What Is Happening at Fort Nelson?
Spectra Energy’s Fort Nelson natural gas processing facility in northeastern British Columbia currently delivers clean-burning natural gas to customers. Spectra Energy is evaluating the feasibility of reducing greenhouse gas emissions through the use of large-scale carbon capture and storage (CCS).

- Carbon dioxide (CO₂) from natural underground processes comes to the surface with raw natural gas.
- The Fort Nelson gas processing plant will capture this formation CO₂ at the processing plant instead of releasing it into the atmosphere.
- The CO₂, separated from the raw natural gas at Fort Nelson will be transported by pipeline to an injection site where it will be injected into a storage zone deep underground.
- Monitoring will help ensure that the CO₂ remains securely stored.

As envisioned, CCS at Spectra Energy’s Fort Nelson gas plant will reduce CO₂ emissions by up to 2.2 million tonnes a year, making it one of the largest CCS projects of its kind in the world. CCS is one of many actions that will be needed to reduce concerns about climate change.

**Raw Natural Gas Contains Impurities**
Natural gas accumulates in the tiny spaces of rocks underground and occurs in containers known as the CO₂ and water. The CO₂ in the raw natural gas comes from natural geologic processes deep underground. This CO₂ in the raw gas is called formation CO₂.

**Making Raw Gas Sweet Nets CO₂**
Raw natural gas has to be purified before it can go to customers and be used in our homes, schools, and vehicles. This happens in a gas processing plant. At the Fort Nelson plant, Spectra Energy is applying the technology of engineered formation CO₂ deep underground for long term storage.

**Using Sweet Gas Reduces CO₂ Emissions**
Discoveries of new reserves of natural gas in unconventional formations like shale, tight sands, and coal seams have greatly increased the supply of natural gas in Western Canada. Natural gas burns cleanly with few by-products. The more it is used for home heating and cooking or the less it is transported. An added benefit is that the burning of natural gas still results in CO₂.

**Protecting Freshwater Aquifers**
The CO₂ injection well is engineered to contain previous groundwater resources. Well construction is governed by British Columbia regulations. Three layers of mid-size piping and fluids and two layers of durable, long-lasting cement separate the contents from the surrounding groundwater. Groundwater sampling, injection well testing, and monitoring further enhance the security.

**Storing the CO₂**
The rock that makes up the storage layer sometimes called the sequestration zone is porous and permeable. Some of the pores, which are very small, act as capillary spaces. Other pores act as combined capillary spaces between the matrix and the rock. Under the natural conditions of the sequestration zone, CO₂ will dissolve in water, forcing out water. The water is then forced out of the rock to make room for CO₂. This means that a lot of CO₂ can be sequestered in the pore spaces of the rock.

**Keeping CO₂ in Place**
Shale is a barrier rock that holds gases and liquids in place underground. The CO₂, trapped underground, is separated by approximately 100 meters of shale cap rock. This cap rock that has held natural gas a planet for millions of years will also hold the CO₂ in place.