

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

**BEDROCK GEOLOGIC MAP OF THE WARREN QUADRANGLE,
WORCESTER, HAMPDEN, AND HAMPSHIRE COUNTIES,
SOUTH-CENTRAL MASSACHUSETTS**

By John S. Pomeroy


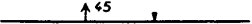



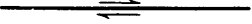










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THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

GEOLOGIC QUADRANGLE MAP
Published by the U.S. Geological Survey, 1977
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



GEOLOGIC MAP SYMBOLS

COMMONLY USED ON MAPS OF THE UNITED STATES GEOLOGICAL SURVEY




(Special symbols are shown in¹ explanation)

| | |
|---|---|
|  | Contact – Dashed where approximately located; short dashed where inferred; dotted where concealed |
|  | Contact – Showing dip; well exposed at triangle |
|  | Fault – Dashed where approximately located; short dashed where inferred; dotted where concealed |
|  | Fault, showing dip – Ball and bar on downthrown side |
|  | Normal fault – Hachured on downthrown side |
|  | Fault – Showing relative horizontal movement |
|  | Thrust fault – Sawteeth on upper plate |
|  | Anticline – Showing direction of plunge; dashed where approximately located; dotted where concealed |
|  | Asymmetric anticline – Short arrow indicates steeper limb |
|  | Overtured anticline – Showing direction of dip of limbs |
|  | Syncline – Showing direction of plunge; dashed where approximately located; dotted where concealed |
|  | Asymmetric syncline – Short arrow indicates steeper limb |
|  | Overtured syncline – Showing direction of dip of limbs |
|  | Monocline – Showing direction of plunge of axis |
|  | Minor anticline – Showing plunge of axis |
|  | Minor syncline – Showing plunge of axis |

Strike and dip of beds – Ball indicates top of beds known from sedimentary structures

| | | | |
|---|----------|---|------------|
|  | Inclined |  | Horizontal |
|  | Vertical |  | Overtured |




Strike and dip of foliation

| | | | | | |
|---|----------|---|----------|---|------------|
|  | Inclined |  | Vertical |  | Horizontal |
|---|----------|---|----------|---|------------|




Strike and dip of cleavage

| | | | | | |
|---|----------|---|----------|---|------------|
|  | Inclined |  | Vertical |  | Horizontal |
|---|----------|---|----------|---|------------|

Bearing and plunge of lineation

| | | | | | |
|---|----------|---|----------|---|------------|
|  | Inclined |  | Vertical |  | Horizontal |
|---|----------|---|----------|---|------------|

Strike and dip of joints



| | | | | | |
|---|----------|---|----------|---|------------|
|  | Inclined |  | Vertical |  | Horizontal |
|---|----------|---|----------|---|------------|

Note: planar symbols (strike and dip of beds, foliation or schistosity, and cleavage) may be combined with linear symbols to record data observed at same locality by superimposed symbols at point of observation. Coexisting planar symbols are shown intersecting at point of observation.

Shafts



| | | | |
|---|----------|---|----------|
|  | Vertical |  | Inclined |
|---|----------|---|----------|

Adit, tunnel, or slope

| | | | |
|---|------------|---|--------------|
|  | Accessible |  | Inaccessible |
|---|------------|---|--------------|

x Prospect








Quarry

| | | | |
|---|--------|---|-----------|
|  | Active |  | Abandoned |
|---|--------|---|-----------|

Gravel pit

| | | | |
|---|--------|---|-----------|
|  | Active |  | Abandoned |
|---|--------|---|-----------|

Oil well

| | | | | | |
|---|----------|---|-------------|---|--------------------|
|  | Drilling |  | Shut-in |  | Dry hole abandoned |
|  | Gas |  | Show of gas | | |
|  | Oil |  | Show of oil | | |