

# REFERENCES

- Arizona Department of Environmental Quality. 2009. Air Quality Plans: Nonattainment Areas and Attainment Areas with Maintenance Plans. <http://www.azdeq.gov/environ/air/plan/notmeet.html>. Website accessed March 10, 2009.
- \_\_\_\_\_. 2008a. Glossary of English/Spanish Superfund and Water Quality Assurance Revolving Fund Terms. <http://www.azdeq.gov/web/download/glossary.pdf>; accessed March 24, 2009.
- \_\_\_\_\_. 2008b. 2006/2008 Status of Ambient Surface Water Quality in Arizona: Arizona's Integrated 305(b) Assessment and 303(d) Listing Report. Available online at: <http://www.azdeq.gov/environ/water/assessment/download/2008/binder1.pdf>
- Arizona Department of Transportation. 2009. Facts About Noise. [http://www.adot.gov/highways/EPG/EPG\\_common/PDF/noise/noise\\_facts1.pdf](http://www.adot.gov/highways/EPG/EPG_common/PDF/noise/noise_facts1.pdf)
- Arizona Game and Fish Department (AGFD). 2008. Heritage Data Management System. Species abstracts and maps. Available at internet site: [http://www.azgfd.com/w\\_c/edits/hdms\\_abstracts.shtml](http://www.azgfd.com/w_c/edits/hdms_abstracts.shtml). Accessed multiple dates June-July 2008.
- \_\_\_\_\_. 2003. *Echinocereus triglochidiatus* var. *arizonicus* unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, Arizona.
- Aztec Engineering (Aztec). 2009. US 60 and Magma Mine Road Intersection Improvements - Traffic Impact Analysis. January 2009. Draft report prepared for Resolution Copper Mining.
- Brown, D. E. (ed). 1994. *Biotic Communities: Southwestern United States and Northwestern Mexico*. University of Utah Press. Salt Lake City, Utah.
- Brown, D. E. and C. H. Lowe. 1980. *Biotic Communities – Southwestern United States and Northwestern Mexico*. Map. University of Utah Press. Salt Lake City, Utah.
- Cedar Creek Associates. 1994. Biological Assessment & Evaluation for the Carlota Copper Project on the Tonto National Forest (Gila and Pinal Counties). Cedar Creek Associates. Fort Collins, Colorado.
- Coates, Bill. 2007. "What Lies Beneath Oak Flat? Resolution Copper Wants to Mine It". *Arizona Capital Times*. Published March 23, 2007. <http://www.azcapitoltimes.com/freestory.cfm?id=5142> (Accessed September 18, 2008)
- Council of Environmental Quality (CEQ). 2005. Guidance on the Consideration of Past Actions in Cumulative Effects Analysis. Memorandum from James L. Cunnaghton to Heads for Federal Agencies. Washington D.C. June 24, 2005

- Environmental Protection Agency (EPA). 2006. Terms of Environment: Glossary, Abbreviations and Acronyms. <http://www.epa.gov/OCEPAterms/aterms.html>; accessed March 24, 2009.
- \_\_\_\_\_. 2004. "Meaningful Involvement and Fair Treatment by Tribal Environmental Regulatory Programs". A Report by the National Environmental Justice Advisory Council. November 2004. <http://epa.gov/oeaerth/resources/publications/ej/nejac/ips-final-report.pdf>. (Accessed March 18, 2008).
- Green, G. R., and W. D. Sellers. 1964. *The Climate of Arizona*. University of Arizona Press, Tucson.
- Goodwin, Grenville. 1942. *The Social Organization of the Western Apache*. The University of Chicago Press, Chicago.
- Lindeman, Michael W., and Gregory J. Whitney. 2005. *The Resolution Project: Results of an Archaeological Survey in Pinal County, Arizona*. Technical Report No. 2003-10. Desert Archaeology, Inc., Tucson.
- MacNider, Barbara S., and Richard W. Effland Jr. 1989. Cultural Resources Overview. In *Tonto National Forest Cultural Resource Assessment and Management Plan and Overview*, pp. 1–375. Cultural Resources Inventory Report No. 89-235. Tonto National Forest, Phoenix
- Malcolm Pirnie. 2009. Air Emissions Inventory Development for Resolution Copper Mining Pre-feasibility Activities Plan of Operations. Report prepared for WestLand Resources, Inc.
- Oliver, John E. and Rhodes W. Fairbridge, 1987, *The Encyclopedia of Climatology*, pp. 935-938.
- Higgins, R.W., Y. Yao, and X.L. Yang, 1997, Influence of the North American Monsoon System on the U.S. Summer Precipitation Regime, *Journal of Climate*, Vol. 10, pp. 2600-2622.
- Peterson, D. W. 1960. *Geologic Map of the Superior Quadrangle, Pinal County, Arizona*. U.S. Geological Survey, Map GQ-818.
- Pinal County Air Quality Control District. 2008. *Ambient Monitoring Network Plan and Data Summary* (final document dated June 16, 2008).
- Ransome, F.L. 1903. *Geology of the Globe Copper District, Arizona*. US Geological Survey Professional Paper 12.
- Resolution Copper Mining, LLC (RCM). 2009. E-mail Correspondence from Carl Hehnke to Jim Tress (Westland Resources, Inc). February 13, 2009.
- \_\_\_\_\_. 2008. *Dewatering of Magma Mine Workings with Pipeline Delivery: Evaluation of Potential Hydrologic Impacts, Special Use Permit (FSM 2540)*. Report. RCM, Superior, Arizona.

- Shafiqullah, M., P. E. Damon, D. J. Lynch, S. J. Reynolds, W. A. Rehrig, and R. H. Raymond. 1980. K-Ar geochronology and geologic history of southwestern Arizona and adjacent area. In J. P. Jenney et al., eds. *Studies in Western Arizona*. Arizona Geological Society, Digest 12, pp. 201-260.
- Teclé, A. and M. Yitayew. 1990. Preference ranking of alternative irrigation technologies via a multi criterion decision-making procedure. *Trans. ASAE*. 33: 1509- 1517
- U.S. Census Bureau. 2008. Census 2000.
- USDA Forest Service. April 2008. Cost Estimating Guide for Road Construction", USDA Forest Service Intermountain, Southwestern and Rocky Mountain Regions, Engineering, April 2008.
- \_\_\_\_\_. 2005. Guidelines for Road Maintenance Levels. USDA Forest Service Technology and Development Program. December 2005.
- \_\_\_\_\_. 1947. R-3 Crook National Forest Recreation Plan. M.A. Daniels and Crook personnel, 1939. Revised, William H. Woods, 1947.
- U.S. Fish and Wildlife Service (USFWS). 1979. Endangered and Threatened Wildlife and Plants: Determination that *Echinocereus triglochidiatus* var. *arizonicus* is an Endangered Species. *Federal Register* 44: 61556-61558.
- \_\_\_\_\_. 1976. Endangered and Threatened Wildlife and Plants: Proposed Endangered status for some 1,700 US vascular plant taxa. *Federal Register* 41: 24523-24572
- Western Regional Climate Center (WRCC). 2008. Available at internet site: <http://www.wrcc.dri.edu/summary/Climsmaz.html>
- WestLand Resources, Inc. (WestLand). 2009a. Resolution Plan of Operations Pre-feasibility Activities: Oak Flat Campground and the Euro Dog Valley Climbing Area Noise Assessment (including Supplement No. 1: Boulder Campsite Noise Assessment). WestLand Resources, Inc. Tucson, Arizona.
- \_\_\_\_\_. 2009b. Resolution Plan of Operations Pre-feasibility Activities: Visual Management System Analysis. WestLand Resources, Inc. Tucson, Arizona.
- \_\_\_\_\_. 2009c. Resolution Plan of Operations Pre-feasibility Activities: Oak Flat Picnic and Campground Withdrawal Area Visibility Assessment. WestLand Resources, Inc. Tucson, Arizona.
- \_\_\_\_\_. 2009d. Resolution Plan of Operations Pre-feasibility Activities: Oak Flat Picnic and Campground Withdrawal Area Traffic Analysis. WestLand Resources, Inc. Tucson, Arizona.

- \_\_\_\_\_. 2009e. Resolution Plan of Operations Pre-feasibility Activities: Road Maintenance, Improvement, and Construction Summary. WestLand Resources, Inc. Tucson, Arizona.
- \_\_\_\_\_. 2008. A Class III Cultural Resources Inventory of Approximately 281 Ac in the Pinal Highlands Pinal and Gila Counties, Arizona. Report prepared for Resolution Copper Mining, LLC. WestLand Resources, Inc. Tucson, Arizona.
- \_\_\_\_\_. 2004 Bat Survey Federal Parcel, Pinal County, Arizona. Report prepared for Resolution Copper Mining, LLC. WestLand Resources, Inc. Tucson, Arizona.

# GLOSSARY OF TERMS

***Aquifer parameters.*** A term for the measured characteristics of an aquifer that quantify an aquifer's potential to transport and store water. These parameters are established using various aquifer testing, measuring, and monitoring methods.

***Air drilling.*** A drilling technique where gases, typically compressed air or nitrogen, are used to cool the drill bit and lift cuttings out of the borehole instead of the more conventional use of liquids.

***Airlift pump.*** A pump used for raising water from a well, consisting of a pipe which surrounds another of smaller diameter. Compressed air is injected into the smaller pipe, causing water to rise up the larger pipe.

***Airshed.*** A geographic and political boundary for air quality standards.

***Aquifer.*** An underground rock formation composed of such materials as sand, soil, or gravel, that can store groundwater and supply it to wells and springs. In aquifers, groundwater occurs in sufficient quantities to be used for drinking water, irrigation, and other purposes (ADEQ 2008).

***Bentonite seal.*** The use of bentonite, an expandable clay, to form an impermeable layer above the sand filter pack of a monitoring well.

***Borehole.*** Any long or deep drill-hole, often associated with a diamond drill.

***Casing.*** A pipe that is assembled and inserted into a recently drilled section of a borehole and typically cemented into place.

***Constant-rate pumping test.*** A test used to predict the hydraulic characteristics of an aquifer and to determine the size of the pump that is to be placed in the well. During the test, pumping levels are held constant and the progressive drawdown with time is recorded. The relation between drawdown and time is a function of the aquifer permeability.

***Decibel.*** Unit that measures the intensity or loudness of sound.

***Deflection.*** The drilling of an exploration hole at a predetermined angle from an existing trunk hole. Multiple deflections result in the intersection of the hydrologic study area at multiple points from the single trunk hole.

***Diamond drilling.*** Drilling method using a diamond bit on a hollow steel rod that is driven into rock using high-speed rotary motion. This process yields a cylindrical core sample for geologic analysis.

**Directional drilling.** The use of specialized drill bits to advance curved boreholes in a controlled arc for installation of horizontal wells.

**Downthrown.** The side of a fault that appears to have moved downward compared with the opposite side of the fault.

**Drill cuttings.** Any material removed from a borehole while drilling a well or exploration hole.

**Drill rig.** A machine that creates boreholes and/or shafts to sample sub-surface mineral deposits, to test rock, soil and groundwater physical properties, and to install tunnels or wells.

**Drilling mud.** A drilling fluid used to drill boreholes. The mud cleans and cools the drill bit during drilling.

**Formation water.** Water that occurs naturally within the pores of rock. Water from fluids introduced to a formation through drilling or other interference does not constitute formation

**Geologic unit.** A volume of rock of identifiable origin and age range that is defined by the distinctive and dominant, easily mapped features that characterize it. Units must be mapable and distinct from one another.

**Geophysical logging.** Making a detailed record (a well log) of the geologic formations penetrated by a borehole.

**Hydraulic conductivity.** A property of soil or rock that describes the ease with which water can move through pore spaces or fractures. Conductivity depends on the intrinsic permeability of the material and on the degree of saturation.

**Hydraulic gradient.** Change in head per unit of distance measured in the direction of the steepest change.

**Inert material.** Material which is passively resistant to any change, particularly a material which is relatively unaffected by the action of heat or water.

**Ore deposit.** Rocks containing minerals that may be profitable to extract.

**Packer.** A device lowered into a borehole which automatically swells or can be made to swell at the correct time to produce a water tight joint against the side of the borehole or casing.

**PM<sub>10</sub>.** Particulate matter with an aerodynamic diameter less than or equal to 10 micrometers.

**Recovery analysis.** The measurement of how long it takes for the water level in a pumped well to return to the original pre-pumped elevation of the water table. Measurements including the amount of water

pumped, how long it took and how far the water table moves are used to calculate common aquifer parameters such as storage, connectivity of fractures and flow characteristics.

**Reverse circulation.** A drilling method in which the sample is brought to the surface inside the drill rods, thereby reducing contamination.

**Rotary drilling.** A drilling method using a rotary drill rig. Open hole drilling does not result in the production of core, rather the material in the hole is ground up in the drilling process and brought to the surface with air or water pressure.

**Specific capacity.** The rate of discharge of water from a well divided by the drawdown of the water level within the well.

**Storage coefficient.** The volume of water released from storage in a confined aquifer. It is the product of the specific storage and the aquifer thickness.

**Submersible pump.** A centrifugal pump which may be driven by electricity or compressed air and may be totally submerged in water.

**Track hoe.** A tracked excavator consisting of an articulated arm, bucket and cab mounted on a pivot atop an undercarriage with tracks.

**Transducer.** An electrical device that converts one type of energy or physical attribute to another for purposes including measurement or information transfer.

**Transmissivity.** The amount of water that can flow horizontally through the entire saturated thickness of the aquifer under a hydraulic gradient of 1 meter/meter.

**Trunk hole.** A large (6- to 8-inch) diameter cased borehole which is drilled and completed prior to the initiation of exploration core drilling. Core drilling commences from the bottom of this trunk hole.

**Understory.** The layer formed by grasses, shrubs, and small trees under the canopy of larger trees and plants.

**Vibrating wire piezometer.** An instrument designed to measure the water within the pores of rock. The measure of pore water provides quantitative data on the magnitude and distribution of pore pressure. The piezometer is installed in a borehole and readings are obtained with a portable data logger.

**Water bar.** A ditch or hump on a road that diverts surface **water** off the road surface to avoid or minimize soil erosion.

**Water level gradient.** The slope of the water table or aquifer. The gradient influences the direction and rate of groundwater flow.

**Wellhead.** The area immediately surrounding the top of a well, or the top of the well casing.