US Army Corps of Engineers
Los Angeles District

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Virgin River and Tributaries-Utah, Arizona and Nevada

Comprehensive Analyses of Multi-jurisdictional Use and Management of Water Resources on a Watershed or Regional Scale

This proposal is for a multi-jurisdictional analysis of the Virgin River Watershed in Utah, Arizona and Nevada in response to the FY06 Energy and Water Development Appropriations Act (PL 109-103), which directs the Secretary to conduct, "at full federal expense, comprehensive analyses that examine multi-jurisdictional use and management of water resources on a watershed or regional scale."

In carrying out this watershed analysis the Corps will work in partnership with local and county governments, state and federal agencies, municipalities, landowners, citizen groups and the public. This collaborative effort will produce a watershed plan that assists stakeholders within the Virgin River in successful management of the river and related resources.

Watershed Area

The Virgin River's headwaters are in Washington, Kane and Iron Counties of Utah. The lower watershed includes portions of Mohave County, Arizona and Clark and Lincoln Counties, Nevada. The river eventually empties into the Colorado River at Lake Mead in southeastern Nevada. The distance from the headwaters to Lake Mead is approximately 200 miles and the basin above Lake Mead includes approximately 5900 square miles. Major tributaries to the Virgin River include the Santa Clara River, Fort Pearce Wash and Beaver Dam Wash.

Much of the watershed is in Federal or state ownership and includes lands managed by the National Park Service, Forest Service and Bureau of Land Management. Despite the large percentage of publicly owned lands the private lands include rapidly growing areas such as Washington County, Utah, Clark County, Nevada, and Mohave County, Arizona.

The Virgin River basin is one of the largest essentially unregulated and free flowing river basin watersheds in the Western United States which is also being impacted by an unprecedented level of human development with rapidly expanding urban infrastructure in Washington County, Utah and NE Clark County Nevada. Much of this development is occurring in lowland areas adjacent to (or within) floodplains and high flood hazard areas and critically important habitats for protected and sensitive wildlife species. The Virgin River is one of the largest riparian corridors in the desert southwest and is home to more than 200 species of wildlife, which utilize the riparian corridor as a residence or seasonal migration route.

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Watershed Issues

Like any watershed the issues within the Virgin are diverse and potentially divisive. The following are issues expected to be some of the major areas of concern to be evaluated in the study. Components of these are all being considered and evaluated by different agencies and entities currently; however, they have yet to be considered as a whole.

Floodplain management- Although local floodplain management regulations are in place, the need for additional consideration of floodplain management was evident in 2005. Flooding and erosion damages were extensive throughout the watershed and included nearly $170 million in damages to structures, contents, and infrastructure along the Santa Clara River in Washington County, Utah, and Virgin River in Littlefield and Beaver Dam in Mohave County, Arizona, and Mesquite, Clark County, Nevada. In concert with a watershed management plan, a more comprehensive approach to reduce flood damages to life and property and protect the natural and beneficial functions of the floodplain should be undertaken. The overall goal of this effort will be to guide communities and stakeholders in a holistic, coordinated effort to raise the consciousness to the risks of flooding.

Water Conservation/water quality- Water supply and water quality are important aspects of the watershed. Municipal, industrial, agricultural, and ecological needs for the water are numerous. With growing populations and drought the pressures for the finite water supply will only continue to grow. Water conservation is an important portion of a watershed management plan. Groundwater and surface water interaction and salinity have also been expressed as areas of concern within the watershed. Washington County Water Conservancy District is the largest water manager in the upper watershed, and in the lower watershed, the Virgin Valley Water District, Bunkerville Irrigation Company, Mesquite Irrigation Company, and Southern Nevada Water Authority all hold water rights.

Transportation- A major highway corridor runs largely parallel to the Virgin River through Nevada, Arizona and Utah. Interstate 15 provides a major link between the interior of Canada, several transcontinental east-west corridors, Southern California, and Mexico. It crosses within the Virgin River Gorge near Beaver Dam and Littlefield in Mohave County, Arizona. I-15 replaced U.S. 91 and the old highway 91 is still an important local and regional connection as it serves as an alternate route during construction and primary route for local residents.

Habitat/Vegetation management- The watershed travels from the mountains of Southwest Utah to the Mojave Desert of Nevada where it enters the Colorado River at Lake Mead. Being the only intact river in the Mojave Desert in Nevada, this habitat is important. The riparian vegetation includes, but is not limited to, coyote and Goodings willow, arroweed, cottonwood,

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tamarisk, cattail, quailbush, wolfberry, mesquite and various sedges and grasses. The invasive tamarisk or salt cedar is a threat to the system and species that rely on it. Currently the BLM under the Healthy Forests Initiative is working to restore native habitat that includes reduction of salt cedar.

Endangered species- The watershed is important habitat for several federally endangered species including the woundfin, Virgin River chub, southwestern willow flycatcher and Yuma clapper rail. The watershed also supports several important state protected sensitive aquatic species including the flannelmouth sucker and Virgin spinedace. For both of these species, multi-jurisdictional Conservation Agreement and Strategy frameworks are in place and being implemented for species conservation through cooperative efforts of the Virgin River basin states (NV, UT, AZ) and several federal agencies. Within the upper watershed a management plan for improvement of habitat including that for endangered species has been completed. A conservation management plan is currently being developed for the lower watershed in Clark County, Nevada involving numerous partners and stakeholders.

Study Components/Products

Integrated watershed strategy: An integrated watershed management strategy that accommodates ongoing development while maintaining natural processes and habitats is critically important and needed. Collaboration among the many stakeholders will result in an integrated watershed strategy. Although there are currently coordination and cooperation among the many stakeholders in the watershed, an overall strategy tying the many components of the watershed would provide further benefits. That strategy will be developed with all interested parties to provide a strategic plan and process for continued cooperation and issue resolution. It will also emphasize maximizing available resources through addressing local and regional priorities in conjunction with programs of the appropriate local and Federal agencies and Authorities.

Floodplain management plan: In order to articulate a comprehensive strategy for implementing technically feasible flood mitigation activities for the watershed the following elements will be developed: a) Description of the planning process and public involvement. Public involvement may include workshops, public meetings, or public hearings; b) Description of the existing flood hazard and identification of the flood risk, including estimates of the number and type of structures at risk, repetitive loss properties, and the extent of flood depth and damage potential; c) Floodplain management goals for the area covered by the plan; d) Identification and evaluation of cost-effective and technically feasible mitigation actions considered;
e) Presentation of the strategy for reducing flood risks and continued compliance with the NFIP, and procedures for ensuring implementation, reviewing progress, and recommending revisions to the plan; f)

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Documentation of formal plan adoption by the legal entity submitting the plan (e.g., Governor, Mayor, County Executive).

Needs analysis and alternatives: In development of a watershed plan the needs analysis and development of alternatives will include the following components: a) Needs, challenges and critical areas of concern will be identified and prioritized, b) watershed objectives will be developed, c) management objectives and alternatives will be developed, and d) authorities of both Federal and non-federal entities will be identified. This needs analysis and development of alternatives will comprise a large portion of the watershed strategy above.

Statement of Interest

This proposal has been coordinated with some local and federal agency personnel within the watershed but participation by all of the stakeholders is anticipated. Timing constraints have not allowed more extensive coordination, but further coordination will take place to develop the analysis and strategies.

Non Federal: So far support for and interest in cooperation with this proposal has been expressed by local entities in the three states. This includes Clark County Regional Flood Control District, Clark County, the City of Mesquite, Mohave County Flood Control District, Nevada Division of Wildlife, Washington County Water Conservation District, and the Virgin Valley Water District. Additional interest by other non federal entities is anticipated in the future.

Federal: As discussed above much of the watershed includes lands managed by Federal agencies. The US Fish and Wildlife Service and Bureau of Land Management offices with jurisdiction along the Virgin have expressed support for conducting a watershed analysis and it is anticipated that they will be an important part of the study team. Other Federal agencies including the Natural Resource Conservation Service, National Park Service, Bureau of Reclamation and the Forest Service will also be approached in the future regarding the proposal and their involvement in the watershed.

Project Delivery Team (PDT)

The Corps PDT for this study will include expertise in planning, floodplain management and flood damage reduction, environmental, engineering, and socio economics and water conservation. Team members will be selected first from the Los Angeles and Sacramento District personnel familiar with the region and stakeholders. Additional assistance if necessary will be sought from Planning Centers of Expertise. Other Federal, state, and local agency personnel and contractors will also be an integral part of the PDT.

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Kevin Inada (Project Manager): Mr. Inada currently serves as the Senior Project Manager of the Southern Nevada region within the Los Angeles District. He is currently managing a $350M civil works project in Las Vegas providing flood damage reduction and a number of other smaller flood control, environmental infrastructure, storm water management projects throughout rural Southern Nevada. He has over 20 years experience in project management and construction management of civil works and military projects in the Pacific Ocean Division and the Los Angeles District.

Scott K. Estergard (Planner): Mr. Estergard currently serves as a Senior Water Resource Planner in the Arizona-Nevada Area Office of the Los Angeles District. He has nearly 14 years experience in federal water resource projects including as planner, project manger and biologist having worked on numerous flood damage reduction, ecosystem restoration, navigation, and stream bank stabilization projects in Arizona and in the Midwest.

Kim M. Gavigan, P.E (Floodplain Management): Mr. Gavigan currently serves as a Senior Water Resource Planner in the Arizona-Nevada Area Office of the Los Angeles District and is the Manager of the Los Angeles District Planning Assistance to States (PAS) and Flood Plain Management Services (FPMS) Programs. Mr. Gavigan has over 18 years of experience in floodplain and storm water management, hydrology and hydraulics, watershed master planning, plan formulation, project management, drainage design, construction, and materials testing.

Major Subordinate Command POC: Mr. Clark Frentzen (CESPD-PDS-P), 415-977-8164

Schedule/Budget

Task	**Schedule**	**Budget**
Scoping-Define scope with stakeholders, establish study plan and team	March-May 2006	$75,000
Watershed Analysis	May-Sept. 2006	$200,000
Water Conservation/quality		
Environmental		
Infrastructure/Development		
Floodplain management plan	May-Dec 2006	$150,000
Integrated watershed strategy	Dec-April 2007	$150,000
Draft Report	Feb 2007	$25,000
Final Report	May 2007	$25,000
Total		**$625,000**