Appendix F
Restoration Techniques

Ash Hill Communication Site
Restoration Techniques

To mitigate for impacts to the ground disturbance cap by the development of the communication lease area and use of an existing undesignated route for access, ground disturbance will be mitigated at a ratio of 3: I, for a total of 1.23 acres, through one or more of the following techniques. These techniques are intended to help reduce the occurrences of inappropriate route use by restoring and camouflaging undesignated routes. Restoration would be conducted on the first 100-150 feet of the routes.

- **Vertical Mulching***:* Dead plant material would be placed at the beginning of illegal routes in the line-of-sight off of BLM-designated routes to disguise the routes and deter additional illicit OHV traffic. Large dead pieces of plants (e.g., nearby trees, including Joshua trees, shrubs, and materials cleared from the communication site and access road) and rocks placed on the soil surface can act as barricades. Similarly, shrubs or branches planted upright in the soil make the trail blend in with surrounding vegetation. Mulch would be placed in a naturally appearing random pattern, with some scattered on the surface of the soil, and some vertically planted back into the soil. Vertical mulch also benefits restoration by trapping wind-blown seeds and lessening wind erosion just above the ground surface. This work would be primarily accomplished with hand tools. Little soil disturbance would occur, except where mulch is "planted" and thus requires a small hole to anchor the material.

- **Soil Decompaction***:* Undesignated routes with repeated OHV traffic may require soil decompaction to increase water infiltration and facilitate seed germination. Improving water infiltration also allows burrowing wildlife, such as desert tortoise, to inhabit the soil again. Workers would preferably use hand tools such as soil spades, spading forks, and shovels to loosen the top 2 to 6 inches of soil.

- **Mechanical Ripping:** Routes too compacted or wide for use of hand tools may require mechanical ripping to a depth of 6 to 10 inches. A trail bulldozer or grader would pull an attachment to mechanically rip the soil. After ripping, hand tools would be used to camouflage bulldozer tracks. Ripping may provide conditions for germinating nonnative invasive plant species. Therefore, weed control measures would be implemented to limit the spread of these species.

- **Soil/Vertical Pitting***:* Soil/vertical pitting of the soil surface would be applied in key areas to create depressions for windblown seeds, provide for local water collection and increased infiltration, reduce surface erosion, discourage vehicular traffic, and create a visual texture to the surface that blends with surrounding undisturbed areas. Soil/vertical pitting contours the soil to direct water flow and draw windblown seeds to focal spots on the ground. Pits would be approximately 1 to 2 feet wide, 6 inches deep, and spaced 1 to

2 feet apart in order to provide the estimated amount of water that may be needed for a plant to naturally germinate and grow in an arid environment. Pitting would create suitable microsites to increase seed germination rates and to promote higher survival and growth rates of small plants. This work would be done by shovel, spade, or power auger. Vertical mulch would be added as needed to some of the vertical pits.

- **Soil Imprinting***:* Soil imprinting would entail raking small trenches to roughen the texture on surface soil and to collect windblown seed. Hand tools such as shovels and rakes would be used in sites with fragile soils or steep slopes.

- **Raking***:* On undesignated routes formed from a single trespass (one person on one vehicle at one time) or on routes with scarce vegetation, work crews would rake or sweep, usually with a broom, the top 1 inch of soil to hide evidence of tracks. Soil surfaces may also be contoured to match surrounding land. Hand tools would be the primary method used for this work.

- **Rocks**: A row of large rocks and boulders would be used as barriers to deter use in especially fragile areas. Placement of small rocks would require no equipment and little or no soil disturbance. Large rocks may also be used through the use of dump trucks, trailers, and loaders. Large rocks and boulders removed to the side of the disturbance shall be placed back with the darkened/naturally varnished side facing up in a natural appearing pattern. To help ensure that rock placement appears natural, several rocks would be partially buried into the soil surface (similar to original conditions), rather than being set only on top of the surface.

- **Planting Vegetation***:* Revegetating would involve directly planting native species in the line-of-sight from a BLM-designated OHV trail to accelerate improvements to soil stability, vegetation cover and diversity, and wildlife habitat. Eventually revegetation would disguise routes. Planting would make use of hand tools (shovels) and some mechanized equipment (augers) to dig holes up to 2 feet deep and 1 foot wide, for the largest transplants. In extraordinary cases, transplantation of larger plants would require somewhat larger holes potentially up to 3 feet deep and 3 feet wide. After planting, work can contour soil to direct the flow of rainwater or irrigation water to plant roots.

- **Seeding:** Seeding would require rakes to collect seed from seed banks in the soil or from dried seedpods still attached on plants. Hand sowing would be used to spread seeds across the soil surface. Raking would disturb, at most, the top 1 inch of soil. Hand seeding also may be concurrent with soil pitting (see above) to improve seed germination rates. Several methods described herein provide a seedbed for seed already onsite.

- **Removing Manufactured Materials and Structures:** A restoration team would remove litter and other unsightly or potentially dangerous manufactured materials or structures less than 50 years old. If the restoration team discovered materials more than 50 years

old, they would consult with the BLM archaeologist. The archaeologist would assess whether removing any materials older than 50 years is appropriate and what archeological documentation is required. Removal would include large structures and materials of nonhistorical value such as abandoned automobiles, fences, and buildings, including those built in trespass.

Impacts of route restoration are expected to be less than the communication site due to the limited ground disturbance of restoration techniques and the brief and temporary use of personnel and equipment. The same Applicant proposed measures/design features as described for the communication facility would be followed, except for installation of desert tortoise fencing

Limited pollutant emissions would occur during route restoration, principally from the use of equipment where rehabilitation is taking place, additional vehicle travel by rehabilitation crews, and the surface disturbance caused by the rehabilitation process. Typically, only one or two pieces of equipment would be in use at any one time, and the duration of use would be temporary and brief. Overall, there would be a long-term positive effect to air quality from the reduction of undesignated routes and revegetation of the surface. These actions would reduce particulates introduced to the air through vehicle travel and wind.

Wildlife would benefit from the decrease in vehicle traffic through their habitat. Routes would grow over and reseed, creating new forage and undisturbed habitat. Native vegetation in the restored areas would be allowed to proliferate undisturbed.

Route restoration could result in a perceived limitation on opportunities for motorized vehicle use and related recreational activities. There would be a negligible effect on OHV riding in the restoration areas because the routes that would be restored are undesignated and not legally available for riding on now. The proposed route restoration does not affect the existing legal riding opportunities. There would be positive benefits to travel in the area because the route restoration would clarify the open route network. Open routes provide a sufficient network to access the restoration areas for recreation purposes. The restoration effort would cause the undesignated routes to be less noticeable.

Restoring the surface contour and vegetation cover in the bed and side banks of undesignated routes to a natural contour can improve soil conservation. Steep terrain is particularly vulnerable to losing soil crusts and mineral soils after OHV impact. Decompaction would increase water infiltration and facilitate seed germination. Improving water infiltration also allows burrowing animals, such as ants and rodents, to inhabit the soil again. Decompaction may promote seed germination of nonnative invasive species.