Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

NRCS, CA
July, 2000

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

LAND RECONSTRUCTION, ABANDONED MINED LAND
(acre)
CODE 543

DEFINITION
Restoring land and water areas that are adversely affected by past mining practices and increasing the productivity of the areas for a beneficial use.

PURPOSES
To stabilize mined areas so that they can be used to support desirable vegetation; reduce erosion and sedimentation; enhance water quality or quantity; maintain and improve the visual quality of the landscape; and protect public health, safety, and general welfare.

CONDITIONS WHERE PRACTICE APPLIES
Abandoned mined land that degrades the quality of the environment, prevents or interferes with the beneficial use of land or water resources, or endangers the health or safety of individuals.

CRITERIA

Site preparation
Unsuitable soil material must be removed and buried so that it does not adversely affect water quality or plant growth. Boulders, other rocks, and similar materials shall be buried or otherwise placed where they do not interfere with water disposal practices, stabilization operations, and the planned use of the land. These materials must be disposed of in a manner that minimizes the potential for seepage that can pollute surface and ground water. Materials containing heavy metals must be buried to a depth below the root zone, or suitable kinds and amounts of soil amendments must be added.

Removal and placement of material for final cover
An effort should be made to reconstruct the soil with material available on site. If feasible, soil material suited to plant growth shall be salvaged, stockpiled, and protected for use as final cover material.

The reconstructed soil must meet the requirements for the specified land use on at least 80 percent of the area. The rest of the area must be in such a condition that it can be stabilized.

The salvaged material and other suitable materials must be spread over the graded areas to the depth specified in the reclamation plan. The final slope must permit application of needed conservation and management practices to keep soil losses at permissible levels. If settlement is likely to interfere with the planned use of the land, surface drainage, or water disposal, allowances must be made for the expected settlement during final grading.

Protective measures in areas with highwalls and landslides
Provisions must be made to reduce potential safety hazards and erosion and water pollution problems in areas that have highwalls and landslides. Treatment shall meet or exceed the requirements of NRCS standards for landslide treatment (453) and highwall treatment (456) as appropriate.

Water disposal
The need for a water disposal system shall be carefully analyzed, and if needed, it shall be included in the design. The system must be intensive enough to control erosion during stabilization and after. If any practices are to be removed after vegetation is established, provisions must be made to promptly stabilize all disturbed areas. Water disposal systems suitable for erosion control on intensively farmed cropland are usually required for mine reclamation and may be used as a guide in the absence of local experience.

Landscape resources
The appearance of the reclaimed site must be in accordance with standards for maintaining and improving the visual quality of the landscape and must be compatible with the adjacent landscape. Areas of high public visibility or those offering direct or indirect
human benefits shall be evaluated and considered in landscape resource management planning and design. Soil piles and borrow areas should be shaped to blend with the adjacent landscape.

Establishment

Due to the nature of mine reclamation work, it is not always possible to achieve complete stabilization with the first effort. Provisions should be made to promptly fill and vegetate areas of excessive settlement, repair and revegetate bare spots and eroded areas, add soil amendments or replace with suitable soil materials, add plant nutrients to achieve acceptable plant development, and install any additional structural measures needed, such as terraces, lined waterways, and grade stabilization structures.

Restoration of borrow area

If cover material is taken from an area outside the site, the borrow area must be graded and reshaped to insure proper drainage and must be revegetated to control erosion.

If the cover material is taken from adjacent farmland, the topsoil from the area must be stockpiled separately and then replaced after the land is restored for its intended purpose.

If the borrow area is prime farmland, the A and B horizons (or the B and C horizons if applicable) must be removed and stockpiled separately by horizon and then replaced on the borrow area in natural sequence. The combined thickness of the replaced horizons should be adequate to restore the original soil productivity.

CONSIDERATIONS

Evaluate the properties of the soils, including geologic and hydrogeologic values; the quantity and quality of water; and the potential of related resources to determine their suitability for use in reconstruction operations. Consider measures for placement of soils or spoil materials; location of access roads; potential for water disposal and impoundment's; measures to enhance visual resources; provisions for controlling erosion and sedimentation; practices for eliminating public health or safety hazards; and suitability of the reclaimed land for its intended use.

Land reconstruction on abandoned mined lands shall include the components necessary to reclaim and stabilize the area and prevent further degradation of air, water, soil, and plant resources. The system may consist of one or two components or several. The land reclamation standards shall be used for those components such as fire control (451) and toxic discharge control (455). Traditional practices such as terraces, grade stabilization structures, and critical area treatment components shall be used also as appropriate.

This practice is a management system that may combine practices to most conservation goals. Consult the planning considerations for water quantity and quality for the practices used in this system.

A special concern is the potential for uncovering or redistributing toxic materials from earth moving activities.

Endangered Species Considerations

Determine if installation of this practice with any others proposed will have any effect on any federal or state listed Rare, Threatened or Endangered species or their habitat. NRCS's objective is to benefit these species and others of concern or at least not have any adverse effect on a listed species. If the Environmental Evaluation indicates the action may adversely affect a listed species or result in adverse modification of habitat of listed species which has been determined to be critical habitat, NRCS will advise the land user of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the landowner selects one of the alternative conservation treatments for installation; or at the request of the landowners, NRCS may initiate consultation with the Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game. If the Environmental Evaluation indicates the action will not affect a listed species or result in adverse modification of critical habitat, consultation generally will not apply and usually would not be initiated. Document any special considerations for endangered species in the Practice Requirements Worksheet.

Some species are year-round residents in some streams, such as, freshwater shrimp. Other species, such as steelhead and salmon, utilize streams during various seasons. Be aware that during critical periods, such as spawning, eggs in gravel's, and rearing of young may preclude activities in the stream that may directly affect the stream habitat during those periods. For example there should be no disturbance of stream gravel beds that may have eggs in them. That could include any equipment in the stream or even walking in the stream.
or work upstream that may result in sediment depositing in the gravel beds. Document any special considerations for endangered species in the Practice Requirements Worksheet.

**Water Quantity**

1. Effects on the water budget, especially on volumes and rates of runoff, evaporation, and infiltration.

2. Potential for changes in plant growth and transpiration because of changes in the soil water.

**Water Quality**

1. Effects on erosion and the movement of sediment, pathogens, and soluble and sediment-attached substances carried by runoff.

**PLANS AND SPECIFICATIONS**

Plans and specifications shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

Areas to be graded shall be cleared of trees, logs, brush, rubbish, and other undesirable materials that can prevent proper application of the practice. These materials shall be disposed of in a manner that precludes interference with water disposal practices or the operations associated with the planned use of the land.

Materials suited to growing vegetation shall be stockpiled and protected for use as final cover. Vegetation that can be saved should be properly identified and protected. Temporary seeding, mulching, water disposal, and similar measures to help control erosion should be used as necessary.

Overhanging rocks and walls that are to be covered shall be sloped 1/2 to 1 before the soil is placed against the wall, unless a flatter slope is needed for stability. The area shall be shaped to the line and grade shown in the plans or as staked in the field. Unless otherwise specified, fill material shall be spread in successive layers not more than 2 ft thick.

Boulders and other rocks shall be covered to the depth specified for the planned land use.

After major earthmoving is completed, the cover material should be spread over the surface. The work shall be finished according to the design and to the tolerances specified in the plans.

If borrow material from areas outside the reclamation site is used, these areas must be graded, reshaped, and left as specified or shown in the plans.

**OPERATION AND MAINTENANCE**

A plan shall be prepared that provides specific details concerning maintenance and operation of conservation practices identified in the reclamation plan. The maintenance and operation plan should specify procedures for filling areas where settlement may adversely affect drainage and land use; promptly repairing and revegetating bare spots and eroded areas; adding soil amendments to soils that cannot support adequate vegetation or replacing them with suitable soil material; maintaining access roads; keeping drainage structures and channels clean and functional; applying fertilizer and lime; controlling weeds; using proper grazing practices; and controlling vehicular traffic.