Glossary of Oil and Gas Terms

The definitions used in this abbreviated glossary are taken from a comprehensive "Dictionary for the Petroleum Industry" 3rd Edition 2001, published by the Petroleum Extension Service of the University of Texas at Austin at http://www.utexas.edu/cee/petex/. The Petroleum Extension Service has granted permission to use their definitions.

These general terms will assist the public to understand the terminology used in the Oil and Gas Business.

A

abyssal *adj*: of or relating to the bottom waters of the ocean.

accumulate *v*: to amass or collect. When oil and gas migrate into porous formations, the quantity collected is called an accumulation.

air gun *n*: a chamber filled with compressed air, often used offshore in seismic exploration. As the gun is trailed behind a boat, air is released, making a low-frequency popping noise, which penetrates the subsurface rock layers and is reflected by the layers. Sensitive hydrophones receive the reflections and transmit them to recording equipment on the boat.

alluvial fan *n*: a large, sloping sedimentary deposit at the mouth of a canyon, laid down by intermittently flowing water, especially in arid climates, and composed of gravel and sand. The deposit tends to be coarse and unworked, with angular, poorly sorted grains in thin, overlapping sheets. A line of fans may eventually coalesce into an apron that grows broader and higher as the slopes above are eroded away.

angle of deflection *n*: in directional drilling, the angle at which a well diverts from vertical; usually expressed in degrees, with vertical being 0°.

angle of dip *n*: the angle at which a formation dips downward from the horizontal.

anticlinal trap *n*: a hydrocarbon trap in which petroleum accumulates in the top of an anticline. See *anticline.*

anticline *n*: rock layers folded in the shape of an arch. Anticlines sometimes trap oil and gas. Compare *syncline*.

associated gas *n*: natural gas that over-lies 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. Also called associated free gas. See *gas cap*.

B

barrel (bbl) *n*: a measure of volume for petroleum products. One barrel is the equivalent of 35 imperial gallons or 42 U.S. gallons or 0.15899 cubic metres (9,702

cubic inches). One cubic metre equals 6.2897 barrels.

basement rock *n*: igneous or metamorphic rock, which seldom contains petroleum. Ordinarily, it lies below sedimentary rock. When it is encountered in drilling, the well is usually abandoned.

basin *n*: a local depression in the earth's crust in which sediments can accumulate to form thick sequences of sedimentary rock.

bbl *abbr*: barrel.

bed *n*: a specific layer of earth or rock that presents a contrast to other layers of different material lying above, below, or adjacent to it.

bedrock *n*: solid rock just beneath the soil.

biogenic *adj*: produced by living organisms.

bit *n*: the cutting or boring element used in drilling oil and gas wells. The bit consists of a cutting element and a circulating element. The cutting element is steel teeth, tungsten carbide buttons, industrial diamonds, or polycrystalline diamonds (PDCs). These teeth, buttons, or diamonds penetrate and gouge or scrape the formation to remove it. 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, and the bit is attached to the end of the drill collars. Drill collars provide weight on the bit to keep it in firm contact with the bottom of the hole. Most bits used in rotary drilling are roller cone bits, but diamond bits are also used extensively.

bitumen *n*: a substance of dark to black color consisting almost entirely of carbon and hydrogen with very little oxygen, nitrogen, or sulfur. Bitumens occur naturally and can also be obtained by chemical decomposition.

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 *kick*.

blowout preventer (BOP) *n*: one of several valves installed at the wellhead to prevent the escape of pressure either in the annular space between the casing and the drill pipe or in open hole (i.e., hole with no drill pipe) during drilling or completion operations. Blowout preventers on land rigs are located beneath the rig at the land's surface; on jackup or platform rigs, at the water's surface; and on floating offshore rigs, on the seafloor.

bright spot *n*: a seismic phenomenon that shows up on a seismic, or record, section as a sound reflection that is much stronger than usual. A bright spot sometimes directly indicates natural gas in a trap.

C

cap gas *n*: natural gas trapped in the upper part of a reservoir and remaining separate from any crude oil, salt water, or other liquids in the well.

caprock n: 1. a disklike plate of anhydrite, gypsum, limestone, or sulfur overlying most salt domes in the Gulf Coast region.
2. impermeable rock overlying an oil or gas reservoir that tends to prevent migration of oil or gas out of the reservoir.

carbonate rock *n*: a sedimentary rock composed primarily of calcium carbonate (limestone) or calcium magnesium carbonate (dolomite); sometimes makes up petroleum reservoirs.

Cenozoic era *n*: the time period from 65 million years ago until the present. It is marked by rapid evolution of mammals and birds, flowering plants, grasses, and shrubs, and little change in invertebrates.

clastic rock *n*: a sedimentary rock composed of fragments of preexisting rocks. The principal distinction among clastics is grain size. Conglomerates, sandstones, and shales are clastic rocks.

coal *n*: a carbonaceous, rocklike material that forms from the remains of plants that were subjected to biochemical processes, intense pressure, and high temperatures. It is used as fuel.

coal bed methane *n*: natural gas, primarily methane, that occurs naturally in the fractures and matrix of coal beds.

concrete gravity rigid platform rig *n*: a rigid offshore drilling platform built of steel-reinforced concrete and used to drill development wells. The platform is floated to the drilling site in a vertical position. At the site, one or more tall caissons that serve as the foundation of the platform are flooded so that the platform comes to rest on bottom. Because of the enormous weight of the platform, the force of gravity alone keeps it in place.

condensate *n*: a light hydrocarbon liquid obtained by condensation of hydrocarbon vapors. It consists of varying proportions of butane, propane, pentane, and heavier fractions, with little or no methane or ethane.

condensate reservoir *n*: a reservoir in which both condensate and gas exist in one homogeneous phase. When fluid is drawn from such a reservoir and the pressure decreases below the critical level, a liquid phase (condensate) appears.

contact *n*: 1. in geology, any sharp or well-defined boundary between two different bodies of rock. 2. a bedding plane or unconformity that separates formations. 3. in a petroleum reservoir, a horizontal boundary where different types of fluids meet and mix slightly; for example, a gas-oil or oil-water contact. Also called an interface.

conventional mud *n*: a drilling fluid containing essentially clay and water; no special or expensive chemicals or conditioners are added.

core *n*: a cylindrical sample taken from a formation for geological analysis. Usually a conventional core barrel is substituted for the bit and procures a sample as it penetrates the formation. *v*: to obtain a solid, cylindrical formation sample for analysis.

core analysis *n*: laboratory analysis of a core sample to determine porosity, permeability, lithology, fluid content, angle of dip, geological age, and probable productivity of the formation.

coring *n*: the process of cutting a vertical, cylindrical sample of the formations encountered as an oil well is drilled. The purpose of coring is to obtain rock samples, or cores, in such a manner that the rock retains the same properties that it had before it was removed from the formation.

Cretaceous *adj*: of or relating to the geologic period from about 135 million to 65 million years ago at the end of the

Mesozoic era, or to the rocks formed during this period, including the extensive chalk deposits for which it was named.

cross section *n*: a geological or geophysical profile of a vertical section of the earth.

crude oil *n*: unrefined liquid petroleum. It ranges in gravity from 9° API to 55° API and in color from yellow to black, and may have a paraffin, asphalt, or mixed base. If a crude oil, or crude, contains a sizable amount of sulfur or sulfur compounds, it is called a sour crude; if it has little or no sulfur, it is called a sweet crude. In addition, crude oils may be referred to as heavy or light according to API gravity, the lighter oils having the higher gravities.

crust *n*: the outer layer of the earth, varying in thickness from 5 to 30 miles (10 to 50 kilometres). It is composed chiefly of oxygen, silicon, and aluminum.

cubic foot (ft^3) *n*: the volume of a cube, all edges of which measure 1 foot. Natural gas in the United States is usually measured in cubic feet, with the most common standard cubic foot being measured at 60°F and 14.65 pounds per square inch absolute, although base conditions vary from state to state.

cubic metre (m^3) *n*: a unit of volume measurement in the SI metric system, replacing the previous standard unit known as the barrel, which was equivalent to 35 imperial gallons or 42 U.S. gallons. The cubic metre equals approximately 6,2898 barrels.

D

deep water *n*: in offshore operations, water depths greater than normal for the time and current technology.

delineation well *n*: a well drilled in an existing field to determine, or delineate, the extent of the reservoir.

deplete *v*: to exhaust a supply. An oil and gas reservoir is depleted when most or all economically recoverable hydrocarbons have been produced.

depth *n*: the distance to which a well is drilled, stipulated in a drilling contract as contract depth. Total depth is the depth after drilling is finished.

derrick *n*: a large load-bearing structure, usually of bolted construction. In drilling, the standard derrick has four legs standing at the corners of the substructure and reaching to the crown block. The substructure is an assembly of heavy beams used to elevate the derrick and provide space to install blowout preventers, casingheads, and so forth. Because the standard derrick must be assembled piece by piece, it has largely been replaced by the mast, which can be lowered and raised without disassembly.

development drilling *n*: drilling that occurs after the initial discovery of hydrocarbons in a reservoir. Usually, several wells are required to adequately develop a reservoir.

development well *n*: 1. a well drilled in proven territory in a field to complete a pattern of production. 2. an exploitation well.

deviation *n*: departure of the wellbore from the vertical, measured by the horizontal distance from the rotary table to the target. The amount of deviation is a function of the drift angle and hole depth. The term is sometimes used to indicate the angle from which a bit has deviated from the vertical during drilling.

diamond bit *n*: a drill bit that has small industrial diamonds embedded in its cutting surface. Cutting is performed by the rotation of the very hard diamonds over the rock surface.

directional drilling *n*: intentional deviation of a wellbore from the vertical. Although wellbores are normally drilled vertically, it is sometimes necessary or advantageous to drill at an angle from the vertical. Controlled directional drilling makes it possible to reach subsurface areas laterally remote from the point where the bit enters the earth. It often involves the use of deflection tools.

discovery well *n*: the first oil or gas well drilled in a new field that reveals the presence of a hydrocarbon-bearing reservoir. Subsequent wells are development wells.

dissolved gas *n*: natural gas that is in solution with crude oil in the reservoir.

dissolved water *n*: water in solution in oil at a defined temperature and pressure.

drill *v*: to bore a hole in the earth, usually to find and remove subsurface formation fluids such as oil and gas.

drilling fluid *n*: circulating fluid, one function of which is to lift cuttings out of the wellbore and to the surface. It also serves to cool the bit and to counteract downhole formation pressure. Although a mixture of barite, clay, water, and other chemical additives is the most common drilling fluid, wells can also be drilled by using air, gas, water, or oil-base mud as the drilling mud. Also called circulating fluid, drilling mud. See *mud*.

drilling mud *n*: specially compounded liquid circulated through the wellbore during rotary drilling operations. See *drilling fluid, mud*.

dry *n*: a hole is dry when the reservoir it penetrates is not capable of producing hydrocarbons in commercial amounts.
dry gas *n*: 1. gas whose water content has been reduced by a dehydration process. 2. gas containing few or no hydrocarbons commercially recoverable as liquid product. Also called lean gas.

dry hole *n*: any well that does not produce oil or gas in commercial quantities. A dry hole may flow water, gas, or even oil, but not in amounts large enough to justify production.

E

ecology *n*: science of the relationships between organisms and their environment.

environment *n*: 1. the sum of the physical, chemical, and biological factors that surround an organism. 2. the water, air, and land and the interrelationship that exists among and between water, air, and land and all living things.

erosion *n*: the process by which material (such as rock or soil) is worn away or removed (as by wind or water).

estuary *n*: a coastal indentation or bay into which a river empties and where fresh water mixes with seawater.

exploration *n*: the search for reservoirs of oil and gas, including aerial and geophysical surveys, geological studies, core testing and drilling of wildcats.

exploration well *n*: a well drilled either in search of an as-yet-undiscovered pool of oil

or gas (a wildcat well) or to extend greatly the limits of a known pool. It involves a relatively high degree of risk. Exploratory wells may be classified as (1) wildcat, drilled in an unproven area; (2) field extension or step-out, drilled in an unproven area to extend the proved limits of a field; or (3) deep test, drilled within a field area but to unproven deeper zones.

F

fault *n*: a break in the earth's crust along which rocks on one side have been displaced (upward, downward, or laterally) relative to those on the other side.

fault plane *n*: a surface along which faulting has occurred.

fault trap *n*: a subsurface hydrocarbon trap created by faulting, in which an impermeable rock layer has moved opposite the reservoir bed or where impermeable gouge has sealed the fault and stopped fluid migration.

field *n*: a geographical area in which a number of oil or gas wells produce from a continuous reservoir. A field may refer to surface area only or to underground productive formations as well. A single field may have several separate reservoirs at varying depths.

fixed platform *n*: a structure made of steel or concrete, firmly fixed to the bottom of the body of water in which it rests.

flare *n*: an arrangement of piping and burners used to dispose (by burning) of surplus combustible vapors, usually situated near a gasoline plant, refinery, or producing well. *v*. to dispose of surplus combustible vapors by igniting them in the atmosphere. Flaring is rarely used, because of the high value of gas and the stringent air pollution controls.

flare gas *n*: gas or vapor that is flared.

floating offshore drilling rig *n*: a type of mobile offshore drilling unit that floats and is not in contact with the seafloor (except with anchors) when it is in the drilling mode. Floating units include barge rigs, drill ships, and semisubmersibles.

floating production and system offloader *n*: a floating offshore oil production vessel that has facilities for producing, treating, and storing oil from several producing wells and which puts (offloads) the treated oil into a tanker ship for transport to refineries on land. Some FPSOs are also capable of drilling, in case they are termed floating production, drilling, and system offloaders (FPDSOs).

flowing well *n*: a well that produces oil or gas by its own reservoir pressure rather than by use of artificial means (such as pumps).

fold *n*: a flexure of rock strata (e.g., an arch or a trough) produced by horizontal compression of the earth's crust. See *anticline, syncline*.

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.

fossil *n*: the remains or impressions of a plant or animal of past geological ages that have been preserved in or as rock.

FPSO *abbr*: floating production and system offloader.

free water *n*: water produced with oil. It usually settles out within five minutes when the well fluids become stationary in a settling space within a vessel.

G

gas *n*: a compressible fluid that completely fills any container in which it is confined. Technically, a gas will not condense when it is compressed and cooled, because a gas can exist only above the critical temperature for its particular composition. Below the critical temperature, this form of matter is known as a vapor, because liquid can exist and condensation can occur. Sometimes the terms "gas" and "vapor" are used interchangeable. The latter, however, should be used for those streams in which condensation can occur and that originate from, or are in equilibrium with, a liquid phase.

gas cap *n*: a free-gas phase overlying an oil zone and occurring within the same producing formation as the oil. See *associated gas, reservoir*.

gas-cap drive *n*: drive energy supplied naturally (as a reservoir is produced) by the expansion of the gas cap. In such a drive, the gas cap expands to force oil into the well and to the surface.

gas detection analyzer *n*: a device used to detect and measure any gas in the drilling mud as it is circulated to the surface.

gasoline *n*: a volatile, flammable liquid hydrocarbon refined from crude oils and used universally as a fuel for internal-combustion, spark-ignition engines.

gas pipeline *n*: a transmission system for natural gas or other gaseous material. The total system comprises pipes and compressors needed to maintain the flowing pressure of the system.

gas processing *n*: the separation of constituents from natural gas for the purpose of making salable products and also for treating the residue gas to meet required specifications.

gas reservoir *n*: a geological formation containing a single gaseous phase. When produced, the surface equipment may or may not contain condensed liquid, depending on the temperature, pressure, and composition of the single reservoir phase.

gas sand *n*: a stratum of sand or porous sandstone from which natural gas is obtained.

gas well *n*: a well that primarily produces gas.

geochemistry *n*: study of the relative and absolute abundances of the elements of the earth and the physical and chemical processes that have produced their observed distributions.

geologist *n*: a scientist who gathers and interprets data pertaining to the rocks of the earth's crust.

geology *n*: the science of the physical history of the earth and its life, especially as recorded in the rocks of the crust.

geophone *n*: an instrument placed on the surface that detects vibrations passing through the earth's crust. It is used in conjunction with seismography. Geophones are often called jugs.

geophysical exploration *n*: measurement of the physical properties of the earth to locate subsurface formations that may contain commercial accumulations of oil, gas, or other minerals; to obtain information for the design of surface structures, or to make other practical applications. The properties most often studied in the oil industry are seismic characteristics, magnetism, and gravity.

geophysics *n*: the physics of the earth, including meteorology, hydrology, oceanography, seismology, vulcanology, magnetism, and radioactivity.

geothermal *adj*: pertaining to heat within the earth.

graben *n*: a block of the earth's crust that has slid downward between two faults. Compare *horst*.

gravity *n*: 1. the attraction exerted by the earth's mass on objects at its surface. 2. the weight of a body.

gravity survey *n*: an exploration method in which an instrument that measures the intensity of the earth's gravity is passed over the surface or through the water. In places where the instrument detects stronger- or weaker-than-normal gravity forces, a geologic structure containing hydrocarbons may exist.

groundwater *n*: water that seeps through soil and fills pores of underground rock formations; the source of water in springs and wells.

gusher *n*: an oilwell that has come in with such great pressure that the oil jets out of the well like a geyser. 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 were the only indication that a large reservoir of oil and gas had been struck. See *blowout*.

H

hole *n*: in drilling operations, the wellbore or borehole.

horizontal drilling *n*: deviation of the borehole at least 80° from vertical so that the borehole penetrates a productive formation in a manner parallel to the formation. A single horizontal hole can effectively drain a reservoir and eliminate the need for several vertical boreholes.

horst *n*: a block of the earth's crust that has been raised (relatively) between two faults. Compare *graben*.

hydrocarbons *n pl*: organic compounds of hydrogen and carbon whose densities, boiling points, and freezing points increase as their molecular weights increase. Although composed of only two elements, hydrocarbons exist in a variety of compounds, because of the strong affinity of the carbon atom for other atoms and for itself. The smallest molecules of hydrocarbons are gaseous; the largest are solids. Petroleum is a mixture of many different hydrocarbons.

ice scour *n*: the abrasion of material in contact with moving ice in a sea, ocean, or other body of water.

igneous rock *n*: a rock mass formed by the solidification of magma within the earth's crust or on its surface. It is classified by chemical composition and grain size. Granite is an igneous rock.

impermeable *adj*: preventing the passage of fluid. A formation may be porous yet impermeable if there is an absence of connecting passages between the voids within it. See *permeability*.
interstice *n*: a pore space in a reservoir rock.

J

jackup drilling rig *n*: a mobile bottom-supported offshore drilling structure with columnar or open-truss legs that support the deck and hull. When positioned over the drilling site, the bottoms of the legs penetrate the seafloor. A jackup rig is towed or propelled to a location with its legs up. Once the legs are firmly positioned on the bottom, the deck and hull height are adjusted and leveled. Also called self-elevating drilling unit.

L

landman *n*: a person in the petroleum industry who negotiates with landowners for oil and gas leases, options, minerals, and royalties and with producers for joint operations relative to production in a field. Also called a leaseman.

lava *n*: magma that reaches the surface of the earth.

limestone *n*: a sedimentary rock rich in calcium carbonate that sometimes serves as a reservoir rock for petroleum.

liquefied natural gas (LNG) *n*: a liquid composed chiefly of natural gas (i.e., mostly methane). Natural gas is liquefied to make it easy to transport if a pipeline is not feasible (as across a body of water). LNG must be put under low temperature and high pressure or under extremely low (cryogenic) temperature and close to atmospheric pressure to liquefy.

log *n*: a systematic recording of data, such as a driller's log, mud log, electrical well log, or radioactivity log. Many different logs are run in wells to discern various characteristics of downhole formation.
v: to record data.

M

magma *n*: the hot fluid matter within the earth's crust that is capable of intrusion or extrusion and that produces igneous rock when cooled.

magnetic survey *n*: an exploration method in which an instrument that measures the intensity of the natural magnetic forces existing in the earth's subsurface is passed over the surface or through the water. The instrumentation detects deviations in magnetic forces, and such deviations may indicate the existence of underground formations that favor the entrapment of hydrocarbons.

median *n*: a statistical measure of the midmost value, such that half the values in a set are greater and half are less than the median.

methane *n*: a light, gaseous, flammable paraffinic hydrocarbon, CH_4, that has a boiling point of -25°F (and is the chief component of natural gas and an important basic hydrocarbon for petrochemical manufacture).

mineral rights *n pl*: the rights of ownership, conveyed by deed, of gas, oil, and other minerals beneath the surface of the earth.

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 the 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 liquids, 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*.

N

natural gas *n*: a highly compressible, highly expansible mixture of hydrocarbons with a low specific gravity and occurring naturally in a gaseous form. Besides hydrocarbon gases, natural gas may contain appreciable quantities of nitrogen, helium, carbon dioxide, hydrogen sulfide, and water vapor. Although gaseous at normal temperatures and pressures, the gases making up the mixture that is natural gas are variable in form and may be found either as gases or as liquids under suitable conditions of temperature and pressure.

nonporous *adj*: containing no interstices; having no pores and therefore unable to hold fluids.

O

offshore *n*: that geographic area that lies seaward of the coastline. In general, the term "coastline" means the line of ordinary low water along that portion of the coast that is in direct contact with the open sea or the line marking the seaward limit of inland waters.

offshore drilling *n*: drilling for oil or gas in an ocean, gulf, or sea. A drilling unit for offshore operations may be a mobile floating vessel with a ship or barge hull, a semisubmersible or submersible base, a self-propelled or towed structure with jacking legs (jackup drilling rig), or a permanent structure used as a production platform when drilling is completed. In general, wildcat wells are drilled from mobile floating vessels or from jackups, while development wells are drilled from platforms or jackups.

offshore production platform *n*: an immobile offshore structure from which wells are produced.

offshore rig *n*: any of various types of drilling structures designed for use in drilling wells in oceans, seas, bays, gulfs, and so forth. Offshore rigs include platforms, jackup drilling rigs, semisubmersible drilling rigs, submersible drilling rigs, and drill ships.

O&G *abbr*: oil and gas; used in drilling reports.

oil *n*: a simple or complex liquid mixture of hydrocarbons that can be refined to yield gasoline, kerosene, diesel fuel, and various other products.

oil in place *n*: crude oil that is estimated to exist in a reservoir but that has not been produced.

oil patch *n*: (slang) the oilfield.

oil pool *n*: a loose term for an underground reservoir where oil occurs. Oil is actually found in the pores of rocks, not in a pool.

oil seep *n*: a surface location where oil appears, the oil having permeated its subsurface boundaries and accumulated in small pools or rivulets. Also called oil spring.

oil shale *n*: a shale containing hydrocarbons that cannot be recovered by an ordinary oilwell but that can be extracted by mining and processing.

oil slick *n*: a film of oil floating on water; considered a pollutant.

oil spill *n*: a quantity of oil that has leaked or fallen onto the ground or onto the surface of a body of water.

oilwell *n*: a well from which oil is obtained.

oil zone *n*: a formation or horizon of a well from which oil may be produced. The oil zone is usually immediately under the gas zone and on top of the water zone if all three fluids are present and segregated.

organic compounds *n pl*: chemical compounds that contain carbon atoms, either in straight chains or in rings, and hydrogen atoms. They may also contain oxygen, nitrogen, or other atoms.

organic rock *n*: rock materials produced by plant or animal life (coal, petroleum, limestone, and so on).

outcrop *n*: part of a formation exposed at the earth's surface. *v*: to appear on the earth's surface (as a rock).

P

peat *n*: an organic material that forms by the partial decomposition and disintegration of vegetation in tropical swamps and other wet, humid areas. It is believed to be the precursor of coal.

permeability *n*: 1. a measure of the ease with which a fluid flows through the connecting pore spaces of rock or cement. The unit of measurement is the millidarcy. 2. fluid conductivity of a porous medium. 3. ability of a fluid to flow within the interconnected pore network of a porous medium.

permeable rock *n*: a porous rock formation in which the individual pore spaces are connected, allowing fluids to flow through the formation.

petroleum *n*: a substance occurring naturally in the earth in solid, liquid, or gaseous state and composed mainly of mixtures of chemical compounds of carbon and hydrogen, with or without other nonmetallic elements such as sulfur, oxygen, and nitrogen.

petroleum geology *n*: the study of oil and gas-bearing rock formations. It deals with the origin, occurrence, movement, and accumulation of hydrocarbon fuels.

petroleum reservoir *n*: a rock formation that holds oil and gas.

petroleum rock *n*: sandstone, limestone, dolomite, fractured shale, and other porous rock formations where accumulations of oil and gas may be found.

petroleum window *n*: the conditions of temperature and pressure under which petroleum will form. Also called oil window.

plate tectonics *n pl*: movement of great crustal plates of the earth on slow currents in the plastic mantle, similar to the movement

of boxes on a conveyor belt. Today geologists believe that the earth's crust is divided into six major plates and several smaller ones atop some of which the continents are carried away from a system of midocean ridges and toward another system of deep-sea trenches. The theory of plate tectonics explains most of the mysteries that confounded earlier geologists.

play *n*: 1. the extent of a petroleum-bearing formation. 2. the activities associated with petroleum development in an area.

pool *n*: a reservoir or group of reservoirs. The term is a misnomer in that hydrocarbons seldom exist in pools, but, rather, in the pores of rock. *v*: to combine small or irregular tracts into a unit large enough to meet state spacing regulations for drilling.

porosity *n*: 1. the condition of being porous (such as a rock formation). 2. the ratio of the volume of empty space to the volume of solid rock in a formation, indicating how much fluid rock can hold.

potential *n*: the maximum volume of oil or gas that a well is capable of producing, calculated from well test data.

producer *n*: 1. a well that produces oil or gas in commercial quantities. 2. an operating company or individual in the business of producing oil; commonly called the operator.

production *n*: 1. the phase of the petroleum industry that deals with bringing the well fluids to the surface and separating them and with storing, gauging, and otherwise preparing the product for the pipeline. 2. the amount of oil or gas produced in a given period.

proved reserves of crude oil *n pl*: according to API standard definitions, proved reserves of crude oil as of December 31 of any given year are the estimated quantities of all liquids statistically defined as crude oil that geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions.

proved reserves of natural gas *n pl*: according to API standard definitions, proved reserves of natural gas as of December 31 of any given year are the estimated quantities of natural gas that geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known natural gas reservoirs under existing economic and operating conditions.

R

reserves *n pl*: the unproduced but recoverable oil or gas in a formation that has been proved by production.

reservoir *n*: a subsurface, porous, permeable or naturally fractured rock body in which oil or gas are stored. Most reservoir rocks are limestones, dolomites, sandstones, or a combination of these. The four basic types of hydrocarbon reservoirs are oil, volatile oil, dry gas, and gas condensate. An oil reservoir generally contains three fluids - gas, oil, and water-with oil the dominant product. In the typical oil reservoir, these fluids become vertically segregated because of their different densities. Gas, the lightest, occupies the upper part of the reservoir rocks; water, the lower part; and oil, the intermediate section. In addition to its occurrence as a cap or in solution, gas may accumulate independently of the oil; if so,

the reservoir is called as gas reservoir. Associated with the gas, in most instances, are salt water and some oil. Volatile oil reservoirs are exceptional in that during early production they are mostly productive of light oil plus gas, but, as depletion occurs, production can become almost totally completely gas. Volatile oils are usually good candidates for pressure maintenance, which can result in increased reserves. In the typical dry gas reservoir natural gas exists only as a gas and production is only gas plus fresh water that condenses from the flow stream reservoir. In a gas condensate reservoir, the hydrocarbons may exist as a gas, but, when brought to the surface, some of the heavier hydrocarbons condense and become a liquid.

reservoir rock *n*: a permeable rock that may contain oil or gas in appreciable quantity and through which petroleum may migrate.

resources *n pl*: concentrations of naturally occurring liquid or gaseous hydrocarbons in the earth's crust, some part of which are currently or potentially economically extractable.

risk analysis *n*: the activity of assigning probabilities to the expected outcomes of drilling venture.

S

samples *n pl*: 1. the well cuttings obtained at designated footage intervals during drilling. From an examination of these cuttings, the geologist determines the type of rock and formations being drilled and estimates oil and gas content. 2. small quantities of well fluids obtained for analysis.

sandstone *n*: a sedimentary rock composed of individual mineral grains of rock fragments between 0.06 and 2 millimetres (0.002 and 0.079 inches) in diameter and cemented together by silica, calcite, iron oxide, and so forth. Sandstone is commonly porous and permeable and therefore a likely type of rock in which to find a petroleum reservoir.

seafloor *n*: the bottom of the ocean; the seabed.

sedimentary rock *n*: a rock composed of materials that were transported to their present position by wind or water. Sandstone, shale, and limestone are sedimentary rocks.

seep *n*: the surface appearance of oil or gas that results naturally when a reservoir rock becomes exposed to the surface, thus allowing oil or gas to flow out of fissures in the rock.

seismic *adj*: of or relating to an earthquake or earth vibration, including those artificially induced.

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

seismic method *n*: a method of geophysical prospecting using the generation, reflection, refraction detection, and analysis of sound waves in the earth.

seismic survey *n*: an exploration method in which strong low-frequency sound waves are generated on the surface or in the water to find subsurface rock structures that may contain hydrocarbons. The sound waves travel through the layers of the earth's crust; however, at formation boundaries some of the waves are reflected back to the surface where sensitive detectors pick them up.

Reflections from shallow formations arrive at the surface sooner than reflections from deep formations, and since the reflections are recorded, a record of the depth and configuration of the various formations can be generated. Interpretation of the record can reveal possible hydrocarbon-bearing formations.

seismic wave *n*: the record of an earth tremor by a seismograph.

semisubmersible drilling rig *n*: a floating offshore drilling unit that has pontoons and columns that, when flooded, cause the unit to submerge to a predetermined depth. Living quarters, storage space, and so forth are assembled on the deck. Semisubmersible rigs are self-propelled or towed to a drilling site and anchored or dynamically positioned over the site, or both. In shallow water, some semisubmersibles can be ballasted to rest on the seabed. Semisubmersibles are more stable than drill ships and ship-shaped barges and are used extensively to drill wildcat wells in rough waters such as the North Sea. Two types of semisubmersible rigs are the bottle-type and the column-stabilized.

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

shallow gas *n*: natural gas deposit located near enough to the surface that a conductor or surface hole will penetrate the gas-bearing formations. Shallow gas is potentially dangerous because, if encountered while drilling, the well usually cannot be shut in to control it. Instead, the flow of gas must be diverted.

show *n*: the appearance of oil or gas in cuttings, samples, or cores from a drilling well.

sour gas *n*: gas containing an appreciable quantity of hydrogen sulfide.

stratigraphic test *n*: a borehole drilled primarily to gather information on rock types and sequence.

stratigraphic trap *n*: a petroleum trap that occurs when the top of the reservoir bed is terminated by other beds or by a change of porosity or permeability within the reservoir itself. Compare *structural trap*.

structural trap *n*: a petroleum trap that is formed because of deformation (such as folding or faulting) of the reservoir formation. Compare *stratigraphic trap*.

structure *n*: a geological formation of interest to drillers. For example, if a particular well is on the edge of a structure, the wellbore has penetrated the reservoir (structure) near its periphery.

subduction zone *n*: a deep trench formed in the ocean floor along the line of convergence of oceanic crust with other oceanic or continental crust when one plate (always oceanic) dives beneath the other. The plate that descends into the hot mantle is partially melted. Magma rises through fissures in the heavier, unmelted crust above, creating a line of plutons and volcanoes that eventually form an island arc parallel to the trench.

sweet crude oil *n*: oil containing little or no sulfur, especially little or no hydrogen sulfide.

syncline *n*: a trough-shaped configuration of folded rock layers. Compare *anticline*.

T

tar sand *n*: a sandstone that contains chiefly heavy, tarlike hydrocarbons. Tar sands are difficult to produce by ordinary methods; thus it is costly to obtain usable hydrocarbons from them.

tectonic *adj*: of or relating to the deformation of the earth's crust, the forces involved in or producing such deformation, and the resulting rock forms.

thermal decomposition *n*: the breakdown of a compound or substance by temperature into simple substances or into constituent elements.

tight formation *n*: a petroleum- or water-bearing formation of relatively low porosity and permeability.

trap *n*: a body of permeable oil-bearing rock surrounded or overlain by an impermeable barrier that prevents oil from escaping. The types of traps are structural, stratigraphic, or a combination of these.

tsunami *n*: a long-period wave produced by a submarine earthquake or explosion. If it strikes land, it can be very destructive. Also called seismic sea wave.

W

water-producing interval *n*: the portion of an oil or gas reservoir from which water or mainly water is produced.

weathering *n*: 1. the breakdown of large rock masses into smaller pieces by physical and chemical climatological processes. 2. the evaporation of liquid by exposing it to the conditions of atmospheric temperatures and pressure.

well *n*: the hole made by the drilling bit, which can be open, cased, or both. Also called borehole, hole or wellbore.

well completion *n*: 1. the activities and methods of preparing a well for the production of oil and gas or for other purposes, such as injection; the method by which one or more flow paths for hydrocarbons are established between the reservoir and the surface. 2. the system of tubulars, packers, and other tools installed beneath the wellhead in the production casing; that is, the tool assembly that provides the hydrocarbon flow path or paths.

well control *n*: the methods used to control a kick and prevent a well from blowing out. Such techniques include, but are not limited to, keeping the borehole completely filled with drilling mud of the proper weight or density during all operations, exercising reasonable care when tripping pipe out of the hole to prevent swabbing, and keeping careful track of the amount of mud put into the hole to replace the volume of pipe removed from the hole during a grip.

well logging *n*: the recording of information about subsurface geologic formations, including records kept by the driller and records of mud and cutting analyses, core analysis, drill stem tests, and electric, acoustic, and radioactivity procedures.

wildcat *n*: a well drilled in an area where no oil or gas production exists.