

# Oil and Gas Exploration and Development Activity in Ontario in 2011

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## INTRODUCTION

Drilling activity in southern Ontario in 2011 decreased compared to 2010. Production volumes also continued to fall as they have for several years. The average price of oil sold in Ontario in January was \$87 per barrel. It reached a monthly average peak of \$108 in April, finishing the year at \$102 for December. The average price for the year was just under \$96, which was significantly higher than the average for 2010 of just under \$81. The price of natural gas in Ontario averaged \$4.87 per MMBtu in January 2011 and remained fairly consistent during the year, with an average December price of \$4.65. High production volumes of recently exploited shale gas continue to suppress prices in the North American market.

Data compiled from annual production reports submitted to the Petroleum Operations Section indicate that annual oil production declined 5.7% to 78,987 m<sup>3</sup> in 2011 with an estimated value of \$47.8 million, compared to 83,779 m<sup>3</sup> with an estimated value of \$42.6 million in the previous year. Natural gas production declined 4% to 224,781 10<sup>3</sup> m<sup>3</sup> with an estimated value of \$34.9 million, compared to 233,987 10<sup>3</sup> m<sup>3</sup> with an estimated value of \$40.4 million in 2010.

The decline in oil production is directly related to reduced levels of drilling activity since 2004, such that there is insufficient new production to replace that from existing wells. The cash value of oil production decreased substantially from 2008 to 2009 due to a dramatic drop in unit price, but increased in 2010 and again in 2011.

## EXPLORATION ACTIVITY

A total of 25 licences to drill and operate new wells were issued by the Ministry of Natural Resources in 2011, compared to 15 in 2010. An additional 29 licences were issued for plugging of existing wells.

Drilling of 19 new wells and 1 deepening were reported in 2011, compared to 24 new wells in 2010. These consisted of 3 exploratory wells and 1 exploratory re-entry, 7 development wells and 9 stratigraphic tests. Two of the development wells were drilled as horizontal wells.

Successful development drilling in 2011 resulted in 2 wells reported to be active gas producers, 1 active oil and gas well, 2 suspended gas wells, 1 potential gas well and 1 active private gas wells. This was a greater commercial success rate than in 2010, which yielded only 1 well reported to be a potential oil producer, 1 suspended natural gas well, 1 capped well with gas show and 6 active private gas wells at the time of writing the 2010 report.

Exploratory drilling in 2011 resulted in 1 potential oil well (Table 1; Figure 1), 2 dry holes and 1 dry deeper pool test. In comparison, exploratory drilling results in 2010 were significantly more positive, with 1 well reported as an active gas producer, 1 active oil producer, 2 potential oil wells, 1 potential gas well and 1 dry hole at the time of writing the 2010 report.

### **Cambrian Play**

One exploratory well was drilled in Kent County to test Cambrian targets for oil and gas in 2011. It was subsequently plugged and abandoned. There had also been only 1 Cambrian exploratory test in 2010.

There were no development wells drilled to Cambrian targets in 2011. One Cambrian development well had been drilled in 2010.

### **Ordovician Play**

One deeper pool test was drilled to Ordovician targets in Essex County in 2011. It was reported as unsuccessful.

Two development wells were drilled in Essex County to test the Ordovician in 2011, resulting in 1 active oil and gas producer and 1 suspended gas well.

No exploration or development wells targeted the Ordovician in 2010.

### **Silurian Sandstone Play**

One exploration well tested Silurian sandstone targets in 2011 in Elgin County and was abandoned as a dry hole. There were no exploration wells testing Silurian sandstone targets in 2010.

Two development wells were drilled for Silurian sandstones in 2011. One was reported as an active commercial gas producer on Lake Erie and the other as an active private gas well in Welland County. In 2010, 6 private gas wells and 2 commercial wells targeted this play.

### **Silurian Carbonate Play**

No exploratory wells were drilled to test Silurian Guelph reef and/or Salina Group targets in 2011. Five exploratory wells were drilled for these targets in 2010, all in Lambton County.

Three development wells were drilled to these targets in 2011, resulting in 1 active gas producer in Kent County, 1 suspended gas well in Essex County and 1 potential gas well in Huron County. There were no development wells drilled for Silurian Guelph–Salina targets in 2010.

### **Devonian Play**

One exploration well tested Devonian targets in 2011 and was reported as a potential oil well in Elgin County. No exploration wells were drilled for the Devonian play in 2010.

As in 2010, no development wells were drilled to test Devonian targets in 2011.

## **EXPLORATION TRENDS**

Recent exploration has been focussed on the proven Silurian sandstone and carbonate reservoirs. High natural gas prices greatly enhance the economics of all gas plays in Ontario. Unfortunately, North American natural gas prices dropped dramatically during 2009 and remained relatively low through 2010 and 2011. Exploration activity focussing on oil has not increased in spite of oil prices that have been consistently robust for more than 2 years.

Activity in Ontario has been reduced to a minimum by the constraints of commodity prices. Low natural gas prices have a dramatic impact on exploration and development activity in the province. Ironically, sustained higher oil prices may also negatively impact activity in Ontario by increasing the attractiveness of larger and more expensive projects in other provinces as well as internationally. Recommendations for future exploration have not changed in this report for several years and will remain unchanged until exploration activity increases and new plays and fairways are tested by industry.

There is considerable remaining untested potential for natural gas in the Ordovician play beneath the eastern basin of

Lake Erie and onshore east and north from Kent County to the Niagara Escarpment. A 2005 re-assessment of potential in this play by the Ministry of Natural Resources indicates potential remaining undiscovered resources totalling 201 billion cubic feet (5.7 billion m<sup>3</sup>) of natural gas and 16.6 million barrels (2.64 million m<sup>3</sup>) of oil. Potential exists for trapping of natural gas in sandy facies of the Ordovician Shadow Lake Formation over the crest of the Algonquin Arch.

Gas or oil accumulations are also possible in stratigraphic traps along the pinch-out edge of the Cambrian sandstone, or in Cambrian reservoirs within fault-controlled structures. There may also be considerable unrealized potential in fault-related structural traps in the Salina A-1 and A-2 carbonate units in Kent, Elgin and Middlesex counties. There was a significant increase in drilling in the Lower Silurian sandstone play in 2006, but that activity has declined from 2007 onward.

**Table 1.** Successful oil and gas exploration wells in southern Ontario in 2011 (see Figure 1 for well locations).

Well #	Well Name	Results	Target	TD	Latitude	Longitude	TD Date
1	Clearbeach et al. #40, Dunwich 1-4-24-A	OS - POT	DEV	108.0	42.71165944	-81.44440306	29/07/2011

Abbreviations: DEV = Devonian; OS = oil show; POT = potential; TD = total depth (in metres).

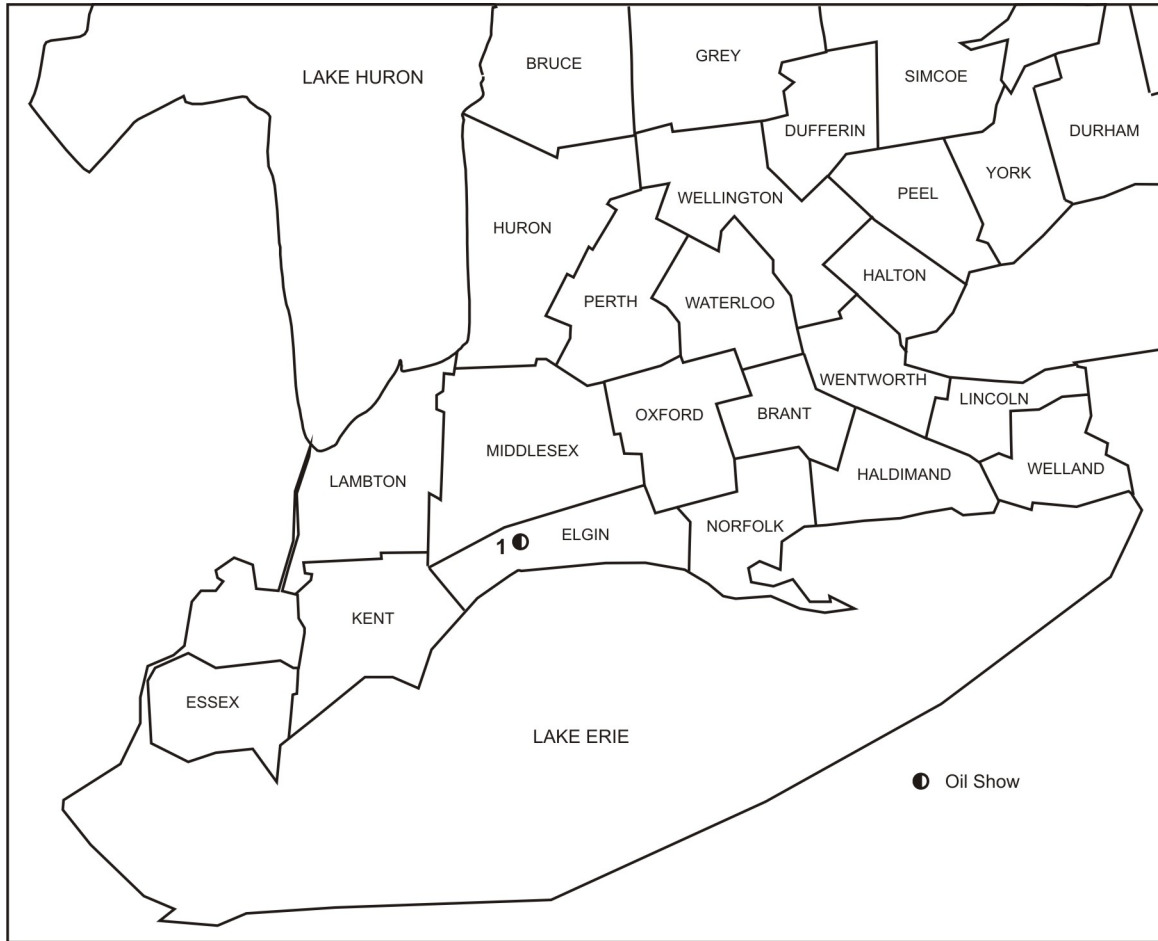


Figure 1. Successful oil and gas exploration wells in southern Ontario in 2011.