

ENGINEERING GEOLOGY

As part of the Management Plan's data gathering effort, the Division of Geologic and Geophysical Surveys compiled a report titled "Engineering Geology of the Matanuska Valley Moose Range Area." This report provided important resource information for use in reaching management decisions within the Range. Engineering geology maps are shown in Appendix VII on pages 237-245.

RESOURCE DESCRIPTION

Engineering geology describes all of the unconsolidated superficial deposits overlying bedrock. These materials are mapped and classified according to genesis, texture, composition, and material lithology. The Matanuska Valley is among the more dynamic regions in Alaska. The bedrock in the Moose Range is primarily young (less than 85 million years old) sedimentary rock of both marine and non-marine origins. Bedrock of igneous origins is also present in various areas of the Moose Range.

Several million years of uplift, folding, erosion and deposition have resulted in a complex geomorphology and a variety of surficial material types. The past 2 million years have seen numerous glacial advances, retreats and resulting stream flow which rearranged the surface materials into glacial formations (e.g. till, moraines), fluvial deposits (e.g. alluvium, terraces) and gravity related formations (e.g. landslides and talus deposits). Even today, natural forces in the form of active faults, gravity, glaciers, rock glaciers, stream action and frost action are changing the geomorphology of the Moose Range. Human actions to a lesser extent are also contributing.

RESOURCE EVALUATION

Engineering geology information can be applied in locating construction materials and engineering constraints. Often road construction or other infrastructure development will be most cost effective and maintenance free when located in areas rated good for material sources. The Moose Range has plenty of sand and gravel available for both large scale construction projects and community needs for many years to come. Construction materials are covered in more detail in the resource description above.

Application of information from the Engineering Constraints Section in the report (listed above) is important for public safety as well as cost effectiveness or development. Four types of constraints were noted in the Moose Range: 1) unstable slopes (landslide, talus slope); 2) unsuitable foundation soils (wetlands, mine tailings); 3) rock glaciers; and 4) fault zones (see Appendix VII on page 237). Unstable slopes are generally found along the Talkeetna Mountain front and along the major drainages. However, these conditions are also found in the Wishbone Hill area, a region with high potential for development. The unsuitable foundation soils are primarily

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isolated pockets of poorly drained, nearly level soils. Mine tailings are also unsuitable but are limited in extent. Rock glaciers are commonly found along upper reaches of the major drainages. This is fortunate in that there is low potential for development where they are found.

The major fault on the north side of the Matanuska Valley, the Castle Mountain Fault, traverses the Moose Range from west to east. The fault is shown in Appendix VII on page 243. Being an active fault means there is potential for ground creep or even major movement during an earthquake. The above-mentioned constraints present more of a limitation on infrastructure development than for recreation, although these factors should be weighed when locating trails and other recreation facilities. These constraints are found in a small portion of the Range and can be mitigated by avoidance of the area or, in some cases, proper design.

Other features related more to public safety that should also be addressed are snow avalanche potential and flood hazard. Up to a fourth of the Moose Range has potential for avalanche. Fortunately most of the potential is located in remote areas where human activity and development is unlikely. Nonetheless, winter recreationists and other back-country users should be aware of the danger that exists in the mountainous areas of the Moose Range. Snow avalanche potential is also shown in Appendix VII. Flood potential is a factor to be considered in any development. Many areas with high value construction materials will also have a high potential for flooding. This will not preclude mining the materials but does limit development such as campgrounds. Areas within the Moose Range with flood hazard are delineated in Map 8, page 47.

Engineering Geology information can be used for interpreting geologic features for recreational and educational uses. Rock glaciers, fault-generated landslides and the Castle Mountain Fault are natural features with high interpretive values. These features provide excellent focal points for hikers.