

Risk Analysis of Prospects vs Plays: The Play's the Thing!

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The most difficult and crucial decision in petroleum exploration is not which prospect to drill, but rather, which new play to enter. Such a decision, whether ultimately profitable or not, commits the Organization to years of involvement, expenditures of \$millions, and hundreds of man-years of effort. Even though uncertainties and risks are high, organizations commonly make the new-play decision in a disjointed, non-analytic, even superficial way. The economic consequences of a bad play choice can be disastrous.

Using established principles of prospect risk analysis, modern petroleum exploration organizations routinely assign economic value to individual prospects, but they actually operate via exploration programs in plays and trends. Accordingly, the prospect is the economic unit of exploration, whereas the play is the operational unit.

Plays can be successfully analyzed as full-cycle economic risk ventures, however, using many principles of prospect risk analysis. Economic measures such as Expected Present Value, DCFROR, etc. apply equally to plays or prospects. The predicted field-size distribution of the play is analogous to the forecast prospect reserves distribution. Economic truncation applies to both. Variance of play reserves is usually much greater than for prospect reserves. Geologic chance factors such as $P_{\text{reservoir}}$, $P_{\text{generation}}$, etc., must be distinguished as independent or shared among prospects in the play, so they should be defined so as to apply as well to the play as to its constituent prospects. They are analogous to multiple objectives on a prospect, and are handled differently in performing the risk analysis.

Environmental Impact and Regulatory Concerns for the Protection of a Freshwater Aquifer Impacted by a Gas Well Blowout in Northwest Louisiana

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The Louisiana Department of Environmental Quality, Ground Water Protection Division (GWPD) is responsible for oversight of the investigation and remediation of unpermitted releases to the waters of the State. In March, 1994, a Sligo Field gas well blowout caused artificial artesian conditions in the shallow Wilcox aquifer resulting in flowing water wells near the drilling location. The eruption of sand and formation water created a crater around an old abandoned well south of the active rig and a collapse crater north of the rig.

The company, in cooperation with the GWPD, began an investigation of the environmental impacts of the blowout. An electric log run in a stratigraphic boring and newly installed monitor wells were used to determine the sand/shale distribution and to assess the extent of contamination in the

aquifer. Monitor wells and nearby water supply wells were sampled for BETX. Only the wells nearest to the blowout showed constituents above regulatory limits. The well positioned between the blowout and residential wells showed no BETX.

This paper will present the continued investigation and remedial activities planned for this site. They include additional wells or borings to delineate the horizontal area impacted by the blowout and evaluation of pump and treat methods to establish hydrologic control of the Wilcox Aquifer in the immediate area. Periodic testing of the residential and monitor wells will ensure that appropriate efforts are made to protect the local residents.