Correlation of Map Units

Extrusive

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<tr>
<th>Extrusive</th>
<th>Intrusive</th>
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<tbody>
<tr>
<td>lv</td>
<td>cag1, cag2, cag3, cag4</td>
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<tr>
<td>Lynn Volcanics</td>
<td>Cape Ann granite</td>
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Intrusive

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<tbody>
<tr>
<td>sgd1, sgd2, sgd3</td>
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<tr>
<td>Salem Gabbro-diorite</td>
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This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards or nomenclature.
Description of Map Units

- **Dike Rocks** - a = syenite; b = basalt or gabbro; d = diabase; r = rhyolite. Where appropriate, rock-type symbols are combined with p (= porphyritic) and (or) s (= dike is separated into isolated angular blocks surrounded by unfoliated country rock).

- **Syenite and feldspathoidal syenite dikes.** Texture variable including trachytic, massive, and pegmatitic types. Potash feldspar dominant, 0-10 percent nepheline and sodalite. 5-15 percent mafic minerals. Occasionally well crystallized magnetite.

- **Fine to medium-grained mafic rocks with granular and porphyritic textures.** Texturally and mineralogically variable. Plagioclase altered, commonly labradorite. Hornblende dominant mafic mineral, also pinkish pigeonite, pale green augite, and biotite; rare olivine. Accessory apatite, sphene, magnetite, and pyrite. Often separated and cut by unfoliated granite. Chilled margins typical but fractured ends of separated blocks not chilled.

- **Medium-grained mafic rock with diabasic texture; otherwise as b.**

- **Porphyritic rhyolite.** Medium gray, aphanitic, with sparse, potash feldspar phenocrysts.
Cape Ann Granite: Predominantly unfoliated fine-, medium- to coarse-grained (0.3 to 1.5 cm) leucocratic alkali granite to alkali syenite. Ranges and medians of the principal minerals are: potash feldspar, 58-85 (63) percent; plagioclase (An_{6-12}), 0-22.5 (2.8) percent; quartz, 0-41 (24) percent; ferrohorneblende, 0.1-17 (4.5) percent; biotite, 0-3.2 (0.8) percent; and opaques 0.2-7.5 (1.0) percent. Augite occasionally present. Accessory minerals include sphene, zircon, apatite, fluorite, allanite, magnetite, and ilmenite. Feldspars in unaltered rock are pale green-gray, have a greasy luster, and weather to a faintly pinkish tan or white. Potash feldspar is the dominant mineral--usually microcline microperthite but sometimes homogeneous microcline; albite or oligoclase is present in minor quantities. Quartz is glassy, shows weak strain shadows, and contains dust-size inclusions. Feldspar and quartz as large single grains and grain clusters partly to completely surrounded by finer grained interstitial quartz and feldspar. Ferromagnesian minerals, variable in amount and appearance, occur as ragged clots, wisps, single subhedral crystals and zonally arranged reaction aggregates. Augite is colorless to pale green as a core partly or completely surrounded by pale-green amphibole, darker-green soda-iron amphibole, and reddish-brown biotite with magnetite granules scattered throughout the reaction aggregate. Isolated crystals and clots of soda-iron amphibole, biotite, or both. Rock fabric is principally uneven granitoid, but varies to subporphyritic and is locally an accumulate.
Beverly Syenite Facies, Cape Ann Granite: Predominantly unfoliated medium- to coarse-grained, texturally variable alkali syenite. Textural extremes include very coarse-grained (2-5 cm) massive and coarse-grained rachytic phases whose mineral composition, except for lack of quartz and common presence of nepheline and sodalite, is identical with Cape Ann Granite. Modal quartz content measured on outcrop less than 5 percent.

Cape Ann Granite: Modal quartz content measured on outcrop 5-15 percent.

Cape Ann Granite: Modal quartz content measured on outcrop 15-25 percent.

Cape Ann Granite: Modal Quartz content measured on outcrop greater than 25 percent.
Salem Gabbro-diorite: Medium- to medium coarse-grained texturally variable mottled black and greenish-white ferrohornblende-biotite-diorite containing variable amounts of augite, pigeonite, and quartz. The rock consists of 55-65% plagioclase as twinned andesine (zoned crystals An$_{20}$ to An$_{35}$) and untwinned albite or oligoclase, 5% potash feldspar, 1-5% quartz, 0-25% pale-green augite, 0-10% pinkish titaniferous pigeonite, 10-30% green pleochroic iron-rich hornblende, 0-10% reddish-brown biotite, and 1-5% opaques as scattered granules and exsolved blades in pyroxenes. Accessory apatite, zircon, and sphene are also present as grains and as rims on opaque granules. Chlorite, iron oxides, and calcite are present as alteration products. Mafic minerals are always somewhat poikilitic and commonly occur in zonally arranged aggregates that represent a reaction series from augite to biotite with magnetite granules dispersed throughout the aggregate. Biotite occurs as irregularly shaped and scattered flakes. The feldspars are pale gray-green with a greasy luster. The fabric is irregular and uneven. The rock is commonly brecciated and cut by salmon-pink felsic stringers.
Salem Gabbro-diorite: Less than 5% pink felsitic veins.

Salem Gabbro-diorite: Identical with sgdl but contains more than 5% pink felsitic veins.

Salem Gabbro-diorite: Hornblende-diorite porphyry characterized by large (as much as 10 x 20 cm) white-weathering red-purple labradorite phenocrysts. Found only as xenoliths.
Lynn Volcanic Complex: Dark-purplish-red to black, massive, flow-banded, and agglomeratic porphyritic rhyolite. Sparse sectoritized phenocrysts of subhedral to euhedral feldspar, 1 to 4 mm; very fine-grained bladed and felted devitrified matrix, some microlites; scattered lenticular and spheroidal aggregates of fine-grained quartz. Mafic minerals, principally biotite, make up less than 5 percent of the rocks. Opaque constituents make up less than 2 percent of the rocks and consist of tiny blebs and strings, rarely magnetite crystals. Chemical composition (range and median of 5 samples): SiO₂, 67.8-76.0 (73.2) percent; Al₂O₃, 12.0-16.5 (13.7) percent; total iron as Fe₂O₃, 1.26-5.61 (2.61) percent; MgO, 1.38-2.47 (1.73) percent; CaO, 0.16-1.89 (0.42) percent; Na₂O, 1.50-4.17 (3.28) percent; K₂O, 0.94-4.40 (2.04) percent.
Symbols

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Lithologic contact of principal formations, Approximately located

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Lithotypic contact of rock types within principal formations. Approximately located

Strike and dip of beds
  Inclined
  Vertical

Strike and dip of primary foliation
  Inclined
  Vertical

Strike, dip, movement sense, and b-lineation of shearing
  Inclined
  Vertical

Strike and dip of joints
  Inclined
  Vertical

Dikes
  More than 10 feet wide
  Less than 10 feet wide
  Melange
    a-syenite, b-basalt, d-diabase, r-rhyolite

Fault. Dashed where approximately located; queried where inferred; dotted where concealed. U, upthrown side; D, downthrown side. Arrows show direction of relative movement; \( \uparrow \) on upper plate of thrust faults

Granite and syenite
  Station for modal analysis
  Subporphyritic or cumulose texture
  Aplite or pegmatite present
  Non-cognate inclusion
  Cognate inclusion
  Pink phase
  Coarse-grained phase, Beverly Syenite
Individual outcrops

Area of abundant outcrop

Cataclased rocks

Glacial striae. Observation at top of arrow

Sand or gravel pit