CANADIAN

OIL AND GAS

EVALUATION HANDBOOK

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Reserves Definitions

and

Evaluation Practices and Procedures

Prepared by

Society of Petroleum Evaluation Engineers
(Calgary Chapter)

2.10.4.1 DESCRIPTIVE EXAMPLE

Background

A regionally extensive, tight gas accumulation has been drilled and logged by a total of eight wells. Three of these wells were subsequently completed, hydraulically fractured and either successfully flow tested or put on long term production, as illustrated in **Figure 2-50**. The pool is considered analogous to a similar accumulation located 20 miles away, which was originally developed on 80-acre spacing with vertical wells and has recently been drilled on 320-acre spacing with horizontal wells. The operator of this new pool is expecting to drill to a similar well density using horizontal wells. The depositional environment is considered low energy and continuous, with no significant changes expected over moderate distances of one to three miles. The available seismic data does not indicate the presence of faulting. Based on a thorough review of all the geological parameters available a net pay map, it has been constructed at the Best estimate level of confidence.

A reasonable interpretation of which lands could be considered for Undeveloped Reserves related to future drilling is presented in **Figure 2-50**. Additionally, given the tight gas accumulation is regional and generally observed in all the wells drilled in the region, the portions of the pool classified as discovered and undiscovered must also be identified. In this example a two-mile distance away from tested well control is considered reasonable to be considered discovered.

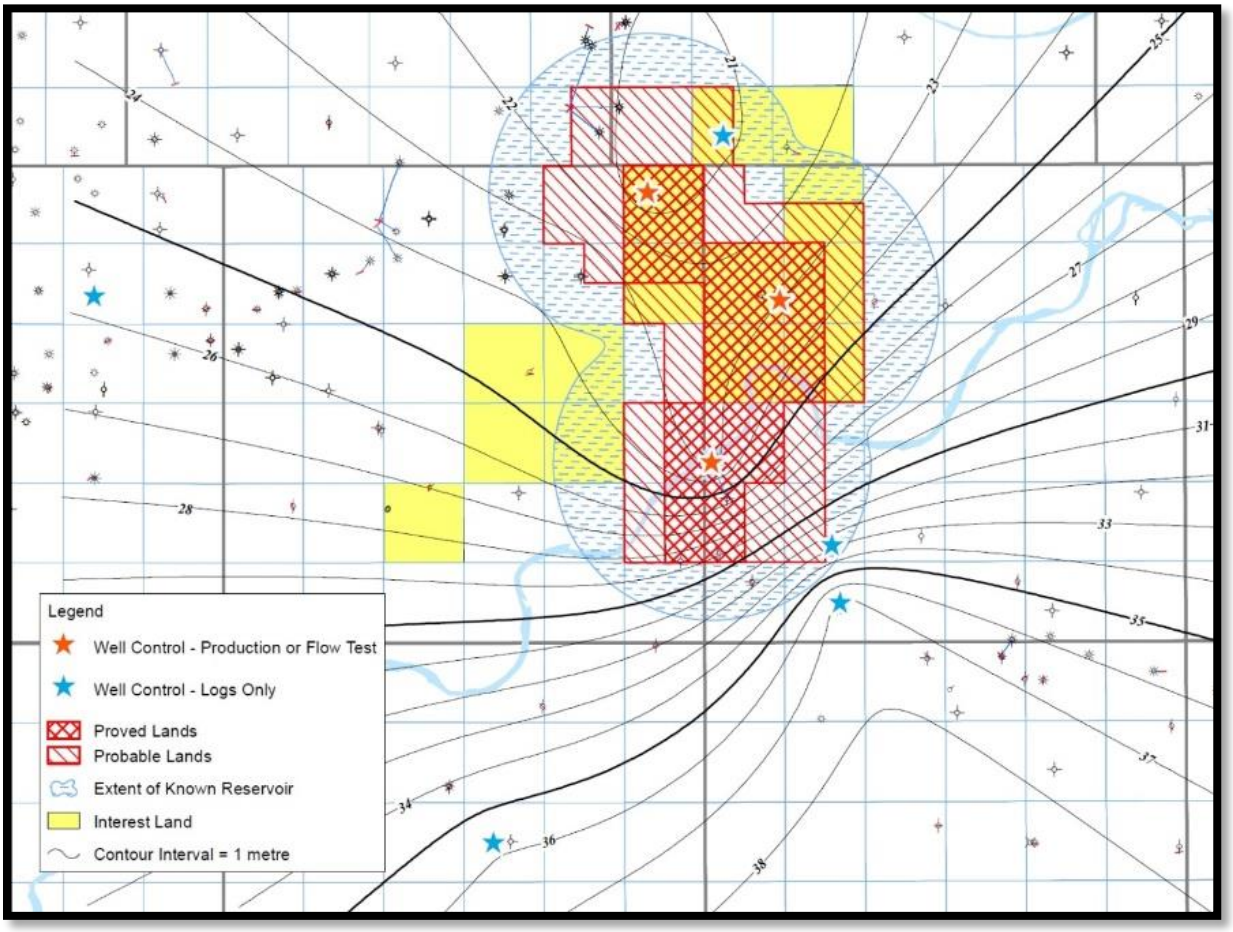

Figure 2-50 Distance from a control point example.

All assets with Reserves previously assigned (opening balances) should only have change records associated with production, economic factors and technical revisions.

Change records for discoveries, extensions, infill drilling, improved recovery, and acquired or disposed interest additions or reductions in a year, will be identified as such and will only have an additional change record for production in the period.

Production change records should match the total production as recorded in a company's accounting statements less adjustments for inventory. Hence production includes all volumes produced from existing developed assets since the last evaluation, production from acquired assets between the closing date of the acquisition and the evaluation date, and production from disposition assets prior to closing.

Mid-term updates to Reserves are only representative of reserve changes up to that date. The completion of a subsequent evaluation used for disclosure must use change records that represent the changes between the last disclosed evaluation and the current evaluation effective date. This means that discoveries, extensions, infill drilling, and improved recovery entities originally evaluated and added in a mid-term update evaluation will continue to be reconciled per their original addition change category in the period reconciled, and therefore, will not contain technical revisions.

4.6.2.3 ACQUISITIONS AND DISPOSITIONS

It is important to understand the meanings attributed to dates when dealing with acquisitions and dispositions. Acquisitions and dispositions can only be recorded when a deal has closed. Until closing has occurred, an acquiring company does not own any interest in a property and a selling company has not disposed of their interest. The closing date is the date when all the conditions of a purchase and sale agreement have been met and funds and interests are transferred.

The closing date is not to be confused with the *effective date of a purchase and sale agreement*. The *effective date of a purchase and sale agreement* simply represents the date at which adjustments are determined. Operational revenues and expenses between the effective date of a purchase and sale agreement and the closing date are applied against the offering as a cash adjustment and typically only adjusts the final transfer of funds or equities between the parties to close the deal.

Acquisition change records are recorded as the sum of the remaining Reserves assessed as of the *evaluation effective date* plus production occurring between the closing date of the acquisition and the *evaluation effective date*.

Entities included within an acquisition can only include those entities which were attributed Reserves as of *the closing date of the purchase and sale agreement*. As such, entities assigned Reserves, which are the result of activity and data occurring and obtained *after the purchase and sale closing date* and *before the effective date of the evaluation*, who's interests are part of the purchase and sale agreement, should be booked as either discovery, extension, infill, or improved recovery reserve additions.

Should significant changes in Reserves interpretations occur within an acquired asset between the *closing date of an acquisition* and the *evaluation effective date,* the difference may be noted in the footnotes of the reconciliation. The change records associated with an acquisition should not contain any technical revisions or economic change record entries.

An evaluator needs to be aware that a purchaser may acquire an asset for reasons other than the Reserves and values which may be assessed under evaluation and reporting guidance. Hence there is no correlation between the Reserves and value assigned in an evaluation and the purchase price.

Disposition change records similarly record the Reserves remaining on the disposition interests as of the closing date of the disposition.

The reduction in Reserves estimates as a result of selling all or a portion of an interest should be recorded at the *closing date of the purchase and sale agreement*. Production occurring between the last evaluation date and the closing date is included as production in the change records of the entity.

4.6.2.4 SPECIAL RESERVES CHANGES

a. Changes in Reserves Category from Probable to Proved. For Reserves assigned to an exploration discovery, a drilling extension, infill drilling, or an improved recovery project, that are initially categorized as probable only, they should be categorized as a proved addition, in the same reserves change category, in the year when the Reserves are categorized as Proved. For multi-phased improved recovery projects, the recategorization of phases from probable to proved would result in a proved addition for that phase in the same Reserves change category in the year when the Reserves are reclassified as proved.

Any subsequent changes to the Proved Reserves assignment should be recorded as a technical revision.

In specific cases, where Proved Reserves were not assigned for economic or technical reasons, and in subsequent years are categorized as Proved Reserves, the Proved Reserves should be recorded as a technical revision.

b. Changes in Reserves Category from Possible to Probable to Proved. For Reserves assigned to an exploration discovery, a drilling extension, infill drilling, or an improved recovery project, that are initially categorized as possible only, they should be categorized as a proved or probable addition, in the same reserves change category, in the year when the Reserves are categorized as proved or probable. For multi-phased improved recovery projects, the recategorization of phases from possible to probable to proved would result in a proved or probable addition for that phase in the same Reserves change category in the year when the Reserves are categorized as proved or probable.

Any subsequent changes to the Proved or Probable Reserves assignment should be recorded as a technical revision.

In specific cases, where Proved or Probable Reserves were not assigned for economic or technical reasons, and in subsequent years are categorized as Proved or Probable Reserves, the Proved or Probable Reserves should be recorded as a technical revision.

c. Changes in Development Status: Changes to the production status between proved producing, proved non-producing, proved undeveloped, etc. are not usually included in the Reserves reconciliation. Evaluators may choose to create sub-categories for the transfer of Reserves between different production statuses and change categories must have sufficient granularity to support a company's disclosure requirements.

d. **Changes due to Different Operating and Capital Cost Assumptions:** Reserves revisions resulting from changes in operating and capital cost estimates should be included in the technical revision category. An exception may be capital expenditures to reduce operating costs, such installing a battery to reduce trucking costs. Reserves additions in this case are classified as improved recovery.
e. **Errors in Interests and Encumbrances:** Changes to Reserves resulting from correcting an incorrect company interest or royalty payable are usually categorized as technical revisions.

In practice, precisely identifying all the individual changes that occur to a Reserves portfolio from one year to the next is difficult, if not impossible. The evaluator should attempt to identify the most significant changes, and then group the remaining minor changes into the technical revisions category so the annual reconciliation balances.

4.6.2.5 SPECIAL RESOURCES CHANGES

a. **Movement of Prospective Resources to Contingent Resources or Reserves:** The development or exploration of prospective Resource assets involves drilling exploratory wells to identify new hydrocarbon accumulations or confirm extensions of existing pools. As such, volumes confirmed by exploration activity need to be classified as either discoveries or extensions within their respective Reserves or contingent Resource reconciliation. The respective volume must be transferred out of the prospective Resource volumes after adjustments have been made based on new data obtained.
b. **Movement of Contingent Resources to Reserves:** Movement of Contingent Resources to Reserves appear as a transfer out of Contingent Resources and a transfer into Reserves with the appropriate change category assigned. The movement of these volumes is associated with removing various contingencies, not spending capital, although capital will generally be required to develop the Resource. Without other activity or data these volumes should move effectively unchanged between the Development Pending Resource classification and the Reserves classification.
c. **Movement of Reserves to Contingent Resources:** In some situations, due to a large petroleum portfolio or perhaps commodity pricing, a company may revise previously approved development plans regarding a Resource and withdraw their corporate commitment to complete development of previously booked Reserves. In this situation, it is best to remove the Reserves using the Resource transfer change category. Note the Resources transfer category is not intended for use when select development goes uneconomic due to changes in expected performance, operating costs, capital requirements etc. Such revisions must still be reconciled as negative technical revisions or economic factors.