

MODULE ENM2100: ENVIRONMENTAL SAFETY

Level: Intermediate

Theme: Management and Conservation

Prerequisite: None

Module Description: Students identify environmental hazards that result from activities within an energy or mineral industry, and describe specific environmental monitoring and management practices adopted by the industry.

Module Parameters: Access to relevant government, industry and community resources.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify environmental hazards and issues relevant to one of Alberta’s energy or mineral industries 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> given a specific energy or mineral industry in Alberta: <ul style="list-style-type: none"> identifying a range of current environmental hazards/issues of relevance to the industry gathering and reporting data regarding a specific environmental hazard preparing a flow chart that outlines an environmental planning process that might be used to address one environmental concern. <p><i>Assessment Tool</i> <i>Assessment Criteria: Flow Charts, ENMFLO</i> <i>Lab Investigations: Intermediate Level, ENMLAB–2</i></p> <p><i>Standard</i> <i>Identify five environmental hazards/issues; conduct lab investigations on one environmental hazard to a standard of 2 on the rating scale; complete a flow chart of the planning process to a standard of 2 on the rating scale</i></p>	<p>30</p>

MODULE ENM2100: ENVIRONMENTAL SAFETY (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> • describe career opportunities relevant to environmental assessment and management • demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> • completing a research project on one or more career opportunities in environmental assessment and management. <p><i>Assessment Tool</i> <i>Career Search: Intermediate Level, ENMCAR–2</i></p> <p><i>Standard</i> <i>Conduct research to a standard of 2 on the rating scale</i></p> <ul style="list-style-type: none"> • observations of individual effort and interpersonal interaction during the learning process. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p style="text-align: center;">10</p> <p style="text-align: right;">Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Environmental Hazards</p>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • identify environmental hazards relevant to an energy or mineral industry; e.g.: <ul style="list-style-type: none"> – air and water pollution – blowouts, spills and fires – emission of sulphur dioxide, carbon dioxide and nitrogen oxide – noise level – disposal of waste – land disturbance – degradation of wildlife habitat • research current theories regarding: <ul style="list-style-type: none"> – global climate change and the emission of greenhouse gases – acid deposition and the burning of fossil fuels – the effects of chemical spills on food chains • collect and report data on a specific environmental hazard 	<p>Research hazards relevant to the Alberta context. For example, a number of factors minimize the formation and effects of sulphur dioxide in Alberta.</p> <p>Gather information using a variety of current sources (e.g., talk to specialists, search the Internet). Distinguish between facts and theories.</p>

MODULE ENM2100: ENVIRONMENTAL SAFETY (continued)

Concept	Specific Learner Expectations	Notes
<p>Environmental Hazards (continued)</p>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • explain how specific environmental concerns relevant to one of Alberta’s energy or mineral industries are addressed through the process of environmental planning. 	<p>Explain applications of environmental planning in:</p> <ul style="list-style-type: none"> • land use management • waste management • spill containment/recovery • maintaining air and water quality • rehabilitation and reclamation.
<p>Policy and Legislation</p>	<ul style="list-style-type: none"> • explain how industry and government work together to resolve environmental concerns • research provincial and federal legislation regarding protection of the environment • identify specific legislative requirements that relate to operations within an energy or mineral industry • describe construction and operating approvals required for specific operations • outline strategies for public involvement in environmental law making • propose changes to existing legislation or suggest new legislation regarding an environmental concern; e.g.: <ul style="list-style-type: none"> – sulphur dioxide/carbon dioxide emissions – water treatment – toxic waste management. 	<p>Research the intent/function of the <i>Environmental Protection Enhancement Act</i>.</p> <p>Discuss specific requirements of industry with respect to:</p> <ul style="list-style-type: none"> • exploration • recovery/production • processing/refining • distribution. <p>Cite local examples of public involvement in persuading government to act on an environmental issue; e.g.:</p> <ul style="list-style-type: none"> • Friends of the Oldman River Association • Alberta Wilderness Society. <p>Request pamphlets from the Canadian Environmental Network.</p> <p>Research the <i>Federal Green Plan</i>.</p>

MODULE ENM2100: ENVIRONMENTAL SAFETY (continued)

Concept	Specific Learner Expectations	Notes
<p>Monitoring and Management Practices</p>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • describe the goals and techniques of environmental monitoring within an energy or mineral industry • explain operating practices and guidelines within the industry that relate to specific legislative requirements • describe major aspects of land management within the industry • research spill containment and recovery techniques • describe the mandates and responsibilities of association, industry and government organizations in spill control • explain the planning process for pipeline facilities • research theories and techniques relevant to waste management within the industry • research current and emerging technologies that address environmental issues and promote sustainable development within the industry. 	<p>For example:</p> <ul style="list-style-type: none"> • environmental audits • impact assessments. <p>Investigate land management practices with respect to:</p> <ul style="list-style-type: none"> • land acquisition • soils engineering • waste management • abandonment and reclamation. <p>Gather information on:</p> <ul style="list-style-type: none"> • spill equipment and usage • spill site assessment • contingency planning. <p>Consider:</p> <ul style="list-style-type: none"> • route selection • public consultation • permits/approvals • impact assessment • topsoil/timber salvage • reclamation techniques. <p>For example:</p> <ul style="list-style-type: none"> • treatment • disposal. <p>Possible research topics:</p> <ul style="list-style-type: none"> • reduction of emissions, odours and noise • water treatment and purification • sulphur recovery • efficient use of energy • recycling systems.

MODULE ENM2100: ENVIRONMENTAL SAFETY (continued)

Concept	Specific Learner Expectations	Notes
Career Opportunities	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • research careers and the range of occupational opportunities relevant to environmental management and safety; e.g.: <ul style="list-style-type: none"> – science and research – industry – government – legal and consulting • evaluate current employment opportunities based on employment statistics • research trends in environmental monitoring and management, and future career opportunities. 	<p>Plan for individual/group research and presentations that address:</p> <ul style="list-style-type: none"> • job description • employment market • education/training • wage expectations. <p>Contact the “Career Information Hotline” (Alberta Advanced Education and Career Development).</p> <p>See the National Occupational Profiles (NOC) in Section H: Linkages/Transitions.</p> <p>Arrange/facilitate:</p> <ul style="list-style-type: none"> • information interviews • work study/experience • job shadowing.