

T e c h n i c a l P r o p o s a l



SOUTHWEST SCOTTSDALE DRAINAGE MASTER PLAN-PHASE I

*Submitted to
the Flood Control District
of Maricopa County*

FCD 95-46

February 28, 1996

217060004.96



Kimley-Horn
and Associates, Inc.



Kimley-Horn
and Associates, Inc.

*Engineering
Planning
and
Environmental
Consultants*

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Suite 150
9201 N. 25th Avenue
Phoenix, Arizona
85021

February 28, 1996

Leanna Cumberland
Chief, Contracting Division
Flood Control District of Maricopa County
2801 W. Durango
Phoenix, AZ 85009

RE: Southwest Scottsdale Master Drainage Plan (Project FCD 95-46)

Dear Ms. Cumberland:

Kimley-Horn and Associates Inc., is pleased to submit the attached proposal for the Southwest Scottsdale Area Drainage Master Plan. As you will read in our proposal we have characterized this project as really containing four distinct yet interrelated elements. These elements are:

1. Urban Drainage- low level drainage concerns
2. Flood Mitigation - significant flood damage concerns
3. Stormwater Quality- quality based impacts of runoff on receiving systems
4. Public Involvement- increasing the likelihood of project acceptance

By using this breakout of project elements we are able to then logically proceed with the implementation of an approach that meshes team strengths, technical disciplines, project sub-tasks, and project elements into a valuable and useful plan.

To assure that our approach is successful we have assembled a team experienced in all facets of this study, and that is without equal in the Valley.

■
TEL 602 944 5500
FAX 602 944 7423



We believe that the Kimley-Horn Team offers the Flood Control District several benefits:

As your Project Manager, I bring to the team technical skills in hydrology, hydraulics and watershed planning; a strong policy and program background; familiarity with regional and statewide issues of drainage and floodplain management; and good working relationships with the entities and the people involved with the development of the plan. I will be supported by a strong technical staff with experience in working for flood control districts, as well as extensive experience in this field in the Southwest.

Bill Mathews and Dan Sagramoso have shaped many of the programs and policies impacting flood control and drainage management throughout Arizona; their long term understanding of policies, programs, and people will prove invaluable in the development and coordination of realistic solutions.

Joining our team for this project is Ken Lewis (KVL) consultants, Diane Simpson-Colebank (Logan Simpson and Dye), and Roland Wass. A former Kimley-Horn employee, Ken developed the base hydrology that will be used in this study, and was the project manager for Scottsdale's Drainage Master Plan. Diane will be assisting in public involvement activities and brings to the team strong experience in the study area. Diane was involved with the Master Recreational Plan for the Cross Cut Canal, has done work in the past for the Flood Control District, and has performed work for City of Phoenix Parks. Roland Wass, one of the few locally based experts in stormwater quality treatment will be assisting in the water quality characterization phase, and recommendations for treatment alternatives.

As demonstrated by this locally based team, Kimley-Horn is committed to providing superior services in the area of drainage master plans and design. By merging leading experts in the field of drainage and stormwater management with a seasoned design team we provide products that are timely, cost effective, and of the highest quality. We look forward to the opportunity to work with your staff on this important project.

Sincerely,

KIMLEY-HORN AND ASSOCIATES, INC.

A handwritten signature in purple ink that reads "Doug Plasencia". The signature is written in a cursive style with a long, sweeping underline.

Doug Plasencia, P.E.
Project Manager

I. Firm's Capabilities

Overview

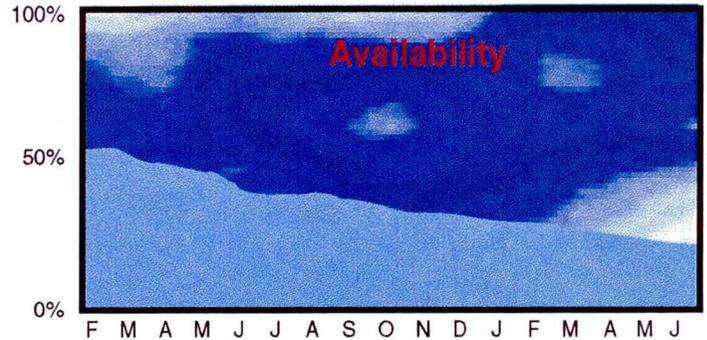
Kimley-Horn is a full service civil engineering firm with 650 professional staff in 34 offices nationwide. Kimley-Horn engineers have been providing a broad range of engineering services to state, county and municipal agencies for more than 28 years. Our Phoenix based staff of 45 specialize in drainage, land development, roadway design and transportation services, airport design, and general civil engineering services.

Our drainage services include extensive experience in hydrologic and hydraulic analysis, water management permitting, stormwater management planning, water control structure design and inventory, and construction contract administration. In drainage, our projects range from the resolution of small localized drainage problems to the development of complex drainage master studies and the preparation of construction drawings.

Drainage services is a discipline that many firms attempt to meet on a part time basis. At Kimley-Horn, we have committed the resources and developed a full time staff of drainage professionals who are widely regarded as among the leading drainage experts in the Southwest. Our project team is unsurpassed in talent and technical capability; they are also supported by the dedication and full resources of a national firm. With this commitment to drainage services, we will provide the Flood Control District, the City of Scottsdale, and the City of Phoenix with workable drainage solutions developed by experienced drainage professionals.

Workload

Our current workload allows our team to assign your project as their top priority. They are ready to begin work upon notice to proceed, and will complete the project in accordance with the District's schedule. *In the following column is a graphic depicting our current and future capacity for work.*



Schedule Control

Project Management is an important part of daily life at Kimley-Horn. We utilize an extensive Management Information System on all of our projects to ensure that the Project Manager and team members are constantly monitoring all aspects of the job, especially schedule and staffing necessary to ensure that schedule is met. A detailed work plan will be prepared at the very beginning of the project and staff needs throughout the study, by name, will be made. Critical tasks, such as Quality Control/Quality Assurance, will be arranged in advance by a written Task assignment to ensure for commitment and understanding by all individuals involved in the project.

The manpower plan for the project is entered into a sub-system of our MIS system called "Castaheads." Staffing by name and office is identified in detail for the next 30 days for each project, and in man-weeks for five months beyond the next month. We know of no other firm which has such detailed forecasting and documentation of staffing requirements as this. We do all of this to ensure that all resources are in place when needed to meet our commitments to you. In addition, the project manager, Doug Plasencia, will review bi-weekly reports to confirm our progress on the study. This allows for small adjustments in a timely manner, if needed, to keep our commitments.

On the following page is a graphic which illustrates the production schedule for this project.



Quality Control/Quality Assurance

KHA has a formal QC/QA program that has been an integral part of our projects for several years. The major provisions of this plan are:

- Establish a quality control plan as part of the workplan, which is done at the beginning each project.
- Review of work products (calculations, studies, plans, specifications, reports, etc.) by an experienced, senior-level member of the firm whose responsibility is limited to quality control reviews.
- Establish a budget for quality control. One of the pitfalls of many QC/QA programs is that time for quality control is included within the work task. This often results in “shortcutting” quality control. To allow necessary time for quality control, KHA budgets at the beginning of the project for control as a separate job category; time cannot be charged except by those individuals authorized to do so by the project manager. This ensures that time for quality control remains in the job.

We have found these procedures to be very effective in reaching the ultimate goal of producing a quality product in a timely, cost-effective manner. Our QC/QA program will assure that the highest level of quality design is maintained from the very start of the project.

Subconsultants

KVL Consultants, Inc. A key part of our team is Ken Lewis, P.E. of KVL Consultants. Mr. Lewis is a recognized leader in master planning flood control and drainage projects. He has pertinent first-hand experience in stormwater master planning for the City of Scottsdale; he is currently Project Manager for the City’s Stormwater Master Plan and Management Program. He is a key team member and critical to the success of this project.

Wood-Patel & Associates (WPA). Our team includes Wood-Patel & Associates (WPA), an exceptionally qualified firm certified as DBE by Maricopa County, the City of Phoenix, and ADOT. Wood-Patel is experienced in floodplain analysis and can assist with hydraulic/ hydrologic calculations, but will primarily provide survey services as needed. The firm’s survey experience includes: the New River Channelization, and Colter Channel for the Flood Control District; the Yavapai County Flood Insurance

Study for FEMA; Dunlap & Northern Avenues and I-17 Interchange, SR-87 Segment E, and SR 82 for ADOT; and Pinnacle Peak Road Bridge Over Skunk Creek for the City of Phoenix.

Western Technologies, Inc. (WTI). WTI will provide geotechnical and stormwater sampling services. WTI, one of the oldest and largest geotechnical and environmental firms in the Southwest, provides a wide range of geotechnical services including subgrade evaluations, foundation and subsurface drainage, groundwater quality and quality studies, geotechnical consultation, stability analyses, and site comparison and selection. They are very familiar with the conditions in this area and have the staff and expertise necessary for timely completion of this project.

Logan, Simpson, & Dye (LSD). Logan, Simpson & Dye will assist with the public involvement activities. LSD is a Tempe based partnership providing professional services in public participation, landscape architecture, and environmental planning. In the past few years, they have conducted more than a dozen public participation programs for involved and complex design and planning projects for numerous municipalities and agencies throughout Arizona. They have worked jointly with the Flood Control District of Maricopa County and the City of Phoenix on the Crosscut Canal Park Master Plan and Public Participation Program, and the Tenth Street Retention Basin Landscape and Irrigation Design. Currently, they are working with Kimley-Horn personnel providing environmental and public participation services for the Yuma Area Service Highway project for ADOT. LSD will provide valuable insight to our team on the incorporation of drainage infrastructure within park lands and open space areas.

Kimley-Horn’s Phoenix Marketing Staff will assist in public involvement activities providing design, assembly and dissemination of printed materials. Local staff have in-house graphics, presentation, and technical writing capabilities. Our staff has experience preparing presentations for public meetings and workshops and steering committee/agency meetings. Our staff can prepare and tailor graphics for newsletters, flyers, and project workbooks to specifically meet the needs of any public outreach and involvement program.

II. Staff Qualifications

Kimley-Horn knows that when you decide on a consultant, you are really choosing the people who offer you the technical training, hands-on experience with similar projects, and high standards of quality and responsiveness that will make your project a success.

Our current staff of drainage experts provides the District with an exceptional and unparalleled experience base for this job. Doug Plasencia, Bill Mathews, Dan Sagramoso and Enda Melvin are former government officials with extensive public service in drainage. They maintain regular contact with virtually all key regulatory agencies which enables them to provide expeditious services relative to agency reviews and approvals. Because they understand agency procedures and expectations, these team members can view a project "from both sides of the desk," and take a more proactive approach at the start of the project.

As drainage professionals in the public sector, they all have considerable experience in developing resolutions for pavement drainage problems, street flooding, dip section maintenance, street induced flooding on private property, and related problems. They are accustomed to finding workable solutions that fall within the severe constraints generally imposed on public maintenance and retrofit budgets. These professionals are local, full time staff in Kimley-Horn's Phoenix office; Dan Sagramoso is a special consultant under exclusive contract to Kimley-Horn and Associates, Inc.

Kimley-Horn's team is joined by Kenneth V. Lewis, of KVL Consultants, Inc., a recognized leader in master planning flood control and drainage projects. Mr. Lewis will assist our Project Manager, Doug Plasencia, in Concept Development. Also joining the team are water quality specialists Roland D. Wass and James Eisenhardt, and Mike Kiefer and Rob Wilfong to assist with permitting.

Our team has prior drainage experience in Scottsdale, having completed several similar projects there. Kimley-Horn drainage professionals are also experienced with the use of hydrologic and hydraulic computations that range from the basics (rational equation, Mannings equation, culvert ratings) to state-

of-the-art computer models such as HEC-1, HEC-2, TR-20, and WSPRO.

The Organization Chart on the next page illustrates our key project personnel and the roles they will be assigned for this assignment. All anticipated professional disciplines required by the proposed contract work requirements are identified in the graphic. Based upon production schedules, other Kimley-Horn personnel in the Phoenix office can be called upon to provide support as needed, as well as the resources of our staff nationwide. Following are resume summaries for Kimley-Horn key personnel.

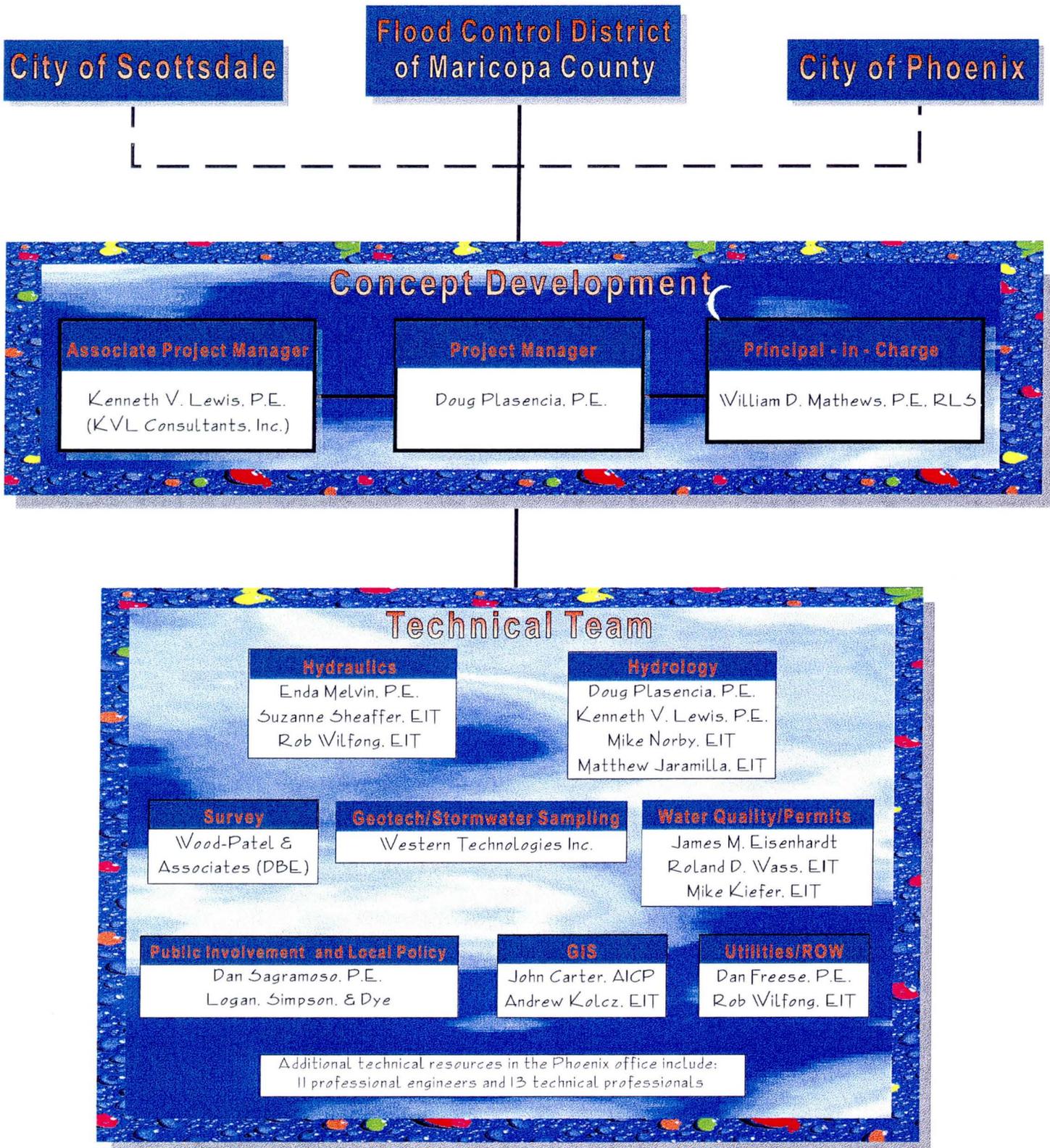
Doug Plasencia, P.E., will be Project Manager/ Project Engineer responsible for the day-to-day administration and all aspects of the master drainage plan. Mr. Plasencia has over 12 years of specialized experience in the area of drainage, floodplain management, and flood control in Arizona and nationwide. Prior to joining Kimley-Horn, Mr. Plasencia was Chief of Flood Protection for the State of Virginia.

Mr. Plasencia was also previously with the Flood Control District of Maricopa County, where he served as Chief of the Watershed Management and Chief of the Flood Plain Management Sections. While with the County, he was involved in four Area Drainage Master Studies and has strong experience in hydrology and hydraulics for developing master drainage plans within Maricopa County and is experienced in FEMA floodplain issues. Having served in such a role with the District, his knowledge and familiarity with the County and associated jurisdictions is a great asset. During his tenure at the County, Mr. Plasencia was also instrumental in the development of the Uniform Drainage Standards and Maricopa County's Hydrology Manual.

Kenneth V. Lewis, P.E., (KVL Consultants, Inc.) will assist Doug as Associate Project Manager. Mr. Lewis is a recognized leader in master planning flood control and drainage projects having completed over 30 stormwater master plans in the US, Australia and Malaysia and served as a Principal Faculty for APWA urban drainage workshops in the US and Canada.

Mr. Lewis is currently Project Manager for the City of Scottsdale Stormwater Master Plan and Management Program and assisted the City in their submittal of the

Team Organization Chart





Southwest Regional Flood Control Project to the Flood Control District for further study consideration. In addition to Scottsdale, he has completed other recent stormwater master plans including: the City and Port of Long Beach, California; the City of Kingman, Arizona; the City of Visalia, California and numerous basins in Yuma and Scottsdale, Arizona. Other relevant local projects Mr. Lewis was Project Manager for include the City of Scottsdale's Downtown Master Plan and TPC Golf Course, both of which had significant drainage elements.

Mr. Lewis' drainage experience extends beyond Arizona. In Malaysia, he established a new unit within the Government's Department of Drainage and Irrigation to plan and design nationwide drainage facilities. In this capacity, he prepared and published national urban drainage standards and procedures, trained new engineers in urban drainage planning and developed master plans for all major cities in the country.

Bill Mathews, P.E., RLS, will be responsible for allocation of the firm's resources, and the timeliness and quality of the Kimley Horn team's services. Mr. Mathews has unparalleled water resources experience in Arizona. As a former General Manager of the Flood Control District of Maricopa County, Bill was responsible for the overall planning and implementation of flood control and floodplain regulation programs in the County. He also served as Chief of the Flood Control Branch and Planning Branch of the Arizona Department of Water Resources. As a result of this experience, Bill is knowledgeable of county, city, Corps of Engineers, FEMA, and state agencies' standards, guidelines, and requirements.

He has more than 33 years of civil engineering experience, primarily in the areas of water resources, hydraulics, drainage, and flood control. He is experienced in FEMA floodplain issues and map revisions, and has served as project manager for drainage studies and channel stabilization designs at several locations throughout Arizona, including Greenway Parkway at Cave Creek; and Agua Fria River (Northern Avenue to Olive Avenue). He also did the Stormwater Pollution Prevention Permit for the Army Reserve facility at 64th Street and Oak.

James M. Eisenhardt will provide environmental services for permitting, water quality, and wetland systems. Mr. Eisenhardt specializes in environmental consulting and planning, assisting clients in obtaining permits from environmental regulatory agencies. In his ten years of experience performing site assessments and assessing environmental impacts, he has performed feasibility studies, wetlands and soils delineations, wetlands mitigation and site analysis, and endangered species surveys. Mr. Eisenhardt has a Master of Science in Biology and Certification from the Wetlands Delineator Certification Program by the U.S. Army Corps of Engineers.

Roland D. Wass, EIT, will provide services for water quality treatment and vegetative treatment systems and will advise our environmental staff on regionally based environmental issues that may evolve, particularly regarding stormwater quality. Roland is very experienced in water quality treatment systems, having worked on the Tres Rios Demonstration Constructed Wetlands Project and several for the Flood Control District of Maricopa County including: the NPDES Stormwater Program, the Best Management Plan Program, Water Quality Characterization of Urban Runoff, Chemistry and Toxicity of Urban Stormwater and Ephemeral Streams, Chemistry and Toxicity of Urban sediments, Groundwater Recharge Activities, among others.

Dan Sagramoso, P.E., will assist with local policy and public issues. Prior to joining Kimley-Horn, Mr. Sagramoso was Chief Engineer and General Manager of the Flood Control District of Maricopa County where he managed programs in maintenance, stormwater quality, floodplain and drainage regulation, property management, flood warning, and the planning, design and construction of capital improvements. In addition to county/city funded projects, he managed the District's partnership with federal agencies in completing over \$600 million in flood control structures. This experience included obtaining the necessary Federal, State, and local clearances and permits. Should it be needed, this first-hand experience dealing with local policy and issues will prove invaluable.

Enda Melvin, P.E. will perform hydraulic calculations. Enda has over eight years of experience in hydrology, hydraulics, storm drain design, drainage studies, floodplain and stream encroachment analysis, and street design.



Michael E. Kiefer, Jr., EIT will provide support for water quality and permitting. Mr. Kiefer specializes in the planning, permitting, design, and analysis of waterfront projects on or near environmentally sensitive land. He often serves as liaison between regulatory agencies and his clients, and is well versed in the rules and regulations affecting development associated with waterfront and environmentally sensitive projects.

Suzanne M. Sheaffer, EIT, Rob Wilfong, EIT, Mike Norby, EIT, and Matthew Jaramilla, EIT, will provide project support. These young professionals are experienced in hydraulic analysis, hydrologic analysis/drainage design, storm drainage systems and 401/404 permitting. They are also proficient in computer modeling using HEC-1, HEC-2, WSPRO, TR-20, and other relevant software.

John Carter, AICP and Andrew Kolcz, EIT will provide GIS for hydrologic and topographic mapping in a format that is compliant with the District's HIS Data Delivery Specifications. Their experience includes the application of GIS for a 1,500 square mile watershed analysis in South Florida. The GIS was used to analyze basins/sub-basins, land use, property ownership, soil classifications, discharges at structures, topography, hydrography, precipitation distribution, and water quality monitoring. Kimley-Horn designed the GIS to map the various themes and associated databases, and implemented a data integration scheme to streamline and manage the model inputs and outputs for hydrological analysis.

An experience matrix highlighting Kimley-Horn team expertise appears on the following page.

Diane Simpson-Colebank (LSD) is a licensed landscape architect with 20 years of professional experience and is a member of the International Association of Public Participation Practitioners. Her strengths include developing and conducting public involvement programs on complex and controversial projects for federal, state, and local agencies. Some of the projects in which Diane was responsible for developing and facilitating the public involvement programs include the City of Phoenix's 56th Street Extension Study, the 44th Street Corridor Specific Plan and Crosscut Canal Master Plan, and the City of Tempe's Alameda Median Landscape Design and Downtown Tempe Transit Facility Location Study.

Thomas R. Gettings, RLS (WPA). Mr. Gettings is a Registered Land Surveyor in Arizona with more than 11 years of experience. His expertise includes office and field involvement with master planned communities including golf courses and lakes, residential, commercial, and industrial, as well as public works surveying involving flood control, utility, roadways, highways, and railroad improvements. Mr. Gettings possesses a practical knowledge of City of Phoenix survey methodologies, requirements, and deliverables. His recent experience includes: Colter Channel, Dysart Drain Improvement Project, Pinnacle Peak Road Bridge over Skunk Creek, and SR-87 Segment E.

Randolph Marwig, P.E. (WTI). Mr. Marwig, an Associate with WTI, has more than nine years of experience as a geotechnical engineer in Arizona and throughout the United States. He has been involved with large geotechnical and environmental projects in Arizona, Nevada, California, and New Mexico. He has experience managing all aspects of projects from initial site investigations, through EIR review, and construction administration.

Expanded resumes for key personnel are included in the Appendix in the 255 form.

III. Project Experience

The KHA team has significant experience in successfully completing drainage and stormwater management projects, and our team members all have previous experience with projects for the Flood Control District. Following is a listing of similar Kimley-Horn projects:

A Master Watershed Study for 48th Street and Ray – Phoenix, AZ

Developed a detailed hydrology model including numerous flow diversions, retention/detention basins, and split flow analysis using hydrology model HEC-1 to analyze a flood prone region in southeast Phoenix. The study was used to quantify flow rates and volumes impacting the Gates Property and to provide a concept design for dealing with very high rates of offsite flow impacting the site. The study also served a secondary objective of providing a portion of the watershed analysis in support of the 48th Street and Chandler Community Improvement District, in the event this CID is implemented.

Team Experience

	Mathews	Plasencia	Sagramoso	Melvin	Lewis	Sheaffer	Jaramilla	Wilfong	Norby	Freese
Floodplain Delineation	●	●	●	●	●				●	●
Drainage Studies	●	●	●	●	●	●	●	●	●	●
Hydrology Models -HEC - 1	●	●		●	●	●	●	●	●	
-TR20-TR55	●	●		●	●	●	●	●	●	
Hydraulic Models -HEC - 2/HEC -RAS	●	●		●	●	●	●	●	●	●
-WSPRO/WSPG		●		●	●	●		●		
Sediment Transport/Scour	●	●				●				
FEMA LOMR/LOMA/CLOMR	●	●	●	●	●					●
Hydraulic Evaluation of Bridges, Culverts and Open Channels	●	●		●	●	●	●	●	●	●
Flood Warning Systems	●	●	●		●					
Flood Proofing	●	●	●	●		●				
Regulatory Programs -Floodplain Permits	●	●	●		●					●
-Cleanwater and Wetland Permits (404, 401)	●	●	●	●			●			●
-Safety of Dams	●	●	●	●						
River Restoration	●	●	●							
Watershed Master Studies	●	●	●	●	●	●				
Public Involvement	●	●	●	●	●	●		●		●
Utility Relocations	●	●	●	●	●			●	●	●
Agency Coordination	●	●	●	●	●			●	●	●
Local Sponsorship of Federal Projects	●	●	●			●		●		
Channel Design	●	●	●	●	●	●	●	●	●	●
Detention Basins	●	●	●	●	●	●	●	●	●	●
Right-of Way Studies/Planning	●	●	●		●			●	●	●
Storm Drain Design	●	●	●	●	●	●	●	●	●	●
Construction Management/Review	●	●	●					●		●
Quality Control/Quality Assurance	●	●	●		●	●		●	●	●
Zoning/Land Use	●	●		●				●		●
Surveys	●			●				●	●	●



U.S. Route 180 – Fine Street – Flagstaff, AZ

Developing a retrofit solution for street flooding on U.S. Route 180 through Flagstaff for ADOT, due to an undersized storm drain system.

Estancia Phase 3, 2B, Access Road, and Clubhouse – Scottsdale, AZ

Utilizing an existing master drainage study, developed estimates of offsite flows and estimates of pavement drainage for sizing culverts, storm drain systems, and drainage easements for this master planned community in Scottsdale.

Yavapai County Fairgrounds – Prescott, AZ

Developed drainage study and design for the development of the new 210 acre fairgrounds site. Project involves preparation of a preliminary plan for relocating the Yavapai County Fairgrounds from the existing 60-acre site to a new 210-acre site. Improvements include parking, roadway access, horse track, and other related buildings. Facilities to be relocated include all exhibition buildings, concessions, a 5/8 mile horse racetrack, a full professional rodeo arena with grandstands (capacity 2,000), stables for 1,200 horses, parking, access, and related infrastructure. Current project.

PVSP Channel Scottsdale Road – Phoenix, AZ

Drainage study necessary for design of one mile of flood control channel adjacent to Scottsdale Air Park. Prepared plans, specifications, and contract documents for construction of a storm drain from Greenway Road to Thunderbird Road.

Rezoning for a Resort Facility at 110th Street and Shea – Scottsdale, AZ

Provided drainage report to support the rezoning of 25 acres at 110th and Shea. Report provided estimates of offsite hydrology, concept design for conveyance of offsite flows, and concept design of site retention facilities.

Skunk Creek Bridge (51st Avenue) – Phoenix, AZ

Prepared plans, specifications and contract documents for one mile of new six-lane roadway, which included a new bridge across a major stream. Scope of work included: HEC-2 analysis and scour study for Skunk Creek Bridge; relocation of Skunk Creek for bridge crossing (obtained Section 404 Permit); drainage

study and street drainage design; design of water line in street and through bridge; and design of a 105' bridge with necessary bank protection.

Broadway Road – Phoenix, AZ

Planning and design services for widening and extending a three-mile section of Broadway Road between 35th Avenue and 59th Avenue. Portions of the scope of work included: floodplain impacts, design of flood levee, drainage facilities, a river bridge, a large box culvert, wetlands, riverbank stabilization, utility relocation, and permitting. Extensive coordination and communication with landowners and participating agencies was necessary to provide for alignment passing through an active mining operation. In addition, coordination with the Maricopa County Flood Control District, the City of Phoenix, U.S. Army Corps of Engineers, and the Arizona Department of Environmental Quality was crucial.

Greenway Parkway, 19th Avenue to 7th Street – Phoenix, AZ

Hydraulic analysis and drainage elements associated with the preparation of construction plans and specifications for 3.5 miles of new roadway. Portions of the scope of work included: a 345-foot bridge design with very tight hydraulic constraints; extensive channel work to provide erosion protection and allow maximum channel flow capacity; box culverts; new six-lane street along banks of Cave Creek Wash with raised median and surface drainage.

KVL Consultants, Inc.

City of Scottsdale Stormwater Master Plan and Management Program –

K.V. Lewis was Project Manager for this project for The City of Scottsdale. The City contracted for the development of a "living" stormwater master plan, a plan that could be easily updated as conditions change and would not be outdated with the consultant's final submittal. With the City's move to a central Geographic Information System (GIS), it was required that system modeling be tied to land use and other appropriate data currently being maintained on a routine basis. The solution was to develop an integrated Management System on a Personal Computer to consolidate all information required for the preparation, analysis and generation of results for the Stormwater Master Plan and Management



Program. By managing the stormwater facilities in a user-friendly computerized environment, City personnel can easily access existing information, analyze the impact of changes in land use and construction costs and can automatically develop costs for alternative levels of protection. Ref.: Bill Erickson, Drainage Planner (602) 994-7652.

City of Port of Long Beach Stormwater Master Plans and Management Programs —

K.V. Lewis was Project Manager for development of comprehensive Stormwater Master Plans and Management Programs for the City and Port of Long Beach, California. For these projects an inventory of the existing systems was developed from available mapping and augmented by field inspection. Hydrologic and hydraulic analysis was carried out using local County standards. Alternative proposals to upgrade drainage facilities in the downtown area were developed and presented to City staff. All other facilities were upgraded to current design standards based on existing alignments. To manage the facilities, a comprehensive database management system was developed that automated the modeling and cost estimating process. Ref.: Ed Putz, City Engineer (310) 590-6957; Robert Riffenburgh, Deputy Chief Harbor Engineer (310) 590-4143.

City of Kingman Stormwater Master Plan and Management Program —

K.V. Lewis was Project Manager for the development of a comprehensive Stormwater Master for the City of Kingman and surrounding environs. The work included aerial mapping, hydrologic and hydraulic modeling, alternative evaluations and cost estimates for drainage improvements and the preparation of a drainage and design administrative manual. A detailed study of the Bull Mountain Basin was prepared to address immediate flooding concerns and drainage alignments, sections, profiles and planning cost estimates were prepared for all other facilities. All hydrologic modeling was performed using HEC-1 and hydraulic modeling using Storm Plus. The study area sited on an alluvial fan contained 72 square miles with contributing drainage basin of 168 square miles. Alternative proposals were presented to Council and the public to gain consensus. Ref.: Lou Sorenson, City Manager (602) 753-5561.

IV. Project Understanding

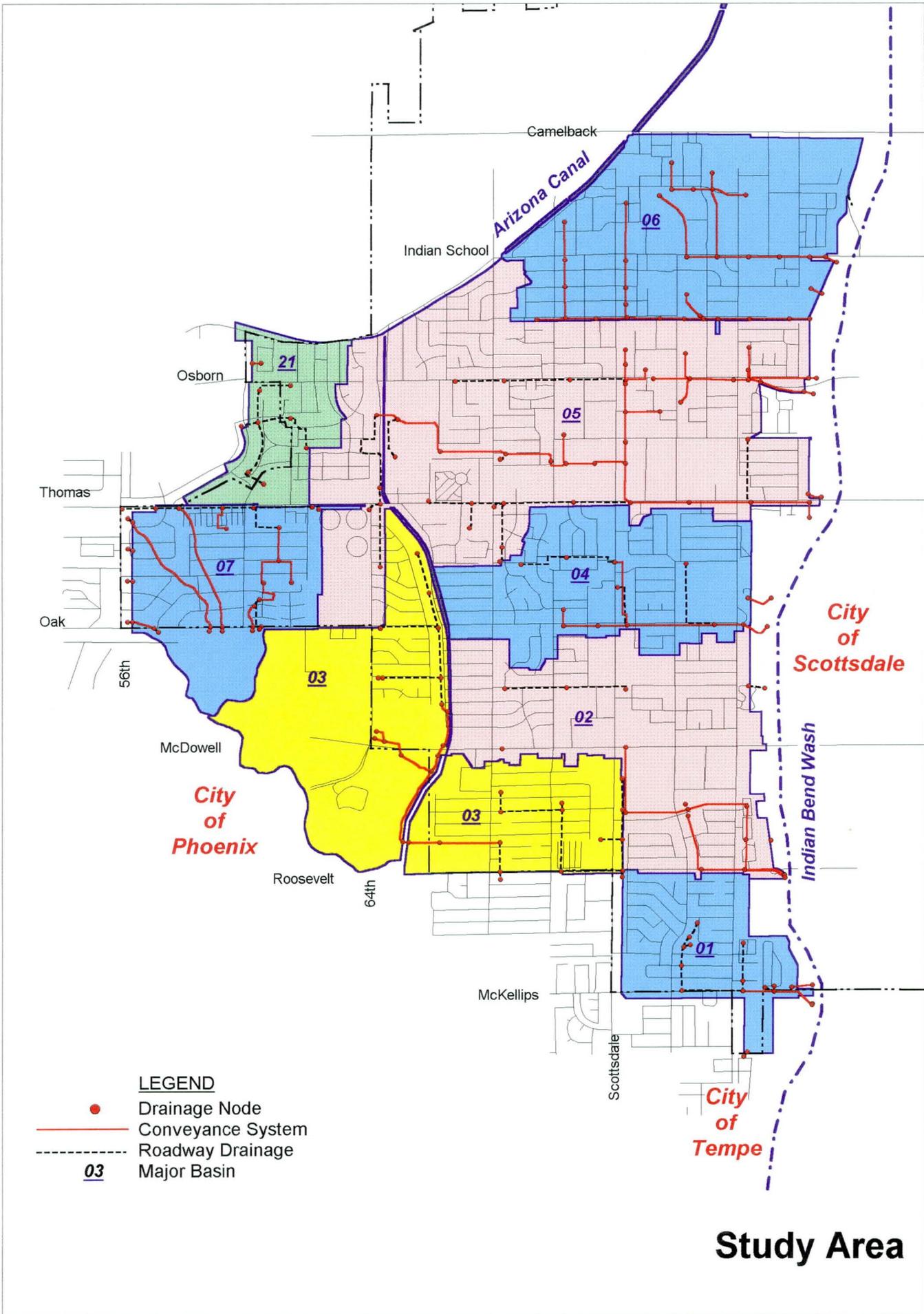
Background

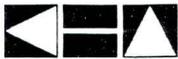
The Southwest Scottsdale Master Drainage Plan effort is in response to localized flooding and associated street drainage problems within the 6.3 square mile study area, *shown on the Study Area Map on the following page*. Flooding has been the most severe along the Cross Cut Canal from Thomas Road south. Runoff originating in Papago Park flows to the east, or to the north and east where it is commingled with other urban runoff prior to ponding behind the canal. This ponded flow has limited conveyance to the south, with severe restrictions at the McDowell Road crossing of the canal. Likewise there is limited conveyance under the canal further restricting flows along the upstream (west) bank of the canal. Under heavy runoff conditions flows ultimately overtop and enter the Cross Cut Canal.

Upstream (west) of the canal are homes and businesses that are subject to flooding. On September 27-28, 1995 approximately 14 homes were flooded by a storm with rainfall of 2.76 inches over a 6 hour period. Flood depths of 2.5 feet were experienced in this estimated 50-year event. There was also damage noted to the Cross Cut Canal, due to the floodwater spilling into the facility.

In addition to these areas of flooding behind the Cross Cut Canal, flood problems have been noted along roadways within the study area. 64th Street, which currently is under design for roadway and drainage improvements, has been subject to inundation from flows crossing the roadway. At 60th street and Thomas, a grocery store and its parking lot have been subject to past flood damages.

In response to these and other related issues of drainage and flooding the primary focus of this study is to develop a system that can collect and safely convey these flows to a logical outfall. As part of the Scottsdale Storm Water Master Plan and Management Program, storm drains directed to the Indian Bend Wash were identified as possible solutions to these flooding problems. Likewise, based on discussion with members of the steering committee there has been interest expressed in exploring the feasibility of directing flows into the Cross Cut Canal, where they would be conveyed to the Salt River. Another idea





discussed was the potential of taking flows to the south, along the canal, with consideration given to routing the flows through the Phoenix Zoo and ultimately to the Salt River.

Significant Project Elements

As with any drainage master plan, a significant amount of the effort and resources will be devoted to the hydrology, hydraulics, engineering analysis, rights-of way issues, survey and other related project components. However for this project to be successful it is necessary to be able to group a number of independent tasks into cohesive project elements.

For purposes of discussion we have identified four major elements or outcomes to this study. These elements include Urban Drainage, Flood Mitigation, Water Quality, and Public Involvement. The first three elements are in essence the culmination of numerous tasks that will help define the overall plan. The public involvement element is listed because of its critical role in developing private and public cooperation, and acceptance for the recommended plan.

1. Urban Drainage

Urban drainage analysis primarily relates to developing drainage systems that will provide a reasonable level of protection against the more frequent storms. These storm events cause nuisance and inconvenience but not major damage from flooding. Within the Southwest Scottsdale drainage area, this level of analysis applies to most of the study area with the exception of Basin 03 (*see Study Area Map, and Map titled Basin 03 - on the following page*) which is prone to more serious flooding.

With reference to the Study Area Map, Basins 01, 02, 04, 05, and 06 naturally drain to the Indian Bend Wash. As demonstrated on the Study Area Map, there are a number of existing outfalls into the Indian Bend Wash. A major goal of this study is to minimize the number of outfalls to the Indian Bend Wash.

Basins 07 and 21 of the system outflow into the City of Phoenix. Available capacity and the identification of a logical outfall will need to be determined.

2. Flood Mitigation

Flood mitigation analysis relates to providing structural or non-structural measures that will protect flood prone property. Basin 03 identified on the

Study Area Map and shown in more detail on the Basin 03 map is susceptible to significant flood damages, and would warrant this level of analysis. A major goal of this part of the study is to identify measures that reduce or eliminate the potential for flood damages within the basin, and if feasible identify solutions that reduce or eliminate the FEMA Flood Zone A.

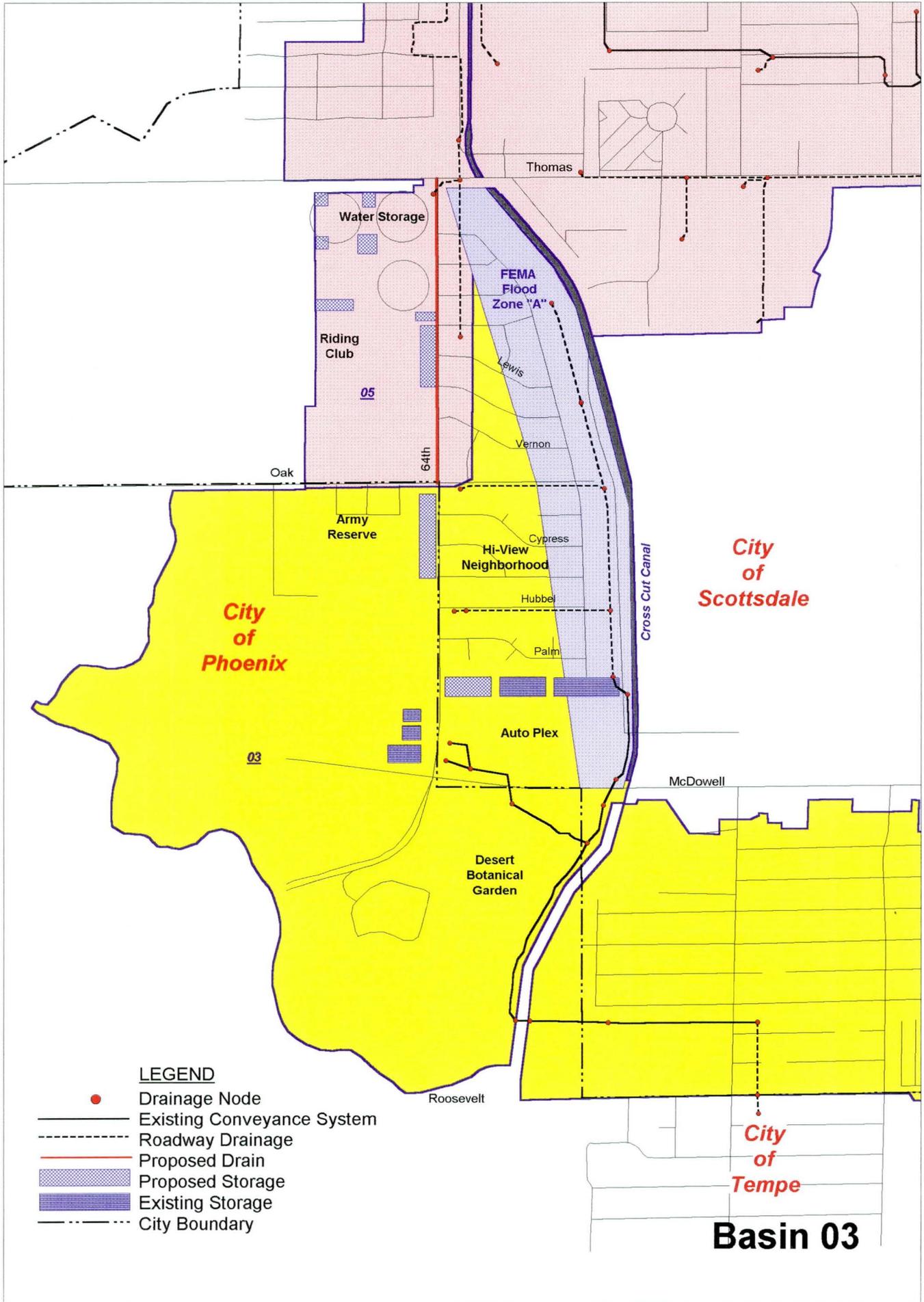
In addition to evaluating the major flooding issues, Basin 03 will be analyzed for localized drainage problems commensurate with the level of detail performed for the Urban Drainage problems of the previous element.

Ongoing within Basin 03 is the design of proposed drainage improvements in 64th street between Thomas and McDowell. Proposed improvements include additional detention storage west of 64th street together with a 36" diameter storm drain flowing north from Oak Street to Thomas Road. This drain currently has no receiving outfall and consideration is being given to a using an abandoned 42" water line in Thomas Road.

An issue that will be significant to this study will be the identification and location of detention basins. There is a high probability that detention basins will be used in conjunction with the outfall for Drainage Basin 03, as an overall cost saving measure. Sighting of these basins will be a challenge. Members of the steering committee have held informal discussions with the U.S. Army Reserve, National Guard, and the Desert Botanical Gardens discussing the potential for onsite stormwater storage. Due to the limited open land, consideration should also be given to the storage of stormwater on Phoenix City Park lands.

3. Water Quality

The consideration of water quality will be important at two related but distinct levels within the analysis. The first level will be related to a watershed based and project specific analysis of overall water quality and watershed based compliance with criteria of the National Pollution Discharge Elimination System (NPDES). The second level will relate to specific issues of water quality at point outfalls into receiving facilities. A major goal of this analysis is to demonstrate compliance with NPDES criteria, and to identify and meet water quality standards at receiving outfalls.





Dependent on the recommended alternative, water quality treatment may be either a desired or necessary option of the plan. It can be anticipated that water quality characterization and treatment will be a required component of any alternatives that would lead to the direct discharge of flows into the Cross Cut Canal, or through the Phoenix Zoo.

Direct discharge into the Indian Bend Wash (IBW) will be less problematic from a water quality perspective since the IBW is a normal outfall for this runoff and would normally receive many of the urban flows currently entering the system. However, special consideration should be given to the introduction of additional point discharges into the IBW and the quality of waters under low flow conditions. At these discharge points it will be important to assess the impacts that a low quality water might have on the recreational use and aesthetics of the IBW; and if necessary identify measures that would mitigate these impacts.

4. Public Involvement

The Public Involvement element is different from the three previous elements in that it is a tool that helps to facilitate the planning process rather than having a specific outcome. Just as hydrology and hydraulics are a tool that help in demonstrating project performance, public involvement is a tool that helps in assuring public acceptance. However the public involvement tool warrants special consideration in this project.

In this project there will be at least four identifiable public involvement groups or issues that will need to be addressed.

The first issue will be the flood prone residents and business owners within the mapped floodplain. Because of their history of recent flooding, alternatives in this area will need to be able to demonstrate a meaningful reduction in flood damage potentials. While, within the engineering and planning professions we are comfortable in discussing design frequencies, for this public it will be important to relate alternatives to the September 1995 flood.

The second issue relates to the involvement of neighborhood associations within the study area. These groups have been involved and take pride in the trail system that parallels the cross cut canal, and in

general will be concerned with the interaction of the project with existing community based amenities.

The third issue will relate to developing alternatives that minimize the disruptions to the community, both through construction and the long term implementation of the project.

The fourth issue is not directed at private individuals, but involves agencies and organizations within the study area. City of Phoenix Parks, the Desert Botanical Gardens, The Phoenix Zoo, and the Salt River Project all potentially could become involved with various elements or alternatives of this project. It will be absolutely essential to the success of this project to involve these groups early in the process, and to develop alternatives that provide workable solutions that benefit all parties involved.

Manhour Estimates

For purposes of establishing an estimated level of effort for the Southwest Scottsdale ADMP we provide our initial effort estimates for the following major tasks. Based on the final scope of work a detailed breakdown of project costs will be developed.

1. Data Collection - This involves the assembly of major project data including studies, plans, meetings with public and private individuals, field investigations, summary of data, report writing, development of GIS data bases, obtaining basic utility data, development of initial property map. 430 Hours
2. Survey - This task is to provide for the survey control for the aerial photogrammetry for the 3 square mile area identified within the scope of work. 175 hours Survey Crew 110 Hours other support.
3. Hydrology - Provides for the review of the hydrology to be provided by the District, field review of the subbasins, verification of hydrologic parameters, modification to the existing model, development of alternative storm events, development of the hydrology reports in compliance with District, and FEMA/ADWR standards. 338 Hours
4. Drainage Master Plan- Alternatives Phase 1 - Provides for incorporating all relevant data and preparation of plan specific exhibits, development of alternatives, identification of permitting or other



special issues, preliminary hydraulics, initial public involvement efforts, meetings with officials and impacted properties, modifications to the hydrology model to account for changes in flow path or incorporation of detention storage, development of preliminary cost estimates, preparation of initial and final reports. 1280 Hours

5. Drainage Master Plan - Final Plan - Phase 2 - Provides for the development of the recommended plan, final modifications to hydrology, detailed hydraulics, preparation of cost estimates for major features and quantities, final identification of ROW requirements and costs, plan and profile sheets commensurate with the level of design, final public involvement activities, meetings with officials and impacted property owners, initial and final reports, preparation of CLOMR submittal. 1350 Hours

6. Water Quality- Research literature on water quality, obtain and review District and USGS water quality data, develop water quality sampling plan and strategy, calculate the estimated loadings using locally modified regression equations, identify BMP strategies for the watershed and the project, develop concept level designs for "end of system" treatment. Incorporate results in alternative and final reports. 369 hours

V. Project Approach

To develop a timely and quality product for this plan requires an approach that separates between tools and products, yet successfully weaves all of these components together as part of the master plan. For purposes of this discussion we have not specifically listed each and every item of the scope, but rather have focused on key components of the project and have attempted to provide an overview of our approach to each of these major elements.

A. Basic Information - Data Collection, Survey and Mapping, Geotechnical

I. Data Collection - The purpose of this task is to obtain basic information that will assist in the identification of known flooding and drainage problems, and to obtain information and records that will facilitate the planning and design of specific project alternatives.

Data related to utilities, rights-of-way, general conditions of soils and other similar information is generally available in reports, quarter section maps, or electronic data bases. The Scottsdale Storm Water Master Plan and Management Program will serve as an important source of information in the identification of the drainage system and problems within the study area. Kimley-Horn subscribes to the TRW-REDI Property Data Disc service which allows us to research property and rights-of-way electronically from our office. These CD-Rom discs are updated quarterly assuring us of up to date information on ownerships, easements, and other relevant property information.

We also intend to meet with agency officials and most important, maintenance personnel involved with the daily operations within the study area to identify drainage and flooding hotspots. The officials can provide a wealth of information in the pre-identification of drainage problems based on their working knowledge of repetitive drainage complaints, road closures, or maintenance problems within the study area.

Close coordination with the City of Scottsdale, and its consultant on 64th Street drainage improvements will be necessary. The proposed drainage design, and the information they obtained as part of the video survey of the abandoned water line along Thomas Road will be useful information to incorporate and consider in the overall recommended approach to the project.

II. Survey, Photogrammetry, and Mapping - The scope of work identified an area approximately three square miles in size for this effort. As part of the refinement to the scope of work it will be necessary to assemble the existing topographic mapping and related data and to better define the exact needs of this element. As part of the decision making process it will be important for the members of the steering committee to determine whether it is necessary to map the entire three square miles, or whether it is only necessary to map those areas where alternatives are being considered.

Our suggested approach would be to perform the ground survey and to obtain the photogrammetric models (rectified photographs) for the entire three square mile area, initiate contour mapping in those areas where there is strong indication that alternatives



will be considered, and then as the alternatives become further developed add additional areas to be mapped with contours as the study proceeds.

Specific attention should be given to any existing topographic mapping upstream of the Cross Cut Canal to assure that available mapping in this area meets FEMA criteria for floodplain mapping.

Surveys for this study will be performed by Wood - Patel and Associates. If selected, we would propose that a meeting be held within several days following our notification of selection to allow for a more definitive discussion on mapping needs. This discussion will greatly improve our ability to focus this portion of the scope and to obtain a sound cost estimate for this work.

We have initiated discussions with several aerial mapping firms, and once the scope is more defined will be looking to these firms to provide cost estimates and their ability to meet the project schedule.

III. Geotechnical Studies - Geotechnical studies will be performed by Western Technologies, Inc. (WTI). Formal geotechnical evaluations will be initiated with the development of the recommended plan, although throughout the study WTI will be kept informed of proposed sites to determine if their experience within the study area would indicate the potential for problems or limitations. These studies will be done to meet industry standards as identified in the scope of work.

B. Hydrology and Hydraulics

We do not anticipate the need for a significant amount of additional hydrologic investigation. As part of the Scottsdale Storm Water Master Plan and Management Program a hydrology model was developed for the study area. Based on discussions with City of Scottsdale, and Flood Control District Staff it is felt this model is generally acceptable and can be appropriately modified for these study conditions. Ken Lewis of KVL consultants and a member of our team was the developer of this basic hydrologic model. To assure an impartial review and to optimize the efficiency our team brings to the task, Kimley-Horn will perform an independent review of the hydrology, and then in consultation with Ken Lewis will suggest necessary revisions to the model to meet study needs. Likewise if it becomes apparent that

additional areas should be incorporated into the model, we will expand the model and methodology to incorporate these additional land areas or new sub-basins.

While the hydrology will be run for all necessary design frequencies, we propose that we also develop a specific model of the rainfall event of September 27-28, 1995. This flood event estimated at a 50-year frequency flooded homes and businesses within the study area. This model will serve as valuable tool to demonstrate to citizens, and non-technical policy makers the impact that a given alternative or recommendation would have on a recent and memorable flood event.

Hydraulic computations will be performed using standard methods for closed pipes and/or open channels. All features will be initially sized using the Manning's equation, culvert rating curves, and related methods. For detailed sizing we will utilize the HEC-RAS for developing open channel water surface profiles, and Storm Plus for developing pipe sizes in storm drains.

We would propose that at the conclusion of the study that the final hydrologic and hydraulic models be incorporated back into the City of Scottsdale Master Plan to assure its model is kept up to date.

C. Urban Drainage and Flood Mitigation Elements - Plan Formulation

Phase I - Alternative Analysis

These elements reflect the effort required to assemble all relevant information and data into a comprehensive plan. The initial phases of the study will be driven by data collection, survey and mapping, and refinements to the hydrologic model. Formal plan development can begin in earnest once known drainage problem areas are identified, knowledge of the existing drainage infrastructure is captured, and basin hydrology is of sufficient detail to provide information related to the magnitude of potential problems.

As detailed in Section 4 Project Understanding, we anticipate two levels of problems in the watershed. The first we are grouping as the Urban Drainage element and relate to street drainage and localized nuisance problems. The urban drainage element will cover the entire watershed. The second level we term Flood Mitigation and relates to the more severe



flooding issues. At this time we anticipate that the flood mitigation element will be primarily constrained to basin 03 of the Scottsdale Master Plan, which is the drainage basin that impacts the upstream (west) face of the Cross Cut Canal.

Once the basic data are assembled we would propose a meeting of the steering committee where information related to known flooding problems, and existing drainage infrastructure would be presented graphically. At this meeting we would identify those problem areas that would warrant continued analysis as part of the study, and those which would be discounted as non-significant or as too remote to be reasonably handled as part of the study. At this meeting we would also recommend that potential alternatives should be brainstormed collectively by the group for continued consideration or for elimination. Once this meeting is accomplished we would recommend holding the first Public Involvement Meeting.

The first Public Involvement Meeting should be used as an opportunity to meet the involved public, introduce the study, present information related to the data collection effort, and validate through break out groups if we have captured the significant drainage issues of the watershed. It will also be an opportunity to receive input on project formulation concerns, (e.g. impacts during construction, long term impacts on recreational features, etc.)

Following these meetings, project alternatives will be developed. Our approach to developing alternatives will be to develop both networked and independent solutions to the drainage problems revealed within the watershed. We would also look very closely at existing master plans or proposed projects within the watershed that should be considered in alternative formulation.

As early as feasible in the alternative process we will identify areas of potential storm water storage that may exist within Papago Park, the Desert Botanical Garden, the Phoenix Zoo, or other adjacent lands. We would then initiate specific meetings with these entities to examine the feasibility of incorporating these features within their properties. If facilities are proposed within these areas it will require the incorporation of these features in such a way as to maximize compatibility with existing uses, and that

realistically will provide an opportunity or benefit for each of the involved entities.

Draft alternatives would be developed from this process, and would again be graphically presented to the steering committee. At this meeting preliminary cost estimates, preliminary sizing, and any limitations will be discussed with the committee for each alternative. Through this process we would propose a number of preferred alternatives that would be utilized as a forum for a second Public Involvement Meeting.

The goal of the second public involvement meeting will be to provide a progress report on the project, and to obtain public input on the preferred alternatives. Again through the use of break out groups, feedback on the preferred alternatives would be acquired, and new alternative concepts would be entertained. It will be essential at this meeting to provide the public with graphic depictions and renderings that could demonstrate the before and after view of the project area, and that would visually demonstrate how the project would look.

During this same period of time following the second steering committee meeting we propose to meet with all of the entities that might be impacted (e.g. Desert Botanical Garden, Phoenix Parks, and others) by the alternatives, and discuss with each the opportunities and challenges that each alternative presents. At this time we would hope to obtain a firm understanding of concerns, and determine if there are any fatal flaws in any of the alternatives.

Based on this series of meetings we would prepare the draft alternatives report including the recommended plan for submittal and review. Following the review it would be advantageous to have one more meeting with the steering committee to resolve any conflicts in review comments in the presentation of the recommended plan. Final comments would be incorporated into the Alternative Analysis Report.

Phase II - Recommended Plan

Based on the approved Alternative Analysis Report, the recommended plan would be developed. At this phase, detailed geotechnical studies, rights-of-way, proposed resolution of utility conflicts, final hydraulic sizing and the development of energy and hydraulic grade lines, design detail sufficient to determine the cost of major project components, permit



requirements, and related analysis required to demonstrate project costs and feasibility will be undertaken.

If there is concern that the public is not favorably disposed to the recommended plan, a Public Meeting would be in order to attempt to resolve outstanding issues prior to developing the details of the recommended plan. Dependent on the degree of controversy, additional meetings may be warranted incrementally through the development of the recommended plan. Assuming no controversy, once the draft Drainage Master Plan Report is completed, a public hearing should be held to present the project concept and the impacts the recommended plan would have on the FEMA Floodplain in the study area.

Based on the review comments the project would be completed, and the final report packaged to include all scoped items, including the preparation of a CLOMR that will be submitted to FEMA.

D. Water Quality

The water quality element can be divided into several distinct levels.

The qualitative assessment of water quality can be accomplished through a review of literature and existing data bases within the Phoenix metropolitan area. We have identified four specific references related to water quality that will be useful to the study. Two of the documents were published by the USGS in 1995, and include a statistical summary and characterization of water quality data in Maricopa County. In 1994 Roland Wass, a member of our team, published a paper in cooperation with G.M. Lohse and L.A. Baker that discussed the chemical composition of runoff in Phoenix.

The qualitative assessment can further be augmented by drawing on water quality data collected by the Flood Control District on 14 urban watersheds, and by drawing on data from the USGS such as the Indian Bend Wash and Curry Road for large flood events, and for non-storm flows in the Salt River as Alma School Road, Priest Avenue, and the 51st Avenue Bridge.

Recently there have been multiple-regression equations established for the Phoenix metropolitan area which could be used to provide predictions of the loading for various quality constituents.

To assist in the quantitative analysis, Western Technologies will provide on-call services to obtain water quality sampling per a pre-determined plan of sampling developed in conjunction with District and City Staffs.

Based on this data, water quality characterization would be accomplished with recommendations developed for watershed based Best Management Practices (BMPs) that would improve water quality in the basin.

If it is determined that "end of system" treatment is warranted we would propose that various vegetative or filtration type systems be examined. These systems could include two-phased free-water surface emergent marshes, a sub-surface flow treatment wetland, or bio-filtration swales. Specific treatment types would warrant further examination based on variables such as quantity of water to be treated, desired outcome of treatment, dry -weather maintenance issues, vector control, and other related issues. These systems all could be incorporated into a mesquite bosque, or could be surrounded by cottonwood or willows providing unique and valuable habitat to this watershed.

The previously mentioned systems could be transported to the point discharges in the Indian Bend Wash; or in conjunction with point treatment, a free surface treatment wetland for low flows may be feasible in the lower reaches of Indian Bend Wash.

E. Public Involvement

The first task in implementing an effective public involvement program is to identify the key "publics". We would anticipate that with this effort key constituents will include those that were flooded in the September 1995 event or that reside in the zone A floodplain, we would also anticipate the Arcadia - Camelback Neighborhood Association and the Greater East Phoenix Neighborhood Association as being interested parties due to their involvement with the recreational plans for the Cross Cut Canal. Likewise we anticipate the need to work closely with the Phoenix Parks Department, the Desert Botanical Gardens, and perhaps the Phoenix Zoo to discuss alternatives that would require the incorporation of facilities in these properties.

Kimley-Horn will manage the public involvement efforts for this project, assisted by Logan Simpson &



Dye in its implementation. Logan Simpson & Dye coordinated the public involvement effort for the Cross Cut Canal and maintains strong relationships with the Phoenix Parks department. We anticipate that Logan Simpson & Dye will assist in the coordination of special public involvement issues related to the Cross Cut Canal, and the Phoenix Parks.

Between KHA and Logan Simpson & Dye, presentation graphics will be developed including as needed digital image simulation.

We would propose that Tonalea Elementary School at 68th Street and Oak might serve as a suitable location for public meetings. Our selection for now is based on proximity within the study area to the most severely impacted regions of the study area. Prior to final determination we would propose a site visit to determine suitability of the facility for these purposes. In addition to news releases and newspaper advertisements we would propose that meeting notices be sent to key members of the public as identified through the various associations, and agency staffs. Interested elected officials would be invited either directly or through the Cities and District Staff.

After the initial presentations the meeting would typically break down into small work groups to get citizen input. At the first meeting we would propose that not only project specific issues be addressed, but issues of general concern be aired so that we can better understand how this project overall relates to other functions and values within these neighborhoods. The meeting would then close with a summary of issues and consensus items.

VI. Location of Work

All work will be performed in Maricopa County. Kimley-Horn's regional office located at 9201 N. 25th Avenue in Phoenix will serve as the principal office for this project. With a local staff of 45 professionals and the resources of 650 nationwide, Kimley-Horn and Associates, Inc. has more than adequate staffing available to complete this project. Additional support from Mr. Lewis and Mr. Wass will be provided in their local offices, and Mr. Eisenhardt will provide services from Kimley-Horn's Phoenix office.

Survey services will be provided on an as-needed basis on-site and from Wood-Patel's local office, at 1550 E. Missouri in Phoenix. Geotechnical and

Stormwater Sampling will be done on-site and at Western Technologies' Phoenix office. Public Involvement services will be handled locally, through Kimley-Horn and Logan, Simpson and Dye's office in Tempe.

VII. MBE/WBE

Kimley-Horn is committed to meeting or exceeding the County's 5% DBE participation goal in this project. Kimley-Horn and Associates currently has an Affirmative Action plan on file with the Public Works Contracts Administration Office.

VIII. Current Prime Consultant Contracts

Kimley-Horn currently has the following contract with Maricopa County :

Project Name: On-Call Design
County Department: Department of Transportation
Remaining Contract Amount:: \$15,000
Ending Date: July, 1996

**STANDARD
FORM (SF)
255**

Architect-Engineer
and Related Services
Questionnaire for
Specific Project

1. Project name/location for which firm is filing:

Flood Control District of Maricopa County:

Southwest Scottsdale Drainage Masterplan
Phase I

2a. Commerce Business
Daily announcement
date, if any:

N/A

2b. Agency identification
number, if any:

FCD 95-46

3. Firm (or joint-venture) name and address:

Kimley-Horn and Associates, Inc.
9201 N. 25th Avenue, Suite 150
Phoenix, Arizona 85021

3a. Name, title and telephone number of principal to contact:

W.D. Mathews, P.E., RLS
Practice Builder
(602) 944-5500

3b. Address of office to perform work, if different from item 3:

Same

4. Personnel by discipline: (List each person only once, by primary function)

<u>65</u> Administrative	<u>3</u> Electrical Engineers	<u>1</u> Oceanographers	<u>15</u> Survey Crew Members
<u>3</u> Architects	<u>0</u> Estimators	<u>10</u> Planners: Urban/Regional	<u>14</u> Design Technicians
<u>1</u> Chemical Engineers	<u>2</u> Geologists	<u>9</u> Sanitary Engineers	<u>14</u> Technical Writers
<u>105</u> Civil Engineers	<u>10</u> Hydrologists	<u>0</u> Soils Engineers	<u>100</u> Technical Support Staff
<u>7</u> Construction Inspectors	<u>8</u> Graphic Designers	<u>2</u> Specification Writers	<u>74</u> CADD Operators
<u>7</u> Draftsmen(Non-CADD)	<u>10</u> Landscape Architects	<u>22</u> Structural Engineers	<u>28</u> Systems Engineers
<u>11</u> Ecologists	<u>2</u> Mechanical Engineers	<u>4</u> Surveyors	
<u>1</u> Economists	<u>0</u> Mining Engineers	<u>130</u> Transportation Engineers	<u>658</u> Total Personnel

5. If submittal is by JOINT-VENTURE list participating firms and outline specific areas of responsibility (including administrative, technical and financial) for each firm: (Attach SF 254 for each if not on file with Procuring Office.)

Not applicable

5a. Has this joint-venture previously worked together? yes no

6. If respondent is not a joint venture, list outside key consultants/associates anticipated for this project (attach SF254 for consultants/associates listed, if not already on file with the contracting office).

Name and Address	Specialty	Worked with prime before? (Yes or No)
<p>1. Wood/Patel & Associates 1550 E. Missouri, #203 Phoenix, AZ</p>	<p>Surveying</p>	<p>Yes</p>
<p>2. Western Technologies, Inc. 3737 E. Broadway Rd. Phoenix, AZ 85040-2966</p>	<p>Geotechnical Testing Stormwater Sampling</p>	<p>Yes</p>
<p>3. Logan, Simpson & Dye 398 S. Mill Ave., Ste. 200 Tempe, AZ 85281</p>	<p>Public Involvement</p>	<p>Yes</p>
<p>4. KVL Consultants, Inc. 9457 E. Davenport Dr. Scottsdale, AZ 85260</p>	<p>Flood Control Drainage</p>	<p>No</p>
<p>5.</p>		
<p>6.</p>		

7. Brief Resume of Key Personnel, Specialists, and Individual Consultants Anticipated for this Project.	
<p>a. Name and Title: William D. Mathews, P.E., RLS</p>	<p>PVSP Channel Scottsdale Road — Phoenix, Arizona. Drainage study necessary for design of one mile of flood control channel adjacent to Scottsdale Air Park. Prepared plans, specifications, and contract documents for construction of a storm drain from Greenway Road to Thunderbird Road.</p> <p>Skunk Creek Bridge at 51st Avenue, Phoenix, Arizona. Principal-in-Charge for preparation of plans, special provisions, and contract documents for this new 6-lane roadway currently under construction, with curb, gutter, sidewalk and surface drainage. Also included was a major waterline, storm drain, bike path and a 150' bridge over Skunk Creek. Scope of work included: HEC-2 analysis and scour study for Skunk Creek Bridge; relocation of Skunk Creek for bridge crossing (obtained Section 404 Permit); drainage study and street drainage design; design of water line in street and through bridge; and design of a 105' bridge with necessary bank protection.</p> <p>Phoenix Country Day School Master Plan, Cuida City Wash — Phoenix, Arizona. Forty-acre campus master plan to include retention basin with joint recreational facilities. Scope of work included pump design for de-watering prior to channel outlet construction. This project required close coordination with the Flood Control District of Maricopa County, and is the inlet for Reach 4 of the Arizona Canal Diversion Channel.</p> <p>Greenway Parkway at Cave Creek — Phoenix, Arizona. Bill Mathews was in charge of hydraulic analysis and drainage elements associated with the preparation of construction plans and specifications for 3.5 miles of new roadway. Portions of the scope of work included: a 345-foot bridge design with very tight hydraulic constraints; extensive channel work to provide erosion protection and allow maximum channel flow capacity; box culverts; new six-lane street along banks of Cave Creek Wash with raised median and surface drainage.</p> <p>Dry Beaver Creek Bridge — Yavapai County, Arizona. Kimley-Horn staff recently utilized HEC-2 to provide design parameters for the replacement of the existing Dry Beaver Creek Bridge in Yavapai County. This study included the determination of the minimum low chord elevation for the proposed bridge and evaluation of scour susceptibility. The scope also included recommendations for bank protection as a result of the velocities indicated by the model.</p> <p>Regulatory Projects:</p> <ul style="list-style-type: none"> • 404 Permit applications made for 45 sand and rock mining operations in Arizona, California and Nevada. Related 401 permit applications also prepared and submitted. • Four recommendations for LOMR's submitted to and approved by FEMA. • Stormwater Pollution Prevention Plans prepared for Ft. Huachuca, AZ and AMSA 17 in Phoenix, AZ. • Over 60 Defense Environmental Restoration Authority - formerly used as a defense site (DERP-FUDS) prepared for Corps of Engineers in Arizona, California and Nevada.
<p>b. Project Assignment: Principal in Charge QC/QA</p>	
<p>c. Name of Firm with which associated: Kimley-Horn and Associates, Inc.</p>	
<p>d. Years experience: With this Firm <u> 1 </u> With other Firms <u> 33 </u></p>	
<p>e. Education: Degree(s) / Year / Specialization BS / 1960 / Civil Engineering BA / 1973 / Public Administration</p>	
<p>f. Active Registration: Year First Registered / Discipline Professional Engineer in Arizona and California Registered Land Surveyor in Arizona</p>	
<p>g. Other Experience and Qualifications relevant to the proposed project:</p> <ul style="list-style-type: none"> • 33 years of civil engineering experience specializing in drainage and water resources • Former Chief, Planning Branch, Arizona Department of Water Resources • Former General Manager, Flood Control District of Maricopa County <p>Arizona Canal Diversion Channel — Phoenix, Arizona. Bill Mathews served as project manager for the preparation of a HEC-2 model for a flood control channel/box culvert structure which crosses diagonally through the intersection of a six-lane divided highway and a five-lane city arterial street. The HEC-2 model was used to analyze the scour potential for the unlined stream bed, size the box culverts, and provide for an overflow inlet to the forebay of the box culverts. This project required close coordination with the Flood Control District of Maricopa County, United States Soil Conservation Service, City of Mesa, ADOT, and the RWCD throughout the duration of this project.</p> <p>Agua Fria River Bank Stabilization — El Mirage, Arizona. This project provided erosion control/bank stabilization and flood control for the Agua Fria River from Olive Avenue to Northern Avenue (one mile). Studies include reviewing all existing hydrology, HEC-2 analyses and numerous soil boring logs. Levee repair and replacement was required and the necessary design prepared. Section 404 and 401 certifications were obtained for the</p>	

7. Brief Resume of Key Personnel, Specialists, and Individual Consultants Anticipated for this Project.	
a. Name and Title: Doug Plasencia, P.E.	<ul style="list-style-type: none"> Task force member in the development of an Unified National Program for Floodplain Management Former Chief of Watershed and Floodplain Management, the Flood Control District of Maricopa County <p>Yavapai County Fairgrounds — Prescott, Arizona. Developed drainage study and design for the development of the new fairgrounds site. Project involves preparation of a preliminary plan for relocating the Yavapai County Fairgrounds from the existing 60-acre site to a new 210-acre site. Improvements include parking, roadway access, horse track, and other related buildings. Facilities to be relocated include all exhibition buildings, concessions, a 5/8 mile horse racetrack, a full professional rodeo arena with grandstands (capacity 2,000), stables for 1,200 horses, parking, access, and related infrastructure. Current project.</p> <p>Estancia Phase 3, 2B, Access Road, and Clubhouse — Scottsdale, Arizona. Project/ Task Manager for this project utilizing an existing master drainage study. Developed estimates of offsite flows and estimates of pavement drainage for sizing culverts, storm drain systems, and drainage easements for this master planned community in Scottsdale. Project completed in 1995.</p> <p>Gates Development — Phoenix, Arizona. Developed master retention design, and site drainage design for the development of a 164 acre parcel. Mixed use site including commercial/retail, business park, apartments, and school sites. Difficult site due to onsite floodplain, and impacts of I-10 and an SRP canal on site drainage. Current Project.</p> <p>A Master Watershed Study for 48th Street and Ray Road — Phoenix, Arizona. Project/ Task Manager for development of a detailed hydrology model including numerous flow diversions, retention/detention basins, and split flow analyses using hydrology model HEC-1 to analyze a flood prone region in south east Phoenix. The study was used to quantify flow rates and volumes impacting the Gates Property and to provide a concept design for dealing with very high rates of offsite flow impacting the site. The study also served a secondary objective of providing a portion of the watershed analysis in support of the 48th Street and Chandler Community Improvement District, in the event this CID is implemented. Project completed.</p> <p>US Route 180 - Fine Street — Flagstaff, Arizona. Project/Task Manager for drainage design for the upgrades and improvements of US route 180 at Fine Street in Flagstaff. Developed hydrology, storm drain capacities, and recommendations for improving pavement drainage from several areas along the roadway alignment. Project completed.</p> <p>Rezoning for a Resort Facility at 110th Street and Shea — Scottsdale, Arizona. Project/ Task Manager for drainage report to support the rezoning of 25 acres at 110th and Shea. Report provided estimates of offsite hydrology, concept design for conveyance of offsite flows, and concept design of site retention facilities.</p>
b. Project Assignment: Project Manager/Engineer	
c. Name of Firm with which associated: Kimley-Horn and Associates, Inc.	
d. Years experience: With this Firm <u><1</u> With other Firms <u>13</u>	
e. Education: Degree(s) / Year / Specialization BS / 1982 / Forest Resource Management MS / 1988 / Watershed Management	
f. Active Registration: Year First Registered / Discipline Professional Engineer in Arizona and Virginia	
g. Other Experience and Qualifications relevant to the proposed project: Doug Plasencia's area of expertise is hydrology, hydraulics, drainage, flood control, floodplain management and mapping, and hazard mitigation. As Chief of Flood Protection for the State of Virginia, he worked extensively in the planning and implementation of flood loss reduction strategies and projects. As Chief of Watershed Management and Chief of Floodplain Management for the Flood Control District of Maricopa County, he led the development of floodplain mapping and the development of watershed hydrology projects. Heavily involved in area drainage master study development, safety of dams analysis, regulatory process and review, and a wide range of public and private works, Mr. Plasencia's national expertise is widely regarded. Recently, he served as an expert reviewer of the National Academy of Sciences report on flood control options in the American River Basin of California. He is one of twelve people nationally appointed to the Advisory Board to the Director of the Federal Emergency Management Agency (FEMA), has been invited to testify before Congress on three occasions regarding floodplain management policy and programs.	
<ul style="list-style-type: none"> 12 years of specialized experience in drainage, floodplain management and hazard mitigation Co-author of comprehensive statewide floodplain management plan Advisor to Director of Federal Emergency Management Agency (FEMA) 	

7. Brief Resume of Key Personnel, Specialists, and Individual Consultants Anticipated for this Project.

a. Name and Title: Daniel E. Sagramoso, P.E.

b. Project Assignment: Public Involvement and Local Policy

c. Name of Firm with which associated:

Kimley-Horn and Associates, Inc.

d. Years experience: With this Firm <1 With other Firms —

e. Education: Degree(s) / Year / Specialization

MS / 1972 / Industrial Engineering
 BS / 1964 / Civil Engineering
 BS / 1955 / Secondary Education

f. Active Registration: Year First Registered / Discipline

Professional Engineer in Arizona and Missouri

g. Other Experience and Qualifications relevant to the proposed project:

Dan Sagramoso has over 30 years experience in civil engineering including planning, design, construction, maintenance, and managing a full complement of services for transportation and flood control and stormwater management projects. Prior to joining KHA, Mr. Sagramoso was Chief Engineer and General Manager of the Flood Control District of Maricopa County, which contains over 9000 square miles, including the greater Phoenix metropolitan area. In that capacity, he managed programs in maintenance, stormwater quality, floodplain and drainage regulation, property management, flood warning, and the planning, design and construction of capital improvements. In addition to county/city funded projects, he managed the District's partnership with federal agencies in completing over \$600 million in flood control structures. This experience included obtaining the necessary Federal, State, and local clearances and permits. Mr. Sagramoso served as Director of the Maricopa County Department of Transportation, which managed a system of 2000 miles of paved and 1000 miles of unpaved roads, with annual budgets of \$70 to \$100 million. He also served in a variety of professional capacities with the U. S. Army Corps of Engineers, including Deputy District Engineer in Charleston District, South Carolina, where he worked on drainage studies, and flood control project design and construction.

- American Society of Civil Engineers (Past President, Arizona Section)
- National Association of Flood and Stormwater Management Agencies (Past National President)
- Chief Engineer & General Manager, Flood Control District of Maricopa County, AZ, 1994-95
- Director, Maricopa County Department of Transportation, AZ, 1991-94
- Chief Engineer & General Manager, Flood Control District of Maricopa County, AZ, 1982-91

7. Brief Resume of Key Personnel, Specialists, and Individual Consultants Anticipated for this Project.	
a. Name and Title: Suzanne M. Sheaffer, EIT	<p>Lake Las Vegas — Nevada. Performed hydrologic analysis/drainage design for parcels 33 and 32 (47 acres), and parcel 22 (26 acres).</p> <p>McCarran International Airport — Las Vegas, Nevada. Water Distribution System Master Plan.</p> <p>Environmental Permitting for: Salt River Sand and Rock (4 sites) Aztec Materials (2 sites) Pioneer Sand Company Arizona Crushing (3 sites) Yavapai Materials (2 sites) United Metro Mesa Materials, Inc. Sunland Salt and Gravel Sun State Rock and Materials Corporation Canyon Sand Fort Mohave Indian Tribe</p>
b. Project Assignment: Hydraulics	
c. Name of Firm with which associated: Kimley-Horn and Associates, Inc.	
d. Years experience: With this Firm <u>2</u> With other Firms <u>—</u>	
e. Education: Degree(s) / Year / Specialization BS / 1993 / Civil Engineering	
f. Active Registration: Year First Registered / Discipline	
g. Other Experience and Qualifications relevant to the proposed project: <p>Suzanne Sheaffer is an engineering analyst providing support to senior engineers on projects that involve hydraulic analysis, structural analysis, and data manipulation. Her responsibilities include writing technical reports, performing calculations, reviewing technical drawings, conducting field reviews, and coordinating plan preparation.</p> <ul style="list-style-type: none"> Hydrologic/hydraulic analysis, stream stability, bridge scour analysis, storm drainage systems, water distribution, and environmental permitting Proficient in computer modeling using HEC-1, HEC-2 WRPRO and TR-20 <p>Gates Development — Phoenix, Arizona. Hydraulic analysis for retention and drainage of a 164 acre parcel. Hydrologic analysis/drainage design for 1450 acres.</p> <p>Bridge Culvert at Ft. McDowell Road near intersection of Yavapai Road — Maricopa County, Arizona. Performed hydraulic analysis.</p> <p>Estancia Development — Scottsdale, Arizona. Performed hydrologic analysis/drainage design for Phase 3 (65 acres), Phase 2B (110 acres), and the Clubhouse (8 acres).</p> <p>Dry Beaver Creek Bridge — Yavapai County, Arizona. Performed hydraulic analysis for a bridge replacement on Dry Beaver Creek.</p>	

7. Brief Resume of Key Personnel, Specialists, and Individual Consultants Anticipated for this Project.

<p>a. Name and Title: James M. Eisenhardt Manager of Environmental Services</p>	<p>Chapel Hill Parking Garage — Chapel Hill, North Carolina. Conducted an environmental audit for Phase One of the site.</p>
<p>b. Project Assignment: Water Quality/Permits</p>	<p>Greensboro Northeast Loop — Greensboro, North Carolina. Wetlands evaluation, natural resource inventory, and impact statement for upgrade of Route 70 Interchange (four-mile highway).</p>
<p>c. Name of Firm with which associated: Kimley-Horn and Associates, Inc.</p>	<p>US 52 (Tolsia Highway) — Wayne and Mingo Counties, West Virginia. Wetlands evaluation for 60-mile highway.</p>
<p>d. Years experience: With this Firm <u> 2 </u> With other Firms <u> 11 </u></p>	<p>Merrick Creek Connector — Huntington, West Virginia. Wetlands evaluation and assessment of secondary/cumulative impacts for the Environmental Impact Statement for four-mile highway.</p>
<p>e. Education: Degree(s) / Year / Specialization BA / 1985 / Biology MS / 1986 / Biology</p>	<p>Berkeley Township — Ocean County, New Jersey. Natural resource inventories for 320-acre site, services included project management, wetlands surveys, endangered/threatened species, soils analysis, feasibility studies, and coastal development permits. Also provided expert testimony to agencies.</p>
<p>f. Active Registration: Year First Registered / Discipline Wetlands Delineator Certification/U.S. Army Corps of Engineers</p>	<p>Summerfield Planned Community — South Brunswick Township, New Jersey. Wetlands delineation, services to assess endangered/threatened species, and permitting of 230 acre site slated for a planned community. Also provided expert testimony to agencies.</p>
<p>g. Other Experience and Qualifications relevant to the proposed project:</p> <ul style="list-style-type: none"> • Specializes in environmental consulting and planning services, assisting clients in both the private and public sectors, often serving as an intermediary to obtain permits from environmental regulatory agencies • Has technical expertise in biology, with extensive experience in performing site assessments and assessing environmental impacts • Has performed feasibility studies, wetlands and soils delineations, aquatic flora and fauna surveys, bottom sediment surveys, biotic community/habitat potential assessments, endangered species surveys, and wetlands mitigation and site analysis <p>Landen Property (Crosland Development) — Charlotte, North Carolina. Wetlands evaluation of 350-acre site for a proposed planned community.</p> <p>Rea Road — Charlotte, North Carolina. Wetlands evaluation for section of highway.</p> <p>Triangle Towne Center — Raleigh, North Carolina. Wetlands evaluation for 120-acre site slated to be developed as a mall.</p>	

7. Brief Resume of Key Personnel, Specialists, and Individual Consultants Anticipated for this Project.	
<p>a. Name and Title: Roland D. Wass, EIT</p>	<p>Chemistry and Toxicity of Urban Stormwater and Ephemeral Streams — Maricopa County, Arizona. Contractor: United States Geological Survey. Fixed Landuse Compliance monitoring and in-stream baseline water quality development.</p>
<p>b. Project Assignment: Water Quality/Permits</p>	<p>Chemistry and Toxicity of Urban Sediments — Maricopa County, Arizona. Contractor: United States Geological Survey. Asses the potential for toxicity reduction in stormwater using detention structures.</p>
<p>c. Name of Firm with which associated: Kimley-Horn and Associates, Inc. (under contract to)</p>	<p>Dry Well Head Protection at a Vehicle Maintenance Yard — Maricopa County, Arizona. Development and assessment of begatated treatment system (Contracted Wetland) used to protect dry wells from petroleum and heavy-metal contaminated runoff.</p>
<p>d. Years experience: With this Firm _____ With other Firms _____</p>	<p>Flood Control District Groundwater Recharge Activities — Maricopa County, Arizona. Assess the technical feasibility and to facilitate municipal groundwater recharge projects within District owned flood control stuctures and rights of way.</p>
<p>e. Education: Degree(s) / Year / Specialization BS / 1987 / Aquatic Biology BS / 1991 / Civil Engineering MS / 1993 / Civil Engineering</p>	<p>Other duties included providing technical insight and developing remedial strategies for District and County pollution abatement projects in both stormwater quality and real property management areas. Provided technical expertise in the field of environmental engineering at Federal, State and Local regulatory meetings, as well as for routine Flood Control District operation and maintenance activities.</p>
<p>f. Active Registration: Year First Registered / Discipline EIT (Engineer in Training) in Arizona</p>	<p>Flood Control District of Maricopa County — Maricopa County, Arizona. Title: Hydrologist I. Formulate and design the Districts regional stormwater monitoring network. Development included design of sampling station structural and hydraulic features. Administrative duties included developing and negotiating intergovernmental agreements and joint funding agreements. Development and testing of submerged-flow vegetative treatment system (Constructed Wetland). Presentation of District stormwater management findings at national and local professional conferences.</p>
<p>g. Other Experience and Qualifications relevant to the proposed project: Tres Rios Demonstration Constructed Wetlands — Maricopa County, Arizona. Responsible for day to day operation of 14 Acre Constructed Wetland for Treating Municipal Effluent discharged from the City of Phoenix 91st Avenue Wastewater Treatment Plant.</p> <p>Flood Control District of Maricopa County — Maricopa County, Arizona. Project Manager on projects listed below:</p> <p>Flood Control District NPDES Stormwater Program — Maricopa County, Arizona. Design, establish, and manage a regional stormwater monitoring/sampling network.</p> <p>Flood Control District Best Management Plan Program — Maricopa County, Arizona. Design and conduct programs to test innovative management practices for water quality improvement in arid regions. Provide technical guidance, including modeling results and design modifications to incorporate water quality enhancements systems into future flood control structures.</p> <p>Water Quality Characterization of Urban Runoff — Maricopa County, Arizona. Contractor: United States Geological Survey. Interpretive report to develop regression equations for use in predicting annual pollutant loads from stormwater runoff.</p>	<p>Flood Control District of Maricopa County — Maricopa County, Arizona. Title: Engineering Aide. Licensing of major flood control structures with Arizona Department of Water Resources. Development of hazardous materials training requirements for District field staff. Drainage delineation and system design to correct drainage problems caused by a District channelization project in New River at a privately owned automotive facility.</p> <p>Center for Advanced Research in Transportation, Arizona State University — Tempe, Arizona. Title: Research Assistant. Assisted in the field testing and collection of airborne particulate matter using high volume cyclone samplers. Assisted in the laboratory testing and gradation of granular materials.</p>

7. Brief Resume of Key Personnel, Specialists, and Individual Consultants Anticipated for this Project.	
<p>a. Name and Title: Michael E. Kiefer, Jr., E.I. Environmental Analyst</p>	<ul style="list-style-type: none"> • He is well-versed in the rules and regulations affecting development in waterfront and environmentally sensitive areas and is involved in the rule-making process when appropriate <p>Coastal, Land Development, and Construction Projects. Twenty-three projects in Florida providing environmental planning, design, permitting (including protected species coordination and management plan development), and construction phase services.</p> <p>Marine Facilities and Waterfront Construction Projects. Sixteen projects including harbor and small boat docking facilities, seawalls, and revetment structures, providing environmental planning, design, permitting, (including water quality analysis, hydrographic survey assessment, secondary and cumulative impacts assessment, environmental impact studies, and mitigation design), and construction phase services.</p> <p>Natural Resource Assessments and Special Studies. Over 70 projects for conducting natural resource assessments and special studies such as habitat identification and evaluation, threatened, endangered and protected species studies, secondary and cumulative impacts assessment, environmental impact studies, mitigation program development and design, development feasibility studies, planning and permitting for land development projects.</p> <p>Natural Resource Documentation. Five projects providing natural resource documentation required for NEPA compliance, such as Environmental Assessments and Environmental Impact Statements which included a secondary and cumulative impacts assessment.</p> <p>Roadway and Drainage Design Projects. Eleven projects which included permitting for the management and storage of surface water from the projects.</p>
<p>b. Project Assignment: Water Quality/Permits</p>	
<p>c. Name of Firm with which associated: Kimley-Horn and Associates, Inc.</p>	
<p>d. Years experience: With this Firm <u> 9 </u> With other Firms <u> 4 </u></p>	
<p>e. Education: Degree(s) / Year / Specialization BS / 1985 / Oceanographic Technology</p>	
<p>f. Active Registration: Year First Registered / Discipline Engineering Intern/Florida Hazardous Materials Health and Safety Certification/OSHA Environmental Permitting/Florida Chamber of Commerce</p>	
<p>g. Other Experience and Qualifications relevant to the proposed project: Mike Kiefer specializes in the planning, permitting, design, and analysis of waterfront land development projects and projects on or near environmentally sensitive land. He directs environmental, coastal, and civil engineering services for marina and inlet projects, erosion control and shoreline stabilization projects, beach projects, and commercial and residential developments. As a project manager, Mr. Keifer ensures that staff resources are available to conduct projects effectively, on time, and within budget. He also serves as liaison between regulatory agencies and his clients. He is well versed in the rules and regulations affecting development in waterfront and environmentally sensitive areas and is involved in the rule-making process when appropriate. He has working relationships with numerous agencies such as the South Florida and St. Johns River water management districts, the Florida Department of Environmental Protection, the U. S. Army Corps of Engineers, and the U.S. Fish and Wildlife Service.</p> <ul style="list-style-type: none"> • Specializes in planning, permitting, design, and analysis of waterfront land development projects and projects on or near environmentally sensitive land • Directs environmental, coastal, and civil engineering services for beach and inlet projects, erosion control and shoreline stabilization projects, beach projects, and commercial and residential developments 	

7. Brief Resume of Key Personnel, Specialists, and Individual Consultants Anticipated for this Project.	
a. Name and Title: Enda Melvin, P.E.	<p>San Antonio Creek — Ojai Valley, Ventura County, California. Performed HEC-2 analysis of 3 miles of natural creek; analyzed various flood protection alternatives utilizing Boss HEC-2 and 3D topography model; met with affected property owners to address their concerns.</p> <p>Malibu Valley Farms — Tract 45465 Los Angeles County, California. Performed detailed hydrological analysis of 2275 acre watershed; 81 lots on 443 acres.</p> <p>Sagebrush/Pacton Specific Plan — Palmdale, Los Angeles County, California. 436 single lots, 48 estate lots and 153 mobile homes on 1307 Acres. Performed detailed hydrological analysis of watershed. Prepared preliminary storm drain, sewer system and water system layout.</p> <p>City of Palos Verdes Estates — Los Angeles County, California. Design of three City storm drains utilizing RCP and Polyethylene pipe. Performed extensive hydraulic modeling and structural design of appurtenances. Prepared construction drawings.</p> <p>Parcel Map 21209 — City of Calabasas, Los Angeles County, California. Complete hydraulic and structural design of a 28' span, 10' high low profile, multi plate corrugated metal arch.</p> <p>Rancho Conejo — City of Thousand Oaks, Ventura County, California. 819 units on 234 Acres. Design of streets, retaining walls and storm drains.</p> <p>Tract 4213 — City of Simi Valley, Ventura County, California. 213 units on 65 Acres. Complete design of storm drain system, detention basin, streets, grading, sewers, retaining walls. Performed earthwork analysis using InterGraph's InRoads.</p> <p>Cherry Valley Country Club — Somerset County, New Jersey. 475 units, golf course on 653 Acres. Performed hydrologic analysis for entire project watershed. Performed floodplain analysis on 8 streams using HEC-2. Responsible for the hydraulic and structural design of 13 detention basin outlet structures.</p> <p>Mercer County Park Golf Course — New Jersey. Two 18 hole golf courses. Performed floodplain analysis on two creeks. Responsible for grading, drainage and soil erosion protection. Prepared sewer area study and maintenance yard site plan.</p> <p>"Thornbridge" — Plainsboro Township, Middlesex County, New Jersey. 108 Manor homes, 128 affordable units, 16 Condos on 124 Acres. Prepared hydrology studies. Responsible for detention basin analysis and design, and storm drain design.</p>
b. Project Assignment: Hydraulics	
c. Name of Firm with which associated: Kimley-Horn and Associates, Inc.	
d. Years experience: With this Firm <u> 1 </u> With other Firms <u> 7 </u>	
e. Education: Degree(s) / Year / Specialization MS / 1987 / Solid Mechanics and Structures BS / 1986 / Civil Engineering	
f. Active Registration: Year First Registered / Discipline Registered Civil Engineer in California	
g. Other Experience and Qualifications relevant to the proposed project: Enda Melvin has more than eight years of civil engineering experience for both private and public clients. His experience includes hydrology, hydraulics, storm drain design, drainage studies, grading and earthwork, street design, sewer system design, water system analysis and design, design of structures, floodplain and stream encroachment analysis site and utility plan preparation, cost and quantity estimating, and soil erosion and sediment control practices for residential, commercial, industrial, educational and public works projects. He is also proficient in the use of HEC1, HEC-2, TR20, TR55, and a variety of other related software.	
<ul style="list-style-type: none"> • Over eight years of experience in hydrology, hydraulics, storm drain design, drainage studies, floodplain and stream encroachment analysis • Formerly with the Planning and Regulatory Division of the Flood Control Department, Public Works Agency for Ventura County, California <p>Thacher Creek, Ojai Valley — Ventura County, California. Performed HEC-2 analysis of Creek to assess various flood control design alternatives.</p> <p>Live Oak Creek, Ojai Valley — Ventura County, California. Diversion of existing Creek to Ventura River. Performed extensive hydrologic modeling of diverted watershed. Performed hydraulic analysis and preliminary structural design of various alternatives for the diversion.</p>	

7. Brief Resume of Key Personnel, Specialists, and Individual Consultants Anticipated for this Project.

a. Name and Title: Daniel T. Freese, P.E.

Water Quality and Floodplain Use Permitting — Arizona. Section 404 permitting through the U.S. Army Corps of Engineers including 401 Water Quality permitting through the Arizona Department of Environmental Quality for over 35 mining and construction sites throughout the state. Floodplain use permitting and evacuation design for the same sites through numerous flood regulatory agencies.

b. Project Assignment:
Utilities/Right-of-Way

Gates Development — Phoenix, Arizona. Hydrology and drainage review of existing conditions for 280-acre site. Master Plan for drainage and retention of four separate developments within the tract. Coordinate and assist design of rerouting existing regional irrigation canal.

c. Name of Firm with which associated:
Kimley-Horn and Associates, Inc.

d. Years experience: With this Firm 2 With other Firms 9

e. Education: Degree(s) / Year / Specialization
MBA / 1989 / Business Administration
BS / 1982 / Civil and Environmental Engineering

f. Active Registration: Year First Registered / Discipline
1991 / Civil Engineering

g. Other Experience and Qualifications relevant to the proposed project:

Dan Freese offers experience in all phases of civil engineering. Working primarily in the fields of commercial development, roadway design and construction, and public works, he has performed engineering planning, design, and project management. He also has considerable experience in ALTA surveys associated with commercial development and in construction management. In the development field, he has been responsible for a wide range of projects including subdivisions, shopping centers, regional malls, shopping mall renovations, offsite streets, planning retail centers, sports complexes, business and industrial parks, multi-family residential complexes, and government facilities. Mr. Freese is also experienced in water distribution and wastewater design work including sewer lift stations, force mains, gravity collection systems, and distribution mains.

Maricopa County Flood Control District, — Phoenix, Arizona. HEC-2 analysis to determine river velocities, surface elevations, and potential scour (for United Metro). Design of crossover connection channel between two excavation pits in the Salt River bottom. Design of rock riprap slope protection.

Camelback Colonnade Mall — Phoenix, Arizona. Stormwater pollution prevention plan for a 60-acre regional shopping mall renovation during construction.

7. Brief Resume of Key Personnel, Specialists, and Individual Consultants Anticipated for this Project.	
a. Name and Title: Rob Wilfong, EIT	a. Name and Title: Mike Norby, EIT
b. Project Assignment: Hydraulics Water Quality/Permits	b. Project Assignment: Hydrology
c. Name of Firm with which associated: Kimley-Horn and Associates, Inc.	c. Name of Firm with which associated: Kimley-Horn and Associates, Inc.
d. Years experience: With this Firm <u>4</u> With other Firms <u>—</u>	d. Years experience: With this Firm <u>3</u> With other Firms <u>—</u>
e. Education: Degree(s) / Year / Specialization BS / 1991 / Civil Engineering BA / 1986 / Business Management	e. Education: Degree(s) / Year / Specialization BS / 1993 / Civil Engineering BS / 1989 / Physics
f. Active Registration: Year First Registered / Discipline EIT (Engineer in Training) in Arizona	f. Active Registration: Year First Registered / Discipline EIT (Engineer in Training) in Arizona
g. Other Experience and Qualifications relevant to the proposed project: Robert Wilfong serves as an analyst in civil engineering and roadway design. His responsibilities include preliminary engineering, design and layout, and construction cost estimates for water, wastewater, site development, and drainage projects. He has experience in irrigation system design and installation and in the development of computer models and conceptual designs for stormwater treatment areas, using HEC2, WSPRO, and Santa Barbara Urban Hydrograph models. His drainage design projects include: • Computer Modeling of Stormwater — Palm Beach County, Florida • Open Canal — Everglades Agricultural Area, Palm Beach County, Florida • Sedona Intersection Improvements — Sedona, Arizona • Large-Channel Pump Station Design for Agricultural Areas (15,000+ acres) — Palm Beach County, Florida	g. Other Experience and Qualifications relevant to the proposed project: Mike Norby is a roadway analyst with experience in transportation design, planning, and construction. His recent experience includes roadway and drainage design, AASHTO report preparation, and hydraulics/hydrology modeling using HEC-1 and HEC-2. In addition to engineering design, Mike is also responsible for supervising workload and providing quality checks for the Phoenix office CADD technicians. His broad background on a range of roadway and transportation projects has made him a versatile addition to project teams throughout the firm's West region. His drainage design projects include: • Fort McDowell Road — Fort McDowell, Arizona • Broadway Road — Phoenix, Arizona • Yavapai County, Arizona • Grand Avenue — Maricopa County, Arizona • Intersectional Improvements — Sedona, Arizona

7. Brief Resume of Key Personnel, Specialists, and Individual Consultants Anticipated for this Project.	
a. Name and Title: John Carter, AICP	a. Name and Title: Andrew Kolcz, EIT
b. Project Assignment: Geographic Information Systems (GIS)	b. Project Assignment: Geographic Information Systems
c. Name of Firm with which associated: Kimley-Horn and Associates, Inc.	c. Name of Firm with which associated: Kimley-Horn and Associates, Inc.
d. Years experience: With this Firm <u>9</u> With other Firms <u>1</u>	d. Years experience: With this Firm <u>4</u> With other Firms <u>—</u>
e. Education: Degree(s) / Year / Specialization BS / 1989 / Urban Geography	e. Education: Degree(s) / Year / Specialization BS / 1992 / Civil Engineering
f. Active Registration: Year First Registered / Discipline Member, American Institute of Certified Planners	f. Active Registration: Year First Registered / Discipline EIT (Engineer in Training) in Arizona
g. Other Experience and Qualifications relevant to the proposed project: John Carter directs Kimley-Horn's GIS development group. In this capacity, he has successfully designed and implemented spatial databases of digital graphic and nongraphic data for public and private sector clients. John has direct experience with the design of dta model (raster, vector, two-dimensional vector, surfaces) requirements for efficient data storage and processing, and the varied applications that make use of GIS. John has assisted clients to design and implement GIS for the organization of information and the design of information systems. He has experience with Arc/Info, Intergraph, MGE/ MGA, AutoCAD, Microstation, Informix, INFO, D-Base, and Paradox for the design of these information systems. He uses a three-step process of requirements definition, data architecture/strategy, and quality control to efficiently plan for the implementation of GIS: Currently, John is serving as a project manager for the Eastside Surveying, Mapping, and Mitigation Program for the expansion of Dallas/Ft. Worth International Airport. This multi-year, multi-million dollar project involves extensive base mapping and related land planning to individually track more than 2,000 parcels of land through the mitigation process; identifying and mapping utility easements, developing an airport-wide base map that interfaces with current systems, and the preparation of one Exhibit "A" property map.	g. Other Experience and Qualifications relevant to the proposed project: Andrew Kolcz is a transportation analyst specializing in traffic systems analysis and design. His technical experience includes signal warrant studies, traffic signal design, systems timing evaluations, traffic impact assessments, and field review. Andrew is currently serving as design task manager for two municipal signal design projects in Arizona. In addition, Andrew authored and produced two electronic database applications that enable ADOT to track equipment testing and operational support effort.

7. Brief Resume of Key Personnel, Specialists, and Individual Consultants Anticipated for this Project.

a. Name and Title: Matthew Jaramilla, EIT

b. Project Assignment:
Hydrology

c. Name of Firm with which associated:
Kimley-Horn and Associates, Inc.

d. Years experience: With this Firm 1 With other Firms —

e. Education: Degree(s) / Year / Specialization
BS / 1995 / Civil Engineering

f. Active Registration: Year First Registered / Discipline
Engineer in Training (EIT) in Arizona

g. Other Experience and Qualifications relevant to the proposed project:

Matthew Jaramilla is an engineering analyst providing support to senior engineers on projects that involve hydrologic analysis, drainage, and 401 and 404 permitting.

- Former internship for the City of Phoenix Engineering and Architectural Services
- Chi Epsilon National Honor Society of Civil Engineering

110th Street and Shea — Scottsdale, Arizona. Performed hydrologic drainage analysis and final reports.

Estancia — Scottsdale, Arizona. Performed hydrologic drainage analysis and final reports for Phase 3, Phase 2B, and the Clubhouse.

Fine Street — Flagstaff, Arizona. Performed hydrologic drainage analysis and final reports.

7. Brief resume of key persons, specialists, and individual consultants anticipated for this project.

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a. Name & Title: Kenneth V. Lewis, PE - President
b. Project Assignment: Associate Project Manager
c. Name of Firm with which associated: KVL Consultants, Inc.
d. Years experience: With this Firm: < 2 With Other Firms 27
e. Education: Degree(s)/Year(s)/Specialization BS/1967/Civil Engineering/University of California at Berkeley MIM/1979/International Management/American Graduate School of International Management
f. Active Registration: Year First Registered/Discipline 1985/Professional Civil Engineer

implementation of the plan was the development of a system of major and local streets; upgrading of the drainage system to reduce street flooding and upgrading of utilities to service the increased level of development. Work managed included: preliminary design of through road couplet system, CAD mapping of all utilities, detailed design of three bridges, right of way and legal descriptions for proposed roads, and a master drainage plan of the downtown area.

Project Manager for the City and Port of Long Beach, California Stormwater Master Plans and Management Programs. Work included hydrology/hydraulic analysis, automated mapping of drainage facilities, computer modeling, alternative proposals and financing and assistance to the City and Port in their NPDES requirements. Personally wrote a computerized stormwater facilities management system integrating system modeling, cost estimates and all reports to manage the drainage system.

Project Manager for the City of Scottsdale Tournament Players Golf Course. The work included the preparation of a master plan and detailed design for the required site grading, roads, drainage, water supply, sewerage and other utilities for the development of the resort, clubhouses and golf courses. The site is located in a flood retention basin constructed by the Bureau of Reclamation. The drainage study gave special consideration to the grading plan to maintain the site's existing flood storage volume. The project took two years from master planning through construction and was ready for its first tournament in January 1987.

g. Other Experience and Qualifications relevant to the proposed project:

- ◇ *President of KVL Consultants, Inc.*, a firm specializing in stormwater master planning and GIS/System Modeling integration. Project Manager for over 30 stormwater master plans and flood control projects in the US, Australia and Malaysia. Principal Faculty for APWA stormwater workshops in Phoenix, Arizona; San Diego, California; Orlando, Florida and Ottawa, Canada.
- ◇ *Project Manager for the City of Scottsdale Stormwater Master Plan and Management Program.* Project includes system inventory, hydrologic and hydraulic analysis, alternative proposals, cost estimates to upgrade facilities to current standards, the development of a capital improvement plan and consideration for financing drainage improvements and maintenance. Personally developed a windows based computerized stormwater management system integrating HEC-1, hydraulic analysis, cost estimating and CIP to a PC based GIS. System reports were automated through a menu driven database.
- ◇ *Project Manager for the City of Scottsdale Downtown Master Plan.* The City planned to redevelop downtown Scottsdale into an intensified, highly functional mixed-use center without losing its small town atmosphere. Essential for the

- ◇ *Project Manager for the preparation of the Downtown, Pima/Doubletree and Hayden/Shea Stormwater Master Plans for the City of Scottsdale.* Work included analysis of existing conditions, alternative proposals to upgrade drainage deficiencies and cost estimates.
- ◇ *Project Manager for the preparation of a comprehensive Stormwater Master Plan for the City of Kingman, Arizona.* Work included aerial mapping and ground control, preparation of a drainage design and administrative manual, hydrology/hydraulic analysis, alternative evaluations and construction estimates. The study area, sited on an alluvial fan contained 72 sq mi with contributing drainage basin of 168 sq mi.
- ◇ *Project Manager for a Stormwater Master Plan for the Federal Capital of Malaysia, Kuala Lumpur.* Advised federal and State Governments on town planning processes and responsibility for and financing of drainage improvements. Established a national Urban Drainage Unit and developed national design standards and procedures for urban drainage. Established major drainage design and flood levels for 14 new towns in Pahang Tenggara. Prepared flood mitigation and drainage plans for five other major cities in the country.

7. Brief resume of key persons, specialists, and individual consultants anticipated for this project.

a. Name & Title:

Thomas R. Gettings, R.L.S.
Survey Manager

b. Project Assignment:

Survey Manager

c. Name of Firm with which associated:

WOOD, PATEL & ASSOCIATES, INC.

d. Years experience: With This Firm 2 With Other Firms 9

e. Education: Degree(s)/Year/Specialization

f. Active Registration: Year First Registered / Discipline

1993/Professional Land Surveyor/Arizona
NICET Level III, Highway Surveys

g. Other Experience and Qualifications relevant to the proposed project:

Mr. Gettings has over 11 years of experience in land surveying. He is in charge of researching recorded documents that pertain to various types of surveys, gathering information from governmental agencies, compiling and reviewing information with crews prior to field work; reducing, checking, and calculating field notes from crews. Relevant projects include:

Yavapai County Flood Insurance Study, Yavapai County, AZ: 35 river miles of horizontal and vertical control survey together with topographic mapping. Project accomplished utilizing Global Positioning System.

Colter Channel, Maricopa County, AZ: Boundary, right-of-way, and topographic survey for this 3-1/2 mile long flood control channel including major irrigation canal and utility relocations.

Dysart Drain Improvement Project, Maricopa County, AZ: Topographic survey and field verification of physical features for this 3-1/2 mile long channel and 160-acre basin area. Included right-of-way mapping.

SR-87, Segment E, Maricopa County, AZ: Six miles of highway alignment and topographic survey for roadway design.

Dunlap & Northern Avenues Bridges/I-17 Interchange, Phoenix, AZ: Topographic survey for design of bridges for these traffic interchanges. Included aerial mapping control, right-of-way mapping, and results of survey.

Pinnacle Peak Road Bridge over Skunk Creek, Phoenix, AZ: One-half mile of field verification of topographic survey including utility locations and physical features.

New River Channelization, Peoria, AZ: Field verification of 2-1/2 miles of topographic and alignment surveying including right-of-way and utility data collection.

Solomon Bridge over the Gila River, Graham County, AZ: Boundary control and topographic mapping of the Gila River using aerial photogrammetry.

Grand Canyon Railway, Williams, AZ: Five miles of acquisition and alignment survey of undeveloped terrain for this railroad extension.

DC Ranch, North Scottsdale, AZ: Breakdown of 14 sections, obtaining permanent horizontal and vertical control points, verifying existing topo and staking of golf course and arterial roads using GPS methods.

Grand Canyon West, Hualapai Reservation, Peach Springs, AZ: Section breakdown and aerial control for future airport, restaurant, hotel, and tourist area infrastructure.

Sun Valley Parkway-ADOT, Maricopa County, AZ: Topographic survey and construction staking of over 30 miles of highway from I-10 at Palo Verde Road north around the White Tank mountains to Bell Road.

Northwest Outer Loop-ADOT, Maricopa County, AZ: 35th Avenue and Beardsley Road topographic survey and staking of a temporary intersection realignment to allow bridge construction to be performed in one phase.

7. Brief resume of key persons, specialists, and individual consultants anticipated for this project.

a. Name & Title:

Scott A. Nelson, R.L.S.

Dysart Drain Improvement Project, Maricopa County, AZ: Topographic survey and field verification of physical features for this 3-1/2 mile long channel and 160-acre basin area. Included right-of-way mapping.

b. Project Assignment:

Project Surveyor

SR-87, Segment E, Maricopa County, AZ: Six miles of highway alignment and topographic survey for roadway design.

c. Name of Firm with which associated:

WOOD, PATEL & ASSOCIATES, INC.

Dunlap & Northern Avenues Bridges/I-17 Interchange, Phoenix, AZ: Topographic survey for design of bridges for traffic interchanges. Included aerial mapping control, right-of-way mapping, and results of survey.

d. Years experience: With This Firm 3 With Other Firms 7

Pinnacle Peak Road Bridge over Skunk Creek, Phoenix, AZ: One-half mile of field verification of topographic survey including utility locations and physical features.

e. Education: Degree(s)/Year/Specialization

B.S./1984/Surveying

New River Channelization, Peoria, AZ: Field verification of 2-1/2 miles of topographic and alignment surveying including right-of-way and utility data collection.

f. Active Registration: Year First Registered / Discipline

1988/Registered Land Surveyor/Arizona
1989/Registered Land Surveyor/Nevada
NICET Level 3, Highway Surveys

Solomon Bridge over the Gila River, Graham County, AZ: Boundary control and topographic mapping of the Gila River using aerial photogrammetry.

Northwest Outer Loop Freeway: Construction staking for four miles of freeway (bridge, roadway, and major drainage).

g. Other Experience and Qualifications relevant to the proposed project:

Mr. Nelson has over ten years of professional surveying experience in the State of Arizona. He has been involved in private and public sector surveying assignments for major streets, utilities, subdivision layout, and railroad facilities. Relevant experience includes:

Yavapai County Flood Insurance Study, Yavapai County, AZ: 35 river miles of horizontal and vertical control survey together with topographic mapping. Project accomplished utilizing Global Positioning System.

Sossaman Road: Topographic survey for three miles of roadway design.

Heber-Overgaard: Control and stationing survey for three miles of State Route 260.

I-10 Vicksburg & Brenda Exits: Spread control and striping surveys for 12 miles east of Quartzsite, Arizona.

Colter Channel, Maricopa County, AZ: Boundary, right-of-way, and topographic survey for this 3-1/2 mile long flood control channel including major irrigation canal and utility relocations.

East Valley Mall: Construction staking for this 160-acre commercial development in Chandler, Arizona.

Topographic Surveys for Rest Areas: Surveys included rest areas along I- 10, I-19, I-8, I-40, and I-15 in Arizona.

7. Brief resume of key persons, specialists, and individual consultants anticipated for this project.

a. Name & Title:

Willie J. Kates, R.L.S.
Crew Chief

b. Project Assignment:

Project Crew Chief

c. Name of Firm with which associated:

WOOD, PATEL & ASSOCIATES, INC.

d. Years experience: With This Firm 4 With Other Firms 6

e. Education: Degree(s)/Year/Specialization

f. Active Registration: Year First Registered / Discipline

1994/Professional Land Surveyor/Arizona
NICET Level II

g. Other Experience and Qualifications relevant to the proposed project:

Mr. Kates' experience includes involvement with a number of complex projects for both private and public works projects. His background includes major roadways, flood control improvements, residential subdivisions, railroad, and commercial/retail projects. Relevant experience includes:

Yavapai County Flood Insurance Study, Yavapai County, AZ: 35 river miles of horizontal and vertical control survey together with topographic mapping. Project accomplished utilizing Global Positioning System for FEMA.

Colter Channel, Maricopa County, AZ: Boundary, right-of-way, and topographic survey for a 3-1/2 mile long flood control channel including major irrigation canal and utility relocations for FCDMC.

Dysart Drain Improvement Project, Maricopa County, AZ: Topographic survey and field verification of physical features for this 3-1/2 mile long channel and 160-acre basin area for the FCDMC. Included right-of-way mapping.

SR-87, Segment E, Maricopa County, AZ: Six miles of highway alignment and topographic survey for roadway design for ADOT.

Dunlap & Northern Avenues Bridges/I-17 Interchange, Phoenix, AZ: Topographic survey for design of bridges for traffic interchanges. Included aerial mapping control, right-of-way mapping, and results of survey for ADOT.

Pinnacle Peak Road Bridge over Skunk Creek, Phoenix, AZ: One-half mile of field verification of topographic survey including utility locations and physical features for the City of Phoenix.

New River Channelization, Peoria, AZ: Field verification of two and one-half miles of topographic and alignment surveying including right-of-way and utility data collection for the FCDMC.

Solomon Bridge over the Gila River, Graham County, AZ: Boundary control and topographic mapping of the Gila River using aerial photogrammetry for ADOT.

Grand Canyon Railway, Williams, AZ: Five miles of acquisition and alignment survey of undeveloped terrain for this railroad extension. Project is currently in progress.

Lake Havasu City Airport, Lake Havasu City, AZ: Surveys for runway taxiway aprons (over 11,000 feet); two miles of terminal service road including drainage, hangars, parking, aprons, and associated facilities.

Prescott Sewerline, Prescott, AZ: Topographic survey for eight miles of effluent sewer design.

48th Street Survey, Phoenix, AZ: Topographic survey for two miles of roadway for utility design.

Sossaman Road, Maricopa County, AZ: Topographic survey for three miles of roadway design west of Phoenix.

7. Brief Resume of Key Persons, Specialists, and Individual Consultants Anticipated for this Project	
<p>a. Name & Title JOHN C. ROSNER, Ph.D., P.E. Director, Geotechnical Consulting Services</p>	<p>for a single story, slab-on-grade structure. Construction consisted of load bearing masonry walls with a wood and metal roof system. Shallow spread footings bearing upon recompacted native soils or engineered fill were recommended for the foundation system.</p> <ul style="list-style-type: none"> • Commissary Building at Whitman AFB, Missouri • Package Store, Ft. Leavenworth Army Base, Kansas • New 10,000 foot runway and associated taxiways and aprons for military aircraft, B-2, at Whitman AFB, Missouri • Bartle Hall Expansion, Kansas City, Missouri • Failure analysis and rehabilitation design for the recreational dam on Clear Creek, south of Winslow, Arizona • Dam safety evaluations for Schulz, Springerville, and Apache dams in Arizona and tailings dams at Twin Buttes Mine, Sahuarita, Arizona • Geotechnical engineering on a 19-mile railroad for the Grand River Dam Authority, Vinta to Pryor, Oklahoma • Geotechnical engineering on the Squaw Peak Expressway, McDowell to Thomas Road, Phoenix, Arizona • Geotechnical exploration and testing on the Inner Loop (Papago Freeway) for the Arizona DOT through HNTB • Superhardening Project for Missile Silos for the USAF, Yuma, Arizona
<p>b. Project Assignment: Geotechnical Engineering Geophysical Investigations</p>	
<p>c. Name of Firm with which associated: Western Technologies Inc.</p>	
<p>d. Years experience: With This Firm <u>15</u> With Other Firms <u>12</u></p>	
<p>e. Education: Degree(s)/Year/Specialization Ph.D., 1969, Soil Mechanics M.S., 1961, Civil Engineering B.S., 1959, Civil Engineering</p>	
<p>f. Active Registration: Year First Registered/Discipline 1967, Civil Engineering</p>	
<p>g. Other Experience and Qualifications relevant to the proposed project: Dr. Rosner directs the Geotechnical Engineering Division at Western Technologies. He has been project manager and project principal on numerous projects during the past 27 years. Projects include earth and tailing dams, multi-story and commercial structures, exhibition halls and convention centers, interstate highway bridges and residential structures. His representative experience includes:</p> <ul style="list-style-type: none"> • ADAL Communications Project for the 107th TAC, Arizona Air National Guard, Papago Military Reservation, Phoenix, Arizona • Expansion to Commissary Building and Parking Structure, Luke AFB, Arizona. Evaluate subsurface conditions and provide geotechnical design criteria for the design of expansion and two-level parking structure. Spread foundations and drilled shafts were recommended. Lateral load analysis of the drilled shafts was performed using COM624. • Hazardous Materials Building, Luke AFB, Arizona. Subsurface exploration, laboratory analyses and foundation recommendations 	

7. Brief Resume of Key Persons, Specialists, and Individual Consultants Anticipated for this Project.

<p>a. Name & Title:</p> <p>RANDOLPH MARWIG, P.E. Geotechnical Engineer</p>	<ul style="list-style-type: none"> ● Geotechnical Engineer for Fire Station No. 49 at 40th Street and Dynamite Boulevard for the City of Phoenix.
<p>b. Project Assignment:</p> <p>Geotechnical Engineer</p>	<ul style="list-style-type: none"> ● Project Engineer for a preliminary geologic study for the 8,300 acre D.C. Ranch Development.
<p>c. Name of Firm with which associated:</p> <p>Western Technologies Inc.</p>	<ul style="list-style-type: none"> ● Geotechnical Engineer for Pima Road Trunk Line, from Dynamite to Stagecoach Roads. Fifty-four test borings and extensive seismic refraction surveys were performed along a proposed sewer trunk alignment for the City of Scottsdale.
<p>d. Years experience: With This Firm <u>2</u> With Other Firm <u>8</u></p>	<ul style="list-style-type: none"> ● Geotechnical Engineer for proposed additions and new structures at nine high schools in the Glendale Union High School District.
<p>e. Education: Degree(s) / Year / Specialization</p> <p>M.S.E., Civil Engineering, Arizona State University, 1988 B.S.E., Civil Engineering, Arizona State University, 1985</p>	<ul style="list-style-type: none"> ● Geotechnical Engineer for retail center in Phoenix, Arizona. The structures will be single-story, slab-on-grade using masonry and steel construction.
<p>f. Active Registration: Year First Registered/Discipline</p> <p>Civil Engineer, Arizona, No. 27947 Civil Engineer, California, No. 47579</p>	<ul style="list-style-type: none"> ● Project Manager for new bridge structure over Sycamore Creek on State Route 87. Geotechnical engineering services were performed for the realignment of a portion of Segment F for the Arizona Department of Transportation.
<p>g. Other Experience and Qualification relevant to the proposed project:</p> <p>Mr. Marwig has over nine years of experience as a geotechnical engineer in Arizona and throughout the western United States. Mr. Marwig has managed and been involved with large geotechnical and environmental projects in Arizona, Nevada, California, and New Mexico. He has experience managing all aspects of projects, from initial site investigations, through E.I.R. review, and construction administration. Mr. Marwig is an Associate at Western Technologies Inc. Project experience includes:</p> <ul style="list-style-type: none"> ● Project Engineer for St. Joseph's Mercy Living Center which consists of six patient care building, an administration building, a physical therapy building, and multiple spas and pools. ● Project Engineer for the three-story Department of Public Safety Crime Laboratory which will serve as the state forensic laboratory for criminal investigations. ● Project Engineer for complete geotechnical investigation and foundation design recommendations for State Farm Service Center, Tempe, Arizona. 	<ul style="list-style-type: none"> ● Project Manager for Chandler Blvd. and I-10 Overpass widening. Geotechnical engineering services for foundation design and abutments for the Arizona Department of Transportation. ● Geotechnical Engineer for proposed additions and new structures at nine high schools in the Glendale Union High School District.

7. Brief Resume of Key Persons, Specialists, and Individual Consultants Anticipated for this Project

<p>a. Name & Title ROBERT WEISS-MALIK, C.P.G. Environmental Services Director</p>	<p>Highlights of Mr. Weiss-Malik's experience include the following:</p> <ul style="list-style-type: none"> • Site Investigations, site assessments and remedial investigations - His experience with site investigations ranges from the performance of "Phase I" assessments and initial hydrogeologic studies to the management of multi-disciplinary investigations. These projects have entailed soil-gas surveys, the drilling and sampling of soil and rock, the installation of monitoring wells, geophysical surveys, sampling and laboratory analyses of groundwater/soil/air/wastes and modelling efforts. • Remedial action planning and system design - Mr. Weiss-Malik has prepared numerous "Remedial Action Plans" and has evaluated remedial options for a broad range of sites, contaminants and matrices. As part of these activities, he has designed remedial systems incorporating virtually all types of soil and groundwater remediation technologies. He has applied this experience toward the development of the "RATE Program": a unique risk and cost evaluation methodology for formulating the scope of remedial programs. • Installation and operation of remedial systems - His experience with the implementation of remedial construction programs range from clean-ups at gasoline service stations to complex corrective actions at industrial facilities. These projects have entailed the construction of systems for the recovery of groundwater, vacuum extraction of soil vapors, excavation of soil and waste, installation of caps and slurry walls, decontamination of facilities and tanks, air stripping and carbon treatment of liquids and vapors, biological treatment of soil and groundwater, and the thermal treatment of vapors, soils, and wastes. • Technical support for negotiations and litigation - Mr. Weiss-Malik has served as technical representative in a wide array of regulatory agency permitting and negotiating efforts. His experience includes the preparation of permits, technical representation at regulatory meetings, development of negotiating strategies, and negotiating assistance under "single" and "multiple" PRP situations. He has also served as a technical expert performing critical reviews and evaluations of technical documentation and providing case development services as part of trial preparation, depositions and in court.
<p>b. Project Assignment: Program Director</p>	
<p>c. Name of Firm with which associated: Western Technologies Inc.</p>	
<p>d. Years experience: With This Firm <u>1.5</u> With Other Firms <u>21</u></p>	
<p>e. Education: Degree(s)/Year/Specialization M.S., Engineering Geology, Kent State University, 1980 B.S., Geology, Kent State University, 1971</p>	
<p>f. Active Registration: Year First Registered/Discipline 1976, Certified Professional Geologist, Indiana</p>	
<p>g. Other Experience and Qualifications relevant to the proposed project:</p> <p>Mr. Weiss-Malik brings a unique blend of technical expertise and program management experience to the implementation and co-ordination of multi-disciplinary environmental projects. As a Principal and Functional Director at Western Technologies Inc. (WT), he has overall responsibility for company-wide Environmental Services operations and serves as the Director of WT's Phoenix Environmental Services division. Mr. Weiss-Malik's credentials also incorporate prior roles as a Senior Technical and Business Manager in line and staff management positions with leading environmental services firms, and, as a business consultant providing strategic planning and business development services to environmental consulting and remediation firms.</p> <p>Mr. Weiss-Malik's technical qualifications include comprehensive environmental consulting experience spanning the planning, the implementation, and, the technical, financial and administrative management of multi-disciplinary environmental programs. His background with environmental restoration applications is particularly extensive and includes experience as a technical representative in a wide array of business and regulatory negotiations and in support of litigation efforts. Through these experiences he has developed a pragmatic, objective oriented approach to the resolution of environmental problems.</p>	

7. **Brief Resume of Key Persons, Specialists, and Individual Consultants Anticipated for this Project**

<p>a. Name & Title DAVID REGONINI, R.E.A. Regulatory Affairs Manager</p>	<ul style="list-style-type: none"> ● Comprehensive environmental compliance and consulting services for a county Flood Control District. Acted as Program Manager responsible for project administration, sub contracting, and technical review. Work included regulatory analysis, hazardous waste assessment, auditing emergency response services, due diligence studies, and occupational safety inspections. ● Comprehensive Phase II/Site Investigation services of former agricultural production facilities for a Phoenix-based land development company. Acted as Project Director responsible for scoping, scheduling, budget analysis, subcontracting, and technical review. Work included all aspects of assessment at nine sites throughout twenty square miles including subsurface investigations of USTs, groundwater investigation, pesticide studies, solid waste investigations, and engineering estimates for remediation work. Coordinated and performed work with a multi-disciplinary team of engineering consultants, attorneys, asset management firms, and land development companies. ● Combined compliance audit/environmental assessment services of six golf course resort facilities in California. Acted as Technical Manager responsible for review and editing. Work included pesticide and hazardous waste issues, UST compliance and hazardous materials handling. ● Multi-media compliance consulting services for an aircraft parts reclamation facility. Served as Project Director responsible for facility compliance audits and design and implementation of a comprehensive site assessment plan to determine the surface extent of metals contamination from aluminum dross generated at the site. Developed a contingency plan, personnel training plan, waste analysis plan, and facility annual reports. Conducted personnel training to comply with RCRA criteria. Evaluated and advised the facility on waste recycling, treatment, and disposal options. Negotiated the terms and conditions of a draft bilateral consent order between the facility and ADEQ.
<p>b. Project Assignment: Regulatory Affairs and Compliance</p>	
<p>c. Name of Firm with which associated: Western Technologies Inc., Phoenix</p>	
<p>d. Years Experience: With This Firm <u>8</u> With Other Firms <u>4</u></p>	
<p>e. Education: Degree(s)/Year/Specialization B.S., Chemistry & Environmental Science, Northern Arizona University, 1983</p>	
<p>f. Active Registration: Year First Registered/Discipline 1988, AHERA Training & Accreditation, Environmental Sciences, Inc., Tucson, Arizona, #ESI #1446 1987, CERCLA/SARA Training for the State of Arizona, EPA, Phoenix</p>	
<p>g. Other Experience and Qualifications relevant to the proposed project:</p> <p>Mr. Regonini has over twelve years of diversified environmental experience including the performance and management of hundreds of Phase I assessments.</p> <p>Mr. Regonini is responsible for Regulatory Compliance and Environmental Assessment services at WT. His duties include scoping, implementation, interpretation and review of all aspects and phases of regulatory compliance and environmental assessments. Mr. Regonini is familiar with the federal RCRA, CERCLA/SARA, TSCA, UST, CWA, and NPDES programs as well as state programs in Arizona and California. He develops hazardous waste management strategies, waste disposal options, corrective actions and site closures. Mr. Regonini has served as a technical representative for numerous clients involved in negotiations with federal, state and local environmental regulatory agencies.</p> <p>Specific projects have included the following:</p> <ul style="list-style-type: none"> ● Regulatory review of above-ground storage tank requirements for a tourist railroad company. Investigated the regulatory requirements and provided the client recommendations for the installation and design of the tank system. ● Comprehensive environmental assessment services for a Phoenix-based apartment management-development company. Served as Program Manager responsible for scoping, budget management, scheduling, subcontracting, and technical review. Work includes all phases of due diligence study, compliance consulting, and third-party technical review. 	

Brief resume by person, specialist, or individual consultants anticipate for this project.	
a. Name and Title: Diane Simpson-Colebank	a. Name and Title: Mick J. Tomalczyk
b. Project Assignment: Public Participation Coordinator	b. Project Assignment: Planner
c. Name of Firm with which associated: Logan Simpson & Dye	c. Name of Firm with which associated: Logan Simpson & Dye
d. Years Experience: With this Firm <u>5.0</u> With Other Firms <u>16.0</u>	d. Years Experience: With this Firm <u>0.6</u> With Other Firms <u>14.0</u>
e. Education: Degree(s)/Year/Specialization	e. Education: Degree(s)/Year/Specialization B.S. / 1982 / Environmental Sciences
f. Active Registration: Year First Registered/Discipline 1989 / Landscape Architect - Arizona #22796	f. Active Registration: Year First Registered/Discipline
g. Other Experience and Qualifications relevant to the proposed project: Diane is a licensed landscape architect with 20 years of professional experience. Her strengths include public participation, environmental studies, agency coordination, and landscape design. She has been responsible for developing and conducting public involvement programs on complex and controversial projects. Alameda Drive Medians Design , City of Tempe. Responsibilities: Project designer, prepared graphic material for public workshop and facilitation of the workshop, construction documents. Built 1994. Sun City Median Landscape Design , Citizens Utilities, Sun City. Responsibilities: Developed the public participation program associated with the evaluation of water use and landscaping of the medians through Phase One of Sun City which involved developing a mailing list, conducting interviews with interest groups and agencies, conducting a public workshop for over 300 people, and presentation of the landscape alternatives at an Open House. Completed 1992. 44th Street Corridor Specific Plan , City of Phoenix Planning Dept. Responsibilities: Team coordination, comprehensive public involvement program, including homeowner associations and landowners, and multiple agency coordination for this 6-mile corridor land use study. Completed 1990.	g. Other Experience and Qualifications relevant to the proposed project: Mick has over 14 years of professional experience in management, design, and implementation of various environmental planning projects throughout Arizona and California. He has expertise in visual resource analysis and assessment, and preparation of computer generated image simulations, presentation graphics, and public presentation. 56th Street Realignment Study , WLB Group for the City of Phoenix. Responsibilities: Prepared two digital image simulations of the proposed realignment of 56th Street over the CAP, preparation for and attendance at public Open House. Completed 1996. 23rd Avenue Wastewater Treatment Plant Odor Control Facility , Malcolm Pirnie for City of Phoenix. Responsibilities: Preparation of visual analysis and computer image simulations of the proposed odor control improvements at the plant. Completed 1992. Cave Creek Wastewater Reclamation Plant , Malcolm Pirnie for City of Phoenix. Responsibilities: Visual impact assessment and computer image simulation preparation for the proposed 000 MGD facility. Completed 1992.

We, firm, joint venture members which best illustrates current qualifications relevant to this project (not more than 10 projects).

a. Project Name & Location	b. Nature of Firm's Responsibility	c. Project Owner's Name & Address and Project Manager's Name & Phone Number	d. Completion Date (actual or estimated)	e. Estimated Cost (in thousands)	
				Entire Project	Work For Which Firm Was/Is Responsible
(1) Dry Beaver Creek Bridge Yavapai County, Arizona	See Below	Yavapai County 225 E. Gurley St. Prescott, AZ 86301	1996	550	15%
<p>Kimley-Horn staff recently utilized HEC-2 to provide design parameters for the replacement of the existing Dry Beaver Creek Bridge in Yavapai County. This study includes the determination of the minimum low chord elevation for the proposed bridge and evaluation of scour susceptibility. Counter measures for scour were also developed. The scope also included recommendations for bank protection as a result of the velocities indicated by the model.</p>					
(2) Cholla Sanitary Landfill Flood & Erosion Protection Agua Fria River El Mirage, AZ	See Below	Browning-Ferris Industries, Inc. Phoenix District 1580 E. Elwood Phoenix, AZ 85040	1991	2,600	100%
<p>This project provided erosion control/bank stabilization and flood control for the Agua Fria River from Olive Avenue to Northern Avenue (1 mile). Studies include reviewing all existing hydrology, HEC-IOI analyses and numerous soil boring logs. Levee repair and replacement was required and the necessary design prepared. Sec. 404 and 401 certifications were obtained for project. Also, a CLOMR was obtained from FEMA. Construction staking and contract administration was provided.</p>					

a. Project Name & Location	b. Nature of Firm's Responsibility	c. Project Owner's Name & Address and Project Manager's Name & Phone Number	d. Completion Date (actual or estimated)	e. Estimated Cost (in thousands)	
				Entire Project	Work For Which Firm Was/Is Responsible
(3) Floodplain Regulation Variance Study Gila River, Buckeye, Arizona	See Below	Ray Barber Route 1, P.O. Box 233 Laveen, AZ 85339	1986	Study	100%
Surveys and hydraulic design for Floodplain Map Amendment; LOMR obtained from FEMA. Included preparation of a revised HEC-II analysis, correcting original studies by Corps of Engineers to define Floodway limits.					
(4) PVSP Channel, Scottsdale Road Phoenix, Arizona	See Below	City of Phoenix Engineering Department 125 E. Washington St. Phoenix, AZ 85004	1986	600	100%
Drainage study necessary for design of one mile of flood control channel adjacent to Scottsdale Air Park Prepared plans, specifications, and contract documents for construction of a storm drain from Greenway Road to Thunderbird Road.					

We, firm joint venture partners, hereby certify that the qualifications listed herein are true and correct and are not more than 12 months old.

a. Project Name & Location	b. Nature of Firm's Responsibility	c. Project Owner's Name & Address and Project Manager's Name & Phone Number	d. Completion Date (actual or estimated)	e. Estimated Cost (in thousands)	
				Entire Project	Work For Which Firm Was/Is Responsible
(5) 51st Avenue - Union Hills Drive to Beardsley Road Phoenix-Glendale, Arizona	See Below	City of Phoenix Street Transportation Dept. 1034 East Madison Street Phoenix, AZ 85034-2292	Est 1992	2,500	100%
<p>Preparation of plans, specifications and contract documents for one mile of new six lane (55 MPH design) where no road exists at present. This new major arterial includes a new bridge across a major stream. Scope of work included:</p> <ul style="list-style-type: none"> * Drainage study and street drainage design * HEC-2 Analysis and scour study for Skunk Creek * Relocate Skunk Creek for bridge crossing (obtain Section 404 Permit) * Design water line in street and through bridge * Meandering sidewalk and bike paths * Define rights-of-way including drainage and slope easements and temporary construction easements * Design 150' bridge with necessary bank protection 					
(6) Arizona Canal Diversion Channel (Reach 3) Phoenix, Arizona	See Below	U.S. Army Corps of Engineers Los Angeles District 300 N. Los Angeles Street Los Angeles, CA 90012	1989	30,000	100%
<p>Prepared plans, specifications and contract documents for \$30 million project consisting of more than three miles of reinforced concrete rectangular channel and box culvert. Major work elements included:</p> <ul style="list-style-type: none"> * Concrete channel and box culvert structural design ranging in size from 22' deep by 45' wide to 24' deep by 60' wide. * Design of major street crossings. * Bridge design (including construction traffic phasing) * Tributary side flow inlet design * Landscape design and irrigation system * Incorporation of bike paths and horse trails * Design of recreation/rest area nodes 					

Work on firm's joint venture members which best illustrates current qualifications relevant to this project (list not more than 10 projects).

a. Project Name & Location	b. Nature of Firm's Responsibility	c. Project Owner's Name & Address and Project Manager's Name & Phone Number	d. Completion Date (actual or estimated)	e. Estimated Cost (in thousands)	
				Entire Project	Work For Which Firm Was/Is Responsible
(7) Gates Development Phoenix, AZ	See Below	M&B Investments 2910 E. Camelback, #180 Phoenix, AZ 85016	1996	100+	100+
<p>Hydrology and drainage review of existing conditions for 280-acre site. Master Plan for drainage and retention of four separate developments within the tract. Coordinate and assist design of rerouting existing regional irrigation canal. Major offsite flows onto site, 10+ square mile drainage area contribution. Regional detention basin and drainage channel design. Site specific detention/retention basin design for four major development parcels: commercial, retail, business industrial park, multi family housing, and educational facility and grounds. Coordination with ADOT regarding I-10 drainage facilities located downstream from the development. Includes CLOMR and LOMR regarding FEMA map revision in a flood zone "A" area.</p>					
(8) Silver Creek Wash Channel Design Bullhead City, Arizona	See Below	WMK Materials P.O. Box 31 Bullhead City, AZ 86430	1996	60	60
<p>This channel design project was required as part of a mitigation effort regarding a major drainage course by three clients in the Silver Creek Wash near Bullhead City, Arizona. Three gravel companies had been working for a number of years in violation of Section 404 requirements. Kimley-Horn was retained to bring the operations into compliance with 404 regulations and mitigate losses determined to have occurred by the Corps of Engineers. Staff members designed a channel around the encroachment of the gravel operation and a five acre mitigation plot at an offsite location, and applied for the 404 permit necessary to continue operation of the sand and gravel mine. The channel was designed to carry the 15,000 cfs 100-year flow and it included soil cement embankment stabilization.</p>					

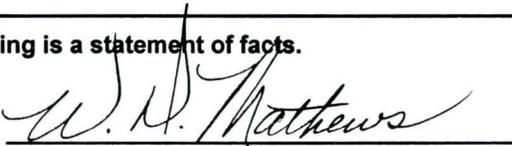
a. Project Name & Location	b. Nature of Firm's Responsibility	c. Project Owner's Name & Address and Project Manager's Name & Phone Number	d. Completion Date (actual or estimated)	e. Estimated Cost (in thousands)	
				Entire Project	Work For Which Firm Was/Is Responsible
(9) Prescott APS Service Yard Bank Stabilization Prescott, Arizona	See Below	Geraghty & Miller, Inc. 8222 S. 48th Street, #140 Phoenix, AZ 85044	1995	20	20
<p>Kimley-Horn is working with environmental issues involved in the stabilization of approximately 250 feet of bank adjacent to the APS Service Yard along Willow Creek. This bank stabilization will entail designing a shortcrete bank stabilization armory and will require a Corps of Engineers Section 404 permit, as well as a Section 401 permit. Part of the stabilization project will require the protection in place of a twelve inch sewer line and an apparent eight inch water line. This work is being performed within the ordinary highwater mark, which is in the Corps of Engineers' jurisdiction. The project design will be completed in 1995 and construction will probably occur sometime in 1996.</p>					
(10) Phoenix Country Day School Master Plan - Cudia City Wash Phoenix, Arizona	See Below	Phoenix Country Day School 3901 E. Stanford Drive Phoenix, AZ 85018 Richard McKinley	1992	1,500	100%
<p>40-Acre campus master plan to include retention basin with joint recreational facilities. Scope of work includes:</p> <ul style="list-style-type: none"> * Elementary school playgrounds * Six tennis courts * Football/soccer field * Relocation of all conflicting utilities, circulation paths and obsolete athletic facilities * Coordination with the Flood Control District of Maricopa County * Pump design for de-watering prior to channel outlet construction * Project is the inlet for Reach 4 of the Arizona Canal Diversion Channel 					

9. All work by firms or joint-venture members currently being performed directly for federal agencies.					
a. Project Name & Location	b. Nature of Firm's Responsibility	c. Project Owner's Name and Address/Project Manager's Name and Phone Number	d. Completion Date (actual or estimated)	e. Estimated Cost (in thousands)	
				Entire Project	Work for which Firm was/is responsible
Highway Engineering Services , various locations throughout the U.S.	Provide construction plans and contract documents for a variety of roadway and bridge projects, including a spur route from the Blue Ridge Parkway near Roanoke, VA, and a concrete arch bridge in Mount Rainier National Park, Pierce County, WA.	Federal Highway Administration Eastern Direct Federal Division Loudoun Tech Center 21400 Ridgetop Circle Sterling, VA 22170 Gary L. Klinedinst (703) 285-0081	N/A	\$9,500	\$9,500
Indefinite Quantity Contract for Civil Engineering and Design Services for Various Projects, Marine Corps Base, Camp Lejeune, NC	Perform field investigations/engineering design and prepare plans, specifications, and estimates for repair and resurfacing of aprons, taxiways, and runway.	Atlantic Division Naval Facilities Engineering Command Contract Office Marine Corps Base Building 1005 Camp Lejeune, NC 28542 K.H. Lacy, P.E. (919) 451-5606	N/A	\$500	\$500

10. Use this space to provide any additional information or description of resources (including any computer design capabilities) supporting your firm's qualifications for the proposed project.

11. The foregoing is a statement of facts.

Signature:



W. D. Mathews

Typed Name and Title: W.D. Mathews, P.E., RLS
Practice Builder

Date: February 28, 1996