So How Does Professional Licensure in Geoscience Impact Me?

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State Licensure

• Legislative Exercise of **Police Power**
• Designed to **Protect** the Public
  – Health
  – Safety
  – Wellbeing
• Violate the Law
  – Penalty from Fine to Revocation
  – Unlicensed – You can’t Practice!

*It is the Law!*
Geoscience Becomes Law in Texas

- Signed by Governor Perry: May 11, 2001
- Act Effective: September 1, 2001
Why Licensure Laws?

• Bad Geology KILLS people!

Protect the Public!!
Why Licensure Laws?

- Bad Geology Costs Money!

Protect the Public!!
What is Licensure?

- A means of assigning legal responsibility to professionals whose work involves matters of public health, safety, and welfare.
- Applies to: Engineers, Attorneys, Architects, Surveyors, Doctors, etc.
- Now it applies to Geoscientists

*It is NOT a Jobs Act!!*
Licensure Requirements

• Hold an undergraduate degree in geology
  – Usually 30 hours of geology coursework
    • With 20 hours of upper division geology courses

• Pass a National Fundamentals of Geology Examination by ASBOG

  Geologist in Training (GIT)

• After 5-years of geological experience, pass a Practice of Geology Examination by ASBOG and become Licensed Professional Geologist
What About Engineers?

• Graduation from an undergraduate engineering program (ABET)
• Pass the Fundamentals of Engineering Examination (NCEES)

Engineer-in-Training (EIT)

• 5 years of engineering experience, pass Practice of Engineering Examination by NCEES and become Licensed Professional Engineer
Professional Geology Practice

- Becoming more balanced
- Professionals active in all Task Domains
- No “select” group of Professionals
- Licensure will become the norm
- Geologists are approaching Engineers as Registered Professionals
- No one should graduate without taking the ASBOG Fundamentals Examination
Why Do I Need Licensure?

• Prove that YOU are Qualified:
  – Hold a geology degree
  – Pass a National Examination
    • Fundamentals of Geology
    • Practice of Geology
  – Have Experience in Geology

• Prove that YOU are Qualified to:
  – Practice before the public
  – Impact public health, safety and wellbeing
  – Open career doors
Benefit of Standards

• Complete your degree in Geology
• Take the ASBOG Fundamentals Examination
• Move to any of 32 States that License Geologists
• You have met the basic licensure REQUIREMENTS
• Now you are ready for any “GEOCAREER”
Society Certification

• Society Certification
  – AIPG: Certified Professional Geologist
  – AAPG: Board Certified Petroleum Geologist
  – NGWA: Certified Groundwater Professional

• Society Code of Ethics
• Professional Experience
• Continuing Education/Training

BUT – It’s NOT Law
License Required for Public Practice of Geoscience
(TGPA Sec. 1002.251)

License Disciplines in Texas

• Geology
• Geophysics
• Soil Science
The Texas Act:

• Limits the public practice of geoscience to professionals who meet minimum educational and experience requirements.
• Assigns penalties to unlicensed practitioners and mal-practitioners.
• Assures safeguards to Texans who employ or are affected by geoscience practitioners.
Texas Occupations Code
Section 1002.251

LICENSE REQUIRED:

– to engage in the public practice of geoscience

– to use the term "Licensed Professional Geoscientist" or the initials "P.G."

– to take responsible charge of geoscientific work required by:
  • municipal or county ordinance
  • state or federal law
  • state agency rule
  • federal regulation
  • any member of the Public or a Public Body
Exemptions to Licensure

- Subordinates/contractors to a licensed professional
- Academic Teaching
- Academic and Corporate Research
- All Practice by Licensed Professional Engineers
- Exploration for and Development of Oil, Gas and other Minerals
- Employees of the Federal Government (e.g., USGS, Bureau of Reclamation)
- Incidental geoscience work in other disciplines not related to Public Protection (archeology, geography, etc.)
Are You Sure of Your Career?

• I will always be a Researcher:
  – Paleontologist, Mineralogist, Geochemist
• I will always be a Teacher
• I will always work in Petroleum
• I will always work for the federal government
• I will always work for a Licensed Geologist
• I will NEVER work for the Public

My Career will NEVER change!!
Academic Degrees 2013

- BS/BA: 79%
- MS/MA: 15%
- PhD: 6%

Status of Recent Geoscience Graduates 2013: American Geosciences Institute
Academic Degrees 2015

BA/BS (72%)

MA/MS (18%)

PhD (10%)

Status of Recent Geoscience Graduates 2015:
American Geosciences Institute
BS Geologist Employment 2013

Environmental Services 21%

Oil & Gas 36%

Mining 11%

Non-Profit 4%

Federal Government 4%

K-12 Education 4%

Research 9%

State/Local Government 7%

4-year University 4%

Status of Recent Geoscience Graduates 2013:
American Geosciences Institute
MS Geologist Employment 2015

- Oil & Gas (67%)
- Environmental Services (13%)
- 4-year University (4%)
- Mining (4%)
- Research Institute (4%)
- State/Local Government (4%)
- Construction (2%)
- Nonprofit/NCO (2%)

Status of Recent Geoscience Graduates 2015: American Geosciences Institute
PhD Geologist Employment 2015

- Research Institute (20%)
- Environmental Services (13%)
- 4-year University (51%)
- Oil & Gas (15%)
- Federal Government (12%)

Status of Recent Geoscience Graduates 2015:
American Geosciences Institute
Examination Development

- Nationwide survey of 200 Licensed Geologists in each licensure state were asked 2 questions about each task.

1. How **Critical** is this task in the PROTECTION of the Public?

2. What percentage of **Time** do YOU spend doing this task?
Examination Tasks and Knowledge Base

• 2015 Task Analysis Team Defined the Knowledge Base for each Examination Domain.

• This Task Analysis is updated and evaluated by 200 licensed geologists in each ASBOG Member State every 5-years.

• **THE PRIMARY QUESTION**: What tasks are critical to protect the public?
The Critical Survey Result

- The Licensed Practice of Geology is Uniform among States

*Uniformity Coefficient = 0.98*

- Without this data a National Examination would be impossible to develop!
The Task Domains
Basic Geology

1. General and Field Geology
2. Mineralogy, Petrology, and Geochemistry
3. Sedimentology, Stratigraphy, and Paleontology
4. Structure, Tectonics, and Seismology
Task Domains
Applied Geology

5. Geomorphology, Surficial Processes and Quaternary Geology
6. Hydrogeology
7. Engineering Geology
8. Economic Geology and Energy Resources
Examination Blueprint

• The Task Weight establishes the examination blueprint.
• The higher the task weight the more important the task is in the protection of the public.
• Percentage of the examination questions reflect the task weight.
• The Blueprint evolved as the Profession responded to Licensure
2010 Test Blueprint

Fundamentals Examination

- General & Field Geology: 20%
- Mineralogy, Pertology & Geochemistry: 11%
- Sedimentology, Stratigraphy & Paleontology: 12%
- Structure, Tectonics & Seismology: 11%
- Geomorphology, Surficial Processes & Quaternary Geology: 13%
- Hydrogeology: 11%
- Engineering Geology: 11%
- Economic Geology & Energy Resources: 11%
2015 Test Blueprint

Fundamentals Examination

- General & Field Geology: 21%
- Mineralogy, Petrology & Geochemistry: 11%
- Sedimentology, Stratigraphy & Paleontology: 12%
- Structure, Tectonics & Seismology: 11%
- Geomorphology, Surficial Processes & Quaternary Geology: 13%
- Hydrogeology: 12%
- Engineering Geology: 11%
- Economic & Resources Geology: 9%

Percent of Examination
Examination Design

Test MINIMUM Competency = **Power Based**

**Power Based**: Allow sufficient time

*Test Basic Knowledge*

**NON-COMPETATIVE**

**Time Based**: Do NOT allow sufficient time

*Test Ultimate Skill*

**COMPETATIVE**
Criterion Referenced Scoring

• “What percentage of the minimally qualified candidates **WOULD** get this question right?”

• “How does this particular question reflect the level of **MINIMUM** competency of the candidate?”

• Based upon a **FIXED** criteria of **MINIMUM** competency

• Statistical Equating to ensure that passing scores on all exams reflect **MINIMUM** competency

**Angoff Scoring Procedure**
Question (Item) Development

• Exam items are written and reviewed by the Council of Examiners (COE).
• COE members are Subject Matter Experts who are licensed in at least one of the ASBOG Member States.
• The COE meets twice a year to work on the examinations.
• An item is prepared by a subject matter expert.
• The item is reviewed and approved by three other subject matter experts.
• Once approved, the item is entered into the item (question) bank.
• When the item is first included in a scheduled examination it is reviewed by the entire COE for accuracy and relevance.
• After administration of the examination, the item is reviewed again.
Question Development

• When water contacts pyrite at the earth's surface, the runoff is commonly:

• When water contacts pyrite on the earth's surface, the runoff is commonly:

• at or on?
Sample Question

When water contacts pyrite on the earth's surface, the runoff is commonly:

A) acidic
B) basic
C) oxygenated
D) nitrogen-rich

Key = A
Why Worry About the Examination?

• Many states have registration by Examination now that their “Grandfather Period” is past.
• Failing the ASBOG Fundamentals of Geology Examination limits your entry level employability!
• To serve as the “Geologist in Responsible Charge” in the Public Practice of Geology you MUST be a Licensed Professional Geologist (PG)
Recent Texas Performance

Texas Performance on the ASBOG Fundamentals of Geology Examination

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<tr>
<th>Date of ASBOG Fundamentals Examination</th>
<th>Percent Passing</th>
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<td>Mar 2012</td>
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<tr>
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<tr>
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Texas Performance vs. National Performance
Preparing for the ASBOG Examination

• Ask yourself: Did my academic program make me **MINIMALLY** competent to be able to complete each task?

• Am I a **MINIMALLY** qualified as a geologist?

• How do I **PREPARE** for the Fundamentals Examination?
• Go to asbog.org – Candidate Handbook
• Review the examination information.
• Review the Tasks and Knowledge Base in each test domain.
• Study the ASBOG sample examination.
• Read modern Physical, Historical and Environmental Geology Textbooks.
• Allocate your study time to follow the examination blueprint
• Do **NOT** memorize trivia!
• Review each task by writing your own question for that task
• Make sure that your question does **NOT** test trivia
• Spend as much effort on identifying good distracters as you spend on the correct option
Study Example

ASBOG Handbook Question

• A topographic map shows several circular depressions in a limestone region. What are these features called?
  A) fensters
  B) kettles
  C) dolines
  D) potholes

Key = C

• Now change the Stem so that “A” is the Key
• Now for “B” and “D”
Conclusions

• The Professional Practice of Geology is common across the United States
• The ASBOG National Examination measures minimum competency
• The critical players are the geologists (Subject Matter Experts) not psychometricians
• Passing the ASBOG Examination is critical for professional development to become the geologist in “Responsible Charge”
Break

Thank You – Questions?