OILFIELD GLOSSARY

Note: These terms can be found all over, via books, the internet, or by talking to your crew on location.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

abnormal pressure n: pressure exerted by a formation and exceeding or falling below the normal pressure to be expected at a given depth. Normal pressure at 10,000 feet (3,048 metres) is 4,650 psi; thus, abnormal pressure is higher or lower than 4,650 psi. Formations with abnormally high pressure must be controlled to prevent a blowout. See pressure gradient.

accumulator n: 1. a vessel or tank that receives and temporarily stores a liquid used in a continuous process in a gas plant. 2. on a drilling rig, the storage device for nitrogen-pressurized hydraulic fluid, which is used in closing the blowout preventers. Also called surge bottles. See blowout preventer control unit.

acoustic travel time n: time required for a specific sound wave to travel from one point to another. Electric logs use acoustic travel time to determine characteristics of a formation.

adaptor spool n: a joint to connect blowout preventers of different sizes or pressure ratings to the casinghead.

adjustable choke n: a choke in which a conical needle and seat vary the rate of flow. Also called automatic choke. See choke.

American National Standards Institute (ANSI) n: an organization that oversees the creation, promulgation and use of industry norms and guidelines. ANSI is actively engaged in accrediting programs that assess conformance to standards.

American Petroleum Institute (API) n: a national trade association representing aspects of America’s oil and natural gas industry. API has led the development of petroleum and petrochemical equipment and operating standards.

annular blowout preventer n: a large valve, usually installed above the ram preventers, that forms a seal in the annular space between the pipe and wellbore or, if no pipe is present, on the wellbore itself. Compare ram blowout preventer.

annular preventer n: see annular blowout preventer.

annular space n: 1. the space surrounding a cylindrical object within a cylinder. 2. the space around a pipe in a wellbore, the outer wall of which may be the wall of either the borehole or casing; sometimes termed the annulus.

Annulus n: also called annular space. See annular space.


API standards n pl: API maintains more than 500 standards and recommended practices developed and written by knowledgeable and experienced persons. API standards cover such sectors of the petroleum and natural gas industry as drilling, producing, pipelining, refining, and measuring. These represent the industry’s proven, sound engineering and operating practices and safe, interchangeable equipment and materials. Many API standards have been incorporated into state and federal regulations and adopted by the International Organization for Standardization.

assembly n: a group of components that make up a mechanism, machine, or similar device.

associated gas n: natural gas that overlies and contacts crude oil in a reservoir. Where reservoir conditions are such that the production of associated gas does not substantially affect the recovery of crude oil in the reservoir, such gas may also be reclassified as non-associated gas.
by a regulatory agency.

**B**

**back-pressure n:** the pressure maintained on equipment or systems through which a fluid flows.

**back-pressure valve n:** a valve used to regulate back-pressure on equipment or systems through which a fluid flows.

**ball up v:** 1. to collect a mass of sticky consolidated material, usually drill cuttings, on drill pipe, drill collars, bits, and so forth. A bit with such material attached to it is called a balled-up bit. Balling up is frequently the result of inadequate pump pressure or insufficient drilling fluid. 2. in reference to an anchor, to fail to hold on a soft bottom, pulling out, instead, with a large ball of mud attached.

**barite n:** barium sulfate, BaSO₄; a mineral frequently used to increase the weight or density of drilling mud. Its specific gravity is 4.2 (i.e., it is 4.2 times heavier than water). See barium sulfate and mud.

**barium sulfate n:** 1. a chemical combination of barium, sulfur, and oxygen. Also called barite. See barite. 2. a tenacious scale that is very difficult to remove.

**bell nipple n:** a short length of pipe (a nipple) installed in the top of the blowout preventer. The top end of the nipple is expanded, or belled, to guide drill tools into the hole and usually has side connections for the fill line and mud return line.

**BHP abbr:** bottomhole pressure.

**bit n:** the cutting or boring element used in drilling oil and gas wells. The bit consists of the cutting element and the circulating element. The circulating element permits the passage of drilling fluid and utilizes the hydraulic force of the fluid stream to improve drilling rates. In rotary drilling, several drill collars are joined to the bottom end of the drill pipe column. The bit is attached to the end of the drill collar. Most bits used in rotary drilling are roller cone bits. See roller cone bit.

**blanket sand n:** a thin layer of sand or sandstone covering a large area. Also known as sheet sand.

**blind flange n:** see target.

**blind ram n:** an integral part of a blowout preventer that serves as the closing element. Its ends do not fit around the drill pipe but seal against each other and shut off the space below completely.

**blind ram preventer n:** a blowout preventer in which blind rams are the closing elements. See blind ram.

**blowout n:** an uncontrolled flow of gas, oil, or other well fluids into the atmosphere. A blowout, or gusher, occurs when formation pressure exceeds the pressure applied to it by the column of drilling fluid. A kick warns of an impending blowout. See formation pressure, gusher, and kick.

**blow out v:** 1. to suddenly expel oilwell fluids from the borehole with great velocity. 2. to expel a portion of water and steam from a boiler to limit its concentration of minerals.

**blowout preventer (BOP) n:** the equipment installed at the wellhead to prevent the escape of pressure either in the annular space between the casing and drill pipe or in an open hole (i.e., hole with no drill pipe) during drilling and completion operations. The blowout preventer is located beneath the rig at ground level on land rigs, at the water’s surface on jackup or platform rigs, and on the seafloor for floating offshore rigs. See annular blowout preventer, ram blowout preventer, and wireline preventer.

**Blowout preventer control unit n:** a device that stores hydraulic fluid under pressure in special containers and provides a method to open and close the blowout preventers quickly and reliably. Usually, compressed air and hydraulic pressure provide the opening and closing force in the unit. See blowout preventer.

**BOP abbr:** blowout preventer.

**BOP stack n:** a vertical assembly of specialized equipment installed on the top of the wellhead used to close in a drilling well.

**borehole n:** the wellbore; the hole made by drilling or boring.

**bottomhole choke n:** a device with a restricted opening placed in the lower end of the tubing to control the rate of flow.

**bottomhole pressure (BHP) n:** the pressure in a well at a point opposite the producing formation, as recorded by a bottomhole pressure
bomb. See bottomhole pressure bomb.

**bottomhole pressure bomb** *n*: a bomb for measuring and recording the pressure in a well at a point opposite the producing formation.

**bullheading** *n*: 1. forcing gas back into a formation by pumping into the annulus from the surface. 2. any pumping procedure in which fluid is pumped into the well against pressure.

**bull plug** *n*: see target.

**C**

**cap rock** *n*: 1. impermeable rock overlying an oil or gas reservoir that tends to prevent migration of oil or gas out of the reservoir. 2. the porous and permeable strata overlying salt domes that may serve as the reservoir rock.

**cased** *adj*: pertaining to a wellbore in which casing has been run and cemented. See casing.

**casing** *n*: steel pipe place in an oil or gas well as drilling progresses to prevent the wall of the hole from caving during drilling and to provide a means of extracting petroleum if the well is productive.

**casinghead** *n*: a heavy, steel, flanged fitting that connects to the first string of casing and provides housing for the slips and packing assemblies by which intermediate strings of casing are suspended and the annulus sealed off. Also called a spool. See annular space.

**casing pressure** *n*: the pressure built up in a well between the casing tubing or casing and drill pipe.

**casing seat** *n*: the location of the bottom of a string of casing that is cemented in a well; typically, a casing shoe is made up on the end of the casing at this point.

**casing shoe** *n*: a short, heavy, cylindrical section of steel filled with concrete and rounded at the bottom, which is placed at the end of the casing string. It prevents the casing from snagging on irregularities in the borehole as it is lowered. A passage through the center of the shoe allows drilling fluid to pass up into the casing while it is being lowered and cement to pass out during cementing operations. Also called a guide shoe.

**cellar** *n*: a pit in the ground to provide additional height between the rig floor and the wellhead to accommodate the installation of blowout preventers, rathole, mousehole, and so forth. It also collects drainage water and other fluids for subsequent disposal.

**cementing** *n*: the application of a liquid slurry of cement and water to various points inside or outside the casing. See primary cementing, secondary cementing, and squeeze cementing.

**cement plug** *n*: a portion of cement placed at some point in the wellbore to seal it. See cementing.

**centrifugal degasser** *n*: see vacuum degasser.

**centrifugal pump** *n*: a pump with an impeller or rotor, an impeller shaft, and a casing, which discharges fluid by centrifugal force.

**choke** *n*: a device with an orifice installed in a line to restrict the flow and control the rate of production. Surface chokes are part of the Christmas tree and contain a choke nipple, or bean, with a small-diameter bore that serves to restrict the flow. Chokes are also used to control the rate of flow of the drilling mud out of the hole when the well is closed in with the blowout preventer and a kick is being circulated out of the hole. See adjustable choke, bottomhole choke, and positive choke.

**choke line** *n*: an extension of pipe from the blowout preventer assembly used to direct well fluids from the annulus to the choke manifold.

**choke manifold** *n*: the arrangement of piping and special valves, called chokes, through which drilling mud is circulated when the blowout preventers are closed to control the pressures encountered during a kick. See choke and blowout preventer.

**circulate-and-weight method** *n*: see concurrent method.

**circulating pressure** *n*: the pressure generated by the mud pumps and exerted on the drill stem.

**close in** *v*: 1. to temporarily shut in a well that is capable of producing oil or gas. 2. to close the blowout preventers on a well to control a kick. The blowout preventers close off the annulus so that pressure from below cannot flow to the surface.
closed reservoir \( n \): a formation with abnormally high pressures that is not connected to formations with normal pressures.

closing unit pump \( n \): another term for an electric or hydraulic pump on an accumulator that serves to pump hydraulic fluid under high pressure to the blowout preventers so that the preventers may be closed or opened.

concurrent method \( n \): a method for killing well pressure in which circulation is commenced immediately and mud weight is brought up gradually, according to a definite schedule. Also called circulate-and-weight method.

conductivity \( n \): a measure of the ability to conduct energy that is used in electric well logging to determine the characteristics of a formation.

conductor pipe \( n \): a short string of large-diameter casing used to keep the top of the wellbore open and to provide a means of conveying the up-flowing drilling fluid from the wellbore to the mud pit.

connection gas \( n \): a relatively small amount of gas that enters a well when the mud pump is stopped in order for a connection to be made.

constant choke pressure method \( n \): a method of killing a well that has kicked in which the choke size is adjusted so as to maintain a constant casing pressure. This method does not work unless the kick is all or mostly all salt water; if the kick is gas, there is no way to maintain a constant bottomhole pressure because gas expands as it rises in the annulus.

constant pit-level method \( n \): a method of killing a well in which the mud level in the pits is held constant while the choke size is reduced and the pump speed slowed. It is not recommended because casing pressure often increases to the point where the formation or casing ruptures and control of the well is lost.

cup packer \( n \): a device made up in the drill stem that is lowered into the well in order to allow the casing and blowout preventers to be pressure-tested. The sealing device is cup shaped and is therefore called a cup.

cut test \( n \): also called a packer test. See packer test.

cuttings \( n \) pl: the fragments of rock dislodged by the bit and brought to the surface in the drilling mud. Washed and dried samples of the cuttings are analyzed by geologists to obtain information about the formations drilled.

D

dart-type blowout preventer \( n \): a blowout preventer that is installed on top of the drill stem when the well is kicking through the drill stem. It is stabbed in the open position and then closed against the pressure. The valve that closes is dart shaped, therefore the name.

degasser \( n \): the equipment used to remove unwanted gas from a liquid, especially from drilling fluid.

density \( n \): the mass or weight per unit volume of a substance. For instance, the density of a drilling mud may be 10 pounds per gallon (ppg), 74.8 pounds per cubic foot (lb/ft³), or 1,198.2 kilograms per cubic metre (kg/m³). Specific gravity and API gravity are other units of density.

derrickhand \( n \): the crew member who handles the upper end of the drill string as it is being hoisted out of or lowered into the hole. On a drilling rig, he or she is also responsible for the circulating machinery and the conditioning of the drilling or workover fluid. Also called derrickman.

d-exponent \( n \): a factor used to evaluate drilling rate and detecting abnormal pore pressure zones. The d-exponent increases with depth when drilling in a normal pressure section. A decrease of the d-exponent with depth indicates abnormal pressure. Also called normalized penetration rate.

differential pressure \( n \): the difference between two fluid pressures; for example, the difference between the pressure in a reservoir and in a wellbore drilled in the reservoir, or between atmospheric pressure at sea level and at 10,000 feet (3,048 metres). Also called pressure differential.

ditch \( n \): the mud flow channel from the conductor-pipe outlet, see mud return line. \( v \): to excavate a trench in which to lay pipe or cable. Ditching equipment and methods for pipe laying vary according to terrain and weather.

diverter \( n \): a system used to control well blowouts encountered at relatively shallow depths and to protect floating rigs during blowouts by directing the flow away from the rig.
drill collar n: a heavy, thick-walled tube, usually steel, used between the drill pipe and the bit in the drill stem to provide a pendulous effect to the drill stem.

drilled show n: oil or gas in the mud circulated to the surface when formation pressure is slightly greater than the hydrostatic pressure of the mud column. Also called a drilling show.

driller's method n: a well-killing method involving two complete and separate circulations; the first vents the kick out of the well, and the second circulates heavier mud through the wellbore.

drilling break n: a sudden increase in the rate of penetration by the drill bit. It sometimes indicates that the bit has penetrated a high-pressure zone and thus warns of the possibility of a blowout.

drilling fluid n: a circulating fluid, one function of which is to force cuttings out of the wellbore and to the surface. While a mixture of clay, water, and other chemical additives is the most common drilling fluid, wells can also be drilled using air, gas, or water as the drilling fluid. Also called circulating fluid. See mud.

drilling spool n: an accessory used as a spacer in wellhead equipment. It provides room between various wellhead devices (such as the blowout preventers) so that devices in the drill stem (such as a tool joint) can be suspended in it.

drill pipe n: the heavy seamless tubing used to rotate the bit and circulate the drilling fluid. Joints of pipe 30 feet (9.14 metres) long are coupled together by means of tool joints.

drill pipe pressure n: the amount of pressure exerted inside the drill pipe as a result of circulating pressure, the entry of formation pressure into the well, or both.

drill pipe pressure gauge n: an indicator that is mounted on the mud circulating system to measure the amount of pressure in the drill stem.

drill pipe rubber n: a rubber or elastomer disk that is placed around a joint of drill pipe and is held stationary below the rotary table. As pipe is removed from the well, the rubber wipes mud off the outside of the pipe to minimize corrosion.

drill stem n: all members in the assembly used for drilling by the rotary method from the swivel to the bit, including the kelly, drill pipe and tool joints, drill collars, stabilizers, and various subsequent items. Compare drill string.

drill-stem safety valve n: also called lower kelly cock. See kelly cock, full opening safety valve.

drill string n: the column, or string, of drill pipe with attached tool joints that transmits fluid and rotational power from the kelly to the drill collars and bit. Often, the term is loosely applied to include both drill pipe and drill collars. Compare drill stem.

drop-type blowout preventer n: a blowout preventer that must be seated in the drill string by being pumped into place. It seats in a special housing and the assembly is locked in place by slips.

E

ECD abbr: equivalent circulating density.

electric log n: also called an electric well log. See electric well log.

electric well log n: a record of electrical characteristics of formations traversed by the borehole used to identify the formations, determine the nature and amount of fluids they contain, and estimate their depth. Also called an electric log or electric survey.

engineer's method n: see wait-and-weight method.

entrained gas n: formation gas that enters the drilling fluid in the annulus. See gas-cut mud.

equivalent circulating density (ECD) n: the increase in bottomhole pressure expressed as an increase in pressure that occurs only when mud is being circulated. Because of friction in the annulus as the mud is pumped, bottomhole pressure is slightly, but significantly, higher than when the mud is not being pumped. ECD is calculated by dividing the annular pressure loss by 0.052, dividing that by true vertical depth, and adding the result to the mud weight. Also called circulating density, mud-weight equivalent.
FCP abbr: final circulating pressure.

fill-up line n: the smaller of the side fittings on a bell nipple, used to fill the hole when drill pipe is being removed from the well.

final circulating pressure (FCP) n: the pressure at which a well is circulated during well-killing procedures after kill-weight mud has filled the drill stem. This pressure is maintained until the well is completely filled with kill-weight mud.

fishing n: the procedure of recovering lost or stuck equipment in the wellbore.

flange n: a projecting rim or edge (as on pipe fittings and openings in pumps and vessels), usually drilled with holes to allow bolting to other flanged fittings.

flow check n: a method of determining whether a kick has occurred. The mud pumps are stopped for a short period to see whether mud continues to flow out of the hole; if it does, a kick may be occurring.

flow line n: the surface pipe through which oil travels from a well to processing equipment or storage.

formation n: a bed or deposit composed throughout of substantially the same kind of rock; often a lithologic unit. Each formation is given a name, frequently as a result of the study of the formation outcrop at the surface and sometimes based on fossils found in the formation.

formation fluid n: fluid (such as gas, oil or water) that exists in a subsurface rock formation.

formation pressure n: the force exerted by fluids in a formation, recorded in the hole at the level of the formation with the well shut-in. Also called reservoir pressure or shut-in bottomhole pressure. See reservoir pressure and shut-in bottomhole pressure.

FOSV abbr: full-opening safety valve.

fracture pressure n: the point at which a formation will crack from pressure in the wellbore.

free water n: 1. water produced with oil. It usually settles out within five minutes when the well fluids become stationary in a settling space within a vessel. 2. the measured volume of water that is present in a container and that is not in suspension in the contained liquid at observed temperature.

full-opening safety valve (FOSV) n: a valve for the automatic release of pressure or temperature exceeding preset limits. The valve is designed to open fully upon opening rather than in increments proportional to the amount of pressure.

gas-cut mud n: a drilling mud that has entrained formation gas giving the mud a characteristically fluffy texture. When entrained gas is not released before the fluid returns to the well, the weight or density of the fluid column is reduced. Because a large amount of gas in mud lowers its density, gas-cut mud must be treated to lessen the chance of a blowout.

gasket n: a material (as paper, cork, asbestos, or rubber) used to seal two essentially stationary surfaces.

gel n: a semisolid, jelly-like state assumed by some colloidal dispersions at rest. When agitated, the gel converts to a fluid state. See gel strength.

gel strength n: a measure of the ability of a colloidal dispersion to develop and retain a gel form, based on its resistance to shear. The gel strength, or shear strength, of a drilling mud determines its ability to hold solids in suspension. Sometimes bentonite and other colloidal clays are added to drilling fluid to increase its gel strength. See gel.

glycol n: a group of compounds used to dehydrate gaseous or liquid hydrocarbons or to inhibit the formation of hydrates. Glycol is also used in engine radiators as an antifreeze. Commonly used glycols are ethylene glycol, diethylene glycol, and triethylene glycol.
gradient $n$: ascending or descending with a uniform slope. The rate of change of temperature or pressure.

gusher $n$: an oilwell that has come in with such great pressure that the oil jets out of the well like a geyser; also called a wild well. In reality, a gusher is a blowout and is extremely wasteful of reservoir fluids and drive energy. In the early days of the oil industry, gushers were common and many times where the only indication that a large reservoir of oil and gas had been struck. See blowout.

H

hanger $n$: a device placed or hung in the casing below the blowout preventer stack to form a pressure-tight seal. Pressure is then applied to the blowout preventer stack in order to test it for leaks. Also called a hanger plug.

hard shut-in $n$: in a well-control operation, closing the BOP without first opening an alternate flow path up the choke line. When the BOP is closed, pressure in the annulus cannot be read on the casing pressure gauge.

hook $n$: a large, hook-shaped device from which the swivel is suspended. It is designed to carry maximum loads ranging from 100 to 650 tons and turns on bearings in its supporting housing. A strong spring within the assembly cushions the weight of a stand (90 feet or 27.43 metres) of drill pipe, thus permitting the pipe to be made up and broken out with less damage to the tool-joint threads. Smaller hooks without the spring are used for handling tubing and sucker rods. See stand and swivel.

HWO abbr: Hydraulic workover unit.

hydraulic workover unit (HWO) $n$: a stand-alone snubbing unit.

hydrostatic head $n$: the pressure exerted by a body of water at rest. They hydrostatic head of fresh water is 0.433 psi per foot of height. Those other liquids may be determined by comparing their gravities with the gravity of water. See pressure gradient.

hydrostatic pressure $n$: the force exerted by a body of fluid at rest; hydrostatic pressure increases directly with the weight and depth of the fluid. In drilling, the term refers to the pressure exerted by the drilling fluid in the wellbore. See hydrostatic head.

I

IBOP abbr: inside blowout preventer.

ICP abbr: initial circulating pressure.

ID abbr: inside or internal diameter.

ideal gas $n$: 1. a gas whose molecules are infinitely small and exert no force on each other. 2. a gas that obeys Boyle’s Law and Joule’s Law. Also called perfect gas.

ideal gas law $n$: the equation of the state of an ideal gas, showing a close approximation to real gases at a sufficiently high temperature and low pressures: $PV = RT$

where

\[ P = \text{pressure} \]
\[ R = \text{gas constant} \]
\[ T = \text{temperature} \]
\[ V = \text{volume per mole of gas} \]

initial circulating pressure (ICP) $n$: the pressure at which a well that has been closed-in on a kick is circulated when well-killing procedures are begun.

inside blowout preventer (IBOP) $n$: a valve installed in the drill stem to prevent a blowout inside the stem. Flow is thus possible only downward, allowing mud to be pumped in but preventing any flow back up the stem. Also called internal blowout preventer.

internal blowout preventer $n$: also called inside blowout preventer. See inside blowout preventer.

internal diameter (ID) $n$: distance across the interior of a circle, especially in the measurement of pipe. Also called inside diamete
**J**

**jet n**: 1. a hydraulic device operated by pump pressure to clean mud pits and tanks in rotary drilling and to mix mud components. 2. in a perforating gun using shaped charges, a highly penetrating, fast-moving stream of exploded particles that cuts a hole in the casing, cement, and formation.

**joint n**: a single length (30 feet or 9.14 metres) of drill pipe or of drill collar, casing, or tubing that has threaded connections at both ends. Several joints screwed together constitute a stand of pipe.

**K**

**kelly n**: the heavy steel member, four- or six-sided, suspended from the swivel through the rotary table and connected to the topmost joint of drill pipe to turn the drill stem as the rotary table turns. It has a bored passageway that permits fluid to be circulated into the drill stem and up the annulus, or vice versa. See drill stem, rotary table, and swivel.

**kelly bushing n**: a special device that, when fitted into the master bushing, transmits torque to the kelly and simultaneously permits vertical movement of the kelly to make hole. It may be shaped to fit the rotary openings or have pins for transmitting torque. Also called the drive bushing. See kelly and master bushing.

**kelly cock n**: a valve installed between the swivel and the kelly. When a high-pressure backflow begins inside the drill stem, the valve is closed to keep pressure off the swivel and rotary hose. See swivel and kelly.

**kelly cock test sub n**: see test sub.

**kick n**: an entry of water, gas, oil, or other formation fluid into the wellbore. It occurs because the pressure exerted by the column of drilling fluid is not great enough to overcome the pressure exerted by the fluids in the formation drilled. If prompt action is not taken to control the kick or kill the well, a blowout will occur. See blowout.

**kill line n**: a high-pressure line that connects the mud pump and the well and through which heavy drilling fluid can be pumped into the well to control a threatened blowout.

**L**

**leak-off test n**: a gradual pressurizing of the casing after the blowout preventers have been installed and drilling of the cement has been completed to determine the maximum pressure that the casing seat will hold.

**liner n**: 1. any string of casing whose top is located below the surface. A liner may serve as the oil string, extending from the producing interval up to the next string of casing. 2. in jet-perforating guns, a conically shaped, metallic piece that is part of a shaped charge. It increases the efficiency of the charge by increasing the penetrating ability of the jet. See jet.

**log n**: a systematic recording of data, as from the driller’s log, mud log, electrical well log, or radioactivity log. Many different logs are run in wells to obtain various characteristics of downhole formations. v: to record data.

**loss zone n**: a rock layer that takes excessive amounts of drilling mud as it is being drilled.

**lost circulation n**: the loss of quantities of whole mud to a formation, usually in cavernous, fissured, or coarsely permeable beds, evidenced by the complete or partial failure of the mud to return to the surface as it is being circulated in the hole. Lost circulation can lead to a blowout and, in general, reduce the efficiency of the drilling operation. It is also called lost returns. See blowout.

**lost returns n**: also called lost circulation. See lost circulation.
lower kelly cock $n$: also called drill-stem safety valve. See drill-stem safety valve.

lube and bleed process $n$: a process used to lower well pressure. Gas in the wellbore is replaced by the mud. Mud is pumped in the well and then allowed to exchange with gas. After a wait time, well pressure is bled equivalent to the hydrostatic pressure increased due to the volume of mud pumped.

M

make a trip $v$: to hoist the drill stem out of the wellbore to perform one of a number of operations such as changing bits, taking a core, and so forth, and then to return the drill stem to the wellbore.

make hole $v$: to deepen the hole made by the bit, i.e., to drill ahead; to run casing or pipe.

managed pressure drilling (MPD) $v$: drilling while controlling the mud circulation to optimize the bottomhole pressure.

mandrel $n$: a cylindrical bar, spindle, or shaft around which other parts are arranged or attached or that fits inside a cylinder or tube.

manifold $n$: an accessory system of piping to a main piping system (or another conductor) that serves to divide a flow into several parts, to combine several flows into one, or to reroute a flow to any one of several possible designations. See choke manifold.

master bushing $n$: a device that fits into the rotary table to accommodate the slips and drive the kelly bushing so that the rotating motion of the rotary table can be transmitted to the kelly. Also called rotary bushing. See kelly bushing, slips.

master control panel $n$: on a drilling rig, the primary station that controls the operation of the blowout preventers and other well-control equipment. Backup control panels are usually installed if the master panel fails, or becomes inaccessible. Also called primary control panel.

mechanical rig $n$: a drilling rig in which the source of power is one or more internal-combustion engines and in which the power is distributed to rig components through mechanical devices (such as chains, sprockets, clutches, and shafts). Also called a power rig.

MPD abbr: managed pressure drilling.

mud $n$: the liquid circulated through the wellbore during rotary drilling and workover operations. In addition to its function of bringing cuttings to the surface, drilling mud cools and lubricates the bit and drill stem, protects against blowouts by holding back subsurface pressures, and deposits a mud cake on the wall of the borehole to prevent loss of fluids to the formation. Although it originally was a suspension of earth solids (especially clays) in water, the mud used in modern drilling operations is a more complex, three-phase mixture of liquid, reactive solids, and inert solids. The liquid phase may be fresh water, diesel oil, or crude oil and may contain one or more conditioners. See drilling fluid.

mud-flow indicator $n$: a device that continually measures and records the volume of mud returning from the annulus and flowing out of the mud return line. If the mud does not flow at a fairly constant rate, a kick may have occurred.

mud-flow sensor $n$: also called mud-flow indicator. See mud-flow indicator.

mud-gas separator $n$: a device that separates the gas from the mud coming out of a well when a kick is being circulated out.

mud log $n$: a record of information derived from examination of drilling fluid and drill-bit cuttings. See mud logging.

mud logging $n$: the recording of information derived from examination and analysis of formation cuttings made by the bit and mud circulated out of the hole. A portion of the mud is diverted through a gas-detecting device. Cuttings brought up by the mud are examined under ultraviolet light to detect the presence of oil or gas. Mud logging is often carried out in a portable laboratory set up at the well.

mud pits $n$ pl: a series of open tanks usually made of steel plates, through which the drilling mud is cycled to allow sand and sediments to settle out. Additives are mixed with the mud in the pits, and the fluid is temporarily stored there before being pumped back into the well. Modern rotary drilling rigs are generally provided with three or more pits, usually fabricated steel tanks fitted with built-in piping, valves, and mud agitators. Mud pits are also called shaker pits, settling pits, and suction pits, depending on their main purpose. Also called mud tanks. See shaker pit, settling pit, and suction pit.

mud pump $n$: a large, reciprocating pump used to circulate the mud on a drilling rig. A typical mud pump is a single- or double-action, two-
or three-cylinder piston pump whose pistons travel in replaceable liners and are driven by a crankshaft actuated by an engine or motor. Also called a slush pump.

**mud return line n**: a trough or pipe placed between the surface connections at the wellbore and the shale shaker, through which drilling mud flows upon its return to the surface from the hole.

**mud riser n**: equipment on the BOP stack that can release pressure by allowing mud to flow to the ditch.

**mud weight n**: a measure of the density of a drilling fluid expressed as pounds per gallon (ppg), pounds per cubic foot (lb/ft3), or kilograms per cubic metre (kg/m3). Mud weight is directly related to the amount of pressure the column of drilling mud exerts at the bottom of the hole.

N

**nipple up v**: in drilling, to assemble the blowout preventer stack on the wellhead at the surface.

**nomograph n**: a chart that represents an equation containing a number of variables in the form of scales so that a straight line cuts the scales at values of the variables satisfying the equation.

**normalized penetration rate n**: a factor used to evaluate drilling rate and detecting abnormal pore pressure zones. See d-exponent.

**nozzle n**: a passageway through jet bits that allows the drilling fluid to reach the bottom of the hole and flush the cuttings through the annulus. Nozzles come in different sizes that can be interchanged on the bit to allow more or less flow.

O

**OD abbr**: outer or outside diameter.

**offshore adj**: situated off the shore or within a zone generally considered to extend to three miles from low-water line (as offshore oil reserves).

**open adj**: 1. of a wellbore, having no casing. 2. of a hole, having no drill pipe or tubing suspended in it.

**operating pressure n**: in a blowout preventer stack, the amount of hydraulic pressure supplied by the blowout preventer control unit that is required to open and to close a blowout preventer. See blowout preventer control unit.

**outer diameter (OD) n**: distance across the exterior of a circle, especially in the measurement of pipe. Also called outside diameter.

**overbalance n**: the extent to which the hydrostatic pressure of the mud column exceeds formation pressure.

**overburden n**: the strata of rock that lie above the stratum of interest in drilling.

**overkill n**: in excess of what is necessary or appropriate to kill a well kick.

**overpressured adj**: see abnormal pressure.

P

**packer n**: a piece of downhole equipment, consisting of a sealing device, a holding or setting device, and an inside passage for fluids, used to block the flow of fluids through the annular space between the tubing and the wall of the wellbore by sealing off the space between them. It is usually made up in the tubing string some distance above the producing zone. A sealing element expands to prevent fluid flow except through the inside bore of the packer and into the tubing. Packers are classified according to configuration, use, method of setting, and
whether or not they are retrievable (that is, whether they can be removed when necessary, or whether they must to milled or drilled out and thus destroyed.

**packer test n:** a fluid-pressure test of the casing. Also called a cup test.

**permeability n:** 1. a measure of the ease with which fluids can flow through a porous rock. 2. the fluid conductivity of a porous medium. 3. the ability of a fluid to flow within the interconnected pore network of a porous medium.

**permeable adj:** allowing the passage of fluid. See permeability.

**pipe ram n:** a sealing component for a blowout preventer that closes the annular space between the pipe and the blowout preventer or wellhead. See annular space and blowout preventer.

**pipe ram preventer n:** a blowout preventer that uses pipe rams as the closing elements. See pipe ram.

**pit gain n:** when mud flows out of the drill hole faster than it goes in.

**pit level n:** height of drilling mud in the mud pits.

**pit-level indicator n:** one of a series of devices that continuously monitors the level of the drilling mud in the mud pits. The indicator usually consists of float devices in the mud pits that sense the mud level and transmit data to a recording and alarm device (called pit-volume recorder) mounted near the driller’s position on the rig floor. If the mud level drops too low or rises too high, the alarm sounds to warn the driller that action may be necessary to control lost circulation or to prevent a blowout.

**pit-volume recorder n:** the gauge at the driller’s position that records data from the pit-level indicator.

**plug n:** any object or device that blocks a hole or passageway (as a cement plug in a borehole).

**pore n:** an opening or space within a rock or mass of rocks, usually small and often filled with some fluid (as water, oil, gas, or all three). Compare vug.

**porosity n:** the condition of something that contains pores (as a rock formation). See pore.

**porous adj:** having pores, or tiny openings, as in rock.

**positive choke n:** a choke in which the orifice size must be changed to change the rate of flow through the choke. See choke.

**positive-displacement meter n:** a mechanical, fluid-measuring device that measures by filling and emptying chambers of a specific volume, also known as a volume meter or volumeter. The displacement of a fixed volume of fluid may be accomplished by reciprocating or oscillating pistons, by rotating vanes or buckets, by nutating disks, or by using tanks or other vessels that automatically fill and empty.

**pounds per gallon (ppg) n:** a measure of the density of a fluid (as drilling mud).

**pounds per square inch per foot (psi/ft) n:** a measure of the amount of pressure in pounds per square inch that a column of fluid (such as drilling mud) exerts on the bottom of the column for every foot of its length. For example, 10 pounds per gallon mud exerts 0.52 pounds per square inch per foot (11.8 kilopascals per meter), so a column of 10 pounds per gallon (1,198.2 kilograms per cubic meter) mud that is 1,000 feet (304.8 metres) long exerts 520 pounds per square inch (3.6 megapascals) at the bottom of the column. See pressure gradient.

**power rig n:** see mechanical rig.

**ppg abbr:** pounds per gallon.

**pressure n:** the force that a fluid (liquid or gas) exerts when it is in some way confined within a vessel, pipe, hole in the ground, and so forth, such as that exerted against the inner wall of a tank or that exerted on the bottom of the wellbore by drilling mud. Pressure is often expressed in terms of force per unit of area, as pounds per square inch (psi) or pounds per square foot (psf).

**pressure gradient n:** a scale of pressure differences in which there is a uniform variation of pressure from point to point. For example, the pressure gradient of a column of water is about .433 psi/ft of vertical elevation (9.794 kPa/m). The normal pressure gradient in a well is equivalent to the pressure exerted at any given depth by a column of 10 percent salt water extending from that depth to the surface (i.e., 0.465 psi/ft or 10.518 kPa/m).

**pressure loss n:** 1. a reduction in the amount of force a fluid exerts against a surface, usually occurring because the fluid is moving against the
2. the amount of pressure indicated by a drill pipe pressure gauge when drilling fluid is being circulated by the mud pump. Pressure losses occur as the fluid is circulated.

**primary cementing** *n*: the cementing operation that takes place immediately after the casing has been run into the hole. It provides a protective sheath around the casing, segregates the producing formation, and prevents the undesirable migration of fluids.

**psi** *abbr*: pounds per square inch. See pressure.

**psf** *abbr*: pounds per square foot. See pressure.

**pump stroke count** *n*: the number of strokes per minute generated by the mud pump.

**pump stroke counter** *n*: mechanical equipment that counts the number of strokes per minute generated by the mud pump to allow the driller to assess whether the pump has slowed down or sped up. This count gives an immediate indication of pump trouble, a hole in the drill pipe, or other problems.

**Q**

**R**

**ram** *n*: the closing and sealing component on a blowout preventer. One of three types – blind, pipe, or shear – may be installed in several preventers mounted in a stack on top of the wellbore. Blind rams, when closed, form a seal on a hole that has no drill pipe in it; pipe rams, when closed, seal around the pipe; shear rams cut through drill pipe and then form a seal. See blind ram, pipe ram, and shear ram.

**ram blowout preventer** *n*: a blowout preventer that uses rams to seal off pressure on a hole that is with or without pipe. It is also called a ram preventer. See blowout preventer and ram.

**ram preventer** *n*: also called a ram blowout preventer. See ram blowout preventer.

**rate of penetration (ROP)** *n*: a measure of the speed at which the bit drills into formations, usually expressed in feet (metres) per hour or minutes per foot (metre).

**reciprocating pump** *n*: a pump consisting of a piston that moves back and forth or up and down in a cylinder. The cylinder is equipped with inlet (suction) and outlet (discharge) valves. On the intake stroke, the suction valves are opened, and fluid is drawn into the cylinder. One the discharge stroke, the suction valves close, the discharge valves open, and fluid is forced out of the cylinder.

**regulator** *n*: a device that reduces the pressure or volume of a fluid flowing in a line and maintains the pressure or volume at a specified rate. See full-openins safety valve.

**remote choke panel** *n*: a set of controls, usually placed on the rig floor that is manipulated to control the amount of drilling fluid being circulated out through the choke manifold. This procedure is necessary when a kick is being circulated out of a well.

**reservoir pressure** *n*: the pressure in a reservoir under normal conditions.

**resistivity** *n*: an electric log measurement of how strongly a material opposes the flow of electric current. The resistivity data can help identify the characteristics of a formation.

**reverse circulation** *n*: the return of drilling fluid through the drill stem. The normal course of drilling fluid circulation is downward through the drill stem and upward through the annular space surrounding the drill stem. For special problems, normal circulation is sometimes reversed, and the fluid returns to the surface through the drill stem, or tubing, after being pumped down the annulus. Also called the short way.

**ring-joint flange** *n*: a special type of flanged connection in which a metal ring (resting in a groove in the flange) serves as a pressure seal between the two flanges.
ring gasket n: soft iron, low-carbon steel or stainless steel gaskets used to seal high-pressure flanges.

riser n: a pipe through which liquid travels upward; a riser pipe. See riser pipe.

riser pipe n: the pipe and special fittings used on floating offshore drilling rigs to establish a seal between the top of the wellbore, which is on the ocean floor, and the drilling equipment, located above the surface of the water. A riser pipe serves as a guide for the drill stem from the drilling vessel to the wellhead and as a conductor of drilling fluid from the well to the vessel. The riser consists of several sections of pipe and includes special devices to compensate for any movement of the drilling rig caused by waves. It is also called a marine riser.

roller cone bit n: a drilling bit made of two, three, or four cones, or cutters, that are mounted on extremely rugged bearings. Also called rock bits. The surface of each cone is made up of rows of steel teeth or rows of tungsten carbide inserts. See bit.

ROP abbr: rate of penetration.

rotary n: the machine used to impart rotational power to the drill stem while permitting vertical movement of the pipe for rotary drilling. Modern rotary machines have a special component, the rotary bushing, to turn the kelly bushing, which permits vertical movement of the kelly while the stem is turning. See rotary drilling, master bushing, and kelly bushing.

rotary drill n: a rotating bit to which a downward force is applied. The bit is fastened to and rotated by the drill stem, which also provides a passageway through which the drilling fluid is circulated. Additional joints of drill pipe are added as drilling progresses.

rotary drilling n: a drilling method in which a hole is drilled by a rotating bit to which a downward force is applied.

rotary hose n: a reinforced, flexible tube on a rotary drilling rig that conducts the drilling fluid from the mud pump and standpipe to the swivel and kelly; also called the mud hose or the kelly hose. See kelly, mud pump, standpipe, and swivel.

rotary table n: the principal component of a rotary, or rotary machine, used to turn the drill stem and support the drilling assembly. It has a beveled-gear-arrangement to create the rotational motion and an opening into which bushings are fitted to drive and support the drilling assembly.

rotating head n: a sealing device used to close off the annular space around the kelly when drilling with pressure at the surface, usually installed above the main blowout preventers. A rotating head makes it possible to drill ahead even when there is pressure in the annulus that the weight of the drilling fluid is not overcoming; the head prevents the well from blowing out. It is used mainly in the drilling of formations that have low-pressure, high-volume fluids. The rate of penetration through such formations is usually rapid.

S

secondary cementing n: any cementing operation after the primary cementing operation. Secondary cementing includes a plug-back job, in which a plug of cement is positioned at a specific point in the well and allowed to set. Wells are plugged to shut off bottom water or to reduce the depth of the well for other reasons.

seismic data n: detailed information obtained from earth vibration produced naturally or artificially (as in geophysical prospecting).

settling pit n: a pit into which mud flows from the well and in which heavy solids in the mud are allowed to settle out. Steel mud tanks are more often used today, along with auxiliary equipment (such as desanders) for controlling solids quickly and efficiently. Also called settling tank.

shaker pit n: the mud pit adjacent to the shale shaker, usually the first pit into which the mud flows after returning from the hole. Also called a shaker tank.

shale n: a fine-grained sedimentary rock composed of consolidated silt and clay or mud. Shale is the most frequently occurring sedimentary rock.

shale shaker n: a series of trays with sieves that vibrate to remove cuttings from the circulating fluid in rotary drilling operations. The size of the openings in the sieve is carefully selected to match the size of the solids in the drilling fluid and the anticipated size of cuttings. Also called a shaker.

shear n: action or stress that results from applied forces and that causes or tends to cause two adjoining parts of a body to slide relative to
each other in a direction parallel to their plane of contact.

**shear ram** *n*: the component in a blowout preventer that cuts, or shears, through drill pipe and forms a seal against well pressure. Shear rams are used in mobile offshore drilling operations to provide a quick method of moving the rig away from the hole when there is no time to trip the drill stem out of the hole. See **shear ram preventer**.

**shear ram preventer** *n*: a blowout preventer that uses shear rams as closing elements. See **shear ram**.

**short way** *n*: see reverse circulation.

**show** *n*: the appearance of oil or gas in cuttings, samples, cores, and so forth of drilling mud.

**shut in** *v*: 1. to close the valves on a well so that it stops producing. 2. to close in a well in which a kick has occurred.

**shut in** *v, adj*: shut off to prevent flow. Said of a well, plant, pump, and so forth, when valves are closed at both inlet and outlet.

**shut-in bottomhole pressure** *n*: the pressure at the bottom of a well when the surface valves on the well are completely closed. The pressure is caused by fluids that exist in the formation at the bottom of the well.

**shut-in casing pressure (SICP)** *n*: pressure of the annular fluid on the casing when a well is shut-in.

**shut-in drill pipe pressure (SIDPP)** *n*: pressure of the drilling fluid on the inside of the drill stem; used to measure the difference between hydrostatic pressure and formation pressure when a well is shut-in and the mud pump is off.

**SICP** *abbr*: shut-in casing pressure.

**SIDPP** *abbr*: shut-in drill pipe pressure.

**siphon** *n*: an inverted U-shaped tube or pipe through which a liquid flows from a high level to a lower level at atmospheric pressure. For a siphon to work, it must be filled with liquid, thus reducing pressure inside the tube and allowing atmospheric pressure to force liquid to the lower level.

**skid** *n*: a low platform mounted on the bottom of equipment for ease of moving, hauling, or storing.

**slips** *pl*: wedge-shaped pieces of metal with teeth or other gripping elements that are used to prevent pipe from slipping down into the hole or to hold pipe in place. Rotary slips fit around the drill pipe and wedge against the master bushing to support the pipe. Power slips are pneumatically or hydraulically actuated devices that allow the crew to dispense with the manual handling of slips when making a connection. Packers and other downhole equipment are secured in position by slips that engage the pipe by action directed at the surface.

**snub** *v*: to put pipe or tools into a high-pressure well that has not been killed (i.e., to run pipe or tools into the well against pressure). Snubbing usually requires an array of wireline blocks and wire rope or hydraulic actuators that force the pipe or tools into the well through a stripper head or blowout preventer until the weight of the string is sufficient to overcome the lifting effect of the well pressure on the pipe in the stripper.

**snubbing** *n*: the forcing of pipe or tools into a high-pressure well that has not been killed (i.e., running pipe or tools into the well against pressure when the weight of pipe is not great enough to force the pipe through the BOPs). Snubbing usually requires an array of wireline blocks and wire rope that forces the pipe or tools into the well through a stripper head or blowout preventer until the weight of the string is sufficient to overcome the lifting effect of the well pressure on the pipe in the preventer. In workover operations, snubbing is usually accomplished by using hydraulic power to force the pipe through the stripping head or blowout preventer.

**snubbing unit** *n*: either a stand-alone device or a rig-assist device that is used to force pipe into the well when the well is shut-in on a kick. When the pipe’s weight is not sufficient to overcome the upward force of well pressure, a snubbing unit must be used. Compare **stripping in**.

**soft shut-in** *n*: in well-control operations, closing the BOPs with the choke and HCR, or fail-safe, valves open. Compare **hard shut-in**.

**spm** *abbr*: strokes per minute.

**squeeze** *n*: a cementing operation in which cement is pumped behind the casing under high pressure to re-cement channeled areas or to block off an uncedmented zone.

**squeeze cementing** *n*: the forcing of cement slurry by pressure to specified points in a well to cause seals at the points to squeeze. It is a
secondary cementing method that is used to isolate a producing formation, seal off water, repair casing leaks, and so forth. See cementing and squeeze.

stack \textit{n}: a vertical pile of blowout prevention equipment. Also called preventer stack. See blowout preventer.

stand \textit{n}: the connected joints of pipe racked in the derrick or mast when making a trip. On a rig, the usual stand is 90 feet (27.43 metres) long or three lengths of pipe screwed together.

standpipe \textit{n}: a vertical pipe rising along the side of the derrick or mast, which joins the discharge line leading from the mud pump to the rotary hose and through which mud is pumped going into the hole. See mud pump and rotary hose.

starter head \textit{n}: wellhead.

strip a well \textit{v}: 1. to pull rods and tubing from a well at the same time – for example, when the pump is stuck. Tubing must be stripped over the rods a joint at a time, and the exposed sucker rod is then backed off and removed. 2. to move the drill stem, tubing, and other tools into or out of the hole with the well closed in. If the weight of the pipe is sufficient to overcome the upward force of well pressure, then the pipe can be stripped in. Compare snub.

stripping \textit{n}: see strip a well.

stripping in \textit{n}: the process of lowering the drill stem into the wellbore when the blowout preventers are closed on a kick.

stripping out \textit{n}: the process of raising the drill stem out of the wellbore when the blowout preventers are closed on a kick.

strokes per minute (spm) \textit{n}: the number of times all the mud pump’s pistons move forward and back to complete one stroke.

stuck pipe \textit{n}: drill pipe, drill collars, casing, or tubing that has inadvertently become immobile in the hole. It may occur when drilling is in progress, when casing is being run in the hole, or when the drill pipe is being hoisted.

subsea blowout preventer \textit{n}: a blowout preventer placed on the seafloor for use by a floating offshore drilling rig.

suction pit \textit{n}: the mud pit from which mud is picked up by the suction of the mud pumps. Also called a sump pit.

surface casing \textit{n}: also called surface pipe. See surface pipe.

surface pipe \textit{n}: the first string of casing (after the conductor pipe) that is set in a well, varying in length from a few hundred to several thousand feet. Some states require a minimum length to protect freshwater sands. Compare conductor pipe.

surging \textit{n}: a rapid increase in pressure downhole that occurs when the drill stem is lowered too fast or when the mud pump is brought up to speed after starting.

swab \textit{n}: a hollow, rubber-faced cylinder mounted on a hollow mandrel with a pin joint on the upper end to connect to the swab line. A check valve that opens upward on the lower end provides a way to remove the fluid from the well when pressure is insufficient to support flow. See mandrel.

swabbing \textit{v}: to operate a swab on a wireline to bring well fluids to the surface when the well does not flow naturally. Swabbing is a temporary operation to determine whether or not the well can be made to flow. If the well does not flow after being swabbed, a pump is installed as a permanent lifting device to bring the oil to the surface.

swabbed show \textit{n}: formation fluid that is pulled into the wellbore because of an underbalance of formation pressure caused by pulling the drill string too fast.

swivel \textit{n}: a rotary tool that is hung from the rotary hook and traveling block to suspend and permit free rotation of the drill stem. It also provides a connection for the rotary hose and a passageway for the flow of drilling fluid into the drill stem.

T

target \textit{n}: a bull plug or a blind flange at the end of a tee to prevent erosion at a point where a change in flow direction occurs.

test sub \textit{n}: equipment that allows the kelly valves and top drive valves to be tested while testing the BOP stack.
Texas Iron Works valve $n$: see full-opening safety valve.

TIW $abbr$: Texas Iron Works valve.

tool joint $n$: a heavy coupling element for drill pipe made of special alloy steel. Tool joints have coarse, tapered threads and seating shoulders designed to sustain the weight of the drill stem, withstand the strain of frequent coupling and uncoupling, and provide a leakproof seal. The male section of the joint, or the pin, is attached to one end of a length of drill pipe, and the female section, or box, is attached to the other end. The tool joint may be welded to the end of the pipe or screwed on or both. A hard metal facing is often applied in a band around the outside of the tool joint to enable it to resist abrasion from the walls of the borehole.

tour (pronounced “tower”) $n$: a working shift for drilling crew or other oilfield workers. Some tours are 8 hours; the three daily tours are called daylight, evening (or afternoon), and graveyard (or morning). Often, 12-hour tours are used, especially on offshore rigs; they are called simply day tour and night tour.

trip $n$: the operation of hoisting the drill stem from and returning it to the wellbore. $v$: shortened form of make a trip. Also called tripping. See make a trip.

trip gas $n$: an accumulation of gas, usually a negligible amount that enters the hole when a trip is being made.

triplex pump $n$: a reciprocating pump with three pistons or plungers.

trip margin $n$: the small amount of additional mud weight needed to balance formation pressure to overcome the pressure-reduction effects caused by swabbing when a trip out of the hole is made.

trip tank $n$: a small mud pit with a capacity of 10 to 15 bbl, usually with 1-bbl divisions, used exclusively to ascertain the amount of mud necessary to keep the wellbore full with the exact amount of mud that is displaced by drill pipe. When the bit comes out of the hole, a volume of mud equal to that which the drill pipe occupied while in the hole must be pumped into the hole to replace the pipe. When the bit goes back in the hole, the drill pipe displaces a certain amount of mud, and a trip tank again can be used to keep track of this volume.

true vertical depth (TVD) $n$: the depth of a well measured from the surface straight down to the bottom of the well. The true vertical depth of a well may be quite different from its actual measured depth, because wells are very seldom drilled exactly vertical.

tubing $n$: small-diameter pipe that is run into a well to serve as a conduit for the passage of oil and gas to the surface.

tubing head $n$: a flanged fitting that supports the tubing string, seals off pressure between the casing and the outside of the tubing.

TVD $abbr$: true vertical depth.

U

UBD $abbr$: underbalanced drilling

underbalanced $adj$: of or relating to a condition in which pressure in the wellbore is less than the pressure in the formation.

underbalanced drilling (UBD) $v$: to carry on drilling operations with a mud whose density is such that it exerts less pressure on bottom than the pressure in the formation while maintaining a seal (usually with a rotating head) to prevent the well fluids from blowing out under the rig. Underbalanced drilling is advantageous in that the rate of penetration is relatively fast; however, the technique requires extreme caution.

unconsolidated formation $n$: a loosely arranged, unstratified section of earth that has not turned to solid rock.

upper kelly cock $n$: the kelly cock, as distinguished from the drill-stem safety valve. See kelly cock.

vacuum degasser n: a device in which gas-cut mud is degassed by the action of a vacuum inside a tank. The gas-cut mud is pulled into the tank, the gas removed, and the gas-free mud discharged back into the pit. Also called a centrifugal degasser.

variable bore ram (VBR) n: a ram blowout preventer that contains blocks (rams) that can close and seal on a range of pipe sizes – for example, from 3H- to 5-inch (89- to 127-millimetre) pipe. Variable bore rams contain a large reserve of rubber in the ram block that specially designed antiextrusion plates force into sealing contact with smaller sizes of pipe. The antiextrusion plates also support the excess rubber when wellbore pressure is applied.

vent line n: an opening in a vessel, line, or pump to permit the escape of air or gas.

viscosity n: measure of the resistance of a liquid to flow. Resistance is brought about by the internal friction resulting from the combined effects of cohesion and adhesion. The viscosity of petroleum products is commonly expressed in terms of the time required for a specific volume of the liquid to flow through an orifice of a specific size.

volumetric correction n: an equation that can be used to accurately calculate casing pressure according to the expansion of gas rising in the annulus when a well is shut-in.

volumetric method n: a method of well control in which bottomhole pressure is kept constant when circulation is not possible and gas is migrating up the hole. Bottomhole pressure is maintained slightly higher than formation pressure while the gas is allowed to expand in a controlled manner as it moves to the surface.

vug n: a cavity in a rock.

t:vugular formation n: a rock formation that contains vugs; a cavernous formation. Also called vuggy formation. See vug.

W

wait-and-weight method n: a well-killing method in which the well is shut-in and the mud weight is raised the required amount to kill the well. The heavy mud is then circulated into the well while at the same time the kick fluids are circulated out; so called, because one shuts the well in and waits for the mud to be weighted before circulation begins.

wellbore n: a borehole; the hole drilled by the bit. A wellbore may have casing in it or may be open (i.e., uncased), or a portion of it may be cased and a portion of it may be open. Also called borehole or hole. See cased and open.

wellhead n: the equipment installed at the surface of the wellbore. A wellhead includes such equipment as the casinghead and tubing head. adj: pertaining to the wellhead (such as wellhead pressure).

wireline preventer n: a manually operated ram blowout preventer that is specially adapted for closure around a wireline. See ram blowout preventer.

workover n: the performance of one or more of a variety of remedial operations on a producing oilwell to try to increase production. Examples of workover jobs are deepening, plugging back, pulling and resetting liners, squeeze cementing, and so forth.