west tunnel portal.	Nighttime construction noise at residential receptors.	If CDOT receives complaints from nearby residents about nighttime construction noise, the contractor will monitor noise at residents immediately adjacent to construction activities. If hourly equivalent noise levels exceed 66 dBA between 10 PM and 7 AM, CDOT will provide affected residents hotel vouchers for the duration of the construction activity causing elevated noise levels.	CDOT	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.9-6
57	Noise	Tunnel blasting.	Twin Tunnels eastbound bore.	Noise impacts at nearby residences and recreation facilities.	Develop a communication protocol in coordination with Idaho Springs, Clear Creek County, and law enforcement agencies to inform local residents, businesses, and the traveling public about blasting schedules. Techniques may include notices on Variable Message Signs, websites, social media, and traditional media outlets.	CDOT/ Contractor	Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.9-6
58	Noise	Tunnel blasting.	Twin Tunnels eastbound bore.	Noise impacts at nearby business and commercial facilities.	During initial blasting at the entrance to the eastbound bore, the contractor will monitor the air blast overpressure at business structures susceptible to damage. Based on monitoring results, an engineer will determine potential risks and need for additional mitigation, and the contractor will implement recommended mitigation.	CDOT/ Contractor	Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.9-6
59	Noise	Tunnel blasting.	Twin Tunnels eastbound bore.	Noise impacts at nearby residences and recreation facilities.	During initial blasting at the entrance to the eastbound bore, CDOT will monitor 24-hour noise levels at nearby residences and recreation areas (such as the trail) to determine if additional temporary mitigation is feasible.	CDOT	Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.9-6
60	Noise	Construction of Portal to Portal Construction Access Road.	Along the construction access road.	Noise resulting from the construction and operation of the Portal to Portal Construction Access Road adjacent to Clear Creek would disrupt the relative quiet experience for anglers and rafters on Clear Creek and bicyclists and pedestrians using the trail.	Use well-maintained equipment, particularly with respect to mufflers.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Portal to Portal Access Road Companion Report 7-7
61	Paleontology	Ground disturbing construction activities	Within Twin Tunnels project area.	Discovery of subsurface bones or other potential fossils.	Halt work and contact CDOT Staff Paleontologist to assess significance and make recommendations. Implement recommendations, which may include work stoppage around area, additional monitoring, or other activities.	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.0-1
62	Recreation Resources	Realignment of I-70.	I-70 west of Hidden Valley Interchange.	Reduction in long-term recreational river access due to removal of "Below Box" Boating Access.	Consider boating access in Final Design, and do not preclude long-term use of other fishing and boating access locations in the study area to preserve adequate recreational river access.	CDOT/ Contractor	Project Design	Twin Tunnels Environmental Assessment Page 3.5-6
63	Recreation Resources	Design and operation of water quality treatment features.	Kermitts Boating Access on Clear Creek near junction of US 6 and I-70.	Potential for reduced parking at Kermitts Boating Access.	Design and construct water treatment features so as not to preclude parking at the Kermitts Boating Access.	CDOT/ Contractor	Project Design and Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.5-6
64	Recreation Resources	Design and operation of water quality treatment features.	Kermitts Trailhead (planned) near US 6/I-70 Interchange.	Potential for reduced parking at Kermitts Trailhead.	Design and construct water quality treatment features so as not to preclude parking at the Kermitts Trailhead.	CDOT/ Contractor	Project Design and Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.5-6
65	Recreation Resource	Design and construction of retaining walls.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Retaining walls would constitute a visual impact to recreational users on the Scott Lancaster Memorial Trail, also a Section 4(f) recreation resource.	Proposed Action design includes shoulder widths that are less than the AASHTO standards to minimize the height of retaining walls along Clear Creek and reduce visual impacts from Scott Lancaster trail.	CDOT	Project Planning and Project Design	Twin Tunnels Environmental Assessment Section 4.8 Page 4-22
66	Recreation Resources	Operation of the detour in proximity to the Scott Lancaster Bridge.	Scott Lancaster Bridge.	Potential damage to the bridge from errant vehicles.	Provide an anchored concrete barrier between the Scott Lancaster Bridge and detour traffic to protect the bridge from errant vehicles.	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.5-7
67	Recreation Resources	Closure and resurfacing of the game check area.	On old US 40 between the Scott Lancaster Bridge and Doghouse Rail Bridge (game check area).	Conversion of game check area to a detour route during construction, and temporary use of Section 4(f) recreation property.	After eastbound interstate traffic is returned to I-70, restore the game check area per agreements in the June 24, 2012 Intergovernmental Agreement between CDOT and Clear Creek County.	CDOT/ Contractor	Project Construction (Package 3)	Twin Tunnels Environmental Assessment Page 3.5-7

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68	Recreation Resources	Closure and resurfacing of the Scott Lancaster Memorial Trail during operation of the detour.	On CR 314 between the Doghouse Rail Bridge and Hidden Valley Interchange (Scott Lancaster Memorial Trail).	Conversion of the Scott Lancaster Memorial Trail to a detour route and temporary use of this Section 4(f) recreation resource during use of the detour.	Detour bicycle and pedestrian traffic by providing a barrier-separated, paved, 8-foot-wide shared use path to maintain pedestrian and bicycle access during closure of portions of the Scott Lancaster Memorial Trail. After eastbound interstate traffic is returned to the I-70 corridor, restore the Scott Lancaster Memorial Trail to existing conditions (which include I-70 Frontage Road Phase 1 improvements).	Contractor	Project Construction (Package 1 and Package 2)	Twin Tunnels Environmental Assessment Page 3.5-7
69	Recreation Resources	Operation of eastbound I-70 detour during construction.	On CR 314 between the Doghouse Rail Bridge and Hidden Valley Interchange.	Temporary closure of Unnamed Fishing Access 400 feet east of the Doghouse Rail Bridge and Unnamed Boating Access 1,400 feet east of the Doghouse Rail Bridge.	Restore accesses after construction so as not to preclude long-term use of the area for fishing and boating access to Clear Creek. The Unnamed Boating Access, which will be formalized with six parking spaces during the Frontage Road Phase 1 improvements, will be restored to that condition.	Contractor	Project Construction (Package 3)	Twin Tunnels Environmental Assessment Page 3.5-7
70	Recreation Resources	Construction and restoration of I-70 detour route and construction of retaining wall along CR 314.	On CR 314 between Doghouse Rail Bridge and Hidden Valley Interchange.	Construction-related delays for pedestrians and bicycles during preparation and restoration of the I-70 detour and construction of retaining walls.	Maintain pedestrian and bicycle access during construction by ensuring that one lane on the frontage road is available for pedestrian, bicycle, and vehicular traffic, and this lane will be managed using flaggers to direct two-way operation of traffic.	Contractor	Project Construction (Package 1 and Package 3)	Twin Tunnels Environmental Assessment Page 3.5-7
71	Recreation Resources	Construction and restoration of grade changes on CR 314.	On CR 314 near Doghouse Rail Bridge and curve west of Hidden Valley Interchange.	Temporary impediment to and temporary use of recreational trail activities due to closure of Scott Lancaster Memorial Trail, a Section 4(f) recreation property.	All attempts will be made to maintain bike traffic on the path, but when significant grade changes or other activities that present safety risks occur, a bike shuttle would be used to ensure continued access to recreational trail activities.	Contractor	Project Construction (Package 1 and Package 3)	Twin Tunnels Environmental Assessment Page 3.5-7
72	Recreation Resources	Rock blasting; I-70 Clear Creek bridge demolition, girder, and deck work; Doghouse Rail Bridge rehabilitation.	Twin Tunnels vicinity and west of Hidden Valley Interchange.	Temporary impediment to recreational river activities including boating and fishing due to periodic closures of Clear Creek.	Unless necessitated by safety concerns, river closures due to rock blasting, bridge demolition, or bridge rehabilitation will not occur during rafting season (June through August).	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.5-8
73	Recreation Resources	Rock blasting; I-70 Clear Creek bridge demolition, girder, and deck work; Doghouse Rail Bridge rehabilitation.	Twin Tunnels vicinity and west of Hidden Valley Interchange.	Temporary impediment to recreational river activities including boating and fishing due to periodic closures of Clear Creek.	CDOT will coordinate with rafting companies prior to construction to develop communication protocols in the event of unanticipated river closures during rafting season. If river closures are necessary during rafting season, CDOT will communicate with rafting companies in accordance with agreed upon protocols.	Contractor	Project Construction (Package 1)	Twin Tunnels Environmental Assessment Page 3.5-8
74	Recreation Resources	Rock blasting; I-70 Clear Creek bridge demolition, girder, and deck work; Doghouse Rail Bridge rehabilitation.	Twin Tunnels vicinity and west of Hidden Valley Interchange.	Potential safety risks to anglers and pedestrians adjacent to the construction zone.	Construction areas near the banks of the creek will be fenced off to prevent access by anglers or other pedestrians.	Contractor	Project Construction (Package 1 and Package 2)	Twin Tunnels Environmental Assessment Page 3.5-8
75	Recreation Resources	Rock blasting; I-70 Clear Creek bridge demolition, girder, and deck work; Doghouse Rail Bridge rehabilitation.	Twin Tunnels vicinity and west of Hidden Valley Interchange.	Potential safety risks to anglers and pedestrians adjacent to the construction zone.	Temporary signage will be placed along Clear Creek to warn recreationalists of rock blasting activities and provide sources of information on the project and potential river closures.	Contractor	Project Construction (Package 1 and Package 2)	Twin Tunnels Environmental Assessment Page 3.5-8
76	Recreation Resources	Rock blasting; I-70 Clear Creek bridge demolition, girder, and deck work; Doghouse Rail Bridge rehabilitation.	Twin Tunnels vicinity and west of Hidden Valley Interchange.	Potential safety risks to anglers and pedestrians adjacent to the construction zone.	A safety-critical zone will be established in the vicinity of rock blasting. Cyclists, pedestrians, and anglers will be evacuated from this zone before, during, and after rock blasting (approximately 30-minute durations).	Contractor	Project Construction (Package 1 and Package 2)	Twin Tunnels Environmental Assessment Page 3.5-8
77	Recreation Resources	Foundation work for I-70 bridge over Clear Creek.	I-70 bridge west of Hidden Valley Interchange.	Potential safety risks to boaters in Clear Creek adjacent to and traveling through the construction zone.	Spotters will be stationed upstream of the bridge to alert boaters of the construction and alert construction crews of approaching boats.	Contractor	Project Construction (Package 1 and Package 2)	Twin Tunnels Environmental Assessment Page 3.5-8
78	Recreation Resources	Foundation work for I-70 bridge over Clear Creek.	I-70 bridge west of Hidden Valley Interchange.	Potential safety risks to boaters in Clear Creek adjacent to and traveling through the construction zone.	Construction activities that present a safety risk to boaters will be stopped temporarily until the boaters have passed through the construction area. CDOT will coordinate with rafting companies regarding protocols for on-river communication between spotters and boaters during construction.	Contractor	Project Construction (Package 1 and Package 2)	Twin Tunnels Environmental Assessment Page 3.5-8
79	Recreation Resources	Foundation work for I-70 bridge over Clear Creek.	I-70 bridge west of Hidden Valley Interchange.	Potential safety risks to anglers and pedestrians adjacent to the construction zone.	Construction areas near the banks of the creek will be fenced off to prevent access by anglers or other pedestrians.	Contractor	Project Construction (Package 1 and Package 2)	Twin Tunnels Environmental Assessment Page 3.5-8
80	Recreation Resources	Construction staging.	Kermitts Trailhead (planned) near US 6/I-70 Interchange.	Potential disruption and temporary use of Kermitts Trailhead use, a Section 4(f) recreation property.	Maintain trail access and some parking capacity.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.5-8

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81	Recreation Resources	Construction staging.	Kermitts Trailhead (planned) near US 6/I-70 Interchange.	Potential damage to and temporary use of Kermitts Trailhead, a Section 4(f) property.	Restore area after construction so as not to preclude long-term use of the area for trail access.	Contractor	Project Construction (Package 3	Twin Tunnels Environmental Assessment Page 3.5-8
82	Recreation Resources	Construction staging.	Kermitts Boating Access on Clear Creek near US 6/I-70 Interchange.	Potential disruption to Kermitts Boating Access use.	Maintain boating access and some parking capacity.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.5-8
83	Recreation Resources	Construction staging.	Kermitts Boating Access on Clear Creek near US 6/I-70 Interchange.	Potential damage to Kermitts Boating Access.	Restore area after construction so as not to preclude long-term use of the area for boating access.	Contractor	Project Construction (Package 3)	Twin Tunnels Environmental Assessment Page 3.5-8
84	Regulated Materials	Exposure of mine waste during construction activities.	Within Twin Tunnels project area.	Potential to encounter mine wastes located within areas of excavation.	Complete a project-specific Materials Management Plan (MMP) that details site-specific standard operating procedures regarding the identification, sampling, handling, and disposal of mine-related wastes that could be encountered during construction of this project.	Contractor	Project Construction (Package 1)	Twin Tunnels Environmental Assessment Page 3.18-5
85	Regulated Materials	Exposure of mine waste during construction activities.	Within Twin Tunnels project area.	Potential to encounter mine wastes located within areas of excavation.	Complete a Health and Safety Plan (HSP) to address potential mine wastes that could be uncovered during construction.	Contractor	Project Construction (Package 1)	Twin Tunnels Environmental Assessment Page 3.18-5
86	Regulated Materials	Exposure of mine waste during construction activities.	Within Twin Tunnels project area.	Potential to encounter mine wastes located within areas of excavation.	Implement BMPs to prevent potential mine wastes from being exposed in the air (dust suppression) or impacting surface waters, in particular Clear Creek (Stormwater Management Plan [SWMP]).	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.18-5
87	Regulated Materials	Exposure of mine waste during construction activities.	Within Twin Tunnels project area.	Potential worker exposure to mine wastes located within areas of excavation.	Workers on this project must follow CDOT Specification 250 – Environmental, Health, and Safety Management during excavation activities at this site.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.18-5
88	Regulated Materials	Exposure of mineralized rock during construction activities.	Eastbound tunnel and construction access road haul route (for disposal of tunnel wastes from blasting).	Release of contaminants and migration to Clear Creek.	Encapsulate mineralized rock generated during blasting activities beneath the roadway pavement, away from groundwater, to prevent chemical reactions that could dissolve contaminants into the water. Such interactions could cause the release of contaminants and migration into Clear Creek. If encapsulation is not feasible, mineralized rock will be removed from the project area to an appropriate disposal site.	Contractor	Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.18-5
89	Regulated Materials	Blasting of Twin Tunnels.	Twin Tunnels eastbound bore.	Excessive vibration resulting from blasting activities could damage underground storage tanks associated with the Idaho Springs Wastewater Treatment Plant.	The contractor's blasting plan will be developed based on a predetermined vibration threshold that ensures no damage will be done to those facilities. Monitoring will be conducted to ensure those thresholds are not exceeded. If the thresholds are approached or exceeded, the contractor's blasting plan may need to be revised.	Contractor	Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.18-5
90	Regulated Materials	Demolition or rehabilitation of bridge structures.	I-70 bridge west of Hidden Valley Interchange and Doghouse Rail Bridge.	Potential worker exposure to lead-based paint.	Notify contractor that lead-based paint is located on the Hidden Valley Bridge over Clear Creek and the Doghouse Rail Bridge.	CDOT	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.18-6
91	Regulated Materials	Demolition or rehabilitation of bridge structures.	I-70 bridge west of Hidden Valley Interchange and Doghouse Rail Bridge.	Potential for release of lead into the environment.	If possible, components that will require demolition will be removed in such a manner as to ensure lead is not released and properly recycled.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.18-6
92	Regulated Materials	Demolition or rehabilitation of bridge structures.	I-70 bridge west of Hidden Valley Interchange and Doghouse Rail Bridge.	Potential worker exposure to lead-based paint.	The contractor will avoid sanding, cutting, burning, or otherwise causing the release of lead from paint on these structures. If this is not possible, the lead must be abated properly.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.18-6
93	Regulated Materials	Demolition or rehabilitation of bridge structures.	I-70 bridge west of Hidden Valley Interchange and Doghouse Rail Bridge.	Potential worker exposure to lead-based paint.	U.S. Department of Labor Occupational Safety and Health Administration (OSHA) Regulation 1926.62 will be consulted for worker protection prior to work on these structures. Worker health and safety precautions in compliance with OSHA must be followed to limit worker exposure to lead. Work will be completed on these structures in accordance with CDOT Specification 250.04, as well as the MMP and HSP.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.18-6
94	Regulated Materials	Demolition or rehabilitation of bridge structures.	I-70 bridge west of Hidden Valley Interchange and Doghouse Rail Bridge.	Potential worker exposure to lead-based paint.	Workers on this project must follow CDOT Specification 250 – Environmental, Health, and Safety Management during excavation activities at this site.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.18-6
95	Regulated Materials	Demolition or rehabilitation of bridge structures.	I-70 bridge west of Hidden Valley Interchange and Doghouse Rail Bridge.	Potential worker exposure to asbestos and release of asbestos into the environment.	Any disturbance to regulated asbestos-containing materials will require proper abatement in accordance with CDPHE and EPA regulations prior to disturbance of that material. Non-regulated asbestos-containing materials are treated like any other solid waste as long as the disturbance does not render it friable.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.18-6

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96	Regulated Materials	Demolition or rehabilitation of bridge structures.	I-70 bridge west of Hidden Valley Interchange and Doghouse Rail Bridge.	Potential worker exposure to asbestos and release of asbestos into the environment.	Comply with CDOT Specification 250.07 – Asbestos-Containing Material Management.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.18-6
97	Section 4(f)[3]	Design and construction of retaining walls.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Retaining walls would constitute a visual impact to recreational users on the Scott Lancaster Memorial Trail, a Section 4(f) recreation resource.	Proposed Action design includes shoulder widths that are less than the AASHTO standards to minimize the height of retaining walls along Clear Creek and reduce visual impacts from Scott Lancaster trail.	CDOT	Project Design	Twin Tunnels Environmental Assessment Section 4.8 Page 4-22
98	Social and Economic Resources	Operation of eastbound I-70 detour during construction.	On CR 314 between the Doghouse Rail Bridge and Hidden Valley Interchange.	Loss of local access for adjacent properties and local travelers on CR 314.	Provide a detailed construction and detour plan to residents and business owners in the surrounding area as far in advance as possible.	Contractor	Project Construction (Package 1)	Twin Tunnels Environmental Assessment Page 3.2-7
99	Social and Economic Resources	Operation of eastbound I-70 detour during construction.	On CR 314 between the Doghouse Rail Bridge and Hidden Valley Interchange.	Loss of local access for adjacent properties and local travelers on CR 314.	Provide safe, effective, well-placed, and highly visible directional signage for access to properties along CR 314 during the detour.	Contractor	Project Construction (Package 1)	Twin Tunnels Environmental Assessment Page 3.2-7
100	Social and Economic Resources	Closure of eastbound lanes on I-70.	I-70 from entrance to eastbound tunnel to Hidden Valley Interchange.	Increase in emergency response travel times between Clear Creek County and hospitals in Jefferson County.	Provide a shoulder of adequate width for emergency vehicle access on the detour route during construction.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.2-7
101	Social and Economic Resources	Closure of eastbound lanes on I-70.	I-70 from entrance to eastbound tunnel to Hidden Valley Interchange.	Increase in emergency response travel times between Clear Creek County and hospitals in Jefferson County.	Provide traffic control contact information to emergency responders. In an emergency, responders will contact the CDOT traffic control office, provide their approximate arrival time at the construction zone, and traffic control will provide a clear path through the construction zone.	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.2-7
102	Social and Economic Resources	Closure of eastbound lanes on I-70.	I-70 from entrance to eastbound tunnel to Hidden Valley Interchange.	Increase in emergency response travel times between Clear Creek County and hospitals in Jefferson County.	Notify emergency service providers (Colorado State Patrol, sheriff, local police, fire dispatchers, ambulance providers, etc.) of the timing of impending closures for blasting or other reasons.	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.2-7
103	Social and Economic Resources	Closure of eastbound lanes on I-70.	I-70 from entrance to eastbound tunnel to Hidden Valley Interchange.	Economic losses due to reduced through-traveler patronage at local businesses.	Develop a public information plan and work with local public information officers to disseminate construction information to the traveling public to encourage business patronage during construction.	Contractor	Project Construction (Package 1)	Twin Tunnels Environmental Assessment Page 3.2-7
104	Social and Economic Resources	Closure of eastbound lanes on I-70.	I-70 from entrance to eastbound tunnel to Hidden Valley Interchange.	Economic losses due to reduced through-traveler patronage at local businesses.	Implement public information strategies such as media advisories, variable message signs, advance signs, a telephone hotline, real-time web cameras, the use of intelligent transportation systems and technology in construction work zones, a construction project website, and alternate route advisories to alert travelers to construction activities and encourage business patronage during construction.	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.2-7
105	Social and Economic Resources	Closure of eastbound lanes on I-70.	I-70 from entrance to eastbound tunnel to Hidden Valley Interchange.	Economic losses due to reduced through-traveler patronage at local businesses.	Provide well-placed and highly visible signage to direct patrons to businesses.	Contractor	Project Construction (Package 1)	Twin Tunnels Environmental Assessment Page 3.2-7
106	Social and Economic Resources	Closure of eastbound lanes on I-70.	I-70 from entrance to eastbound tunnel to Hidden Valley Interchange.	Increased commuting travel times between Idaho Springs and the Denver metropolitan area.	Work with Idaho Springs and Clear Creek County to identify community representatives who will partner in the construction traffic control program and provide assistance/ feedback to the traffic control team to minimize inconvenience.	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.2-7
107	Social and Economic Resources	Closure of eastbound lanes on I-70.	I-70 from entrance to eastbound tunnel to Hidden Valley Interchange.	Increased commuting travel times between Idaho Springs and the Denver metropolitan area.	Hold public meetings at critical construction phases to provide information and discuss mitigation strategies. Provide a construction information exchange center near the construction area for public input and up-to-date construction information.	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.2-7
108	Social and Economic Resources	Closure of eastbound lanes on I-70.	West of Twin Tunnels and east of Hidden Valley Interchange.	Increase in travel times due to lane closure.	Work requiring closure of one lane will be conducted at night as much as possible. Avoid all daytime construction lane closures during peak directional periods.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.2-7
109	Social and Economic Resources	Construction of highway and retaining walls on I-70.	West of Twin Tunnels and east of Hidden Valley Interchange.	Increase in emergency response travel times between Clear Creek County and hospitals in Jefferson County.	Provide contact information for the traffic control personnel to the emergency responders. In an emergency, responders will contact the traffic control office, provide their approximate arrival time at the construction zone, and traffic control will provide a clear path through the construction zone when feasible.	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.2-8

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[3] Additional mitigation measures for impacts to Section 4(f) recreation and historic resources are listed in the Historic Resources and Recreation Resources sections of this table.

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Mitigation Commitment #	Mitigation Category	Activity Triggering Mitigation	Location of Activity Triggering Mitigation	Impact from NEPA Document	Commitment From Mitigation Table In Source Document	Responsible Agency[1]	Life Cycle Phase[2] Mitigation to be Implemented	Source Document of Mitigation Commitment and Page Number
110	Social and Economic Resources	Construction of highway and retaining walls on I-70.	West of Twin Tunnels and east of Hidden Valley Interchange.	Increase in emergency response travel times between Clear Creek County and hospitals in Jefferson County.	Notify emergency service providers (Colorado State Patrol, sheriff, local police, fire dispatchers, ambulance providers, etc.) of the timing of impending closures.	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.2-8
111	Social and Economic Resources	Roadway closures for blasting and closure of eastbound lanes on I-70 during construction and detour operation.	Within Twin Tunnels project area.	Delays to school bus travel times.	Consider Clear Creek County School District busing schedules when developing the traffic control plan, distribute the public information plan to Clear Creek County School District prior to construction, and include the School District in public information updates during construction. .	CDOT/ Contractor	Project Construction (Pre-Construction, Package 1, Package 2, and Package 3)	Twin Tunnels Finding of No Significant Impact Page 4-3
112	Terrestrial Wildlife	Widening of I-70 eastbound lane and adding a through lane.	East portal of Twin Tunnels–riparian area that extends upgradient from Clear Creek.	Loss of riparian habitat (trees and shrubs).	Riparian trees and shrubs removed during construction will be replaced as stipulated in CDOT's *Guidelines for Senate Bill 40 Wildlife Certification*, which state that trees removed during construction, whether native or non-native, shall be replaced with a goal of 1:1 replacement based on a stem count of all trees with diameter at breast height of 2 inches or greater. Shrubs removed during construction, whether native or non-native, will be replaced based on their pre-construction areal coverage. In all cases, all such trees and shrubs will be replaced with native species.	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.10-7
113	Terrestrial Wildlife	Reconstruction of the bridge on I-70 over Clear Creek west of Hidden Valley Interchange. This area was identified in the Clear Creek Junction Linkage Interference Zone.	I-70 bridge west of Hidden Valley Interchange.	Potential to decrease wildlife connectivity if existing bench under the bridge is not extended. In addition, the upstream side of the creek is steep and large rip rap on the south side of the existing bridge inhibits wildlife movement.	When this bridge is replaced, the existing bench under the bridge will be extended to improve wildlife movement under the bridge. The approach on the upstream side of Clear Creek will be softened and large riprap will be replaced with smaller substrate to allow animals to move more freely.	Contractor	Project Construction (Package 1 and Package 2)	Twin Tunnels Environmental Assessment Page 3.10-7
114	Terrestrial Wildlife	Operation and maintenance of I-70.	Within Twin Tunnels project area.	Existing fence north of I-70 and west of the Twin Tunnels entraps wildlife	The existing barbed and woven wire fencing located north of I-70 between the west portal and Clear Creek will be replaced. The new fence will be a more wildlife friendly per CPW's recommendations and its publication, *Fencing with Wildlife in Mind* (Hanophy, 2009), and will consist of smooth wire and barbed wire. The new fence would continue to contain livestock.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.20-13
115	Terrestrial Wildlife	Widening eastbound I-70 west of the Twin Tunnels and adding a through lane.	I-70 from the entrance to tunnel west to Clear Creek.	Deicer salts, used for winter maintenance operations, attract sheep to the shoulder north of the highway, in an area that is obscured by upland trees, resulting in animal/vehicle collisions. On average, one sheep per year is hit by a vehicle at this location.	Upland (non-riparian) trees, primarily junipers and pines, will be removed north of I-70 outside the west portal of the westbound tunnel. This will improve westbound motorists' ability to visually detect sheep as motorists exit the tunnel and reduce the potential for animal-vehicle collisions.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.20-13
116	Terrestrial Wildlife	Widening eastbound I-70 west of the Twin Tunnels and adding a through lane.	Concrete box culvert (CBC) near milepost 242.	Widening I-70 creates a wider I-70 barrier for sheep movement and access to Clear Creek. The CBC presents an opportunity for wildlife crossing but its design is not conducive to wildlife movement or use.	To encourage use of the CBC by wildlife, a natural substrate will be placed along the bottom of the CBC, and baffles will be installed to retain the substrate and prevent scour. Material will also be used to fill in and level the drop-off at the CBC discharge point.	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.20-13
117	Terrestrial Wildlife	Widening eastbound I-70 west of the Twin Tunnels and adding a through lane.	Concrete box culvert (CBC) near milepost 242.	Widening I-70 creates a wider I-70 barrier for sheep movement and access to Clear Creek. The CBC presents an opportunity for wildlife crossing but its design is not conducive to wildlife movement or use.	CDOT will replace the existing fencing near the entrance to the CBC, and instead of fencing across the drainage (like the existing condition), the fence will be tied into the CBC to encourage wildlife usage. On the exit of the CBC, the drainage will be left open.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.20-13
118	Terrestrial Wildlife	General construction activities associated with the Twin Tunnels project.	Within Twin Tunnels project area.	Garbage generated by construction crew could attract wildlife, particularly bears.	Construction crews will remove food and food-related garbage from construction site daily.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels FONSI Page 4-3
119	Terrestrial Wildlife	Use of temporary erosion control blankets for erosion control.	Twin Tunnels project area, where BMPs will control erosion adjacent to Clear Creek.	Potential snake mortality from entanglement in plastic mesh deployed for erosion control.	Erosion control blankets will have flexible natural fibers to allow for safe passage of snakes through the erosion control blanket.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.10-7
120	Terrestrial Wildlife	Widening of I-70 eastbound lane and adding a through lane.	Twin Tunnels project area–riparian and wetland habitat adjacent to Clear Creek.	Loss of vegetation and impacts to sensitive habitats beyond the needed construction footprint.	Wetland/riparian areas not required to be impacted by the project will be protected from construction activities by temporary and/or construction limit fencing.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.10-8

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Table 3-1. Summary of Impacts and Committed Mitigation Measures

Mitigation Commitment #	Mitigation Category	Activity Triggering Mitigation	Location of Activity Triggering Mitigation	Impact from NEPA Document	Commitment From Mitigation Table In Source Document	Responsible Agency[1]	Life Cycle Phase[2] Mitigation to be Implemented	Source Document of Mitigation Commitment and Page Number
121	Terrestrial Wildlife	Closure of eastbound lanes on I-70 and use of CR 314 detour.	Approximately 1,200 feet of old US 40 alignment (game check area)	Potential for increased animal/vehicle collisions in the vicinity of the Twin Tunnels land bridge while the eastbound I-70 detour is in place. In addition, deicing liquids and salt placed on old US 40 (game check area) during the eastbound I-70 detour may attract big horn sheep down to the roadway in the vicinity of the Twin Tunnels land bridge.	A 10-foot-high temporary wildlife fence will be constructed along the north side of old US 40 (game check area). The fencing is intended to keep wildlife off the north side of old US 40 (game check area) and prevent big horn sheep from coming down to access the roadway while the eastbound I-70 detour is in place. The fence will be removed when the eastbound I-70 detour is no longer in place.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.10-8
122	Terrestrial Wildlife	Closure of eastbound lanes on I-70 and use of CR 314 detour.	Approximately 1,200 feet of old US 40 alignment (game check area)	Potential for increased animal/vehicle collisions in the vicinity of the Twin Tunnels land bridge while the eastbound I-70 detour is in place. In addition, deicing liquids and salt placed on old US 40 (game check area) during the eastbound I-70 detour may attract big horn sheep down to the roadway in the vicinity of the Twin Tunnels land bridge.	If an increase in animal/vehicle collisions is observed during operation of the eastbound I-70 detour, temporary fencing will be considered on the south side of the roadway.	CDOT/ Contractor	Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.10-8
123	Terrestrial Wildlife	Closure of eastbound lanes on I-70 and use of CR 314 detour.	Approximately 1,200 feet of old US 40 alignment (game check area)	Potential for increased animal/vehicle collisions in the vicinity of the Twin Tunnels land bridge while the eastbound I-70 detour is in place. In addition, deicing liquids and salt placed on old US 40 (game check area) during the eastbound I-70 detour may attract big horn sheep down to the roadway in the vicinity of the Twin Tunnels land bridge.	Temporary lighting will be used on the eastbound I-70 detour to improve safety and detection of wildlife on the roadway.	Contractor	Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.10-8
124	Terrestrial Wildlife	Closure of eastbound lanes on I-70 and use of CR 314 detour.	Approximately 1,200 feet of old US 40 alignment (game check area)	Deicing liquids and salt placed on old US 40 (game check area) during the eastbound I-70 detour may attract big horn sheep to the roadway in the vicinity of the Twin Tunnels land bridge. Potential for increase in animal-vehicle collisions.	CPW will place salt blocks on the north side of I-70 before blasting begins to encourage sheep to use an area away from the tunnel and roadway during operation of the eastbound I-70 detour.	CPW	Project Construction (Package 1)	Twin Tunnels Environmental Assessment Page 3.10-8
125	Terrestrial Wildlife	Construction-related disturbance between April 1 and August 31.	Twin Tunnels project area in the vicinity of active nests.	Potential loss of eggs or young of nesting migratory birds.	If construction is to commence between April 1 and August 31, follow CDOT specification 240-Protection of Migratory Birds. To avoid impacts to nesting birds in accordance with the MBTA, a qualified biologist will conduct a nest survey prior to construction. If active nests are found during construction, coordination with CPW and USFWS is required to determine an appropriate course of action, which may include, but is not limited to, a delay in construction to avoid the breeding season	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.10-7
126	Terrestrial Wildlife	Construction of Portal to Portal Construction Access Road.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Loss of vegetation, including sensitive habitat and riparian area.	Riparian trees and shrubs removed will be replaced as stipulated in CDOT's *Guidelines for Senate Bill 40 Wildlife Certification*, which states that trees removed during construction, whether native or non-native, shall be replaced with a goal of 1:1 replacement based on a stem count of all trees with diameter at breast height of 2 inches or greater. Shrubs removed during construction, whether native or non-native, will be replaced based on their pre-construction areal coverage. In all cases, all such trees and shrubs will be replaced with native species. Because the impacted area contains older trees (60 years old or older), CDOT has committed to additional riparian habitat restoration, as described in the Intergovernmental Agreement between CDOT and Clear Creek County.	CDOT/ Contractor	Project Construction (Package 1 and Package 3)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-2
127	Terrestrial Wildlife	Construction of Portal to Portal Construction Access Road.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Loss of vegetation, including sensitive habitat and riparian area.	Loss of riparian vegetation will be offset by the creation of 34,400 square feet of riparian habitat connected to the natural function of Clear Creek. The existing riparian area is elevated above the creek with drainage from the Twin Tunnels being a major water source for the area. The new riparian habitat will be created by regrading and lowering the existing manmade bench that is currently elevated as much as 6 to 8 feet above the creek. This will effectively return the area to natural riparian conditions and improve habitat.	CDOT/ Contractor	Project Construction (Package 3)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-2

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128	Terrestrial Wildlife	Construction of Portal to Portal Construction Access Road.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Loss of vegetation, including sensitive habitat and riparian area.	The regrading effort for riparian habitat mitigation will include the reconstruction of the natural terraces that are associated with western rivers and streams. Each terrace supports a different native ecosystem based on its relative relationship to the water table. The revegetation effort will be focused on re-establishing the different and unique ecosystems. All large trees, measured at 2 inches or more (in caliper) measured 4 feet above ground level, will be replaced at a minimum of one for one. Long pole plantings will be used. The final vegetation mitigation ratio will be determined through discussions with CPW and Clear Creek County.	CDOT/ Contractor	Project Construction (Package 3)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-3
129	Terrestrial Wildlife	Construction of Portal to Portal Construction Access Road.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Loss of vegetation, including sensitive habitat and riparian area.	New trees and shrubs for riparian habitat mitigation must be watered by truck. A 2- to 5-year establishment warranty or incentive specification must be required of the contractor.	Contractor	Project Construction (Package 3) and Operations, Maintenance, and Monitoring	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-3
130	Terrestrial Wildlife	Vegetation disturbance and ground clearing.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Potential for establishment and spread of noxious weeds.	An Integrated Noxious Weed Management Plan will be developed during final design and implemented during construction to prevent the spread of noxious weeds into temporary disturbance areas.	Contractor	Project Design and Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.13-5 and Twin Tunnels Portal to Portal Access Road Companion Report Page 7-3
131	Terrestrial Wildlife	Vegetation disturbance and ground clearing.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Potential for establishment and spread of noxious weeds.	Reseed and protect temporary disturbance areas with CDOT-approved BMPs and avoid disturbance to existing vegetation to the maximum extent possible.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.13-5 and Twin Tunnels Portal to Portal Access Road Companion Report Page 7-3
132	Terrestrial Wildlife	Vegetation disturbance and ground clearing.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Potential for establishment and spread of noxious weeds during construction.	Seed, mulch, and mulch tackifier will be applied in phases throughout construction. See mix will be certified weed-free.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.13-5 and Twin Tunnels Portal to Portal Access Road Companion Report Page 7-3
133	Terrestrial Wildlife	Vegetation disturbance and ground clearing.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Potential for establishment and spread of noxious weeds.	Where permanent seeding operations are not feasible due to seasonal constraints (e.g., summer and winter months), disturbed areas will have certified weed-free mulch and mulch tackifier applied to prevent erosion and noxious weeds from establishing.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.13-5 and Twin Tunnels Portal to Portal Access Road Companion Report Page 7-3
134	Terrestrial Wildlife	Vegetation disturbance and ground clearing.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Potential for establishment and spread of noxious weeds.	Minimize disturbance and limit time that disturbed areas are allowed to remain non-vegetated.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-3
135	Threatened and Endangered Species	Construction activities that cause water depletions, including water used for compaction, cement mixing, detention ponds, dust control, and dewatering for access and construction in and near Clear Creek.	Within Twin Tunnels project area.	Platte River species could be impacted by construction activities causing water depletions in tributaries such as Clear Creek.	Mitigation for impacts caused by water depletions on federally listed species will be addressed by FHWA and CDOT through the South Platte Water Related Activities Program. This will include yearly reporting to the USFWS of water usage per the Programmatic Biological Assessment and the subsequent Biological Opinion signed by USFWS on April 4 2011.	CDOT/ FHWA	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.12-4
136	Transportation and Safety	Drivers traveling on I-70 at night.	Locations along I-70 in the Twin Tunnels project area, as determined by safety analyses.	Crashes at night.	Existing lighting will be reviewed to make sure current light fixtures are operating as designed.	CDOT	Project Design	Twin Tunnels Environmental Assessment Page 3.1-9
137	Transportation and Safety	Drivers traveling on I-70 at night.	Locations along I-70 in the Twin Tunnels project area, as determined by safety analyses.	Crashes at night.	Safety will be monitored closely after construction to see if nighttime crash patterns persist that could be addressed with localized lighting treatments.	CDOT	Operations, Maintenance, and Monitoring	Twin Tunnels Environmental Assessment Page 3.1-9
138	Transportation and Safety	Drivers traveling on I-70 at night.	Locations along I-70 in the Twin Tunnels project area, as determined by safety analyses.	Crashes at night.	Lighting will follow I-70 Mountain Corridor Aesthetics Guidance and the objectives of the Dark Sky Initiative.	CDOT	Project Design	Twin Tunnels Environmental Assessment Page 3.1-9
139	Transportation and Safety	Operation of the managed lane at night.	Entrance to managed lane.	Potential for crashes at entrance to managed lane.	Lighting and safety conditions at the managed lane entrance will be further evaluated during final design. If lighting near the managed lane entrance is determined to be necessary to improve safety conditions, lighting will follow I-70 Mountain Corridor Aesthetics Guidance and the objectives of the Dark Sky Initiative.	CDOT	Project Design and Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.1-9

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140	Transportation and Safety	Construction on or adjacent to I-70.	Construction and operation of the detour from I-70 to CR 314.	Increased potential for crashes.	There will be extensive warning of the detour for eastbound traffic so that drivers can slow to the posted speed limit of 35 mph.	Contractor	Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.1-10
141	Transportation and Safety	Construction on or adjacent to I-70.	Construction and operation of the detour from I-70 to CR 314.	Increased potential for crashes.	Colorado State Patrol and local police will be encouraged to monitor speeds during off-peak periods when enforcement activities will not create traffic congestion.	CDOT	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.1-10
142	Transportation and Safety	Construction on or adjacent to I-70.	Between East Idaho Springs Interchange and base of Floyd Hill.	Traffic shifts from I-70 to less-capable facilities such as SH 9 and US 285.	As feasible on weekends and holidays, minimize I-70 construction activities that could shift travel to alternative routes (SH 9 and US 285, in particular).	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.1-10
143	Transportation and Safety	Construction on or adjacent to I-70.	Between East Idaho Springs Interchange and base of Floyd Hill.	Traffic shifts from I-70 to less-capable facilities such as SH 9 and US 285.	Monitor signal operations and timing on these alternative routes during peak periods and modify signal timing, if necessary.	CDOT	Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.1-10
144	Transportation and Safety	Construction on or adjacent to I-70.	Between East Idaho Springs Interchange and base of Floyd Hill.	Disruption of emergency response.	Provide emergency responders traffic control contact information. In an emergency, responders will contact the CDOT traffic control office, provide their approximate arrival time at the construction zone, and traffic control will provide a clear path through the construction zone.	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.1-10
145	Transportation and Safety	Construction on or adjacent to I-70.	Between East Idaho Springs Interchange and base of Floyd Hill.	Disruption of emergency response.	Notify emergency service providers (Colorado State Patrol, sheriff, local police, fire dispatchers, ambulance providers, etc.) of the timing of impending closures for blasting or other reasons.	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.1-10
146	Transportation and Safety	Construction on or adjacent to I-70.	Between East Idaho Springs Interchange and base of Floyd Hill.	Potential difficulty accessing local businesses during construction.	Provide frequent and timely updates about construction activities and remind the public that the corridor is open except for necessary interruptions.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.1-10
147	Transportation and Safety	Construction on or adjacent to I-70.	Between East Idaho Springs Interchange and base of Floyd Hill.	Potential difficulty accessing local businesses during construction.	Signs notifying drivers of access to local business will be placed in both directions in advance of the East Idaho Springs Interchange (Exit 241).	Contractor	Project Construction (Package 1)	Twin Tunnels Environmental Assessment Page 3.1-10
148	Transportation and Safety	Closure of eastbound lanes on I-70.	West of Twin Tunnels and east of Hidden Valley Interchange.	Traffic backups due to lane restriction during construction in the peak direction during peak periods.	Contractor will prepare a CDOT-approved project-specific lane closure strategy that minimizes lane closures during peak weekend travel. Any variances will be developed in close coordination with the contractor and approved by CDOT.	CDOT/ Contractor	Project Construction (Package 1)	Twin Tunnels Environmental Assessment Page 3.1-10
149	Transportation and Safety	I-70 closures during peak periods.	West of Twin Tunnels and east of Hidden Valley Interchange.	Traffic backups due to lane restriction during construction in the peak direction during peak periods may divert through trips onto local roads and cause congestion.	Create a traffic control plan to keep through-traffic from exiting I-70 and congesting local roads.	CDOT	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.1-10
150	Transportation and Safety	I-70 closures during peak periods.	On I-70 westbound; on eastbound I-70 and eastbound I-70 detour route.	Traffic backups.	Stoppages will be minimized to the greatest extent possible during peak periods (westbound Friday afternoon and Saturday morning, and eastbound Sunday afternoon). Advance signage along I-70 will provide warning of impending closures.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.1-10
151	Vegetation and Noxious Weeds	Construction and operation of Portal to Portal Construction Access Road.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Loss of mature riparian trees and shrubs near the western side of the eastbound tunnel.	Loss of mature riparian vegetation will be offset by the creation of 34,400 square feet of riparian area connected to the natural function of Clear Creek. The existing riparian area is elevated above the creek with drainage from the Twin Tunnels being a major water source for the area. The new riparian area will be created by lowering the existing manmade bench that is currently elevated as much as 6 to 8 feet above the creek. This will effectively return the area to natural riparian conditions. The regrading effort for riparian habitat mitigation will include the reconstruction of the natural terraces that are associated with western rivers and streams. Each terrace supports a different native ecosystem based on its relative relationship to the water table. The revegetation effort will be focused on re-establishing the different and unique ecosystems. The Intergovernmental Agreement between CDOT and Clear Creek County provides a concept for the restoration. The final plan will evolve through discussions with CPW and Clear Creek County.	CDOT/ Contractor/ Clear Creek County/ CPW	Project Construction (Package 3)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-5
152	Vegetation and Noxious Weeds	Construction and operation of Portal to Portal Construction Access Road.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Potential loss of riparian trees.	For minimal protection of trees older than 4 years outside of the direct impact area of the construction access road, the contractor will install barricades beyond the dripline; for each inch of diameter of the tree's trunk, the protection area will be extended an additional foot. For additional protection, a layer of wood chips (4 to 6 inches deep) will be placed around each tree prior to placement of the barricades.	Contractor	Project Construction (Package 1)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-5

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Table 3-1. Summary of Impacts and Committed Mitigation Measures

Mitigation Commitment #	Mitigation Category	Activity Triggering Mitigation	Location of Activity Triggering Mitigation	Impact from NEPA Document	Commitment From Mitigation Table In Source Document	Responsible Agency[1]	Life Cycle Phase[2] Mitigation to be Implemented	Source Document of Mitigation Commitment and Page Number
153	Vegetation and Noxious Weeds	Surface grading and MSE wall construction of the Portal to Portal Construction Access Road.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Potential loss of riparian trees and shrubs.	Riparian habitat (particularly older cottonwoods and river birch) will be protected from construction activities by properly installed construction limit fencing, to the greatest extent possible.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-5
154	Vegetation and Noxious Weeds	Vegetation disturbance and ground clearing.	Within Twin Tunnels project area.	Potential for establishment and spread of noxious weeds.	An Integrated Noxious Weed Management Plan will be developed during final design and implemented during construction to prevent the spread of noxious weeds into temporary disturbance areas.	Contractor	Final Design, Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.13-5 and Portal to Portal Access Road Companion Report Page 7-6
155	Vegetation and Noxious Weeds	Vegetation disturbance and ground clearing.	Within Twin Tunnels project area.	Potential for establishment and spread of noxious weeds.	Reseed and protect temporary disturbance areas with CDOT-approved BMPs and avoid disturbance to existing vegetation, to the maximum extent possible.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.13-5 and Portal to Portal Access Road Companion Report Page 7-5
156	Vegetation and Noxious Weeds	Vegetation disturbance and ground clearing.	Within Twin Tunnels project area.	Potential for establishment and spread of noxious weeds.	Seed, mulch, and mulch tackifier will be applied in phases throughout construction. Seed mix will be certified weed-free.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.13-5 and Portal to Portal Access Road Companion Report Page 7-5
157	Vegetation and Noxious Weeds	Vegetation disturbance and ground clearing.	Within Twin Tunnels project area.	Potential for establishment and spread of noxious weeds.	Where permanent seeding operations are not feasible due to seasonal constraints (e.g., summer and winter months), disturbed areas will have certified weed-free mulch and mulch tackifier applied to prevent erosion and noxious weeds from establishing.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.13-5 and Portal to Portal Access Road Companion Report Page 7-5
158	Vegetation and Noxious Weeds	Vegetation disturbance and ground clearing.	Within Twin Tunnels project area.	Potential for establishment and spread of noxious weeds.	Minimize the amount of disturbance and limit the amount of time that disturbed areas are allowed to remain non-vegetated.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.13-5 and Portal to Portal Access Road Companion Report Page 7-6
159	Vegetation and Noxious Weeds	Vegetation disturbance and ground clearing.	Within Twin Tunnels project area.	Loss of riparian trees and shrubs from previous construction and during construction of the Proposed Action.	Enhance native vegetation along Clear Creek for wildlife habitat, water quality stabilization, and visual quality. Trees removed during construction shall be replaced with a goal of 1:1 replacement based on a stem count of all trees with diameter at breast height of 2 inches or greater. Shrubs removed during construction, whether native or non-native, will be replaced based on their pre-construction areal coverage. In all cases, all such trees and shrubs will be replaced with native species.	CDOT/ Contractor	Project Construction (Package 3)	Twin Tunnels Environmental Assessment Page 3.13-5
160	Visual Resources	Construction of new or expanded transportation elements	Within the Twin Tunnels project area.	Introduction of new or expanded transportation features in the project area changes the visual quality for both motorists and recreationalists using the project area.	Incorporate I-70 Mountain Corridor Aesthetic Guidance into the project design and vegetation/revegetation plans. Review specific design elements, such as lighting, walls, signs, etc. with the Project Leadership Team and Technical Team to ensure consideration of core values and local preferences,	CDOT	Project Design	Twin Tunnels Environmental Assessment Page 3.7-10
161	Visual Resources	Construction and operation of Portal to Portal Construction Access Road.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Removal of vegetation that changes the visual setting of Clear Creek and the Scott Lancaster Memorial Trail.	CDOT Landscape Architect will evaluate riparian habitat mitigation sites for elevation, solar orientation, soil conditions, and Mountain Mineral Belt ecosystem type (subalpine, montane, foothills, or riparian).	CDOT	Project Design	Twin Tunnels Portal to Portal Access Road Companion Report, Page 7-1
162	Visual Resources	Construction and operation of Portal to Portal Construction Access Road.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Replacement of riparian vegetation that is not appropriate for Mountain Mineral Belt ecosystem.	CDOT Landscape Architect will review plant selections for drought tolerance, salt and alkali tolerance, seedling vigor, fire-retardant characteristics, growth habit, suitable soil groups, and seeding rates; natural patterns and distribution of plants are the predominate landscape principle; ensure that the selected plant palette complements the site-specific existing vegetation; vary plant height, size, and width in restored plant communities.	CDOT	Project Design	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-1
163	Visual Resources	Construction and operation of Portal to Portal Construction Access Road.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Changes to visual setting to motorists and recreationalists along Clear Creek and the Scott Lancaster Memorial Trail.	Minimize the linear effect of vegetation clearing when designing riparian revegetation plan.	CDOT	Project Design	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-2

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Table 3-1. Summary of Impacts and Committed Mitigation Measures

Mitigation Commitment #	Mitigation Category	Activity Triggering Mitigation	Location of Activity Triggering Mitigation	Impact from NEPA Document	Commitment From Mitigation Table In Source Document	Responsible Agency[1]	Life Cycle Phase[2] Mitigation to be Implemented	Source Document of Mitigation Commitment and Page Number
164	Visual Resources	Construction and operation of Portal to Portal Construction Access Road.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Changes to visual setting to motorists and recreationalists along Clear Creek and the Scott Lancaster Memorial Trail.	Mimic surrounding conditions of plant density and spacing, species composition, and plant community structure when designing riparian revegetation.	CDOT	Project Design	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-2
165	Visual Resources	Construction and operation of Portal to Portal Construction Access Road.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Changes to visual setting to motorists and recreationalists along Clear Creek and the Scott Lancaster Memorial Trail.	When installing new vegetation in riparian area, blend existing rock and natural materials from the site with the landscape; save and reuse native rock, stumps, and other natural materials in conditions such as boulder fields, talus slopes, or ground cover that emulates the existing landscape; reuse of existing materials will be part of site design.	Contractor	Project Design and Project Construction (Package 3)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-2
166	Visual Resources	Installation and maintenance of erosion control BMPs	Within Twin Tunnels project area.	Changes to visual setting to motorists and recreationalists along Clear Creek and the Scott Lancaster Memorial Trail.	Remove visually obtrusive erosion-control devices, such as silt fences, plastic ground cover, and straw bales, as soon as areas are stabilized.	Contractor	Project Construction (Package 3)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-2
167	Water Quality	Use of hazardous materials during construction	Within Twin Tunnels project area.	Potential for water quality degradation due to spills of hazardous materials used during construction.	Complete a project-specific Materials Management Plan (MMP) that details standard operating procedures regarding the management of hazardous materials that may be required to be used during construction.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	
168	Water Quality	Transportation of hazardous materials through the project area.	Within Twin Tunnels project area.	Potential for water quality degradation due spills of hazardous materials transported along I-70.	Hazardous spill containment structure locations have been identified and the feasibility of BMPs will be evaluated to assess their potential effectiveness in reducing hazardous waste discharge to Clear Creek.	CDOT	Project Design	Twin Tunnels Environmental Assessment Page 3.16-8
169	Water Quality	Development of the Clear Creek SCAP	Within Twin Tunnels project area.	Clear Creek SCAP is not finalized	Finalize Clear Creek SCAP, and incorporate the Twin Tunnels project-specific sediment control BMPs into the final SCAP.	CDOT	Operations, Maintenance, and Monitoring (SCAP development)	Twin Tunnels FONSI Page 4-3
170	Water Quality	Operation and maintenance of additional roadway lane.	Within Twin Tunnels project area.	Water quality degradation due to increased stormwater runoff and associated sediment transport on impervious surfaces.	Three different drainage inlet sediment trap concept designs have been developed to accommodate various drainage conditions anticipated for the Proposed Action. These traps will be installed as part of the drainage system in locations where surface water is discharged to Clear Creek. Locations for surface sediment basins have also been identified in the plan and will be constructed as part of the drainage system.	CDOT	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.16-8
171	Water Quality	Winter roadway maintenance.	Within Twin Tunnels project area.	Potential for elevated sediment and chloride levels in Clear Creek due to use of traction sand and liquid and solid deicer salts.	Structural BMPs, such as detention basins, will be constructed to capture winter roadway maintenance traction sand and other solid material. Non-structural BMPs will include ongoing training of maintenance staff in the application of winter roadway maintenance materials.	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3) and Operations, Maintenance, and Monitoring	Twin Tunnels Environmental Assessment Page 3.16-8
172	Water Quality	Construction and operation of the Proposed Action.	Within Twin Tunnels project area.	Incomplete data regarding water quality and water quality trends in Clear Creek.	The I-70 Clear Creek water quality monitoring program (conducted from 2001-2005) in the Twin Tunnels/Hidden Valley reach will be restarted and operated before, during, and after construction to monitor water quality conditions. The duration of post-construction monitoring will be determined by CDOT. The water quality monitoring program will sample both ambient and runoff event (snowmelt or rainstorm) flows.	CDOT	Project Construction (Pre-Construction, Package 1, Package 2, and Package 3) and Operations, Maintenance, and Monitoring	Twin Tunnels Environmental Assessment Page 3.16-8 and 3.16-9
173	Water Quality	Ground disturbance exposing soils	Within Twin Tunnels project area.	Potential for stormwater runoff from disturbed construction areas to increase erosion and sediment transport in Clear Creek.	Implement appropriate temporary BMPs according to the CDOT Erosion Control and Stormwater Quality Guide (CDOT, 2002) to reduce erosion and control sediment being transported outside of construction areas, and develop a stormwater management plan, which includes water quality monitoring by the construction contractor to ensure effectiveness of temporary construction BMPs.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.16-9
174	Water Quality	Ground disturbance exposing soils	Within Twin Tunnels project area.	Potential for stormwater runoff from disturbed construction areas to increase erosion and sediment transport in Clear Creek.	Achieve permanent stabilization of bare soils through revegetation and permanent erosion controls measures, and through maintenance of temporary erosion controls and plantings to stabilize non-rocky areas.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.16-9; Twin Tunnels Portal to Portal Access Road Companion Report Page 7-6
175	Water Quality	Construction and operation of Portal to Portal Construction Access Road.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Potential for stormwater runoff from Portal to Portal Construction Access Road to increase erosion and sediment transport in Clear Creek.	Implement appropriate temporary BMPs for erosion and sediment control according to the CDOT Erosion Control and Storm Water Quality Guide (CDOT, 2002) and develop a stormwater management plan, which includes water quality monitoring.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-6
176	Water Quality	Operation of Portal to Portal Construction Access Road.	Along the construction access road, adjacent to Clear Creek, west of the eastbound tunnel exit.	Potential failure of sediment control features on the Portal to Portal Construction Access Road to prevent additional sediment loading in Clear Creek.	An inspection and maintenance plan, including schedule, will be developed to ensure that the sediment control measures required for the Access Road are functioning as designed. The contractor will implement the inspection and maintenance plan and revise BMPs as needed.	CDOT/ Contractor	Project Construction (Pre-Construction, Package 1, Package 2, and Package 3)	Twin Tunnels FONSI Page 4-5

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177	Water Quality	Tunnel excavation.	Eastbound tunnel.	Potential impacts to water resources due to the potential exposure of mineralized rock and introduction of mineralized materials into water, which can increase loading of metals, dissolved solids, and suspended solids. Such interactions could cause the release of contaminants and migration into Clear Creek.	Encapsulate mineralized rock generated during blasting activities beneath the roadway pavement, away from groundwater, to prevent chemical reactions that could mobilize contaminants into water. If encapsulation is not feasible, mineralized rock will be removed from the project area to an appropriate disposal site.	Contractor	Project Construction (Package 2)	Twin Tunnels Environmental Assessment Page 3.16-9
178	Water Quality	Construction and operation of Portal to Portal Construction Access Road.	Residence near Doghouse Rail Bridge.	Disturbance of residence' septic systems (tank and/or pump station leach field).	The extent of the septic system will be determined prior to construction activities; if system is located within the Portal to Portal Construction Access Road alignment, it will be bridged with crane mats or a steel plate will be installed to avoid damage to the septic tanks and pump station.	Contractor	Project Design and Project Construction (Pre-Construction, Package 1, and Package 2)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-7
179	Water Quality	Construction and operation of Portal to Portal Construction Access Road.	Residence near Doghouse Rail Bridge.	Disturbance of residence' septic systems (tank and/or pump station leach field).	Pre- and post-construction inspection of the septic system facilities, household wells, and residential structure(s) will be performed. If any damage occurs, contractor will repair facilities.	Contractor	Project Construction (Pre-Construction and Package 2)	Twin Tunnels Portal to Portal Access Road Companion Report Page 7-7
180	Wetlands and Waters of the United States	General construction activities.	Within Twin Tunnels project area.	Potential disturbance of wetlands not within the direct construction footprint.	All wetlands delineated and mapped for the project will be protected from construction activities using properly installed construction limit fencing.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.14-8 and Portal to Portal Access Road Companion Report Page 7-6
181	Wetlands and Waters of the United States	General construction activities.	Within Twin Tunnels project area.	Potential indirect impacts to wetlands and other waters of the United States from erosion and sedimentation.	Achieve permanent stabilization through revegetation and permanent erosion controls measures, and through maintenance of temporary erosion controls and plantings to stabilize non-rocky areas.	CDOT/ Contractor	Project Construction (Package 3)	Twin Tunnels Environmental Assessment Page 3.14-8 and Portal to Portal Access Road Companion Report Page 7-6
182	Wetlands and Waters of the United States	Revegetation of soils, trees, and shrubs.	Within Twin Tunnels project area.	Change in nutrient levels affecting soil or vegetation in wetlands from runoff of fertilizers or other organic materials.	Fertilizers and/or hydro-mulching will not be allowed within 50 feet of wetlands.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.14-8 and Portal to Portal Access Road Companion Report Page 7-6
183	Wetlands and Waters of the United States	Staging and stockpiling of materials in the construction staging areas.	Twin Tunnels staging and stockpiling areas.	Potential disturbance of wetland vegetation and pollutant discharges into sensitive habitats from construction staging and stockpiling.	Construction staging and materials stockpiling will be located greater than 50 feet from the edge of wetlands or the edge of Clear Creek, when possible, to avoid disturbance of vegetation and to prevent pollutant discharges into sensitive habitats. Specific locations will be determined during construction planning and, considering the narrowness of the corridor and limited areas available, this buffer may need to be reduced. If this buffer is not achievable, consider the placement of materials closer to the edge of wetlands or the edge of water and identify appropriate additional BMPs that would be required to minimize disturbance of vegetation and prevent pollutant discharges into sensitive habitats. BMPs will be determined on a site-by-site basis and any modifications will require CDOT environmental staff approval.	CDOT/ Contractor	Project Construction (Pre-Construction, Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.14-8 and Portal to Portal Access Road Companion Report Page 7-6
184	Wetlands and Waters of the United States	Construction work and installation of retaining walls.	Within the Clear Creek 2-year floodplain.	Construction equipment use near ordinary high water mark (OHWM) (2-year floodplain) damages wetlands	Prohibit construction equipment from entering the OHWM except where identified on design plans.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.14-8

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185	Wetlands and Waters of the United States	Construction work and installation of retaining walls.	Within the Clear Creek 2-year floodplain.	Fill of wetlands or waters of the United States.	Replacement of rip-rap along Clear Creek will be closely monitored to ensure that additional fill is not placed into the 2-year floodplain. Any additional encroachment into the 2-year floodplain would need to be identified in the Section 404 permit.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.14-8
186	Wetlands and Waters of the United States	Construction work and installation of retaining walls.	Within the Clear Creek 2-year floodplain.	Pollutants from construction work areas enter into wetlands or other waters of the United States.	Ensure BMPs and containment structures are in place for work conducted within and adjacent to the 2-year floodplain to prevent concrete washout and other potential pollutants from reaching Clear Creek and wetlands.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.14-8
187	Wetlands and Waters of the United States	Refueling construction vehicles and equipment.	Within the Clear Creek 2-year floodplain.	Fuel spills in refueling areas enter into wetlands or other waters of the United States.	Refuel equipment within designated refueling containment area away from floodplain, Clear Creek, and wetlands.	Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.14-8
188	Wetlands and Waters of the United States	Bridge Reconstruction.	Within the Clear Creek 2-year floodplain at the I-70 bridge west of the Hidden Valley Interchange.	Bridge replacement involves work in Clear Creek that could directly and/or indirectly impact the Clear Creek 2-year floodplain.	CDOT will carefully monitor the bridge construction, demolition, and temporary stream crossing area to ensure that all identified mitigation commitments for work within the OHWM are implemented in this location. CDOT will closely monitor work around the Hidden Valley bridge to ensure compliance with the U.S. Army Corps of Engineers Section 404 permit.	CDOT/ Contractor	Project Construction (Package 1, Package 2, and Package 3)	Twin Tunnels Environmental Assessment Page 3.14-8

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3.2 Permit Requirements

Table 3-2 lists the permits and plans that will be obtained prior to construction of the Proposed Action. If the permit or plan contains additional stipulations with which the contractor must comply during construction, those conditions will be added to **Table 3-1** and tracked with other mitigation commitments.

Table 3-2. Permit Requirements for the Proposed Action

Permit	Applicability	Permitting Agency
Federal		
Clean Water Action Section 404 Permit – Nationwide Permit 14	Impacts to wetlands and Waters of the United States; Nationwide Permit (NWO-2011-1778-DEN) issued on July 24, 2012	U.S. Army Corps of Engineers
I-70 Mountain Corridor Section 106 Programmatic Agreement, Twin Tunnels Supplemental Agreement	Adverse effects to the Twin Tunnels historic property; supplemental agreement identifies mitigation requirements and was signed on September 5, 2012.	Colorado State Historic Preservation Office and other signatory agencies
State		
Fugitive Dust Permit	Projects disturbing more than 25 acres of land and/or project duration is longer than 6 months	Colorado Department of Public Health and Environment
Demolition Permit	Bridge (and building) demolition; requires asbestos survey	Colorado Department of Public Health and Environment
CDPS General Permit for Stormwater Associated with Construction Activities (COR030000)	Projects disturbing more than 1 acre of land; requires Stormwater Management Plan	Colorado Department of Public Health and Environment
CDPS General Permit for construction Dewatering Activities (COG070000)	Excavations that encounter groundwater; additional requirements apply if contaminated groundwater is encountered	Colorado Department of Public Health and Environment
Materials Management Plan	Encounters with mine wastes, other contaminated soils or groundwater, or hazardous materials	Colorado Department of Public Health and Environment
Health and Safety Plan	Contaminated materials, including mine wastes, are encountered by workers	Office of Labor Occupational Safety and Health Administration, Colorado Department of Public Health and Environment
Colorado Senate Bill 40 Certification	Construction activities within riparian corridors; requires replacement of impacted vegetation	Colorado Division of Wildlife
Local		
Intergovernmental Agreement	Construction of the Twin Tunnels and Frontage Road projects and use of CR 314 in Clear Creek County; includes approval of some permits, such as road construction	Clear Creek County
Colorado House Bill 1041 Permit	Projects of statewide interest, such as development of I-70 and use of CR 314 as an I-70 detour; may include noise or other project-specific stipulations.	Idaho Springs
Other Local Permits	Construction and building activities, such as utility relocates, retaining walls, blasting, and grading	Idaho Springs, Clear Creek County