The National Association of State Boards of Geology (ASBOG®) develops national competency examinations used by these Member Boards. The ASBOG® examinations have been adopted by all of the states in the U.S. and the territory of Puerto Rico which have geologic practice acts. The following areas of professional practice contain generalized, and some specific, activities which may be performed by qualified, professional geologists.

Professional geologists uniquely qualified to perform these activities based on their formal education, training and experience. Under each major heading is a group of activities associated with that specific area of geoscience practice. The major areas of professional, geologic practice include, but are not limited to: Research; Field Methods and Communications; Geochemistry; Mineralogy; Petrology; Stratigraphy; Historical Geology; Geochemistry; Engineering Geology; Economic Geology; Mining Geology and Energy Resources. These areas are specifically included in the ASBOG® examinations to assure geologic competency. Again, this list represents only a cross-section of possible activities, and does not include all potential professional practice activities.

Also included in this publication is a listing of “Other related activities which may be performed by qualified Professional Geologists.” These activities, although not specifically geoscience in content, may be performed by a qualified, professional geologist.

### Tasks of a Professional Geologist

#### Statement by the National Association of State Boards of Geology

The National Association of State Boards of Geology (ASBOG®) is a non-profit organization, comprised of state boards which license/register professional geologists. ASBOG® develops national competency examinations used by these Member Boards. The ASBOG® examinations have been adopted by all of the states in the U.S. and the territory of Puerto Rico which have geologic practice acts. The following areas of professional practice contain generalized, and some specific, activities which may be performed by qualified, professional geologists.

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Also included in this publication is a listing of “Other related activities which may be performed by qualified Professional Geologists.” These activities, although not specifically geoscience in content, may be performed by a qualified, professional geologist.

### RESEARCH, FIELD METHODS AND COMMUNICATIONS

- Plan and conduct field operations including human and ecological health, safety, and regulatory considerations
- Evaluate property/mineral rights
- Interpret regulatory constraints
- Select and interpret appropriate base maps for field investigations
- Determine scales and distances from remote imagery and/or maps
- Identify, locate and utilize available data sources
- Plan and conduct field operations and procedures to ensure public protection
- Construct borehole and trench logs
- Design and conduct laboratory programs and interpret results
- Evaluate historic land use or environmental conditions from remote imagery
- Develop and utilize Quality Assurance/Quality Control procedures
- Construct and interpret maps and other graphical presentations
- Write and edit geologic reports
- Interpret and analyze aerial photos, satellite and other imagery
- Perform geological interpretations from aerial photos, satellite and other imagery
- Design and conduct field programs
- Interpret data from geologic monitoring programs
- Read/interpret topographic and bathymetric maps
- Perform geological research in the field and laboratory
- Prepare soil, sediment and geotechnical logs
- Prepare lithological logs
- Interpret dating, isotope and/or tracer studies
- Plan and evaluate remediation and restoration programs

- Identify geological structures, lineaments, or fracture systems from surface or remote imagery
- Select, construct, and interpret maps, cross-sections, and other data for field investigations
- Design and interpret analytical or numerical models

### GEOCHEMISTRY

- Evaluate geochemical data and/or construct geochemical models related to rocks and minerals
- Establish analytical objectives and methods
- Make determinations of sorption/desorption reactions based upon aquifer geochemistry
- Assess the behavior of dissolved phase and free phase contaminant flow in groundwater and surface water systems
- Assess salt water intrusion

### MINERALOGY/PETROLOGY

- Design, implement and interpret fate and transport models
- Identify minerals and rocks based on their chemical properties and constituents

### STRATIGRAPHY/HISTORICAL GEOLOGY

- Plan and conduct sedimentologic, and rock sequence analyses
- Interpret and identify sedimentary structures depositional environments, and sediment composition
- Interpret and identify sediment or rock sequences, positions, and ages
- Plan, execute and evaluate post-depositional changes
- Perform facies analyses
- Correlate rock units
- Interpret geologic history
- Determine and establish basis for stratigraphic classification and nomenclature
- Establish stratigraphic correlations and interpret rock sequences
- Establish provenance of sedimentary deposits

### GEOLOGY

- Plan and conduct structural and tectonic investigations

### PALEONTOLOGY

- Plan and conduct paleontologic investigations
- Correlate rocks, biostratigraphy, and evaluate paleontologic interpretations for age and paleoecological interpretations

### GEOMORPHOLOGY

- Evaluate geomorphic processes and development of landforms and soils
- Identify geomorphic processes
- Plan and conduct geomorphic investigations
- Determine geomorphic processes and development of landforms and soils
- Identify absolute and relative age relationships of landforms and soils
- Identify potential hazardous geomorphologic conditions
- Identify flood plain extent
- Determine high water (i.e. flood) levels
- Evaluate stream or shoreline erosion and transport processes
- Evaluate regional geomorphology

### GEOPHYSICS

- Select methods of geophysical investigations
- Perform geophysical investigations in the field
- Perform geophysical interpretation of geophysical data
- Design, implement, and interpret data from surface or subsurface geophysical programs including data from borehole geophysical programs
- Identify potentially hazardous geological conditions by using geophysical techniques
• Use wireline geophysical instruments to delineate stratigraphic/lithologic units.
• Conduct geophysical field surveys and interpretations, e.g.: petrophysical well bore logging; seismic data (reflection and refraction); radiological, chemical, and remote sensing, electro-conductive or resistive surveys. Includes delineation of mineral and hydrocarbon deposits, interpretation of depositional environments, formation boundaries, faults, salt water contamination-intrusion, contaminant plume delineation and other structural/stratigraphic interpretations.
• Identify and delineate earthquake/seismic hazards.
• Interpret paleoseismic history.

**HYDROGEOLOGY/ENVIRONMENTAL GEOCHEMISTRY**

- Plan and conduct hydrogeological, geochemical, and environmental investigations.
- Develop and interpret groundwater models.
- Design and interpret data from hydrologic testing programs including monitoring plans.
- Utilize geochemical data to evaluate hydrologic conditions.
- Apply geophysical methods to analyze hydrologic conditions including geophysical logging analysis and interpretation.
- Determine physical and chemical properties of aquifers and vadose zones.
- Define and characterize groundwater flow systems.
- Develop water well abandonment plans including monitoring and public water supply wells.
- Develop/interpret analytical, particle tracking and other designed structures.
- Define and establish site selection and evaluation criteria.
- Design and implement field and laboratory programs and interpretations.
- Describe and sample soils for geologic analyses.
- Describe and sample soils for material properties/geotechnical testing.
- Interpret historical land use, landforms, or environmental conditions from imagery, maps, or other records.
- Conduct geological evaluations for surface and underground mine closure and land reclamation.
- Laboratory permeability testing of earth and earth materials.

**ECONOMIC GEOLOGY, MINING GEOLOGY, AND ENERGY RESOURCES** (including metallic and non-metallic ores/minerals, petroleum and energy resources, building stones/materials, sand, gravel, clay, etc.)

- Plan and conduct mineral, rock, hydrocarbon, or energy resource exploration and evaluation programs.
- Implement geologic field investigations on prospects.
- Perform geologic interpretations for rock, mineral, and petroleum deposit evaluations, resource assessments, and project success analyses.
- Perform economic analyses/appraisals.
- Provide geologic interpretations for mine development and production activities.

**ENGINEERING GEOLOGY**

- Provide geological information and interpretations for plan and develop remedial-corrective action.
- Identify, map, and evaluate potential seismic and other geologic-geomorphological conditions and/or hazards.
- Provide geological consultation during and after construction.
- Develop and interpret engineering geology investigations, characterizations, maps, and cross sections.
- Evaluate materials resources.
- Plan and evaluate remediation and restoration programs for hazard mitigation and land restoration.
- Evaluate geologic conditions for buildings, dams, bridges, highways, tunnels, excavations, and/or other designed structures.
- Define and establish site selection and evaluation criteria.
- Design and implement field and laboratory programs and interpretations.
- Provide geotechnical evaluation and testing services.
- Develop and implement field and laboratory programs for hazard mitigation and land reclamation.
- Conduct water well inventories.
- Implement siting plans for the location of lagoons and landfill.
- Environmental contaminant isocoupling mapping.
- Determine geotechnical aquifer parameters.
- Land and water (surface and ground water) use utilization, planning, land usage, and other determinations.
- Determine sampling parameters and provide field oversight.
- Environmental Site assessments (Phase I, II, and III).
- Use of Global Positioning Systems (GPS) and/or Geographic Information Systems (GIS) and/or Remote Sensing (RS) instruments, techniques, and software to delineate the following:
  - Contamination of earth and earth materials
  - Ore deposits (including sand, gravel, clay and other economic deposits)
  - Hydrocarbon deposits
  - Physical, structural and other features and components of the earth including topography, naturally occurring or man-made.
  - Depiction of other spatially dependent data including but not limited to:
    - Radiometric surveys and analyses
    - Geophysical surveys and analyses
    - Electro-conductive or resistive surveys and analyses
  - Other quantitative, qualitative measurements, and software analyses.
  - Computer modeling of all types of statistical data integration of GPS and other RS and/or GIS data into georeferenced and non-georeferenced sampling maps, geologic maps, geotechnical, and other mapping products.
  - Expert Witness Testimony, as qualified, before regulatory boards, commissions, evidentiary hearings, public meetings, including depositions and other matters of litigation.
  - Emergency response activities and spill response planning including implementation and coordination with local, state, and federal agencies.
  - Develop plans and methods with law enforcement, fire, emergency management agencies, toxicologists and industrial hygienists to determine methods of protection for public health and safety.
  - Provide training related to hazardous materials and environmental issues related to hazardous materials.
  - Develop plans and methods with biologists for protection of wildlife during spill events.
  - Prepare post spill assessments and remediation plans.
  - Develop and implement site safety plans and environmental sampling plans.
  - Provide educational outreach related to geological, hydrologic, engineering, environmental response and other activities.
  - Respond to natural disaster events (i.e. floods, earthquakes, etc.) for protection of human health and the environment.
  - Participate in pre-planning for spill events in coordinate with other environmentally sensitive environments.
  - Provide resource(s) and infrastructure vulnerability assessment plans and reports related to potable and non-potable water supplies, waste water treatment facilities, etc.

**OTHER RELATED ACTIVITIES WHICH MAY BE PERFORMED BY QUALIFIED PROFESSIONAL GEOLOGISTS**

- Participate in pre-planning for spill events.
- Provide educational outreach related to geological, hydrologic, engineering, environmental response and other activities.
- Participate in pre-planning for spill events in coordinate with other environmentally sensitive environments.
- Provide resource(s) and infrastructure vulnerability assessment plans and reports related to potable and non-potable water supplies, waste water treatment facilities, etc.

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