

## *Drilling into Reserves: How Do We Find Oil?*

### **Researching Hydrocarbon Natural Resources by Examining the Life and Work of Dr. Helen Belyea**

#### **Introduction**

Students need to value and appreciate the variety and abundance of Alberta's natural resources and demonstrate care and concern for the environment through their choices and actions. They will analyze how Albertans interact with their environment exploring how Albertans deal with competing demands on land use and natural resources. What are the significant natural resources in Alberta? Where are they located? How are natural resources used by Albertans? What natural resource issues will we have to solve in the future of our province or world?

#### **Project Explanation**

In this project, students will develop an appreciation of the non-renewable hydrocarbon-based natural resources in Alberta through an examination of the life of Dr. Helen Belyea, an Alberta geologist who was very important in the oil patch. They will then research one hydrocarbon-based natural resource and examine its impact on the province of Alberta.

#### **Alberta Social Studies Curriculum Unit Connections**

##### **Grade Four - Alberta: The Land, Histories and Stories**

- 4.1 Alberta: A Sense of the Land
- 4.2 The Stories, Histories and People of Alberta
- 4.3 Alberta: Celebrations and Challenges

##### **Grade Five - Canada: The Land, Histories and Stories**

- 5.1 Physical Geography of Canada
- 5.2 Histories and Stories of Ways of Life in Canada

#### **Materials and Resources Needed**

- *Mavericks: An Incorrigible History of Alberta* - Character Biographies and Online Artifacts - Oil & Gas Overview, the Biography of Dr. Helen Belyea (1913-1986)  
<http://www.glenbow.org/mavericks>
- CBC Archives - Striking Oil in Alberta  
<http://archives.cbc.ca/300c.asp?id=1-73-378>

- Looking Down an Oil Well  
<http://www.fe.doe.gov/education/energylessons/oil/>
- Centre for Energy – (Numerous links on left toolbar)  
<http://www.centreforenergy.com/silos/ong/ET-ONG.asp>
- Alberta Energy – Oil (links on left also)  
<http://www.energy.gov.ab.ca/736.asp>
- Alberta's Natural Resources – Crude Oil – (links also on right side)  
[http://www.abheritage.ca/abresources/inventory/resources\\_hydro\\_crude.html](http://www.abheritage.ca/abresources/inventory/resources_hydro_crude.html)
- Alberta Energy – Natural Gas (links on left also)  
<http://www.energy.gov.ab.ca/222.asp>
- Alberta's Natural Resources – Natural Gas – (links also on right side)  
[http://www.abheritage.ca/abresources/inventory/resources\\_hydro\\_gas.html](http://www.abheritage.ca/abresources/inventory/resources_hydro_gas.html)
- Alberta Energy – Oil Sands (links on left also)
- <http://www.energy.gov.ab.ca/89.asp>
- Alberta's Natural Resources – Oil Sands – (links also on right side)  
[http://www.abheritage.ca/abresources/inventory/resources\\_hydro\\_sands.html](http://www.abheritage.ca/abresources/inventory/resources_hydro_sands.html)
- Oil Sands Discovery Centre - The Oil Sands Story  
[http://www.oilsandsdiscovery.com/oil\\_sands\\_story/story.html](http://www.oilsandsdiscovery.com/oil_sands_story/story.html)
- CAPP – Oil Sands Industry Facts  
[http://www.capp.ca/default.asp?V\\_DOC\\_ID=688](http://www.capp.ca/default.asp?V_DOC_ID=688)
- Exploring for Offshore Oil & Gas  
<http://www.oilworks.com/New/exploreb.html>
- Canada's Offshore Oil and Gas Industry  
[http://www.em.gov.bc.ca/DL/offshore/Reports/OffshoreFAMar2004\\_low.pdf](http://www.em.gov.bc.ca/DL/offshore/Reports/OffshoreFAMar2004_low.pdf)
- Ocean Energy – Made for students, but is an American resource  
<http://www.mms.gov/mmskids/PDFs/OceanEnergyMMS.pdf>
- BC Offshore Oil & Gas  
<http://www.energybc.ca/topics.html>
- Sable Island Offshore Energy Project  
<http://collections.ic.gc.ca/sable/>
- British Newspaper Article "The End of Oil is Closer Than You Think" from Thursday April 21<sup>st</sup>, 2005.  
<http://www.guardian.co.uk/life/feature/story/0,13026,1464050,00.html>

## Procedures

Students will create a research presentation consisting of two parts. First, they will introduce and describe Dr. Helen Belyea, a geologist in Alberta from 1950 to 1982. Second, they will organize for their classmates a short presentation on a hydrocarbon natural resource in Canada. The teacher may introduce the project by asking students if they know some of the natural resources are that are abundant in the province of Alberta and how they are be used by human beings. The CBC archives page has television and radio clips about the oil

sector in Alberta and would allow students to get a visual understanding of the importance of oil in Alberta. The following scenario may then be presented:

### **Drilling Into Reserves Project Scenario**

You are a geologist and a colleague of Dr. Helen Belyea, one of the first female geologists in a field dominated by men. A classroom teacher has asked you to come and discuss with their students the life of the Maverick Dr. Belyea. As you are also very knowledgeable about hydrocarbon natural resources such as oil and natural gas, you have also volunteered to make a presentation for the children about one of the following:

- Oil (crude oil)
- Natural Gas
- Oil Sands
- Offshore Oil Drilling

Using the *Mavericks: An Incurable History of Alberta* site, research about Dr. Belyea. The following questions may help to guide you:

- Who was Dr. Helen Belyea?
- What is the science of geology?
- How did she start out in the geology field?
- How did her geological work help to find where oil was underneath the ground?
- Why was she a Maverick?

Using other web resources such as the sites in the *Mavericks: An Incurable History of Alberta* Internet Resources, research about the hydrocarbon natural resource you have chosen. The following questions may help to guide you:

- What is \_\_\_\_\_?
- How was \_\_\_\_\_ formed or created?
- How do scientists find \_\_\_\_\_? Has this changed over the last 100 years?
- How is \_\_\_\_\_ produced?
- How is \_\_\_\_\_ transported?
- How is \_\_\_\_\_ refined (made free of impurities)?
- How do human beings use \_\_\_\_\_?
- How has the \_\_\_\_\_ industry affected the environment?
- How could the \_\_\_\_\_ industry affect the environment in the future?
- What is the future like for the \_\_\_\_\_ industry?
- How will this natural resource industry affect the province of Alberta?

You will need to decide how to present your research to the class of students. Some options include creating a speech, a poster, a picture book, a pamphlet, a PowerPoint presentation, an Inspiration mind map, or even a web site.

### **Assessment and Evaluation**

- Students and their teacher should develop their own rubric by identifying evaluation criteria for the project that will match their own

- learner outcomes. This allows students to understand the expectations for their work and to have input into the ongoing evaluation process.
- Individually or in small groups, students might evaluate the work of two or three other students in order to gain insight into how their peers approached the project.
  - After completing the project, students may talk or journal about what they felt they did very positively, what they had difficulty with, and how they would change how they would approach a similar project in the future.
  - The final student presentations may be videotaped in order to be shared, re-examined, and evaluated. These may also be shared or evaluated along with their parents or be presented at student-led conferences.

### **Ideas to Enrich this Project**

- Students could undertake the project in the Oil & Gas project #3 - *Saving the Environment One Maverick at a Time... Examining Oil's Impact on the Environment and Taking Action for Conservation & Preservation*.
- Students could examine the issue as to whether the idea of "Peak Oil" is true and how we could approach this potential problem. The theory of Peak Oil is that we have used or are coming close to using over half of the total oil reserves in the Earth. They could examine the British Newspaper Article "The End of Oil is Closer Than You Think" from Thursday April 21<sup>st</sup>, 2005, and discuss the implications.  
<http://www.guardian.co.uk/life/feature/story/0,13026,1464050,00.html>

Glenbow Museum

WHERE THE WORLD MEETS THE WEST