



**EXPLANATION OF SYMBOLS**

- UNSTABLE ROCK SLOPES - Regions of Recent (Holocene or slightly older) bedrock landslides and regions of extensive rock falls.
- UNSTABLE SOIL SLOPES - Regions of shallow till and undifferentiated drift over bedrock that are characteristic of small slump failures. Individual failures have extended 160 feet onto the Makushin (Broad Bay) Valley.
- POTENTIALLY UNSTABLE SOIL SLOPES - Regions of shallow till and undifferentiated drift over bedrock that might fail if excavated for roads and powerline installations. A dashed boundary indicates the presence of volcanically derived deposits on top of the till or drift.
- SEASONALLY UNSTABLE SOILS - Regions of pronounced soil solifluction.
- HIGH POTENTIAL FOR SUBSIDENCE AND FISSURING - Regions of high potential for subsidence and fissuring due to liquefaction and consolidation of soils during large earthquakes.
- POTENTIAL FOR SUBSIDENCE AND FISSURING - Regions of potential for subsidence and fissuring due to liquefaction and consolidation of soils during large earthquakes.
- POTENTIAL FOR SUBSIDENCE - Regions of potential for subsidence due to consolidation of soils caused by man-made surface loads such as road fill.
- ACTIVE FAULT ZONE - Fault (fracture) marked by a surface scarp due to recent (Holocene) movements.
- ROCK GLACIERS - Possibly active rock glaciers.
- POND SAMPLING SITES - Spring-fed ponds.

Topographic Map of  
A Portion of  
**MAKUSHIN VALLEY & VICINITY**  
UNALASKA, ALASKA

Produced for  
STATE OF ALASKA DIVISION OF  
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**GROUND STABILITY CONSTRAINTS MAP  
OF THE MAKUSHIN (BROAD BAY) VALLEY REGION  
OF UNALASKA ISLAND, ALASKA**

by John W. Reeder  
1986

Scale 1:24,000  
Magnetic Declination: 14°26' East

This report is a preliminary publication of DGGS. The author is solely responsible for its content and will appreciate candid comments on the accuracy of the data as well as suggestions to improve the report.

This map was adopted from an unpublished D.G.G.S. map entitled "Unconsolidated deposits and geologically recent volcanic rocks and faults of the Makushin Volcano and Dutch Harbor region, Unalaska Island, Alaska" by Reeder, J.W., Swanson, K.E., and Larsen, M.J.

Prepared by NORTH PACIFIC AERIAL SURVEYS, INC.