

# Louisiana Energy Topic

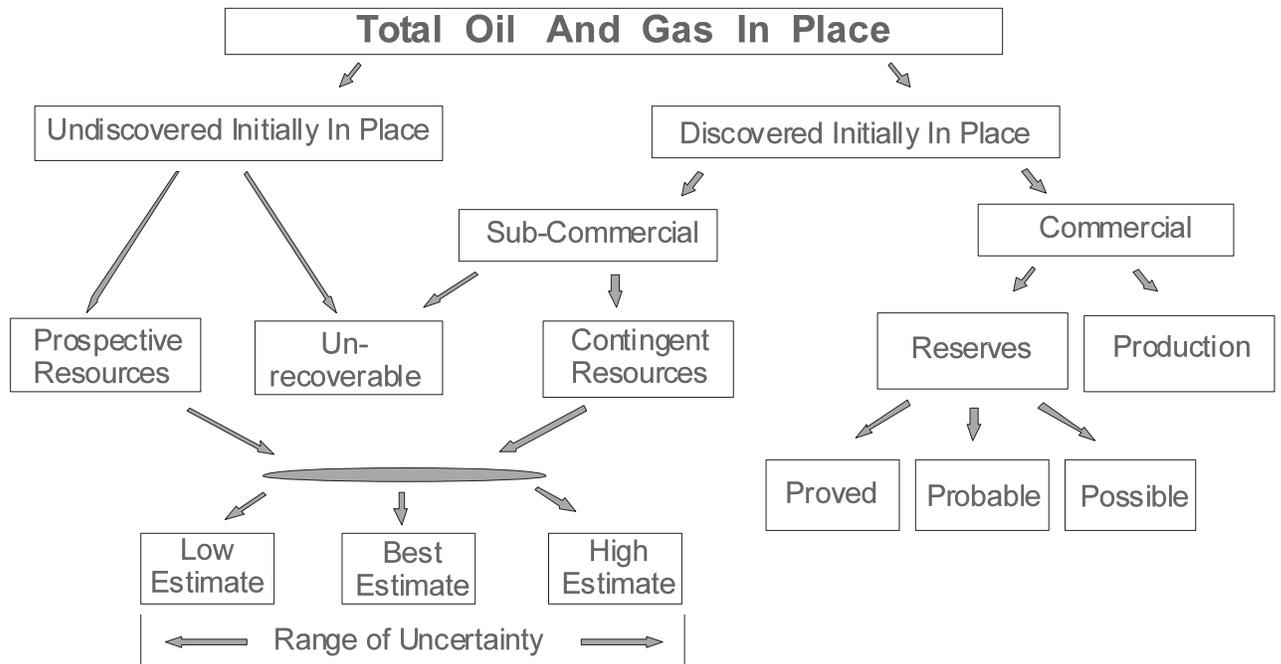
## OIL AND NATURAL GAS RESERVE DEFINITIONS

By Bob Sprehe

The Society of Petroleum Engineers (SPE), the World Petroleum Congress (WPC), and the American Association of Petroleum Geologists (AAPG) have approved a set of “petroleum” definitions as of February, 2000. These definitions cover the entire resource base. It was felt that the increased geopolitical discussions regarding the potential supplies of resources, especially crude oil and natural gas, made it necessary to establish a classification system to include those quantities of petroleum contained in accumulations that are currently sub-commercial or that are yet to be discovered. These categories of resources represent potential future additions to reserves and are therefore important to both countries and companies for planning and portfolio management. An agreed resource classification system is summarized in Figure 1.

**Figure 1**

### RESOURCE CLASSIFICATION SYSTEM



Source: Petroleum Resources Classification and Definition web page, SPE.org

Figure 1 is similar to the chart for Resource Classification System approved by the Board of Directors, Society of Petroleum Engineers (SPE) Inc., the Executive Board, World Petroleum Congress (WPC), and the Executive Committee, American Association of Petroleum Geologists (AAPG), February, 2000.

For purposes of these definitions, the term “petroleum” refers to naturally occurring liquids and gases which are predominantly comprised of hydrocarbon compounds. Petroleum may also contain non-hydrocarbon compounds in which sulfur, oxygen, and/or nitrogen atoms are combined with carbon and hydrogen. Common examples of non-hydrocarbons found in petroleum are nitrogen, carbon dioxide, and hydrogen sulfide.

## **Definitions:**

In these definitions the quantities estimated to be initially in place are defined as Total Petroleum initially in place, Discovered Petroleum initially in place, and Undiscovered Petroleum initially in place.

Recoverable portions are defined as Reserves, Contingent Resources, and Prospective Resources.

Reserves constitute a subset of resources, being those quantities that are discovered in known accumulations, recoverable, commercial, and remaining.

**Total Petroleum Initially In Place** is that quantity of petroleum which is estimated to exist originally in naturally occurring accumulations as of a given date of evaluation.

**Discovered Petroleum Initially In Place** is that quantity of petroleum which is estimated, on a given date, to be contained in known accumulations, plus those quantities already produced therefrom.

**Reserves** are defined as those quantities of petroleum which are anticipated to be commercially recovered from known accumulations from a given date forward.

**Contingent Resources** are those quantities of petroleum which are estimated, on a given date, to be potentially recoverable from known accumulations, but which are not currently considered to be commercially recoverable. **Contingent Resources** may include, for example, accumulations for which there is no viable market, or where commercial recovery is dependent on the development of new technology, or where evaluation of the accumulation is still at an early stage.

**Undiscovered Petroleum Initially In Place** is that quantity of petroleum estimated, on a given date, to be contained in accumulations yet to be discovered.

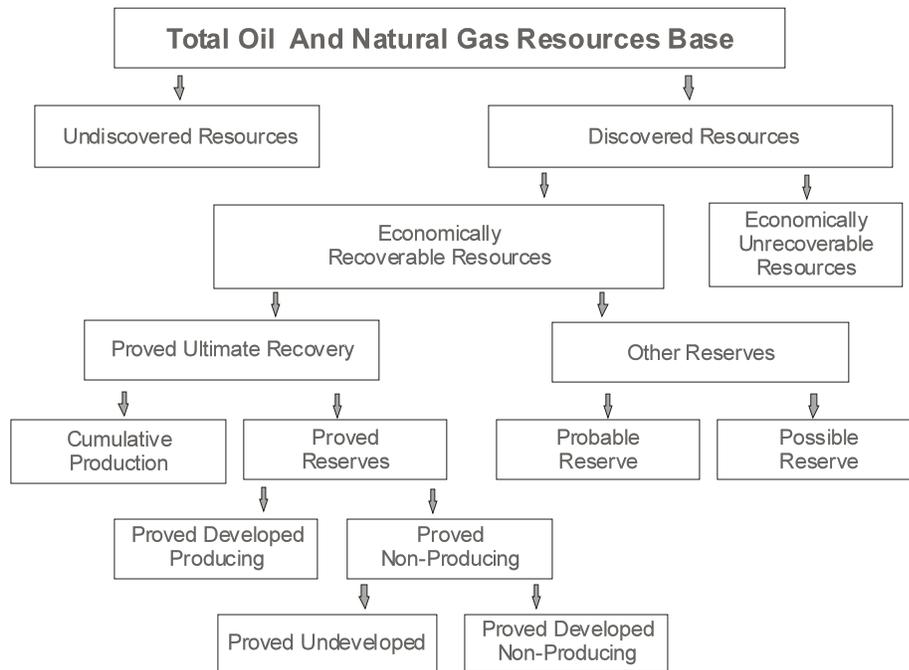
**Prospective Resources** are those quantities of petroleum which are estimated, on a given date, to be potentially recoverable from undiscovered accumulations.

**Range of Uncertainty** reflects a reasonable range of estimated potentially recoverable volumes for an individual accumulation. “**Best Estimate**” is used here as a generic expression for the estimate considered being closest to the quantity that will actually be recovered from the

accumulation between the date of the estimate and the time of abandonment. The terms “**High and Low Estimates**” should provide a reasonable assessment of the range of uncertainty in the Best Estimate.

We illustrate below a similar categorization but from the Energy Information Administration (EIA). The EIA carries the definition of Proved Reserves on to define the Status of Proved Reserves.

**Figure 2**  
**COMPONENTS OF THE OIL AND GAS RESOURCE BASE**



Source: Energy Information Administration (EIA), Office of Oil and Gas

**Proved Reserves** are those quantities of petroleum which by analysis of geological and engineering data, can be estimated with reasonable certainty to be commercially recoverable, from a given date forward, from known reservoirs and under current economic conditions, operating methods, and government regulations. Proved reserves can be categorized as developed or undeveloped.

**Unproved Reserves** are based on geologic and/or engineering data similar to that used in estimates of proved reserves; but technical, contractual, economic, or regulatory uncertainties preclude such reserves being classified as proved. Unproved reserves may be further classified as probable reserves and possible reserves.

**Probable Reserves** are those unproved reserves which analysis of geological and engineering data suggests are more likely than not to be recoverable.

**Possible Reserves** are those unproved reserves which analysis of geological and engineering data suggests are less likely to be recoverable than probable reserves.

**Reserve Status Categories** define the development and producing status of wells and reservoirs:

**Developed Reserves** are expected to be recovered from existing wells including reserves behind pipe. Improved recovery reserves are considered developed only after the necessary equipment has been installed, or when the costs to do so are relatively minor. Developed reserves may be sub-categorized as producing or non-producing.

**Producing:** Reserves subcategorized as producing are expected to be recovered from completion intervals which are open and producing at the time of the estimate. Improved recovery reserves are considered developed only after the necessary equipment has been installed, or when the costs to do so are relatively minor.

**Non-Producing:** Reserves subcategorized as non-producing include shut-in and behind pipe reserves.

**Undeveloped Reserves** are expected to be recovered (1) from new wells on undrilled acreage, (2) from deepening existing wells to a different reservoir, or (3) where a relatively large expenditure is required to (a) recomplete an existing well, or (b) install production or transportation facilities for primary or improved recovery projects.

For further information on definitions go to the Society of Petroleum Engineers (SPE) web site,

[www.spe.org](http://www.spe.org)

All of these charts and definitions came from publications on that web site, or from the EIA's "U. S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 2000 Annual Report". Also available at the EIA web site,

[www.eia.doe.gov/](http://www.eia.doe.gov/)