

Table 3 ---Chemical and normative mineral composition of lamprophyre dikes, granite xenolith, and extrusive flow, western Seward Peninsula, Alaska

| Analysts:                      | 1,5/               | 2/          | 3/             | 4/          | 2/          | 4/          | 4/          | 4/          | 3/              | 4/                | 2/                | 4/          | 3/                 |
|--------------------------------|--------------------|-------------|----------------|-------------|-------------|-------------|-------------|-------------|-----------------|-------------------|-------------------|-------------|--------------------|
| Laboratory analyses            | No number          | D10025      | D112972        | 160635      | D100122     | 160633      | 160634      | 160632      | D113009         | 163721            | D100124           | 160631      | D113003            |
| Field sample                   | 41-AC-66           | 62-ASn-RR24 | 63-ASn-EM27A   | 62-ASn-RR20 | 62-ASn-TC23 | 62-ASn-RR18 | 62-ASn-RR22 | 62-ASn-RR6  | 64-ASn-594      | 64-ASn-410        | 62-ASn-786        | 62-ASn-RR11 | 61-ASn-266 (Lava)  |
| Location                       | Anikovich River    | Rapid River | Black Mountain | Rapid River | Tin Creek   | Rapid River | Rapid River | Rapid River | Brooks Mountain | Lost River Valley | Lost River Valley | Rapid River | Black Mountain     |
| Sp. gravity                    | 2.62               | 2.76        | 2.77           | 2.81        | 2.77        | 2.80        | 2.80        | 2.74        | 2.80            | 2.71              | 2.66              | 2.62        | N.D. <sup>8/</sup> |
| SiO <sub>2</sub>               | 45.70              | 44.58       | 45.86          | 46.0        | 51.02       | 51.6        | 51.5        | 52.0        | 56.66           | 55.7              | 56.10             | 69.6        | 43.58              |
| Al <sub>2</sub> O              | 18.50              | 16.10       | 14.71          | 13.2        | 15.61       | 16.2        | 16.1        | 15.8        | 15.30           | 15.4              | 14.78             | 14.5        | 15.27              |
| Fe <sub>2</sub> O <sub>3</sub> | 1.77               | 1.73        | 1.29           | 1.3         | .82         | 1.8         | 1.5         | 1.9         | 2.22            | 1.4               | .96               | 2.3         | 4.32               |
| FeO                            | 7.87               | 6.32        | 6.54           | 5.4         | 7.63        | 6.5         | 6.7         | 5.8         | 5.00            | 4.9               | 5.51              | .95         | 8.58               |
| MgO                            | 4.57               | 4.76        | 6.53           | 8.0         | 4.56        | 5.4         | 4.7         | 5.0         | 3.54            | 3.4               | 3.17              | .57         | 7.72               |
| CaO                            | 8.98               | 10.15       | 8.58           | 10.5        | 7.19        | 6.6         | 7.0         | 6.4         | 5.07            | 4.9               | 5.93              | .55         | 8.16               |
| Na <sub>2</sub> O              | 3.82               | 1.06        | 1.66           | 2.1         | 3.98        | 2.8         | 2.8         | 2.5         | 3.10            | 3.3               | 2.51              | 2.2         | 4.58               |
| K <sub>2</sub> O               | 1.00               | 2.26        | 1.57           | 2.3         | 2.67        | 2.4         | 2.2         | 2.7         | 3.33            | 3.3               | 3.62              | 6.7         | 2.34               |
| H <sub>2</sub> O-              | .27                | .85         | .32            | .51         | .12         | .79         | .55         | .72         | .99             | .42               | .27               | .52         | .48                |
| H <sub>2</sub> O+              | 1.21               | 3.51        | 3.72           | 3.1         | 1.38        | 2.4         | 1.8         | 2.4         | 2.62            | 1.9               | 1.55              | 1.4         | .73                |
| TiO <sub>2</sub>               | 2.44               | 1.50        | 1.65           | 1.2         | 1.82        | 1.6         | 1.6         | 1.5         | 1.45            | 1.2               | 1.33              | .43         | 2.94               |
| P <sub>2</sub> O <sub>5</sub>  | .01                | .39         | .74            | .37         | .35         | .45         | .45         | .44         | .31             | .41               | .31               | .13         | .78                |
| MnO                            | .70                | .16         | .30            | .10         | .15         | .11         | .14         | .10         | .14             | .13               | .12               | .02         | .18                |
| CO <sub>2</sub>                | 2.90               | 3.08        | 3.89           | 5.5         | 2.07        | 1.4         | 2.5         | 2.6         | .14             | 2.9               | 3.50              | .05         | .31                |
| S                              | .00                | N.D.        | .68            | N.D.        | N.D.        | N.D.        | N.D.        | N.D.        | N.D.            | N.D.              | N.D.              | N.D.        | N.D.               |
| Cl                             | N.D. <sup>8/</sup> | .01         | .16            | N.D.        | .08         | N.D.        | N.D.        | N.D.        | N.D.            | N.D.              | .01               | N.D.        | N.D.               |
| F                              | .05                | .75         | .01            | N.D.        | .77         | N.D.        | N.D.        | N.D.        | N.D.            | N.D.              | .18               | N.D.        | N.D.               |
| Subtotal                       | 99.63              | 100.26      | 98.21          | 100         | 100.22      | 100         | 100         | 100         | 100             | 100               | 99.88             | 100         | 99.95              |
| Less O = F <sub>2</sub>        |                    | .32         | .41            |             | .34         |             |             |             |                 |                   | .08               |             |                    |
| Total                          | 99.63              | 99.84       | 97.80          | 100         | 99.88       | 100         | 100         | 100         | 100             | 100               | 99.77             | 100         | 99.93              |

|                                               |        |        |        |        |        |        |        |        |        |        |        |        |        |
|-----------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Normative Minerals (in molecular percentages) |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Quartz                                        | .000   | 14.633 | 11.897 | 3.434  | .077   | 5.405  | 8.953  | 11.229 | 9.649  | 14.627 | 17.893 | 29.518 | .000   |
| Corundum                                      | 1.538  | 8.141  | 5.822  | 1.796  | .977   | 1.321  | 3.258  | 4.209  |        | 5.194  | 5.265  | 2.943  | .000   |
| Orthoclase                                    | 5.908  | 13.352 | 9.276  | 13.589 | 15.775 | 14.179 | 12.998 | 15.952 | 19.674 | 19.497 | 21.387 | 39.584 | 13.825 |
| Albite                                        | 32.391 | 8.891  | 13.965 | 17.760 | 33.068 | 23.680 | 23.680 | 21.143 | 26.069 | 27.909 | 21.154 | 18.606 | 13.016 |
| Anorthite                                     | 26.145 | 10.326 | 12.207 | 14.901 | 14.770 | 20.947 | 15.979 | 12.437 | 18.082 | 3.297  | 4.050  | 1.879  | 14.402 |
| Nepheline                                     |        |        |        |        |        |        |        |        |        |        |        |        | 13.733 |
| Halite                                        |        | .016   | .016   |        | .132   |        |        |        | .033   |        | .016   |        | .082   |
| Wollastonite                                  |        |        |        |        |        |        |        |        | 1.734  |        |        |        | 7.940  |
| Enstatite                                     | 5.115  | 11.850 | 16.257 | 19.917 | 11.352 | 13.444 | 11.701 | 12.448 | 8.813  | 8.465  | 7.892  | 1.419  | 5.265  |
| Ferrosillite                                  | 4.613  | 7.995  | 7.377  | 7.045  | 10.605 | 8.010  | 8.680  | 6.788  | 5.212  | 6.100  | 7.350  |        | 2.100  |
| Forsterite                                    | 4.389  |        |        |        |        |        |        |        |        |        |        |        | 9.780  |
| Fayalite                                      | 4.362  |        |        |        |        |        |        |        |        |        |        |        | 4.298  |
| Magnetite                                     | 2.566  | 2.508  | 1.870  | 1.885  | 1.189  | 2.610  | 2.175  | 2.755  | 3.219  | 2.030  | 1.392  | 1.881  | 6.264  |
| Hematite                                      |        |        |        |        |        |        |        |        |        |        |        | 1.003  |        |
| Ilmenite                                      | 4.634  | 2.849  | 3.134  | 2.279  | 3.457  | 3.039  | 3.039  | 2.849  | 2.754  | 2.279  | 2.526  | .817   | 5.584  |
| Apatite                                       | .024   | .924   | 1.753  | .876   | .829   | 1.066  | 1.066  | 1.042  | .734   | .971   | .734   | .308   | 1.847  |
| Calcite                                       | 6.595  | 11.553 | 8.847  | 12.508 | 4.708  | 3.184  | 5.686  | 5.913  | .318   | 6.595  | 7.960  |        | .705   |
| Fluorite                                      |        | 1.505  | .261   |        | 1.550  |        |        |        |        |        | .341   |        |        |
| Pyrite                                        |        |        | 1.272  |        |        |        |        |        |        |        |        |        |        |
| Total                                         | 98.280 | 94.544 | 93.954 | 95.990 | 98.389 | 96.885 | 97.215 | 96.764 | 96.293 | 96.963 | 97.962 | 97.957 | 98.841 |
| Salic                                         | 65.982 | 55.359 | 53.183 | 51.480 | 64.699 | 65.533 | 64.868 | 64.969 | 73.508 | 70.523 | 69.766 | 92.530 | 55.058 |
| Femic                                         | 32.298 | 39.185 | 40.770 | 44.510 | 33.690 | 31.352 | 32.347 | 31.795 | 22.785 | 26.440 | 28.196 | 5.427  | 43.783 |
| Class                                         | II     | III    | III    | III    | II     | II     | II     | II     | II     | II     | II     | I      | III    |
| Subclass                                      | I      | II     | I      | I      | I      | I      | I      | I      | I      | I      | I      | I      | I      |
| Order                                         | 5      | 4      | 4      | 5      | 5      | 5      | 4      | 4      | 4      | 4      | 4      | 4      | 6      |
| Section                                       | -      |        |        | -      | -      | -      | -      | -      | -      | -      | -      | -      | -      |
| Range                                         | 3      | 3      | 3      | 3      | 2      | 3      | 3      | 3      | 3      | 1      | 2      | 1      | 2      |
| Subrange                                      | 4      | 3      | 3      | 3      | 4      | 4      | 4      | 3      | 3      | 3      | 3      | 2      | 4      |

|                                                                                   |          |                  |                       |                       |                |                |                       |                  |                           |                      |                           |             |                  |
|-----------------------------------------------------------------------------------|----------|------------------|-----------------------|-----------------------|----------------|----------------|-----------------------|------------------|---------------------------|----------------------|---------------------------|-------------|------------------|
| Main Minerals (X denotes xenocrysts, G denotes groundmass, P denotes phenocrysts) |          |                  |                       |                       |                |                |                       |                  |                           |                      |                           |             |                  |
| Field sample                                                                      | 41-AC-66 | 62-ASn-RR24      | 63-ASn-EM27A          | 62-ASn-RR20           | 62-ASn-TC23    | 62-ASn-RR18    | 62-ASn-RR22           | 62-ASn-RR6       | D113009<br>64-ASn-594     | 163721<br>64-ASn-410 | 62-ASn-786                | 62-ASn-RR11 | 61-ASn-266       |
| No thin section                                                                   |          | Brown biotite    | Plagioclase(G)        | Plagioclase(G)        | Brown biotite  | Plagioclase(G) | Plagioclase(G)        | Plagioclase(G)   | Plagioclase(G)            |                      | Plagioclase (G)           | Quartz      | Nephelite (P)    |
|                                                                                   |          | Plagioclase(G)   | Orthoclase(X)         | Oligoclase(X)         | Plagioclase(G) | Oligoclase(X)  | Oligoclase(X)         | Oligoclase(X)    | Oligoclase(X)             |                      | Oligoclase (X)            | Orthoclase  | Olivine          |
|                                                                                   |          | Orthoclase(X)    | Oligoclase(X)         | Quartz (X)            | Hornblende     | Quartz (X)     | Quartz (X)            | Orthoclase(X)    | Orthoclase(X,G)           |                      | Orthoclase(X,G)           | Oligoclase  | Plagioclase (G)  |
|                                                                                   |          | Quartz (X)       | Quartz (X)            | Carbonate (X)         | Amphibole (G)  | Biotite (G)    | Biotite (G)           | Quartz (X)       | Quartz (X)                |                      | Quartz (X)                | Biotite     | Pyroxene (P,G)   |
|                                                                                   |          | Carbonate(X,G)   | Carbonate (G)         | Carbonate (G)         | Carbonate      | Carbonate(G,X) | Carbonate(G,X)        | Carbonate (G)    | Biotite (G)               |                      | Biotite (G)               |             | Iron ores        |
|                                                                                   |          | Calcic           | Carbonate             | Biotite (G)           | Sphene         | Pyroxene (P)   | Pyroxene (P)          | Pyroxene (G)     | Diopsidic                 |                      | Pyroxene (P)              |             |                  |
|                                                                                   |          | Pyroxene(P)      | (replacing pyroxenes) |                       |                |                |                       |                  | pyroxene (G)              |                      | Iron ores                 |             |                  |
|                                                                                   |          | Sphene           |                       | Pyroxene (P)          | Quartz (X)     | Pyroxene (G)   | Clinzoisite (?) (G)   | Biotite (G)      | Iron ores                 |                      | Pyrite                    |             |                  |
|                                                                                   |          | Pyrite           | Biotite(minor)        | Pyrite                | Iron ores      | Sericite (G)   | Sericite (G)          | Sericite (G)     |                           |                      |                           |             |                  |
|                                                                                   |          | Fluorite         | Pyrite                |                       |                | Iron ores      | Pyrite                | Pyrite           |                           |                      |                           |             |                  |
| K-feldspar by stain                                                               |          |                  | Chlorite              |                       |                |                | Iron ores             | Iron ores        |                           |                      |                           |             |                  |
|                                                                                   |          | Negligible       | Xenocrysts            | Minor                 | Negligible     | 1 Xenocryst    | Xenocrysts            | Xenocrysts       | Xenocrysts and groundmass |                      | Xenocrysts and groundmass | Major       | None             |
| Optic angle of pyroxene (2V <sub>2</sub> )                                        |          | 64°              | Not determinable      | 32-34°                | None           | 50-60°         | 62-72°                | Not determinable | 54-60°                    |                      | 55-60°                    | No pyroxene | 55°              |
| NB of pyroxene phenocrysts                                                        |          | 1.68±.005        | " "                   | 1.71± ±.005           |                | 1.69±.005      | 1.70-                 | Not determinable | 1.71±.005                 |                      | 1.69±.005                 |             | 1.70±.005        |
| Type pyroxene <sup>6/</sup>                                                       |          | Diopsidic augite | Completely altered    | Subcalcic ferriaugite | Hornblende     | Augite         | Diopside-hedenbergite | Not determinable | Diopside-hedenbergite     |                      | Augite                    |             | Augite           |
| Rock classification <sup>7/</sup>                                                 |          | Kersantite       | Camptonite(?)         | Kersantite            | Lamprophyre    | Kersantite     | Kersantite            | Kersantite       | Minette                   | Minette              | Minette                   | Granite     | Nepheline basalt |

Analysts: 1/ Cyrus Feldman 2/ Christel L. Parker 3/ Elaine L. Munson 4/ Paul Elmore, Sammel Botte, Gillison Chloe, Lowell Artis, H. Smith  
5/ Collected by Robert R. Coates, 1941, no rock description available  
6/ According to classification of H. H. Hess, 1949  
7/ According to the main groups of Metais and Chayes, 1963, p. 157  
8/ N.D. means not determined

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