SECTION II

TABLE OF CONTENTS

II – MINED LAND INTERPRETATIONS

INTRODUCTION

Various interpretations can exist here including the potential of the soil as a source of certain construction materials, the potential for certain minerals to occur, and the revegetation issues associated with reclamation of mined land. Interpretations for mined land reclamation, revegetation, and maintenance are locally developed. Guides are available in the *USDA, NRCS National Soils Handbook* (Table 603-25) for rating the suitability of soils as reconstruction material for drastically disturbed areas.

Soil as a Source of Construction Materials

Within the soil survey report tables and the section on "Use and Management of the Soils," is information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair*, or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. Soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments. *Sand* and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. Specifications for each type of use vary widely. Only the probability of finding material in suitable quantity is evaluated. The properties used to evaluate the soil as a source of sand and gravel are gradation of grain sizes, the thickness of suitable material, and the content of rock fragments. *Topsoil* is used to cover an area so that vegetation can be established and maintained. Soils are rated for use as topsoil and for the reclamation potential of the borrow area. The rating is based on various factors affecting plant growth (including toxic material, soil reaction, available water capacity, and fertility); the ease of excavating, loading and spreading the material (affected by rock fragments, slope, water table, soil texture and thickness of suitable material); and reclamation of the borrow area (affected by slope, water table, rock fragments, bedrock and toxic material).

Potential for Minerals to Occur

Information on the potential for certain minerals to occur can be found with the California Department of Conservation, Division of Mines and Geology (DMG). Their Website address is http://www.consrv.ca.gov/dmg/index.htm. DMG develops and interprets information concerning California's geology, mineral resources, and seismology through

reports and maps. Examples of some of the reports available from DMG are the County Reports, which provide localized information on the mines and mineral resources of specific counties; mineral hazards reports (e.g. the presence and location of asbestos); and specialized reports on different geology and mining topics. DMG also publishes reports on soil-related and other natural hazards such as mudslides, debris flows, landslides, and earthquakes. Information on oil, gas and geothermal wells can be found at the Department of Conservation Website at http://www.consrv.ca.gov/dog/index.htm.

Management of Disturbed Land (Mined Land Reclamation)

Soil properties should be considered in managing and reclaiming mined lands. Potential considerations include soil organic matter content, soil pH (will be typically acidic), bulk density, compaction, available water capacity, and erosion hazard.

The organic matter content is considerably lower in formerly mined soils than in natural soils. A high bulk density is common in both the replaced soil material and the underlying graded spoil. The compaction is a result of the use of heavy machinery, especially wheeled reclamation equipment; excessive handling of topsoil materials when it is stockpiled and spread; mining and reclamation activities performed under unfavorable moisture conditions; and insufficient time for soil-forming processes to decrease the bulk density. The high bulk density reduces the available water capacity and retards plant growth. As a result, it is more difficult to establish vegetative cover.

Although highly variable, the content of rock fragments in mine spoil is generally higher than the surface layer of most soils. Rock fragments reduce the available water capacity and few roots penetrate the compact, massive spoil material.

Planting suitable grass and legume species improves soil structure, reduces bulk density, and increases the organic matter content, the water infiltration rate, pore space, and root growth in formerly mined soils. The established grasses and legumes provide soil protecting cover and reduce the susceptibility to runoff and erosion. The NRCS Vegetative Guide (Technical Guide, Section II) provides vegetative recommendations for planting in these areas (critical area planting practice).

Thin stands should be reseeded. Conservation tillage methods of seedbed preparation that keep plant residue on the surface, including no-till planting, reduce the hazard of erosion. Companion crops also reduce this hazard.

Formerly mined lands generally are unsuited to grazing in winter, when they are wet. Winter grazing can result in compaction and damage to the plants and can increase the erosion hazard. These soils are better suited to frequent, light applications of fertilizer than to larger applications because of the loss of plant nutrients through runoff and the concentration of roots in the upper few inches of the soil.

Other considerations when reclaiming or otherwise managing mined lands include filtering out heavy metals (will affect vegetation establishment); presence of asbestos,

mercury and other toxic minerals; water quality issues; and structural stability associated with abandoned shafts and tunnels.

Information on reclaiming mined lands can be found with the California Department of Conservation, Office of Mine Reclamation (OMR). Their Website address is http://www.consrv.ca.gov/omr/index.htm.