CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

Chapter 4 presents the environmental impacts of each of the five alternatives described in Chapter 2. These include the following:

- Northern Network Alternative 1;
- Central Network Alternative 2;
- Southern Network Alternative 3;
- Combined Network Alternative 4; and
- No Action Alternative.

Impacts to resource values and uses are addressed for each alternative, consistent with resource values found in the area of potential affect and discussed in Chapter 3, the Affected Environment. The following assumptions are made with respect to the impacts analysis:

1. Outside of areas designated Open for off-highway vehicle (OHV) use, vehicles will be specifically confined to designated open routes and parking on adjacent disturbed shoulders, and the event is a non-competitive (endurance/navigational) challenge and will have specified speed limits, which vary depending on resource sensitivity, State law or community ordinance.

2. Within areas designated Open for OHV Use, the event is not confined to designated routes, is competitive, and resource-specific limitations may be identified.

4.2 NORTHERN NETWORK ALTERNATIVE 1

4.2.1 Vegetation

Potential direct impacts to vegetation include crushing by vehicles or pedestrians associated with the activities of the Phase 4 field test identified in Section 2.2.1. The Northern Network includes 415 miles of open routes comprised of existing paved and unpaved roadways. For practical purposes actual route lengths would be approximately 200 miles. Damage to vegetation would be limited to vegetation found within existing open, unpaved roadways, consistent with regular roadway use, since operation of the challenge vehicles and supporting vehicles are confined to the roadway at all times.

Competitive segments would be conducted in established OHV or other identified open areas. Vehicles would use their sensing capability to determine the best route to follow and cross-country travel or off-road driving may be allowed. In OHV open areas crushing of vegetation by challenge vehicles and the following control vehicles would be of a similar magnitude consistent with normal recreation use in the

Stoddard Valley OHV Area and the OHV area in Nevada, as discussed in the OHV activity plan and the Resource Management Plans.

Support vehicles operating on or near the event route would not leave existing roadways and would park in one of the following areas: 1) to one side of an intersecting roadway (within the roadway) intersecting the event route, 2) on existing disturbed shoulders adjacent to either the event route or on an intersecting roadway, 3) to one side of the event route on the roadway, where the roadway width is greater than 20 feet. Therefore, impacts to vegetation from support vehicles and pedestrians would be limited to vegetation present in roadways and adjacent disturbed areas.

Route marking and road barriers would be placed within the roadways so that vegetation adjacent to the route would not be disturbed. Individual plants could be crushed by pedestrian route monitors accessing their monitoring locations, or tortoise monitors, observing tortoises off the route. Up to 50 monitoring locations would each be staffed by two people. Twenty tortoise monitors are estimated.

Staging areas including the start and finish, spectator and media viewing areas would be established in existing commercial or disturbed areas, which substantially lack vegetation. Staging areas would be directly impacted by pedestrian and vehicle areas, set up of temporary seating and ancillary facilities such as portable toilets and trash receptacles. Staging areas would be patrolled at all times by DARPA staff to ensure that use of these areas would be controlled and confined to the existing disturbed areas, and to ensure proper removal of all facilities following the conclusion of activities.

Challenge Vehicles may come from any geographic location in the United States. Vehicles may transport seeds on their tires, and spread non-native seeds during the Challenge Event. Challenge Vehicles tires would be washed at the qualification inspection and demonstration (QID) to remove all seeds prior to vehicles arrival at the start location in order to prevent the spread of non-native invasive species.

Threatened & Endangered, and Sensitive Plant Species

The BLM-sensitive Mojave monkey flower potentially occurs in the Stoddard Valley OHV area that would be used for the Event under all of the action alternatives. This Mojave monkey flower is an annual species which develops each year and is reduced to seed after the blooming period of April through June. Plants may be crushed by Challenge and support vehicles during operation of the event, which would be held in March when plants may be developing. Outside of the open area, vehicle operation would be restricted to the roadway so that plants would not be impacted. Mitigation that could reduce effects to the monkey flower populations in this designated OHV open area include restriction of vehicles to designated roadways or survey to identify specific populations prior to the event, and development of avoidance measures. See Section 4.2.13 for survey and avoidance measures that are proposed to minimize impacts to Mojave monkey flower.

The white-margined beardtongue is found in the vicinity of the Northern Network in Nevada. However, the network in this vicinity is comprised of paved roads, and would not impact this BLM-sensitive plant.

4.2.2 Wildlife

Potential direct impacts to small mammal and reptile species associated with the activities of the Grand Challenge field test identified in Section 2.2.1 include crushing by vehicles or pedestrians, and indirect impacts include the crushing of burrows. Wildlife injury and mortality would be largely limited to animals found within or traversing roadways and staging areas (start, finish, media, observation areas).

Competitive segments would be conducted in established OHV areas or equivalent. Crushing of small wildlife species by challenge vehicles and the control vehicles that follow challenge vehicles would be expected to be of a similar magnitude consistent with early spring recreation use anticipated in an OHV area. These impacts are summarized in the various bioregional plans. Large raptors, other birds such as burrowing owls, and mammals such as desert kit fox are not anticipated to be substantially affected by this one-day event. Impacts specific to desert tortoise, MGS and MFTL are discussed below.

Threatened & Endangered, and Sensitive Wildlife Species

Desert Tortoise

A biological assessment (BA) has been submitted to the Service, under the Section 7 consultation process by DARPA. The BA identifies potential impacts to the federally and state threatened desert tortoise that could result from selecting the Northern Network Alternative 1, and identifies protective measures that would be implemented to minimize impacts. Information from the BA is summarized herein. The USFWS renders a biological opinion on the effects of the event on the desert tortoise, including required terms and conditions for authorization of the event that would be incorporated in the decision.

At the time of year that the Grand Challenge would be held, desert tortoises may be active above ground, or may be inactive within their burrows. Weather conditions would be a major factor on the potential for encounters with desert tortoises by event participants and support vehicles. If it is cold the day that the robotic vehicles traverse the chosen route, few if any desert tortoises may be foraging about above ground. If it is warm, desert tortoises may be very active.

Within the Stoddard Valley OHV area, the OHV area in Nevada, and the roads of the Northern Network, desert tortoises would not be able to get out of the way of robotic and support vehicles, as the tortoises are slow moving. Direct impacts may include the loss of individual desert tortoise through crushing of animals above ground or in their burrows by event vehicles or through contact with event personnel or spectators.

Indirect impacts could come about through habitat degradation from soil compaction and loss of vegetation caused by event vehicles operating off-road in OHV areas. Although most robotic vehicles that would be entered in the event have rubber tires, tracked vehicles are not precluded from entering. Tracked vehicles, if any such vehicles are developed, would result in greater surface disturbance. All surface disturbances would be confined to existing road surfaces (not including road berms) except in OHV areas where off-road activity would be permitted.

Adverse effects are not anticipated within Category I or critical habitat, where the event is constrained to the width of the roadway, and other measures are in place. Confining vehicles to existing roads and trails except in designated OHV areas, and the strict control of the robotic and support vehicles by DARPA, as defined under the event description, further reduces the potential for adverse effects to desert tortoise.

The Northern Network traverses 11 miles of unpaved roadway in BLM Category 1 Habitat, and 46.7 miles of unpaved roadway in USFWS Critical Habitat.

This is during the non-competitive portion of the route, and, as with dual-sport events that are annually authorized through this area during the fall, strict speed limits and other measures for conservation and protection of desert tortoise have been developed (See Section 4.2.13).

Mohave Ground Squirrel

The Northern Network does not traverse the known range of the MGS and operation of the Grand Challenge in the Northern Network would not be expected to impact MGS.

Mojave Fringe-toed Lizard

The Northern Network traverses habitat of the MFTL which is present in sand habitats throughout the Mojave Desert. Direct impacts may include the loss of individual lizards through crushing of animals by event and support vehicles, or through direct contact with event personnel and spectators. Species activity is dependent on the temperature, but may be present in March when the event would be held.

4.2.3 Areas of Critical Environmental Concern

Specific segments of the Northern Network traverse the ACECs identified below on designated open roadways. In all ACECs, Grand Challenge activities would include traverse by Challenge and support vehicles on roadways and pedestrian tortoise monitors adjacent to roadways as needed. No staging areas, or public or media viewing areas are located within any of the ACECs, except Shadow Valley, which has one media location where it intersects Excelsior Mine Road.

Clark Mountain ACEC

The Northern Network would traverse the northern portion of this ACEC over approximately 4 miles of unpaved open road. Grand Challenge activities in this ACEC would also include pedestrian route monitors to view the Challenge vehicles as they traverse the area. Two monitoring points are planned, with a total of four pedestrian monitors. Because of the high elevation, little desert tortoise activity is anticipated. Use of open roads is consistent with the ACEC Plan. Pedestrian activities may result in crushing of vegetation and cultural resources, soil compaction, and startling or disturbance of any wildlife present along roadways. Because of the temporary nature of the event, it would not impact the scenic value, value as an outdoor laboratory, historical importance, or spiritual importance to Native Americans, nor adversely impact the existing uses in the ACEC.

Salt Creek Hills ACEC

The Northern Network would traverse the southern boundary of this ACEC over approximately 3 miles of paved road. No event monitoring areas are located in this ACEC. Use of open roads is consistent with the ACEC Plan. Pedestrian activities may result in crushing of vegetation and cultural resources, soil compaction, and startling or disturbance of any wildlife present along roadways. Because of the temporary nature of the event, it would not impact the resource values for which this ACEC was designated.

Amargosa River ACEC

The Northern Network would traverse this ACEC over approximately 3 miles of paved road. No event monitoring areas are located in this ACEC. Use of open roads is consistent with the ACEC Plan. Because of the temporary nature of the event, it is not anticipated to impact the resource values for which this ACEC was designated.

Kingston Range ACEC

The Northern Network would traverse this ACEC over approximately 6 miles of paved road. No event monitoring areas are located in this ACEC. Use of open roads is consistent with the ACEC Plan. Because of the temporary nature of the event, it is not anticipated to impact the resource values for which this ACEC was designated.

Shadow Valley ACEC

The Northern Network would traverse this ACEC over approximately 11 miles of unpaved road. There is one event monitoring area and one media area located within this ACEC, at the junction of the

transmission line and Excelsior Mine Road. Use of open roads is consistent with the ACEC Plan. Location of a media area, or similar activity, within this area is not specifically identified provided for in the management plan for this ACEC; however, tortoise densities are low in the area that would be traversed by the Northern Network. In addition, Section 4.2.13 identifies desert tortoise protection measures. Therefore, the event is not anticipated to impact the resource values for which this ACEC was designated (protection of desert tortoise as a Desert Wildlife Management Area [DWMA]).

Superior-Cronese Proposed ACEC

The Northern Network would traverse this ACEC proposed in the West Mojave Coordinated Management Plan over approximately 25 miles of unpaved road. There is one event monitoring area located within the northeastern portion of this proposed ACEC. Use of open roads is consistent with the ACEC Plan. Because of the temporary nature of the event, it is not anticipated to impact the resource values for which this ACEC is proposed. Tortoise protection measures identified in Section 4.2.13 would provide additional protection for tortoise within this proposed ACEC.

Ord-Rodman Proposed ACEC

The Northern Network would traverse this ACEC proposed in the Draft West Mojave Coordinated Management Plan (2003) over approximately 10 miles of unpaved road. There are two event monitoring areas located within the northwestern portion of this proposed ACEC. Use of open roads is consistent with the proposed ACEC Plan. Because of the temporary nature of the event, it is not anticipated to impact the resource values for which this ACEC is proposed. Tortoise protection measures identified in Section 4.2.13 would provide additional protection for tortoise within this proposed ACEC.

4.2.4 Air Quality

Air Quality impacts associated with the Grand Challenge include emissions of Federal EPA criteria pollutants, primarily PM_{10}. Indirect impacts result from fugitive dust that is caused by soil disturbance from Grand Challenge activities on unpaved surfaces. Since Grand Challenge activities would occur within the MDAB and LVAB non-attainment areas for PM_{10}, this air quality impact analysis focuses on the generation of PM_{10} emissions. These impacts are generally most concentrated in staging areas and dissipate substantially within a few hours of the event, although some smaller particles will remain airborne for up to 72 hours on a typical spring day. Wind conditions are a factor for adverse affects. Vehicle exhaust emissions are insubstantial as compared to normal highway traffic in the high desert on a typical spring weekend.

Grand Challenge activities within the LVAB non-attainment area would occur on paved roadways and would not generate fugitive dust emissions within this air basin. With the Grand Challenge confined to

paved roadways within the LVAB, the Clark County Department of Air Quality Management does not require reasonably available control measures for PM_{10} emissions.

For activities within the MDAB, the BLM Fugitive Dust/ PM_{10} Emissions Control Strategy for the Mojave Desert Planning Area outlines procedures for Clean Air Act conformity determinations for activities within the PM_{10} non-attainment areas. These include PM_{10} emissions calculations for activities on unpaved roads. Factors such as soil moisture, soil composition, vehicle speed, vehicle weight, distance traveled, and the number of vehicles on dirt roads all contribute to the amount of PM_{10} generated. The PM_{10} emissions calculations within the BLM Fugitive Dust/PM_{10} Emissions Control Strategy have default values for many of these variables. These default values are: 15 percent silt content in soil, 3 tons average weight of vehicles, and 347 average dry days per year. The average speed of all vehicles on unpaved roads during the Grand Challenge is expected to be 35 miles per hour. Using these values, 2.95 pounds of PM_{10} per vehicle mile traveled would be generated.

The Northern Network comprises the longest distance on unpaved roads and would generate a total of approximately 16.55 tons of PM_{10} as a result of Grand Challenge activities on unpaved roads. These activities include approximately 50 challenge vehicles, 5 route marking vehicles, and 13 administrative and desert tortoise sweeps traveling 126.9 miles each; 20 route monitor vehicles traveling 104.4 miles each; and 50 vehicles associated with temporary road closures traveling 10 miles each. In the MDAB, Reasonably Available Control Measures are applied above 15 tons/day of PM_{10}. Approximately 12 miles of unpaved segments are outside of the MDAB (in the IVAB), so that PM_{10} emissions in the MDAB would be less than 16.55 tons of PM_{10} in the MDAB.

DARPA consulted with MDAQMD to discuss feasible control measures that would reduce short-term PM_{10} emissions (personal communication with Alan DeSalvio, MDAQMD, 12/2/03). Measures discussed include watering, application of temporary surface hardener, and speed reductions. Application of water or a temporary surface hardener (application) in dusty areas can be effective in reducing dust emissions over the short term. Application should be minimized because water may attract desert tortoise to the activities areas for the event negatively impacting desert tortoise. Accordingly, application over the entire route was not considered as a viable measure due to potential impacts to tortoise. Application in staging areas including the start area and two spectator areas would be effective since most of the activity in these areas would take place over a 4-hour period of time. Application in this area would be of a manageable size, and tortoise monitors are already planned for these areas. Reductions in speed would further reduce PM_{10} emissions. Speed limits already constrain operation of the Grand Challenge in desert tortoise critical habitat areas, railroad right-of-ways, and other areas for safety considerations. A reasonable average speed (approximately 35 mph) is necessary in order for the event to be completed within a reasonable time-frame. Additional speed limit constraints would jeopardize the average speed necessary to make the event feasible, and would be contrary to the proposed action. Dust would also be minimized at the spectator areas through strict traffic and pedestrian control measures which will limit

travel by pedestrians and vehicles. Since the two spectator areas are located adjacent to paved roadways, travel on unpaved surfaces will be controlled and minimized. See Section 4.2.13 for reasonably available control measures that will minimize impacts to air quality.

4.2.5 Cultural Resources

A Cultural Resources Assessment has been prepared for the DARPA Grand Challenge, including a records search and review, and selected field investigation.

Potential direct impacts to prehistoric or historical resources associated with the event include crushing, or disturbance by vehicles or pedestrians. Impacts would be limited to OHV areas, unpaved roadways, areas immediately adjacent to unpaved roadways where pedestrian monitoring may occur, and staging areas (start, finish, media locations).

The area traversed by the Northern Network has a high potential for concentrations of cultural resources due to the presence of past water sources, lithic resources, and other concentrated resources in this network. Unpaved segments of the Northern Network are primarily associated with the access roads of the Boulder Corridor, an extensive utility corridor which includes transmission lines and supporting access roads for a number of utilities. As a result of this utility work, extensive study, and site specific cultural investigation have been conducted in this area. Resources uncovered during excavation for utilities have been recorded and placed in repositories for the conservation of these resources. The extensive evaluation and development of utilities and past removal of sensitive resources in the Boulder Corridor minimizes the likelihood that impacts would result from use of the roadways in the Northern Network. However, substantial cultural resources may still be present outside the roadways and utility development footprint, and could be impacted by pedestrian activities. See Section 4.2.13 for measures to minimize impacts on cultural resources.

Native American Religious Concerns

The area traversed by the Northern Network has a high potential for Native American sacred sites to be located nearby, due to the occurrence of natural resources in this area (water sources, areas of higher elevation). Sacred sites can vary in scale from specific locations, to a particular mountain or area. Disturbance from event operations near sacred sites would be limited to traverse by vehicles on open routes, and pedestrian monitoring activities. Access to sacred sites during operation of the event may be limited if the site would normally be accessed via a route segment. Native American and public access to a sacred site may be temporarily precluded if the site would normally be accessed via a vehicle and route segment that is being closed for the Grand Challenge event.

4.2.6 Water Quality

Water quality impacts associated with the Grand Challenge include the potential release of automotive fluids and contributions to the turbidity (suspended sediment creating clouding) in water bodies. Potential sources of vehicle fluids include Challenge Vehicles, support vehicles, spectator vehicles and fueling areas. Vehicle fluids released into the environment can be carried by stormwater runoff into waterways, thereby polluting those waters. Turbidity in water bodies can inhibit the growth of algae and other microorganisms which provide food for fish, birds, and other organisms. Given the scarcity of water resources in the desert, it is especially important to protect them.

Vehicle Fluids

Challenge Vehicles would be required to be in quality working order, free from any fluid leaks, in order to participate in the field test. Vehicles would be inspected at the qualification inspection and demonstration (see Chapter 2) and on the morning of the field test to ensure proper operation. Any vehicles not in proper condition would be disqualified from participating in the field test. Cardboard oil catchers would be placed under the Challenge Vehicles stored overnight at the start area for protection of the environment and as a tool for detecting any potential fluid leaks. All Challenge Vehicles must arrive at the event fully fueled.

Support vehicles would be similarly required to be maintained in good condition, free from leaks. A fuel area, including a portable 40-foot tractor trailer fuel station would be established at the start area for support vehicles only. Thereafter, support vehicles would obtain fuel from commercial establishments. The fuel area would have full containment capability for any spills or overflows that could occur.

A Spill Prevention and Cleanup Plan is being prepared by DARPA and will be submitted for BLM review and approval, and would be in place prior to the event. Consistent with this plan, sufficient spill prevention and clean up materials would be placed at all staging areas of the event including the start and finish areas. Any release would be immediately cleaned up, including affected soils, and disposed of at an appropriate facility. Care would be taken to minimize ground disturbance during any cleanup.

Turbidity

The event is likely to contribute to turbidity in two ways: 1) vehicles crossing a stream or river may stir up sediments in the water, and 2) vehicles may increase erosion in dry washes or areas proximate to water bodies, so that the loose sediment is more readily transported to the water bodies in subsequent storm flows.

The Northern Network traverses the Mojave River (River) just northeast of Daggett, California. Water flow in this segment of the River is usually subterranean, though small pools would form here during or just following large storm events. Given the subterranean nature of the water flows on this segment any increase in turbidity would be limited to puddles of water where the roadway crosses the River.

4.2.7 Wastes, Hazardous or Solid

Trash

DARPA staff, media and spectators would generate trash in staging areas where people may be congregated for extended periods of time. Trash is a concern because it diminishes the visual appeal of the desert environment, and because it attracts ravens which prey on young desert tortoise. DARPA would provide covered trash bins in all staging areas including the start, finish, media and spectator areas, would monitor containers to ensure no overflowing, and sweep the area for trash at the close of the event.

Hazardous Waste

In the event a vehicle fluid is released, hazardous waste would be generated from the clean up of this substance. A Spill Prevention and Cleanup Plan is being prepared by DARPA and will be submitted for BLM review and approval, and would be in place prior to the event. The plan will specify the proper disposal method and location consistent with California and Nevada regulation for oil and hazardous wastes.

4.2.8 Safety and Law Enforcement

Safety and law enforcement issues associated with the Grand Challenge include: 1) law enforcement support and potential hazards associated with implementing a recreation and access closure on the Challenge route, and 2) the risk of a collision with a Challenge Vehicle.

DARPA has been working with law enforcement officials (LE) to plan the closure of the event route, and identify the support that would be needed for the event. LE would be notified in advance of the specific route within the authorized network to be used for the event. DARPA staff would coordinate with LE to effect actual closure of the route, so that no vehicles unrelated to the event would be able to travel on the route while the event is in progress. Major roadways, especially highways that intersect the route would remain open until the event approaches a specific segment. At that time the road crossing would be closed until it is safe to reopen. Depending on how spread out the Challenge Vehicles are, some segments may be opened intermittently for traffic to cross to assure private land access and other needed access by non-participants in the event. In other areas, where traverse is not essential, segments would remain closed until all Challenge Vehicles have crossed that segment, or have been disqualified. With the

expertise of professional law enforcement officials involved, road closures are expected to be highly effective, so that the public remains outside of the closure, or in designated areas, and hazards would be minimized.

Challenge Vehicles would operate unmanned and fully autonomous. Vehicles would be able to sense their environment, but not see for a distance down the route. This scenario makes the Challenge Vehicles a potential hazard to people and private property. This was understood early in the planning stages for the Grand Challenge, so that measures to ensure public safety have been planned into the event.

A significant adverse impact would result if a Challenge Vehicle were to collide with a person, or damage private property. The following strategies have been developed to ensure safety of people and private property.

A comprehensive system is planned to ensure public safety during operation of the Grand Challenge. All Challenge Vehicles would be equipped with a wireless emergency stop (E-Stop) system. This system will communicate three distinct signals to the Challenge vehicles using established technology:

1. A "run" signal allowing the vehicle to operate. A run signal will only be issued if DARPA staff can clearly observe the vehicles and the route before them to ensure the Challenge Vehicle has a clear path in which to operate.

2. A "stop" signal that overrides the "run" signal to command the Challenge Vehicle's onboard computers to bring the vehicle to a controlled stop.

3. A "disable" signal that overrides all other signals to bypass the Challenge Vehicle's onboard computers and disrupt vehicle propulsion to bring it to a stop.

The E-Stop system uses line-of-sight communications. By design, the Challenge Vehicles would stop themselves if they are out of the radio line-of-sight. As a result there is no probability that the vehicles would ever be operating without being under the direct supervision of a DARPA monitor.

Each Challenge Vehicle will be immediately followed by a control vehicle which will observe the vehicles at all times to ensure that they stay on the route, and do not pose a safety or environmental threat. In addition, there will be pedestrian route monitors positioned along the route for addition observation where control vehicles may not have a clear view of the path before the Challenge Vehicles. A central command center would receive constant real time information from DARPA field staff in control vehicles, at monitoring positions and at road closures to ensure that vehicles and their immediate paths are monitored at all times, and that no vehicles, pedestrians or large mammals are in the path of the vehicle. In the event that any vehicles, pedestrians, large mammals or other obstacles of concern are observed, the Challenge Vehicle would be stopped until the path is clear.

As an added measure of safety, a wireless tracking and display system would be used. This would provide the command center with the exact position of each Challenge Vehicle along the route, and an overall view of the event. This would also allow the command center to provide information to field staff, and assist with the coordination of road closures.

In addition, each Challenge Vehicle would have increased visibility through an audible warning sound and use of flashing yellow or amber warning lights. These features would operate whenever the Challenge Vehicle is operating. The warning sound would comply with Society of Automotive Engineers (SAE) Class 1 standards for audible warning devices and would not produce sounds that can be confused with those of public-safety vehicles such as law-enforcement, fire, or ambulance.

4.2.9 Utilities

During the operation of the event the Grand Challenge field test may inhibit the ability of utilities to access their utility lines. Utilities would be able to schedule routine maintenance outside of the days for the Grand Challenge event, but would need immediate access to power lines in the event of a break. DARPA has contacted the impacted utilities and will enter into an agreement with each utility to provide any essential access to their lines. Collision by a Challenge Vehicle with a transmission tower could affect the structural integrity of a tower. Both the design of the route through field surveys, and the safety control measures that will be employed (see Section 4.2.8) should ensure that energy infrastructure would not be jeopardized. Fugitive dust (PM_{10}) emissions can impact the efficient operation of insulators. However, because the distribution of PM_{10} emissions will take place across the network, as opposed to concentrated in one area, dust emissions are not expected to adversely impact insulators.

4.2.10 Recreation and Access

The Grand Challenge field test would inhibit access to a portion of the OHV areas included in the recreational closure area, on selected route segments, and intersecting roads near the route segments. Since only a portion of the Stoddard OHV area and the Nevada open area would be used for the event, the balance of the Stoddard OHV open area and Nevada open area, as well as two other popular OHV Open areas in western San Bernardino County, California (Johnson Valley OHV Area, El Mirage Cooperative Management Area) would still be available, though access in portions of Stoddard OHV area would be somewhat hindered during certain time periods In addition, the available area for OHV use would be more crowded during the affected weekend since other areas would be unavailable and therefore less crowded, somewhat diminishing the recreating experience for those seeking a more isolated experience.

During the event, access to the selected route segments would not be allowed, thereby limiting available acreage for four-wheel drive exploring, sight-seeing, and other recreation activities, as well as destinations that would only be accessible by the particular route segments. For instance, use of the

Northern Network may temporarily prevent access to the northern portion of Clark Mountain ACEC during the field test event.

4.2.11 Scenic

Since the Grand Challenge is a temporary event, vehicle activities would be limited to existing roads and open areas. Therefore, scenic values would not be affected over the long-term. Short-term impacts to visibility may occur along portions of the route as a result of fugitive dust generation by vehicle passage. This impact would dissipate within two hours to three days of the event and is further discussed in the air quality section of the analysis. Areas of the Northern Network where scenic values may be temporarily impacted include the Ord/Rodman Mountains, portions of the Boulder Corridor, and areas along I-15, near Primm, Nevada.

4.2.12 Wetlands/Riparian Values

The Northern Network traverses the Mojave River (River) just northeast of Daggett, California. Water flow in this segment of the River is usually subterranean, though small pools would form here during or just following large storm events. Direct impacts include compaction of soil by vehicles and increase in turbidity (also see Section 4.2.6, Water Quality) from erosion by vehicles. Given the subterranean nature of the water flows on this segment any increase in turbidity would be limited to puddles of water where the roadway crosses the River. The Northern Network traverses the Amargosa River on paved roads so that no impacts are anticipated.

4.2.13 Mitigation Measures

A number of protective measures have been identified to minimize effects of the event on resource values and uses, which the BLM would impose as mitigation measures, or conditions, to the authorization of this alternative. The event involves a temporary activity, primarily using BLM open routes, and does not involve any construction or installation of long-term facilities. Therefore, these protective measures focus on event operations, and would be temporary in nature.

In the protective measures that follow, a ‘desert tortoise monitor’ is defined as a trained wildlife biologist who is knowledgeable concerning desert tortoise biology, protective measures, habitat requirements, identification of desert tortoise sign, and procedures used to survey for desert tortoises, and has been approved by the BLM to conduct pre-sweep and event monitoring activities. An ‘authorized desert tortoise biologist’ is a desert tortoise monitor who has been authorized by the Service to handle desert tortoises.

1. The Grand Challenge operational staff would include a BLM-approved "Field Contact Representative" who may be an authorized desert tortoise biologist and who would be responsible for overseeing compliance with these desert tortoise protective measures, and coordination with all biologists.

2. All Grand Challenge operational staff would receive desert tortoise training on the distribution, general behavior and ecology, protection afforded by the State and Federal Endangered Species Acts, and procedures for reporting encounters, and the importance of following the protective measures. Operational staff would be instructed that they are not authorized to handle tortoises encountered on the Challenge course. Rather, they would be directed to report all tortoise sightings to the lead desert tortoise biologist identified below in protective measure #5.

3. DARPA would provide a sufficient number of authorized desert tortoise biologists or desert tortoise monitors to ensure the proper removal of species from the Challenge course if encountered during the pre-Challenge activities or during the Event.

4. Authorized desert tortoise biologists and desert tortoise monitors would provide rolling sweeps of the entire Challenge course before and during the Event, and monitor all Challenge operations (i.e., route marking, administrative sweeps, recreational and road closures, communication trucks, route monitor locations, media observation points, and spectator viewing areas) in conjunction with Grand Challenge operational staff to minimize impacts to desert tortoises. Beginning not more than one hour prior to the start of the Event, authorized desert tortoise biologists would sweep the entire Challenge course, and clear the route of all desert tortoises found on, or immediately adjacent to the route. Desert tortoises would be moved, as needed, approximately 100 feet off the course in the same direction it was heading by an authorized desert tortoise biologist.

5. Only desert tortoise biologists who have been authorized by the Service would be allowed to handle desert tortoises.

6. Desert tortoises would be moved only by an authorized desert tortoise biologist and solely for the purpose of moving the animals out of harm's way. Desert tortoises would be moved the minimum distance to ensure their safety.

7. All handling of desert tortoises would be conducted by an authorized desert tortoise biologist in accordance with Desert Tortoise Council-recommended (1999) protocol.

8. Any vehicle on the course that stops would be checked for the presence of desert tortoise under the vehicle prior to moving the vehicle. Any desert tortoises found would be moved by an authorized desert tortoise biologist.

9. Vehicles shall not exceed the legal speed limit (posted or unposted) of the road(s) used during the event.

10. To ensure that desert tortoises do not re-enter the route, a desert tortoise monitor would track desert tortoises found until all participants have passed.

11. Not later than 48 hours after completion of each Event, DARPA, in cooperation with the BLM, would conduct a post-sweep review to determine if the DARPA Grand Challenge Event complied with the conservation and protective measures detailed in this EA and the terms and conditions of the biological opinion.

12. To reduce the attractiveness of the event route to the common raven (*Corvus corax*) and other desert tortoise predators, DARPA would implement a "pack-it-in, pack-it-out" strategy for trash and food items. No food or trash would be left by event participants on the route. All trash and food items must be removed.

13. A mitigation fee based on the amount of acreage disturbed during the Event would be paid by DARPA as determined by the BLM during its post event sweep. The BLM would determine the required steps and associated costs, including the use of ground crews such as the California Conservation Corps, to mitigate all identified disturbances. DARPA would provide the necessary funding for the BLM to implement these measures.

14. Six to twelve weeks prior to the Event, areas of the Stoddard Valley OHV area which would be used by the Event would be surveyed for suitable habitat for the Mojave monkey flower. GPS locations would be recorded for areas that provide suitable habitat. Within one week of the Event these areas would be surveyed for the presence of Mojave monkey flower. Areas which have this species present would be staked and flagged so that they can be avoided by all vehicles associated with the event.

15. Site-specific field investigations (Class II or III inventories) would be conducted for any segments warranted by the results of cultural records review, prior to the use of any such segments for the event. These investigations are warranted under two circumstances:

    - When the records search indicates that previous investigations are altogether lacking or are insufficient to determine the potential impacts to cultural resources, or achieving substantial avoidance to resources.

    - When the records search indicates the presence of highly sensitive resources the location of which should be field verified to determine the best means of achieving substantial avoidance to cultural resources.

16. Archeological monitors shall be used in locations of substantial archeological sensitivity, as determined by the BLM archeologist in light of the Cultural Resources Assessment and site specific field investigations.

17. Biological and event monitors (pedestrian monitors) would be provided information on historic and prehistoric artifacts indicating the potential for contact with such resources, and emphasizing that they should be left undisturbed.

18. For routes that would result in PM_{10} emissions in excess of 15 tons/year, the following measures would be imposed:

    - A soil amendment would be applied at the start area and two spectator areas to minimize fugitive dust from vehicles and pedestrians.

    - At spectator areas, vehicle traffic, including parking would be strictly controlled by DARPA staff to minimize the distance over which vehicles travel on unpaved surfaces, thereby minimizing fugitive dust emissions.

4.2.14 Residual Impacts

Mitigation measures have been imposed to protect the BLM-sensitive Mojave monkey flower. Other vegetation, particularly small plants and shrubs in the Stoddard Valley OHV area and within the Nevada open area may be crushed by Challenge Vehicles. These types of impacts were anticipated in the Stoddard Valley OHV management plan, California Desert Conservation Area Plan and Las Vegas Resource Management Plan consistent with typical OHV use of these areas.

Small mammals and reptiles could be crushed by Challenge Vehicles. Given that most of the routes would remain on paved roads and dirt roads designated by the BLM for recreational use, and given the protective measures that DARPA would follow, it is anticipated that few, if any desert tortoises would be killed or injured by event participants or support vehicles. Despite all mitigation measures identified, take in the form of desert tortoise injury or mortality could still occur because of collisions with event robotic or manned support vehicles. The likelihood of this occurring on a given length of route outside of the OHV open area would be considerably less because impacts with event vehicles would be confined to the narrow width of route boundaries as defined by the lateral boundaries available to robotic vehicles on these routes. A pre-sweep and rolling sweeps of the Challenge route during the event would substantially reduce the possibility of desert tortoise being on the route during the event. However, in OHV areas, the robotic vehicles would be allowed much greater flexibility to traverse, including off-road, within a much wider lateral boundary. Given the same length of travel in an OHV open area compared to designated open routes, collisions between vehicles and desert tortoise would be more likely to occur in the OHV open areas. Additionally, the odds of a desert tortoise being crushed within its burrow would also be much greater in an OHV area. On designated open routes, vehicles would very likely not encounter desert tortoise burrows. Depending on the weather, if desert tortoises are active, there could be considerable take in the form of harassment from desert tortoises being removed from the route by authorized desert tortoise biologists.

MFTL mortality may result from crushing of lizards by event vehicles on paved and unpaved roads and in OHV areas. Primary threats to this species are degradation of habitat by OHV vehicles, urbanization, and loss of sand sources for sand habitat (also from urbanization). OHV impacts were anticipated in the OHV management plan and LVRMP consistent with typical OHV use of these areas. Because of the temporary nature of the event, it would not contribute to urbanization.

Staging of a media area within the Shadow Hills ACEC is inconsistent with the resource values for which this ACEC was designated (tortoise protection and recovery as a Desert Wildlife Management Area). Desert tortoise mitigation measures have been identified (see Section 4.2.13 above) to minimize potential impacts to desert tortoise located in this ACEC.

Impacts to air quality would be higher under this alternative than the Central and Southern Network since it has more miles of unpaved route segments. The fugitive dust emissions (PM_{10}) would largely settle within 2 hours to 3 days of the traverse of vehicles, unless there are adverse weather conditions.

Some fugitive dust may be transported and persist for up to 3 days, temporarily diminishing scenic values.

Closure of the event route and immediate surrounding areas would limit access to, and travel across these areas for recreation and commerce. Portions of open areas would be closed to access up to a day prior to the event and during event operations, for a total of up to 3 days. Other areas would be closed intermittently, during the event.

4.3 CENTRAL NETWORK ALTERNATIVE 2

4.3.1 Vegetation

Impacts to vegetation under the Central Network Alternative would be the same in scope, and potentially greater in magnitude than those described for the Northern Network Alternative, but would be specific to route segments within the Central Network. The Central Network includes 455 miles of open routes comprised of existing paved and unpaved roadways. For practical purposes actual route lengths would be approximately 200 miles, which is the same as the Northern Network. Under this alternative, however, in addition to Stoddard and Nevada open areas, Rasor OHV may be affected. Therefore, potential impacts to vegetation can be expected in the Rasor OHV area also.

Threatened & Endangered, and BLM-Sensitive Plant Species

Impacts to threatened and endangered or BLM-sensitive plant species under the Central Network Alternative would be the same as those described for the Northern Network Alternative. Some crushing of Mojave monkey flower plants may occur in the Stoddard OHV Open area. See Section 4.2.13 for proposed survey and avoidance measures to minimize impacts to this species.

4.3.2 Wildlife

Impacts to wildlife under the Central Network Alternative would be the same in scope, and potentially greater in magnitude to those described for the Northern Network Alternative. Use of the Central Network includes the Rasor OHV area, in addition to the Stoddard Valley OHV area, and the OHV area in Nevada, so that impacts to wildlife, including the crushing of burrows, would also occur there. Therefore, impacts to wildlife would be greater under the Central Network Alternative.

Threatened & Endangered, and Sensitive Wildlife Species

Desert Tortoise

Potential impacts to the desert tortoise under the Central Network Alternative would be the same in scope, and potentially greater in magnitude than those described for the Northern Network Alternative, and would be specific to route segments within the Central Network. The Central Network traverses more miles of BLM Category 1 Habitat and USFWS Critical Habitat compared to the Northern Network, and therefore more quality habitat would be traversed, and a higher average density of desert tortoise may be present, if they are active. The Central Network traverses 54 miles of unpaved roadway in BLM Category 1 Habitat compared with 11 in the Northern Network, and 59.3 miles of unpaved roadway in USFWS Critical Habitat compared with 46.7 in the Northern Network. This is during the non-competitive portion of the route, and, as with dual-sport events, strict speed limits and other measures for conservation and protection of desert tortoise have been developed (See Section 4.2.13).

Mohave Ground Squirrel

As with the Northern Network, the Central Network does not traverse the known range of the MGS and operation of the Grand Challenge in the Central Network is therefore not expected to impact MGS.

Mojave Fringe-toed Lizard

Impacts to the MFTL would be greater under the Central Network because of the higher propensity for aeolian (sand) habitat which the species prefers, including the Rasor OHV area which has extensive sand areas, as well as adjacent to routes in the vicinity such as the Mojave Road.

4.3.3 Areas of Critical Environmental Concern

Specific segments of the Central Network traverse the ACECs identified below on designated open roadways. In all ACECs Grand Challenge activities would include Challenge and support vehicles on roadways, and pedestrian tortoise monitors adjacent to roadways as needed. No staging areas, public or media viewing areas are located within any of the ACECs along this route.

Piute/Eldorado ACEC

The Central Network would traverse this ACEC over approximately 27 miles of unpaved open road. No event monitoring areas are located in this ACEC. Use of open roads is consistent with the ACEC Plan. Tortoise monitors and other mitigation measures are identified in Section 4.2.13 and serve to minimize

impacts to the desert tortoise conservation and recovery, which is the primary focus of this ACEC. Therefore, the event would not impact the resource values for which this ACEC was designated.

Afton Canyon ACEC

The Central Network would traverse this ACEC over approximately 6 miles of unpaved open road. One event monitoring point is located in this ACEC. Use of open roads is consistent with the ACEC Plan. Activities would be concentrated along the roadway, which is largely set back from the riparian vegetation in this ACEC. Because of the temporary nature of the event, it would not impact the resource values for which this ACEC was designated.

Cronese Basin ACEC

The Central Network would traverse this ACEC over approximately 3 miles of unpaved open road. No event monitoring areas are located in this ACEC. Use of open roads is consistent with the ACEC Plan. The roadway segment used is not proximate to the wetlands, mesquite hummocks and desert willow washes, so that the wildlife which frequent these habitat rich areas would not be disturbed. Because of the temporary nature of the event, it would not impact the resource values for which this ACEC was designated.

Clark Mountain ACEC

Impacts to this ACEC under the Central Network Alternative would be less than those described for the Northern Network Alternative, as follows. The Central Network would traverse the southern portion of this ACEC over approximately 1 mile of unpaved open road as compared with 4 miles for the Northern Network. No event monitors would be required for this segment so that pedestrian impacts would be reduced, compared to the Northern Network which would have four monitors at two monitoring points. Use of open roads is consistent with the ACEC Plan. Because of the temporary nature of the event, it would not impact the resource values for which this ACEC was designated.

Manix ACEC

The Central Network would traverse this ACEC over approximately 0.4 mile of unpaved open road. No event monitoring points would be located in this ACEC. Use of open roads is consistent with the ACEC Plan. The event would not impact the value of this site as a source of blow sand for fringe-toed sand lizard habitat. Because of the temporary nature of the event, it would not impact the resource values for which this ACEC was designated.

Halloran Wash ACEC

The Central Network would traverse this ACEC over approximately 4 miles of unpaved open road. No event monitoring points would be located in this ACEC. Use of open roads is consistent with the ACEC Plan. Because of the temporary nature of the event, it would not impact the resource values for which this ACEC was designated.

Superior-Cronese Proposed ACEC

The Central Network would traverse this ACEC proposed in the Draft West Mojave Coordinated Management Plan (2003) over approximately 6 miles of unpaved road. There is one event monitoring area located within the northeastern portion of this proposed ACEC. Use of open roads is consistent with the proposed ACEC Plan. Because of the temporary nature of the event, it is not anticipated to impact the resource values for which this ACEC is proposed. Tortoise protection measures are identified in Section 4.2.13.

Ord-Rodman Proposed ACEC

The Central Network would traverse this ACEC proposed in the Draft West Mojave Coordinated Management Plan (2003) over approximately 10 miles of unpaved road. There are no event monitoring points located within this proposed ACEC. Use of open roads is consistent with the proposed ACEC Plan. Because of the temporary nature of the event, it is not anticipated to impact the resource values for which this ACEC is proposed. Tortoise protection measures are identified in Section 4.2.13.

Chemehuevi ACEC

The Central Network would traverse this ACEC designated for desert tortoise conservation and recovery over approximately 23 miles of paved road. There are four event monitoring points located within this ACEC. Use of open roads is consistent with the ACEC Plan. Because of the temporary nature of the event, it is not anticipated to impact the resource values for which this ACEC was designated. Tortoise protection measures are identified in Section 4.2.13.

Ivanpah Valley ACEC

The Central Network would traverse this ACEC over approximately 10 miles of unpaved road. There are no event monitoring points located within this ACEC. Use of open roads is consistent with the ACEC Plan. Because of the temporary nature of the event, it is not anticipated to impact the resource values for which this ACEC was designated. Tortoise protection measures are identified in Section 4.2.13.

Puite-Fenner Valley ACEC

The Central Network would traverse this ACEC designated for desert tortoise conservation and recovery over approximately 9 miles of unpaved road. There are no event monitoring points located within this ACEC. Use of open roads is consistent with the ACEC Plan. Because of the temporary nature of the event, it is not anticipated to impact the resource values for which this ACEC was designated. Tortoise protection measures are identified in Section 4.2.13.

4.3.4 Air Quality

Impacts to air quality under the Central Network Alternative would be similar in scope and less in magnitude to those described for the Northern Network Alternative, as follows.

The Central Network is close in proximity to I-15 and would generate a total of approximately 12.77 tons of PM_{10} as a result of Grand Challenge activities on unpaved roads, compared to up to 16.55 tons for the Northern Network. Activities associated with the Central Network would include approximately 50 challenge vehicles, 5 route marking vehicles, and 13 administrative and desert tortoise sweeps traveling 110.2 miles each; 20 route monitor vehicles traveling 33.21 miles each; and 50 vehicles associated with temporary road closures traveling 10 miles each. Since less than 15 tons per day and 100 tons per year of PM_{10} is generated, Reasonably Available Control Measures are not required for this one-time event.

4.3.5 Cultural Resources

A Cultural Resources Assessment has been prepared for the DARPA Grand Challenge, including a records search and review, and selected field investigation.

Potential direct impacts to prehistoric or historical resources associated with the event include crushing, or disturbance by vehicles or pedestrians. Impacts would be limited to OHV areas, unpaved roadways, areas immediately adjacent to unpaved roadways where pedestrian monitoring may occur, and staging areas (start, finish, media locations).

The area traversed by the Central Network has a high potential for concentrations of cultural resources due to the presence of past water sources, and along the Mojave River and other concentrated resources in this network. However, easy access to the areas traversed by the Central Network via I-15 has vastly jeopardized the integrity of cultural resources in this area, especially in areas where roads (paved and unpaved) have been forged. Substantial cultural resources may still be present outside roadway footprints and could be impacted by pedestrian activities. See Section 4.2.13 for measures to minimize impacts on cultural resources.

Native American Religious Concerns

The area traversed by the Central Network has a high potential for Native American sacred sites to be located nearby, due to the occurrence of natural resources in this area (water sources, areas of higher elevation). Sacred sites can vary in scale from specific locations to a particular mountain or area. Disturbance from event operations near sacred sites would be limited to traverse by vehicles on open routes and pedestrian monitoring activities. Access to sacred sites during operation of the event may be limited if the site would normally be accessed via a route segment. Native American and public access to a sacred site may be temporarily precluded if the site would normally be accessed via a vehicle and route segment that is being closed for the Grand Challenge event.

4.3.6 Water Quality

Impacts to water quality under the Central Network Alternative would be similar to those described for the Northern Network Alternative.

As with the Northern Network, the upper branch of the Central Network traverses the Mojave River (river) just northeast of Daggett, California. In addition, this branch follows an open road (Mojave Road) which runs for more than 10 miles along the Mojave River to Afton Canyon. This segment of the river is wide, flat, and predominantly subterranean until Afton Canyon, except during and following storm events. The route is generally located within the floodplain of the river, with frequent subterranean flows, and stream crossings where perennial or ephemeral surface flows occasionally occur. Challenge vehicles would be likely to increase sediment in this area, though no more so than regular road use, and this effect is moderated by the generally sandy conditions along the Mojave Road. Similarly, after Afton Canyon, the route continues to traverses the river basin to the Cronese basin.

In certain portions of Afton Canyon, water is forced to the surface by bedrock and supports year-round surface water flow and riparian habitat. The route largely parallels and is set back from the surface flows, except in two places where the roadway crosses the river. Afton Canyon is a very popular recreation spot for camping, wildlife viewing, and vehicle driving on the open roads, with easy access from a well-graded road from the freeway. As a result, the river crossings are used frequently, and the soil in the river here is well compacted, somewhat limiting turbidity. The water is fairly still with vegetation on each side of the crossing, further dissipating turbidity created by vehicles crossing. Under these conditions, Challenge Vehicles and support vehicles would be expected to have a modest impact on the turbidity of the water here. Therefore, water quality impacts are modest overall, but higher under this alternative than the Northern Network Alternative and they are short-term.

4.3.7 Wastes, Hazardous or Solid

Impacts related to wastes under the Central Network Alternative would be the same as those described for the Northern Network Alternative, as would be the spill prevention and clean-up strategies.

4.3.8 Safety and Law Enforcement

Impacts related to safety and law enforcement under the Central Network Alternative would be greater in magnitude than those described for the Northern Network Alternative. The Central Network uses a greater portion of paved roadways, including public highways, compared to the Northern Network. Closure of these roadways would have a bigger impact on the traveling public and require a greater law enforcement effort than that required for the Northern Network.

4.3.9 Utilities

The impacts to routine maintenance would be the same for all action alternatives; utility companies would avoid the delays of closure areas as feasible for discretionary activities. Impacts to utilities under the Central Network Alternative would be the same as those described for the Northern Network Alternative. In no case would the event preclude access by utilities for needed repairs for any alternative.

4.3.10 Recreation and Access

Impacts to recreation under the Central Network Alternative would be greater than those described for the Northern Network Alternative. In addition to the portions of the Stoddard Valley OHV Area and an OHV Open Area in Nevada that would be closed under the Northern Network Alternative, use of the Central Network would also limit access to Afton Canyon ACEC and Rasor OHV area. The Afton Canyon/Rasor OHV area is a popular family recreation area which provides established camping and picnicking areas, highly scenic views and significant wildlife viewing areas. During the Grand Challenge, the access roads off of I-15 would be blocked, limiting access to these areas during the event.

4.3.11 Scenic Values

Short-term impacts to visibility may occur along portions of the route as a result of fugitive dust generation by vehicle passage. This impact would dissipate within 2 hours to 3 days of the event and is further discussed in the air quality section of the analysis. Scenic views for travelers on I-15 may be slightly diminished during event operation because the Central Network largely parallels this freeway. In addition, segments of the Central Network include a north-south transmission road adjacent to the eastern edge of the Mojave Preserve. Therefore, scenic values along this margin of the Preserve may be temporarily impaired, although prevailing winds are usually easterly.

4.3.12 Wetlands/Riparian Values

Impacts to riparian values under the Central Network Alternative would be greater than those described for the Northern Network Alternative, because the Central Network traverses a greater portion of riparian areas in the Mojave Desert. In addition to traversing the Mojave River northeast of Daggett, the Central Network also traverse the Mojave River west, east and through Afton Canyon, and through Manix Wash and Halloran Wash. Specific route segments of this network include portions of the historic Mojave Road, a popular open route which is sometimes coincident with the floodplain of the Mojave River, an active riparian area. Sandy soils in this area minimize impacts to riparian soils, but active road use inhibits riparian vegetation growth. In this vicinity the route passes adjacent to active riparian vegetation. However, this event/activity alone is not substantial due to regular and frequent use of the Mojave Road. The route would also traverse Manix and Halloran Washes. However, in the location the route would traverse, riparian vegetation is lacking, so that no impacts to riparian values would occur from operation of the event under this Alternative.

4.3.13 Mitigation Measures

The mitigation measures proposed for the Central Network Alternative would be the same as those described for the Northern Network Alternative (see Section 4.2.13).

4.3.14 Residual Impacts

Residual impacts from the Central Network Alternative would be similar to those for the Northern Network Alternative, except for the following.

There may be a higher potential for mortality to MFTL under the Central Network compared to the Northern and Southern Network Alternatives due to a greater amount of suitable habitat in this Alternative.

No inconsistencies between the Central Network and the resource values for the ACECs this route would traverse have been identified. The Central Network would impact more ACECs compared to the Northern Network. Therefore, residual impacts to ACECs would be greater under the Central Network than the Northern Network.

Impacts to air quality would be less under this alternative than the Northern Network, and marginally higher than the Southern Network based on the amount of unpaved route segments in this Network. The fugitive dust emissions (PM_{10}) would settle within 2 hours to 3 days of the traverse of vehicles, unless there are adverse weather conditions.

The Central Network users a greater portion of paved roadways, including public highways, compared to the Northern Network. Closure of these roadways would have a bigger impact on the traveling public and require a greater law enforcement effort than the Northern Network.

4.4 SOUTHERN NETWORK ALTERNATIVE 3

4.4.1 Vegetation

Impacts to vegetation under the Southern Network Alternative would be similar in type to those described for the Northern and Central Networks. The Southern Network includes 514 miles of open routes comprised of existing paved and unpaved roadways. For practical purposes actual route lengths would be approximately 200 miles. Since the Southern Network is comprised of a large proportion of paved roads, a greater portion of support vehicles would be parked on the shoulders of paved roadways which have less vegetation than some unpaved roads. Road closure would have more emphasis on paved roads, and more route monitors would be stationed adjacent to paved roads, compared to the Northern Network. Impacts to vegetation in the OHV areas would include the same areas as those for the Northern Network, plus the Johnson Valley OHV area. Impacts to vegetation under the Southern Network would be less than those for the Central Network.

Threatened & Endangered, and Sensitive Plant Species

Impacts to the BLM-sensitive Mojave monkey flower under the Southern Network Alternative would be the same as those described for the Northern and Central Network Alternatives. Some crushing of Mojave monkey flower plants may occur in the Stoddard OHV Open area. See Section 4.2.13 for proposed survey and avoidance measures to minimize impacts to this species.

The white-margined beardtongue is found in the vicinity of the southern network, north and south of Interstate 40. However, the network in this vicinity is comprised of paved roads, and would not impact this BLM-sensitive plant.

4.4.2 Wildlife

Impacts to wildlife under the Southern Network Alternative would be similar to those described for the Northern Network Alternative, but would be specific to route segments within the Southern Network. In addition to road segments, the Southern Network would potentially use an additional OHV area (Johnson Valley).

Potential direct impacts to small mammal and reptile species include crushing by vehicles or pedestrians, and indirect impacts include the crushing of burrows. Wildlife injury and mortality would be largely

limited to animals found within or traversing roadways and staging areas (start, finish, media, observation areas) outside of OHV areas.

Competitive segments would be conducted in established OHV areas or equivalent. Crushing of wildlife species by challenge vehicles and the following control vehicles would be expected to be of a similar magnitude consistent with consistent with early spring recreation use anticipated in an OHV area.

Threatened & Endangered, and Sensitive Wildlife Species

Desert Tortoise

Impacts to the desert tortoise under the Southern Network Alternative would be similar in scope and potentially greater in area affected to those described for the Northern Network Alternative, but would be specific to route segments within the Southern Network. The Southern Network traverses 44 miles of unpaved roadway in BLM Category 1 Habitat, as compared with 11 miles in the Northern Network and 54 miles in the Central Network, and 68.9 miles of unpaved roadway in USFWS Critical Habitat, compared with 46.7 in the Northern Network and 59.3 miles in the Central Network. This is during the non-competitive portion of the route, and, as with dual-sport events, strict speed limits and other measures for conservation and protection of desert tortoise have been developed (see Section 4.2.13).

Mohave Ground Squirrel

Segments of the Southern Network traverse the known range of the MGS. Direct impacts may include the loss of individual MGS through crushing of animals by event and support vehicles. MGS are active during the time period when the Grand Challenge event would be held, but spend most of their time below ground. They are also fast and would be expected to flee an area when a vehicle approaches, or seek cover under ground when a person approaches. As a result of this behavior, the potential for mortality or injury to MGS from operation of the Challenge event is considered very low.

Mojave Fringe-toed Lizard

Impacts to the MFTL under the Southern Network would be similar in scope, but lesser in magnitude to those for the Central Network. Less of the preferred habitat (sandy environments) for the MFTL is present compared to the Central Network. Direct impacts may include the loss of individual lizards through crushing of animals by event and support vehicles, or through direct contact with event personnel and spectators.

4.4.3 Areas of Critical Environmental Concern

Specific segments of the Southern Network traverse the ACECs identified below on designated open roadways. In all ACECs Grand Challenge activities would include traverse by Challenge and support vehicles on roadways and pedestrian tortoise monitors adjacent to roadways as needed. No staging areas, public or media viewing areas are located within any of the ACECs on the Southern Network.

Piute/Eldorado ACEC

The Southern Network would traverse this ACEC which was designated for conservation and protection of desert tortoise over approximately 26 miles of paved open road. Two event monitoring points are located in this ACEC, along paved roadways. Use of open roads is consistent with the ACEC Plan. Tortoise monitors and other mitigation measures identified in Section 4.2.13 serve to minimize impacts to the desert tortoise. Therefore, the event would not impact the resource values for which this ACEC was designated.

Ord-Rodman Proposed ACEC

The Southern Network would traverse this ACEC proposed in the Draft West Mojave Coordinated Management Plan (2003) over approximately 24 miles of unpaved road. There are seven event monitoring points located within this ACEC. Use of open roads is consistent with the proposed ACEC Plan. Because of the temporary nature of the event, it is not anticipated to impact the resource values for which this ACEC is proposed. Tortoise protection measures identified in Section 4.2.13 would provide additional protection for tortoise within this proposed ACEC.

Chemehuevi ACEC

The Southern Network would traverse this ACEC which was designated for conservation and protection of desert tortoise, over approximately 40 miles of unpaved road. There are four event monitoring points located within this ACEC. Use of open roads is consistent with the ACEC Plan. Because of the temporary nature of the event, it is not anticipated to impact the resource values for which this ACEC was designated. Tortoise protection measures identified in Section 4.2.13 would provide additional protection for tortoise within this ACEC.

Puite-Fenner ACEC

The Southern Network would traverse this ACEC which was designated for conservation and protection of desert tortoise as, over approximately 5 miles of unpaved road. There are no event monitoring points located within this ACEC. Use of open roads is consistent with the ACEC Plan. Because of the

temporary nature of the event, it is not anticipated to impact the resource values for which this ACEC was designated. Tortoise protection measures identified in Section 4.2.13 would provide additional protection for tortoise within this ACEC.

4.4.4 Air Quality

Impacts to air quality under the Southern Network Alternative would be similar in type to those described for the Northern and Central Networks. The overall volume of PM_{10} generated would be less under the Southern Network Alternative than the other action alternatives. The Southern Network would generate a total of approximately 11.58 tons of PM_{10}. Activities associated with the Southern Network would include approximately 50 challenge vehicles, 5 route marking vehicles, and 13 administrative and desert tortoise sweeps traveling 85.5 miles each; 20 route monitor vehicles traveling 89.42 miles each; and 50 vehicles associated with temporary road closures traveling 5 miles each. Since less than 15 tons per day and 100 tons per year of PM_{10} is generated, Reasonably Available Control Measures are not required for this one-time event under this alternative.

4.4.5 Cultural Resources

A Cultural Resources Assessment has been prepared for the DARPA Grand Challenge, including a records search and review, and selected field investigation.

Potential direct impacts to prehistoric or historical resources associated with the event include crushing or disturbance by vehicles or pedestrians. Impacts would be limited to OHV areas, unpaved roadways, areas immediately adjacent to unpaved roadways where pedestrian monitoring may occur, and staging areas (start, finish, media locations).

The area traversed by the Southern Network has high potential for concentrations of cultural resources due to the presence of lithic resources, nearby water sources (most notably the Colorado River), as well as other concentrated resources in this network. However, the Southern Network is comprised primarily of paved roadways, so that impacts to cultural resources are limited to an area south of Barstow and a north-south transmission line largely south of Interstate 40. These roadways are not likely to have any cultural integrity. However, substantial cultural resources may still be present outside roadway footprints, and could be impacted by pedestrian activities. See Section 4.2.13 for measures to minimize impacts on cultural resources.

Native American Religious Concerns

The area traversed by the Southern Network has a moderate potential for Native American sacred sites to be located nearby, due to the occurrence of natural resources in this area (lithic resources, areas of higher

elevation). Sacred sites can vary in scale from specific locations to a particular mountain or area. Disturbance from event operations near sacred sites would be limited to traverse by vehicles on open routes and pedestrian monitoring activities. Access to sacred sites during operation of the event may be limited if the site would normally be accessed via a route segment. Native American and public access to a sacred site may be temporarily precluded if the site would normally be accessed via a vehicle and route segment that is being closed for the Grand Challenge event.

4.4.6 Water Quality

Impacts to water quality under the Southern Network Alternative would be similar to those described for the Northern Network Alternative. The Southern Network does not traverse the Mojave River or other water body and would not contribute to the turbidity of any water body.

4.4.7 Wastes, Hazardous or Solid

Impacts related to wastes under the Southern Network Alternative would be the same as those described for the Northern Network Alternative, as would be the spill prevention and clean-up strategies.

4.4.8 Safety and Law Enforcement

Impacts related to safety and law enforcement under the Southern Network Alternative would be greater than those described for the Northern Network Alternative and similar to those for the Central Network. The Southern Network uses the greatest portion of paved roadways, including public highways, compared to the Northern or Central Network. Closure of these roadways would have a bigger impact on the traveling public and require a greater law enforcement effort than the Northern Network, and potentially the Central Network, depending on the specific route selected for the event.

4.4.9 Utilities

Impacts to utilities under the Southern Network Alternative would be the same as those described for the Northern and Central Network Alternative. In no case would the event preclude access by utilities for needed repairs, for any alternative.

4.4.10 Recreation

Impacts to recreation under the Southern Network would be similar in magnitude, but would affect different user groups and geographic areas than those described for the Northern Network and Central Network. Use of the Southern Network Alternative would not inhibit access to any ACECs with high recreational values along the I-15 corridor, such as Clark Mountain and Afton Canyon. While it would

not limit access to the more family-oriented Rasor OHV area, it would potentially limit access to Johnson Valley OHV area, which is accessible from Victor Valley and Highway 247. Travel to Joshua Tree National Park via Highway 247 would also be intermittently disrupted during operation of the event along this highway.

4.4.11 Scenic Values

Short-term impacts to visibility may occur along portions of the route as a result of fugitive dust generation by vehicle passage. This impact would dissipate within 2 hours to 3 days of the event and is further discussed in the air quality section of the analysis. Segments of the Southern Network include a north-south transmission road adjacent to the eastern edge of the Mojave National Preserve. Therefore, scenic values along this margin of the Preserve may be temporarily impaired, although prevailing winds are usually easterly, away from the Preserve boundary.

4.4.12 Wetlands/Riparian Values

Impacts to riparian values would be negligible under the Southern Network Alternative. The Southern Network does not traverse the Mojave River, or run adjacent to other important hydrologic features. Other larges washes are traversed by the network over paved roadways.

4.4.13 Mitigation

The mitigation measures proposed for the Southern Network Alternative would be the same as those described for the Northern Network Alternative (see Section 4.2.13).

4.4.14 Residual Impacts

Residual impacts from the Southern Network Alternative would be similar to those for the Northern Network Alternative, except for the following.

The Southern Network has a lower potential for mortality to MFTL than the Northern or Central Network. The Southern Network has less suitable MFTL habitat than the Central Network.

No inconsistencies between the Southern Network and the resource values for the ACECs this route would traverse have been identified. The Southern Network would impact fewer ACECs compared to the Northern and Central Network. Therefore, residual impacts to ACECs would be lower under the Southern Network.

Impacts to air quality would be less under this alternative than the Northern and Central Networks, due to the predominance of paved roadways in the Southern Network. The limited fugitive dust emissions (PM_{10}) on unpaved surfaces would settle within 2 hours to 3 days of the traverse of vehicles, unless there are adverse weather conditions.

The Southern Network uses the greatest proportion of paved roadways, including public highways, compared to the Northern and Central Networks. Closure of these roadways would have a bigger impact on the traveling public and require a greater law enforcement effort than the Northern Network. However, it would not limit access to popular recreation areas along I-15.

4.5 COMBINED NETWORK ALTERNATIVE 4

The Combined Network is comprised of all network segments from the Northern, Central, and Southern Networks. Actual use would be similar to that of any one of the previous alternatives, that is, a combination of use of OHV Open Areas and designated routes that would be approximately 200 miles. If this alternative is selected, impacts would be commensurate with one of the previous alternatives, or a combination thereof where Network route connectors exist, rather than cumulative. Therefore, for each issue, the previous route network alternative that would produce the greatest impact is analyzed. This creates an artificially high cumulative impact analysis, since not all combinations of all route networks are simultaneously feasible, but the route combinations possible with this alternative are so varied that this analysis provides the greatest impact that could result to any resource value or use from selection of this alternative as a basis for alternative comparison and does not require the reader to evaluate dozens of analyses.

4.5.1 Vegetation

Impacts to vegetation under the Combined Network Alternative would be the same as those described under the Central Network Alternative, which includes extensive use of unpaved roads coupled with the use of up to three open areas. Damage to vegetation would be limited to open unpaved roadways, consistent with regular roadway use, and to open areas of a similar magnitude, consistent with early spring recreation use anticipated in Stoddard Valley and Rasor OHV areas and the OHV area in Nevada.

Threatened & Endangered, and Sensitive Plant Species

Impacts to the BLM-sensitive Mojave monkey flower would be the same for all Networks. The Mojave monkey flower potentially occurs in the Stoddard Valley OHV area that would be used for the Event under all action alternatives. Plants may be crushed by Challenge and support vehicles during operation of the event, which would be held in March when plants may be developing. Outside of the open area, vehicle operation would be restricted to the roadway so that plants would not be impacted. See

Section 4.2.13 for survey and avoidance measures that would minimize impacts to Mojave monkey flower.

Route segments of the Combined Network traverse white-margined beardtongue habitat only on paved roadways, so that no impacts to this species would result from use of the Combined Network. Impacts to the white-margined beardtongue would be the same for all Networks.

4.5.2 Wildlife

Potential impacts to terrestrial wildlife species are the same as those described for the Central Network, which would allow use of three open areas including Stoddard and Rasor OHV areas and the OHV area in Nevada, so that impacts to wildlife, including the crushing of burrows, would occur there, in addition to direct crushing of wildlife, including small mammal and reptile species, on roadway segments.

Threatened & Endangered, and Sensitive Wildlife Species

Desert Tortoise

Impacts to the desert tortoise under the Combined Network Alternative would be similar to those described for the Central Network Alternative, which traverses the most mileage of BLM Category I habitat, and 54 miles and 59 miles of USFWS Critical Habitat. This is during the non-competitive portion of the route, and, as with dual-sport events, strict speed limits and other measures for conservation and protection of desert tortoise have been developed (see Section 4.2.13).

Mohave Ground Squirrel

Potential impacts to the MGS would be the same as those for the Southern Network, which traverses the known range of the MGS. Direct impacts may include the loss of individual MGS through crushing of animals by event and support vehicles. MGS are active during the time period when the Grand Challenge event would be held, but spend most of their time below ground. They are also fast and would be expected to flee an area when a vehicle approaches, or seek cover under ground when a person approaches. As a result of this behavior the potential for mortality or injury to MGS from operation of the Challenge event is considered very low. Impacts would be lesser under the Northern Network and Central Network which do not traverse MGS habitat.

Mojave Fringe-toed Lizard

Impacts to the MFTL under the Combined Network would be similar in scope and magnitude as those for the Central Network, which has more of the preferred habitat (sandy environments) for the MFTL, than

the Northern or Southern Networks. Direct impacts may include the loss of individual lizards through crushing of animals by event and support vehicles, or through direct contact with event personnel and spectators. Impacts would be expected to be of a similar magnitude consistent with early spring recreation use anticipated in an OHV area.

4.5.3 Areas of Critical Environmental Concern

Specific segments of the Combined Network traverse the ACECs identified below on designated open roadways. In all ACECs Grand Challenge activities would include traverse by Challenge and support vehicles on roadways and pedestrian tortoise monitors adjacent to roadways as needed. No staging areas, public or media viewing areas are located within any of the ACECs.

A particular group of ACECs would be impacted depending on the specific route selected. These may be consistent with the previous alternatives or some new combination, and impacts would be specific to each ACEC. Impact analyses for various ACECs can be reviewed in the previous alternatives, in one of the following groupings.

- Clark Mountain ACEC, Salt Creek Hills ACEC, Amargosa River ACEC, Kingston Range ACEC, Shadow Valley ACEC, Superior-Cronese ACEC, Ord-Rodman ACEC (consistent with Northern Network Alternative)

- Piute/Eldorado ACEC, Afton Canyon ACEC, Cronese Basin ACEC, Clark Mountain ACEC, Manix ACEC, Halloran Wash ACEC, Superior-Cronese ACEC, Ord-Rodman ACEC, Chemehuevi ACEC, Ivanpah Valley, Puite Valley (consistent with Central Network Alternative)

- Piute/Eldorado ACEC, Ord-Rodman ACEC, Chemehuevi ACEC, Puite Valley (consistent with Southern Network Alternative)

See the ACEC section for each Alternative referenced for an analysis of the event's consistency with the established resource values for which each ACEC was designated. No inconsistencies were identified between the event and the established resource values for which each ACEC was designated. Tortoise protection measures are identified in Section 4.2.13.

4.5.4 Air Quality

Impacts to air quality under the Combined Network Alternative would be similar to those described for the Northern Network Alternative. It is assumed that this alternative would include activities and distances traveled on unpaved roads similar to the Northern Network and generate a total of approximately 16.55 tons of PM_{10}. See Section 4.2.13 for reasonably available control measures that would minimize impacts to air quality.

4.5.5 Cultural Resources

Potential direct impacts to prehistoric or historical resources associated with the event include crushing, disturbance by vehicles or pedestrians, or removal of items by pedestrians. Impacts would be limited to OHV areas, unpaved roadways, areas immediately adjacent to unpaved roadways where pedestrian monitoring may occur, and staging areas (start, finish, media locations).

The area traversed by the Combined Network has high potential for concentrations of cultural resources due to the presence of lithic resources, past and current nearby water sources (Mojave River, dry lake beds, Colorado River), as well as other concentrated resources in this network. Utility development has led to excavation of resources in some areas and subsequent conservation of resources in repositories. Roadway and utility footprints generally lack resources and cultural integrity. However, substantial resources may still be present outside of these footprints and could be impacted by pedestrian activities. See Section 4.2.13 for measures to minimize impacts on cultural resources.

Native American Religious Concerns

The area traversed by the Combined Network has a high potential for Native American sacred sites to be located nearby, due to the occurrence of natural resources in this area (water sources, areas of higher elevation, lithic resources). Sacred sites can vary in scale from specific locations to a particular mountain or area. Disturbance from event operations near sacred sites would be limited to traverse by vehicles on open routes and pedestrian monitoring activities. Access to sacred sites during operation of the event may be limited if the site would normally be accessed via a route segment. Native American and public access to a sacred site may be temporarily precluded if the site would normally be accessed via a vehicle and route segment that is being closed for the Grand Challenge event.

4.5.6 Water Quality

Impacts to water quality under the Combined Network Alternative would be similar to those described for the Central Network Alternative, which includes a route segment on the Mojave Road which is coincident with the floodplain of the Mojave River. It is assumed that this alternative would traverse and parallel the Mojave River over a greater distance than the Northern and Southern Network Alternatives, potentially contributing to localized, short-term turbidity in the water.

4.5.7 Wastes, Hazardous or Solid

Impacts related to wastes under the Combined Network Alternative would be the same as those described for the Northern, Central, and Southern Network Alternatives. The event may contribute to trash which diminishes the appeal of the desert environment and attracts ravens that prey on young desert tortoise.

DARPA would provide covered trash bins and ensure that all trash is recovered following the event. A Spill Prevention and Cleanup Plan would be prepared and implemented to address the potential release and cleanup of any automotive fluids.

4.5.8 Safety and Law Enforcement

Impacts related to safety and law enforcement under the Combined Network Alternative would be similar in scope to those described for the Northern Network Alternative. Safety and law enforcement issues associated with the Grand Challenge include: 1) law enforcement support and potential hazards associated with implementing a recreation and access closure on the Challenge route, and 2) the risk of a collision with a Challenge Vehicle.

Depending on the specific route used, this Alternative may require closure of paved roads including highways, unpaved roadways, and up to three open areas. Depending on how spread out the Challenge Vehicles are, some segments may be open intermittently for traffic to cross to assure private land access and other needed access by non-participants. In other areas, where traverse is not essential, segments would remain closed until all Challenge Vehicles have crossed that segment, or have been disqualified. Closure of highways has a bigger impact on the traveling public and requires a greater law enforcement effort then closure of unpaved roadways and open areas. With the expertise of professional law enforcement officials, road closures are expected to be highly effective so that the public remains outside of the closure, or in designated areas, and hazards would be minimized.

Because Challenge Vehicles would operate unmanned and fully autonomous, they are a potential hazard to people and private property. This was understood early in the planning stages for the Grand Challenge, so that measures to ensure public safety have been planned into the event. DARPA has a comprehensive safety system planned to ensure public safety during operation of the Grand Challenge (see Section 4.2.8).

4.5.9 Utilities

Impacts to utilities under the Combined Network Alternative would be the same as those described for the Northern, Central, and Southern Network Alternatives. Event operation may inhibit the ability of utilities to access their utility lines. Utilities would be able to schedule routine maintenance outside of the days for the Grand Challenge event, but would need immediate access to power lines in the event of a break. DARPA has contacted the impacted utilities and will enter into an agreement with each utility to provide any essential access to their lines.

4.5.10 Recreation

Impacts to recreation under the Combined Network Alternative would be similar in scope to those described for the Northern Network but may involve other specific geographical areas. Depending on the specific route used, this Alternative may require closed access to portions of up to 3 OHV areas, and inhibit travel to areas with high recreation values such as Clark Mountain and Afton Canyon, or Joshua Tree National Park via Highway 247. Since only a portion of the OHV areas would be used, the balance of the areas would be open to use for the public, as would other OHV Open areas, such as El Mirage Cooperative Management Area. The available area for OHV use would be more crowded during the affected weekend, somewhat diminishing the recreating experience.

During the event, access to travel on the selected route segments would not be allowed, thereby limiting available acreage for four-wheel drive exploring, sight-seeing, and other recreation activities. In addition, destinations that would only be accessible by the particular route segments being used would also be temporarily limited. For instance, use of the segments from the Northern Network may eliminate access to the northern portion of Clark Mountain ACEC during the field test event, while use of Central Network segments may limit access to the popular Afton Canyon/Rasor area.

4.5.11 Scenic Values

Short-term impacts to visibility may occur along portions of the route as a result of fugitive dust generation by vehicle passage. This impact would dissipate within 2 hours to 3 days of the event and is further discussed in the air quality section of the analysis. Depending on the specific route used, view sheds along I-15, along the routes within the Boulder Corridor, or on the eastern margin of the Mojave Preserve may be temporarily impaired.

4.5.12 Wetlands/Riparian Values

Impacts to riparian values under the Combined Network Alternative would be the same as those for the Central Network Alternative, which traverses a greater portion of riparian areas compared to the Northern or Southern Network Alternatives. In addition to traversing the Mojave River northeast of Daggett, the Central Network also traverses the Mojave River west, east and through Afton Canyon, and through Manix Wash and Halloran Wash. Specific route segments of this network include portions of the historic Mojave Road, a popular open route which is sometimes coincident with the floodplain of the Mojave River, an active riparian zone. Sandy soils in this area minimize impacts to riparian soils, but active road use inhibits riparian vegetation growth. In this vicinity the route passes adjacent to active riparian vegetation. However, this event/activity alone is not substantial due to regular and frequent use of the Mojave Road. The route will also traverse Manix and Halloran Washes. In these areas, where the route

would traverse, riparian vegetation is lacking, so that no impacts to riparian values are anticipated from operation of the event under this Alternative.

4.5.13 Mitigation

The mitigation measures proposed for the Combined Network Alternative would be the same as those described for the Northern Network Alternative (see Section 4.2.13).

4.5.14 Residual Impacts

Residual impacts from the Combined Network Alternative would be similar to those for the Northern Network Alternative, except for the following.

There may be a higher potential for mortality to MFTL under the Combined Network compared to the Northern and Southern Network Alternatives, due to a greater amount of suitable habitat in this Alternative.

The Combined Network users a greater portion of paved roadways, including public highways, compared to the Northern Network. Closure of these roadways would have a bigger impact on the traveling public and require a greater law enforcement effort than the Northern Network.

4.6 NO ACTION ALTERNATIVE

4.6.1 Vegetation

Under the No Action Alternative impacts to vegetation from operation of the Grand Challenge event would be avoided. Impacts from regular weekend use of the OHV Open areas, including the area temporarily closed, would occur in its stead. These impacts include typical early spring OHV activity within the OHV areas, both on and off of designated open routes.

Threatened & Endangered, and BLM-Sensitive Plant Species

Under the No Action Alternative impacts to the Mojave monkey flower from operation of the Grand Challenge event in the Stoddard Valley OHV area would be avoided. Impacts from regular weekend use of the Stoddard Valley OHV Open area would occur in its stead. These impacts include typical early spring OHV activity both on and off of designated open routes.

The No Action Alternative would not result in any changes in the population or status of the white-margined beardtongue.

4.6.2 Wildlife

Under the No Action Alternative impacts to terrestrial wildlife from operation of the Grand Challenge event would be avoided. Impacts from regular weekend use of the OHV Open areas, including the area temporarily closed, would occur in its stead. These impacts include typical early spring OHV activity within the OHV areas, both on and off of designated open routes.

Threatened & Endangered, and Sensitive Wildlife Species

Desert Tortoise

Under the No Action Alternative impacts to the desert tortoise from operation of the Grand Challenge event would be avoided. No desert tortoise BLM Category I or critical habitat would be potentially affected by the Grand Challenge Event.

Mohave Ground Squirrel

Under the No Action Alternative impacts to the MGS from operation of the Grand Challenge event would be avoided.

Mojave Fringe-toed Lizard

Under the No Action Alternative impacts to the MFTL from operation of the Grand Challenge event would be avoided. Impacts from regular weekend use of the Rasor OHV Open area would occur in its stead. These impacts include typical early spring OHV activity both on and off of designated open routes, including aeolian (sand) habitat of MFTL.

4.6.3 Areas of Critical Environmental Concern

Under the No Action Alternative no inconsistencies between ACEC management plans and the Grand Challenge event would occur. Use of ACECs consistent with specific management plans would continue. Therefore, the No Action Alternative would not contribute to any inconsistency with ACEC management plans.

4.6.4 Air Quality

Under the No Action Alternative no fugitive dust emissions (PM_{10}) from use of OHV areas and unpaved roads would be created by operation of the Grand Challenge event. Fugitive dust emissions from regular weekend use of the OHV Open areas, including the area temporarily closed, would occur in its stead.

These impacts include typical early spring OHV activity within the OHV areas, both on and off of designated open routes.

4.6.5 Cultural Resources

Under the No Action Alternative impacts to cultural resources from the Grand Challenge event would be avoided. Therefore, the No Action Alternative would not contribute to any changes related to impacts to cultural resources.

Native American Religious Concerns

Under the No Action Alternative, any impacts to known or unknown Native American Religious Concerns or Sacred Sites from the Grand Challenge event would be avoided, including short-term restriction of access.

4.6.6 Water Quality

Under the No Action Alternative the Grand Challenge event would not contribute to any water quality impacts, including turbidity. Impacts from regular weekend use of the Afton Canyon ACEC, Mojave Road, and Rasor OHV Open Area would occur in its stead. This use would result in minimal turbidity impacts to the Mojave River crossings similar in scope to those described under the Central Network Alternative, based on the relatively lower levels of casual public use anticipated on that day.

4.6.7 Wastes, Hazardous or Solid

Under the No Action Alternative the Grand Challenge event would not contribute to any trash or hazardous waste.

4.6.8 Safety and Law Enforcement

Under the No Action Alternative impacts to safety and law enforcement related to the Grand Challenge event would be avoided, and no law enforcement efforts or road closures would be required.

4.6.9 Utilities

Under the No Action Alternative impacts to utilities related to the Grand Challenge event would be avoided, and no access limitations to utility corridors would result.

4.6.10 Recreation and Access

Under the No Action Alternative impacts to recreation and access would be avoided, and no access limitation to recreation areas would result.

Under the No Action Alternative, the opportunity for the public to view the Grand Challenge Robotic Demonstration and Competition, either directly or later through the eye of a camera, would be foregone.

4.6.11 Scenic Values

Under the No Action Alternative, short-term impacts to visibility resulting from fugitive dust emission from operation of the Grand Challenge event would be avoided

4.6.12 Wetlands/Riparian Values

Under the No Action Alternative the Grand Challenge event would not result in any impacts to wetlands or riparian values. Therefore, the No Action Alternative would not contribute to changes in impacts to wetlands or riparian values.

4.6.13 Mitigation Measures

No mitigation measures are proposed for the No Action Alternative.

4.6.14 Residual Impacts

Selection of the No Action Alternative would mean that the Grand Challenge event would not be held, and impacts associated with this specific activity would not occur. Therefore, residual impacts from the No Action Alternative represent the continuation of existing environmental conditions and ongoing impacts in the APE, consistent with area-wide and site-specific BLM management plans for this region.

Impacts would be limited to those resulting from typical weekend use of the Stoddard Valley, Johnson Valley, Rasor, and Nevada OHV areas. In OHV areas, vehicles are allowed to travel cross-country, which may result in the crushing of vegetation, lizards and other small wildlife, and burrows that provide habitat for wildlife.

In the Stoddard OHV area, cross-country travel may result in the crushing of the annual plant, the Mojave monkey flower, if present. If crushed prior to release of seed, this could adversely affect future populations of this and other plants, as identified in the CDCA Plan, Appendix V.

Impacts to desert tortoise, MGS, and MFTL would be limited to those resulting from typical early spring weekend use of open areas and open routes by the recreating public. Therefore, the No Action Alternative would not result in any changes to management areas or critical habitat, nor contribute to changes in impacts to Threatened and Endangered Species.

Impacts to visibility would be limited to those resulting from typical early spring weekend use of open areas and open routes by the recreating public, and would in most cases be similar to the Action Alternatives.

4.7 CUMULATIVE IMPACTS

BLM and Department of Defense regulations implementing NEPA require that the cumulative impacts of a proposed action be assessed. CEQ regulations implementing the procedural provisions of NEPA define cumulative effects as: "The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1507).

The cumulative effects region (CER) for which effects of the proposed action and other past, proposed, and reasonably foreseeable actions would be cumulatively recorded or experienced includes San Bernardino, southeastern Inyo, and western Clark Counties. Therefore, this analysis considers additional effects arising from the proposed action with effects of other known past, present, and reasonably foreseeable actions in the CER. In Fiscal Year 2003, approximately 100 OHV event permits were cumulatively authorized by the Barstow, Needles, and Las Vegas Field Offices within the CER. This is typical of permitted OHV activity in the high desert in recent years. It is anticipated that permit activity will moderately increase in the reasonably foreseeable future, consistent with continued population growth anticipated in the region. Other permitted activities which generate cumulative effects include mining plans of operation. The BLM permitted or renewed approximately 10 plans in 2003 in the CER. Some years this number is lower, depending on mining interest and economic conditions. The other factors in cumulative effects in the high desert are casual use activities which the BLM does not permit, on paved and unpaved roads. The BLM does not have records on the level of casual use activities, except at El Mirage Cooperative Management Area. Casual use at this OHV Open area near the Victor Valley metropolitan area, after briefly leveling off in the mid 1980's, is increasing at a modest pace along with the population increase in the Valley.

Due to the fact that both San Bernardino and portions of Clark Counties are in non-attainment for PM_{10} with Clean Air Act National Ambient Air Quality Standards and because this event occurs on a popular weekend for motorized recreational activity in the desert, all action alternatives would contribute to short-term cumulative impacts on air quality. These impacts would dissipate within approximately 48 to 72 hours following the completion of the event, depending upon weather conditions.

Cumulative impacts to cultural resources are anticipated and will be similar to direct and indirect impacts described under all of the action alternatives. Loss or destruction of cultural resources within and adjacent to the Stoddard Valley and Johnson Valley OHV Areas has occurred as a result of increased use of these areas over time and is unavoidable. Additional damage to and destruction of cultural resources during and after the event could contribute to the cumulative loss of irreplaceable, scientifically important information contained in known and unknown cultural resources in the OHV open areas. In addition, some of the designated open routes in the East Mojave have had historical significance in the settling of the west and/or its growth. While the integrity of these resources has been depleted through many years of continued use and sometimes has been substantially altered or lost in areas through paving over of original sections of historic routes, evidence remains in areas of earlier times, and continues to be at risk until survey and recovery is complete for these eligible properties. All other sites determined eligible for the National Register of Historic Places that could be impacted by the event would be avoided.

Cumulative impacts in relation to threatened and endangered species (desert tortoise) would occur if additional desert tortoise habitat take in the form of desert tortoise injury or mortality occurs because of collisions with Grand Challenge Event robotic or support vehicles. The likelihood of this occurring on a given length of route in the CER would be considerably less because impacts with Event vehicles would be confined to the narrow width of route boundaries as defined by the lateral boundaries available to robotic vehicles within the roadways. Desert tortoise pre-sweeps and rolling sweeps will further reduce the potential for take. Therefore, outside of the OHV Open Areas, the Event is not anticipated to have a substantial contribution to cumulative impacts to desert tortoise in the CER.

However, in the OHV Open Areas, the robotic vehicles have much greater flexibility to traverse, including off-road within desert tortoise habitat in a much wider lateral boundary. Given the same length of travel in an OHV open area compared to outside of an open area, collisions between vehicles and desert tortoise would be more likely to occur in the open area. Additionally, the odds of a desert tortoise being crushed in a burrow would also be much greater in an OHV Open area. In non-Open Areas, vehicles would very likely not encounter desert tortoise burrows. The percentage of miles of any particular route within an open area would be small (less than 10%) compared to routes outside of OHV Open Areas. Further, OHV Open Areas do not include critical habitat. It is anticipated that few, if any desert tortoises would be killed or injured by Event participants, with the mitigation identified in Section 4.2.13, but if weather conditions are adverse (desert tortoise are active), take in the form of harassment could be substantial. Therefore, some contribution to cumulative effects within the OHV Open areas is possible, in the form of additional harassment of desert tortoise, in conjunction with the harassment and take caused by other casual users in the CER.

Other Phases of the DARPA Grand Challenge would not contribute substantively to cumulative impacts, with the exception of Phase 3, the Qualification, Inspection, and Demonstration (QID) Phase. This would take place at the California Motor Speedway and environmental impacts associated with QID activities are primarily associated with noise, and air pollution of the surrounding areas, oil pollution from leaking

vehicles, potential safety risk to participants and attendees during testing, and transportation safety to the start point. These types of impacts are consistent with those of other events conducted at the Speedway, and compared with other activities at the Speedway, impacts from the Grand Challenge would result in minimal impacts. In addition, the contribution of Phase 3 activities to the overall impacts of the Grand Challenge is anticipated to be minimal as well.

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