



# Well Status & Classification v3

The PPDM Association exists to create a global professional community of practice for those who manage oil and gas data and information as an essential asset using a collectively developed body of knowledge. In collaboration with the members, the PPDM Association delivers events, publications, professional development programs, and standards that support interoperability of people, processes, and data.



R-3 June 2020

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FOR PURPOSES OF PARAGRAPHS 4, 5, 6 AND 7 OF THESE TERMS AND CONDITIONS, PPDM™ SHALL INCLUDE ANY OR ALL OF ITS DIRECTORS, OFFICERS, EMPLOYEES, AGENTS, CONTRACTORS OR OTHER INDIVIDUALS AFFILIATED WITH THE PPDM™, AS THE CASE MAY BE.

These Terms and Conditions are to be governed and interpreted under the laws of the Province of Alberta and the laws of Canada applicable therein, and any and all disputes arising out of these Terms and Conditions, their performance, breach, enforcement, existence or validity, any failure of the parties to reach agreement with respect to matters provided for in these Terms and Conditions and all matters of dispute relating to the rights and obligations of the parties, which cannot be amicably resolved, even if only one of the parties declares that there is a difference, will be referred to and finally settled by private and confidential binding arbitration held in Alberta and governed by Alberta law pursuant to the Alberta Arbitration Act if the User is a party created under the laws of Canada or any province or territory of Canada; or the Arbitration Rules of the United Nations Commission of International Trade Law (UNCITRAL) if the User is a party outside of Canada.

The following arbitration procedures shall apply, notwithstanding whether the arbitration is governed by the Alberta Arbitration Act or UNCITRAL:

–the place of arbitration shall be Calgary, Alberta;

–the Arbitration tribunal shall consist of one (1) arbitrator;

–the Courts of the Province of Alberta shall be the appointing authority in accordance with UNCITRAL Rules;

–the language to be used in the arbitral proceedings shall be English;

–the Arbitrator shall be a person who is legally trained and who has experience in the information technology field in Canada and is independent of either party; and,

–the decision of the arbitration court shall be final and binding upon each of the parties.

Except as otherwise provided herein, all notices must be in writing to the PPDM™ at Bankers Hall, P.O. Box 22155, Calgary, Alberta, T2P 4J5 and to the User at the most recent address in the PPDM™'s records. Notices shall be deemed delivered three business days after posting in the Canadian postal system, or one business day if delivered via courier.

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# About the PPDM Association

The Professional Petroleum Data Management (PPDM) Association is a global, not-for-profit society within the petroleum industry that provides leadership for the professionalization of petroleum data management through the development and dissemination of best practices and standards, education programs, certification programs and professional development opportunities. PPDM represents and supports the needs of operating companies, regulators, software vendors, data vendors, consulting companies and data management professionals around the globe.

Through the PPDM Association, petroleum data experts gather together worldwide in a collaborative, round table approach to engineer business driven, pragmatic data management standards that meet industry needs.





# Introduction

Clear, well-defined reference value lists which convey information with precision and clarity are essential to unambiguous communication, integration and interoperability. Members of the PPDM Association expend considerable energy and attention to identifying and resolving key areas where current reference lists are conflicting or unclear.

Well status and classification reference lists used today usually combine many kinds of information in one list, to the extent that one value in a list may explicitly convey more than one kind of information in a complex code, imply (but not state) critical information, or even leave important information out entirely.

## FACETED TAXONOMY

One approach to creating useful reference lists is to assemble various relevant properties into a logical set as has been done in “Well Status and Classification”. The set is a faceted taxonomy, and each list is one facet in the taxonomy.

**Each facet is constructed according to some simple rules:**

- Each facet describes one property of an object or description, and therefore contains only one kind of information.
- The facets work together to tell a complete story about a well and its components from multiple points of view.
- The values in each facet should be mutually exclusive with values in other facets of the taxonomy.
- Values in a facet may be hierarchical. Users should be able to select at any level of the hierarchy that is relevant to their purpose. Data retrieval or reporting may leverage the hierarchies.
- Unambiguous criteria must be used for the selection of any facet value. If more than one value may be appropriate to a business purpose, the business rules for selection should be reviewed, or the design of the facet may be flawed. Local criteria may be used to choose the best level in the case of a hierarchal facet.

**A faceted taxonomy offers some powerful functionality:**

- Objects can be retrieved from one or more datasets according to their value in a single facet.
- By combining information from many facets, users can group objects for many business purposes.
- A properly constructed set of facets allows rapid retrieval of data objects according to criteria that are familiar to users, without requiring complex queries or knowledge of the data structure. While this information is derivable from a good data store, facets can be helpful shortcuts.
- Facets can be used to develop symbol sets or dashboard displays as appropriate.

# Well Status & Classification v3 Overview

A faceted taxonomy was created by the PPDM Association to deal with the multitude of values describing wells in the global petroleum industry. This is an evolving product, responding to changes in data management needs and practices. Version 2 (2016) is in wide use but a survey of members in 2018 showed opportunities for enhancements.

A work group of member volunteers began in 2019 and finalized Version 3 in March 2020. The process uses The PPDM Way — priorities, expertise and resources are provided by our members, supported by the Association's staff.

The facets are designed and arranged according to life cycle, stakeholder perspectives and significant events or conditions.

**The changes from Version 2 are documented separately. In summary, the main changes are:**

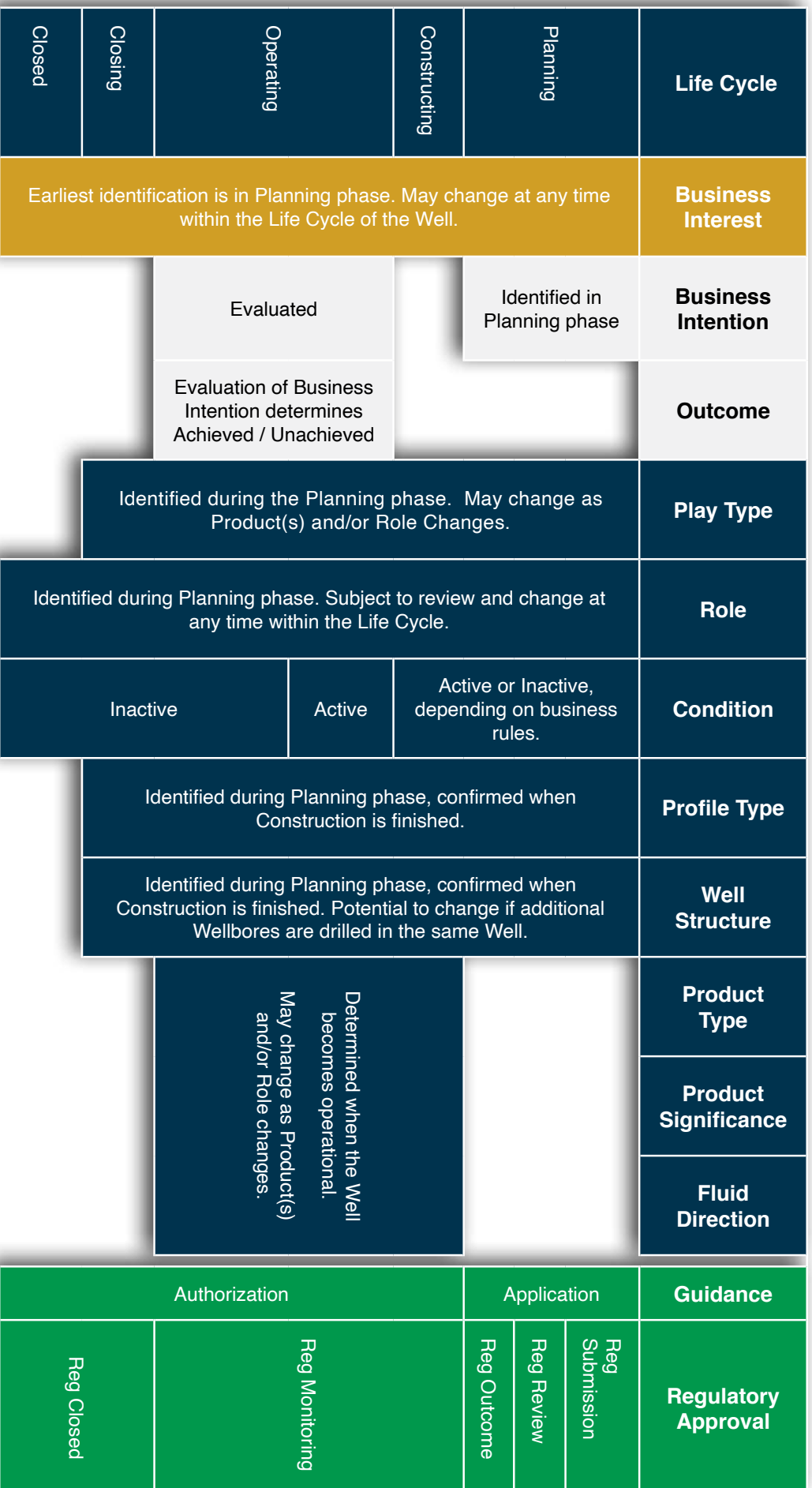
- Simplify the phases of the well life cycle.
- Show the different perspectives of the stakeholders in the context of the life cycle.
- Distinguish the life cycle of a permit (regulatory authorization) from the life cycle of a well.
- Recognize that well status and wellbore status may be different, even at the same time.
- Reword some facet names and facet values to improve clarity.
- Combine or split some facets to improve the logic of the taxonomy.
- Eliminate facets for Lahee Class and Well Reporting Class.

Please visit the PPDM website for a full supplemental mapping to this version 3 of the Well Status & Classification Standard.

Your feedback is important in the ongoing evergreen process. Please send all comments to [projects@ppdm.org](mailto:projects@ppdm.org).

## Stakeholder Perspectives

This chart shows all the facets in the context of the life cycle. It highlights certain facets that are primarily of interest to the business (well operator and partners), the regulator, or both. This does not imply that any facet is the exclusive domain of any stakeholder.



### Legend

	Corporate Internal Purpose
	Business (operational) Internal Purpose
	Regulator Internal Purpose - may be shared to Business
	Business and Regulatory Purpose

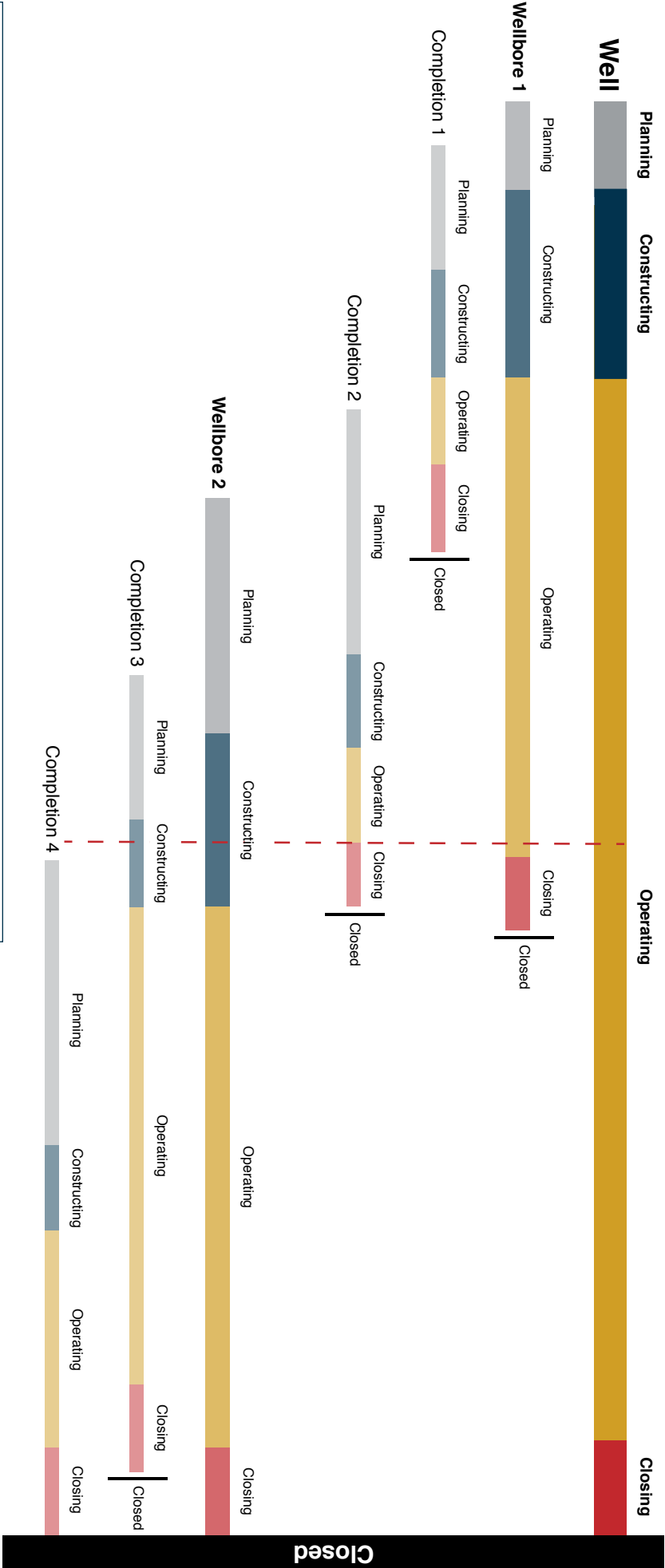
## Life Cycle

**Life Cycle** is a set of major phases that are significant to regulators and/or business stakeholders. Life Cycle may apply to a well or its components.

Facet Value	Facet Value Definition
<b>Planning</b>	Planning is all the activities of the Life Cycle before construction has commenced. It includes designing a well and obtaining management and regulatory approvals.
<b>Constructing</b>	Constructing is the approved activities of the Life Cycle prior to operation.
<b>Operating</b>	Operating is the activities of the Life Cycle while the well or component is capable of performing its intended Role. It includes periods where the well is temporarily shut in.
<b>Closing</b>	Closing is the set of activities of the Life Cycle to make the well or component permanently incapable of any Role.
<b>Closed</b>	Closed is the phase of the Life Cycle when the well or component is permanently incapable of performing any Role.

# Life Cycle Sample Timeline

This Gantt chart shows the phases of the Life Cycle of a hypothetical well. Of special note is that the phases in the life of a wellbore or completion may differ from the phases of the entire well but are also dependent on the parent. For example, a wellbore must not be classified as “Operating” if the parent well is “Closing.” Conversely, a well component (e.g. completion) may be “Planning” while another component is “Operating” and therefore the parent well is “Operating.”



## Clarifications:

The Life Cycle of the well is derived from the current Life Cycle of each component.

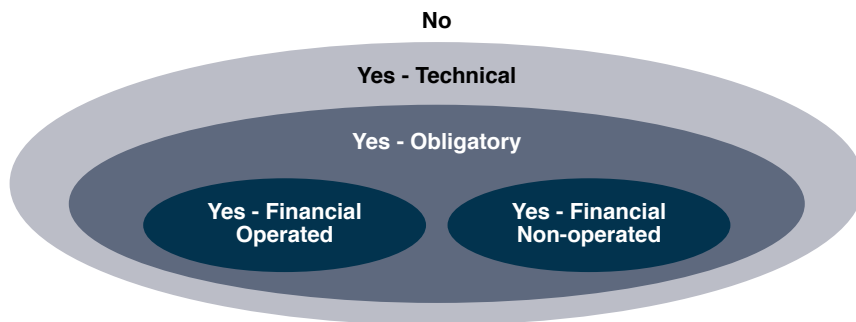
It is not essential to assign a Life Cycle to a component; it depends on business requirements.

At any point in time (e.g. red dashed line), the Life Cycle phase of components may differ but must be consistent with reality. For example, a well cannot be operating if there is no operating component; a wellbore cannot be closed if it is part of a completion which is operating.

Gantt not to scale

## Business Interest

This facet is different from others in this document. When the facet value is Yes, the qualifiers exist in a hierarchy and are not necessarily mutually exclusive. In implementation, the most important qualifier in the hierarchy should be selected.



**Business Interest** describes whether a company currently considers a well entity or its data to be a real or planned asset, and if so, the nature of and motivation for that company's interest.

An asset has benefits and/or obligations. Business Interest can change over time.

Facet Value	Facet Value Definition										
<b>Yes</b>	A Yes Business Interest means that the company currently considers a well entity or its data to be a real or planned asset in which the company is interested. If the facet value is Yes, a qualifier is mandatory.										
	<table> <tr> <th>Qualifier</th><th>Comment</th></tr> <tr> <td><b>Financial – Operated</b></td><td> <p>The Financial – Operated qualifier indicates that the business has primary accountability for all activities performed on the well entity.</p> <p>Financial - Operated well entities necessarily have Obligatory and Technical Interest.</p> </td></tr> <tr> <td><b>Financial – Non-operated</b></td><td> <p>The Financial – Non-operated qualifier indicates that the well entity affects the business's income statement through revenue and/or expenses in a scenario where the business does not have the primary accountability for all activities performed on the well entity.</p> <p>Financial - Non-operated well entities necessarily have Obligatory and Technical Interest.</p> </td></tr> <tr> <td><b>Obligatory</b></td><td> <p>The Obligatory qualifier indicates that the business has reason to monitor a well entity in order to ensure that the business fulfills any obligations.</p> <p>Obligatory Interest well entities necessarily have Technical Interest.</p> </td></tr> <tr> <td><b>Technical</b></td><td>The Technical qualifier indicates that the business has an interest in monitoring a well entity and/or maintaining non-public data about a well entity.</td></tr> </table>	Qualifier	Comment	<b>Financial – Operated</b>	<p>The Financial – Operated qualifier indicates that the business has primary accountability for all activities performed on the well entity.</p> <p>Financial - Operated well entities necessarily have Obligatory and Technical Interest.</p>	<b>Financial – Non-operated</b>	<p>The Financial – Non-operated qualifier indicates that the well entity affects the business's income statement through revenue and/or expenses in a scenario where the business does not have the primary accountability for all activities performed on the well entity.</p> <p>Financial - Non-operated well entities necessarily have Obligatory and Technical Interest.</p>	<b>Obligatory</b>	<p>The Obligatory qualifier indicates that the business has reason to monitor a well entity in order to ensure that the business fulfills any obligations.</p> <p>Obligatory Interest well entities necessarily have Technical Interest.</p>	<b>Technical</b>	The Technical qualifier indicates that the business has an interest in monitoring a well entity and/or maintaining non-public data about a well entity.
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<b>Technical</b>	The Technical qualifier indicates that the business has an interest in monitoring a well entity and/or maintaining non-public data about a well entity.										
<b>No</b>	A No Business Interest means that the company does not currently consider a well entity or its data to be a real or planned asset in which the company is interested.										



## Business Interest Continued

### Clarification

**Financial - Operated:** The well operator directly funds and controls all well operations. The well operator is accountable to the regulator and any partners and is usually the holder of the well permit. The well operator may assign portions of the work to other business associates but remains the responsible party.

**Obligatory Interest:** One example when a well might have current Obligatory Interest without any current Financial Interest is the following: An operator sells/divests a well. A few years later, the company that acquired the well goes out of business and ceases to exist. In some legal jurisdictions, environmental responsibility for the well reverts to the operator that drilled the well or that previously owned the well.

**Technical Interest:** Once a business has any technical interest in a well entity, that technical interest remains unless and until all non-public information about that well entity is purged. It is possible, but rare, to completely purge all data.

**Historical Interest:** While this standard is focused on the current Business Interest of a well, historical values for Business Interest often remain relevant at the same time. For example:

- A company may acquire a well that it did not drill and operate. It may want to know that the well is currently operated and simultaneously that it formerly had non-operating financial interest, so as not to confuse different streams of accounting that are both active.
- A company may divest a well. It may want to know that the well is formerly operated in order to fulfill certain types of accounting and regulatory obligations, and simultaneously that the company has current non-operating financial interest in the well so that it can ensure it receives partner reports from the current operator.

Those implementing this standard should consider whether it is a business need to maintain former Business Interest values as current attributes, and how to account for it. See the business rules below for examples..

### Business Rules for the Business Interest Facet

Deriving historical values from a history of current values: There are various data management practices by which historical values may be captured through versioning and/or auditing. If a company wants to derive or otherwise manage current values that identify historical business interest (such as “formerly operated”) from this historical data, the following is one example.

Historical data is used to create derived attributes that enable a company to simultaneously track the current Business Interest value and whether other Business Interest values were ever applicable. Only the first row of this example is populated, but this pattern may be followed for other derived attributes.

Historical Attributes			
	Currently	Formerly	Never
Financial - Operated	If Business Interest is Financial-Operated, then <b>Financial-Operated</b> <b>Currently</b> = Yes Otherwise, No	If Business Interest has ever been Financial-Operated, then <b>Financial-Operated</b> <b>Formerly</b> = Yes Otherwise, No	If Business Interest has ever been Financial-Operated, then <b>Financial-Operated</b> <b>Never</b> = No Otherwise, Yes

## Business Interest Continued

Deriving Historical Values from Other Historical Values: If a company has derived historical values as in the example above, it is possible to logically derive and/or quality check historical values against each other with business rules. Below is one possible example. Certain values can be derived from other values more reliably than others.

	Historical Attributes		
	Currently	Formerly	Never
Financial – Operated			<p>↑</p> <p>If Obligatory and/or Technical = Never then both Financial attributes = Never</p>
Financial – Non-operated			<p>↑</p> <p>If Obligatory and/or Technical = Never then both Financial attributes = Never</p>
Obligatory	<p>↓</p> <p>If either of the Financial attributes = Currently then Obligatory = Currently</p> <p>If either of the Financial attributes = Formerly then there is a higher likelihood that Obligatory = Currently</p>		<p>↑</p> <p>If Technical = Never then Obligatory = Never</p>
Technical	<p>↓</p> <p>If either of the Financial or Obligatory attributes = Currently then Technical = Currently</p> <p>↓</p> <p>If either of the Financial or Obligatory attributes = Formerly then almost always Technical = Currently</p>		

## Business Intention

**Business Intention** is the general purpose for which resources are approved for drilling a new well or subsequent wellbore(s).

Facet Value	Facet Value Definition
<b>Explore</b>	A Business Intention of Explore refers to a well drilled to determine and evaluate the hydrocarbon potential of a previously undeveloped area or zone.
<b>Appraise</b>	A Business Intention of Appraise refers to a well drilled into a formation shown to be potentially productive by an earlier well and is used to obtain more information about the reservoir.
<b>Extend</b>	A Business Intention of Extend refers to a well drilled to determine the continuation of a known pool or to find a nearby pool in the same formation.
<b>Develop</b>	A Business Intention of Develop refers to a well drilled into an area or zone already proven to be productive, in order to assist in the recovery of hydrocarbons. This includes service wells.

### Clarification

The distinction between Business Intention and Lahee Class is perspective. Business Intention is focused on approvals and Return on Investment, while Lahee Class is more about risk. Although intended to be universal, Lahee Class is implemented individually by each regulator. Specific definitions or criteria for assignment may vary between regulators. The AAPG is the custodian of the Lahee Class.

## Outcome

**Outcome** is the result of attempting to accomplish the Business Intention.

Facet Value	Facet Value Definition
<b>Achieved</b>	An Outcome of Achieved means that the Business Intention was accomplished.
<b>Unachieved</b>	An Outcome of Unachieved means that the Business Intention was not accomplished.

### Clarification

This facet is only meaningful if the Business Intention is known.

## Play Type

**Play Type** is the focus or area conducive to hydrocarbon discovery and includes the related activities for the development and production of the reservoir.

Facet Value	Facet Value Definition						
<b>Conventional</b>	A Conventional Play Type describes an intention or development to produce hydrocarbons from a typical, porous and permeable reservoir.						
<b>Shale</b>	A Shale Play Type describes an intention or development to produce hydrocarbons from shale, using special methods to release the hydrocarbons from the very low permeability mudrock.						
<table> <tr> <th>Qualifier</th><th>Comment</th></tr> <tr> <td><b>Shale Gas</b></td><td>Shale gas plays primarily produce gas from shale formations.</td></tr> <tr> <td><b>Shale Oil</b></td><td>Shale oil plays primarily produce oil from shale formations.</td></tr> </table>		Qualifier	Comment	<b>Shale Gas</b>	Shale gas plays primarily produce gas from shale formations.	<b>Shale Oil</b>	Shale oil plays primarily produce oil from shale formations.
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<b>Shale Oil</b>	Shale oil plays primarily produce oil from shale formations.						
<b>Oil Sands</b>	An Oil Sands Play Type describes an intention or development to produce bitumen or very heavy oil from a sand reservoir.						
<table> <tr> <th>Qualifier</th><th>Comment</th></tr> <tr> <td><b>In Situ</b></td><td>In Situ describes using special technology to mobilize the oil with heat or solvent.</td></tr> <tr> <td><b>Mineable</b></td><td>Mineable describes using surface mining techniques.</td></tr> </table>		Qualifier	Comment	<b>In Situ</b>	In Situ describes using special technology to mobilize the oil with heat or solvent.	<b>Mineable</b>	Mineable describes using surface mining techniques.
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<b>In Situ</b>	In Situ describes using special technology to mobilize the oil with heat or solvent.						
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<b>Coalbed Methane</b>	A Coalbed Methane (CBM) Play Type describes an intention or development to produce hydrocarbons from an impermeable matrix of coal beds.						
<b>Gas Hydrate</b>	A Gas Hydrate Play Type describes an intention or development to produce methane trapped within the molecular structure of solid water (ice.) Gas hydrates occur on some continental margins and polar regions.						
<b>Tight Sand</b>	A Tight Sand Play Type describes an intention or development to produce hydrocarbons from a low-permeability reservoir using special completion techniques.						
<b>Sub-salt</b>	A Sub-salt Play Type describes an intention or development to produce hydrocarbons from beneath a salt layer.						
<b>Non-hydrocarbon</b>	A Non-hydrocarbon Play Type does not have hydrocarbons as the main objective. Examples are geothermal, potash, uranium and sulphur. The product can be defined in the Product Type facet.						
<b>Carbon Capture and Storage</b>	A Carbon Capture and Storage (CCS) Play Type describes an intention or development to sequester and/or store CO2 in the subsurface.						

### Clarification

Product is normally captured in the Product Type facet.

The facet value of the Play Type may change over the Life Cycle of the well if the Role of the well changes or a different formation is targeted.



## Role

**Role** is the current purpose, whether planned or actual.

If there are multiple Roles among a well's components, the well may be assigned the facet value with the highest significance. The value of Role may change over the Life Cycle.

Facet Value	Facet Value Definition												
<b>Produce</b>	A Role of Produce is to extract products for commercial purposes.												
<b>Inject</b>	A Role of Inject is to force fluids into the reservoir to enhance recovery of hydrocarbons.												
	<table> <tr> <th>Qualifier</th><th>Comment</th></tr> <tr> <td><b>Single Product</b></td><td>In a Single Product injector, the injection does not alternate between products. Products are captured in the Product Type facet.</td></tr> <tr> <td><b>Multiple Products</b></td><td>In a Multiple Products injector, the injection alternates between products. Products are captured in the Product Type facet.</td></tr> </table>	Qualifier	Comment	<b>Single Product</b>	In a Single Product injector, the injection does not alternate between products. Products are captured in the Product Type facet.	<b>Multiple Products</b>	In a Multiple Products injector, the injection alternates between products. Products are captured in the Product Type facet.						
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<b>Multiple Products</b>	In a Multiple Products injector, the injection alternates between products. Products are captured in the Product Type facet.												
<b>Produce/Inject</b>	A Role of Produce/Inject can both produce and inject, either cyclically or simultaneously.												
	<table> <tr> <th>Qualifier</th><th>Comment</th></tr> <tr> <td><b>Simultaneous</b></td><td>Simultaneous may be used when a well or a wellbore is simultaneously producing and injecting to and from the subsurface. This may be by a dual string installation, or by an annulus and production string combination.</td></tr> <tr> <td><b>Cyclic</b></td><td>Cyclic allows a well to alternate between the roles of Produce and Inject. A well with a qualifier of cyclic does not require regulatory approvals to change between producing and injecting.</td></tr> </table>	Qualifier	Comment	<b>Simultaneous</b>	Simultaneous may be used when a well or a wellbore is simultaneously producing and injecting to and from the subsurface. This may be by a dual string installation, or by an annulus and production string combination.	<b>Cyclic</b>	Cyclic allows a well to alternate between the roles of Produce and Inject. A well with a qualifier of cyclic does not require regulatory approvals to change between producing and injecting.						
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<b>Cyclic</b>	Cyclic allows a well to alternate between the roles of Produce and Inject. A well with a qualifier of cyclic does not require regulatory approvals to change between producing and injecting.												
<b>Service</b>	A Role of Service provides maintenance and monitoring; for example, fluid monitoring, blowout relief, borehole re-acquisition.												
	<table> <tr> <th>Qualifier</th><th>Comment</th></tr> <tr> <td><b>Supply</b></td><td>Supply is for the purpose of obtaining fluids for operations.</td></tr> <tr> <td><b>Storage</b></td><td>Storage is for the purpose of injection and subsequent recovery of a fluid into / out of a reservoir.</td></tr> <tr> <td><b>Disposal</b></td><td>Disposal is for the purpose of permanent injection of a waste fluid into a reservoir.</td></tr> <tr> <td><b>Relief</b></td><td>Relief is for the purpose of intersecting another well where control has been or may be lost (e.g. blowout).</td></tr> <tr> <td><b>Observation</b></td><td>Observation is for the purpose of monitoring subsurface conditions.</td></tr> </table>	Qualifier	Comment	<b>Supply</b>	Supply is for the purpose of obtaining fluids for operations.	<b>Storage</b>	Storage is for the purpose of injection and subsequent recovery of a fluid into / out of a reservoir.	<b>Disposal</b>	Disposal is for the purpose of permanent injection of a waste fluid into a reservoir.	<b>Relief</b>	Relief is for the purpose of intersecting another well where control has been or may be lost (e.g. blowout).	<b>Observation</b>	Observation is for the purpose of monitoring subsurface conditions.
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**Role** Continued

Facet Value	Facet Value Definition
<b>Research</b>	A Role of Research describes a well drilled primarily with the intention of gathering data. The information may include stratigraphy, temperature gradient, or evaluation of new technologies. A Research well is usually drilled under a permit that does not grant mineral or production rights.
<b>No Role</b>	A facet value of No Role indicates the well or component does not have a current configuration that would accomplish any specific purpose.

## Condition

**Condition** is the operational state relative to the Role.

If there are multiple Conditions among a well's components the well must be assigned the facet value with the highest significance.

Facet Value	Facet Value Definition								
<b>Active</b>	The Active Condition describes a well or component that is fulfilling its Role.								
<b>Inactive</b>	The Inactive Condition describes a well or component that is not fulfilling its Role.								
	<table> <tr> <th>Qualifier</th><th>Comment</th></tr> <tr> <td><b>Shut In</b></td><td>Shut In is an intentional pause in operation <i>that does not require regulatory notification</i>. Shutting in involves closing valves or shutting off pumps that are required to accomplish the Role.</td></tr> <tr> <td><b>Idle</b></td><td>Idle is an intentional pause in operation that <i>requires regulatory notification</i>. Idle involves closing valves or shutting off pumps that are required to accomplish the Role.</td></tr> <tr> <td><b>Abandoned</b></td><td>The well or component is permanently incapable of fulfilling its Role.</td></tr> </table>	Qualifier	Comment	<b>Shut In</b>	Shut In is an intentional pause in operation <i>that does not require regulatory notification</i> . Shutting in involves closing valves or shutting off pumps that are required to accomplish the Role.	<b>Idle</b>	Idle is an intentional pause in operation that <i>requires regulatory notification</i> . Idle involves closing valves or shutting off pumps that are required to accomplish the Role.	<b>Abandoned</b>	The well or component is permanently incapable of fulfilling its Role.
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<b>Abandoned</b>	The well or component is permanently incapable of fulfilling its Role.								

### Clarification

The change in facet value is usually based on business rules that may vary by operator or regulator. For example, a producing well that is undergoing routine service or testing for a few days may or may not be considered Inactive.

Idle may be referred to as suspended, temporary abandonment, temporary cessation, etc. in some areas.

## Profile Type

**Profile Type** is the general geometry of the wellbore relative to the vertical plane.

The specific criteria for Profile Type may vary by operator or regulator. The facet value may change if conditions encountered during drilling are not what was planned or permitted.

Facet Value	Facet Value Definition										
<b>Vertical</b>	A Vertical Profile Type does not deviate significantly from the vertical plane.										
<b>Inclined</b>	An Inclined Profile Type deviates significantly from the vertical plane but is not Horizontal.										
	<table> <tr> <th>Qualifier</th><th>Comment</th></tr> <tr> <td><b>Slant Hole</b></td><td> <p>A Slant Hole deviates from vertical for a significant distance near the surface.</p> <p>The path near the terminus may be deviated or vertical.</p> </td></tr> <tr> <td><b>S-type</b></td><td>An S-type hole has an S-shaped path.</td></tr> <tr> <td><b>Deep Inclined</b></td><td>A Deep Inclined wellbore is vertical for a significant distance near the surface and deviates from vertical before the terminus.</td></tr> </table>	Qualifier	Comment	<b>Slant Hole</b>	<p>A Slant Hole deviates from vertical for a significant distance near the surface.</p> <p>The path near the terminus may be deviated or vertical.</p>	<b>S-type</b>	An S-type hole has an S-shaped path.	<b>Deep Inclined</b>	A Deep Inclined wellbore is vertical for a significant distance near the surface and deviates from vertical before the terminus.		
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<b>Deep Inclined</b>	A Deep Inclined wellbore is vertical for a significant distance near the surface and deviates from vertical before the terminus.										
<b>Horizontal</b>	A Horizontal Profile Type has a general L-shape and a significant distance near the terminus is generally perpendicular to the vertical plane.										
	<table> <tr> <th>Qualifier</th><th>Comment</th></tr> <tr> <td><b>Toe-up</b></td><td>A Toe-up Horizontal wellbore is inclined slightly upwards from the heel to the toe.</td></tr> <tr> <td><b>Toe-down</b></td><td>A Toe-down Horizontal wellbore is inclined slightly downwards from the heel to the toe.</td></tr> <tr> <td><b>Level</b></td><td>A Level Horizontal wellbore is approximately 90 degrees from the heel to the toe.</td></tr> <tr> <td><b>Undulating</b></td><td> <p>An Undulating Horizontal wellbore has a wave-like shape from the heel to the toe.</p> <p>This Qualifier overrides Toe-up, Toe-down or Level.</p> </td></tr> </table>	Qualifier	Comment	<b>Toe-up</b>	A Toe-up Horizontal wellbore is inclined slightly upwards from the heel to the toe.	<b>Toe-down</b>	A Toe-down Horizontal wellbore is inclined slightly downwards from the heel to the toe.	<b>Level</b>	A Level Horizontal wellbore is approximately 90 degrees from the heel to the toe.	<b>Undulating</b>	<p>An Undulating Horizontal wellbore has a wave-like shape from the heel to the toe.</p> <p>This Qualifier overrides Toe-up, Toe-down or Level.</p>
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<b>Toe-down</b>	A Toe-down Horizontal wellbore is inclined slightly downwards from the heel to the toe.										
<b>Level</b>	A Level Horizontal wellbore is approximately 90 degrees from the heel to the toe.										
<b>Undulating</b>	<p>An Undulating Horizontal wellbore has a wave-like shape from the heel to the toe.</p> <p>This Qualifier overrides Toe-up, Toe-down or Level.</p>										

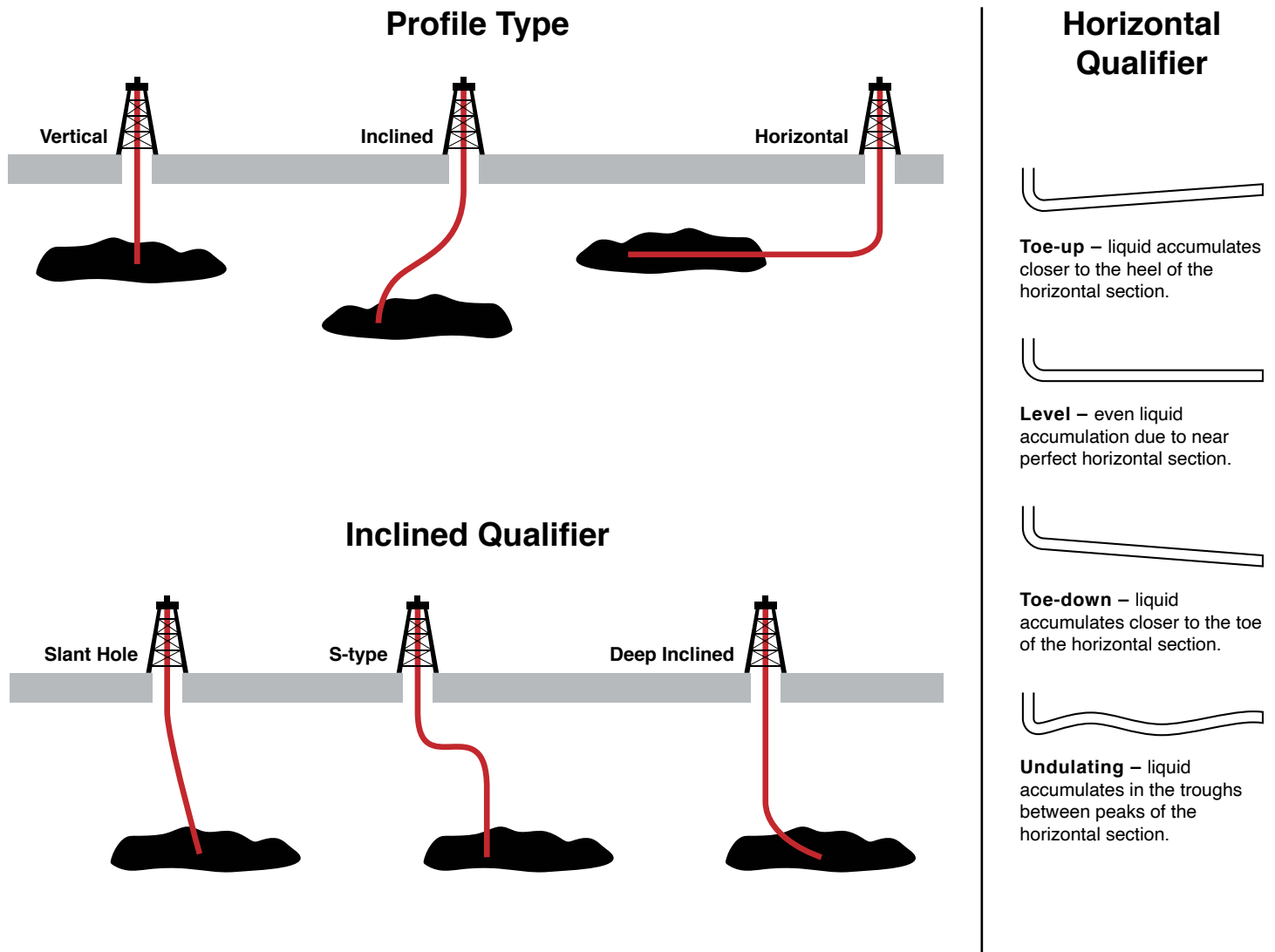
# Profile Type Continued

## Clarification

The intended Profile Type and the as-drilled Profile Type may both remain relevant to the data record of a wellbore.

An operator's Profile Type may differ from that of the regulator. For example, a well may be permitted as Vertical but deviates significantly during drilling. It now fits the definition of Inclined, but the regulator may retain the permitted value of Vertical. Subsurface analysts should be aware that it is an Inclined wellbore even though the regulatory designation is still Vertical.

Horizontal and Inclined wellbores potentially have portions that exceed 80 degrees inclination. Subsurface analysts should be aware that this parameter alone is not enough for identifying Horizontals.





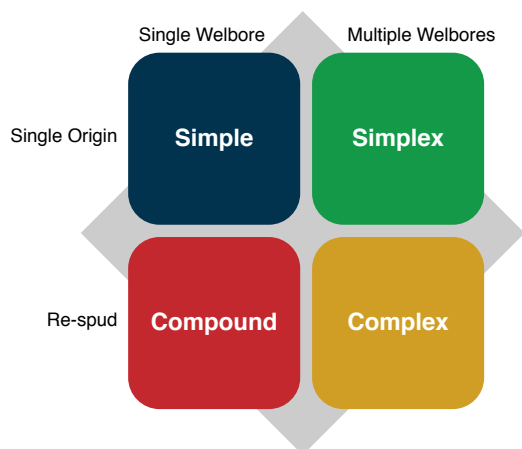
# Well Structure

**Well Structure** is the geometric relationship of all the wellbores within a well or well set, relative to each other.

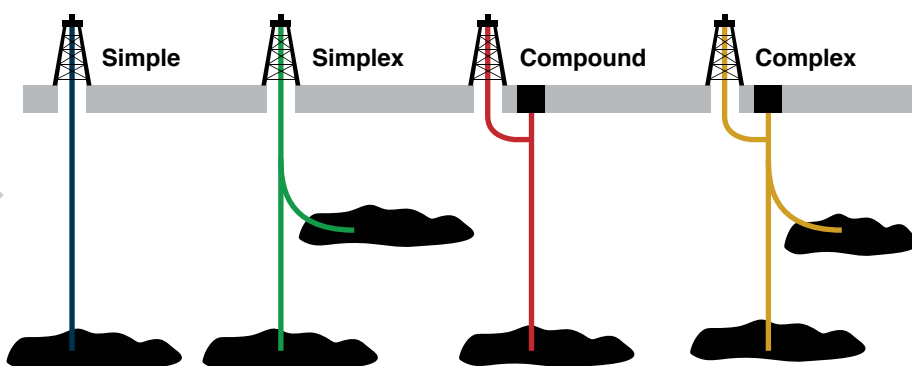
The value of Well Structure may change as new wellbores are drilled.

Facet Value	Facet Value Definition
<b>Simple</b>	A Simple Well Structure has one well origin and one wellbore. It may have multiple geologic targets, but they must all be accessed along the same wellbore.
<b>Simplex</b>	A Simplex Well Structure has one well origin and more than one wellbore. A Simplex well may contain remedial (bypass or deviation correction) wellbores and one or more wellbores deviated to a new target(s).
<b>Compound</b>	A Compound Well Structure has an initial Simple well and one or more additional wellbores, all sharing the same intended well origin but with different well origins because of re-spud to correct drilling difficulties. It may have multiple geologic targets, but they must all be accessed along the same wellbore. A Compound well may have a remedial bypass wellbore, but only if it is plugged and has no associated data (cores, logs, tests).
<b>Complex</b>	A Complex Well Structure has a Simple, Simplex or Compound well and one or more additional wellbores, all sharing the same intended well origin but with at least two separate well origins because of re-spud to correct drilling difficulties. It may have remedial (bypass, deviation correction, or blowout relief) wellbores and zero or more wellbores deviated to a new target(s).
<b>Network</b>	A Network Well Structure is a well in which component wellbores may start at one or more points on the surface of the earth (multiple well origins), are interconnected below the surface of the earth, and may be created for the acquisition of many primary geological targets. A Network well may have many surface access points to shared geologic targets.

**Well Structure Matrix**



**Well Structure**



## Product Type

**Product Type** is the physical product(s) that can be attributed to any well component. Qualifiers allow for further description. This facet is always used with the Product Significance facet.

The value of Product Type can change over the life of a well.

Facet Value	Facet Value Definition
<b>Oil</b>	An Oil Product Type is a mixture of hydrocarbon substances that occurs as a viscous liquid. It is extracted by wells or mining and processed into fuels, lubricants, chemicals, etc.
Qualifier	Comment
<b>Fine Light</b>	Fine Light oil is crude oil with an API gravity > 45.0.
<b>Premium Light</b>	Premium Light oil is crude oil with an API gravity > 39.9 and < 45.1.
<b>Light</b>	Light oil is crude oil with an API gravity > 31.1 and < 40.0.
<b>Medium</b>	Medium oil is crude oil with an API gravity > 22.2 and < 31.2.
<b>Heavy</b>	Heavy oil is crude oil with an API gravity > 9.9 and < 22.3.
<b>Bitumen</b>	Bitumen is crude oil with an API gravity < 10.0.
<b>Naphtha</b>	Naphtha is a colourless and highly volatile, flammable liquid hydrocarbon intermediate product between gasoline and benzene formed from the distillation of crude oil.

### Clarification

Naphtha is used as a solvent, fuel, etc.

## Product Type Continued

Facet Value	Facet Value Definition																						
<b>Gas</b>	<p>A Gas Product Type is a substance that exists in a non-solid or non-liquid state under normal temperatures and pressures. It possesses perfect molecular mobility and the property of indefinite expansion and is lighter than oil or water.</p> <table> <tr> <th>Qualifier</th><th>Comment</th></tr> <tr> <td><b>Methane</b></td><td>Methane (CH<sub>4</sub>) is the lightest of the hydrocarbon gases.</td></tr> <tr> <td><b>Ethane</b></td><td>Ethane (C<sub>2</sub>H<sub>6</sub>) is a hydrocarbon gas.</td></tr> <tr> <td><b>Ethane Plus</b></td><td>Ethane Plus is a mixture of ethane and higher molecular weight hydrocarbon gases, also known as C<sub>2</sub>+</td></tr> <tr> <td><b>Propane</b></td><td>Propane (C<sub>3</sub>H<sub>8</sub>) is a hydrocarbon gas.</td></tr> <tr> <td><b>Butane</b></td><td>Butane (C<sub>4</sub>H<sub>10</sub>) is a hydrocarbon gas.</td></tr> <tr> <td><b>Pentane</b></td><td>Pentane (C<sub>5</sub>H<sub>12</sub>) is a hydrocarbon gas.</td></tr> <tr> <td><b>Pentanes Plus</b></td><td>Pentanes Plus is a mixture of pentanes and higher molecular weight hydrocarbon gases, also known as C<sub>5</sub>+</td></tr> <tr> <td><b>Gas Condensate</b></td><td>Condensate is a natural gas mixture that exists in a liquid state with a low vapor pressure compared with liquid petroleum gas (LPG). Condensate is mainly composed of propane, butane, pentane and heavier hydrocarbon fractions.</td></tr> <tr> <td><b>Liquid Petroleum Gas</b></td><td>Liquid Petroleum Gas (LPG) is a natural gas mixture composed of mainly ethane, propane, and butanes, with small amounts of pentanes plus (C<sub>5</sub>+) in any combination. The fluid is usually gaseous under atmospheric conditions but becomes a liquid under pressure.</td></tr> <tr> <td><b>Acid Gas</b></td><td>Acid Gas is a poisonous and corrosive gas mixture consisting of hydrogen sulfide and carbon dioxide in varying concentrations.</td></tr> </table>	Qualifier	Comment	<b>Methane</b>	Methane (CH <sub>4</sub> ) is the lightest of the hydrocarbon gases.	<b>Ethane</b>	Ethane (C <sub>2</sub> H <sub>6</sub> ) is a hydrocarbon gas.	<b>Ethane Plus</b>	Ethane Plus is a mixture of ethane and higher molecular weight hydrocarbon gases, also known as C <sub>2</sub> +	<b>Propane</b>	Propane (C <sub>3</sub> H <sub>8</sub> ) is a hydrocarbon gas.	<b>Butane</b>	Butane (C <sub>4</sub> H <sub>10</sub> ) is a hydrocarbon gas.	<b>Pentane</b>	Pentane (C <sub>5</sub> H <sub>12</sub> ) is a hydrocarbon gas.	<b>Pentanes Plus</b>	Pentanes Plus is a mixture of pentanes and higher molecular weight hydrocarbon gases, also known as C <sub>5</sub> +	<b>Gas Condensate</b>	Condensate is a natural gas mixture that exists in a liquid state with a low vapor pressure compared with liquid petroleum gas (LPG). Condensate is mainly composed of propane, butane, pentane and heavier hydrocarbon fractions.	<b>Liquid Petroleum Gas</b>	Liquid Petroleum Gas (LPG) is a natural gas mixture composed of mainly ethane, propane, and butanes, with small amounts of pentanes plus (C <sub>5</sub> +) in any combination. The fluid is usually gaseous under atmospheric conditions but becomes a liquid under pressure.	<b>Acid Gas</b>	Acid Gas is a poisonous and corrosive gas mixture consisting of hydrogen sulfide and carbon dioxide in varying concentrations.
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<b>Acid Gas</b>	Acid Gas is a poisonous and corrosive gas mixture consisting of hydrogen sulfide and carbon dioxide in varying concentrations.																						
<b>Geothermal</b>	Geothermal Product Types are naturally heated fluids. They may be steam or hot water, and may contain salts, minerals, or other dissolved substances.																						

# Product Type Continued

Facet Value	Facet Value Definition																
<b>Mineral</b>	Mineral Product Types are nonhydrocarbon inorganic solids dissolved or carried in a fluid obtained from well operations.																
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<b>Non-hydrocarbon Gas</b>	The Non-hydrocarbon Gas Product Type is gas that does not contain hydrocarbons. It is generally not flammable. If the composition of the gas is not known, do not use the qualifier facet.																
	<table> <tr> <th>Qualifier</th><th>Comment</th></tr> <tr> <td><b>Air</b></td><td>Air is a mixture of colourless, tasteless, invisible gases that surround the earth and are composed of mainly nitrogen and oxygen molecules.</td></tr> <tr> <td><b>Carbon Dioxide</b></td><td>Carbon Dioxide (CO<sub>2</sub>) is a pure gaseous or liquid compound chemically composed of 1 carbon atom and 2 oxygen atoms.</td></tr> <tr> <td><b>Hydrogen Sulfide</b></td><td>Hydrogen Sulfide (H<sub>2</sub>S) is a colorless, transparent gas with a characteristic rotten-egg odor at low concentrations and not detectable by odor at higher concentrations. H<sub>2</sub>S is toxic at very low concentration.</td></tr> <tr> <td><b>Helium</b></td><td>Helium (He) is a colorless, odorless, tasteless, non-toxic, inert monatomic gas produced as a by-product in certain oil and gas reservoirs.</td></tr> <tr> <td><b>Hydrogen</b></td><td>Hydrogen is the lightest and most abundant chemical element.</td></tr> <tr> <td><b>Nitrogen</b></td><td>Nitrogen, used in various well treatments, is a colorless, odorless, tasteless and mostly inert diatomic gas at standard conditions.</td></tr> <tr> <td><b>Oxygen</b></td><td>Oxygen (O<sub>2</sub>) is a colorless, odorless, tasteless diatomic gas.</td></tr> </table>	Qualifier	Comment	<b>Air</b>	Air is a mixture of colourless, tasteless, invisible gases that surround the earth and are composed of mainly nitrogen and oxygen molecules.	<b>Carbon Dioxide</b>	Carbon Dioxide (CO <sub>2</sub> ) is a pure gaseous or liquid compound chemically composed of 1 carbon atom and 2 oxygen atoms.	<b>Hydrogen Sulfide</b>	Hydrogen Sulfide (H <sub>2</sub> S) is a colorless, transparent gas with a characteristic rotten-egg odor at low concentrations and not detectable by odor at higher concentrations. H <sub>2</sub> S is toxic at very low concentration.	<b>Helium</b>	Helium (He) is a colorless, odorless, tasteless, non-toxic, inert monatomic gas produced as a by-product in certain oil and gas reservoirs.	<b>Hydrogen</b>	Hydrogen is the lightest and most abundant chemical element.	<b>Nitrogen</b>	Nitrogen, used in various well treatments, is a colorless, odorless, tasteless and mostly inert diatomic gas at standard conditions.	<b>Oxygen</b>	Oxygen (O <sub>2</sub> ) is a colorless, odorless, tasteless diatomic gas.
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## Product Type Continued

Facet Value	Facet Value Definition
<b>Steam</b>	The Steam Product Type is water in the gas phase.
<b>Water</b>	The Water Product Type is a chemical substance of hydrogen and oxygen (H <sub>2</sub> O). In common usage, water is the liquid phase. Water is denser than oil or gas.
Qualifier	Comment
<b>Alkaline</b>	Alkaline Water is a water-based fluid which has more hydroxyl ions (OH <sup>-</sup> ) than hydrogen ions (H <sup>+</sup> ) and pH greater than 7.
<b>Brine</b>	Brine Water has a salinity greater than (>) 50.0 parts per thousand (ppt).
<b>Salt</b>	Salt Water has a salinity between 30.1 and 50.0 parts per thousand (ppt).
<b>Brackish</b>	Brackish Water has a salinity generally between 0.5 and 30.0 parts per thousand (ppt). The specific range of salinity may vary by agency.
<b>Fresh</b>	Fresh Water has a salinity less than (<) 0.5 parts per thousand (ppt).
<b>Combination</b>	Combination Water is water of differing salinity measurements.



## Product Significance

**Product Significance** is the current business priority of a specific Product Type. Any facet value selected here also requires an associated Product Type.

Facet Value	Facet Value Definition
Primary	A Primary Product Significance identifies the Product Type that is most significant.
Secondary	A Secondary Product Significance identifies the Product Type that is the second most significant.
Tertiary	A Tertiary Product Significance identifies the Product Type that is the third most significant.
Show	A Show Product Significance identifies a Product Type present in non-commercial quantity.

### Clarification

Significance is based on various technical and economic factors, not just volume, and may vary over the life of the well.

## Fluid Direction

**Fluid Direction** is the flow direction of the wellhead stream. The facet value can change over the life of the well.

Facet Value	Facet Value Definition
<b>Inflow</b>	The Inflow Fluid Direction indicates that fluids from the surface are moved downhole.
<b>Outflow</b>	The Outflow Fluid Direction indicates that fluids from downhole are moved to the surface.
<b>Static</b>	A Static Fluid Direction indicates that there is no movement of fluids.
<b>Dual Flow</b>	A Dual Flow Fluid Direction indicates that the well is capable of both inflow and outflow, either simultaneously or cyclically.

### Clarification

A well may be shut in for testing or recompletion, but this does not necessarily change the intended fluid direction for the well or wellbore.

The value of Fluid Direction may not be a good indicator of the overall Condition of a well or wellbore. An observation or test well may show Fluid Direction as “Static”, but this value does not indicate that the well is Inactive.

## Regulatory Approval

The approval stage headings, are not a part of the facet. The headings are included to assist in visualizing how an ‘application to perform a regulated activity’ can evolve from Application through Authorization.

**The Regulatory Approval** Facet describes the condition of government authorization to perform a regulated activity on a well or well component, from notice of application until the approval is no longer valid. A well may have multiple Regulatory Approvals during its life.

Facet Value		Facet Value Definition
Application	<b>Reg Submission</b>	The Regulator receives an application for regulatory review or receives notification of the intent to send an application.
	<b>Qualifier</b>	<b>Comment</b>
	<b>Pre-application</b>	Informal communication between the regulator and applicant prior to receipt of the application.
	<b>Initial</b>	Initial receipt of the application.
	<b>Submission Complete</b>	Regulator has deemed that the application is ready for regulatory review.
	<b>Reg Review</b>	Review is a regulator-specific process to assess and determine compliance with legislation and regulations, including determining specific conditions to be met.
	<b>Qualifier</b>	<b>Comment</b>
	<b>In Review</b>	The review process has begun.
	<b>Review Complete</b>	The review process is complete.
	<b>Reg Outcome</b>	The application process has concluded, based on the decisions made by the regulator or applicant.
	<b>Qualifier</b>	<b>Comment</b>
	<b>Approved</b>	Permission is granted by the regulator to proceed according to the terms of the application.
Authorization	<b>Denied</b>	Permission is denied by the regulator.
	<b>Withdrawn</b>	The applicant has withdrawn the application.
	<b>Reg Monitoring</b>	The regulator is aware that an approved activity has begun. The regulator has the authority to ensure compliance and intervene where necessary.
	<b>Reg Closed</b>	The approval has ended and the permit holder has been notified. The well may still be active under a different Regulatory Approval.

## Regulatory Approval Continued

### Clarification

Different jurisdictions and their associated regulators have unique requirements for the types of activities which require regulatory approval. Generally, over the life of a well, there will be multiple approvals which are required to perform specific activities, and upon the conclusion of those activities, the approval will typically be closed. There can be more than one approval in action at any given time, and this facet is intended to track each approval as a separate item. Most approvals will occur and close during different periods within the life of a well.

Regulatory Approvals can be related to wells or well components.

Many regulators use a specific authorization number (permit, license, etc.) to identify each well. This number usually remains with the well throughout the well's life but may sometimes be superseded by another number. Conversely, some regulators relate a single Authorization Number with many wells.

Thank you to everyone who participated in this Well Status & Classification v3 work. PPDM's library of International Petroleum Data Standards (IPDS) is a collaboration, globally and among numerous industry stakeholders. Thank you to everyone who shared their time and expertise with us from the initial discussions, survey and recommendations through intensive working sessions, meetings, online collaboration and mapping between versions.



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The PPDM Association owns and stewards the Well Status & Classification Standard. Feedback on this and any PPDM Standard are always welcome at [projects@ppdm.org](mailto:projects@ppdm.org).



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