U.S. Securities and Exchange Commission Regulations

Part 1: Reserves Definitions

SPE Webinars are Sponsored by:

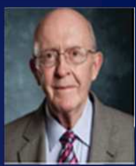
SPE Foundation

Poll Question

How many year(s) have you been working in reserves?

Poll Question

What is your motivation to attend this webinar?



Dr. W. John Lee
Von Gonten Chair in Petroleum
Engineering, Texas A&M University

Importance of SEC Regulations

- All companies that raise capital from the public in the U.S. must abide by SEC regulations in disclosing oil and gas reserves
  - Required for both U.S. and foreign-based companies
  - Companies based overseas are interested in capital formation in the U.S. because of the size and influence of U.S. capital markets
  - SEC regulations thus affect significant fraction of world petroleum reserves despite limited fraction of world reserves in the U.S.

Sources of Information on SEC Reserves Reporting

Information listed below available on SEC or FASB websites

- Regulation S-X, section 4-10 as revised in December 2008, effective 1-1-10
  - Revised S-X 4-10 refers to original 4-10, published in 1978, for definitions that were not revised
- Regulation S-K, section 1200 added in 2008, effective 1-1-10
- SEC Compliance and Disclosure Interpretations: Oil and Gas Rules, issued 13 May 2013
- FASB, Financial Accounting Series, Extractive Industries – Oil and Gas (Topic 932), Oil and Gas Reserves Estimation and Disclosures, issued 10 January 2010 (amending SFAS 69 to conform with December 2008 modifications to SEC Regulations S-X, section 210.4-10 and Regulation S-K section 229.1200)

SEC Regulations: Definitions

- New definitions in S-X 210.4-10(a) in adopting release issued on December 29, 2008
- Some previous definitions retained; to be found in 1978 S-X 210.4-10(a)

SEC Definitions: Reserves [4-10(a)(26)]

- Estimated remaining quantities of oil and gas and related substances anticipated to be economically producible, as of a given date, by application of development projects to known accumulations
- Following must exist or be reasonably expected to exist
  - Legal right to produce (or revenue interest in production)
  - Installed means to deliver oil, gas or related substances to market
  - All permits and financing required to implement project

Developed Oil and Gas Reserves [4-10(a)(4)]

- Reserves of any category that can be expected to be recovered
  - Through existing wells with existing equipment and operating methods or in which cost of required equipment is relatively minor compared to cost of new well
  - Through installed extraction equipment and infrastructure operational at time of reserves estimate if extraction is by means not involving a well

Undeveloped Oil and Gas Reserves [4-10(a)(31)]

- Reserves of any category expected to be recovered from new wells on undrilled acreage or from existing wells where relatively major expenditure required for recompletion
  - Reserves on undrilled acreage limited to directly offsetting development spacing areas reasonably certain of production unless evidence using reliable technology establishes reasonable certainty of economic producibility at greater distances

Undeveloped Oil and Gas Reserves [4-10(a)(31)]

- Undrilled locations classified as having undeveloped reserves only if development plan has been adopted indicating they are to be scheduled to be drilled within five years unless specific circumstances justify longer time
- Under no circumstances shall estimates for undeveloped reserves be attributable to acreage for which fluid injection or other improved recovery technique is contemplated unless such techniques have been proved effective by actual projects in same reservoir or an analogous reservoir, or by other evidence using reliable technology establishing reasonable certainty

Economically Producible [4-10(a)(10)]

- As related to resource, means resource which generates revenue that exceeds, or is reasonably expected to exceed, costs of operation
- Value of products determined at terminal point defined in (a)(16)

Proved Oil and Gas Reserves [4-10(a)(22)]

- Those quantities which, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be economically producible – from a given date forward, from known reservoirs, and under existing economic conditions, operating methods, and government regulations – prior to time contracts providing right to operate expire unless evidence indicates renewal reasonably certain
- Either deterministic or probabilistic methods can be used for estimation
- Project to extract hydrocarbons must have commenced or be reasonably certain to commence within reasonable time

Proved Oil and Gas Reserves [4-10(a)(22)]

- Proved area includes
  - Area identified by drilling and limited by fluid contacts
  - Adjacent undrilled areas with reasonable certainty to be continuous and to contain economically producible oil or gas
- Fluid contacts limited by
  - Lowest known hydrocarbons (LKH) identified in well penetration unless reliable technology indicates lower contact
  - Highest known oil (HKO) unless reliable technology indicates higher contact

Proved Oil and Gas Reserves [4-10(a)(22)]

- Reserves produced economically with improved recovery processes considered proved by
  - Successful pilot with properties no more favorable than reservoir as a whole or
  - Operation of installed program in reservoir or analogous reservoir or
  - Other evidence using reliable technology establishes reasonable certainty and
- Project has been approved for development by all necessary parties and entities, including government entities

Existing Economic Conditions [4-10(a)(22)(v)]

- Prices and costs at which economic producibility is to be determined
- Price is average price during 12-month period immediately prior to ending date of period covered by report
  - Unweighted arithmetic average of first-day-of-month price for each month during period unless prices are defined by contractual arrangements, excluding escalations based upon future conditions
- Computational procedure for costs not specified

Reasonable Certainty [4-10(a)(24)]

- Deterministic: high degree of confidence that quantities will be recovered
  - "high degree of confidence" exists if quantity much more likely to be achieved than not
- Probabilistic: at least 90% probability quantities actually recovered will equal or exceed estimate
- As EUR estimates change due to more data with time, reasonably certain EUR much more likely to increase or remain constant than to decrease

Reliable Technology [4-10(a)(25)]

- Grouping of one or more technologies (including computational methods) that has been field tested and demonstrated to provide reasonably certain results with consistency and repeatability in formation being evaluated or analogous formation

Analogous Reservoir [4-10(a)(2)]

- Similar rock and fluid properties, reservoir conditions (depth, temperature, pressure), drive mechanisms
- At more advanced stage of development than reservoir of interest, may provide concepts to assist in interpretation of more limited data and estimation of recovery
- Key common characteristics
  - Same geological formation (not necessarily in pressure communication with reservoir of interest)
  - Same environment of deposition
  - Similar geological structure
  - Same drive mechanism
- Reservoir properties must, in aggregate, be no more favorable in analog than in reservoir of interest

Probable Reserves [4-10(a)(18)]

- Additional reserves less certain to be recovered than proved reserves but which, together with proved reserves, are as likely as not to be recovered
  - Deterministic: as likely as not that actual remaining quantities recovered will exceed sum of estimated proved plus probable reserves
  - Probabilistic: at least 50% probability that actual quantities recovered will equal or exceed proved plus probable reserves estimates

Probable Reserves: [4-10(a)(18)(ii),(iii)]

- May be assigned to areas of reservoir adjacent to proved reserves where data control or interpretations less certain, even of interpreted continuity of structure or productivity does not meet reasonable certainty criterion
- May be assigned to areas structurally higher than proved areas when in pressure communication with proved reservoir
- May be assigned to areas structurally lower than proved area if these areas are in communication with proved reservoir (implied, not stated)
- Includes potential incremental quantities associated with greater percentage recovery of hydrocarbons in place than assumed for proved reservoirs

Probable Reserves: [4-10(a)(17)(iv),(vi)]

- Proved plus probable reserves estimates must be based on reasonable alternative technical and commercial interpretations within reservoir or project that are clearly documented, including comparisons to results in successful similar projects
- Probable reserves may be assigned to elevations above HKO that fail to meet reasonable certainty criterion if fluid property and pressure gradient interpretations provide sufficient supporting evidence

Possible Reserves [4-10(a)(17)]

- Additional reserves less certain to be recovered than probable reserves
- Deterministic: total quantities ultimately recovered from project have low probability of exceeding proved plus probable plus possible reserves
- Probabilistic: at least 10% probability that total quantities ultimately recovered will equal or exceed proved plus probable plus possible reserves

Possible Reserves: [4-10(a)(17)(ii),(iii)]

- May be assigned to areas of reservoir adjacent to probable reserves where data control and interpretations are progressively less certain – frequently where data unable to define clearly the area and vertical limits of commercial production by defined project
- Includes incremental quantities associated with greater percentage recovery of in-place hydrocarbons than assumed for probable reserves

Possible Reserves: [4-10(a)(17)(iv),(vi)]

- Proved plus probable plus possible reserves estimates must be based on reasonable alternative technical and commercial interpretations within reservoir or project that are clearly documented, including comparisons to results in successful similar projects
- Possible reserves may be assigned to elevations above HKO that fail to meet reasonable certainty criterion if fluid property and pressure gradient interpretations provide sufficient supporting evidence

Possible Reserves: [4-10(a)(17)(v)]

- May be assigned where data identify immediately adjacent portions of reservoir in same accumulation that may be separated from proved area by faults with displacement less than formation thickness or other geological discontinuities not penetrated by wellbores if filer believes adjacent portions are in communication with proved reservoir
- May be assigned to areas structurally higher or lower than proved area if these areas are in communication with proved reservoir

Development Project [4-10(a)(8)]

- Means by which petroleum resources brought to status of "economically producible"
- Examples
  - development of single field
  - incremental development in producing field
  - integrated development of group of several fields and associated facilities with common ownership

Oil and Gas Producing Activities [4-10(a)(16)]

- Search for crude oil, including condensate and natural gas liquids, or natural gas in their natural states and original locations
- Acquisition of property rights for purpose of further exploration for purpose of removing oil or gas from such properties

Oil and Gas Producing Activities [4-10(a)(16)]

- Construction, drilling, and production activities necessary to retrieve oil and gas from natural reservoirs, including acquisition, construction, installation, and maintenance of field gathering and storage systems, such as
  - Lifting oil and gas to the surface
  - Gathering, treating, and field processing (as in processing gas to extract liquid hydrocarbons)
- Extraction of saleable hydrocarbons in solid, liquid, or gaseous state from oil sands, shales, coalbeds, or other non-renewable natural resources intended to be upgraded into synthetic oil or gas and activities undertaken with view to such extraction

Oil and Gas Producing Activities: [4-10(a)(16)]

- Oil and gas production function ends at "terminal point," which is outlet valve on lease or field storage tank
- In unusual circumstances, terminal point may be
  - First point at which oil, gas, or gas liquids, natural or synthetic, are delivered to main pipeline, common carrier, refinery, or marine terminal
  - For natural resources upgraded to synthetic oil or gas, if delivered to purchaser prior to upgrading, first point at which natural resources are delivered to main pipeline, common carrier, marine terminal, or facility which upgrades such resources into synthetic oil or gas

Oil and Gas Producing Activities: Saleable Hydrocarbons [4-10(a)(16)]

- "Saleable hydrocarbons" means saleable in state in which hydrocarbons are delivered

Oil and Gas Producing Activities: [4-10(a)(16)]

Do not include

- Transporting, refining, or marketing oil and gas
- Processing produced oil, gas or natural resources that can be upgraded into synthetic oil or gas by entity that has neither legal right to produce nor revenue interest in such production
- Activities relating to production of natural resources other than oil, gas, or natural resources from which synthetic oil and gas can be extracted
- Production of geothermal steam

Webinars

U.S. Securities and Exchange Commission Regulations

Part 1: Reserves Definitions

Thank you and Questions