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UNITED STATES DISTRICT COURT

DISTRICT OF ALASKA

ROBERT HALE; JOSHUA HALE; **NAVA S. SUNSTAR**; and **BUTTERFLY SUNSTAR**, Plaintiffs, v. **GALE NORTON**, Secretary of the Interior; **GARY CANDELARIA**, Superintendent, Wrangell-St. Elias National Park and Preserve; **HUNTER SHARP**, Chief Ranger, Wrangell-St. Elias National Park and Preserve; **DEPARTMENT OF THE INTERIOR**; **NATIONAL PARK SERVICE**; **FRAN MAINELLA**, Director of the National Park Service; **MARCIA BLASZAK**, Acting Regional Director of the National Park Service, all in their official capacities, Defendants.	No. **DECLARATION OF RAYMOND A. KREIG IN SUPPORT OF MOTION FOR TEMPORARY RESTRAINING ORDER AND PRELIMINARY INJUNCTION**

I, Raymond A. Kreig, declare as follows:

1. The facts set forth in this declaration are based on my personal knowledge and, if called as a witness, I could and would competently testify thereto under oath. As to those matters which reflect a matter of opinion, they reflect my personal opinion and judgment upon the matter.

2. I live in Anchorage, Alaska. I am a licensed and registered professional civil engineer and a licensed professional geologist specializing in land consulting, airphoto and imagery interpretation and terrain analysis. I have worked in Alaska since 1970 in the following experience areas: project management, geotechnical investigation, natural resource evaluation, and land title determination. I am widely known throughout Alaska as an expert in aerial photo interpretation and photogrammetry. Photogrammetry is defined as the art, science, and technology of obtaining reliable information about physical objects and the environment through processes of recording, measuring, and interpreting images and patterns of electromagnetic energy and other phenomena. I have extensive field experience on the North Slope, in the Brooks Range, in interior Alaska, and in South Central Alaska. I also have extensive experience with vegetation mapping and assessment. An example was our being retained by the Alaska Dept. of Fish & Game to redo moose habitat vegetation mapping previously done by the University of Alaska Fairbanks in the Susitna Dam reservoir area (UAF cost was $500,000).

3. I am a member of the American Society of Photogrammetry and Remote Sensing and have been practicing in this field for 33 years, 32 of which have been in Alaska. For the last 28 years I have been President of R.A. Kreig & Associates, Alaska's leading specialty consulting firm for aerial photo and terrain analysis. I have performed many projects for business and industry as well as governments at all levels in the area of expertise described above. I was one of two U.S. appointees made by Vice President Al Gore to the United Nations Environment Program expert team to investigate on site the 1994 Komi Russia oil spill. My purpose on that effort was contribution of expertise on terrain analysis and assessment of environmental affects.

4. My academic experience includes instructing and conducting research in airphoto interpretation at Cornell University, Center for Aerial Photographic Studies and as a photo interpreter for the New York

Land Use and Natural Resources Survey. I obtained my B.S. in Civil Engineering from Cornell University in 1968, and M.S. in Civil Engineering (Aerial Photographic and Geotechnical Studies) from the same university in 1970. I have also provided presentations at the Forestry Survey and Design Institute, Yakeshi, Inner Mongolia; and the Institute of Glaciology and Cryopedology, Lanzhou, Gansu. I attended the Third Chinese National Conference on Frozen Ground in Harbin, China, in August, 1986. I was also a guest of the Northwest Institute (Railway Ministry) on the Qinghai-Xizang (Tibet) Plateau examining high altitude permafrost terrain, highways, the Lhasa-Golmud products pipeline, and airphotos. Finally, I have participated in field excursions to study permafrost terrain in northern Sweden and Finland, northeastern Canada, northwestern Siberia, and the far east of the former Soviet Union.

5. I am a member of the American Society of Photogrammetry and Remote Sensing; the Association of Engineering Geologists; the American Institute of Professional Geologists; the American Society of Civil Engineers; and the Alaska Geological Society. I have been a member of the United States Committee on Permafrost, Polar Research Board, National Research Council; and I was a member of the United States Permafrost Delegation to the People's Republic of China, in July, 1984.

6. A partial list of my publications include the following: Kreig, Raymond A., *Test Boring in "Frost Heave" Mound, Little Tonsina River Valley, Southern Copper River Basin, Alaska*, Proc. Conference on Ground Ice and Cryomorphogenesis, Anadyr, Chukotka, USSR, (1991); Kreig, Raymond A., and Metz, Michael C., *Recent Advances in Pipeline Route Selection and Cost Estimating Methodology for Pipelines in Arctic and Subarctic Regions*, International Symposium on Geocryological Studies in Arctic Regions, Conference on Yamal Development, Yamburg, Northwest Siberia, USSR, 1990; Jorgenson, M. T., and Kreig, Raymond A., *A Model for Mapping Permafrost Distribution Based on Landscape Component Maps and Climatic Variables*, Proc. 5th International Conference on Permafrost, Trondheim, Norway, Vol. 1 (1988); Brown, J. A., and Kreig, Raymond A., *Elliott and Dalton Highways, Fox to Prudhoe Bay, Alaska. Guidebook to Permafrost and Related Features*, Guidebook 4, 4th International Conference on Permafrost, Alaska Division of Geological and Geophysical Surveys, (eds. 1983); Kreig, Raymond A., and Reger, R. D., *Airphoto Analysis and Summary of*

Landform Soil Properties Along the Route of the Trans-Alaska Pipeline System, Geologic Report 66, Alaska Division of Geological and Geophysical Surveys (1982); Kreig, Raymond A., *Terrain Analysis for the Trans-Alaska Pipeline*, Civil Engineering, 47(7):61-65 (1977); Kreig, Raymond A., and Reger, R. D., *Preconstruction Terrain Evaluation for the Trans-Alaska Pipeline Project*, Geomorphology and Engineering, Coates, Donald ed., Dowden, Hutchinson & Ross (1976)

7. I personally traversed the entire McCarthy-Green Butte Road by horseback on August 21, 2003. The conclusions herein are from those field observations as well as office airphoto analysis. The route involved is an 80 to 100-year-old road right-of-way. My observations are based on the understanding that the Plaintiffs have requested emergency access for approximately four round trip tracked vehicle trips on the road with the blade up, dragging a freighting sled along the existing road route between McCarthy, Alaska, and the Marvelous Millsite and Spokane Placer.

8. A large majority, 90%, of the route lies in the flat floodplain of McCarthy Creek. The tracked vehicle and sled would be traversing very stable terrain, consisting of largely granular, course-grained soils. No clearing or impacts on trees would be necessary. Most of the road has little vegetation growth other than grasses. *See* Exhibit (Ex.) A, photos 1 and 2.

9. Some sections of the road do have low brush generally less than four feet high, which would be depressed by passing of the tracked vehicle and sled. Photos typical of this type of route traversed may be seen at Ex. A, photos 3 and 4.

10. There are very few wet or muddy spots on the road. *See* Ex. A, photo 5. These spots comprise only a few hundred feet of the entire 14 mile road. Although now likely frozen, they may not be frozen thick enough to prevent vehicle tread breakthrough into softer ground underneath. However, gravel and firm ground is within a few feet of the surface so terrain disturbance, even in these locations, will be slight and easily restored if necessary.

11. There are two locations with side hill slopes. The most difficult section is approximately 2,000 feet long. *See* Ex. A, photo 7. The major hazard here is to the operator, not the terrain, because of several short sections of glaciering where springs higher on the slope issue small amounts of water that seep

downhill and freeze in the current fall temperatures, making any cross slope on the road surface slick for traversing even with tracked vehicles. However, expected terrain impact from traverse of these sections will be minimal as long as a thaw sets in. If no thaw, then this late in the year, the operator may have to carefully remove the built up ice layers and scrape down to mineral soil in this section. In my professional opinion, at this location, none of this will result in any significant terrain damage or long or short term impacts. It would be considered normal maintenance on a road section already very visible on the landscape. *See* Ex. A, photo 7.

12. The other section of significant cross slope is alongside McCarthy Creek where minor sloughing of the back slope has deposited material on the road surface. *See* Ex. A, photo 6. There may be a need in places for very minor blade engagement to redistribute some of the sloughed material on the existing road surface. As can be seen from photo 6, the soils are cobbles and gravel. No muddy material will be displaced into the stream and it is not clear that any blading will even be needed.

13. The other section where the road is not flat is approximately 8,000 feet long. However, cross slopes are generally minimal and no significant terrain impacts are expected.

14. Sixteen stream crossings have been identified. In all cases these stream crossings are in reaches of the stream where the bed consists of coarse-grained cobbles and boulders. *See* Ex. A, photos 8 and 9. There are no fine-grained soils where tracked vehicle crossings would generate any significant amount of mud in the water. As long as the crossings are made at near right angles to the stream beds, these stream crossings will affect an insignificant portion, 0.26%, of the stream bed of McCarthy Creek. This figure is arrived at based on the following assumptions: tracked vehicle width of eight feet or less; each traverse crosses the stream at virtually the same locations as used for the existing road and each previous traverse; allow for a 12-foot wide crossing zone at right angles to the stream; 12-foot wide crossing zone multiplied by 16 stream crossings equals 192 feet of stream bed disturbed divided by 14 miles of stream bed equals 0.26% total disturbance of stream bed.

15. In conclusion, the soils of the McCarthy Creek valley are course grained, sand, gravel, and cobbles or dense glacial till. In addition, there is no thaw unstable permafrost or "tundra" type terrain

crossed by the proposed access along the road. Thus, in my professional opinion, there is no chance that the requested number of tracked vehicle passes with a freighting sled would initiate any significant terrain impacts, erosion or slope instability as long as the work is done by an operator of average experience exercising normal and customary due care.

I declare under penalty of perjury that the foregoing is true and correct and that this declaration was executed this 3rd day of November, 2003, at Anchorage, Alaska.

[signed]

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RAYMOND A. KREIG