

Members of the Review Panel:

Re: Misconceptions about Oil Seeps around Port au Port Bay

I appreciate this opportunity to address a couple of issues regarding oil seeps that appear to be controversial to some members of the public, but which should not be of concern when the facts are known.

Here are some facts:

- Oil has been seeping continuously into Port au Port Bay for approximately 10,000 years, since the glaciers melted and southern Newfoundland rose up above sea level.
- The oil is sourced from shallow packages of the Humber Arm Allochthon, which outcrop at surface around the bay.
- Seeps have been mapped and documented around the entire bay, from the tip of Long Point to Fox Island and further north, since the 1800's.
- There is a documented history of difficulty finding drinkable water wells due to the presence of hydrocarbons – unrelated to any oil drilling activity.
- Guided by seeps, approximately 11 shallow oil wells were drilled on the west side of Shoal Point more than 100 years ago.

Scallop fishery

One concern we have heard is that the leakage from one of the hundred year old oil wells has led to the collapse of the scallop fishery. But with oil seeping continuously all around the bay since time immemorial, and a robust scallop fishery for more than 100 years, why would the seeps suddenly cause the scallop fishery to collapse? Nothing has changed with regard to oil seepage. As to the 100 year old shallow oil wells, they have been seeping continuously this whole time with no negative impact on the scallop fishery. Again, nothing has changed.

While the cause of the scallop fishery decline is not known at this time, most marine biologists I have talked to speculate that a new predator has found its way into Port au Port Bay. This speculation is supported by the fact that the draggers sometimes come up with empty shells, which shows that the scallops grew, but were then eaten by something, leaving the shells behind.

Seeps and frac fluids

Another concern we have heard is that, with all these seeps, if we drill holes and hydraulically fracture the wells at depth, the frac fluids will flow to surface through the seeps.

It is extremely unlikely that the surface seeps are connected to the deep formations that we are interested in. The sources of the seeps are shallow. These are impermeable rocks, meaning that fluids can flow very slowly, if they can flow at all. Any natural fractures that exist are thinner than a human hair. It would be rare to find a crack that extends more than 10 meters, and wildly improbable that a crack extends more than 1 kilometer.

But for the sake of discussion, let's say that the seeps at surface are connected through several kilometers of impermeable rock to where we will be performing near wellbore stimulations. What would happen then?

Pressure increases with depth. At one kilometer of depth, the pressure is approximately 250 times surface pressure and, at two kilometers, pressure is 500 times surface pressure. Oil and gas wells flow because they open a path for fluids to escape from high pressure to low pressure.

When a well is hydraulically stimulated, fluids and sand are pumped down to the target formation at pressures higher than formation pressure. The fluids and sand push into fractures in the rock because pressure in the well bore is temporarily higher than formation pressure. Then, as soon as the pumps stop pumping, pressure in the well bore drops and the fluids rush out of the rocks, into the well bore and up to surface. The fluids flow in one direction and one direction only, from the high pressure at depth, through the well bore to the low pressure at surface. Fluids never flow away from the well bore, because to do so would violate the laws of physics.

Mark Jarvis
CEO
Shoal Point Energy