EngGeoMB Geoscience Competencies

CBA Competency Interpretation Statements

Competency Description	EngGeoMB Interpretation
Competency Category 1: Professionalism Minimum overall category rating: 3.0	
1.1 Regulations, Codes & Standards	
Comply with relevant legislation, regulations, and statutory reporting requirements.	Candidate to provide an example that refers to specific legislation/regulations/reporting requirements and how they impacted their geoscience work. Stating "*I followed applicable environmental regulations"* is not sufficient. Does the example: • Reference a specific Canadian legislation/regulation/standard etc.? • Cite a specific section of legislation/regulations etc. and explain how it applies to the example?
1.2 Recognizing Limitations	
Practice within the bounds of personal expertise and limitations.	Candidate to provide an example that describes a situation where personal limitations of **geoscience knowledge or experience** were identified and shows what steps were taken to address them. Does the example: • Clearly specify a limit to geoscience knowledge or experience? • Specify how that limitation was overcome, for example, by obtaining advice from a more experienced colleague or supervisor? • Identify an example that relates to professional and not personal limitations?
1.3 Continuing Professional Development	
Increase relevant knowledge, skills, and level of performance over time.	Candidate to provide an example that demonstrates their knowledge, and skills have been purposefully built up over time by identifying gaps and obtaining training. The example must include how the gap is relevant to the area of practice. Does the example: • Clearly identify a gap and why it is relevant to the area of practice? • Clearly explain what training/experience was obtained to fill it? • Explain how training/experience contributed to an increased level of performance?

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1.4 Relationship Management	
Maintain construction working relationships.	Candidate to provide an example that demonstrates an appreciation of the business culture in Canada by taking appropriate actions to maintain good working relationships with diverse people. They must ensure that sufficient details are given to describe the working relationship, the actions that were taken and the outcome. Does the example: • Identify the context of the working relationship? • Explain the steps that were taken and why they were appropriate? • Explain how the steps taken positively impacted the relationship?
1.5 Ethics	
Apply ethical principles.	Candidate to provide an example that demonstrates a time when they recognized an ethical dilemma and describes the appropriate decision or action that was taken to address it. The example must demonstrate an understanding of what the ethical issue was and why the chosen course of action was ethical. Does the example: • Explain what the ethical issue was? • Explain the action(s) that were taken? • Explain various options for what actions could have been taken and why the chosen course of action was ethical. • Show how a potentially unethical situation was avoided?
1.6 Obligations to Stakeholders	
Respond to obligations and responsibilities to the public. To the natural environment, to clients and to employers.	Candidate to provide an example that demonstrates their ability to balance stakeholder needs (e.g., clients or employers) with the obligation of Canadian Professional Geoscientists to safeguard the public interest and protect the natural environment. What actions were taken to ensure that the professional obligations were met? Does the example: • Specify a situation where consideration for the public and/or environment was appropriately balanced against other stakeholder expectations or requirements? • Show what methods, techniques or approaches were applied to resolve the issue? • Explain why the approach taken was the appropriate one.

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1.7 Safety Awareness	
Contribute to health and safety in the workplace.	Candidate to provide an example that demonstrates their ability to address the health and safety of clients, coworkers, the public, or individuals, consistent with Canadian regulations, codes, and standards. The example should demonstrate an understanding of potential safety issues or impacts related to geoscience activities. What steps did they take to adhere to best practices and to maintain safety, reliability, and quality in their practice? Why is it important and what are the consequences of non-adherence? General safety activities such as mandatory OHS training, confined space training, morning safety meetings, etc. are not acceptable since they are applicable to all employees. The example must be specific to geoscience related activities. Does the example: • Demonstrate the steps taken to proactive address safety issues related to geoscience activities? • Demonstrate an understanding of the possible consequences of not addressing the issue(s)?
Competency Category 2: Scientific Method Minimum overall category rating: 3.0	
2.1 Scientific Principles	
Apply scientific principles.	Candidate to provide an example that shows how a specific scientific principle or concept was applied to a **geological study or investigation**. The principle being applied must be explicitly stated. The example must explain why the principle was appropriate to the situation and how it was used to generate the outcome. Does the example: • Demonstrate use of appropriate scientific concepts to address the **geoscience** problem or investigation? • Explicitly state what the scientific principle was used and why? • Explain the analysis that was done and how it related to the outcome?
2.2 Scientific Literature	
Effectively utilize scientific literature.	Candidate to provide an example that demonstrates the appropriate use of scientific literature in **geoscience** work. Specify the sources that were used and explain why they were appropriate for the situation. Explain how the use of scientific literature impacted the results of the work.

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	Does the example: • Provide a specific situation in where scientific or technical literature was used in a geoscience undertaking or project? • Include reference to the specific literature that was used and explain why it was relevant? • Explain how the effective use of scientific literature impacted the results?
2.3 Data Confidence	
Identify uncertainty and ambiguity in data, and limits to knowledge.	Candidate to provide an example that demonstrates their ability to identify and address uncertainty or ambiguity in **geoscience data sets**. How does the ambiguity/uncertainty affect the limits of knowledge about the geological history or conditions and why is it important. What steps were taken to address data limitations and how did data limitations affect the interpretation of the results? Does the example: • Provide a specific situation where data sets were collected and used for analysis in a geoscience context? • Explain the limitations of the data and how that was accounted for in the interpretation? • Give a description of the approaches used to remedy any data bias or describe the uncertainty?
2.4 Quality Assurance	
Apply principles of quality assurance and quality control (QA/QC).	Candidate to provide an example that describes a situation relating to quality assurance and quality control protocols and explains why the protocols are important. What would the impact of not following the protocols be? Does the example: • Provide a specific situation where protocols or standards are commonly followed in geoscience practice? • Link to a QA/QC process in a geoscience task? • Explain the importance of these measures and standards being in place for geoscience in the situation?

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2.5 Scientific Risk Management	
Undertake relevant investigation and due diligence.	Candidate to provide an example that shows that the appropriate investigation and due diligence was undertaken to limit risk associated with the **geoscience results**. Explain any potential risks, unanticipated outcomes or hazards associated with the geoscience results and what was done to mitigate them. Show that the mitigation was effective. They should provide an example showing the potential concern for an identified risk to geoscience work (data gaps, poor work records, etc.). Does the example: • Explain the potential risks/hazards related to use of the geoscientific results? • Explain what was done to mitigate the potential risks? • Describe how the mitigation steps were effective?
Competency Category 3: Area of Geoscience Practice Minimum overall category rating: 3.0	
3.1 Project Planning	
Plan investigations based upon purpose of study, incorporating existing site-specific information and appropriate approaches.	Candidate to provide an example that demonstrates a time when they planned a **geoscience investigation or study** and details the approaches used. They should explain why those approaches were chosen for the type of investigation, how site-specific aspects were considered and accounted for, and summarize the outcome to state if the planning was effective for undertaking the investigation. Does the example: • Explain the purpose of the investigation? • Explain what the approach was and why it was appropriate? • Explain how site-specific information was dealt with? • Explain how the approach resulted in a successful investigation or study?
3.2 Data Analysis	
Acquire, process, and analyze data using appropriate methodologies.	Candidate to provide an example that demonstrates how a specific data set was collected, processed, and/or analyzed as part of a **geoscientific study or project**. They should demonstrate why that type of data was appropriate for the study and how the analysis contributed to the geoscientific results. Does the example: • Explain the specific method(s) used to collect and/or process the data? • Explain how the data was analyzed (include reference to any software used)? • Explain how the analysis contributed to the geoscientific results? • Explain how the data was processed the resulting analysis that followed?

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3.3 Additional Data Consideration	
Incorporate relevant data from other sources.	Candidate to provide an example that shows how data from multiple sources was incorporated into a **geoscientific study**. They should describe why the data was relevant, what steps were taken to incorporate the data and how incorporation of the other data contributed to the result. Does the example: • Describe the source(s) of the other data and explain why it was relevant? • Explain how the data was processed to be incorporated into the study (e.g., did it have to be converted, georeferenced, levelled etc.)? • Explain how the data contributed to the geoscientific results?
3.4 Interpretation of Data	
Interpret and evaluate data to construct models consistent with purpose of investigation.	Candidate to provide an example that demonstrates the approaches used to evaluate data to construct **geological models**. They should clearly demonstrate that the tools used were appropriate for the type of investigation and how they contributed to the **geoscientific results**. They should include an explanation of how geoscientific principles were used to generate the model. Some common approaches for evaluating geoscientific data are maps, sections, logs, spreadsheets, charts, diagrams etc. Does the example: • Explain the specific method(s) chosen to evaluate the data and why they were suitable? • Explain how the data evaluation contributed to the geoscientific result?
3.5 Model Evaluation	
Critically evaluate models.	Candidate to provide an example that demonstrates a time they performed a critical analysis or evaluation of a **geoscientific model**. They should explain what steps were taken to analyze or evaluate the model and what the result of the analysis was. If the model was generated using sophisticated modelling software, the description must clearly explain what level of involvement the candidate had in evaluating the inputs and/or outputs (even if the modelling itself was done by someone else). Does the example: • Provide specific information about the type of model and why it was chosen? • Demonstrate what steps were taken to evaluate the model? • Explain how the evaluation contributed to the geoscientific results?

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3.6 Outcomes	
Formulate conclusions and recommendations.	Candidate to provide an example that demonstrates how **geoscientific results** were used to formulate a conclusion or recommendation. Some examples of typical scientific outcomes are defining drill targets, site assessments, resource evaluation, etc. The example should give the resulting conclusion along with recommendations based on the outcome observed. Does the example: • Specify the situation and the approach taken to resolve a geoscience task? • Explain the tools and methods applied to work towards the solution? • Detail any concerns, modifications or deviations during the work to the point of resolution?
3.7 Adapting Methodologies	
Adapt methodologies to address unfamiliar situations	Candidate to provide an example that a time when an unfamiliar **geoscience situation** led to new or modified techniques being applied. This could be describing how mapping or sampling methods were altered or how new geoscience knowledge was gained to address the situation. The example must clearly explain what was unfamiliar, what steps were taken, and how the adapted methodology impacted the outcome. Does the example: • Identify an unfamiliar geoscience situation? • Discuss the changes made in response to the situation and elaborate on the resulting modifications? • Explain how the modification successfully addressed the situation?
Competency Category 4: Complementary Minimum overall category rating: 3.0	
4.1 Oral Communication	
Deliver and comprehend oral communication.	Candidate to provide an example that demonstrates their ability to effectively communicate verbally in English (the language of business in Manitoba). The example must be in a **geoscience context** and must provide evidence that the language of communication was English. They must also demonstrate both understanding spoken English and speaking English so that others can understand. Does the example: • Explicitly demonstrate that the language of communication was English? • Demonstrate both speaking and understanding of spoken English?

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4.2 Written Communication	
Deliver and comprehend written communication.	Candidate to provide an example that demonstrates their ability to effectively communicate in writing in English (the language of business in Manitoba). The example must be in a **geoscience context** and must provide evidence that the language of communication was English. They must also demonstrate both understanding written English and writing in English so that others can understand. Does the example: • Explicitly demonstrate that the language of communication was English? • Demonstrate both understanding something written by others and others understanding something written by the candidate?
4.3 Technical Communication	
Communicate technical information effectively to a variety of audiences.	Candidate to provide an example that demonstrates their ability to communicate **technical geoscience information** to a variety of target audiences. The example must show how technical geoscientific information was presented to different audiences. They must explicitly show what changes were made to make it appropriate for each different audience. Does the example: • Explain the type of technical geoscientific information? • Identify multiple distinct types of audiences (e.g. geoscience colleagues, the public, elementary school children, investors, community leaders etc.)? • Describe the approaches that were used for each different audience?
4.4 Management	
Manage activities.	Candidate to provide an example that demonstrates a time when they managed **geoscience activities**. This could include overseeing a mapping project, planning or coordinating data collection or analysis for a project, or organizing a conference, workshop or meeting. The example must be in a geoscience context and must include examples of the different aspects of the project that were managed, for example, people, processes, materials, logistics etc. Does the example: • Refer to various aspects of the project(s) that were managed? • Explain the methods/tools/techniques used to manage each aspect of the project or program?

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4.5 Time Management	
Use time management skills.	Candidate to provide an example that demonstrates how they used effective time management skills in a **geoscience context**. Does the example: • Show how time management was used to handle multiple activities at once? • Discuss the methods/tools/techniques used?
4.6 Providing Supervision	
Provide direction to others.	Candidate to provide an example that demonstrates how they provided oversight, supervision or direction to others in a **geoscience situation**. This could be providing advice or instruction to other geoscientists, non-geoscience members of the team, summer students etc. Does the example: • Describe the relationship with the person/people being supervised? • Describe the nature of the direction/oversight/supervision?
4.7 Financial & Budgets	
Contribute to budgetary management.	Candidate to provide an example that demonstrates their ability to manage a budget or contribute to budget management for a **geoscientific project, program or study**. This could include evaluating quotes, estimating costs or controlling expenditures for all or part of a project/program/study. Does the example: • Describe specific aspects of the budget process? • Clearly explain the level of responsibility and accountability within the budget process?
4.8 Risk Identification & Mitigation	
Apply basic principles of risk management.	Candidate to provide an example that demonstrates how they implemented risk management principles in a **geoscientific context**. They must clearly identify the risk being addressed and the steps taken to mitigate the risk. The types of risks could include physical health and safety, financial, reputational, environmental etc. This competency is more general than competency 2.5 which is looking specifically for scientific risks. Does the example: • Clearly identify the type of risk? • Clearly identify what measures were taken to address the risk? • Explain how the steps taken reduced the risk?

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4.9 Data Security	
Contribute to secure data management.	Candidate to provide an example that describes how they managed data in a secure way. They must explain how the data integrity was maintained through various protocols and procedures, including any specific methods or tools that were used. The example should demonstrate an understanding of why secure data management is important and what is at stake if data security is not maintained. Does the example: • Explain how data was received, stored and managed in a proper and secure manner? • Demonstrate an understanding of why data security is important? • Explain the potential risks of not maintaining proper data security?
4.10 Document Management	
Maintain comprehensive professional records.	Candidate to provide an example that demonstrates how they maintained professional records of data and **other geoscience information**. They should describe why records are important and the potential consequences of not keeping proper records. Possible examples include proper recording and archiving of field observations, labelling, storing and cataloguing samples, or preparing and retaining proper administrative records for a geoscience business. Does the example: • Describe how data and information was properly acquired, organized and stored? • Demonstrate an understanding of why keeping proper records is important? • Demonstrate an understanding of the risks of not keeping proper records?

= Canadian geoscience work-experience competency