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**La Niña** — (Oceanography and Meteorology) [From the “little girl”] The name given to the weather phenomenon characterized by abnormally cold ocean surface water temperatures in the eastern Pacific Ocean near the equator. According to the *National Oceanic and Atmospheric Administration (NOAA)*, during a La Niña event, temperatures are typically warmer than normal in the southeast United States and cooler than normal in the northwest, bringing drier than normal conditions to southern California and the Southwest U.S. With the cold water in the Pacific tropics characterizing a La Niña event, the chill, west-to-east high-altitude winds known as the jet stream no longer move southward attracted by the temperature differential which exists during the El Niño warm-water event. Therefore, instead of being “pulled” downward as the jet stream hurls across the United States, it tends to shift northward, producing unusually wet springs in the Northwestern U.S. and summer droughts in the mid-Atlantic region. It also means that there are no strong upper elevation winds in the middle Atlantic to blow the tops off of any big tropical storms forming, consequently allowing for the formation of more hurricanes.

**Laboratory Blank** — An artificial sample, usually distilled water, introduced to a chemical analyzer to observe the response of the instrument to a sample that does not contain the material being measured. The blank can also detect any contamination occurring during laboratory processing of the sample.

**Lacustrine** — Pertaining to, produced by, or inhabiting a lake.

**Lacustrine Deposits** — Stratified materials deposited in lake waters and later become exposed either by the lowering of the water level or by the elevation of the land.

**Lacustrine Wetlands** — According to criteria of the U.S. Fish and Wildlife Service (USFWS), *Lacustrine Wetlands* are greater than 20 acres and have less than 30 percent cover of persistent vegetation. Also see *Wetlands*. [See Appendix D-2 for an explanation of the USFWS Wetland and Deepwater Habitat Classification System and more detailed information on these Systems.]

**Lade** — To take up or remove water with a ladle or dipper.

**Lag (Time)** — (Statistics) The difference in time units of a series value and a previous series value. In time series analysis, the lag typically represents the period of time between the change in the independent or predictor (*Exogenous*) variable and its strongest (most significant) effect on the dependent or predicted (*Endogenous*) variable. Also see Lead (Time).

**Lagged Endogenous Variable** — (Statistics) Refers to the use of a prior-period *Dependent Variable* used as an *Explanatory Variable* in the current period. The model below uses a prior *Endogenous* value,  $Y_{t-1}$ , to explain the behavior of  $Y_t$ :

$$Y_t = \phi_1 Y_{t-1} + \ddot{a} + \dot{a}_t$$

In many instances of social, economic, and natural phenomenon, the behavior of a variable in the current period may be dependent upon or somehow influenced by its prior behavior or level. This constitutes the fundamental underpinning of an *Autoregressive Process* in the analysis of *Time-Series Data*.

**Lagoon** — (1) A shallow lake or pond, especially one connected with a larger body of water. (2) The area of water enclosed by a circular coral reef, or atoll. (3) An area of shallow salt water separated from the sea by sand dunes. (4) A metaphorical term for the ponding area behind a Pleistocene offshore or barrier bar (beaches) that collects fine textured sediments. (5) (Water Quality) Lagoons are scientifically constructed ponds in which sunlight, algae, and oxygen interact to restore water to a quality equal to effluent from a secondary treatment plant.

**Lagoon System** — (Water Quality) A system of scientifically construction Lagoons or ponds in which sunlight, algae, and oxygen interact to restore water to a quality equal to effluent from a *Secondary Treatment Plant*.

**Lag Time, also Lagtime** — (1) The time from the center of a *Unit Storm* to the peak discharge or center of volume of the corresponding *Unit Hydrograph*. (2) (Flood Irrigation) The period between the time that the irrigation stream is turned off at the upper end of an irrigated area and the time that water disappears from the surface at the point or points of application.

**Lahar** — A mudflow composed of volcanic debris and water.

**Lahontan Basin** — A major basin within the *Great Basin* that is fed by the Truckee, Carson, Walker, Susan, Quinn

and Humboldt Rivers. It has a drainage or hydrologic area of about 45,000 square miles and during the Pleistocene Epoch (11,000 years B.P. to approximately 1.8 million years B.P.) Contained the 8,600 square mile Lake Lahontan. The Lahontan basin encompasses much of northern Nevada and parts of eastern California and southern Oregon.

**Lahontan Valley Environmental Alliance (LVEA) [Nevada]** — An association of Lahontan Valley (Churchill County, Nevada) entities formed in October 1993 to represent the broad-based concerns and issues of the Newlands Irrigation Project's residents including quality of life, water quality and quantity, municipal and industrial water supply, and land-use planning issues. The LVEA membership includes the City of Fallon, Town of Fernley, Churchill County, Truckee-Carson Irrigation District (TCID), Lahontan Conservation District and the Stillwater Conservation District.

**Lahontan Valley Wetland System [Nevada]** — An extensive wetland system in northwestern Nevada in Churchill County near the City of Fallon encompassing the *Stillwater Wildlife Management Area* and the *Stillwater National Wildlife Refuge*, as well as the Carson Lake and Carson Pasture, which serves as a key migration and wintering area for up to 1 million waterfowl, shorebirds, and raptors. Each spring and fall, it hosts a significant percentage of the Pacific Flyway's migratory birds. The Lahontan Valley Wetland System was named to the Western Hemisphere Shorebird Reserve Network in 1988, and it has been nominated for inclusion under the Convention of Wetlands of International Importance, attesting to the continental significance of this invaluable resource. By one estimate, in the early 1900s the Lahontan Valley Wetland System alone contained about 85,000 acres (34,400 ha) of wetlands visited by millions of waterfowl and shorebirds using the eastern edge of the Pacific Flyway during migration. With the advent of the *Newlands Project*, fresh water that traditionally charged the wetlands was replaced by a greatly diminished supply of agricultural drain water. Overall, wetland acreage in the Lahontan Valley declined by 85 percent. Because it is one of only three large interior basin wetland systems along the west coast, deterioration of Lahontan Valley wetlands has already markedly reduced the carrying capacity of the Pacific Flyway. In 1990, Congress passed *Public Law 101-618* (the *Negotiated Settlement*) authorizing the purchase and transfer of enough water rights to maintain a total of 25,000 acres of primary wetlands in the Lahontan Valley. The U.S. Department of the Interior, Fish and Wildlife Service (USFWS) estimates this will require up to 125,000 acre-feet of water annually. Also see *Newlands Project [Nevada]* and *Public Law 101-618 [Nevada]*.

**Lake** — A considerable body of inland water or an expanded part of a river.

**Lake Bonneville [Utah and Nevada]** — An ancient Ice Age (Pleistocene) lake which during the last *Glacial Epoch* covered most of the Utah portion of the *Great Basin*, encompassing most of northwestern Utah and stretching into eastern Nevada. The present Great Salt Lake is the remaining remnant of this lake.

**Lake Evaporation** — Normal evaporation such as from a pond or lake.

**Lake Lahontan [Nevada and California]** — An ancient Ice Age (Pleistocene) lake which covered an extensive portion of northwestern Nevada during the last *Glacial Epoch*, a period when the *Great Basin* was covered with a considerable number of lakes and rivers. Lake Lahontan, along with Lake Bonneville far to the east, represented the major Ice Age lakes which covered vast portions of Nevada and Utah and provided a far more lush and hospitable environment for both flora and fauna. Now, only the Great Salt Lake remains to provide an indication of the prehistoric presence of Lake Bonneville, and only Pyramid Lake and Walker Lake remain to provide testament of the presence of Lake Lahontan. In its day, Lake Lahontan would cover some 8,655 square miles in northwestern Nevada, an area equal to almost 8 percent of Nevada's present surface area. This Ice Age lake was fed by the flows of the Truckee, Carson, Walker, Humboldt, Susan and Quinn rivers, attained a maximum surface elevation of approximately 4,380 feet, reached a maximum depth of at least 886 feet where Pyramid Lake, the lowest point in the system, now remains, covered the Lahontan Valley Wetlands (Stillwater Wildlife Refuge) to a depth of 500–700 feet, stretched from just below Nevada's northern boundary to Walker Lake, and extended well up the lower Truckee Canyon towards the city of Reno to near the present-day location of Lagomarsino Canyon near Lockwood. Lake Lahontan experienced at several peaking enlargements — approximately 65,000, 45,000, 30,000, and as recently as 12,500 years ago — and at times nearly dried up.

**Lake Plain** — A major landform of some *Bolson* floors that is built of the nearly level, fine textured, stratified, bottom sediments of a Pleistocene lake.

**Lake-Plain Terrace** — A somewhat elevated portion and component landform of a *Lake Plain*.

**Lake Truckee [California]** — In Neocene times, which occurred during the late Tertiary Period approximately 25 million to 13 million years ago and encompassed both the Pliocene and Miocene Epochs, Lake Truckee was formed from a basalt flow that dammed the upper Truckee River canyon just below the present-day site of Hirshdale, California. The lake covered an area of some 73 square miles, its surface level reached an elevation of at least 6,000 feet above mean sea level (MSL), and attained a maximum depth of 465 feet. Lake Truckee remained through part of the glacial (Pleistocene) period until the river eventually wore down the obstruction and

subsequently drained the lake

**Lakes, Seepage** — Lakes whose ecology is determined primarily by ground water rather than surface water.

**Lake Whitening** — A phenomenon which occurs in moderately productive lakes when photosynthetic uptake of carbon dioxide (CO<sub>2</sub>) causes the precipitation of small particles of calcite (mostly calcium carbonate, CaCO<sub>3</sub>). Since small particles have a greater effect on water transparency and typical calcite particles are only 1–2 micrometers (µm) in diameter, lake water takes on a milky appearance, hence lending to its name.

**Lambert-Beer Equation** — See *Light-Attenuation Coefficient*.

**Laminar Flow** — A flow in which fluid moves smoothly in streamlines in parallel layers or sheets. The stream lines remain distinct and the flow directions at every point remain unchanged with time. It is characteristic of the movement of ground water. Contrasts with turbulent flow. Synonymous with *Streamline Flow* and *Viscous Flow*.

**Land** — The entire complex of surface and near surface attributes of the solid portions of the surface of the earth, which are significant to man. Water bodies occurring within land masses are included in some land classification systems.

**Land Application** — The reuse of reclaimed water or the utilization or disposal of effluents on, above, or into the surface of the ground through spray fields or other methods.

**Land Breeze** — The land-to-sea surface wind that occurs in coastal areas at night. It is caused by the rising of the air above the ocean, which is warmer than the land due to the rapid cooling of the land after sunset. Contrast with *Sea Breeze*.

**Land Capability** — The suitability of land for use without permanent damage. Land capability, as ordinarily used in the United States, is an expression of the effect of physical land conditions, including climate, on the total suitability for use, without damage, for crops that require regular tillage, for grazing, for woodland, and for wildlife. Land capability involves consideration of the risks of land damage from erosion and other causes and the difficulties in land use owing to physical land characteristics including climate.

**Land Capability Classification** — The U.S. Department of Agriculture, *Natural Resources Conservation Service (NRCS)*, formerly the *Soil Conservation Service (SCS)*, has distinguished eight classes of land capability according to the risk of land damage or the difficulty of land use:

- [1] **Class I** – Soils that have few limitations restricting their use;
- [2] **Class II** – Soils that have some limitations, reducing the choice of plants or requiring moderate conservation practices;
- [3] **Class III** – Soils that have severe limitations that reduce the choice of plants or require special conservation practices, or both;
- [4] **Class IV** – Soils that have very severe limitations that restrict the choice of plants, require very careful management, or both;

The following classes are generally not considered suitable for cultivation without some form of major treatment:

- [5] **Class V** – Soils that have little or no erosion hazard, but that have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife food and cover;
- [6] **Class VI** – Soils that have severe limitations that make them generally unsuited for cultivation and limit their use largely to pasture or range, woodland, or wildlife food and cover;
- [7] **Class VII** – Soils that have very severe limitations that make them unsuited to cultivation and that restricts their use largely to grazing, woodland, or wildlife;
- [8] **Class VIII** – Soils and land forms that preclude their use for commercial plant production and restrict their use to recreation, wildlife, water supply, or aesthetic purposes.

**Land Development (for Irrigation)** — The following constitutes a partial listing of land development and improvement activities normally associated with irrigation projects. While these techniques have been prevalent in the past and have had a beneficial effect on land from an agricultural productivity standpoint, more recent concerns over wetland preservation and restoration and wildlife habitat concerns have tended to more recently restrict their widespread usage.

- [1] **Land Leveling and Smoothing** – Leveling to a more uniform grade to permit more efficient gravity irrigation and to facilitate surface drainage on undulating lands developed for sprinkler or drip irrigation;
- [2] **Artificial Drainage** – Installation of tile drains or ditches or installation of drainage wells to facilitate the removal of excess water from lands prone to accumulate excess water;
- [3] **Deep Ripping** – When some lands, especially older terrace deposits, develop hardpan or cemented layers, if relatively thin in nature, they can often be ripped by powerful equipment thereby deepening the effective root zone and improving internal soil drainage;

- [4] **Soil Amendments** – In order to improve the chemical and physical properties of the soil, it is sometimes necessary to apply gypsum, sulfur, or farm manure to the land;
- [5] **Terracing** – A technique specifically designed for sloping land to prevent accelerated erosion on exposed slopes;
- [6] **Land Clearing** – Initially and periodically, brush and trees must be cleared from irrigated lands to improve overall productivity;
- [7] **Surface Outlet Excavation** – A technique to provide an outlet for standing water, most common in prior glacial areas where many closed depressions allow for the accumulation of runoff during wet periods;
- [8] **Tailwater Return Systems** – Allow for the recycling and reuse of farm runoff water for additional irrigation;
- [9] **Rock Removal** – Particularly prevalent in glacial areas, initial and periodic surface rock is especially important for development and on-going use of irrigated lands;
- [10] **Shelter Belt Planting** – Mitigates wind erosion and provides cover for livestock and wildlife by planting tree lines in strategically located areas in and around irrigated fields.

**Land Farming** — A technique for the controlled biodegradation of organic waste that involves the mixture of waste sludges with soil. Microorganisms in the soil degrade the organic wastes. The biodegradation is enhanced by tilling the soil-waste mixture to ensure adequate oxygen and the control of moisture content, nutrient levels, and soil pH.

**Landfill** — (Water Quality) A disposal site which disposes of solid wastes on land. Wastes are deposited and compacted. At specific intervals, a layer of soil covers the waste and the process of deposit and compaction is repeated. The purpose is to confine the wastes to the smallest practical area and volume without creating nuisances or hazards to public health and safety, for example through leaching into the groundwater below the waste site.

**Landform** — (Geography) (1) A discernible natural landscape that exists as a result of wind, water or geological activity, such as a plateau, plain, basin, mountain, etc. (2) A three dimensional part of the land surface, formed of soil, sediment, or rock that is distinctive because of its shape, that is significant for land use or to landscape genesis, that repeats in various landscapes, and that also has a fairly consistent position relative to surrounding landforms.

**Landform Element** — A morphological part of a component landform. Sideslope landform elements may be divided into slope components.

**Land Improvement** — See *Land Development*.

**Landlocked** — (1) Enclosed or nearly enclosed by land, as a landlocked country without access to the sea or ocean. (2) Confined to fresh water by some barrier, as salmon.

**Land Pan** — An evaporation pan located on land. See *Evaporation Pan*.

**Land Reclamation** — Making land capable of more intensive use by changing its general character, as by drainage of excessively wet land, irrigation of arid or semiarid land, or recovery of submerged land from seas, lakes, and rivers.

**Land Reconstruction** — (Mining) (1) Restoring land and water areas adversely affected by past mining practices and increasing the productivity of the areas for a beneficial use. (2) Restoring currently mined land to an acceptable form and for a planned use.

**Land Retirement** — (Agriculture) Taking land out of agriculture production by leaving it fallow or letting it return to a natural state.

**Lands** — References to federally owned lands are defined as follows:

- [1] **Federal** – All classes of land owned by the federal government, which includes *Public Domain (Lands)*, withdrawn and acquired federal lands;
- [2] **Acquired** – Lands acquired by the federal government through purchase, condemnation, or gift;
- [3] **Withdrawn** – Federal lands for which formal withdrawal action has been taken which restricts the disposition of specific public lands and which holds them for specific public purposes; also, public lands which have been dedicated to public purposes;
- [4] **National Forest** – Federal lands which have been designated by executive order or statute as national forests or purchase units, and other lands under the administration of the Forest Service, including experimental areas and Bankhead-Jones Title III lands; and
- [5] **Public Domain** – Original public lands which have never left federal ownership. Also includes lands in federal ownership which were obtained by the federal government in exchange for public lands, or for timber on public lands.

Also see *Public Domain (Lands)*.

**Landscape** — (1) (Geography) All the natural features, such as fields, hills, forests, and water that distinguish one part of the earth's surface from another part. Usually refers to that portion of land or territory which the eye can comprehend in a single view, including all of its natural characteristics. These characteristics are a result not only of natural forces but of human occupancy and use of the land as well. (2) (Ecology) A heterogeneous area composed of a cluster of interacting *Ecosystems* that are repeated in similar form throughout the area. Forest landscapes of the Southwest United States usually range from hundreds to thousands of acres and are the result of geologic, edaphic (soil), climatic, biotic, and human influences.

**Landscape Impoundment** — A body of reclaimed water which is used for aesthetic enjoyment or which otherwise serves a function not intended to include contact recreation.

**Landslide** — A mass of material that has slipped downhill under the influence of gravity, frequently occurring when the material is saturated with water.

**Land Spreading** — The disposal of solid effluents derived from wastewater treatment facilities on the surface of the ground for dilution or dispersal.

**Land Subsidence** — The sinking or settling of land to a lower level in response to various natural and man-caused factors, for example:

- [1] earth movements;
- [2] lowering of fluid pressure (or lowering of ground water level);
- [3] removal of underlying supporting materials by mining or solution of solids, either artificially or from natural causes;
- [4] compaction caused by wetting (*Hydrocompaction*);
- [5] oxidation of organic matter in soils; or
- [6] added load on the land surface.

With respect to ground water, subsidence most frequently results from overdrafts of the underlying water table or aquifer and its inability to fully recharge, a process termed *Aquifer Compaction*. Also see *Subsidence*.

**Land Surface Datum (lsd)** — A datum plane that is approximately at land surface at each groundwater observation well.

**Land Treatment Measures** — The application of vegetative tillage, structural and land management measures, individually or in combination, to alter runoff, to reduce erosion and sediment production, to increase fertility, and to improve drainage and irrigation applications. Also refers to the land disposal of sludge from sewage treatment plants.

**Landtype** — A land system with a designated soil, vegetation, geology, topography, climate, and drainage situation.

**Land Use** — The primary or primary and secondary uses of land, such as cropland, woodland, pastureland, etc. The description of a particular land use should convey the dominant character of a geographic area, and thereby establish the types of activities which are most appropriate and compatible with primary uses.

**Land Use Plan** — A coordinated composite of information, ideas, policies, programs, and activities related to existing and potential uses of land within a given area and frequently the key element in a comprehensive plan for an area under development for public and private land uses, such as residential, commercial, industrial, recreational, and agricultural activities.

**Land Use Planning** — The process of inventorying and assessing the status, potentials, and limitations of a particular geographic area and its resources, interacting with the populations associated and/or concerned with the area to determine their needs, wants, and aspirations for the future.

**Land Voiding** — The process of damaging land by gully action causing this land to be unproductive for agricultural uses and relegating its use primarily to wildlife and recreation.

**Langelier Index (LI)** — An expression of the ability of water to dissolve or deposit calcium carbonate scale in pipes. The index has important implications in industrial water system where the formation of scale or sludge can cause equipment or process failure. The index is calculated from direct measurements of the following in the water system: pH, alkalinity, calcium concentrations, total dissolved solids, and temperature. A positive value indicates a tendency to form scale, and a negative value means the water will dissolve scale and may be corrosive.

**Lap** — (1) To wash or slap against with soft liquid sounds, as waves on a seashore. (2) A watery food or drink.

**Lapse Rate** — The rate of change of temperature with height in the free atmosphere.

**Large Water System** — A water system that services more than 50,000 customers.

**“Lasagna” Process** — (Environmental) A cleanup technique involving the use of an electrical current to treat subsurface hazardous waste. The process, which derived its name from the layered structure of various treatment zones in the soil, grew from a cooperative initiative launched by the *U.S. Environmental Protection Agency (EPA)* in 1992 to develop innovative techniques to treat buried hazardous waste *in situ*, thereby requiring no excavation.

- Laser Land Leveling** — The use of precision instruments featuring laser beams to guide earth-moving equipment for leveling land for surface-type irrigation in order to improve irrigation efficiency.
- Late Seral Condition** — Synonymous with good ecological conditions.
- Latent Heat** — (1) The quantity of heat absorbed or released by a substance undergoing a change of state, such as ice changing to water or water to steam, at constant temperature and pressure. (2) The heat released or absorbed per unit mass of water in a reversible, isobaric-isothermal change of phase. Also referred to as the *Heat of Transformation*.
- Latent Heat of Condensation** — The amount of heat released by a unit mass of substance, without change in temperature, while passing from the vapor to the liquid state.
- Latent Heat of Vaporization** — The amount of heat absorbed by a unit mass of substance, without change in temperature, while passing from the liquid to the vapor state.
- Latent Heat Transfer** — The removal or addition of heat when a substance changes state. In the environment, this almost always refers to the release of heat from water upon condensation and the absorption of heat by water upon evaporation. Also see *Latent Heat of Condensation* and *Latent Heat of Vaporization*.
- Lateral** — (1) A branch canal or pipeline that diverges from the main canal or other branches. (2) (Irrigation) A water project or irrigation conveyance structure, smaller than a canal intended to convey water away from the main canal or ditch. The part of an irrigation district's delivery system that conveys water from the district's main canals to turnouts for farmers's fields. (3) (Water Quality) A municipal wastewater drain pipe that connects a home or business to a branch or main line.
- Lateral Line** — A series of sensory pores along the head and sides of fish and some amphibians by which water currents, vibrations, and pressure changes are detected.
- Lateral Moraines** — The ridges of *Glacial Till* that mark the sides of a glacier's path. Also see *Moraines*, *Terminal Moraines*, and *Recessional Moraine*.
- Lateral Sewers** — Pipes that run under city streets and receive the sewage from homes and businesses, as opposed to domestic feeders and main trunk lines.
- Lateritic Soil** — Land that consist of minerals that are rich in iron and aluminum compounds, other minerals having been removed by *Leaching*. The land is hard and unsuitable for agricultural use.
- Launch** — (Nautical) To put (a boat) into the water in readiness for use.
- Laundering Weir** — A sedimentation basin overflow weir.
- Lava Flow** — (Geology) A solidified mass of rock formed when a stream of viscous, molten lave from a volcano or fissure has cooled and congealed.
- Lavage** — A washing, especially of a hollow organ, such as the stomach or lower bowel, with repeated injections of water.
- Lavatory** — (1) A room equipped with washing and often toilet facilities; a bathroom. (2) A washbowl or basin, especially one permanently installed with running water. (3) A flush toilet.
- Lave** — (1) to wash or bathe. (2) to flow along or against. (3) to dip or pour with or as with a ladle.
- LC<sub>50</sub> (Lethal Concentration-50)** — The concentration of a toxic substance which is fatal to 50 percent of the organisms tested under specific test conditions and time periods.
- LD<sub>50</sub> (Lethal Dose-50)** — The dose of a toxicant that is fatal to 50 percent of the organisms tested in a specific time. The dose is the actual quantity administered to the organism.
- Leach** — (1) To apply water in excess of a crop's needs to flush out salts from the root zone. (2) To remove soluble or other constituents from a medium by the action of a percolating liquid, as in leaching salts from the soil by the application of water.
- Leachate** — Liquid which has percolated through the ground, such as water seeping through a sanitary landfill, wastes, pesticides, or fertilizers. Leaching may occur in farming areas, feedlots, and landfills, and may result in hazardous substances entering surface water, ground water, or soil.
- Leachate Collection System** — An arrangement of reservoirs and pipes underlying a waste disposal site designed to accumulate and remove *Leachate*, water that migrates through the waste, and pump it to the surface for treatment.
- Leached Layer (Soil)** — A soil layer or an entire soil profile from which the soluble materials (CaCO<sub>3</sub> and MgCO<sub>3</sub> and material more soluble) have been dissolved and washed away by percolating waters.
- Leaching** — (1) The washing out or flushing of a soluble substance from an insoluble one. (2) The flushing of salts from the soil by the downward percolation of applied water. (3) The process by which soluble materials in the soil, such as salts, nutrients, pesticide chemicals or contaminants, are washed into a lower layer of soil or are dissolved and carried away by water. Also see *Leachate*.
- Leaching Efficiency** — The ratio of the average salt concentration in drainage water to an average salt concentration

in the soil water of the root zone when near field capacity (also defined as the hypothetical fraction of the soil solution that has been displaced by a unit of drainage water).

**Leaching Field** — The area used for disposal of liquid through a non-water-tight artificial structure, conduit, or porous material by downward or lateral drainage, or both, into the surrounding permeable soil.

**Leaching, Heap** — See *Heap Leaching (Mining)*.

**Leaching Requirement** — (1) The amount of excess irrigation water passing through the *Root Zone* to reduce the salt concentration in the soil for reclamation purposes. (2) The theoretical amount of irrigation water that must pass (leach) through the soil beyond the root zone to keep soil salinity within acceptable levels for sustained crop growth. (3) That fraction of irrigation water (*Crop Water Requirement*) that must be leached through the root zone to control soil salinity at a specified level. The extra water is used to dissolve the salts and move them from the soil root zone and out into a drainage tile or channel where they can be removed from the area entirely. Extra water can be added by irrigating more or by natural precipitation. The amount of water needed is governed by the amount of salt that the crop can tolerate in its root zone. As a general equation, this amount of water can be defined (U.S. Bureau of Reclamation, 1993) as a leaching requirement (LR):

$$LR = EC_{iw}/EC_{dw} \times 100$$

where:

LR = leaching requirement in percent;

EC<sub>iw</sub> = electrical conductivity of irrigation water in millimhos per centimeter (mmhos/cm);

EC<sub>dw</sub> = electrical conductivity of soil drainage water at the bottom of the root zone (mmhos/cm).

Both natural precipitation (rainfall) and conservation efforts affect the leaching requirement. Rainfall that enters the soil in sufficient quantity to create deep percolation will help move the salts down through the soil. As irrigators increase conservation efforts and use less water, there will be a point at which the deep percolation requirements for soil salt balance will not be met, soil salinity will increase, and crop production will decrease.

**Lead** — (1) To serve as a channel for a pipe as to conduct water to the house. (2) A channel of water, especially through a field of ice.

**Lead** — Chemical symbol Pb, lead is a toxic metal present in air, food, water, soil, and old paint. Overexposure to this metal can cause damage to circulatory, digestive, and central nervous systems. Children less than six years old are considered the most susceptible. Atmospheric levels have dropped sharply with the introduction of unleaded gasolines. Lead in air, water, and food is regulated by a number of environmental statutes to include the *Clean Air Act*, *Clean Water Act (CWA)*, *Safe Drinking Water Act (SDWA)*, *Food, Drug, and Cosmetic Act*, among others.

**Lead and Copper Rule** — Water quality standards covered under the *Safe Drinking Water Act (SDWA)*, and amendments thereto, as set by the *U.S. Environmental Protection Agency (EPA)*. The rule is a set of treatment technique requirements which apply to all community and non-transient non-community water systems (see *Public Water Supply Systems*). Treatment techniques rather than *Minimum Contaminant Levels (MCLs)* were established for lead and copper because the occurrence of these contaminants in a drinking water supply is usually the result of corrosion in plumbing materials within both the household plumbing and the distribution system. The rule requires all systems which do not meet the specified lead and copper action levels at the tap to optimize corrosion control treatment in an effort to minimize the levels of these contaminants. The action level is 0.015 mg/l (milligrams per liter) for lead and 1.3 mg/l for copper measured at the 90th percentile. See *90th Percentile*.

**Lead (Time)** — (Statistics) The difference in time units of a series value and a subsequent series value. In time series analysis, the lead represents the time by which the change in an independent or predictor (*Exogenous*) variable precedes the strongest (most significant) change in a dependent or predicted (*Endogenous*) variable. Also see *Lag (Time)*.

**Lead Line** — (Nautical) A line marked at intervals of fathoms and weighted at one end, used to determine the depth of water. Also referred to as a *Sounding Line*.

**Lead Service Line** — A service line made of lead which connects the water to the building inlet and any lead fitting connected to it.

**Leadsman** — A person who uses a sounding lead to determine depth of water.

**Leaf Area Index** — The area of one side of leaves per unit area of soil surface.

**Leaf Drip** — Water that is intercepted and rerouted to the ground via collection on and drop from leaf surfaces.

**Leakage** — (1) (Hydrology) The flow of water from one *Hydrogeologic Unit* to another. This may be natural, as through a somewhat permeable confining layer, or *Anthropogenic*, as through an uncased well. It may also be the natural loss of water from artificial structures, as a result of *Hydrostatic Pressure*. (2) (Dams) The uncontrolled loss of water by flow through a hole or crack.

- Leaky Aquifer** — An artesian or water table aquifer that loses or gains water through adjacent semipermeable *Confining Units*.
- Le Châtelier's Principle** — A principle of dynamic equilibrium stating that a change in one or more factors that maintain equilibrium conditions in a system will cause the system to shift in a direction that will work against or adjust to the change(s), with a resulting reestablishment of equilibrium conditions. For example, assume the concentrations of gaseous oxygen in the atmosphere and dissolved oxygen in a stream are in equilibrium at a certain temperature. As oxygen dissolves in water, heat is released. If an outside influence (e.g., sunlight) raises the water temperature in the stream, this shifts the equilibrium back in the direction of lower dissolved oxygen and greater atmospheric oxygen, and oxygen escapes from the water. As a result, at higher water temperatures, equilibrium concentrations of dissolved oxygen are lower.
- Lee** — Located in or facing the path of an oncoming glacier. Used of a geologic formation.
- Left Abutment** — That part of the left-hand side of a valley side wall against which a dam is constructed. The left abutment is viewed by an observer looking downstream.
- Left Bank** — The left-hand bank of a stream viewed when the observer faces downstream.
- Legionella** — A genus of bacteria, some species of which have caused a type of pneumonia called *Legionnaires Disease*.
- Lemna Gibba (Duckweed)** — The genus and species name of a small, stemless, free-floating plant used in experiments to determine the toxicity of pollutants to aquatic plant life. Commonly called duckweed.
- Lentic** — Characterizing aquatic communities found in standing water. Compare to *Lotic*.
- Lentic System** — A non-flowing or standing body of fresh water, such as a lake or pond. Compare to a *Lotic System*.
- Lentic Waters** — Ponds or lakes (standing water).
- Lenticles** — Tiny pores, into which oxygen passes, on the roots or branches of trees. For example, both red and black mangrove trees have lenticles on some of their roots.
- Lenticular Clouds** — Lenticular clouds are characteristic of all mountain ranges and form in response to wind. When strong winds blow over the mountains and force moist air up to cooler elevations, the moisture condenses. As the winds blow back down the other side of the mountains, the moisture re-vaporizes. The lenticular cloud is the condensed (visible) moisture under the wind stream; it doesn't drift like other clouds do because it's "trapped" in a pocket of relatively calm air just below the wind stream and just above warmer air below. The notion that the clouds are stationary is an optical effect. A lenticular cloud actually is forming on one end (front edge) and vanishing on the other, giving the appearance that it is in a fixed position. Lenticular clouds assume distinct shapes, generally resembling a disc (hence giving rise to a common name of "pancake clouds" or in a flat elongated shape stretching parallel to the mountain range. Also see *Clouds* and *Sierra Wave [Sierra Nevada Mountains]*.
- Lethe** — A river in Hades whose waters cause drinkers to forget their past.
- Levee** — (1) A natural or man-made earthen obstruction along the edge of a stream, lake, or river. Also, a long, low embankment usually built to restrain the flow of water out of a river bank and protect land from flooding. If built of concrete or masonry, the structure is usually referred to as a flood wall. The term *Dike* is commonly used to describe embankments that block an area on a reservoir rim that are lower than the top of the main dam. (2) (FEMA) A man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control or divert the flow of water so as to provide protection from temporary flooding.
- Levee (Natural)** — Bank of sand and silt built by a river during floods, where the *Suspended Load* is deposited in greatest quantity close to the river. The process of developing natural levees tends to raise river banks above the level of the surrounding flood plains. A break in a natural levee is sometimes called a *Crevasse*.
- Levee (Manmade)** — An embankment, generally constructed on or parallel to the banks of a stream, lake or other body of water, for the purpose of protecting the land side from inundation by flood water or to confine the stream flow to its regular channel.
- Levee System** — A flood protection system which consists of a levee, or levees, and associated structures, such as closure and drainage devices, which are constructed and operated in accord with sound engineering practices.
- Level of Development** — In a planning study, the practice of holding constant the population, irrigated acreage, industry, and wildlife so that hydrologic variability can be studied to determine adequacy of supplies.
- Level of Protection** — (FEMA) The greatest flood level against which a protective measure is designed to be fully effective; often expressed as a recurrence interval (e.g., 100-year level of protection) or as an exceedance frequency (e.g., one-percent chance of exceedance).
- Levigate** — (1) To make into a smooth, fine powder or paste, as by grinding when moist; to separate fine particles from coarse by grinding in water. (2) To suspend in a liquid.

- License** — An official document giving permission to engage in a specified activity, such as an appropriation of water.
- Life Cycle Assessment (LCA)** — (Environmental) An objective process to evaluate all the environmental burdens of a product or process through its entire existence (life cycle). This encompasses extracting and processing raw materials, manufacturing, transportation, distribution, use and maintenance, recycling and final disposal.
- Lifeline Rates** — A system used by many water purveyors of providing subsidized water rates to needy individuals and those on fixed incomes for a minimum amount of water delivered.
- Life Zone** — (Ecology) A broad class of vegetation and climatic condition based on temperature and precipitation. Merriam's (1898) life zones in the Southwest United States include the Hudsonian, Canadian, and Transitional (from cool wet to warm dry; terms are nominal rather than specifically geographic).
- Lift Station** — A pumping facility that raises municipal sewage to a higher elevation to allow for further gravity flow. Such facilities are required in areas with a flat topography.
- Lifts** — Layers of loose soil. Used to specify how much loose soil should be laid down at a time before it must be compacted or wrapped in geotextile fabrics.
- Light-and-Dark Bottle Technique** — A method used to determine the extent of *Photosynthesis* in an aquatic *Ecosystem*. Duplicate portions of a water sample are collected. One portion is *Incubated* in a clear bottle, and the other is incubated in a dark, light-impermeable bottle. Following incubation for a prescribed time period, the net uptake of carbon dioxide in each is measured and compared.
- Light-Attenuation Coefficient** — A measure of water clarity. Light is attenuated according to the Lambert-Beer equation

$$I = I_0 e^{-\kappa L}$$

where  $I_0$  is the source light intensity,  $I$  is the light intensity at length  $L$  (in meters) from the source  $\kappa$  is the light-attenuation coefficient, and  $e$  is the base of the natural logarithm. The light attenuation coefficient is defined as

$$\kappa = -1/L \log_e I/I_0$$

- Light Water** — (Chemistry and Physics) Ordinary water,  $H_2O$ , as compared to *Heavy Water*.
- Light Water Reactor (LWR)** — A nuclear power plant which uses ordinary *Water* ( $H_2O$ ) as distinguished from one that uses *Heavy Water* ( $D_2O$ ) or *Deuterium Oxide*. Fission energy is released in the form of heat and is transferred to a conventional steam cycle which generates electric energy. Heat generated by the fission of the uranium fuel raises the temperature of the water, which is then pumped to heat exchange units for the production of steam and subsequent generation of electricity. The process results in a continuous transfer of heat from the reactor to the outside. The water also functions as a moderator to reduce the energy level of neutrons released by the fission process in order to allow the neutrons to promote additional fission events. The light-water reactor is the most common type of nuclear reactor operated in the United States.
- Limb (Rising or Falling)** — The part of the *Hydrograph* in which the discharge is steadily increasing or decreasing.
- Lime** — Calcium oxide ( $CaO$ ) used in many water and wastewater treatment operations such as softening, coagulation and phosphorus removal. Also referred to as *Quicklime*.
- Limestone** — (Geology) A sedimentary rock composed of calcite, or calcium carbonate ( $CaCO_3$ ), and sometimes containing shells and other hard parts of prehistoric water animals and plants. When chemical conditions are right, some calcite crystallizes in sea water and settles to the bottom to form limestone.
- Limestone Scrubbing** — The use of a *Limestone* and water solution to remove gaseous stack-pipe sulfur before it reaches the atmosphere.
- Limicolous** — Living in mud.
- Liming** — The application of lime to land, primarily to reduce soil acidity and supply calcium for plant growth. Liming an acid soil to a pH of about 6.5 is desirable to maintain a high degree of availability of most of the nutrient elements required by plants.
- Limited Degradation** — An environmental policy permitting some degradation of natural systems but terminating at a level well beneath an established health standard.
- Limited Water-Soluble Substances** — (Water Quality) Water pollution chemicals that are soluble in water at less than one milligram of substance per liter of water.
- Limiting Factor** — A condition whose absence or excessive concentration is incompatible with the needs or tolerance of a species or population and which may have a negative influence on their ability to thrive and/or survive. A factor such as temperature, light, water, or a chemical that limits the existence, growth, abundance, or distribution

of an organism.

**Limnetic** — Referring to a standing water *Ecosystem* (ponds or lakes); of, relating to, or inhabiting the open water of a body of fresh water, as a limnetic environment or *Limnetic Zone*.

**Limnetic Zone** — The open water of a pond or lake supporting *Plankton* growth. Contrast with *Profundal Zone*.

**Limnology** — The branch of *Hydrology* pertaining to the study of freshwater, the aquatic environment and its life; the study of the physical, chemical, hydrological, and biological aspects of fresh water bodies. Related terms include *Limnological*, *Limnologic*, and *Limnologist*.

**Limnology Hydrobiologist** — A person who undertakes the biological study of bodies of water.

**Lindane** — A pesticide that causes adverse health effects in domestic water supplies and is toxic to freshwater fish and aquatic life.

**Lineament** — (Geology) An essentially rectilinear topographic feature resulting from a fault or zone of faulting. Frequently such areas provide indications of available groundwater sources.

**Linear** — (Statistics) Indicating a constant (straight-line) relationship between two *Variables*. Linearity constitutes one of the principal underpinnings of the *Classical Linear Regression (CLR) Model*. Also see (*Inherently*) *Linear Model*, below.

**(Inherently) Linear Model** — (Statistics) *Regression Models* which can be expressed in a linear form by an appropriate transformation of the *Variables*. It is this transformation, as represented by the model's *Parameters*, or *Coefficients*, that determines the linearity of the model. For example, the model

$$Y = \hat{a}_2 X_2 + \hat{a}_3 X_3 + \dots + \hat{a}_n X_n + \hat{a}$$

is inherently linear because it is linear with respect to the coefficients  $\hat{a}_2, \hat{a}_3, \dots, \hat{a}_n$ . Other transformations resulting in inherently linear models are as follows:

***Polynomial Model:***

$$Y = \hat{a}_1 + \hat{a}_2 X_2 + \hat{a}_3 X_2^2 + \hat{a}$$

***Log-Log Model:***

$$\log Y = \hat{a}_1 + \hat{a}_2 \log X_2 + \hat{a}_3 \log X_3 + \hat{a}$$

***Multiplicative Model:***

$$Y = \tilde{a}_1 X_2^{\tilde{a}_2} X_3^{\tilde{a}_3} \tilde{a}$$

***Exponential Model:***

$$Y = \exp(\hat{a}_1 + \hat{a}_2 X_2 + \hat{a}_3 X_3) \cdot \hat{a}$$

***Reciprocal Model:***

$$Y = 1/(\hat{a}_1 + \hat{a}_2 X_2 + \hat{a}_3 X_3 + \hat{a})$$

***Semilog Model:***

$$Y = \hat{a}_1 + \hat{a}_2 \log X_2 + \hat{a}$$

**Linear Programming** — (Mathematics) A mathematical method used to determine the most effective allocation of limited resources between competing uses when both the objective (e.g., profit, cost, or output) and the restrictions (constraints) on its attainment can be quantified as a system of linear equations representing equalities or inequalities.

**Lined Waterway or Outlet** — A waterway or outlet with an erosion-resistant lining of concrete, stone, or other permanent material. The lined section extends up the side slopes to a designed height.

**Liner** — (1) (Water Quality) A low-permeability material, such as clay or high-density polyethylene, used for the bottom and sides of a landfill. The liner retards the escape of *Leachate* from the landfill to the underlying groundwater. (2) An insert or sleeve for sewer pipes to prevent leakage or infiltration.

**Line Storm** — A violent storm or a series of storms of rain and wind believed to take place during the equinoxes.

**Lining** — With reference to a canal, tunnel, shaft, or reservoir, a coating of asphaltic concrete, reinforced or unreinforced concrete, shotcrete, rubber or plastic to provide water tightness, prevent erosion, reduce friction, or support the periphery of the structure. May also refer to the lining, such as steel or concrete, of an outlet pipe of conduit of a dam or reservoir.

**Lining (Hydraulics)** — A protective covering over all or part of the perimeter of a reservoir or a conduit to prevent

seepage losses, withstand pressure, resist erosion, reduce friction, or otherwise improve conditions of flow.

**Lipid** — Any of a group of organic compounds, including the fats, oils, waxes, steroids, and triglycerides, that are insoluble in water but soluble in common organic solvents, are oily to the touch, and together with carbohydrates and proteins constitute the principal structural material of living cells. Many environmental contaminants such as organochlorine pesticides are lipophilic.

**Liquefaction** — (1) (General) The act or process of making or becoming liquid; especially the conversion of a solid into a liquid by heat, or of a gas into a liquid by cold or pressure. (2) (Soils) The sudden and spontaneous large decrease of the shearing resistance of a cohesionless soil, caused by a collapse of the structure from shock or other types of strain and associated with a sudden but temporary increase in the pore-fluid pressure resulting in the temporary transformation of the material into a fluid mass.

**Liquefy, also Liquefy** — (1) To cause to become liquid. (2) To melt (a solid) by heating.

**Liquid** — A state of matter in which the molecules are closer and held more tightly by one another than in the gaseous state. Has a definite volume, but indefinite shape. See *Water*.

**Liquid Fertilizer** — A fluid in which the plant nutrients are in true solution.

**Liquid Injection Incinerator** — Commonly used system that relies on high pressure to prepare liquid wastes for incineration, breaking them up into fine droplets to allow for easier combustion.

**Liquor** — (Water Quality) A liquid solution containing dissolved substances. A concentrated solution of process chemicals or raw materials added to an industrial process. Compare with *Slurry*.

**Liter** — The basic unit of measurement for volume in the *Metric System* equivalent to 0.001 cubic meters ( $10^{-3}$  m<sup>3</sup>); also equal to 61.025 cubic inches or 1.0567 liquid quarts.

**Lithia Water** — Mineral water containing lithium salts.

**Lithology** — (Geology) (1) The scientific study of rocks, usually with the unaided eye or with little magnification. (2) Loosely, the structure and composition of a rock formation. (3) The description of rocks, especially sedimentary *Clastics* and especially in hand specimen and in outcrop, on the basis of such characteristics as color, structures, mineralogic composition, and grain size.

**Lithometeor** — Solid material, except ice (water), suspended in the atmosphere, as dust, smoke, or pollen. Contrasts with *Hydrometeor*.

**Lithosphere** — That part of the earth which is composed predominantly of rocks (either coherent or incoherent, and including the disintegrated rock materials known as soils and subsoils), together with everything contained in this rocky crust.

**Lithotripter** — A device that pulverizes kidney stones by passing shock waves through a water-filled tub in which the patient sits. The device creates stone fragments small enough to be expelled in the urine.

**Litigage** — To bring a dispute or claim before a court of law for decision or settlement.

**Litmus** — A water-soluble blue powder derived from certain lichens that changes to red with increasing *Acidity* and to blue with increasing *Basicity*.

**Litmus Paper** — An unsized white paper impregnated with *Litmus* and used as a Ph or acid-base indicator.

**Litter** — The vegetative material on the surface of the soil, referred to as the *Oi* horizon.

**Littoral** — The region along the shore of a non-flowing body of water; corresponds to *Riparian* for a flowing body of water. More specifically, the zone of the sea flood lying between the tide levels.

**Littoral Transport** — The movement of material along the shore by waves and currents.

**Littoral Water Rights** — The equivalent of *Riparian Water Rights* for a lake, reservoir, or other non-flowing body of water. As with riparian water rights, littoral water rights allow persons who own land adjacent to a body of water to make reasonable use of those waters on lands within the watershed. Littoral users share the waters among themselves and the concept of priority use (*Prior Appropriation Doctrine*) is not applicable. Under drought conditions, the lake or waterfront users also share shortages. Littoral rights cannot be sold or transferred to use on other (nonriparian) lands. Also see *Riparian Doctrine*, *Riparian Water Rights*, *Appropriative Water Rights*, *Prescribed Water Rights*, and *Reserved Water Rights*.

**Littoral Zone** — (1) The shallow area near the shore of a non-flowing body of water; that portion of a body of fresh water extending from the shoreline lakeward to the limit of occupancy of rooted plants. (2) A strip of land along the shoreline between the high and low water levels.

**Livestock Water Use** — Water use for stock watering, feed lots, dairy operations, fish farming, and other on-farm needs. Livestock as used here includes cattle, sheep, goats, hogs, and poultry. Also included are such animal specialties as horses, rabbits, bees, pets, fur-bearing animals in captivity, and fish in captivity. Also see *Rural Water Use*.

**Load** — The amount of material that a transporting agency, such as a stream, a glacier, or the wind, is actually

carrying at a given time. Also, the amount of power delivered to a given point. In this respect:

- [1] **Base Load** = The minimum load in a stated period of time.
- [2] **Firm Load** = That part of the system load which must be met on demand.
- [3] **Peak Load** = Literally, the maximum load in a stated period of time. Sometimes the term peak load is used in a general sense to describe that portion of the load above the base load.

**Load Allocation (LA)** — (Water Quality) The portion of the pollution *Load* of a stream attributable to human *Nonpoint Sources (NPS)* of pollution. The amount of pollution from each point source is the *Wasteload Allocation*.

**Loading** — The quantity of a substance (a contaminant) entering the receiving waters. Synonym for the pollution *Load* of a stream.

**Loading Capacity** — The greatest amount of chemical materials or thermal energy that can be added to a stream without exceeding water quality standards established for that stream.

**Load Line** — The line on a ship indicating the depth to which it sinks in the water when properly loaded. Also referred to as *Plimsoll's Mark*.

**Loam** — (1) A soil consisting of a friable mixture of varying proportions of clay, silt, and sand. A soil which has nearly equal proportions of silt, sand and clay. The word is used by gardeners to mean a soil that is rich in organic material, does not compact easily, and drains well after watering. (2) A rich, permeable soil composed of a *Friable* mixture of relatively equal and moderate proportions of clay, silt, and sand particles, and usually containing organic matter (humus) with a minor amount of gravelly material. It has somewhat gritty feel yet is fairly smooth and slightly plastic. Loam may be of residual, fluvial, or *Eolian* origin, and includes many loesses and many of the alluvial deposits of *Flood Plains*, *Alluvial Fans*, and *Deltas*.

**Loamy** — Said of a soil (such as a clay loam and a loamy sand) whose texture and properties are intermediate between a coarse-textured or sandy soil and a fine-textured or clayey soil.

**Local Flooding** — Flood conditions which occur over a relatively limited area.

**Local (Test-Well) Site Designation [Nevada]** — The local test-well site designation used in Nevada is based on the identification of a site by hydrographic area and by the official rectangular subdivision of the public lands referenced to the Mount Diablo (located east of Walnut Creek, California) base line and meridian and is based on the *Public Land Survey System (PLSS)*. Each site designation consists of four units: The first unit is the hydrographic area number. The second unit is the township, preceded by an N or S to indicate location north or south of the base line. The third unit is the range, preceded by an E to indicate location east of meridian. The fourth unit consists of the section number and letters designating the quarter section, quarter-quarter section, and so on (A, B, C, and D indicate the northeast, northwest, southwest, and southeast quarters, respectively), followed by a number indicating the sequence in which the site was recorded. For example, site 210 S12 E63 29DABC2 is in Coyote Spring Valley (hydrographic area 210). It is the second site recorded in the southwest quarter (C) of the northwest quarter (B) of the northeast quarter (A) of the southeast quarter (D) of Section 29, Township 12 South, Range 63 East, Mount Diablo base line and meridian.

**Loch** — A lake; also, a bay or arm of the sea especially when nearly landlocked.

**Lock** — A section of a waterway, such as a canal, closed off with gates, in which vessels in transit are raised or lowered by raising or lowering the water level of that section.

**Loess (Soil)** — A fine-grained, yellowish-brown, extremely fertile loam deposited mainly by the wind and found widely in North America, Asia, and Europe. Such soils are highly susceptible to water erosion.

**Log** — An apparatus for measuring the rate of a ship's motion through the water that consists of a block fastened to a line and run out from a reel.

**Log and Safety Boom** — A net-like device installed around the discharge facility of a dam to prevent logs, debris, or boaters from entering the outlet device.

**Logarithm (Log)** — (Mathematics) The value of the exponent that a fixed number (the base) must have to equal a given number. It is calculated as  $b^x = y$ , where  $b$  is the base and  $x$  is the logarithm. The base for the common logarithm is 10. As an example, the logarithm of 100 is 2 since  $10^2$  is equal to 100. This may also be written as  $\log_{10} 100 = 2$ . The base of the *Natural Logarithm* is approximately equal to 2.718282.

**Logarithmic Transformation** — (Statistics) A transformation applied to a *Time Series* to remove exponential growth, that is, when a series grows by some percentage of itself. The logarithmic transformation is frequently used in conjunction with simple (linear) differencing, especially for series like U.S. Gross Domestic Product (GDP), the Consumer Price Index (CPI), money supplies, and other time series subject to both growth and inflation.

**Logged** — Sodden, especially with water, i.e. *Waterlogged*.

**Long-Term Acceptance Rate (of Soils)** — A term used to describe the permeability or porosity of various soils and their ability to drain water; usually expressed in gallons per square foot per day.

- Longitudinal Profile** — A graphic presentation of elevation versus distance; in channel hydraulics it is a plot of water surface elevation against upstream to downstream distance.
- Losing Stream** — A stream or reach of a stream that is losing water by seepage into the ground. Also referred to as an *Influent Stream*. Also see *Stream*.
- Losses Incidental to Irrigation** — The quantity of water depleted by irrigation in excess of the beneficial irrigation consumptive use.
- Lotic** — (1) Of, relating to, or living in moving water. (2) Referring to a running water *Ecosystem* (streams and rivers). Compare to *Lentic*.
- Lotic Environment** — Characterizing aquatic communities found in running water. Also referred to as a *Lotic Habitat*.
- Lotic System** — A flowing body of fresh water, such as a river or stream. Compare to *Lentic System*.
- Lotic Waters** — Describing the waters of rivers and streams (flowing waters) as compared to *Lentic Waters* of ponds or marshes (standing waters).
- Lough** — (Irish) (1) A lake. (2) A bay or an inlet of the sea.
- Low** — (1) Situated below the surrounding surfaces as in water standing in low spots. (2) Of less than usual or average depth; shallow, as in the river is low.
- Lower Basin States [Colorado River Basin]** — Arizona, Nevada, and California. Also see *Colorado River Compact* and *Upper Basin States*.
- Low Flow Frequency Curve** — A graph showing the magnitude and frequency of minimum flow for a specified period of time (duration).
- Lowland Flooding** — Inundation of the very lowest portions of floodplain areas near a river, stream or lake, which are normally subject to frequent flooding; usually considered nuisance flooding.
- Low-Level Drawdown** — A discharge feature of a dam allowing water to be removed from the bottom of a reservoir.
- Low-Level Outlet** — An opening at a low level from a reservoir generally used for emptying or for scouring sediment and sometimes for irrigation releases. Also referred to as *Bottom Outlet* or *Sluiceway*.
- Low-Lying** — Lying close to water or ground level as low-lying coastal areas.
- Low-Pressure/Low-Volume Irrigation** — Irrigation systems that apply water directly, or very near to the soil surface, either above the ground or into the air, in discrete drops, continuous drops, small streams, mist, or sprays. These include drip systems, spray systems, jet systems, and bubbler systems. Also referred to as *Micro or Trickle Irrigation*. The efficiencies of these low pressure irrigation systems range from 75 to 95 percent; however, the average of 80 percent is commonly used.
- Low Tide** — (1) The lowest level of the tide; the minimum height reached by each falling tide. (2) The time at which the tide is lowest. The high-low and low-low tides are the higher and lower of the two low tides, respective, of each tidal day. Also referred to as *Low Water*.
- Low Water (LW)** — (1) The lowest level of water in a body of water, such as a river, lake, or reservoir. (2) (Navigation) The depth of a navigation channel is generally referenced to the low water stage which coincides with the lowest sustained flow over a 15-day period. On most streams this is referred to as “adopted low water”; on the lower Columbia, for example, it is the “Columbia River Datum”.
- Low-Water Mark (LWM)** — The lowest level attained by a varying water surface level.
- Lowest Annual Mean** — A value used for river flow readings representing the lowest total annual volume (in acre-feet per year) and the corresponding lowest annual average rate of flow (in cubic feet per second) recorded at a specific gaging station location over a specific period of record. Also referred to as the *Low Water Year*.
- Lowest Floor** — (FEMA) Under the *National Flood Insurance Program (NFIP)*, this term means the lowest floor of the lowest enclosed area (including basement). The lowest floor is required to be placed at or above the Base Flood Elevation if elevated foundation construction techniques are employed.
- LTAR (of Soils)** — See *Long-Term Acceptance Rate (of Soils)*.
- Lunette** — A broad, low-lying, typically crescent-shaped mound of sandy or loamy matter that is formed by the wind, especially along the windward side of a lake basin.
- LVEA [Nevada]** — See *Lahontan Valley Environmental Alliance (LVEA) [Nevada]*.
- Lysimeter** — (1) An artificial device for evaluating the *Water Budget* by enclosing a block of soil, often on a scale, with equipment for monitoring inputs and outputs. (2) A field-situated tank or container filled with soil and planted to a crop. Crop consumptive use is measured by weighing or volumetrically monitoring this tank. Also a device for measuring the percolation of water through soils and for determining the soluble constituents removed in the drainage.