LSP Association
assess. advise. restore.
405 Concord Avenue #352, Belmont, MA 02478
617-977-4304 • info@lspa.org • www.lspa.org

Bedrock Geology of Southern New England

Course Outline

The course includes a 30-minute break mid-way through the course.

Module 1- Igneous and Sedimentary Rocks

1. Igneous Rocks
    a. Introduction to Igneous Rocks
    b. Causes of Melting-Decompression, Addition of Volatiles, Heat Transfer
    c. Composition of Magma-Solids, Liquids and Gases
    d. Magma Chemical Variability
    e. Magma Movement
    f. Bowen's Reaction Series
    g. Extrusive Igneous Rocks
    h. Intrusive Igneous Rocks
    i. Igneous Rock Classification
    j. Igneous Rocks and Plate Tectonics

2. Sedimentary Rocks
    a. Introduction to Sedimentary Rocks
    b. Sedimentary Rocks form layers like the pages of a book
    c. Sedimentary Structures
    d. Depositional Environments
    e. Sedimentary Basins
    f. Transgression-Regression
    g. Diagenesis
    h. Sedimentary Terranes
    i. Sedimentary Rock Classification

Module 2-Metamorphic Rocks & Geologic Terranes of Southern New England

1. Metamorphic Rocks
    a. Introduction to Metamorphic Rocks
    b. What is a Metamorphic Rock?
    c. Types of Metamorphism
    d. Metamorphic Grade-Low, Intermediate, High
    e. Index Minerals
    f. Metamorphic Facies
    g. Metamorphic Environments
    h. Metamorphic Rock Classification
2. Southern New England Geologic Terranes and Rock Types
    a. Marble Belt
    b. Precambrian Grenville Thrust Sheets
    c. Hartford and Deerfield (Sedimentary) Basins
    d. Bronson Hill Volcanic Belt

e. Merrimack Terrane
f. Nashoba Terrane
g. Avalon Terrane
h. Boston Basin
i. Narragansett Basin
j. Meguma Terrane

--30 MINUTE BREAK--

Module 3-Real World Examples (Part 1)

1. Bedrock Geologic Maps, Aerial Photos and Google Earth
2. Geologic Cross Sections
3. How Understanding Bedrock Geology Will Assist/Affect the Waste Site Cleanup Process (example: Highly fractured granite much more permeable than metamorphic schist)
4. How different types of bedrock will act as filters and/or absorber of contaminants.
5. Reporting Exemptions (example: Arsenic in Groundwater in Worcester Co.)

Module 4-Real World Examples (Part II)

1. Case Studies

Three case studies will be presented using examples from each of the three types of rock. Each case study will discuss the interactions of contaminants and groundwater flow through the various types of bedrock and how bedrock may act as either a conduit for contaminant flow or an aquitard.

a. Igneous Terrane
b. Sedimentary Terrane
c. Metamorphic Terrane

Summary and Closing Remarks

Questions & Answers