Oil and Gas in Idaho
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Overview

• Geology
• Elements of an oil and gas reservoir
• History of exploration and development
• Current Production and Trends
• Recent Actions of the Commission
Conventional gas play / primarily unconsolidated sands

- Effective production from vertical or slightly deviated wells
- Horizontal drilling or hydraulic fracturing is not needed
Elements of an oil and gas reservoir

- Source
- Migration
- Reservoir
- Seal Rock
- Trap

Image is not to scale; Actual depth in top of reservoir is 4000 to 5000 feet
Over 150 wells have been drilled since 1903
- Weiser-Payette Basin is currently the only producing hydrocarbon field
- Production began in 2014 by Alta Mesa
- Idaho the 31st state producing oil and gas
- FY 2017:
  - 4.5 billion cubic feet of natural gas (enough to meet the annual needs of about 45,000 homes)
  - ~138,000 barrels of condensate
  - 153,000 barrels of NGL’s and
  - 91,000 barrels of produced water.
- Production mix is:
  - ~73% Pipeline Quality Natural Gas (Methane)
  - ~14% NGL - Natural Gas Plant Liquids (Ethane, Propane, Butane)
  - ~13% Condensate – Liquids with Pentanes plus heavier hydrocarbons.
Current Production and Trends

Production in Barrels (42 US Gallons)

Year - Month

- Condensate (BBL)
- NGL’s (BBL)
- Oil (BBL)
- Water (BBL)
Current Production and Trends

Production in MCF (Thousand Cubic Feet)

Year - Month

- Gas (MCF)
- Gas for Fuel
Recent Actions of the Commission

• Submitted a request to examine five years of production quantities from Alta Mesa.
  o Will verify the accuracy of department records

• Working with the department to create new reporting forms
  o Will increase the amount of information department receives
Well Spacing and Setbacks
Fruitland City Council passed Ordinance No. 629 on March 12, 2018

• Oil and gas wells not allowed within 1200’ of property line of:
  • Existing occupied structure
  • Church, school, hospital/medical facility or places of assembly.
  • Water well, canal, ditch or ordinary high water mark of surface waters

• Oil and gas wells not allowed within 800’ of a highway.

• 1200’ limit can be reduced to 100’ with express written permission from the property owner.
• 2012 the State passed into law HB 464 that requires the state to occupy the field of oil and gas exploration and production.

• Idaho Statute 47-314 (10)(b):
  • “No ordinance . . . , except a state agency with authority, shall actually or operationally prohibit the extraction of oil and gas . . . Provided however, that extraction may be subject to reasonable local ordinance . . .”

• Idaho Statute 47-319 (1):
  • “. . . Oil and gas wells, tank batteries and gas processing facilities shall not be constructed within (300) feet of existing occupied structure, domestic water well, canal, . . . Or within (50) feet of a highway.”
Flaring

prepared by:

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• For well control safety

• To safely dispose of waste gases that are unable to be processed or sold during drilling and testing of all oil and gas wells

• To allow an operator to test the potential volumes of hydrocarbons found to determine the economic viability of the well

• Can also occur during well completion and workover processes
Well Control Safety = Controlling “Kicks”

• Kick = An unexpected pressure increase in Formation Pressure

• Formation Pressure is “controlled” by Hydrostatic Pressure of Drilling Mud

• Pressure increases must be circulated out of the hole to maintain safety
Completion and testing

During test flaring, must determine:
• Pressure,
• Flow Rates, and
• Composition of hydrocarbon fluids

Information is used to help:
• Characterize the reservoir
• Determine how to safely handle fluids in pipelines and processing plants
Is there another way to handle waste gas?

• **Yes.** Gases can be vented directly to the air without being burned

• **But** - methane is several times more potent than carbon dioxide as a greenhouse gas

• The Division of Oil and Gas does not consider venting a safe, acceptable alternative to flaring

• If gas volumes are sufficient to sustain stable combustion, then the gases should be burned

• Burning reduces emissions of ozone-forming pollutants (such as VOCs), and the main by-product is carbon dioxide

• **Flaring is also preferred to venting for safety reasons**
Who regulates emissions from flaring?

• The Air Quality Division within the Idaho DEQ

• assures compliance with federal and state health-based air quality standards by monitoring air quality and collecting data

  • Permitting Contact:
    • Darrin Pampaian, P.E.
    • 208-373-0587
    • darrin.pampaian@deq.idaho.gov

  • Compliance Contact:
    • David Luft
    • 208-373-0201
    • david.luft@deq.idaho.gov
How long can a well flare waste gas?

- No more than 14 days over a 60 day test period
- For safety and efficiency reasons, flaring can occur anytime during the day or night.

Who has to be notified?

- All owners of occupied structures within a ¼ mile radius of the well
- Officials of the county where the well is located

Currently the operator contacts the office of emergency management in the Payette County sheriffs office prior to operations. An officer goes on site and evaluates the operation.
Injection Wells

- In Idaho, the oil and gas is mixed with water and trapped in sandy layers deep below the surface.

- When the oil and gas resources are developed, water comes out of the well as a byproduct.

- Currently water is either trucked to an evaporation facility in Kuna, or the well is “shut in” – turned off.

- Returning the water into the formation would maintain reservoir pressure and improve well efficiency – possibly allowing shut in wells to come back online.
Well operation / Idaho is unique

- Naturally occurring formation water is removed along with oil and gas. Baseline water testing is done (DEQ, EPA)
- Oil and gas are removed, water is again tested. If water is at the same level or cleaner the water is injected back into the formation
- Process is similar to our closed loop geothermal wells in the state
Injection Wells

• In 2010 IDWR began working with the EPA to revise the states UIC primacy to update the Class V injection program and add a Class II injection program.

• From 2010 to 2015, IDWR worked with the public, the Idaho Water Resource Board, the EPA, and the Idaho Legislature to update its administrative rules, governing statutes, and policy to support a primacy revision package to the EPA. After submission, several deficiencies were found in the primacy revision package that needed to be addressed.

• After continued communication with the EPA the decision was made to ask the EPA to oversee the Class II Injection program.

• The EPA is currently evaluating the transfer as well as comments received. The EPA plans a response to the transfer request within the next several weeks.
Construction of a well

- Injection fluid must be isolated from any USDW.

- Surface casing pipe and cement is set to isolate the well from drinking water. Integrity is verified and reported on cement bond log.

- Must be confined within a zone that is free of open faults or fractures within area of review outlined in the Electronic Cod of Federal Regulations §146.22 Construction requirements.

- Ongoing monitoring of injected fluid, pressure, rate, volume and well integrity.
Fracking in Idaho?

No

Has not happened

Here’s why
Fracking – What is it?

- “Fracking” is the term used when the rock is fractured using a pressurized liquid.
- Used in source plays to remove oil and gas from “tight” rocks.
- Tight rocks have very little space between the grains and those spaces are not well connected.

Image is not to scale; Actual depth in top of reservoir is 4000 to 5000 feet
Fracking – Where is it used?

- Fracking has been used in source plays for decades with horizontal wells.
- Common in Oklahoma, Texas, Pennsylvania because of their tight reservoirs.
- Not used in basin because our it is mostly loose (unconsolidated) sand.

Image is not to scale; Actual depth in top of reservoir is 4000 to 5000 feet
What we know about wells in Idaho:
Vertical to slightly deviated holes
Unconsolidated to weakly consolidated sands
High permeability/porosity

What is common in areas with hydraulic fracturing:
Horizontal holes
Tight to heavily cemented and lithified sands
Low permeability

(From corporate presentation of Bridge Energy, Feb. 2011)
Fracking Summary

• The Payette Basin fields is a conventional reservoir – meaning oil and gas are extracted using vertical or slightly deviated well.

• The Payette Basin fields are the only economic field in the state. There have been exploratory wells drilled in Southeast Idaho, but none were successful.

• The state has not received any applications for horizontal and/or fractured wells.
Current Operations

- 8 wells currently producing
- 2 completed
- 8 wells shut in
- 3 Permit applications in past 24 months
- Total production down ~50% over 12 months
NOTE: Wellbore will begin to cross under the river at a depth of ~ 2250 feet – nearly ½ mile under surface.
Plan Forward

- Provide answers to questions with Payette County residents given priority

- Similar questions will be combined and answered at once

- Town Hall will go until 8:00 PM

- We plan on making these meetings a regular occurrence. Our goal is 3 to 4 times per year.

- Additional information added regularly at ogcc.idaho.gov