



Attachment 8 FUNDING AND IMPLEMENTATION STRATEGIES

El Rio Watercourse Master Plan and Area Drainage Master Plan

Contract FCD 2001C024
Stantec Project No. 82000240



April 2006



Stantec

FINAL REPORT

El Rio Watercourse Master Plan

Attachment 8 Funding and Implementation Strategies

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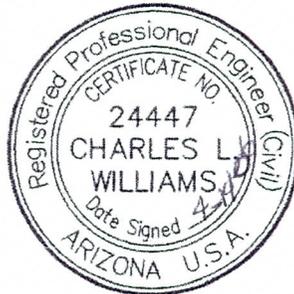
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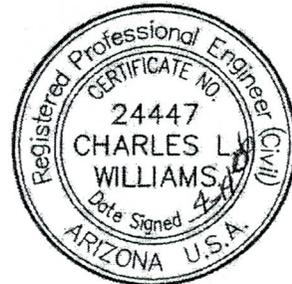


Charles L. Williams



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Charles L. Williams



INTRODUCTORY MEMORANDUM

DATE: April 14th, 2006
TO: John Hathaway
FROM: Chuck Williams *CW*
RE: EL RIO WATERCOURSE MASTER PLAN IMPLEMENTATION PLAN
OVERVIEW

STAKEHOLDER INVOLVEMENT PROGRAM APPROACH

The Stakeholder Involvement program for this project was designed and completed with the goal of maximizing implementation opportunities for the Recommended Alternative of the WMP. To achieve this end, the "3 I's" method which has been used successfully in other similar projects was utilized. Simply put, the 3 I's method of Stakeholder Involvement is to utilize a 3-Phase approach as follows:

Phase 1

Inform the stakeholders of the project at the early stages to obtain any useful knowledge they may have from a data collection standpoint as well as to receive any initial input they may have regarding scope of work or process. This was accomplished through facilitated Stakeholder Workgroups, bi-monthly Steering Committee meetings with key staff of the affected local communities (Avondale, Buckeye, Goodyear, and Unincorporated County) and at Executive Committee meetings with elected officials from the above mentioned communities. Several individual meetings were also held for those stakeholders with a unique interest (i.e. King Ranch, Arizona Game & Fish Dept., etc.). Stakeholders and their concerns/interests were identified and addressed throughout the project.

Phase 2

Involve the stakeholders throughout the course of the WMP so that they stay informed and interested in the project. This allowed for them to see the reasons how, or how not, their input would be included in the development of alternatives. This was

accomplished through the use of Workgroups, Steering Committee meetings, Executive Committee meetings as well as individual meetings. An added benefit of maintaining contact through the course of the project is that new staff members and elected officials from the agencies were educated prior to being shown the end product. Their involvement was reflected in the products throughout development of the Recommended Alternative.

Phase 3

Include the stakeholders in the process of selection of the Recommended Alternative. This was accomplished using a combination of Workgroups, Steering Committee meetings, Executive Committee meetings as well as individual meetings. Stakeholders' input was included throughout the project and was included in developing the Recommended Alternative.

IMPLEMENTATION SUMMARY

The results of the Stakeholder Involvement and Implementation Strategy are summarized below. The summary details the Recommended Alternative by reach location, improvement type (structural versus non-structural), improvement function (flood protection versus enhancement), potential improvement funding source (public versus private), potential cost sharing partners, reported public reaction to the recommended alternative (favorable versus non-favorable) and any known regulatory or permitting requirements. A more detailed description of the implementation methodology can be found in the accompanying Implementation and Funding Strategies Report. This Implementation Summary was developed iteratively and in cooperation with the affected stakeholders. It does not represent a binding legal agreement on any partners, but does provide a summary of implementation strategies to date and a roadmap for the Flood Control District of Maricopa County implementation efforts once the WMP is adopted by the Board of Directors. Many of the elements of the Recommended Alternatives are connected with other agency programs and authorities. The result is that often their schedule or funding will drive the construction timeline. Recognition of this fact by the District and planning for this in future follow through efforts will allow for cost effective and efficient construction completion. If the coordination is not continued after WMP completion, it is possible that other agencies will move ahead with their projects and not include Recommended Alternative drainage improvements.

The Recommended Alternative for this project is comprised of structural and non-structural solutions at various locations. These locations are distributed

throughout the project area and include construction and non-construction activities that will ultimately be funded in one of three ways:

- 1) Solely funded by the District.
- 2) Funded solely or in partnership among private and/or public entities including the District.
- 3) Funded solely or in partnership among private and/or public entities **not** including the District.

The Recommended Alternative was developed after extensive technical review of the drainage, infrastructure and land use conditions in the project area. Significant effort was also put forth by the project team to involve the general public, as well as public and private sector stakeholders, in development of the Recommended Alternative. The stakeholder effort was designed and carried out so as to maximize development of a Recommended Alternative that could be implemented as efficiently and cost-effectively as possible. The purpose of this memo is to summarize the key opportunities and constraints for implementation of the Recommended Alternative.

RECOMMENDED ALTERNATIVE OPPORTUNITIES AND CONSTRAINTS

The Recommended Alternative is organized into the 5 reaches of the project:

BUCKEYE TOWN LAKE REACH

TUTHILL REACH

PERRYVILLE REACH

ESTRELLA REACH

CONFLUENCE REACH

A narrative of opportunities and constraints of each of the reaches contained within the Recommended Alternative follows. The features within each reach can be characterized as those primarily necessary for flood protection and those that are primarily desired by either the public or stakeholders as enhancements. Typically for all reaches except the Perryville Reach the Recommended Alternative is a combination of soft structural features to address flood protection and non structural measures to address the desire for enhancements as well as

certain flood protection. It should be noted that certain enhancements do provide some component of flood protection and that all enhancements as proposed in the Recommended Alternative do not decrease flood protection.

BUCKEYE TOWN LAKE REACH

Structural Components

This Reach lies primarily in the Town of Buckeye but includes some area of unincorporated County. The structural component along the north side of the River in this reach will most likely be constructed by a combination of private landowners as they develop their farmland into residential urban facilities. The exception may be upstream of the SR 85 Bridge on both the north and south sides of the River which may be funded by the Arizona Department of Transportation or the Town of Buckeye. Permitting and regulatory requirements are anticipated commensurate with those associated with floodplain development such as US Army Corps of Engineers 404, etc. There was no negative feedback from the public regarding this component of the Recommended Alternative. Cost estimates for this component are \$18.2M. The Town will be the lead agency for implementation of this Reach and will be responsible for pursuing an Intergovernmental Agreement (IGA) with ADOT or the District if they pursue public funding or for requiring landowners to provide private funding as they improve their lands.

Enhancements

Enhancements in this area include development of open water lakes, marshes, cottonwood/willow corridors and mesquite bosques. The open water lakes will most likely be developed in conjunction with sand and gravel operations. The remaining features would most likely be funded as part of 404 permit mitigation efforts by the District, Town or others. Permitting and regulatory requirements are anticipated commensurate with those associated with floodplain development such as US Army Corps of Engineers 404, etc. There was no negative feedback from the public regarding this component of the Recommended Alternative. Cost estimates for this component are \$18.2M. The Town will be the lead agency for implementation of this alternative and will be responsible for requiring sand and gravel operators to construct the water features as part of their reclamation plans. Other enhancement opportunities will be pursued by individual agencies as part of their 404 permitting requirements.

TUTHILL REACH

Structural Components

This Reach lies primarily in the Town of Buckeye but includes some area of unincorporated County. The structural component along the north side of the River in this reach will most likely be constructed by a combination of private landowners as they develop their farmland into residential urban facilities and through a jointly funded Town and District project near the Tuthill Road Bridge alignment. Permitting and regulatory requirements are anticipated commensurate with those associated with floodplain development such as US Army Corps of Engineers 404, etc. There was no negative feedback from the public regarding this component of the Recommended Alternative. Cost estimates for this component are \$8.7M. The Town will be the lead agency for implementation of this alternative and will be responsible for pursuing an Intergovernmental Agreement (IGA) with the District if they pursue public funding or for requiring landowners to provide private funding as they improve their lands.

Enhancements

Enhancements in this area include development of open water features, native vegetation restoration and marshes. The open water features will most likely be developed in conjunction with 404 permit mitigation efforts by the District, Town or others. Permitting and regulatory requirements are anticipated commensurate with those associated with floodplain development such as US Army Corps of Engineers 404, etc. There was no negative feedback from the public regarding this component of the Recommended Alternative. Cost estimates for this component are \$2.2M. Enhancement opportunities will be pursued by individual agencies as part of their 404 permitting requirements.

PERRYVILLE REACH

Structural Components

This Reach lies primarily in the City of Goodyear with small portions in the Town of Buckeye and unincorporated County. The structural component along the north and south sides of the River in this reach will most likely be constructed by private landowners as they develop their farmland into residential urban facilities. Cost estimates for this component are \$14.7M. The exception may be near the eastern end of the Reach where the improvements may be funded by MCDOT, the City and King Ranch Development as they construct the planned Cotton Lane Bridge. Permitting and regulatory requirements are anticipated commensurate with those associated with major floodplain development such as US Army Corps of Engineers 404, etc. There was no negative feedback from the

public regarding this component of the Recommended Alternative. The City will be the lead agency for implementation of this alternative and will be responsible for pursuing an Intergovernmental Agreement (IGA) with MCDOT or the District if they pursue public funding or for requiring landowners to provide private funding as they improve their lands.

Enhancements

Enhancements in this area are being designed by others and include cobble strand areas, salt cedar removal and cottonwood/willow plantings. Cost estimates for this component are \$7.7M. The Town will be the lead agency for implementation of these enhancements.

ESTRELLA REACH

Structural Components

This Reach lies entirely in the City of Goodyear. The structural component along the north side of the River in this reach will most likely be constructed by a combination of private landowners as they develop their farmland into residential urban facilities. The exception may be on the southwest side of the confluence with the Agua Fria River which may be funded by public funding as part of the Programmatic Demonstration Pilot being considered at the confluence. Permitting and regulatory requirements are anticipated commensurate with those associated with floodplain development such as US Army Corps of Engineers 404, etc. There was no negative feedback from the public regarding this component of the Recommended Alternative. Cost estimates for this component are \$12.7M. The City will be the lead agency for implementation of this alternative and will be responsible for requiring landowners to provide private funding as they improve their lands.

Enhancements

River vegetative or habitat enhancements in this area are not recommended due to the fact that the majority of this reach lays within the Goodyear Airport Critical Zone for aircraft runway setbacks. There was no negative feedback from the public regarding this component of the Recommended Alternative. Cost estimates for this component are \$3.4M. The City will be the lead agency for implementation of this alternative and will be responsible for ensuring that water feature type enhancements will not be constructed in this reach.

CONFLUENCE REACH/PROGRAMMATIC DEMONSTRATION PILOT

This Reach lies primarily in the Cities of Goodyear and Avondale with some area of unincorporated County also. The Recommended Alternative in this Reach is also the location for a proposed Programmatic Demonstration Pilot. The Programmatic Demonstration Pilot has multiple features including expansion of the existing water storage lake owned by the Buckeye Conservation and Drainage District with appurtenant features such as a new concrete diversion structure and sluice gate, connection of the north side levee from the Estrella Reach to the sluice gate, development of two trailhead parking areas, re-establishment of native vegetation along the new shoreline and development of an environmental education trail. For more detailed information see the Site Selection and Project Proposal Report which has been submitted as part of the WMP. The structural component along the north side of the River in this reach will most likely be constructed by a combination of private landowners as they develop their farmland into residential urban facilities as well as a portion may be constructed with public funds as part of the Programmatic Demonstration Pilot. Permitting and regulatory requirements are anticipated commensurate with those associated with floodplain development such as US Army Corps of Engineers 404, etc. There was no negative feedback from the public regarding this component of the Recommended Alternative.

Enhancements in this area include development of open water features, native vegetation restoration and marshes. The open water features will most likely be developed in conjunction with 404 permit mitigation efforts by the District, Town or others. Permitting and regulatory requirements are anticipated commensurate with those associated with floodplain development such as US Army Corps of Engineers 404, etc. There was no negative feedback from the public regarding this component of the Recommended Alternative. Cost estimates for this component are Total cost estimates for this component including flood control features are \$29.3M. The lead agency for implementation of this alternative is yet to be determined.

Implementation Mechanisms

Significant interest has been expressed by multiple stakeholders in formation of a special District for the implementation of the El Rio WMP. Issues identified by the stakeholders for the Programmatic Demonstration Pilot which could potentially be addressed effectively by a special District include the 4 key components of the overall El Rio Implementation Strategy:

Funding Opportunities to include mechanisms for generating financial resources for capital funding of flood protection and enhancement improvements as well as maintenance funding of both.

Programs and Policies to include:

Governance: A representative body – appointed or elected – that has the ability to make and enforce decisions and monitor compliance with Plan.

Maintenance/Security/Liability: An agency that has the ability to provide an annual revenue stream for maintenance and security. The agency should also have the ability to assume ownership and liability for the project area.

Regulatory Compliance to include the ability to manage and enforce compliance with local, state and federal regulations such as an El Rio regional 404 permit for implementation of the Recommended Alternative.

Community Outreach to include the ability to use resources to fund education and participation efforts for stakeholders, elected officials and the public.

A detailed evaluation of Implementation Mechanisms including the possibility of a Special District has been conducted and is included as an appendix to this document.

An Implementation Committee composed of representatives of the communities of Avondale, Buckeye, Goodyear and the Flood Control District of Maricopa County is currently being formed. The committee will focus on funding and programming opportunities for the El Rio WMP and will further investigate the potential for a special district.

IMPLEMENTATION AND FUNDING STRATEGY MEMO FOR THE EL RIO WATERCOURSE MASTER PLAN

February 11, 2006

PROJECT ACTIVITIES FOR THE WATERCOURSE MASTER PLAN RECOMMENDED ALTERNATIVE

As described in the el Rio WMP Overview report, flood control alternatives were evaluated including structural, soft structural, non-structural, and no action. Four criteria were used to evaluate each alternative, including public safety, social, environmental and economic impacts.

The recommended alternative for all four river reaches of the El Rio project is a combination of the soft structural and non-structural alternatives. Table 1 lists proposed project improvements within four of the five reaches as developed for the recommended alternative. The fifth reach, the Confluence Reach is addressed as the Program Demonstration Pilot which is discussed later in this document.

The El Rio Watercourse Master Plan (WMP) encompasses a significant stretch of the Gila River. The WMP, sponsored by the Flood Control District of Maricopa County in collaboration with local communities and other entities, emphasizes critically needed flood control improvements along the river corridor. The Plan incorporates elements to accommodate ongoing planning, conservation and management actions in adjacent reaches of the Gila River and in the greater Gila River ecosystem.

The WMP presents a comprehensive approach that includes engineering, environmental, landscape, social and economic considerations. Proposed improvements will result in flood protection for greater public safety along the river corridor, increased recreation opportunity and improvements in

environmental resources. While these differing elements are seemingly distinct in purpose, they are proposed to be implemented in a coordinated fashion to best achieve specified overall goals.

Table 1 - Proposed El Rio WMP Recommended alternative flood mitigation, environmental, recreational, and community improvements.

| EI RIO PLANNING REACHES | FLOOD MITIGATION IMPROVEMENTS | ENVIRONMENTAL, WILDLIFE HABITAT, VEGETATION IMPROVEMENTS | RECREATION BASED IMPROVEMENTS | COMMUNITY/SOCIAL IMPROVEMENTS |
|-------------------------|--|---|---|---|
| Buckeye Town Lake Reach | <ul style="list-style-type: none"> • Levee alignment • Vegetation management | <ul style="list-style-type: none"> • Mesquite Bosque • Cottonwood corridor • Willow corridor • Cobble strand • Marsh • Wetlands • Open water | <ul style="list-style-type: none"> • Regional Trail alignment • River trail loop • Trail access points | <ul style="list-style-type: none"> • Buckeye Town Lake • Empty Acres horse facility |
| Tuthill Reach | | | | <ul style="list-style-type: none"> • River access • River vista |
| Perryville Reach | <ul style="list-style-type: none"> • Levee Alignment • Channel excavation | | <ul style="list-style-type: none"> • Regional trail alignment • Goodyear multi-use equestrian trail • Goodyear multi-use trail | <ul style="list-style-type: none"> • River vista • Cotton Lane bridge |
| Confluence Reach | <ul style="list-style-type: none"> • Levee Alignment | <ul style="list-style-type: none"> • Cottonwood, willow corridor • Cottonwood, willow enhancement site | <ul style="list-style-type: none"> • Trail head • Estrella Mt. Regional Park trail | <ul style="list-style-type: none"> • Regional multi-use equestrian trail • River access • Goodyear multi-use equestrian trail • Visitor center • Buckeye drainage district lake • Avondale trail system • Avondale equestrian trail • Vistas • Research and development site |

PROPOSED IMPLEMENTATION AND FUNDING STRATEGIES

The proposed implementation and funding strategy is developed as part of the WMP, to assure that needed future actions for implementation are considered in the planning effort. As noted in Table 1 extensive non-structural and soft structural development activities are proposed in the recommended alternative. Public safety improvements in the form of levees, bank armoring, channeling, vegetation restoration, etc. are proposed. Millions of dollars of benefit in reclaimed floodplain property are expected to be realized from these improvements. Several recreation opportunities in the form of equestrian facilities, lakes, trails and trail realignment projects are proposed. Habitat restoration will focus on native vegetation, i.e., cottonwood, willow, marsh, riparian grasses, etc. Significant programs for developing both deep and shallow water bodies are proposed adjacent to cities and towns to enhance recreation opportunities. Vistas, interpretative centers and Research & Development sites are proposed to both inform people and engage community support.

Although no specific schedules are proposed for the wide ranging activities some are implied to permit appropriate staging of projects. In this implementation and funding strategy some general guidelines are proposed for scheduling to accommodate appropriate planning, permitting, staging and funding of projects. Implementation and funding strategies incorporate key proposals for four differing elements as follows.

- Community outreach
- Program and policies
- Regulatory compliance
- Funding opportunities

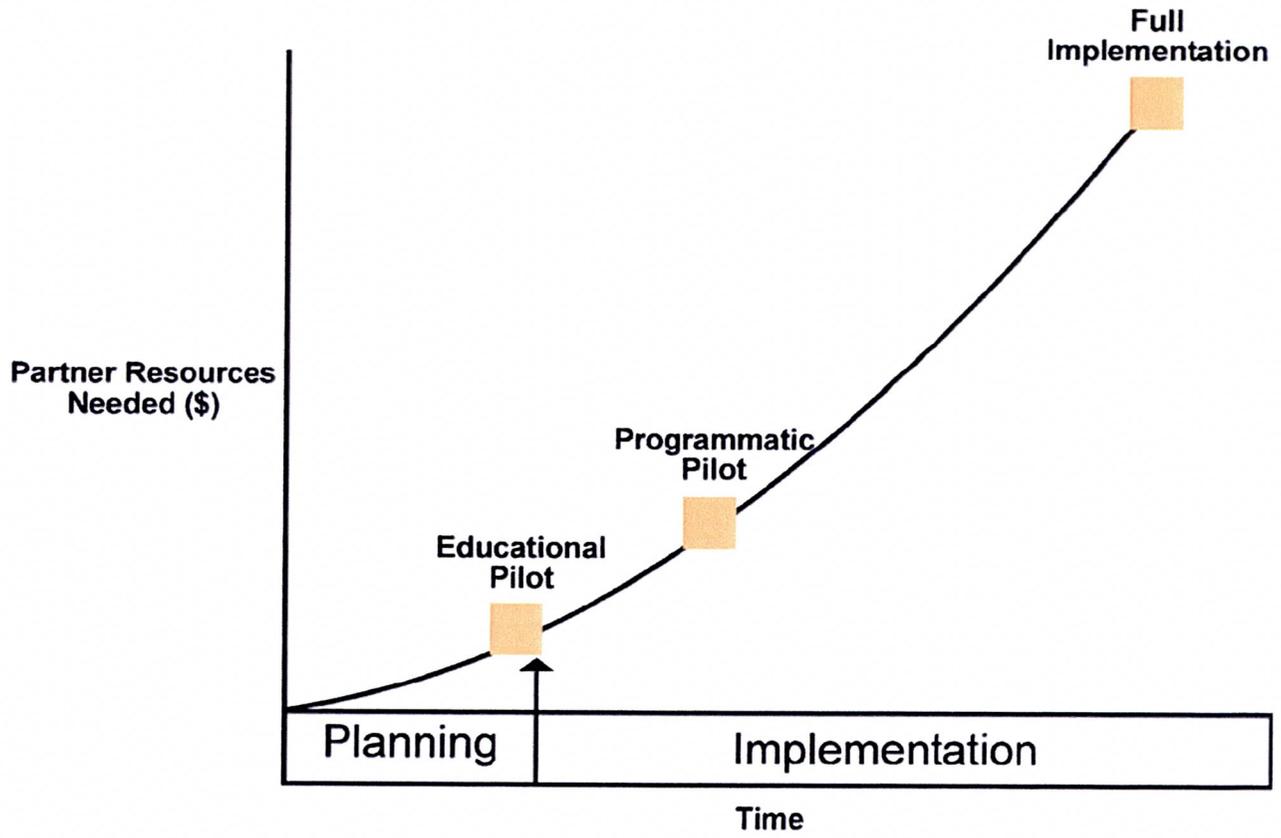
Each of these four elements will be treated in detail, but the following describes aspects of each.

The overall project will require a continued public and community outreach strategy through planning and implementation stages, to engage political, business, environmental, community and other interest groups in this rapidly developing area of the County. The implementation strategy for outreach emphasizes education, input, participation, and funding support for the various proposed programs in the WMP.

Programs and policies in the implementation strategy include adoption of the Plan by local governments as guidance for future public and private development activity. Pilot projects are proposed to transition from planning to full implementation (See the attached Implementation Timeline). Public activities proposed include locating facilities such as a new lake, recreational corridors, visitor information areas, and transportation networks in conformity with the Plan. Site development considerations such as location of commercial and residential facilities related to private development are recommended in accordance with Plan requirements.

Compliance with various laws and ordinances are specified as part of a successful implementation strategy for the Plan. These include Federal laws such as the Endangered Species Act (ESA), the Clean Water Act (Section 404 permitting) and the National Environmental Policy Act (NEPA). Strategies to respond to state regulations such as the Arizona Pollutant Discharge Elimination System program (AZPDES) and local floodplain and zoning ordinances are also proposed. Proposed public and private activities must comply with these regulations, and while they impose constraints on certain activities, they also present opportunities for implementation.

IMPLEMENTATION TIME LINE



Funding for all activities proposed in the Watercourse Master Plan is a critical aspect of the implementation strategy and will occur over the next few decades. They will require differing programs and selective funding from multiple sources. Implementation strategies and procedures are proposed to improve funding and completion of projects in a timely manner. Funding consideration may be separated into flood control activities and watercourse enhancement activities and will draw on both public and private sources. Examples of how flood control facilities can be built using public funding include use of Flood Control District tax revenues and bond funding from local governments as budgeted in annual Capital Improvement Programs. In addition, cost share programs with federal agencies such as the Bureau of Reclamation and Army Corps of Engineers can be utilized. An example might be to utilize District and Town of Buckeye funds to construct a levee upstream of the Tuthill Road Bridge and utilize federal cost share dollars to conduct river restoration activities in concert with the levee improvements. An example of how both flood control and recreation enhancements can be built by private funding includes construction of facilities by private developers as part of their project infrastructure and open space set-asides as required by local ordinances.

The following sections provide greater detail on these implementation and funding strategies to support the recommended alternative. The proposals acknowledge the needs and wishes of land owners, regulatory agencies, political jurisdictions and the public.

IMPLEMENTATION STRATEGY FOR COMMUNITY OUTREACH

Community outreach is a critical part of any major development project. It is especially important in the El Rio Project because of the broad base of resources, communities, agencies, interest groups and other parties affected by the program.

The developed outreach effort has been structured from the start to support the overall planning, implementation and funding strategies for the program. That is, a continued focus has been maintained and should continue in outreach efforts to engage and inform the public and gain support for specific actions over the full term of the program.

Three general periods of outreach strategies are envisioned for the El Rio Program as follows.

- Year 1-2 General community involvement and education during WMP development.
- Year 2-5 Outreach to engage select supporters in pilot projects and form implementation and funding groups.
- Year 5-10 Longer term outreach to sustain development programs.

Outreach for General Public Involvement and Education; Years 1 and 2

Gaining continued community involvement and support for the El Rio Project was initiated at the start of the planning process and is detailed in the Public Involvement Plan prepared by the District. Community involvement has included aspects of the general planning process and specific project needs and concerns.

The general public involvement process has focused on the local communities, but has also involved a broader cross section of interested parties, including agency specialists, elected officials, and special interest groups. The objective of the process has been one of continued education focused on updates in the planning process at prescribed time intervals, or at project benchmarks. Meetings have been held in Phoenix, Avondale, Buckeye and Goodyear to update the general public and specific groups on progress.

Special interest meetings have been held to discuss specific aspects of proposed activities such as pilot projects, vegetation restoration, and developed recreation such as the Buckeye Town Lake. These have been noticed as special meetings of the El Rio Project.

General public involvement for year one and two has satisfied the strategy to inform local communities as to the purpose and proposed outcomes for the El Rio Project. Over a dozen meetings have been held and education materials have been developed and distributed. Also, this first phase of the outreach program has developed an effective segue to the second phase of the outreach strategy.

An Outreach Strategy to Engage the Public and Specific Supporters in Pilot Projects and Development Groups: Years 2-5

Major flood control watershed development projects often move through the planning phase with significant outreach in public involvement, only to disengage from the public when planning is accomplished. In recent years, federal and state agencies leading special projects have taken direction from County Supervisors, and engaged the public continuously through planning, development and implementation of projects. This is critical for special projects such as El Rio, because both support for funding and gaining acceptance for actual project development is increased by maintaining public interest and involvement through outreach programs. One of the possible implementation mechanisms for the El Rio is establishment of a Special District. A useful function of such a district would be to maintain robust community outreach over the decades needed to fully implement the El Rio.

The implementation strategy for the second phase of outreach was to use pilot projects to maintain general public interest and gain monetary and collaborative support from specific sectors of the public. These efforts can also be helpful in creating longer term development groups for implementation of the total El Rio Project. Pilot programs would be expected to be completed by year five from the start of planning.

Two pilots were chosen for the El Rio Project. The first is an Educational Research & Development Pilot, having an objective to continue to inform the general public of program direction and progress. A second pilot, titled a Program Demonstration Pilot, was designed to move from education to actual project implementation. The two pilots are designed to be a formal bridge from planning to full project implementation, and can accomplish the following outcomes.

- To inform and educate all interested parties on overall El Rio goals, planned activities and expected public benefits. To maintain public interest and involvement in the project.
- To surface possible program implementation difficulties and mitigate through interaction.
- To engage potential funding sources without commitments to full program implementation. And, to develop greater interest and involvement in the full program.

The Educational Research & Development Pilot incorporates an education kiosk and tamarisk vegetation restoration demonstration at the Estrella Mtn. Regional Park. Several criteria were evaluated and are presented in a site selection report for the Educational Research & Development Pilot in another section of this report. The parking area at the roadway turnoff site has a large tri-part educational kiosk. Adjacent to the parking area in the riparian corridor is a vegetation treatment demonstration area. Both are structured to transfer significant education on the El Rio Project, and also to demonstrate the extensive nature of overall project activities.

The Program Demonstration Pilot is used in the outreach implementation strategy to transition from an emphasis on education about the El Rio to an emphasis on significant program involvement of organizations in long term support of overall El Rio program activities. It is designed to educate the public about the primary components of the El Rio Program, but the primary focus is on informing funding entities of the breadth of the overall program, and that supporting the program is a worthwhile pursuit. Instead of the one site for education and demonstration, the Program Demonstration Pilot has proposed multiple sites within the Confluence Reach where multiple concepts can be implemented.

Following is a listing of several key program elements of the El Rio Recommended Alternative proposed for the Program Demonstration Pilot Project.

- Flood mitigation
 - Armoring of erosion prone areas
 - Tamarisk management
 - Narrowing of the floodplain with levees or other structures
 - Creating ponding areas to slow water velocity and control the flow regime
- Aquatic/wildlife area enhancement
 - Establishing low profile dams, grade control structures and/or levees to create/enhance habitat
 - Riparian area habitat restoration
 - Wildlife habitat creation
- Recreation
 - Trails and picnic areas
 - Developed lakes
 - Fishing opportunities
 - Equestrian areas
- Land development
 - Levees for flood control
 - Trails for recreation
 - Sand and Gravel operations to build lakes

Outreach for Implementation of Long Term El Rio Activities: Years 5-10

The broad based flood control, recreational, social, environmental, and community associated activities proposed in the recommended alternative of the WMP are expected to require decades for implementation. An outreach program should fully engage local entities, and also maintain involvement of regional and national entities.

This project must create enhancements to the El Rio segment and benefit the total system. Many parties that have critical involvement with the larger River system are being engaged, informed and, as needed, counseled. Accomplishing this step successfully over the longer term is critical.

Effective implementation of this type of project over a 5-10 year time period requires support from partners who are not funding entities, as well as those who are approached for funding. Important in these are congressional, tribal, state, county and city leaders, federal and state resource management agencies, regulatory agencies (EPA, USFWS, ADEQ,USCOE), and members of the local and regional environmental and business communities. These parties are being engaged early on in planning and pilot program implementation. Some will become positive supporters of the project.

An outreach program for this size of project must involve federal/state/local partnerships, both because of broad objectives sought, and also because of the diverse entities and their existing authorities and responsibilities along the river corridor. An outreach approach for implementing and maintaining the project should embrace these diverse groups.

The implementation strategy proposes that outreach activities for the entire program continue upon completion of the WMP, using the pilot program for transition. The strategy should incorporate development of several groups with explicitly defined roles as follows:

- An El Rio Project Implementation Executive Committee: Policy direction, general guidance, and program approvals for implementation, outreach, funding, etc.
- Funding Specialist: Implementation of funding program; team leader of funding sub-groups; funding activity management.
- Funding Group:
 - A Federal, state, tribal, local agency group for funding is needed. The proposed lead is a regional entity such as the Flood Control District.
 - Local funding subgroup (s). Congressional, state, county, local political leadership; business, foundations, trusts, environmental, etc. Proposed lead is local town or city.

The Flood Control District of Maricopa County (FCDMC), already in a leadership position, could be the lead agency due to its flood control responsibilities and authorities, and expanded environmental authorities. It could lead the El Rio Project Executive Implementation Committee. It will be critical that the District, through new state and federal partnership authorities, also engage the Bureau of Reclamation, Corps of Engineers and Bureau of Land Management to derive potential river restoration funding. The EPA, USDA and USDI should also be engaged to provide support for necessary environmental impact assessments and resource mitigation.

A regional funding subgroup should be formed to guide implementation of the overall funding plan. It would support and help coordinate local funding groups. On these types of projects, federal funding often requires other match funds (state, county, tribal, etc.). Project designs and objectives dictate specific match funding opportunities.

A public project funding specialist should be hired by the District to assist the Executive Committee in design and implementing a specific funding plan. This

specialist would sit on the Executive Implementation Committee, and chair the Funding Group.

Local funding subgroups should be sought from communities in the four reaches to help match federal, state, local and private funding opportunities, including foundations. These small subgroups will focus on match funding that supports critical localized elements of the total program, including local area recreation programs, restoration programs, infrastructure maintenance, program management, etc. These types of funding needs are more easily supported in local communities.

POLICIES AND PROGRAMS TO ENHANCE THE IMPLEMENTATION STRATEGY

The implementation strategy is enhanced greatly by local communities and regional groups collaborating on activities, policies, programs, etc. that streamline adoption of various program elements.

Establishment of policies, agreements, zoning regulations, etc. by local and regional government leadership can greatly improve El Rio project implementation, especially in the near term. These can relate to zoning, permitting, joint approval of activities crossing multiple jurisdictions, joint approval of collaborative agreements on funding, support of pilot projects etc.

Increased flexibility in local and regional government policies greatly improves implementation. For example, overlapping federal and state government requirements exist regarding assessment procedures on any development project for every activity performed, from disposal of waste to surveys for Threatened & Endangered Species. And, as time passes local governments are entering the process with potential additional requirements, especially in regards

to water rights. To satisfy these requirements collaborative actions on legal requirements, policies, agreements will greatly enhance implementation.

Collaborative activities and partnerships on policies, programs and other necessary agreements are proposed as part of the implementation strategy in several areas. Most critical are areas of law, policy, programs and funding.

Much of the legal requirements will pertain to permitting proposed activities, especially as relates to actual site disturbance activities. Permitting needs, the primary concern here, are presented in a following section.

Policy issues relate strongly to specification on how various project activities will be implemented. Policies often vary from agency to agency, especially from federal to state and local agencies. Often projects managers, such as El Rio project managers, find themselves ensnarled in multi-agency policies that appear at cross purpose. Examples are policies relating to survey requirements prior to development regarding biological resource issues or cultural resource issues. The proposed implementation strategy for addressing multi-agency policy issues is to resolve them in the El Rio Executive Implementation Committee. A purpose of the committee will be to assist with guidance documents, to afford greater coordination among agencies and also provide mediation in areas where needed.

Pilot Programs can facilitate implementation of the larger El Rio Project. As noted, two pilots, an Educational Research & Development Pilot and a Program Demonstration Pilot are proposed. These were addressed briefly in the outreach section and are addressed in more detail in the section on funding strategies.

The Educational Research & Development Pilot program is developed to educate the public about the El Rio Project, including the relationship of flood control to habitat/restoration. It provides an opportunity for the public to become informed

about the Gila River/El Rio Program and visualize a pilot tamarisk restoration management area.

The Program Demonstration Pilot is proposed to demonstrate how community goals for the river are transformed into improvements on the ground. The Pilot has three clear missions:

1. Transform plans into an on the ground demonstration of community goals.
2. Blend community goals into activities that represent the general mosaic of interests, desires and needs of the community.
3. Utilize the project to demonstrate the extensive benefit to be gained from implementation of the Districts Watercourse Master Plan.

AN IMPLEMENTATION STRATEGY FOR ADDRESSING LEGAL REQUIREMENTS

Compliance with federal, state and local laws and ordinances is critical to effective implementation of the WMP recommended alternative. Capabilities for compliance fully exist with the extensive federal, state and local partners involved in planning the El Rio Project. However, explicit interest exists in having compliance and project activities move forward in both an efficient and effective manner. This will become a challenge due to the extent of law and regulation that will impact the project. This includes federal laws such as the Endangered Species Act (ESA), the Clean Water Act (Section 404 permitting) and the National Environmental Policy Act (NEPA). Actions to respond to state regulations such as the Arizona Pollutant Discharge Elimination System program (AZPDES) and local flood plan and zoning ordinances will also be critical in the implementation strategy.

Proposed public and private development activities in the El Rio must comply with these regulations, and while they impose constraints on certain activities, they also present opportunities for implementation. Examples of these

opportunities in accordance with the adopted Plan include restoration of certain reaches of the Gila River as part of required mitigation for Section 404 permitting of flood control or other construction activities. These restored areas would also enhance wildlife habitat values and provide passive recreational opportunities to the public. Examples of these opportunities at the local government level may include satisfying requirements for erosion hazard setbacks through open space and recreational amenities for future private developments at locations identified in the Plan.

Completion of the Plan permits identification of many areas of compliance that will be necessary. However, some areas will not be obvious until actual project designs for specific areas are formulated.

Several types of proposed activities will require permitting such as:

- Levee realignment or development
- Developed instream channels
- Armoring river banks
- Constructing visitor information and education sites
- Constructing recreation facilities including lakes, trails, road access, parks etc.

These improvements will create the greatest requirements for permitting and conformance to legal constraints. However, as noted above, effective planning and collaboration by involved agencies and local groups can create mitigation strategies that can support overall project implementation. Examples include public/private partnership with gravel operations to construct lakes, open water, park improvements, channels, wildlife improvements, etc., and public/private partnerships to create visitor information sites (VIS), vegetation management demonstration sites, trails, water habitat improvements, etc.

The latter example applies to extensive non-structural improvements in the WMP that can significantly improve access, use and enjoyment of the El Rio project area by local communities and citizens, while providing extensive improvements to wildlife habitat and native flora. Other examples include:

- Equestrian and foot trail development
- Research sites
- Native grass, forb and shrub development
- Restoring native mesquite bosques
- Restoring native cottonwood galleries
- Restoring native willow stands
- Managing tamarisk stands
- Planting native marsh species

One of the greatest difficulties in obtaining and maintaining compliance to laws, statutes, ordinances, regulations, etc., for the above improvements relates to understanding and adhering to procedure.

All federal, state and local agencies have developed guidelines and procedures for appropriate compliance to federal, state and local law, ordinances and regulations. These procedures are fully appropriate for implementation of all aspects of the El Rio Project.

A proposed strategy to improve project implementation related to compliance is to utilize the El Rio Implementation Executive Committee for development of more streamlined multi-agency procedures to assure improved compliance. The Executive Committee could provide two levels of support as follows.

1. Develop general procedures for overall coordination and completion of compliance procedures requiring multi-agency approvals.
2. Providing team assistance on specific problem areas or projects, including potential mitigation of conflict.

The above approach has been utilized successfully on local and regional programs in the west. An example in the southwest is the regional strategy adopted by federal and state agencies to mitigate conflicts regarding protection of threatened and endangered species and their habitat, reintroductions of T&ES, and general conflicts associated with T&ES on federal lands. The effort led by federal resource agencies is titled the "Southwest Strategy." It has had success at a policy level.

The Glen Canyon Dam Adaptive Management Program in USDI has focused on using an Adaptive Management Work Group (AMWG) and Technical Work Group (TWG) to work through multi-agency compliance problems associated with management actions in the Colorado River. The AMWG is a federal advisory committee, and has been effective in assisting multi-agency compliance on many management actions affecting T&ES.

**A FUNDING STRATEGY FOR THE
RECOMMENDED ALTERNATIVE AND
PILOT PROJECTS OF THE
EL RIO WMP**

The proposed recommended alternative presents diverse activities for responding to the vision articulated for the El Rio Project. Significant funding capability will be necessary over a 7-10 year period to effectively implement all the proposed projects in the recommended alternative, including the desired pilots. A funding strategy and follow up funding program will greatly assist the effort.

Funding of activities in Table 1 is proposed to address issues, opportunities and concerns identified by stakeholders in the public involvement process, including the need for:

- Flood control and property protection

- Multi-use/multi-resource programs
- Environmental restoration/protection/management of flora and fauna, cultural, and physical resources
- Managed protection from environmental degradation
- Hydrologic process restoration for both water quantity and quality
- Incorporation of established existing uses
- Expanded recreation programs

DEFINING APPROACHES TO THE FUNDING STRATEGY

Funding the El Rio WMP should and does involve the broadest cross section of interests and affected partners in outreach development and planning. The El Rio segment is but part of the Greater Gila River system and funding the recommended alternative must create enhancements to the El Rio segment as well as the total system. Parties that have critical involvement with the larger system are being engaged, informed and approached for funding support of the El Rio segment as mentioned in the Outreach Strategy section of this report.

An effective funding strategy for this type of project requires support from partners who are not funding entities, as well as those who are approached for funding. Important in these are congressional, tribal, state and local county and city leaders; regulatory agencies; members of the environmental community and members of business and agricultural communities. A developmental funding package for this size of project involves collaboration and partnerships with diverse federal/state/local entities because of broad objectives sought, and also because of the diverse interests along the corridor.

A funding strategy for implementing and maintaining the project must embrace fully all the above diverse groups across an extended time horizon. It must also present a logical approach for identifying viable funding entities and potential

partnerships. Following are elements of the strategy proposed for funding the WMP.

1. Identify and design one or more potential demonstrations or pilots and funding requirements for implementation. Specify a long term strategy for implementation and funding groups to support the El Rio Project.
2. Define activities included in the recommended alternative requiring funding support. Specify funding requirements across a 5-10 year timeline.
3. Identify potential funding entities that traditionally fund projects or project components in the recommended alternative, including the Educational Research & Development Pilot and Program Demonstration Pilot components. Identify potential support in a funding matrix.
4. Identify potential partner scenarios for funding a Program Demonstration Pilot while considering constraints and regulation criteria.
5. Utilizing the analysis of potential funding partners develop a funding scenario for an Educational Research & Development Pilot or Program Demonstration Pilot. Include specification of constraints and other requirements on direct funding as well as cost-share, land exchanges and other indirect funding options.

Developing a Formal Implementation Team and Funding Group

Planning for funding the WMP has been part of the ongoing project. As noted earlier in the outreach, policy, and compliance sections the plan for implementation and funding development should incorporate at least two groups with explicitly defined roles.

- El Rio WMP Executive Implementation Committee or Team: Develop implementation and funding plan, policy direction, general guidance and support for funding, compliance and program coordination
- El Rio WMP Funding Group or Team for design and implementation of funding programs and funding activity management.

As noted earlier, the El Rio Project Executive Implementation Committee or Team is necessary to effectively coordinate all activities to fully implement the WMP over the next 5-10 years. One of its key roles is to oversee the development of a funding group or team, and hire a fund development specialist to design and implement specific funding activities.

The El Rio WMP Funding Group or team would work closely with the funding specialist to implement the funding strategy through designed funding plans for projects or groups of projects. It would also work closely with local funding groups.

Guidelines for an Implementation and Funding Schedule

The El Rio WMP Implementation Executive Committee would be responsible for developing a specific implementation and funding plan and establishing, implementing and revising the schedule for completing all project activities of the WMP. This would require significant effort over the life of the program.

As noted earlier, planning, implementation and funding was initiated in year one by the Flood Control District of Maricopa County (FCDMC) in developing the WMP. In the second year the Educational Research & Development Pilot was developed. In the third year the Program Demonstration Pilot is being developed, to be funded in years four and five. And, the entire WMP is developed to be implemented and funded in year's five to ten.

The specific schedules for WMP individual activity implementation is to be developed by the Executive Implementation Committee led by the FCDMC. The committee, once formed, will need to structure guidelines for its implementation schedule. This schedule will directly impact and be impacted by the funding schedule. The committee should consider several factors in structuring the implementation schedule as follows.

- Issues of personal safety. Projects directed at flood mitigation or control should receive primary consideration in the program schedule. Where possible these should be integrated with projects for habitat, recreation, etc., improvements and also be given priority.
- Interdependent projects. Where completion of one project is dependant upon prior completion of another project, the initial project should be scheduled early enough to insure overall program completion in ten years.
- Issues of project or program size. Large complex projects comprised of multiple activities should be scheduled early in the program to assure time for planning and completion.
- Issues of permitting. Projects that require multiple permitting or an extended permitting process due to required surveys should be planned earlier in the program.
- Complex funding issues. Planning for large projects that require federal congressional and or state legislature support and multiple years to establish authorities for funding should begin early in the program.

Identifying Constraints to Funding Plan

Past and current local ordinances, and plans; state and federal law, and regulation; agency policy; future land use planning, etc. all present potential constraints on implementation of project components, and their viability for funding. Consideration of all of these potential obstacles/constraints in an Implementation Plan and Funding Plan is critical. The following strategies are proposed to assure consideration of all potential constraints in drafting the proposed Implementation Plan by the Executive Committee.

- Identify project constraints by engineers on proposed project components in the recommended alternative, including existing laws and ordinances, agency policy, design and operation guidelines, etc. This assessment includes potential constraints identified in the public involvement process.

- Develop a matrix of potential costs for activities in the recommended alternative. This includes engineering estimates of development cost constraints that can be mitigated.

An assessment of future funding requirements for maintenance of the El Rio Project activities in the recommended alternative depend in part on effective design and integration of project components, such as flood control, river restoration, wetland conservation, and multiple use components. Guidelines are needed to assure consistency in development of individual components and their planned integration in the riverine ecosystem.

The overarching guideline is to approach the El Rio Project Implementation Plan, in as much possible, as part of a greater riverine ecosystem. As possible, natural processes are proposed to be utilized to both modify and sustain various components of the system.

ASSESSING THE EL RIO PROJECT FUNDING CAPABILITY

With aggressive effort, even the worst planned projects can receive some funding. However, the best approach to obtain funding for a project is to accomplish as much as possible at high standards, from conceiving a needed project, through designing it well with strong public support, to marketing it effectively for funding. And, where potential obstacles exist, good approaches are developed to overcome them.

Evaluating a project for funding requires assessment of several factors that might affect success.

Project Marketability

Often resource project ideas are too narrow in scope, serving single interests, and are therefore difficult to fund. The El Rio Project focuses on a broad base of issues and opportunities that are critical to stakeholders. The original El Rio Project concept developed by local community leaders, the general design by FCDMC and the current comprehensive design by Stantec, the District and community stakeholders, are all high quality. This project has strong attributes of responding to critical needs of health and safety with a robust design to capture other issues and opportunities in the riverine corridor for valley communities. This approach has significantly enhanced marketability.

Public Support

Funding opportunity is severely impacted when limited public support exists for a project involving critical public resources, i.e., open space, water resources, riparian corridors, scenic vistas, wildlife habitat etc. This project addresses these resources, and many are in degraded condition. However, it addresses the issues with strong public support for making the resource improvements proposed in the plan. Developing this flood control project around restoration of natural attributes and resources, incorporating flood control structures and processes into the design with recreation, multiple uses, water management, etc., and doing so through a public involvement process has gained broad-based support. This broad-based project support is critical to funding entities.

Merging Public and Private Interests

Although some constraints exist, the El Rio Project has significant funding options. The most positive aspects of the program for funding is that it has merged public and private interests in its alternatives, responded to safety and protection issues using the approaches that enhance many public and private values and engaged all of these interests for continuous input during project

development. These efforts promote partnerships that actually open up funding options.

IDENTIFYING FUNDING OPPORTUNITIES

Funding opportunities for the El Rio Project exist in all levels of government, as well as in a broad expanse of national, regional and local private entities. Funding opportunities of a project are often defined by the components of the overall program, and ability to establish partnerships for the components.

The El Rio Funding Opportunity Spectrum

The following areas of project activity briefly capture the El Rio Funding Opportunity Spectrum.

- Flood control, health and safety, property protection
- Environmental enhancement, restoration
- Water quality and quantity enhancement
- Wildlife and fish enhancement
- Recreation enhancement, recreation development
- Science enhancement
- Multiple use protection/enhancement/development

In selected funding venues, several of these areas can be grouped, but parts of each will remain to form these clearly separate categories. Each area will spawn multiple project activities in the plan. The multiple activities/projects associated with each have identifiable funding venues from various divisions of government and areas in the private sector.

SPECIFYING FUNDING NEEDS FOR EL RIO WMP IMPLEMENTATION

The El Rio Project has funding needs in several key areas over a ten year development period. The areas and expected annual costs are as follows:

- Coordination and management of WMP implementation
- Outreach
- Support for a funding program, i.e., economic development specialist, funding group
- Funding to support WMP project activities
- Funds to support project maintenance

Managing WMP Implementation

To support a chairperson of the WMP Implementation Executive Committee will require annual expenditures of 10%-20% of a person/year (\$20,000). No costs are proposed to support Executive Committee members, but \$5,000 to \$10,000 annually is needed to support quarterly meetings.

Future Outreach Programs

Outreach programs need not be extensive, but annual funds of approximately \$15,000 are necessary to support at least two activities

- Brochures to update communities annually on program progress (\$5,000)
- Two meetings annually to address stakeholders concerns and update stakeholders on progress, changes, etc. (\$10,000)

Financial Support for Developing Necessary Program Funds

One-third of a person/year annually is required in the form of an economic development officer to develop necessary funds for the WMP and manage the WMP Funding Group (\$30,000). The cost is expected for years 3-9.

Annual Costs to Support Project Activities

The overall costs for 7-10 years to implement the WMP recommended alternative is estimated at \$100-\$150 million, or approximately \$10-\$15 million per year. Most of these costs (75%) will occur in the final five years of the program. Funds to implement the pilot projects are estimated at \$200,000 for the Educational Research & Development Pilot and \$20 Million for the Program Demonstration Pilot. These are one time costs in years 3, and 4 & 5

Annual Maintenance costs

Maintenance costs in out years cannot be estimated at this time, but will likely equal or exceed \$30-\$50 thousand/year. These costs can best be estimated in later stages of program implementation. As possible these costs and entities who support them should be specified in project funding plans.

POTENTIAL FUNDING ENTITIES OF THE PUBLIC AND PRIVATE SECTOR

Funds to support the broad-based activities proposed for the El Rio Project are generally not sought from one entity, but from multiple public and private entities. And, most often funding is staged across time, with large multi-year investments for infrastructure or resource base changes obtained in the first phase(s). This might include investments in flood control structures, drainage, or improvement in specific wildlife or fish enhancements. Activities such as recreation facilities and community enhancements are included in the second development phase.

Potential Funding Sources

Many of the proposed El Rio WMP Project Activities are designed to have benefits to natural resources in general as well as local communities and the public at large. As such benefits from individual projects will justify expenditures of federal, state and local public funds as well as private funds. The following

general sources of funds are most appropriate for many of the El Rio Project Activities.

- Federal agencies that are involved with natural resource management and protection such as USDA and USDI represent significant opportunities for funding, as well as regulatory and community oriented agencies such as EPA and DOE.
- Arizona state agencies of similar missions to the noted federal agencies have equal interest in successful completion of the El Rio Project, including ADEQ, ADWR and others. All provide funding opportunities.
- Regional, county and community governments also offer significant opportunities for funding, including Water Districts, Regional Economic Development Groups, cities and towns.
- Congressional leaders provide opportunities for funding in specific program areas. Especially appropriate are areas of water resource protection and management, public safety, and economic development.
- Private funding groups have significant interaction in the El Rio Project and provide opportunity for funding development for individual projects, especially those linked to community enhancement. Examples include sand and gravel operations and housing development firms.

Following is a partial listing of potential collaborators, partners and funding entities for the El Rio Project.

- Federal Government
 - Bureau of Reclamation
 - Bureau of Indian Affairs
 - Natural Resource Conservation Service
 - Army Corps of Engineers
 - Fish and Wildlife Service
 - Environmental Protection Agency
- Local Government
 - Flood Control District of Maricopa County

- Hohokam RC & D; NRCS
- Maricopa Association of Governments
- Maricopa County Board of Supervisors
- Maricopa County Farm Bureau
- Town of Buckeye
- Roosevelt Irrigation District
- Buckeye Water Conservation Drainage District
- City of Goodyear
- City of Avondale
- Maricopa County Parks and Recreation
- Maricopa County Department of Transportation
- State Government
 - Department of Game and Fish
 - State Land Department
 - Department of Natural Resource
 - Department of Water Resources
 - Department of Environmental Quality
 - Universities (ASU, U of A, NAU)
- Private Entities
 - Foundations
 - Developers (i.e., King Ranch)
 - Sand and Gravel Operators
 - Environmental Groups (i.e., Audubon)
 - Utilities (i.e., APS)

The range of potential cooperating and funding entities for this project is broad, because the program is large. Following are potential example funding entities indexed under governments (G) and private sector (P).

POTENTIAL FUNDING MATRIX, RECOMMENDED ALTERNATIVE

| POTENTIAL FUNDING ENTITIES AND PROGRAMS | PROGRAM APPLICATIONS |
|--|--|
| <p>US. Dept. of Agriculture, NRCS (G) Farmland Protection Program (FPP) http://www.nrcs.usda.gov</p> | <p>The FPP is a voluntary program that helps farmers keep private lands in agriculture production. The program supports purchase of conservation easements or other property interest. Managed by NRCS, it requires approved conservation plan by NRCS; managed through state, tribal, counties, NGO's that have farmland protection programs. Minimum 30 years on CE, although perpetual easements preferred. Funded through CCC. Limited cost share of 50% of land values.</p> |
| <p>USDA, NRCS (G) Wildlife Habitat Incentives Program (WHIP) http://www.ag.nrcs.usda.gov/agprogs/</p> | <p>The WHIP is a NRCS voluntary private landowner program to develop wildlife habitat. Utilizes a land conservation plan to implement practices. Managed by NRCS and requires limited practice on accepted lands, but ownerships retained. Programs are 5-15 years or more with cost shares for accepted programs.</p> |
| <p>USDA, NRCS (G) Resource Conservation and Development: http://www.az.nrcs.usda.gov/az/progs</p> | <p>The RC&D program is developed through local councils administered by NRCS but comprised of local community leaders. Programs can access a broad array of federal, state, local government and private funds. Activities can involve local and state governments and be applied across private ownership. Technical and coordination assistance provided in grant writing and program administration.</p> |

| POTENTIAL FUNDING ENTITIES AND PROGRAMS | PROGRAM APPLICATIONS |
|--|---|
| USDA, (G) NRCS Wetlands Reserve Program | Voluntary program for private landowners to provide technical or financial assistance to address wetland, wildlife, soils water, concerns. Achieves productive wetlands and wildlife habitat. Restores lands (70% of enrolled) to original conditions. |
| USDI, USF&WS (G) Wildlife Habitat Restoration http://www.fws.gov | The partners program is for restoration of wetlands, riparian corridors, and natural grasslands to original conditions. Private landowners are eligible. Most put land in practices for 10 years or more. Cost share of 60%. |
| USDI, USF&WS (G) Wildlife Conservation Program http://www.fws.gov | The Wildlife Conservation Programs are special grants to multiple agency sponsored projects including USFWS, state agencies and private groups or individual. The focus is to identify problems that affect habitats and fish and wildlife, conserve and improve habitats, monitoring species, and develop non-consumptive fish and wildlife programs. Provides projects grants of 100% funds. |

| POTENTIAL FUNDING ENTITIES AND PROGRAMS | PROGRAM APPLICATIONS |
|---|---|
| USDA, Farm Service Agency (G) Conservation Reserve Program http://www.fsa.usda.gov | The Conservation Reserve Program offers long-term rental payments and cost share assistance to establish long-term resource conserving cover on sensitive lands such as marginal pasture. Enrollment is based on an environmental benefits index. Individuals, tribes, estates, trusts, state, countries or local governments owning land. Land must be evaluated to enter and receive cost share payments of up to 50% to establish cover. |
| USDA, NRCS (G) <ul style="list-style-type: none"> • Watershed Protection and Flood Prevention • http://www.az.nrcs.usda.gov/azprop/ | The Watershed Protection and Flood Prevention Program focuses on watersheds or watershed area of 250,000 acres or less. The program works through local government sponsors to resolve watershed resource as well as economics issues in a watershed. Eligible entities are flood control districts, conservation districts, local or state government, Native American, Tribes, and NGOS. The program provides technical assistance and financial assistance through variable cost share arrangements. |
| USDA, NRCS (G) Environmental Quality Incentives Program (EQUIP) http://www.nhq.nrcs.usda.gov | The EQUIP program is comprehensive covering wide ranging programs for livestock and crop producing ranches/farms. It provides significant assistance in irrigated agriculture, associated activities or agricultural protection. Includes farm, ranch and forestland. Cost share at 75% of costs. |

| POTENTIAL FUNDING ENTITIES AND PROGRAMS | PROGRAM APPLICATIONS |
|---|--|
| USDA, USFS (G) Rural Community Assistance Program Economic Recovery Program | Program is focused generally on forest dependent communities, but has application to joint programs with BLM to build infrastructure of rural communities. Administered by USDA-FS. Population less than 10,000. 15% dependence on forest related industry. Economic impact due to public land issues. Grant. |
| EPA (G) Wetlands Protection Program http://www.epa.gov | The wetlands protection program is one of the largest wetlands programs in government. It funds projects that provide for habitat protection and restoration, flood loss reduction, and water quality protection. Conservation Districts, water districts, local governments, Native American Tribes, and NGOS are eligible. Program generally requires match funds. |
| Arizona ADWR (G) Non Point Source Implementation Grants: 319 Program http://www.adeq.state.az.us | The 319 program provides funds for non-point source demonstration projects. Funding from Section 319 of the Clean Water Act. Includes implementation and evaluation of best management practices for rangeland, cropland, confined feeding operations, etc. The program is to local governments, conservation districts, Native American Tribes, and nonprofit groups. Matching funds are required, but vary with project application. Individual awards can exceed \$1,000,000. |

| POTENTIAL FUNDING ENTITIES AND PROGRAMS | PROGRAM APPLICATIONS |
|---|---|
| <p>Arizona, ADWR (G)AZ Water Protection Fund http://www.land.state.az.us</p> | <p>The Arizona Water Protection Fund provides funds for water planning, research and development activities. Targeted areas include projects that protect and restore riparian areas and their water resources. Specific emphasis is on field treatments. Eligible applicants include Conservation Districts, local governments, Native American Tribes, and non-profit organizations. Match funds.</p> |
| <p>Arizona, ADF&G (G) The Heritage Fund http://www.gf.state.az.us</p> | <p>This program is jointly funded and focuses on improving wildlife and fish habitat as well as developing new habitats. Significant funds have been allocated to restoration of instream habitat and riparian habitat. Eligible entities include Conservation Districts, local governments, Native American Tribes, non-profit organizations. Matching funds are required but vary in application.</p> |

STRATEGIES FOR IMPLEMENTING AND FUNDING ELEMENTS OF THE EL RIO WMP

Many differing funding strategies can be structured to implement the El Rio WMP. In implementing a program of this scope and cost it is critical to understand several elements of a basic funding strategy as follows:

1. A very general strategy for funding should be structured for the broad based flood control program, with specific strategies to be implemented by diverse groups over multiple years. Funding support is always linked directly to programs and people, both of which are highly dynamic over space and time due to changing law, regulation, policy, budgets, managers, etc.
2. Over the timeframe represented in the El Rio Program, funding support must be responding to some oversight group which is responsible for coordinating and/or managing the overall program implementation. A Special District with a functional governance structure in place could accomplish this.
3. Funding development should be vested in an individual with professional experience in economic development and/or funding development. Further, that individual should work with a diverse group of individuals committed to providing funding support to the El Rio Project, and another committee or group charged with implementing the El Rio WMP.
4. Due to large project size the funding strategy must approach funding through multiple venues and multiple organizations and across multiple years. At least ten years of funding at levels above \$10 million per year is proposed.
5. In initial years efforts should be extended to fund smaller pilots to gain public support, demonstrate accomplishment, and work out problems.

The following elements of a general implementation and funding strategy are proposed for the El Rio WMP.

Program Coordination and Management

A **Special District** is needed to provide overall guidance, support and coordination to the various projects in the WMP proposed for implementation. Following are attributes of this proposed group that should be considered.

Funding Development

- A **Special District** is necessary to assure that funding is developed for the various projects, many of which will be planned as concurrent activities.

Multiple Funding Venues from Diverse Sources

Funding can be developed through different venues, and several should be pursued on the El Rio Project due to its size. Often venues such as the private sector or universities are not pursued due to the structure of the program. The El Rio Project design permits these and other venues to be pursued as follows:

Federal agencies are the primary funding venue for watershed projects of this scope. And although the dominant agencies are the USDA and USDI and their various divisions and bureaus, divisions of EPA and DOE are also candidates. Federal agencies should be approached as the principal lead on many aspects of the El Rio Project with other collaborators enticed to join based on the federal support.

An example of collaborative partnership funding using a federal venue that could be applied to El Rio Project activities is located in Discovery Park, Safford, Arizona. Partners in the Gila River Valley Wetlands Project committed a total of \$430,000 to restore a wetland. The project was initiated with a \$50,000 North American Wetlands Conservation Act grant through USDI. Other partners involved included.

- Arizona National Guard
- Arizona Game & Fish Heritage Fund

- Arizona Department of Water Resources
- Phelps Dodge
- Graham County
- Coronado RC&D
- BLM
- Americorp
- Mt. Graham Foundation

Discovery Park has committed to long term wetland maintenance.

Using state agencies for lead funding as a venue has become much more prominent in the last decade, due to greater fund availability to state resource agencies from state lotteries and select federal agency sources. Also, many state agencies have determined that mitigating environmental degradation is best approached through annual state funded program activity.

In Arizona, the Heritage Fund is developed with state lottery funds, and has allowed the Arizona Department of Game and Fish to become a lead agency in funding many watershed improvements. In the wetlands restoration example noted above on the Gila River, Arizona Game & Fish was a primary funding source using Heritage funds.

In the El Rio Project, even though AzG&F has a limited landownership, it has several interests and responsibilities for species enhancement, habitat enhancement etc. Improving marsh habitats, creating expanded cottonwood habitats, and open water habitats are critical to several species managed by AzG&F.

In like manner, Arizona Department of Water Resources (ADWR) and Arizona Department of Environmental Quality (ADEQ) have significant authorities and responsibilities associated with improving both water quality and quantity of the

Gila River in the El Rio reach. Both represent critical lead funding venues for water improvement projects.

Flood Control Districts and Water Conservation Districts are now venues that drive many watershed planning and development projects in the West. Higher values for water and the need to invest in better planning and conservation measures have placed many districts in the forefront in funding watershed projects that have significant flooding issues.

For the El Rio Project the FCDMC is the funding entity for development of the WMP. Further, the FCD has significant interest and responsibility in reducing flood threat and insuring public safety during future floods in the El Rio segment of the Gila River. In addition to flood control districts, water districts have also become more active in funding both watershed planning and project activities. Much of the funding targets cost share programs with other districts, counties and cities and towns.

Local governments are now an active funding venue for watershed programs. County governments have provided much of the leadership, but cities, especially larger cities in the West are spending extensive funds on water storage, water banking and watershed improvement programs. These types of expenditures are becoming common place in small cities and towns as well.

NGOs, foundations, universities, and businesses are also now venues for funding watershed programs. In some cases such as the Pacific Gas and Electric Co. of California and other hydroelectric based utilities, funding watershed management programs is commonplace. In similar fashion select research based universities and foundations with a focus on water related programs annually fund millions into various programs.

Pursuing Congressional Budget Opportunities is another venue for funding watershed programs, especially where broad based federal, state and local support exists for the programs. Utilizing this venue often requires greater advance planning, significant time involvement with political leaders and often a longer time horizon, i.e., 2-4 years for a large program. Normally a professional lobby group is approached to support the effort.

STRATEGIES FOR INCORPORATING DIFFERING VENUES IN FUNDING EL RIO WMP PILOT ACTIVITIES

As noted earlier, the Implementation Strategy for the WMP is to first develop and fund an Educational Research & Development Pilot with demonstration tamarisk treatments.

Following the Educational Research & Development Pilot, a Program Demonstration Pilot on several major WMP project activities is being developed for implementation. These two pilots will transition into funding of all activities in the WMP recommended alternative.

Following are proposed funding strategies for elements of the Educational Research & Development and Program Demonstration Pilots. Funding of other segments of the WMP is expected to proceed in like manner.

An Educational Research & Development Pilot

The goal of the Educational Research & Development Pilot is to maximize El Rio WMP information transfer to the public through visual media. The Pilot incorporates a roadside educational kiosk and tamarisk vegetation restoration demonstration in one roadway turnoff site.

Funding partners to FCDMC are required to support several areas of the Educational Research & Development Pilot. Although the Educational Research

& Development Pilot will not require extensive resources, partners are engaged that have been and continue to be critical to long-term resource development and protection in the El Rio Program. These include resource management agencies such as the Bureau of Reclamation, Corp of Engineers, Arizona Departments of Game and Fish, Environmental Quality, and Water Resources, as well as FCDMC, County government, cities, and local communities.

Examples of areas where partnerships are sought include the following:

- Direct Funds: Funds are needed to develop information and education materials, demonstration treatments, site improvements, etc.
- In-kind services: Support is needed for technical expertise, design work, site improvements, permitting, maintenance, etc.
- Land agreements: A physical site of 7-10 acres is needed.

Partners that are currently identified for involvement in the overall project include:

- Bureau of Reclamation, Corps of Engineer, and Natural Resource Conservation Service: The BOR and COE are associated with many valley watercourse projects, and can provide technical expertise and direct funds for site development, vegetation treatments, education, etc. The NRCS becomes a critical partner on projects like El Rio, where resources are needed to merge government and private ownership activities. Other federal partnerships are also being pursued.
- Arizona Departments of Game and Fish, Environmental Quality, and Water Resources: AzG&F, ADEQ and ADWR have high interest and involvement in projects involving rivers and riparian areas. They often provide in-kind services for technical needs, permitting, site evaluation, etc., and can also provide land areas, water, protection service, and direct funding. Other state agencies may also be utilized for support
- Flood Control District of Maricopa County, Maricopa County Parks Department, Maricopa County Department of Transportation, FCDMC

have provided planning support to the Educational Research & Development Pilot.

- Communities of Avondale, Buckeye and Goodyear: Counties, cities, towns and local communities are critical partners because they can contribute toward long-term maintenance of local projects. They can provide extensive in-kind services such as land for the facility, water, maintenance, monitoring, etc. to these types of projects.

Preliminary site design requires a total of 7-10 acres to effectively implement the Educational Research & Development Pilot. Information including physical characteristics and cost estimates can be found in the accompanying Site Selection and Project Proposal report.

A Program Demonstration Pilot

The Program Demonstration Pilot is also designed to educate the public about the El Rio WMP. However, it has greater focus on convincing the public that the program is a worthwhile pursuit. Adding this dimension causes the Pilot to expand significantly in scope. Generally, a Program Demonstration Pilot will try to emulate in a pilot design several of the key concepts of the overall WMP. Information including physical characteristics and cost estimates can be found in the accompanying Site Selection and Project Proposal report.

| Activities | Partners/Cooperators/Funding Entities | Time Required Over 36 Months | Costs |
|-------------------------------|---|-------------------------------------|--------------|
| Permitting & Planning | AzG&F, ADEQ, BOR, MCDOT, MCPD, Town of Buckeye, FCDMC, USF&WS, ADWR | 6-9 Months | TBD |
| Land Exchange, Use Agreements | AzG&F, FCDMC, MCPD, MCCP, City of Goodyear, ADWR | 6-8 Months | TBD |

| Activities | Partners/Cooperators/Funding Entities | Time Required Over 36 Months | Costs |
|--|---|-------------------------------------|--------------|
| Visitor Information Displays; Audio; Video | FCDMC, MCPD, MCCP | 4-6 Months | TBD |
| Development of Sites; Construction; Information Center Installation, | FCDMC, AzG&F, BOR, COE, MCCP, Sand & Gravel, Town of Buckeye, ADEQ, ADWR | 24-36 Months | TBD |
| Education Materials | NAU/ASU/U of A, FCDMC, MCPD, AzG&F, ADEQ | 8-12 months | TBD |
| Site Restoration, Plantings, Irrigation Systems | NAU/ASU/U OF A, ADEQ, USF&WS, AzG&F, Town of Buckeye, City of Avondale, Sand & Gravel, ADWR | 10-18 Months | TBD |
| Right-of-Way, Transportation Plan, Roadway Modification, Turnouts | MCDOT, MCPD, FCDMC, ADOT, City of Avondale, Town of Buckeye | 12-20 Months | TBD |
| Annual Maintenance Needs | AzG&F, BOR, Town of Buckeye | Annual | TBD |

In addition to the above potential public and private funding strategies it is proposed the Maricopa County solicit state legislature and Congressional support for the Program Demonstration Pilot. The strategy is proposed to insure that both the state and federal political leadership is aware of the benefits the El Rio Project will provide to state resources and the public. These leaders would also be asked to support the program through both existing government programs and potential new legislation initiative.

A POTENTIAL FUNDING MATRIX FOR FLOOD CONTROL ACTIVITIES IN THE EL RIO PROJECT

Much of the costs to implement the El Rio Project WMP are associated with flood mitigation activities. As noted earlier, channels and banks have degraded along the entire stretch of the river, with significant restoration now required in several reaches. Exotic tamarisk stands have encroached into the waterway, blocking normal channels for water movement, and trapping significant sediment and debris during high flow events, to further impede water movement through the corridor. The net effect of the above conditions is to reduce water transfer capability of the river in normal flows, and significantly impede water transfer in high flow events, so as to create uncontrolled flooding.

The El Rio Project of flood mitigation treatments are intended to significantly reduce the risk of flooding events, and do so while providing enhanced recreation, wildlife habitat and community improvements from construction activities.

IMPLEMENTATION AND FUNDING MATRIX; EL RIO PROJECT

TABLE 2: A POTENTIAL ANNUAL FUNDING MATRIX EXAMPLE FOR THE FOUR REACHES OF THE EL RIO PROJECT

Note: This matrix does not include the Confluence Reach which is being developed separately as the Program Demonstration Pilot.

| FLOOD CONTROL ACTIVITIES AND FUNDING | | | | |
|---|---|--|--|--|
| POTENTIAL FUNDING ENTITY/SOURCE | Estrella Reach: structural fill, rip rap, filter fabric landscape fill, planting, seeding Cost \$12.28 million; \$1.75million/year | Perryville Reach: structural fill, rip rap, filter fabric, landscape fill, planting, seeding Cost \$14.66 million; \$2.09 million/year | Tuthill Reach: Structural fill, rip rap, filter fabric, landscape fill, planting, seeding Cost \$8.73 million; \$1.25 million/year | Buckeye Reach: Structural fill, rip rap, filter fabric, landscape fill, planting, seeding Cost \$ 63.26 million; \$9.04 million/year |
| EXAMPLE POTENTIAL FUNDING MILLIONS/YEAR | | | | |
| Federal Government Programs | | | | |
| <ul style="list-style-type: none"> • Resource Mgt agencies: i.e., USDI, USDA • Regulatory agencies: i.e., USDI, EPA, USDA | 0.1 | 0.1 | 0.1 | 0.5 |
| Congressional Directed Programs | | | | |
| <ul style="list-style-type: none"> • Flood protection • Wildlife habitat, and environmental | 0.2 | 0.2 | 0.1 | 0.4 |
| State Government Programs | | | | |
| <ul style="list-style-type: none"> • Resource mgt agencies • Regulatory Agencies | 0.1 | 0.1 | 0.1 | 0.5 |

| FLOOD CONTROL ACTIVITIES AND FUNDING | | | | |
|--|---|--|---|--|
| POTENTIAL FUNDING ENTITY/SOURCE | Estrella Reach: structural fill, rip rap, filter fabric landscape fill, planting, seeding Cost \$12.28 million; \$1.75million/year | Perryville Reach: structural fill, rip rap, filter fabric, landscape fill, planting, seeding Cost \$14.66 million; \$2.09 million/year | Tuthill Reach: Structural fill, rip rap, filter fabric, landscape fill, planting, seeding Cost \$8.73 million; \$1.25 million/year | Buckeye Reach: Structural fill, rip rap, filter fabric, landscape fill, planting, seeding Cost \$ 63.26 million; \$9.04 million/year |
| EXAMPLE POTENTIAL FUNDING MILLIONS/YEAR | | | | |
| Local Government Entities <ul style="list-style-type: none"> • County government • Flood control districts • Development districts • Cities & Towns | 0.5 | 0.2 | 0.1 | 1.5 |
| Private Programs <ul style="list-style-type: none"> • Foundations • Private Business | 0.7 | 1.3 | 0.7 | 4.5 |
| Total Annual Funding | 1.7 | 2.0 | 1.2 | 7.9 |

Table 2 provides a treatment of potential strategies and costs for funding the proposed El Rio flood control features. These costs will be expanded to incorporate activities to improve wildlife habitat, develop recreational opportunities and private community improvements such as parks or lakes.

The proposed flood mitigation improvements total approximately \$98.3 million. They include structure and landscape fills, rip-rap, filter fabric, planting and seeding. Most activities are focused in the river corridor, or are associated with the north bank. These flood mitigation costs seems very large. However, the level of proposed flood mitigation is also very large.

Of the general cost elements; construction, governmental mitigation, property acquisition, levee landscape aesthetics, and administration including contingency: construction requires nearly forty percent of the total budget at approximately \$40 million. Levee landscaping required the next largest share at \$32.5 million.

Referencing Table 2, if one assumes that this example distribution of potential El Rio Project funding needs are for 1 of 10 years, a more realistic assessment can be made of how the El Rio Project could be funded and implemented over time.

First, implementation of the El Rio Project will likely not be realized without the leadership and coordination of the aforementioned Executive Implementation Committee El Rio Funding Group and a development specialist. Table 2 presents a hypothetical or potential funding schematic for the El Rio Project, and it is based on many assumptions, three of which are critical.

- The total cost of all proposed flood mitigation, environmental, wildlife habitat, native vegetation, community improvement projects proposed in the WMP could reasonably cost a total of \$150 million. The costs for the proposed flood mitigation programs above are estimated at \$98 million.

- The activities specified for the WMP can only be implemented over an extended time frame. Although seven to ten years are proposed, a longer time period may be required. And, implementation schedules will be constantly adjusted during project development.
- One entity, whether government or private, will not fund the project. Funding development will be complex, and will involve multiple parties and partners in almost every activity.

Completion of such a large project requires an extensive budget as defined in the WMP. In fact, additional funds will be necessary, possibly equal to one half the flood mitigation costs, to accommodate the additional recreational, environmental, wildlife habitat and community improvements specified for the four differing El Rio Project reaches. However, as noted large projects of this nature are not funded as one project, but as a coordinated group of projects. They are also not funded by one agency or entity, but rather by multiple entities. And last, they are not funded in one year, but over several years.

The proposed El Rio Project Executive Implementation Committee would be charged with developing an explicit Implementation and Funding Plan for the project and coordinating completion of the project through a funding specialist, El Rio Funding Groups and a wide spectrum of government and private entities that will actually complete project activities.

Currently estimated total costs of \$98 million to \$ 150 million for the El Rio Project might be significantly reduced by in-kind services, donated materials, etc. Annual total costs would still equal \$7-\$15 million per year but when distributed across multiple parties, the project appears feasible.

As noted earlier, it is anticipated that years 1-3 will be required to complete planning and pilot programs, with full project implementation beginning in year four and continuing through year 10. Table 2 illustrates only one potential annual

funding distribution of total annual costs that would equal approximately \$12.0 million.

Over 60% of the annual flood mitigation costs are required for construction and armoring and landscaping of levees needed to reclaim riverside land areas from potential flooding. They exist in each reach but are most prominent in the Buckeye, Estrella and Perryville reaches. Some of these costs are borne by the Flood Control District, but significant costs would be borne by developers and homeowners who will receive direct benefit in enhanced home values and related community benefit. That is \$5 - \$6 million of these annual El Rio Project costs for levee construction might appropriately be distributed among private developers and new home buyers along the four reaches.

The towns of Buckeye, Goodyear and Avondale would also benefit directly in safety from increased flood protection and could assume annual costs of \$200 thousands to \$300 thousand over a seven year period. County government would benefit directly in increased safety to its citizens and potentially realize decreased social service costs, for police, health, roads, etc. These benefits could permit the County and the Flood Control District to assume \$500 thousand each in annual costs for program implementation.

Several federal and state agencies have explicit missions and goals to protect and enhance natural resources. Riverine resources and related flora and fauna are critical resources in any region of the United States, but rank at the highest level in the arid southwest. And, the Gila River is ranked as a critical resource by both federal and state resource agencies.

Much of the support provided by federal and state agencies such as NRCS, BOR, COE, EPA, ADEQ, ADWR, AzG&F, etc., for program such as the El Rio Project, are in the form of collaborative partnerships. Funding is often provided as cost share to the total programs for activities relating to wildlife and fish habitat

improvement, wetlands enhancement or protection, native vegetation restoration, recreation, etc. Because of the importance of the Gila River ecosystem to the southwest, annual cost share contributions from each of these agencies between \$250 thousand and \$500 thousand would appear realistic for the overall benefit expected to the ecosystem.

A group that is often over looked for support to critical projects such as El Rio is foundations. In Arizona, the Heritage Foundation is a limited funding support group. However, other state, regional, national and even international foundations fund projects for perennial waterways, especially those existing in arid zones like El Rio.

Another potential source of funds to the El Rio Project would be through legislative or congressional support. Because of the diverse benefits to broad based publics targeted in the WMP, political leaders would see the project as highly beneficial to the state and region at large. Potential annual funding of \$500 thousand to \$1 million is possible.

EDUCATIONAL RESEARCH & DEVELOPMENT PILOT SITE SELECTION REPORT

BACKGROUND

The Flood Control District of Maricopa County(FCDMC) oversees urban and rural settings covering 9,000 square miles of central Arizona. The District provides regional flood hazard identification, regulation, remediation, and education to Maricopa County residents. For more than 30 years, the District focused chiefly on regulation of drainage and floodplain areas, identification of floodplain areas, and the design and construction of flood control structures for remediation of those flood prone areas. In the 1990's, as the urbanized areas of the County constructed the drainage and flooding infrastructure necessary to provide residents with flood protection, the District's focus moved to the more rural county watersheds and non-structural solutions to flood hazards. The El Rio Watercourse Master Plan(WCMP) vision is representative of this new focus.

PURPOSE/OBJECTIVES

The proposed Project is intended to test the success and viability of replacement of dense, monocultural stands of salt cedar with more diverse stands of cottonwood, willow, and other attendant species more suitable to a floodplain environment, over a several year period in order to understand the dynamics from a hydraulic, hydrogeologic, chemical, biological, and habitat standpoint, and to provide an educational opportunity regarding these issues to the public. The Project is intended to serve as a demonstration towards the eventual El Rio Watercourse Master Plan, a flood control project for the west Phoenix Metropolitan area, by incorporating new, non-structural flood control concepts, with traditional flood control features. These concepts are researchable at a low cost should they be ineffective in any way. The El Rio

program is focused on flood mitigation on the Gila River, and will likely have vegetation management components designed to improve hydraulics, water quality, water quantity, and habitat.

The knowledge, experience, and results gained by establishment of this pilot project will allow investigators to verify the effectiveness of integrating new, non-structural flood control concepts into the eventual watercourse master planned flood control project along the Gila River.

The purpose of the pilot is to provide educational opportunities for the public and to establish the effectiveness of vegetation management in improving flood conveyance, water quality and quantity, biological diversity, and wildlife and ecological resources on the Gila River by designing, constructing, operating, and maintaining this cooperative educational, research, and pilot project. The major objectives of this Project are as follows:

- a. To demonstrate the applicability, suitability, and sustainability of a complex biodiverse system in a semi-rural setting toward the Master Plan. The purpose will involve assessing the existing site with respect to modifications necessary to test the objective.
- b. To provide the District's residents with educational opportunities related to the objective including floodplain hydraulics, biological sciences, any new technology, and the environmental issues associated with the research. Educational signage is planned. The residents of Maricopa County will be provided opportunities to participate in public meetings, environmental education, passive recreation, and water conservation education.
- c. To operate and maintain the educational pilot project so as to establish habitat, provide for onsite education, and to support the collection of

research and operational data for the studies developed within the Project. This data may be used to improve future constructed watercourse designs.

BENEFITS

The benefits are to the public, the environment, the Federal government, and to the District. The benefit to the public is ultimately a river corridor that will better handle floods, and have recreational amenities such as walking trails, picnic benches, etc. The Project serves as a point of interest and education to the public.

The benefits to the environment are greater plant diversity than generally exists now, and with greater plant diversity, greater wildlife diversity is possible. Less flooding means less soil erosion in the area.

The benefits to the Federal government are somewhat in-line with the District's benefits. An improved flood channel minimizes Federal emergency management efforts in the future, and ecosystem diversity is in the Federal interest. The Federal government directly benefits from the knowledge gained during the operations, and from the research conducted on the Project.

The District's interest is to improve the flood corridor within the next several years prior to development entrenching itself in the area to a degree that little change to the river is possible. The District gains in the knowledge of being able to replicate the success in the future.

SITE SELECTION OVERVIEW

Critical elements of this Site Selection Report on the "Educational Pilot" follow, including:

- Site selection analysis
- Partnership analysis
- Preliminary site design
- Resource requirement
- Schedule

SITE SELECTION ANALYSIS

The goal of this Educational Pilot is to maximize El Rio WCMP information transfer to the public through visual media. The Educational Pilot Phase 1 objective is to incorporate an educational placard and parking area. Phase 2 includes construction of a tamarisk vegetation restoration demonstration adjacent to the roadway turnoff site. Several criteria are considered important during site selection, and were used as evaluating criteria during the site selection process.

- **Ownership:**
 - Public or private. Public ownership is preferred.
- **Location:**
 - View corridors from transportation system, # of acres available, flood hydraulics. A site where hydraulic differential impacts can be observed and having a relatively high volume of local traffic flow is preferred.
- **Parcel size:**
 - Seven to ten acres is preferred ; five acres is the minimum.
- **Vegetation type:**
 - Streamside and/or over bank. Streamside dense mono-typical tamarisk vegetation preferred.
- **Water availability:**
 - Needed for irrigation and maintenance. Connecting to existing system water preferred.
- **Airport constraints:**

- City of Phoenix Goodyear Airport critical zone must be avoided. Buffer from 10,000 ft. critical zone corridor perimeter preferred.
- **TES impacts:**
 - No TES impacts preferred.
- **Land use, zoning constraints:**
 - Must be compatible with adjoining land uses No zoning constraints preferred.
- **Development costs:**
 - Minimal development costs preferred.
- **Maintenance:**
 - Minimal maintenance costs including transportation of resources to and from the site and minimizing vandalism through existing law enforcement system preferred.
- **Community resistance factor:**
 - Minimal community resistance preferred.

Five potential sites within the El Rio WCMP area were selected/considered for location of the Educational Pilot as follows:

- **State Route 85:**
 - This site is in the NW ¼ of section 13, northeast of the SR 85 bridge crossing. It is fairly close to the Az Game & Fish facility at Robbins Butte. The site could have issues with ADOT right-of-way, and high traffic volumes. It is publicly owned.
- **Tuthill Road:**
 - The site on the southeast side of the Tuthill Road Bridge has moderate local traffic and space for site development. Irrigation water source would be an issue. Located near the middle of project, the access roadway is owned by the County.
- **Beloat Rd:**

- The site is NE of Beloat Rd, off of Jackrabbit Rd, located near the middle of project. Access and a visual corridor from the road are issues, access to water is possible, and it is public property. It is near private property.
- **Estrella Road:**
 - Located at the river within Estrella Park and near the bridge crossing. Lies in or near 10,000 ft. airport corridor. Owned by the County.
- **Bullard Road:**
 - Located near the bridge crossing at the river. Owned by the County. Lies outside the 10,000 ft. airport corridor. Existing water system is nearby

Each site was evaluated in Table 1 using the above site selection criteria. A numerical ranking of 1-3 was used for each criterion with 1 being the lowest ranking. Site 5 was the top ranked site and has been selected as the educational pilot site (Figure1).

Permitting will be required with any site selected. However, more difficulty may exist with federal lands than state or county lands. The permitting considered includes:

- **MCDOT permits:** MCDOT, if required, could assist in any Traffic Impact Analysis or Right -of -Way permitting.
- **404 permits:** Assistance could be requested from ADEQ and COE. Stantec will submit permit application as a component of El Rio 404 application.
- **NEPA clearance:** BOR to assist. Possible categorical exclusion.
- **AzG&F permits:** May relate to vegetation treatments or potential wildlife impacts. Could be handled in FCDMC/AzG&F lease agreements if utilized.

- **ADEQ permits:** National pollutant discharge elimination system (NPDES) may be required. FCDMC will obtain from ADEQ if needed.
- **Maricopa county planning and development permit:** Grading activities may require this permit and it will be acquired by FCDMC.

Table 1: Education Pilot Site Evaluation Matrix

| SITE | | | | | |
|-------------------------------|-------------------------------|------------------------------------|------------------------------------|-------------------------------------|------------------------------------|
| Designation | 1 | 2 | 3 | 4 | 5 |
| Criteria | SR 85 (Parcel 004) | Tuthill Rd (Parcel 007) | Beloat Rd (Parcel 009B) | Estrella Rd (Parcel 002) | Bullard Rd (Parcel 007) |
| Ownership | 2 | 2 | 2 | 3 | 3 |
| Political Jurisdiction | County | County | Buckeye | Goodyear | Goodyear |
| Location | 3 | 3 | 1 | 1 | 3 |
| Vegetative Type | 3 | 3 | 2 | 3 | 3 |
| Water Availability | 1 | 1 | 1 | 2 | 3 |
| Airport Corridor | 3 | 3 | 3 | 1 | 3 |
| TES | 2 | 2 | 2 | 3 | 3 |

| | | | | | |
|-----------------------------|------------------------------------|------------------------------|--------------------------------------|-----------------------------|--|
| Land use | 2 | 2 | 1 | 3 | 3 |
| Right-of-Way | 1 | 3 | 1 | 3 | 3 |
| Development | 1 | 1 | 2 | 2 | 3 |
| Maintenance | 1 | 2 | 2 | 3 | 3 |
| Community Resistance | 3 | 3 | 1 | 3 | 3 |
| Total | 23 | 26 | 18 | 27 | 33 |
| Rank By Points | 4 | 3 | 5 | 2 | 1 |
| Comments | High volume of traffic, needs well | On MCDOT Roadway, needs well | No existing access, has water nearby | Partially in critical zone, | County owned, golf course water nearby |

RESOURCE PARTNERSHIP ANALYSIS

Resource partners to FCDMC will be required to support several areas of the project. FCDMC is committing extensive dollars in planning, public involvement, in-kind activities, etc. To fully implement programs from this collaborative planning effort will require considerable resources from multiple sources.

Although the Educational Pilot itself will not require extensive resources, partners are being engaged that have been and continue to be critical to long-term resource development and protection in the valley. These include resource management agencies such as the Bureau of Reclamation, Arizona Departments of Game and Fish, Environmental Quality, and Water Resources, as well as County government, cities, towns and local communities.

Examples of areas where partnerships are sought include the following:

- **Direct Funds:** Funds are needed to develop information and education materials, demonstration treatments, site improvements, etc.
- **In-kind services:** Support is needed for technical expertise, design work, site improvements, permitting, maintenance, etc.
- **Land agreements:** A physical site of 7-10 acres is needed.
- **Maintenance agreements:** An agency or combination of agencies is needed to insure that improvements are taken care of.

Partners that are currently identified for involvement in the project include:

- **Bureau of Reclamation, Corps of Engineers, Natural Resource Conservation Service:** The BOR and COE are associated with many valley watercourse projects, and can provide technical expertise and direct funds for site development, vegetation treatments, education, etc. The NRCS becomes a critical partner on projects like El Rio, where resources are needed to merge

government and private ownership activities. Other federal partnerships are also being pursued.

- **Arizona Departments of Game and Fish, Environmental Quality, and Water Resources:** AzG&F, ADEQ and ADWR have high interest and involvement in projects involving rivers and riparian areas. They often provide in-kind services for technical needs, permitting, site evaluation, etc., and can also provide land areas, water, protection service, and direct funding. Other state agencies may also be utilized for support.
- **Maricopa County Flood Control District, Maricopa County Parks Department, Maricopa County Department of Transportation, Buckeye Irrigation District, Communities of Avondale, Buckeye and Goodyear:** Counties, cities and towns and local communities are critical partners because local government entities contribute initially and over the long-term success of local projects. They can provide extensive in-kind services such as land for the facility, water, maintenance, monitoring, etc. to these types of projects.

PRELIMINARY SITE DESIGN

A total of 7-10 acres is required to effectively implement the Education Pilot. This area includes Phase 1 which is a parking area that can accommodate 7-10 cars and up to 2 buses and also has a large tri-part educational placard. Phase 2 is adjacent to the parking area in the riparian corridor and is a vegetation treatment demonstration area. An overview of each follows:

- **Parking Area:** The parking area would be approximately 150x100 feet.
- **Educational Placard:** The placard will be low maintenance aluminum with three separate boards. Board #1 will have a history of the Gila River (vegetation, use, etc) as well as original river description and picture. Board #2 will present the El Rio

Watercourse Master Plan Program, including all elements and activities that will occur in the riverine corridor with emphasis on flood mitigation needs, environmental issues and strategies. Also included will be a listing of all cooperating agencies and partners on the El Rio educational Pilot. Board #3 will continue the El Rio Program elements, with the lower half devoted to the tamarisk treatment demonstration and walking guide.

- **Tamarisk Treatment Demonstration:** The treatment demonstrations will all tie into the recurring theme of improving hydraulic efficiency for flood control/hydraulic benefits as well as issues associated with invasive plant management activities in riverine corridors such as threatened & endangered species issues, river restoration issues and habitat mitigation efforts. A self guided walking tour will lead from the parking area through the four tamarisk treatments as follows:
 - Existing monotypical tamarisk stand, no treatment.
 - Partially restored tamarisk stand with large tamarisk plants (20%) and cottonwood/willow (80%).
 - Completely restored arboreal stand to native species such as cottonwood/willow or mesquite bosque.
 - Completely restored cobble strand treatment to native species.
 - Marsh habitat(optional).

RESOURCE REQUIREMENTS

To fully implement the Educational Pilot will require all concept design work to be completed by FCDMC , and then implementation will occur by merging various resource component needs as in the following examples:

- **Permitting:** MCDOT/AzG&F/ADEQ/BOR/COE
- **Land lease or agreement:** AzG&F/FCDMC or MCPD/FCDMC
- **Site/Placard/Treatment Design:** FCDMC/MCPD

- **Site Construction:** BOR/ FCDMC
- **Education Material:** BOR/NRCS/FCDMC
- **Vegetation Treatments:** BOR/NRCS
- **Maintenance Needs:** MCPD

A total cost for establishing Phase 1 the site is estimated at \$149,750.

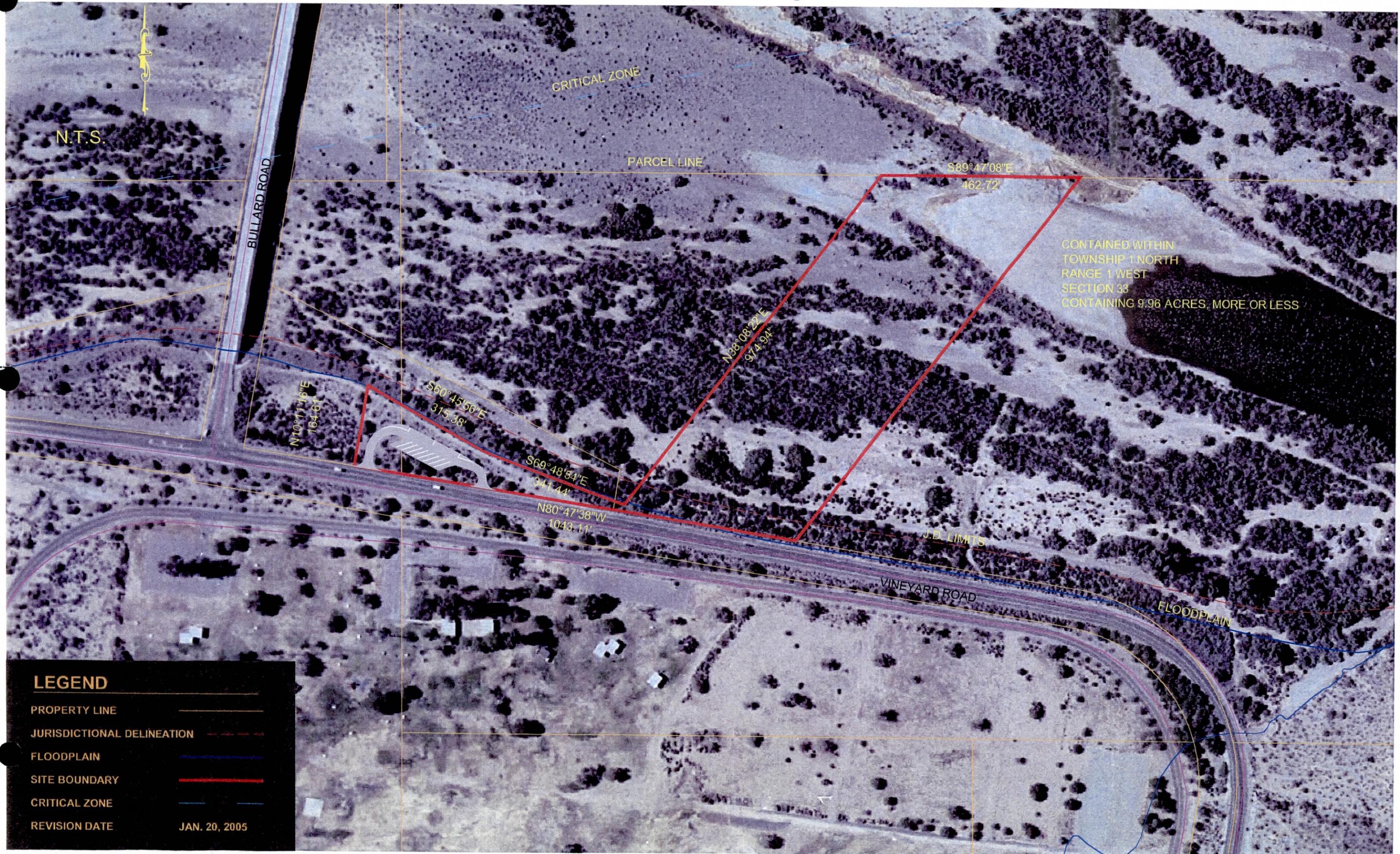
SCHEDULE

The Educational Pilot Project is completed as part of the El Rio Watercourse Master Plan. The project has three phases that should be developed over the period July 2003-March 2004 as follows.

| PROJECT PHASE | SCHEDULE |
|--|-----------------------------|
| Project Initiation; Project Design/Preliminary Partner Agreements: Completion of Site Selection Report and Site Design | July 2003 - December 2003 |
| Phase 1a; Permitting: Obtaining/Finalizing all necessary permits, leases, agreements; development of placard | December 2003 - July 2004 |
| Phase 1b; Parking Area Development: Site construction, placard installation | August 2004 – December 2004 |
| Phase 2; Vegetation Demonstration Development: Site Construction | January 2005 – June 2005 |

EXHIBIT A - El Rio Educational Research and Development Project

Flood Control District of Maricopa County Resolution #2005R002



PROGRAMMATIC DEMONSTRATION PILOT PROJECT SITE SELECTION REPORT

BACKGROUND

The Flood Control District of Maricopa County (District) oversees urban and rural settings covering over 9,000 square miles of central Arizona. The District provides regional flood hazard identification, regulation, remediation, and education to Maricopa County residents. For more than 30 years, the District focused chiefly on regulation of drainage and floodplain areas, identification of floodplain areas, and the design and construction of flood control structures for remediation of those flood prone areas. In the 1990's, the District expanded its focus to include non-structural flood control solutions and began concentrating on watersheds in the rapidly urbanizing rural parts of the county. The El Rio Watercourse Master Plan (WMP) vision is representative of this new focus.

PURPOSE/OBJECTIVES

The Programmatic Demonstration Pilot Project (Project) is being developed to educate the general public on requirements and benefits of the overall El Rio WMP Program. However, it also attempts to create community and funding support for the El Rio WMP, by actually providing a demonstration project of the selected design components of the overall WMP. The WMP is focused on flood mitigation on the Gila River, and outlines vegetation treatment components designed to improve hydraulics, water quantity, and habitat. As part of the WMP, significant public and stakeholder involvement was undertaken and their input was considered as much as possible in developing the Recommended Alternative. There is considerable interest in restoring the river corridor to a more natural condition, installing enhancements such as lakes and trails and improving wildlife habitat

The knowledge, experience, and results gained by establishment of this pilot project will help determine the most effective methods of integrating non-structural and soft-structural flood control concepts into the overall flood control project along the Gila River.

The major objectives of this Project are as follows:

- a. To demonstrate the applicability, suitability, and sustainability of a complex biodiverse system in a semi-rural urbanizing setting in support of the Recommended Alternative of the El Rio WMP.
- b. To provide residents with environmental educational opportunities related to the Recommended Alternative including floodplain hydraulics, biological sciences, water conservation, any new technology, and the environmental issues associated with the river. Educational and interpretive signage is planned.
- c. To operate and maintain the programmatic project so as to establish habitat, provide for onsite education, and to support the collection of research and operational data for the studies developed within the Project. This data will be used to improve future constructed watercourse designs.

BENEFITS

The benefits are to the public, the environment, the local, state, and federal government, as well as the District. The benefit to the public is ultimately a river corridor that will better handle floods, and have recreational amenities such as walking trails, fishing, and bird watching opportunities.

The benefits to the environment are greater plant diversity, and with greater plant diversity, greater wildlife diversity is possible. Less flooding means less soil erosion and property damage in the area.

The benefits to all of the government levels are consistent with the District's benefits. An improved flood channel minimizes emergency management efforts

in the future. It is easier and more cost-effective to improve the flood corridor prior to the development of adjacent land. Extensive development would limit the type of flood control solutions and enhancements that could be implemented. All governments directly benefit from the information gained during the operation, and from the potential research conducted on the Project.

The District and its partners all gain from understanding the Project issues and this knowledge will be used to replicate the success in the future.

SITE SELECTION OVERVIEW

Critical elements of this Project Proposal and Site Selection Report for the Programmatic Demonstration Pilot, include:

- Site selection analysis
- Partnership analysis
- Preliminary site design
- Resource requirement
- Schedule

SITE SELECTION ANALYSIS

The goal of the Programmatic Demonstration Pilot is to maximize El Rio WMP information transfer to an on- the-ground pilot demonstration project that enhances flood safety while improving the river function. The Programmatic Demonstration Pilot objective is to incorporate river restoration, water conservation and environmental education opportunities with flood safety improvements. Several criteria are considered important during site selection, and were used as evaluation criteria during the site selection process. The criteria are as follow:

1. Ownership:

- Public or private. A combination of public and private land ownership is preferred in order to maximize potential project elements. If private land is not available then ownership by multiple public agencies is preferred.

2. Partnerships:

- Multiple cost sharing partners are preferred in order to demonstrate strong collaborative relationships as well as to disperse any local cost sharing obligations.

3. Political Jurisdiction:

- A site involving multiple political jurisdictions is preferred in order to insure diversity of objectives as well as to demonstrate strong local consensus.

4. Parcel Size:

- One to two hundred acres is preferred; eighty acres is the minimum. This size range will allow for a meaningful demonstration site regarding vegetative impacts to flood hydraulics, habitat and water supply features.

5. Location:

- Relatively easy access from existing vehicular and pedestrian transportation systems, availability of the optimal number of acres for the project and an opportunity for improvement of flood hydraulics is preferred.

6. Vegetative Types:

- Stream or lake side with some dense mono-typical tamarisk vegetation preferred. Existing range of low to high quality habitat also preferred.

7. Water Availability:

- Existing water features with sufficient water rights available for enlargement in order to provide increased opportunity to enhance aquatic habitat is preferred.

8. Airport Constraints:

- City of Phoenix Goodyear Airport critical zone must be avoided. Buffer from 10,000 ft. critical zone corridor perimeter preferred.

9. **Threatened and Endangered Species (TES) Impacts:**
 - Minimal TES impacts and habitat enhancement opportunities are preferred.
10. **Land Use, Zoning Constraints:**
 - Compatibility with existing adjoining land use and zoning is preferred.
11. **Development Costs:**
 - Minimal development costs are preferred.
12. **Access:**
 - Limited (controlled) access is preferred.
13. **Maintenance Costs:**
 - Minimal maintenance costs including transportation of resources to and from the site are preferred.
14. **Community Support:**
 - Maximum community support is preferred.
15. **Security:**
 - Minimizing vandalism through existing law enforcement system(s) is preferred.

Three potential sites within the El Rio WMP study area were selected and considered for location of the Programmatic Demonstration Pilot as follows:

Buckeye Lake (Site 1):

- This is the area south of downtown Buckeye near existing and future sand and gravel operations.

Waterman Wash Confluence (Site 2):

- This is the area to the north of the Waterman Wash confluence and downstream of the Tuthill Road Bridge.

Agua Fria Confluence (Site 3):

- This is the area at the confluence of the Agua Fria and includes the current Buckeye Water Conservation and Drainage District impoundment.

Each site was evaluated as shown in Table 1 using the above site selection criteria. A numerical ranking of 1-3 was used for each criterion with 1 being the lowest ranking. Site 3 was the top ranked site and has been selected as the Programmatic Demonstration Pilot site (Figure 1). Figure 1 reflects the features to be found in the Recommended Alternative for this Site.

Table 1: Programmatic Demonstration Pilot Site Evaluation Matrix.

| Designation | 1 Buckeye Lake | 2 Waterman Wash Confluence | 3 Agua Fria Confluence |
|-----------------------------------|---------------------------|---|---------------------------------------|
| Criteria | Score | Score | Score |
| Ownership | 2 | 1 | 3 |
| Partnerships | 2 | 2 | 3 |
| Political Jurisdiction | 2 | 1 | 3 |
| Location | 1 | 1 | 3 |
| Parcel Size | 2 | 1 | 3 |
| Vegetative Type | 2 | 1 | 3 |
| Water Availability | 2 | 1 | 3 |
| Airport Constraints | 3 | 3 | 2 |
| TES | 2 | 3 | 2 |
| Land Use | 3 | 2 | 3 |
| Development Costs | 2 | 2 | 2 |
| Access | 1 | 1 | 3 |
| Maintenance Costs | 2 | 1 | 2 |
| Community Support | 3 | 2 | 3 |
| Security | 2 | 1 | 3 |
| Total | 31 | 23 | 41 |

| Designation | 1 Buckeye Lake | 2 Waterman Wash Confluence | 3 Agua Fria Confluence |
|----------------|----------------------|----------------------------------|---------------------------------------|
| Criteria | Score | Score | Score |
| Rank By Points | 2 | 3 | 1 |
| Comments | May happen anyway | Too remote for good access | Multiple funding partner potential |

PERMITTING

Permitting will be required with any site selected. However, more difficulty may exist with federal lands than with local government or privately owned lands. The permitting considered includes:

- **401 and 404 permits:** A 404 permit application may be prepared as a component of El Rio WMP and information from that will be available for the Programmatic Demonstration Pilot application.
- **NEPA clearance:** Will be required when federal funds or lands are utilized.
- **USFWS clearance:** May relate to vegetation treatments or potential wildlife habitat impacts.
- **ADEQ permits:** National pollutant discharge elimination system (NPDES/AZPDES?) may be required.
- **Maricopa County or City/Town planning and development permit:** Grading or excavation activities may require these and other permits.

RESOURCE PARTNERSHIP ANALYSIS

Resource partners to the District will be required to support several areas of the project. The District is committing extensive dollars in planning, public involvement, and in-kind services To fully implement programs from this

collaborative planning effort will require considerable resources from multiple sources. The District will most likely not be the lead agency for this project.

The Programmatic Demonstration Pilot requires significant resources and partners are being engaged that have been and continue to be critical to long-term natural resource development and protection in Maricopa County. These include resource management agencies such as the Bureau of Reclamation, Arizona Departments of Game and Fish and Environmental Quality, Arizona State Parks as well as county government, cities, towns and local districts.

Examples of areas where partnerships are sought include the following:

- **Direct Funds:** Funds are needed to develop information and education materials, demonstration treatments, site improvements, etc.
- **In-kind services:** Support is needed for technical expertise, design work, site improvements, permitting, maintenance, etc.
- **Land agreements:** Long term right of way, easements or rights of entry for a physical site of 100-200 acres minimum is needed.
- **Maintenance agreements:** An agency or combination of agencies is needed to insure that improvements are maintained and security provided.

Partners that are currently identified for involvement in the project include:

- **Bureau of Reclamation, Corps of Engineers, Natural Resource Conservation Service:** The BOR and COE are associated with many valley watercourse projects, and can provide technical expertise and direct funds for site development, vegetation treatments, education, etc. The NRCS becomes a critical partner on projects like El Rio, where resources are needed to merge government and private ownership activities. Other federal partnerships are possible.
- **Arizona Departments of Game and Fish and Environmental Quality, and Arizona State Parks:** AzG&F, ADEQ and State Parks have high interest and involvement in projects involving rivers and riparian areas. They often provide in-kind services for technical needs, permitting, site evaluation, etc., and can also provide land areas, water, protection service, and funding either directly or through grant programs. Other state agencies may also be utilized for support.
- **Flood Control District of Maricopa County, Maricopa County Parks Department, Buckeye Water Conservation and Drainage District, Communities of Avondale, Buckeye and Goodyear:** Counties, cities and towns and local communities are critical partners

because local government entities contribute initially and over the long-term to the success of local projects. They can provide extensive in-kind services such as land, water, maintenance, security, monitoring, etc. to these types of projects as well as direct funding.

An Opportunities and Constraints Matrix developed through stakeholder involvement is included as an appendix to this report.

PRELIMINARY SITE DESIGN

In order to effectively implement the Programmatic Demonstration Pilot at Site # 3 the following features are anticipated.

- **Lake:** The Lake will be approximately 200 surface acres with a maximum depth of 25 feet.
- **Parking Area:** The two parking areas would be approximately 1/2 acre each.
- **Impoundment Structure:** A new irrigation water takeout structure and a replaceable earthen dam with a hardened (concrete) foundation are needed.
- **Passive Recreational Features:** These would include shore fishing, non-motorized boating, a looping interpretive trail system, scenic viewpoint, bird watching, and picnicking.
- **Bathrooms:** These would be located at the parking areas.
- **Tamarisk Treatment Demonstration:** The treatment demonstrations will all tie into the recurring theme of improving hydraulic efficiency for flood control/hydraulic benefits as well as issues associated with invasive plant management activities in riverine corridors such as threatened and endangered species issues, river restoration issues, water conservation and habitat mitigation efforts. A self guided walking tour will lead from the parking areas through the Project as follows:
 - Completely restored arboreal stand to native species such as cottonwood/willow or mesquite bosque.
 - Completely restored cobble strand treatment to native species.
 - Shoreline habitat.
 - Marsh habitat.

RESOURCE REQUIREMENTS

To fully implement the Programmatic Demonstration Pilot will require all concept design work to be completed by the District, and then implementation will occur by merging various resource component needs as in the following examples:

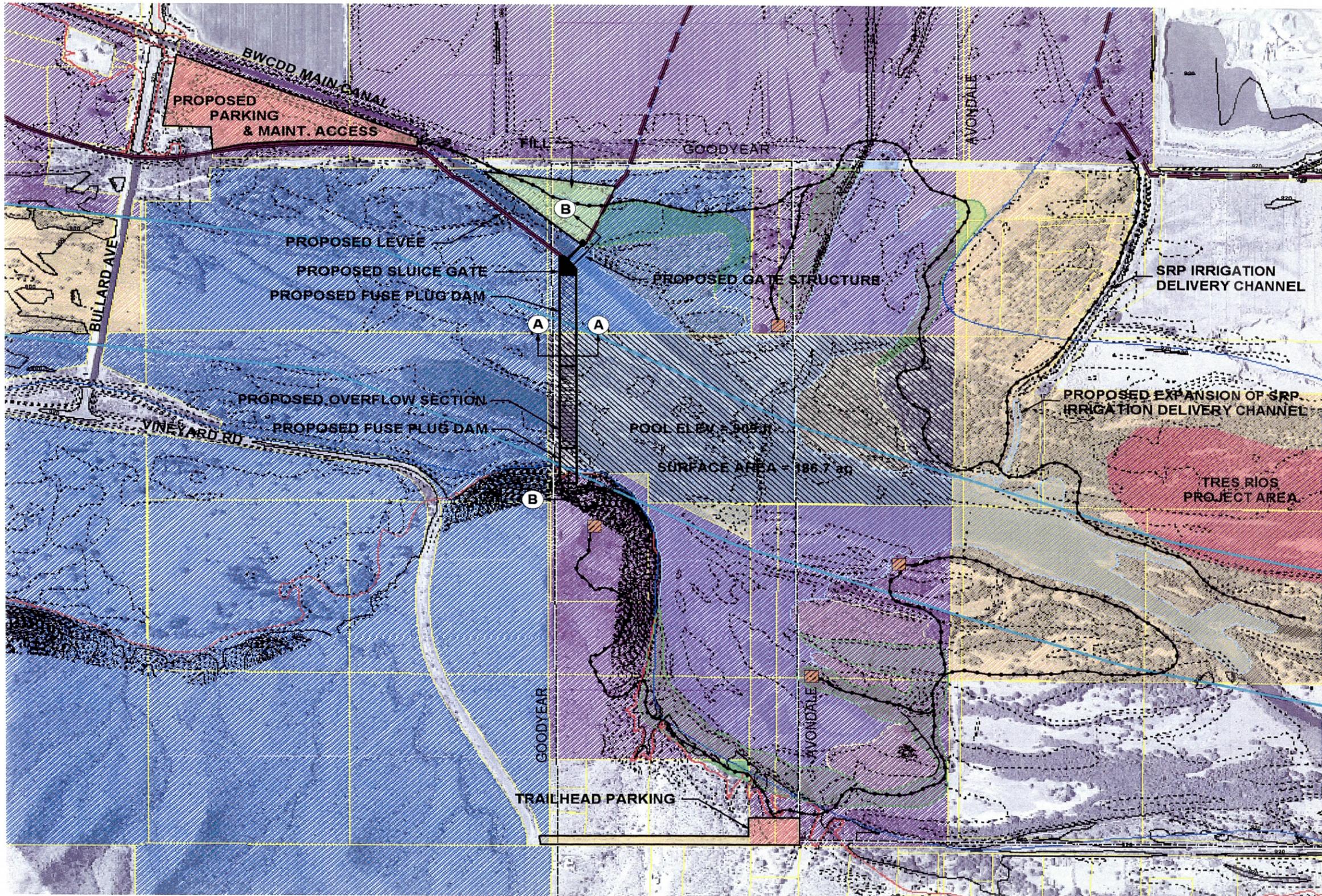
- **Permitting:** Cities/AzG&F/ADEQ//COE
- **Land lease or agreement:** BWCDD/ MCPD/FCDMC/ASLD
- **Site/Placard/Treatment Design:**
AZG&F/Cities/MCPD/FCDMC
- **Site Construction:** BOR/
BWCDD/Avondale/Goodyear/FCDMC
- **Education Material:** BOR/NRCS/FCDMC/AZG&F/Cities
- **Vegetative Treatments:** BOR/NRCS
- **Maintenance Needs:** To be determined

A total cost for establishing all features of the site is estimated at approximately \$30 million not including land acquisition.

SCHEDULE

The Programmatic Demonstration Pilot Project is initiated as part of the El Rio Watercourse Master Plan. The project is anticipated to be developed by another lead agency(ies) over the period from May 2006-September 2016.

| PROJECT PHASE | SCHEDULE |
|---|-----------------------------|
| Project Initiation; Project Design/Preliminary Partner Agreements: Completion of Site Selection Report and Concept Site Design | August 2005 - December 2006 |
| Phase 2; Permitting: Obtaining/Finalizing all necessary permits, leases, agreements; development of trails and some vegetative treatments | January 2007 - July 2009 |
| Phase 1; Funding; Obtaining; Finalizing all necessary permits, leases, and agreements | August 2005 – December 2006 |



Flood Control District
of Maricopa County
2801 W. Durango St.
Phoenix, AZ 85009

**EL RIO WATCOURSE MASTER PLAN
FCD 2001C024**



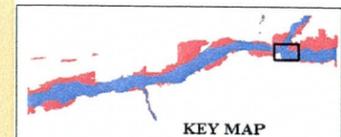
Prepared By
Stantec Consulting Inc.
8211 S. 48th Street
Phoenix, AZ U.S.A. 85044
Tel. 602.438.2200
Fax. 602.431.9582
www.stantec.com

Legend

- Proposed Levee by Others
- Proposed Levee
- Corporate Boundary
- FCDMC 1000-foot Drainage Easement
- Multi-Use Recreation Trail
- Ramada
- 100-Year Floodplain
- 100-Year Floodway
- Land Ownership**
- BWCCD
- MPCR
- FCDMC
- State of Arizona
- Resource Enhancements**
- Marsh
- Cottonwood/Willow
- Open Water
- Tres Rios Wetlands

Notes

Topographic mapping source is the Salt-Gila Floodplain Delineation Study, circa 1992-1993, with a contour interval of 4-feet (NVGD 29).
Limits of the Tres Rios wetland area are approximate.
Property ownership is from the Maricopa County Assessors database circa 2005.



File Name: BGS PJE MCG 11.11.05
Date: Des. Desg. 11/11/05

Title
**Figure 1
Programmatic Demonstration Site**
Project No. 82000240
Scale 0 300 600
Sheet No. 1 of 2
1" = 300'

APPENDICES

APPENDIX A

STAKEHOLDER INVOLVEMENT MEETING DOCUMENTATION

Agendas

Sign In

Summaries



El Rio
Stakeholders Meeting #1
Final Report

Presented by:
RH & Associates, Inc.
“Partnering & Value Specialists”

14631 N. Cave Creek Road, Suite 204
Phoenix, AZ 85022
(602) 493-1947 Fax (602) 493-2433
(800) 480-1401
email: rhpartnering@earthlink.net



Project Partners

Arizona Game and Fish

U.S. Bureau of Reclamation

BWCDD

C L Williams

City of Avondale

City of Goodyear

Corp of Engineers

Ed King & Associates

Flood Control District of Maricopa County

Hohokam RC&D

J E Fuller

Maricopa Association of Governments

Maricopa County Parks & Recreation Department

Maricopa County Farm Bureau

Phoenix Goodyear Airport

Roosevelt Irrigation District

Stantec

Town of Buckeye

WGA, Inc.

FINAL REPORT

Meeting Date: September 24, 2002

Project #: 21502.60

Facilitator: Renee Hoekstra

Attendees

Arizona Game and Fish
7200 E. University
Mesa, AZ 85207

| | | Phone | Fax | E-Mail |
|-----------------|-----------------------|------------------|------------|-----------------------------|
| Russ Haughey | Habitat Program Mgr. | 480-981-9400x222 | 255-3941 | Rhaughey@gf.state.az.us |
| Tom Hildebrandt | Wildlife Program Mgr. | 480-981-9400 | 255-3941 | Thildebrandt@gf.state.az.us |

Bureau of Reclamation

| | | | | |
|------------|--|--------------|--|---------------------|
| Will Doyle | | 602-216-3843 | | Wadoyle@lc.usbr.gov |
|------------|--|--------------|--|---------------------|

BWCDD

| | | | | |
|-------------|--|--------------|--|--|
| Jackie Meck | | 623-386-2196 | | |
|-------------|--|--------------|--|--|

City of Avondale
1003 S. Third
Avondale, AZ

| | | | | |
|-----------|--|--------------|--|---------------------|
| Dan Davis | | 623-932-9440 | | Ddavis@avondale.org |
|-----------|--|--------------|--|---------------------|

City of Goodyear
190 N. Litchfield Rd.
Goodyear, AZ 85338

| | | | | |
|-----------------|------------------|--------------|----------|-----------------------------|
| Janeen Hollomon | | 623-882-7958 | 932-7748 | Jhollomon@ci.goodyear.az.us |
| Kevin Kugler | Planning Manager | 623-932-3005 | 932-7748 | Kkugler@ci.goodyear.az.us |

City of Goodyear
3752 N. 156th Drive
Goodyear, AZ 85338

| | | | | |
|---------------|------------|--------------|----------|--|
| Jim Cavanaugh | Councilman | 623-535-9400 | 535-3133 | |
|---------------|------------|--------------|----------|--|

C L Williams

| | | | | |
|----------------|--|--------------|--|--|
| Chuck Williams | | 480-688-2298 | | |
|----------------|--|--------------|--|--|

Corps of Engineers
3636 N. Central, Suite 740
Phoenix, AZ 85012

| | | | | |
|-----------|--|--|--|--|
| Joe Dixon | | | | |
|-----------|--|--|--|--|

Attendees (Cont.)

Ed King & Associates
1115 E. Villa Nueva Dr.
Litchfield Park, AZ 85348

| | | | | |
|---------|--|--------------|--|---------------------|
| Ed King | | 623-536-6354 | | Kingranchaz@aol.com |
|---------|--|--------------|--|---------------------|

Flood Control District of Maricopa County
2801 W. Durango St.
Phoenix, AZ 85009

| | | | | |
|----------------|-----------------------|--------------|----------|-----------------------|
| Dennis Holcomb | Sr. Landscape Planner | 602-506-4074 | | Dbh@mail.maricopa.gov |
| Melissa Lempke | Public Involvement | 602-506-0612 | | Mgl@mail.maricopa.gov |
| Joe Munoz | PIO-FCD | 602-506-2983 | 506-4601 | Jfm@mail.maricopa.gov |
| Theresa Pinto | Environmental Planner | 602-506-8127 | | Tmp@mail.maricopa.gov |
| Doug Williams | Project Manager | 602-506-8743 | | Daw@mail.maricopa.gov |

| | | | | |
|---------------|--|--|--|--|
| Terry Goddard | | | | |
|---------------|--|--|--|--|

Hohokam RC&D; NRCS
18256 E. Williams Field Rd #2
Higley, AZ 85236

| | | | | |
|-----------|--|--------------|----------|-----------------------|
| Jim Neven | | 480-988-1078 | 988-1474 | Jim.neven@az.usda.gov |
|-----------|--|--------------|----------|-----------------------|

J E Fuller / H&G
6101 S. Rural #110
Tempe, AZ

| | | | | |
|------------|--|--------------|----------|------------------|
| Jon Fuller | | 480-752-2124 | 839-2193 | Jon@jefuller.com |
|------------|--|--------------|----------|------------------|

Maricopa Association of Governments
302 N. 1st Ave., #300
Phoenix, AZ 85003

| | | | | |
|----------------|----------------------|--------------|----------|--------------------------|
| Dawn Coomer | MultiModal Prog. Mgr | 602-254-6300 | 254-6490 | Dcoomer@mag.maricopa.gov |
| Michelle Green | | 602-254-6300 | 254-6490 | Mbgreen@mag.maricopa.gov |

Maricopa County Board of Supervisors

| | | | | |
|------------------|--|--|--|--|
| Mary Rose Wilcox | | | | |
|------------------|--|--|--|--|

Maricopa County
411 N. Central Ave.,
Phoenix, AZ 85004

| | | | | |
|--------------------|--------------------------------------|--------------|----------|------------------------------------|
| Fareed Abou-Haidar | Parks & Recreation Suite #470 | 602-506-6323 | | Fareedabouhaidar@mail.maricopa.gov |
| Matt Holm | Planning & Development, Suite 300 | 602-506-7162 | 506-8369 | Matthewholm@mail.maricopa.gov |

Attendees (Cont.)

Maricopa County Farm Bureau
4001 E. Broadway #B-9
Phoenix, AZ 85040

| | | | | |
|---------------|--|--------------|----------|--------------|
| Jeanette Fish | | 602-437-1330 | 437-1380 | Mcfb@msn.com |
|---------------|--|--------------|----------|--------------|

Phoenix Goodyear Airport
1658 S. Litchfield Rd.
Goodyear, AZ 85338

| | | | | |
|--------------|--|--------------|----------|--|
| Anne Quigley | | 623-932-1200 | 932-2716 | |
|--------------|--|--------------|----------|--|

Roosevelt Irrigation District
103 W. Baseline Rd
Goodyear, AZ 85338

| | | | | |
|------------|--|--------------|----------|-------------------|
| Stan Ashby | | 623-386-2046 | 386-4360 | Stanashby@aol.com |
|------------|--|--------------|----------|-------------------|

Stantec
8211 S. 48th St
Phoenix, AZ

| | | | | |
|-----------------|---------------|--------------|----------|-----------------------|
| Patrick Ellison | | 602-438-2200 | 315-9582 | Pellison@stantec.com |
| George Sabol | | 602-707-4635 | 315-9582 | |
| Scot Schlund | Consultant PM | 602-438-2200 | 315-9582 | Sschlund@stantec.com |
| Jamie Sturgess | | 602-438-2200 | 315-9582 | Jsturgess@stantec.com |

Town of Buckeye
100 N. Apache, Suite A
Buckeye, AZ 85326

| | | | | |
|-------------|--|--------------|----------|------------------------|
| Joe Blanton | | 623-386-4691 | 386-7832 | Jblanton@buckeyeaz.org |
|-------------|--|--------------|----------|------------------------|

WGA, Inc.
5040-2 E. Siesta
Phoenix, AZ 85044

| | | | | |
|-------------|--|--------------|----------|-------------------------|
| Roland Wass | | 480-994-4542 | 994-0436 | Rwass32@aol.com |
| Sara Gerke | | 602-454-0678 | 994-0436 | Sara@wetlandsbywass.com |

Roles & Responsibilities

To better understand the way the project will be run and managed, the various roles and responsibilities needed to be understood of all the stakeholders. These are identified below:

Roosevelt Irrigation District

Main Point of Contact – Stan Ashby

- Wants to be kept informed
- Provide information on water issues including availability
- Possible water provider
- Participate in stakeholders meetings

Buckeye Irrigation District

Main Point of Contact - Jackie

- Individual board members own land along the river
- An Hydrology study was completed and available from Montgomery Watson
- Able to provide in-kind services, i.e.
 - Equipment
 - Planting
- Wants to be kept informed
- Participate in stakeholders meetings
- Whatever they can do to help
- Provide water quality data

TOWN OF BUCKEYE

Main Point of Contact - Joe Blanton

- Participate in stakeholders meetings
- Attend Public Involvement meetings
 - Would like to have one within the Town of Buckeye
- Currently planning the Buckeye Lake project
- Help gain support for the project

ARIZONA GAME & FISH

Main Point of Contact – Russ Haughey

- Participate in stakeholder meetings
- Wildlife and Habitat issues
- If there is federal money involved in the project
 - FWCA – Coordinate role
- Technical advise
- Land ownership – with constraints
- Land management
- Recreational issues
 - Wildlife related
- Law enforcement issues
 - Wildlife
- Document review and comments

Roles & Responsibilities (Cont.)

- Provide information on recreational resources
- Keep team updated on endangered species
 - Legal changes

FCDMC

Main Point of Contact – Dennis Holcomb

- Contract oversight for recreational resources and scenic assessment
 - Working with subconsultant

MARICOPA COUNTY PLANNING

Main Point of Contact – Matt Holm

- Help to coordinate the existing / future land use planning process
- Participate in stakeholder meetings

CITY OF GOODYEAR

Main Point of Contact – Kevin Kugler (Technical)

Grant Anderson

- Participate in stakeholder meetings
- Public Involvement effort, both attend and support the process
 - Capture the voice of the public
- A source of data
 - Existing studies that have been completed by the City
- They need information regarding the land uses around the River and areas that need to be considered as untouchable
- Put together a potential citizens' involvement group to help support and capture the voice of the community

MAG

Main Point of Contact – Michelle Green

- Regional management of the open space guidelines
- Provide data and information from current and previous studies
- Review documents related to open space
- Participate in stakeholders meetings
- Interested in transportation issues related to multi-use and recreation (trails)
- Incorporation of outcomes into regional plans
- Help find potential funding opportunities

CITY OF AVONDALE

Main Point of Contact – Dan Davis

- Participate in stakeholder meetings
- Coordinate with current and future projects along the river
- Provide data and information
- Pursue park opportunities and partnerships – trails – interpretive areas



Roles & Responsibilities (Cont.)

PHOENIX GOODYEAR AIRPORT

Main Point of Contact – Anne Quigley

- Participate in stakeholder meetings
- Attend Public Involvement meetings
- Promote coordination with aviation needs/concerns/impacts
 - The goal is to look out for each other

MARICOPA COUNTY PARKS AND RECREATION

Main Point of Contact – Fareed Abou Haidar

- Coordination of the regional trail system
- Participate in stakeholder meetings
- Provide data – Re: facilities and trails

BUREAU OF RECLAMATION

Main Point of Contact – Will Doyle

- Participate in stakeholder meetings
- Water supply issues
- Funding possibilities
- Provide data and information (available from the Denver office)

HOHOKAM RC&D

Main Point of Contact – Jim Neven

- Potential opportunities using their tax-exempt status
 - At the end of the federal fiscal year there are often funds that are use or lose that might be available to the team
- Participate in stakeholder meetings
- USDA potential funding and programs
- Coordination with their sponsors
- Safe Harbor Agreements to increase wildlife numbers
 - These agreements protect land owners without impacting property values

USDA – NRCS

Main Point of Contact – Jim Neven

- Provide data and information
 - Soils reports
- Participate in stakeholder meetings
- Potential funding sources

BVNRCD

Main Point of Contact – Dick Napolitano

- Data and information from land owners
- Involved in NRCS projects
- Participate in stakeholder meetings

Roles & Responsibilities (Cont.)

CORPS OF ENGINEERS

Main Point of Contact – Cindy Lester (404 Permit Issues)

Joe Dixon (All other Issues)

- Non regulatory
- Participate in stakeholder meetings
- Provide data and information
 - All up stream communities involved in river restoration projects
 - Also communities along the Agua Fria
- COE research labs
 - They are working on Eco system restoration projects
 - Scientists will be interacting locally
 - Salt cedar
 - Mesquitos
 - Evaporation
 - Potential federal money

KING RANCH

Main Point of Contact – Ed King

- Own property on the eastern bound to Estrella
- Participate in stakeholder meetings
- Integration with property issues
 - Recreational issues
- Provide a development thought process
 - Part of the public/private partnership
 - Providing data and information on how restoration and private development is important

FISH AND WILDLIFE

Main Point of Contact – Don M.

- Wildlife (Endangered species) issues
- Safe Harbor Agreements

OTHER STAKEHOLDERS

- Maricopa County Vector Control
- Maricopa County Department of Transportation
- Gila River Indian Community
- Arizona State Land
- Bureau of Land Management
- Arizona Department of Environmental Quality
- US Department of Agriculture



Roles & Responsibilities (Cont.)

Nature Groups

- Audubon Society
- Sierra club
- Utility Companies
- ARPA

Issues & Concerns

The attendees were asked to share some of their issues and concerns that they want to have considered during the study. These are listed here:

| | |
|---|--|
| 1. Preservation of existing wildlife habitat / community | |
| | • Connectivity issues |
| 2. Contiguous regional land use plan | |
| 3. Multi-modal concerns | |
| 4. Work closely with land owners | |
| 5. Wildlife related issues | |
| | • Increase opportunities |
| 6. Law enforcement issues | |
| | • Policing the river • Shooting wildlife • Dumping |
| 7. Year around water flow | |
| | • Continuity of water |
| 8. Focus on legislation | |
| | • Water • Funding |
| 9. Connections to the regional trails system | |
| | • Hard and soft trails |
| 10. Connection with Estrella | |
| 11. Maintaining cities' character along the trails | |
| 12. Potential for public lands disposal/exchange | |
| | • Look at these areas |
| 13. Identify alignment for regional trail | |
| 14. Can we tie into CAP water? | |
| 15. Opportunity for Safe Harbor Agreements | |

Issues (Cont.)

| | |
|-----|--|
| 16. | keep in mind 91 st Avenue Treatment Facility and potential increases in water discharge |
| 17. | Gila River Indian Community water possibilities |
| 18. | Prevent migratory bird paths away from flight paths |
| 19. | Agricultural designation along the river |
| 20. | Scenic river designation |
| | <ul style="list-style-type: none"> • Local and or federal designations |
| 21. | Audabon Society if designating this area as “important bird area” |
| | <ul style="list-style-type: none"> • 83rd – Gillespie Dam |
| 22. | Loop 303 / Cotton Lane crossing – MCDOT |
| 23. | Consistant and accurate in the message given out to the public |
| | <ul style="list-style-type: none"> • One main point of contact |
| 24. | Edge treatment |
| | <ul style="list-style-type: none"> • Between built environment and the ecosystem |
| 25. | Potential sand and gravel operations |
| | <ul style="list-style-type: none"> • Standards and restrictions |
| 26. | Implementation phasing plan |
| 27. | Demonstration projects |
| | <ul style="list-style-type: none"> • Order of magnitude |
| 28. | Policies for land uses adjacent to the river |
| 29. | Establish mechanics and expectations for private development |
| 30. | Trail linkage from Bullard Wash |
| 31. | Protection from floods and vector control |



EL RIO WATERCOURSE MASTER PLAN

SOUTHWESTERN TAMARISK MANAGEMENT STRATEGY SESSION AGENDA

LOCATION: 8211 South 48th Street
Phoenix, Az. 85044
Main Conference Room

DATE: January 15th, 2003

TIME: 1:00 pm – 5:00 pm

- | | |
|--|---------------|
| 1) Introductions and Meeting Purpose | 10 min |
| 2) Agenda Review | 10 min |
| 3) Trends in Tamarisk Distribution | 10 min |
| 4) Benefits and Consequences of Tamarisk | 45min |
| 5) Previous and Ongoing Research, Treatments & Case Studies | 75 min |
| 6) Break | 15 min |
| 7) Next Steps | 60 min |
| 8) Summary and Adjourn | 15 min |



EL RIO WATERCOURSE MASTER PLAN

SOUTHWESTERN TAMARISK MANAGEMENT STRATEGY SESSION DRAFT SUMMARY

PLUSES

- Provide long term habitat for Southwestern willow-fly catcher due to structure.
- It has evolved & adapted.
- With time it integrates into biological communities
- Native pollinators other than honey bees
- Wildlife habitat given current hydrologic conditions
- Shade
- Exists where others may not survive salt cedar structure depends on flood regimes
- Invertebrate production
- Can restore habitat in areas nothing else will grow
- Better than no habitat
- Can increase undestroyed diversity & cover of plants compared to Cottonwood willow

MINUSES

- Departs from natural range of variability in biological & physical
- Decrease in agricultural production grazing & farm land
- Not modeled appropriately (hydraulics)
- Invaded irrigation systems
- Institutional constraints
- Lacks structural diversity (on Gila)
- Lacks vertical structure needed for some species
- Prospers on "regulated" contained river system after scour seeds dominate
- Out compete native due to seasonality of seed source
- Ecologic niches eliminated
- Diversity NCO tropical species reduced



EL RIO WATERCOURSE MASTER PLAN

- Diversity invertebrate
 - No cultural significance
 - Fire cycle
 - Can reduce understory diversity
 - Monotypic stands reduced recreational opportunities
 - Non Native
- BOTH**
- Difficult to eradicate
 - Potential to develop resistance adaptive
 - Manage for species diversity (cover)
 - Hydrologic regimes
 - Conditions (salinity) impact on native species
 - High water consumption
 - Sediment deposition/ bank stabilization alters hydraulics



EL RIO WATERCOURSE MASTER PLAN

EL RIO TAMARISK MANAGEMENT STRATEGY SESSION AGENDA

LOCATION: 8211 South 48th Street
Phoenix, Az. 85044
Main Conference Room

DATE: April 29th, 2003

TIME: 12:00 noon – 4:00 pm

- | | |
|--|--------|
| 1) Introductions and Meeting Purpose | 10 min |
| 2) Agenda Review | 10 min |
| 3) El Rio Project Overview | 10 min |
| -Scope & Deliverables | |
| -Schedule | |
| 4) Review of Data Collection & Existing Conditions | 60 min |
| - Hydrology & Hydraulics | |
| - Water Supply | |
| - Environmental | |
| 5) Open Discussion of Item 4 | 30 min |
| 6) Break | 15 min |
| 7) Educational Pilot Component | 30 min |
| - Scope | |
| - Concept Design | |
| 8) Open Discussion of Item 7 | 30 min |
| 9) Next Steps | 30 min |
| 10) Summary and Adjourn | 15 min |



EL RIO WATERCOURSE MASTER PLAN

EL RIO TAMARISK MANAGEMENT STRATEGY SESSION NEXT STEPS

- Land acquisition may be needed to insure 100-year flood conveyance.
- Need global action to reduce seed source.
- Expect annual maintenance.
- There is a need for small-scale experiments on the Gila River that are well planned & documented.
- Consider 404 act mitigation impacts of Tamarisk management.
- The El Rio Gila River project would be a useful experimental site for the southwest.
- 10-20 acre pilot plots are good for very detailed research.
- A ¼ to 1 river mile long reach is good for “landscape level” pilot.
- Pilot clearing of a narrow corridor for a low flow channel would provide useful information.
- Science to support any action is important to project success.
- Drag coefficients (hydraulics) need to be evaluated as part of any demonstration project.
- Water conservation savings that result from tamarisk management should be used for habitat establishment and maintenance.
- As water rights are retired they should be held in trust to be used for trust for restoration.
- Statewide, (Regional and National) partners should be sought out and included in any El Rio/Gila River effort.
- Participation in the 4-corners Salt Cedar Symposium would be beneficial.
- Water quality is an element that should be considered in any pilot study.
- Meet with all river restoration projects in area so that information can be shared and efforts coordinated.
- A Symposium on tamarisk management issues in Arizona should be held.



EL RIO WATERCOURSE MASTER PLAN

- Grass root support for tamarisk management should be considered for a successful effort.
- Historical picture and a "Library" central repository for tamarisk info in Arizona are needed.



EL RIO WATERCOURSE MASTER PLAN

STAKEHOLDER PARTNERING MEETING

LOCATION: Estrella Mountain Community College

DATE: Tuesday, June 3rd, 2003

TIME: 8:30 am – 11:30 am

8:00 – Continental Breakfast (All)

8:30 – Welcome (Mike Ellegood)

- **Opening Comments** (Supervisors: Mary Rose Wilcox, Max Wilson)
- **Introductions** (Renee Hoekstra)
- **Project Overview and Update** (Marilyn DeRosa)
- **El Rio Data Collection Findings** (Scot Schlund & Team)

10:00 – Break (All)

- **Opening Comments** (Supervisors: Mary Rose Wilcox, Max Wilson)
- **Implementation and Funding Update** (Dave Garrett /Chuck Williams)
- **Project Next Steps** (Scot Schlund)
- **Open Discussion** (Renee Hoekstra)

11:45 – Summary and Adjourn (Marilyn DeRosa)



EL RIO WATERCOURSE MASTER PLAN

PROGRAMMATIC DEMONSTRATION PILOT STAKEHOLDER COORDINATION MEETING AGENDA

LOCATION: Guadalupe/Pass Mountain Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ

DATE: Wednesday, September 28th, 2005

TIME: 1:30 pm – 3:30 pm

1:30 - Introductions

1:35 - Meeting Purpose

- Review of Demonstration Pilot work task.
- How best to collaboratively move forward the El Rio Demonstration Pilot project located near the confluence of the Gila and Agua Fria Rivers.

1:45 – Project Overview and Status

- Review of Draft Recommended Alternative at the confluence.
- Review of Identified Opportunities/ Constraints and Issues

2:15 – Open Discussion on Pilot Features, Lead Agency (s), Physical Features

- Operational Issues
 - Maintenance
 - Enforcement
- Schedule/ Timing
- Funding Opportunities
- Other

3:15 – Summary /Next Steps

3:30 - Adjourn



EL RIO WATERCOURSE MASTER PLAN

EXECUTIVE COMMITTEE/ EL RIO TOUR MEETING AGENDA

LOCATION: Goodyear City Hall
190 N. Litchfield Road
Goodyear, AZ 85338

DATE: Wednesday, January 11th, 2006

TIME: 9:30 am – 2:30 pm

- | | |
|--------------------|---|
| 9:30 | Meet at Goodyear City Hall |
| | Opening Comments by Supervisor Mary Rose Wilcox |
| 9:45 | Board Buses |
| 10:00 | Leave Parking Lot and Travel to Stop #1 |
| 10:35-10:50 | Stop # 1 (Out of Bus) - SR 85 Bridge SE Corner on Frontage Road |
| 1:00- 11:20 | Stop # 2 (In Bus) - Buck Fire on Miller Road South of Hazen Road |
| 1:25-11:45 | Restroom Break at Buckeye Community Center |
| 2:05-12:15 | Stop # 3 (In Bus) - Cotton Lane Bridge North Abutment |
| 12:25-1:15 | Lunch at Estrella Mt. Park Ramada #8 |
| 1:20-1:30 | Stop # 4 (In Bus)-Educational R&D Pilot Parking Lot |
| 1:50-2:15 | Stop # 5 (Out of Bus) -Buckeye WCDD Lake |
| 2:30 | Adjourn at Goodyear City Hall |



EL RIO WATERCOURSE MASTER PLAN

PROGRAMMATIC DEMONSTRATION PILOT STAKEHOLDER COORDINATION MEETING AGENDA

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ

DATE: Tuesday, March 28th, 2006

TIME: 1:30 pm – 3:30 pm

1:30 – Introductions

1:35 - Meeting Purpose

- Review of Demonstration Pilot work task and deliverables.
- How best to collaboratively move forward the El Rio Programmatic Demonstration Pilot project located near the confluence of the Gila and Agua Fria Rivers.

1:45 – Project Overview and Status

- Review of the:
 - Site Selection Report
 - Recommended Alternative at the Confluence Reach
 - Schedule & Cost Estimate

2:15 – Open Discussion on Pilot Next Steps

- Collaboration Framework
 - Lead Agency(ies)
 - Other Possible Partners
 - Funding Opportunities
 - Schedule/ Timing
 - Other
- Next Steps
 - Tentative Meeting Date
 - Location
 - Agenda Items

3:15 – Summary

3:30 - Adjourn



EL RIO WATERCOURSE MASTER PLAN

PROGRAMMATIC DEMONSTRATION PILOT STAKEHOLDER COORDINATION MEETING SUMMARY

Attendees

- Pat Ellison, Stantec
- Don Harris, Maricopa County Parks
- John Hathaway, Flood Control District of Maricopa County (FCD)
- Russ Haughey, Arizona Game and Fish Department
- Paula Illardo, City of Goodyear
- Nicole Kelley, Flood Control District of Maricopa County
- Jackie Meck, Buckeye Water Conservation and Drainage District (BWCDD)
- Jen Pokorski, Flood Control District of Maricopa County
- Scot Schlund, Stantec
- Chuck Williams, CL Williams Consulting

Meeting Purpose

- Review of demonstration pilot work task and deliverables.
- Determine how to maintain partnerships and move toward construction of the El Rio Programmatic Demonstration Pilot.
- Distribute site selection report and review design elements

Project Overview and Status

- Two prior stakeholder meetings have been held on the programmatic demonstration pilot.

Open Discussion

- Suggestions to:
 - Utilize sand and gravel mining in northwest part of pilot site and begin to build parking lot.
 - Move parking lot along Baseline Road to the east on BWCDD land.

Funding Source Possibilities

- Mine the 1,000 foot flood control easement in the El Rio project area and put royalties in an account for El Rio. (FCD does not own the entire 1,000 foot easement some land is leased and the lease will expire soon.)
- Mitigation banking: The Corps could direct funds to the El Rio area.
- BWCDD is investigating the possibility of creating an overlay district covering the program demonstration pilot area, and possibly all of El Rio.
- County Parks may be able to provide easements/use of land owned in project area if it is used for recreation purposes as parks' cost share portion
- Bureau of Reclamation (BOR): Money is currently programmed in the BOR budget through FY 09/10. It must be authorized by Congress and it must have matching funds contributed from another agency.

BOR Programmed Funding for Pilot Project (and funds committed by FCD)

| Fiscal Year | BOR | FCD |
|-------------|----------|-----------|
| 04/05 | \$83,000 | \$83,000+ |
| 05/06 | 90,000 | 90,000 |
| 06/07 | 80,000 | 0 |
| 07/08 | 80,000 | 0 |
| 08/09 | 120,000 | 0 |
| 09/10 | 80,000 | 0 |



EL RIO WATERCOURSE MASTER PLAN

Issues

- Address policing, vandalism and liability issues by making it part of a city or county park (no money to fund this through parks budget)
- Draft an IGA between Avondale/Goodyear/County/BWCDD to provide operation and maintenance

Other possible partners

- Department of Tourism and State Parks (once the project is up and running)

Next Steps

- Future involvement in the program demonstration project:
 - BWCDD – full participant (planning, limited funding, etc.)
 - Arizona Game & Fish – planning participant, lend expertise
 - Avondale- full participant (planning, funding, etc.)
 - Goodyear – full participant (planning, limited funding, etc.)
 - County Parks – planning participant
 - FCD – full participant for planning & limited funding
- Determine lead agency(s).
- Develop plan for generating matching funds for BOR's future funding commitment in order to keep project moving forward.



EL RIO WATERCOURSE MASTER PLAN

IMPLEMENTATION WORKGROUP MEETING AGENDA

LOCATION: New River Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ

DATE: Thursday, April 13, 2006

TIME: 9:30 – 11:30 am

9:30 - Introductions

9:35 - Meeting Purpose

- Review of implementation efforts to date
- Dialogue and input regarding implementation process and mechanism
- Determine how to collaboratively complete the transition from the planning phase to the implementation phase of the El Rio WCMP
- Establish next steps (Participants, Forum, Schedule, Action Items, etc.)

9:40 - Implementation Overview and Status

- Review of approach and deliverables

9:50 - Open Discussion on Implementation Process and Mechanism

- Implementation Committee
- Makeup/membership
- Purpose/goals
- Schedule/meeting locations
- Memorandum of Understanding
- Purpose
- Elements
- Timetable
- Signers
- Next Steps
- Tentative Meeting Date
- Location
 - Agenda Items
 - Other

11:20 - Summary

11:30 - Adjourn

APPENDIX B
COOPERATIVE AGREEMENT BETWEEN BOR & FCDMC

**UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
ASSISTANCE AGREEMENT**

| | | | | | |
|--|------------------------|---|---|--|--|
| 1. AGREEMENT NUMBER 05FC320380 | | 2. TYPE OF AGREEMENT <input type="checkbox"/> GRANT <input checked="" type="checkbox"/> COOPERATIVE AGREEMENT | | 3. CLASS OF RECIPIENT County government | |
| 4. ISSUING OFFICE (NAME, ADDRESS) PxAO-8016 Phoenix Area Office Bureau of Reclamation P.O. Box 81169 Phoenix, AZ 85069-1169 | | | 5. RECIPIENT (NAME, ADDRESS, TELEPHONE) Flood Control District of Maricopa County 2801 W. Durango Street Phoenix, AZ 85009 DUNS #: 610085896 EIN #: 866000472 | | |
| 6. ADMINISTRATIVE POINT OF CONTACT (NAME, ADDRESS, TELEPHONE, E-MAIL) Michael W. Cause, Office Code PxAO-8016 Bureau of Reclamation P.O. Box 81169 Phoenix, AZ 85069-1169 Phone: 602.216.3885, E-mail: mcause@lc.usbr.gov | | | 7. RECIPIENT PROJECT MANAGER (NAME, ADDRESS, TELEPHONE, E-MAIL) John Hathaway Flood Control District of Maricopa County 2801 W. Durango Street Phoenix, AZ 85009 Phone: 602.506.1501, email: | | |
| 8. TECHNICAL REPRESENTATIVE (NAME, ADDRESS, TELEPHONE, E-MAIL) William Doyle, PxAO-7000 Bureau of Reclamation P.O. Box 81169 Phoenix, AZ 85069-1169 Phone: 602.216.3843, E-mail: wdoyle@lc.usbr.gov | | | 9. EFFECTIVE DATE See Block 17A | | |
| | | | 10. COMPLETION DATE September 30, 2007 | | |
| 11. PROGRAM STATUTORY AUTHORITY Fish and Wildlife Coordination Act of 1934, Pub.L 85-624 as amended | | | | | |
| 12. FUNDING INFORMATION | | | 13. REQUISITION NUMBER | | |
| | <u>Recipient/Other</u> | <u>Reclamation</u> | 05320700014 | | |
| Total Amount of Agreement: | \$160,500.00 | \$120,607.00 | | | |
| Amount of Funds Obligated: | \$160,500.00 | \$ 83,670.00 | | | |
| Total Projected Project Amount | \$325,500.00 | \$285,670.00 | | | |
| Cost Share Ratio: | | | | | |
| 14. ACCOUNTING AND APPROPRIATION DATA Cost Authority: A10-1861-6010-105-00-0 Cost Center: 3207000 Object Code: 411C | | | | | |
| 15. PROJECT TITLE AND BRIEF SUMMARY OF PURPOSE AND OBJECTIVES OF PROJECT Project Title: El Rio Educational Pilot Project under the El Rio River Restoration Study Summary Description: The proposed Project is to test the success and viability of salt cedar replacement with native vegetation over several years in order to understand the dynamics from a biological, habitat, hydraulic, and flood conveyance standpoint. The Project is to serve as a demonstration towards the eventual El Rio watercourse master plan, a flood control project for the west Phoenix Metropolitan area, without incorporating traditional flood control infrastructure, but rather incorporating new concepts. | | | | | |
| 16a. Acceptance of this Assistance Agreement in accordance with the terms and conditions contained herein is hereby made on behalf of the above-named recipient | | | 17a. Acceptance of this Assistance Agreement in accordance with the terms and conditions contained herein is hereby made on behalf of the United States of America, Bureau of Reclamation | | |
| BY (signature) _____ DATE _____ | | | BY (signature) _____ DATE _____ | | |
| 16b. NAME, TITLE, AND TELEPHONE NUMBER OF SIGNER (Type or print) Name: Timothy S. Phillips, P.E. Title: Acting Chief Engineer/General Manager Telephone No.: 602-506-1501 <input type="checkbox"/> Additional signatures are attached | | | 17b. NAME OF GRANTS AND COOPERATIVE AGREEMENTS OFFICER (Type or print) Name: Ruth Martin Title: Grants and Cooperative Agreement Officer Telephone No.: 602-216-3880 | | |

| | |
|---|------------|
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Schedule

Statement of Joint Objectives Article

A. Purpose: The Pilot Project intends to test the success and viability of salt cedar replacement with native vegetation over several years in order to understand the dynamics from a biological, habitat, hydraulic, and flood conveyance standpoint.

B. Objective: To demonstrate the applicability, suitability, and sustainability of a complex biodiverse system in a semi-rural setting and to provide educational opportunities related to the objective including biological sciences, any new technology, and the environmental issues associated with the research.

C. Benefits: This project will benefit the public by establishing an onsite educational pilot project that supports and provides research and operational data that may be used to improve future constructed watercourse designs in semi- rural setting.

Project Management Plan Article

A. Flood Control District of Maricopa County (District) Responsibilities

(1) Planning and Site Selection - The District shall be responsible for all planning and site selection tasks including preparation of final site design and securing availability of the site.

(2) Biological Opinion and Cultural Resources - The District shall be responsible for all biological and cultural resources tasks related to Pilot Project planning, site selection, Clean Water Act (CWA) Section 404 permitting, and National Environmental Policy Act (NEPA) compliance, in order for Reclamation to publish the NEPA compliance document.

(3) CWA Section 404 Permitting – The District shall be responsible for applying for and obtaining a CWA Section 404 permit for the Pilot Project.

(4) Site Development— The District shall be responsible for all site development and oversight of the Pilot Project. The District shall provide Reclamation with backup documentation for the in-kind cost-share portion of the Pilot Project.

(5) Site Monitoring, Research and Development Plan - The District shall conduct site monitoring on an annual cycle and shall submit an annual report for the life of the Pilot Project. The District shall draft a one-time Development Plan. The Development Plan will document the aspects of the site creation and monitoring, which shall take place over time. Upon completion of the plan, the District shall submit a copy to Reclamation.

(6) Financial Reporting - The District shall prepare financial reports in accordance with Section 9.1.C, Reporting.

B. Reclamation Responsibilities

(1) Provide funding and monitoring in accordance with the work program as set forth in this agreement.

(2) Reclamation's work for this Pilot Project is as follows:

- (a) NEPA Compliance - Prepare the required NEPA document and will record the document with respect to the laws and roles pertaining to Federal NEPA compliance.
- (b) Permit Application - Provide consultation, if requested by the District.
- (c) Funding - Contribute to the overall funding necessary for a habitat restoration site, which includes, but is not limited to, a parking area, educational kiosk, and vegetative treatment area. Reclamation's funding contribution will be in accordance with Section 7, Cost Sharing in the 'Proposed Budget for fiscal year 2005.'
- (d) Development Plan - Provide review and comment, if necessary and requested, on the annual plan and the draft Development Plan to the District for inclusion into the final Report. Reclamation will provide comments to the District on the annual report and draft Report within the guidelines mutually agreed to by the District on the specific comment period.

C. Performance Schedule

| Item No. | Reclamation | District | Activities/Description | Activity and/or Completion Date |
|----------|-------------|----------|---|--|
| i | | X | Administrative Pilot Project Initialization | Within 14 calendar days of agreement execution |
| ii | X | | Review of Development Plan (if necessary) | 3 business weeks after receipt of "Draft" report |
| iii | | X | Annual Report | 1 year after execution of agreement and then yearly until agreement completion |
| iv | | X | Completion of Field Work and Monitoring | July 31, 2007 |
| v | | X | Final Report | 2 business weeks after receipt of comments |
| vi | X | X | Agreement Completion | September 30, 2007 |

Financial Support Article

- A. Reclamation's share of the cost of the Project shall, under no circumstances, exceed 50 percent of the Project's total cost. The District agrees to reimburse to Reclamation any funds that have been advanced to them by Reclamation in excess of the percentages authorized to be spent if this agreement is terminated before the completion of the Project.

The estimated schedule of payments to the District is:

| FISCAL YEAR | TOTAL BUDGETED BY RECLAMATION | TOTAL RECLAMATION DIRECT COSTS | TOTAL AMOUNT TRANSFERRED TO DISTRICT |
|---|-------------------------------|--------------------------------|--------------------------------------|
| FY 2004: From October 1, 2003 through September 30, 2004 | \$21,937.00 | \$21,937.00 | \$0.00 |
| FY 2005 From October 1, 2004 through September 30, 2005 | \$98,670.00 | \$15,000.00 | \$83,670.00 |
| TOTALS | \$120,607.00 | \$36,937.00 | \$83,670.00 |

Program income that may result from this project shall reside with the District if used for the continuation of the Project. Unused program income, if available, will be distributed between the District and the Government (Reclamation) in accordance to financial participation.

(i) OMB Circular A-87 for State, local and Indian Tribal recipients covered by OMB Circular A-102.

Payment Article

505 DM 2.10.B(4)(a) For recipients covered by OMB Circulars A-102 and A-110, 43 CFR 12.61 and 43 CFR 12.922, respectively will normally be used.

505 DM 2.10.B(4)(b) Financial support of the project will be arranged so that each participant to the agreement will provide its prorata share in a timely manner so as not to cause undue hardship to the other participant(s) and to avoid placing performance in jeopardy.

Term of the Agreement Article

The term of this agreement is effective from the date of award indicated in Block 17A, until the date identified in Block 10, of page one of the Agreement, unless otherwise modified or terminated pursuant to Sections II.2 and/or Section II.16, respectively.

Project Information System Article

EI Rio Educational and Research Pilot Project – Proposed Budget for FY05

| Item Description | Reclamation Funds | | | District Funds | | | Project Total |
|---|-------------------------------|--|------------|----------------|----------------|-----------|---------------|
| | FY 05 | | Rec. Total | FY 05 | District Total | | |
| | Rec. Labor/Xf rom to District | | | | | | |
| 1.0 Preliminary Work and Monitoring | | | | | | | |
| 1.1 Agreement Creation, Agreement Monitoring | \$5,500/0 | | \$5,500 | \$26,500 | | \$26,500 | \$32,000 |
| 1.2 Agreement Closeout | 0 | | 0 | 0 | | 0 | 0 |
| 2.0 Site Preparation | | | | | | | |
| 2.1 NEPA and Cultural Res. | 1,500/0 | | 1,500 | 28,500 | | 28,500 | 30,000 |
| 2.2 CMP | 0/3,000 | | 3,000 | 0 | | 0 | 3,000 |
| 2.4 Construction Survey | 0/1,000 | | 1,000 | 0 | | 0 | 1,000 |
| 2.5 Clearing and Grubbing | 0/1,000 | | 1,000 | 0 | | 0 | 1,000 |
| 2.6 Access Gates & Fencing | 0/24,000 | | 24,000 | 0 | | 0 | 24,000 |
| 2.7 Utility Sleeves | 0/4,550 | | 4,550 | 0 | | 0 | 4,550 |
| 2.8 Asphaltic Concrete | 0/16,520 | | 16,520 | 0 | | 0 | 16,520 |
| 2.9 Placard Installation | 0/7,300 | | 7,300 | 0 | | 0 | 7,300 |
| 2.10 Site Planning, Design, & Permitting | 0 | | 0 | 65,000 | | 65,000 | 65,000 |
| 2.11 Piping & Drip Lines | 0/3,000 | | 3,000 | 0 | | 0 | 3,000 |
| 2.12 Trail Development | 0/2,000 | | 2,000 | 0 | | 0 | 2,000 |
| 2.13 Purchase Trees | 0/2,000 | | 2,000 | 0 | | 0 | 2,000 |
| 2.14 Tree Disposal | 0/1,500 | | 1,500 | 0 | | 0 | 1,500 |
| 2.15 Vegetation Treatment (supplies/equipment/installation) | 0/5,200 | | 5,200 | 0 | | 0 | 5,200 |
| 2.16 Signing & Striping | 0/12,400 | | 0/12,400 | 0 | | 0 | 12,400 |
| 2.17 Project Monitoring -Maintenance | 29,937/0 | | 29,937 | 22,000 | | 22,000 | 51,937 |
| 3.0 Development | | | | | | | |
| 3.1 Development Plan (preparation and publishing) | 0 | | 0 | 9,000 | | 9,000 | 9,000 |
| 3.2 Site Monitoring (1 st year) | 0 | | 0 | 9,000 | | 9,000 | 9,000 |
| 3.3 Educational Material | 0/200 | | 200 | 500 | | 500 | 700 |
| 4.0 Total | | | | | | | |
| 4.1 Total Project | \$36,937/ 83,670 | | \$120,607 | \$160,500 | | \$160,500 | \$281,107 |

Special Provisions (July 2004)

Grants and Cooperative Agreements Officer's Representative (GCAOR) (Reclamation 08/03)

The GCAOR for this agreement will be:

William Doyle, PxAO-7000
Bureau of Reclamation
P.O. Box 81169
Phoenix, AZ 85069-1169
Phone: 602.216.3843, E-mail: wdoyle@lc.usbr.gov

The GCAOR is authorized to act only on technical matters during the term of this Agreement. The GCAOR and the Recipient's Project Manager shall work closely to insure that all requirements of the Agreement are being met. The GCAOR's responsibilities include, but are not limited to, the following:

- (a) Assist the Recipient concerning the accomplishment of the tasks described in the Agreement;
- (b) Provide information to the Recipient which assists in the interpretation of the tasks; and
- (c) Review, and where required, approve reports and information to be delivered to the Government.

Technical assistance must be within the general scope of the Agreement. The GCAOR does not have the authority to, and may not, issue any technical assistance which:

- (a) Constitutes an assignment of additional work outside the general scope of the Agreement;
- (b) In any manner causes an increase or decrease in the total estimated cost or the time required for performance; or
- (c) Changes any of the expressed terms, conditions, or specifications.

Modifications (Reclamation 08/03)

Any changes to this agreement shall be made by means of a written modification. Reclamation may make changes to the agreement by means of a unilateral modification to deal with administrative matters, such as changes in address, no-cost time extensions, the addition of previously agreed upon funding, or deobligation of excess funds at the end of the agreement. Additionally, a unilateral modification may be utilized by Reclamation if it should become necessary to suspend or terminate the agreement in accordance with 43 CFR 12.83 or 43 CFR 12.961, as applicable.

All other changes shall be made by means of a bilateral modification to the agreement. No oral statement made by any person, or written statement by any person other than the GCAO, shall be allowed in any manner or degree to modify or otherwise effect the terms of the Agreement.

All requests for modification of the Agreement shall be made in writing, provide a full description of the reason for the request, and be sent to the attention of the GCAO. Any request for project extension shall be made at least 45 days prior to the expiration date of the agreement or the expiration date of any extension period that may have been previously granted. Any determination to extend the period of performance or to provide follow-on funding for continuation of a project is solely at the discretion of Reclamation.

Reporting Requirements and Distribution (Reclamation 11/03)

Failure to comply with the reporting requirements contained in this agreement may be considered a material non-compliance with the terms and conditions of the award. Non-compliance may result in withholding of payments pending receipt of required reports, denying both the use of funds and matching credit for all or part of the cost of the activity or action not in compliance, whole or partial suspension or termination of the agreement, recovery of funds paid under the agreement, withholding of future awards, or other legal remedies.

(1) Financial Reports.

All financial reports shall be signed by an Authorized Certifying Official for the recipient's organization. The following forms are available at http://www.whitehouse.gov/omb/grants/grants_forms.html.

(a) SF-269 or SF-269a, Financial Status Report. This form is utilized to report total expenditures for the reporting period. The SF-269 must be used if the recipient is accountable for the use of program income; otherwise, the SF-269a may be used.

An original and two copies of this form shall be submitted quarterly, within 30 days following the end of the reporting period.

A final SF-269 or SF-269a shall be submitted within 90 days following completion of the agreement.

(b) SF-272, Report of Federal Cash Transactions. This report shall be submitted by recipients that draw down cash advances by means of electronic funds transfer or Treasury check. Recipients shall identify in the "Remarks" section the amount of cash advances received in excess of 3 days prior to disbursement and explain actions taken to reduce excess balances.

An original and two copies of this form shall be submitted on a quarterly basis within 15 days following the end of the reporting period.

(2) Program Performance Reports.

(a) Interim Reports. Recipients shall submit an original and two copies of program performance reports on a quarterly basis within 30 days following the end of the reporting period. Program performance reports shall contain the following:

- (i) A comparison of actual accomplishments with the goals and objectives established for the reporting period;
- (ii) Where project output can be quantified, a computation of the cost per unit of output;
- (iii) When appropriate, reasons why goals and objectives were not met; and
- (iv) Other pertinent information including, when appropriate, analysis, and explanation of cost overruns or high unit costs.

(b) Annual Reports. An original and two copies of an annual program performance report shall be submitted within 90 days following the end of each year of the agreement. Copies of this report may be required to be included with any application for continuing support of the agreement.

(c) Final Report. An original and two copies of the final program performance report shall be submitted no later than 90 days following the expiration or termination of the agreement.

(3) Significant Developments.

During the term of the agreement, the recipient must immediately notify the GCAO if any of the following conditions become known:

- (a) Problems, delays or adverse conditions that will materially impair their ability to meet the objectives of the agreement;
- (b) Favorable developments which enable the recipient to meet time schedules and objectives sooner than or at less cost than projected or to produce more beneficial results than originally planned.

This notification is to include information on the actions taken or contemplated to resolve problems, delays, or adverse conditions, and any assistance needed from Reclamation to help resolve the problem.

(4) Report Distribution. Copies of reports shall be distributed as follows:

| | To the GCAO at the address in Block 6, Page 1 | To the GCAOR at the address in Block 8, Page 1 |
|--------------------------|---|--|
| Financial Reports | 2 | 1 |
| Performance Reports | 1 | 2 |
| Significant Developments | 2 | 1 |

Recipient's Project Manager (Reclamation 08/03)

The Recipient's key personnel for this agreement shall be [to be completed at time of award]

Key Personnel (Reclamation 08/03)

The Recipient's key personnel for this agreement are identified as follows:

[To be completed at time of award]

In accordance with 43 CFR 12.70(d) (3) or 43 CFR 12.925, as applicable, the Recipient shall request prior approval from Reclamation before making any changes in the key personnel identified above.

Payment Policy (Reclamation 11/03)

Acceptance of a financial assistance agreement from Reclamation creates a legal responsibility on the part of the recipient organization to use the funds and property provided in accordance with the terms and conditions of the agreement. Reclamation has a reversionary interest in the unused balance of funding and in any funds improperly applied.

Payments to recipients are made in accordance with the basic standards and methods stated in the payment regulations at 43 CFR 12.61 or 43 CFR 12.922, as applicable to this agreement. These requirements are intended to minimize the time elapsing between the transfer of funds from the Federal government and the disbursement of these funds by the recipient.

Payment will be made in advance or by reimbursement as follows:

- (1) Advance Payment. Recipients shall be paid in advance provided (i) they maintain or demonstrate the willingness and ability to maintain procedures to minimize the time elapsing between the transfer of funds and their disbursement by the recipient, (ii) they comply with reporting requirements for timely submission of financial status reports, and (iii) they impose these same standards on subrecipients.

Advances to recipients shall be limited to the minimum amounts needed and shall be timed to be in accordance with the actual, immediate cash requirements of the recipient in carrying out the purpose of the agreement. The timing and amount of cash advances shall be as close as administratively feasible (generally no more than 3 days) to actual disbursements for direct program costs and the proportionate share of allowable indirect costs.

(2) Reimbursement. Reimbursement shall be the preferred method of payment when a recipient (i) does not meet the requirements for advance payment stated above; (ii) does not have financial management systems that meet the standards in 43 CFR 12.60 or 43 CFR 12.921, as applicable; or (iii) has been converted to payment restrictions for non-compliance with the terms and conditions of the agreement. Reimbursement is also the preferred method of payment for agreements involving construction.

Payment Method (Reclamation 11/03)

Electronic Funds Transfer. Payments under this agreement will be made to recipients by electronic funds transfer (EFT) unless the recipient qualifies for exemption from this payment method. Reclamation utilizes the Automated Clearinghouse (ACH) Vendor Express payment system for EFT. Whether funds are paid in advance or as a reimbursement, the actual payment will be made through Vendor Express. Vendor Express allows the Government to transfer funds to a recipient's financial institution along with explanatory information regarding the payment.

Enrollment. Upon award, recipients will receive a copy of the SF-3881, ACH Vendor/Miscellaneous Payment Enrollment Form. This form is required to implement the Vendor Express system and to notify Reclamation of any change or corrections to financial institution information.

Requesting Payments. Requests for advance or reimbursement may be made by the following methods:

(1) SF-270, Request for Advance or Reimbursement. On a monthly basis, recipients may submit an original and two copies of a properly certified SF-270 form to the address identified in Block #6, page 1 of this agreement. For advance payments, this form may be submitted on a monthly basis, at least two weeks prior to the date on which funds are required, and based on expected disbursements for the succeeding month and the amount of Federal funds already on hand. Requests for reimbursement may be submitted on a monthly basis, or more frequently if authorized by the GCAO. Requested funds are delivered to the recipient via ACH Vendor Express. This form is available on the Internet at http://www.whitehouse.gov/omb/grants/grants_forms.html.

(2) SF-271, Outlay Report and Request for Reimbursement for Construction Programs. The SF-271 shall be used for construction agreements paid by the reimbursement method, letter of credit, electronic funds transfer, or Treasury check advance, except where the advance is based on periodic requests from the recipient, in which case the SF-270 shall be used. This request may be submitted on a quarterly basis, but no less frequently than on an annual basis. Recipients may submit an original and two copies of a properly certified SF-271 form to the address identified in Block #6, page 1 of this agreement. This form is available on the Internet at http://www.whitehouse.gov/omb/grants/grants_forms.html.

(3) Automated Standard Application for Payments (ASAP). Recipients may utilize the Department of Treasury ASAP payment system to request advances or reimbursements. ASAP is a recipient-initiated payment and information system designed to provide a single point of contact for the request and delivery of Federal funds. Once a request is made through ASAP, funds are provided to the recipient through either ACH or Fedwire. Further information regarding ASAP may be obtained from the ASAP website at <http://www.fms.treas.gov/asap>. Upon award, you will be provided with information regarding enrollment in the ASAP system.

Funds Available for Payment (Reclamation 08/03)

The Government's obligation under this Agreement is contingent upon the availability of appropriated funds from which payment for Agreement purposes can be made. No legal liability on the part of the Government for any payment may arise until funds are made available to the GCAO for this Agreement, and until the Recipient receives notice of such availability, to be confirmed in writing to the Recipient by the GCAO.

Pursuant to the Act of Congress of June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto, all commonly known as Reclamation Law, funds for payment under the first year of this agreement are included in the fiscal year 2005 Energy and Water Development Appropriations Act, Public Law 108-447. Funding for any optional year of the agreement is contingent upon subsequent Congressional funding.

Budget Revisions (Reclamation 08/03)

The Recipient shall follow the requirements at 43 CFR 12.70(c) or 43 CFR 12.925, as applicable, when revising budget and program plans. Additionally, approval shall be requested for transfers of amounts budgeted for indirect costs to absorb increases in direct costs, or vice versa.

Reimbursable Costs and Limitations (Reclamation 08/03)

(1) The Recipient shall provide all personnel, services, facilities, equipment, materials and supplies, and perform all travel which may be necessary and appropriate for the proper performance of this Agreement. Costs so incurred will be paid for as provided herein. Reclamation's obligation to provide funding to the Recipient for costs incurred in these connections shall be limited to the Recipient's direct and indirect costs associated with this Agreement. All such direct and indirect costs must be determined to be allowable under the regulations contained in 48 CFR Subpart 31.2 or an OMB Cost Principle Circular, as applicable, which are incorporated herein through the General Provisions of this agreement.

(2) The recipient shall not incur costs or obligate funds for any purpose pertaining to operation of the program or activities beyond the expiration date stated in the agreement. The only costs, which are authorized for a period of up to 90 days following the award expiration date, are those strictly associated with closeout activities for preparation of the final report.

(3) Reclamation shall not be obligated to provide funding to the Recipient and the Recipient shall not be obligated to continue performance under the Agreement or to incur costs in excess of the costs set forth in the annual project budget unless the GCAO has furnished the Recipient a modification to increase the available funding for the Agreement.

Procurement Standards (Reclamation 08/03)

When utilizing Federal funds for the procurement of supplies and other expendable property, equipment, real property, and other services under this agreement, the Recipient shall utilize the Procurement Standards set forth at 43 CFR 12.76 or 43 CFR 12.940 -12.948, as applicable. The Recipient may be required to submit evidence that its procurement procedures comply with the standards stated therein. Additional guidance for contracting with small and minority firms, and women's business enterprises is included in the General Provisions section of this agreement.

Property Standards (Reclamation 08/03)

All property, equipment and supplies acquired by the Recipient with Federal funds shall be subject to usage, management, and disposal in accordance with the Property Standards at 43 CFR 12.72 - 12.73, or 43 CFR 12.930 - 12.937, as applicable.

Property Standards (Real Property) (Reclamation 08/03)

In accordance with 43 CFR 12.71 or 43 CFR 12.932, as applicable, if real property is acquired in whole or in part under this agreement, it shall be subject to the following regulations:

(1) Title. Title to real property acquired under this agreement shall vest upon acquisition in the Recipient or Subrecipient, shall be used for the originally authorized purpose of the project as long as it is needed, and shall not be disposed of or encumbered without Reclamation approval.

(2) Disposition. When the real property is no longer needed for the originally authorized purpose, the Recipient or Subrecipient shall request disposition instructions from Reclamation. The instructions shall provide for one of the following alternatives:

(2.1) Transfer. The Recipient may be permitted to transfer the property to another Federally sponsored project if the Recipient determines that the property is no longer needed for the purpose of the original project. Use in other projects or programs shall be limited to those with have purposes consistent with those authorized for support by the Department of the Interior.

(2.2) Retention of Title. The Recipient may be allowed to retain the title after compensating Reclamation for that percentage of the current fair market value of the property attributable to the Federal government's financial participation in the project.

(2.3) Sale of Property. The Recipient may be directed to sell the property under guidelines provided by Reclamation, and to compensate Reclamation in an amount calculated by applying Reclamation's percentage of participation in the cost of the original purchase to the proceeds of the sale after deduction of any actual and reasonable selling and fix-up expenses. When the Recipient is directed to sell the property, sales procedures shall be followed that provide for competition to the extent practicable and result in the highest possible return.

(2.4) Transfer of Title. The Recipient may be directed to transfer title to Reclamation or to an eligible third-party. The Recipient shall be entitled to compensation for its attributable percentage of the current fair market value of the property.

Inspection (Reclamation 08/03)

Reclamation has the right to inspect and evaluate the work performed or being performed under this agreement, and the premises where the work is being performed, at all reasonable times and in a manner that will not unduly delay the work. If Reclamation performs inspection or evaluation on the premises of the Recipient or a subrecipient, the Recipient shall furnish and shall require subrecipients to furnish all reasonable facilities and assistance for the safe and convenient performance of these duties.

Audit (Reclamation 09/03)

Recipients are responsible for obtaining audits in accordance with the Single Audit Act Amendments of 1996 (31 U.S.C. 7501-7507) and revised OMB Circular A-133, "Audits of States, Local Governments, and Non-Profit Organizations." Audits shall be made by an independent auditor in accordance with generally

accepted government auditing standards covering financial audits. Additional audit requirements applicable to this agreement are found at 43 CFR 12.66 or 43 CFR 12.926, as applicable. General guidance on the single audit process is included in a pamphlet titled, "Highlights of the Single Audit Process" which is available on the internet at <http://www.dot.gov/ost/m60/grant/sincontact.htm>. Additional information on single audits is available from the Federal Audit Clearinghouse at <http://harvester.census.gov/sac/>.

Enforcement (Reclamation 08/03)

In accordance with 43 CFR 12.83 or 43 CFR 12.962, as applicable, if the recipient materially fails to comply with any term of this agreement, whether stated in a Federal statute or regulation, an assurance, in a State plan or application, a notice of award, or elsewhere, Reclamation may take one or more of the following actions as appropriate:

- (1) Temporarily withhold cash payments pending correction of the deficiency by the recipient or subrecipient or more severe enforcement action by the awarding agency;
- (2) Disallow (deny both use of funds and any matching credit for) all or part of the cost of the activity or action not in compliance;
- (3) Wholly or partly suspend or terminate the current award for the recipient's or subrecipient's program;
- (4) Withhold further awards for the program; or
- (5) Take other remedies that may be legally available.

Termination (Reclamation 08/03)

In accordance with 43 CFR 12.84 or 43 CFR 12.961, as applicable, and except as provided for in the provision entitled, "Enforcement," this agreement may be terminated in whole or part only as follows:

- (1) By the awarding agency with the consent of the recipient or subrecipient in which case the two parties shall agree upon the termination conditions, including the effective date and in the case of partial termination, the portion to be terminated, or
- (2) By the recipient or subrecipient upon written notification to Reclamation, setting forth the reasons for such termination, the effective date, and in the case of partial termination, the portion to be terminated. However, if, in the case of a partial termination, the awarding agency determines that the remaining portion of the award will not accomplish the purposes for which the award was made, the awarding agency may terminate the award in its entirety under either the Provision entitled "Enforcement" or paragraph (1) of this Provision.

Preaward Incurrence of Costs (Reclamation 08/03)

The Recipient shall be entitled to have incurred costs for this agreement, in a total amount not to exceed \$30,000, for allowable costs incurred on or after October 1, 2004, which if had been incurred after execution of this agreement, would have been allowable under the provisions of the agreement.

Preaward Incurrence of Costs - Cost Sharing or Matching Agreements (Reclamation 08/03)

DELETED - Not Applicable for this agreement.

Patents and Inventions (Reclamation 08/03)

The administrative standards set forth in OMB Circular A-102 and OMB Circular A-110, as implemented by 43 CFR 12.936(b), require recipients of agreements which support experimental, developmental, or research work to be subject to applicable regulations governing patents and inventions, including the government-wide regulations issued by the Department of Commerce at 37 CFR 401, "Rights to Inventions Made by Non-profit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements." These regulations do not apply to any agreement made primarily for educational purposes.

In accordance with 37 CFR 401.3(a), the provision at 37 CFR 401.14(a), with authorized modifications for the Bureau of Reclamation, is hereby included in this agreement:

Patent Rights

(a) Definitions

- (1) "Invention" means any invention or discovery which is or may be patentable or otherwise protectable under Title 35 of the United States Code, or any novel variety of plant which is or may be protected under the Plant Variety Protection Act (7 U.S.C. 2321 et seq.).
- (2) "Subject invention" means any invention of the recipient conceived or first actually reduced to practice in the performance of work under this agreement, provided that in the case of a variety of plant, the date of determination (as defined in section 41(d) of the Plant Variety Protection Act, 7 U.S.C. 2401(d)) must also occur during the period of agreement performance.
- (3) "Practical Application" means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are, to the extent permitted by law or government regulations, available to the public on reasonable terms.
- (4) "Made" when used in relation to any invention means the conception or first actual reduction to practice of such invention.
- (5) "Small Business Firm" means a small business concern as defined at section 2 of Pub. L. 85-536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration. For the purpose of this provision, the size standards for small business concerns involved in government procurement and subcontracting at 13 CFR 121.3-8 and 13 CFR 121.3-12, respectively, will be used.
- (6) "Nonprofit Organization" means a university or other institution of higher education or an organization of the type described in section 501(c) (3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c) and exempt from taxation under section 501(a) of the Internal Revenue Code (25 U.S.C. 501(a)) or any nonprofit scientific or educational organization qualified under a state nonprofit organization statute.

(b) Allocation of Principal Rights

The Recipient may retain the entire right, title, and interest throughout the world to each subject invention subject to this provision and 35 U.S.C. 203. With respect to any subject invention in which the Recipient retains title, the Federal government shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States the subject invention throughout the world.

(c) Invention Disclosure, Election of Title and Filing of Patent Application by Recipient

- (1) The Recipient will disclose each subject invention to the Bureau of Reclamation within two months after the inventor discloses it in writing to Recipient personnel responsible for patent matters. The disclosure to the Bureau of Reclamation shall be in the form of a written report and shall identify the agreement under which the invention was made and the inventor(s). It shall be sufficiently complete in

technical detail to convey a clear understanding to the extent known at the time of the disclosure, of the nature, purpose, operation, and the physical, chemical, biological, or electrical characteristics of the invention. The disclosure shall also identify any publication, on sale or public use of the invention and whether a manuscript describing the invention has been submitted for publication and, if so, whether it has been accepted for publication at the time of disclosure. In addition, after disclosure to the Bureau of Reclamation, the Recipient will promptly notify the Bureau of Reclamation of the acceptance of any manuscript describing the invention for publication or of any on sale or public use planned by the Recipient.

(2) The Recipient will elect in writing whether or not to retain title to any such invention by notifying the Bureau of Reclamation within two years of disclosure to the Bureau of Reclamation. However, in any case where publication, on sale or public use has initiated the one year statutory period wherein valid patent protection can still be obtained in the United States, the period for election of title may be shortened by the Bureau of Reclamation to a date that is no more than 60 days prior to the end of the statutory period.

(3) The Recipient will file its initial patent application on a subject invention to which it elects to retain title within one year after election of title or, if earlier, prior to the end of any statutory period wherein valid patent protection can be obtained in the United States after a publication, on sale, or public use. The Recipient will file patent applications in additional countries or international patent offices within either ten months of the corresponding initial patent application or six months from the date permission is granted by the Commissioner of Patents and Trademarks to file foreign patent applications where such filing has been prohibited by a Secrecy Order.

(4) Requests for extension of the time for disclosure, election, and filing under subparagraphs (1), (2), and (3) may, at the discretion of the Bureau of Reclamation, be granted.

(d) Conditions When the Government May Obtain Title

The Recipient will convey to the Bureau of Reclamation, upon written request, title to any subject invention—

(1) If the Recipient fails to disclose or elect title to the subject invention within the times specified in (c), above, or elects not to retain title; provided that the Bureau of Reclamation may only request title within 60 days after learning of the failure of the Recipient to disclose or elect within the specified times.

(2) In those countries in which the Recipient fails to file patent applications within the times specified in (c) above; provided, however, that if the Recipient has filed a patent application in a country after the times specified in (c) above, but prior to its receipt of the written request of the Bureau of Reclamation, the Recipient shall continue to retain title in that country.

(3) In any country in which the Recipient decides not to continue the prosecution of any application for, to pay the maintenance fees on, or defend in reexamination or opposition proceeding on, a patent on a subject invention.

(e) Minimum Rights to Recipient and Protection of the Recipient Right to File

(1) The Recipient will retain a nonexclusive royalty-free license throughout the world in each subject invention to which the Government obtains title, except if the Recipient fails to disclose the invention within the times specified in (c), above. The Recipient's license extends to its domestic subsidiary and affiliates, if any, within the corporate structure of which the Recipient is a party and includes the right to grant sublicenses of the same scope to the extent the Recipient was legally obligated to do so at the time the agreement was awarded. The license is transferable only with the approval of the Bureau of Reclamation except when transferred to the successor of that party of the Recipient's business to which the invention pertains.

(2) The Recipient's domestic license may be revoked or modified by the Bureau of Reclamation to the extent necessary to achieve expeditious practical application of the subject invention pursuant to an application for an exclusive license submitted in accordance with applicable provisions at 37 CFR part 404 and Bureau of Reclamation licensing regulations (if any). This license will not be revoked in that field of use or the geographical areas in which the Recipient has achieved practical application and continues to make the benefits of the invention reasonably accessible to the public. The license in any foreign country may be revoked or modified at the discretion of the Bureau of Reclamation to the extent the Recipient, its

licensees, or the domestic subsidiaries or affiliates have failed to achieve practical application in that foreign country.

(3) Before revocation or modification of the license, the Bureau of Reclamation will furnish the Recipient a written notice of its intention to revoke or modify the license, and the Recipient will be allowed thirty days (or such other time as may be authorized by the Bureau of Reclamation for good cause shown by the Recipient) after the notice to show cause why the license should not be revoked or modified. The Recipient has the right to appeal, in accordance with applicable regulations in 37 CFR part 404 and Bureau of Reclamation regulations (if any) concerning the licensing of Government-owned inventions, any decision concerning the revocation or modification of the license.

(f) Recipient Action to Protect the Government's Interest

(1) The Recipient agrees to execute or to have executed and promptly deliver to the Bureau of Reclamation all instruments necessary to (i) establish or confirm the rights the Government has throughout the world in those subject inventions to which the Recipient elects to retain title, and (ii) convey title to the Bureau of Reclamation when requested under paragraph (d) above and to enable the government to obtain patent protection throughout the world in that subject invention.

(2) The Recipient agrees to require, by written agreement, its employees, other than clerical and nontechnical employees, to disclose promptly in writing to personnel identified as responsible for the administration of patent matters and in a format suggested by the Recipient each subject invention made under agreement in order that the Recipient can comply with the disclosure provisions of paragraph (c), above, and to execute all papers necessary to file patent applications on subject inventions and to establish the government's rights in the subject inventions. This disclosure format should require, as a minimum, the information required by (c) (1), above. The Recipient shall instruct such employees through employee agreements or other suitable educational programs on the importance of reporting inventions in sufficient time to permit the filing of patent applications prior to U.S. or foreign statutory bars.

(3) The Recipient will notify the Bureau of Reclamation of any decisions not to continue the prosecution of a patent application, pay maintenance fees, or defend in a reexamination or opposition proceeding on a patent, in any country, not less than thirty days before the expiration of the response period required by the relevant patent office.

(4) The Recipient agrees to include, within the specification of any United States patent applications and any patent issuing thereon covering a subject invention, the following statement, "This invention was made with government support under (identify the agreement) awarded by (identify the Federal agency). The government has certain rights in the invention."

(g) Subcontracts

The Recipient will include this provision, suitably modified to identify the parties, in all subagreements or subcontracts, regardless of tier, for experimental, developmental or research work. The subrecipient or subcontractor will retain all rights provided for the Recipient in this provision, and the Recipient will not, as part of the consideration for awarding the subagreement or subcontract, obtain rights in the subrecipient's or subcontractor's subject inventions.

(h) Reporting on Utilization of Subject Inventions

The Recipient agrees to submit on request periodic reports no more frequently than annually on the utilization of a subject invention or on efforts at obtaining such utilization that are being made by the Recipient or its licensees or assignees. Such reports shall include information regarding the status of development, date of first commercial sale or use, gross royalties received by the Recipient, and such other data and information as the Bureau of Reclamation may reasonably specify. The Recipient also agrees to provide additional reports as may be requested by the Bureau of Reclamation in connection with any march-in proceeding undertaken by the Bureau of Reclamation in accordance with paragraph (j) of this provision. As required by 35 U.S.C. 202(c) (5), the Bureau of Reclamation agrees it will not disclose such information to persons outside the government without permission of the Recipient.

(i) Preference for United States Industry

Notwithstanding any other part of this provision, the Recipient agrees that neither it nor any assignee will grant to any person the exclusive right to use or sell any subject inventions in the United States unless such person agrees that any products embodying the subject invention or produced through the use of the subject invention will be manufactured substantially in the United States. However, in individual cases, the requirement for such an agreement may be waived by the Bureau of Reclamation upon a showing by the Recipient or its assignee that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible.

(j) March-in Rights

The Recipient agrees that with respect to any subject invention in which it has acquired title, the Bureau of Reclamation has the right in accordance with the procedures in 37 CFR 401.6 and any supplemental regulations of the Bureau of Reclamation to require the Recipient, an assignee or exclusive licensee of a subject invention to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if the Recipient, assignee, or exclusive licensee refuses such a request the Bureau of Reclamation has the right to grant such a license itself if the Bureau of Reclamation determines that:

- (1) Such action is necessary because the Recipient or assignee has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of the subject invention in such field of use.
- (2) Such action is necessary to alleviate health or safety needs which are not reasonably satisfied by the Recipient, assignee or their licensees;
- (3) Such action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by the Recipient, assignee or licensees; or
- (4) Such action is necessary because the agreement required by paragraph (i) of this provision has not been obtained or waived or because a licensee of the exclusive right to use or sell any subject invention in the United States is in breach of such agreement.

(k) Special Provisions for Agreements with Nonprofit Organizations

If the Recipient is a nonprofit organization, it agrees that:

- (1) Rights to a subject invention in the United States may not be assigned without the approval of the Bureau of Reclamation, except where such assignment is made to an organization which has as one of its primary functions the management of inventions, provided that such assignee will be subject to the same provisions as the Recipient;
- (2) The Recipient will share royalties collected on a subject invention with the inventor, including Federal employee co-inventors (when the Bureau of Reclamation deems it appropriate) when the subject invention is assigned in accordance with 35 U.S.C. 202(e) and 37 CFR 401.10;
- (3) The balance of any royalties or income earned by the Recipient with respect to subject inventions, after payment of expenses (including payments to inventors) incidental to the administration of subject inventions, will be utilized for the support of scientific research or education; and
- (4) It will make efforts that are reasonable under the circumstances to attract licensees of subject invention that are small business firms and that it will give a preference to a small business firm when licensing a subject invention if the Recipient determines that the small business firm has a plan or proposal for marketing the invention which, if executed, is equally as likely to bring the invention to practical application as any plans or proposals from applicants that are not small business firms; provided, that the Recipient is also satisfied that the small business firm has the capability and resources to carry out its plan or proposal. The decision whether to give a preference in any specific case will be at the discretion of the Recipient. However, the Recipient agrees that the Bureau of Reclamation may review the Recipient's licensing program and decisions regarding small business applicants, and the Recipient will negotiate changes to its licensing policies, procedures, or practices with the Bureau of Reclamation when this review discloses that the Recipient could take reasonable steps to implement more effectively the requirements of this paragraph (k) (4).

(l) Communication

Communications regarding matters relating to this provision shall be directed to the Deputy Associate Solicitor, Branch of Procurements and Patents, Office of the Solicitor, U.S. Department of the Interior, Washington, DC 20240.

Copyrights (Reclamation 08/03)

(1) For recipients subject to the administrative standards set forth in OMB Circular A-110, the following copyright provision, as implemented by 43 CFR 12.936(a), shall apply:

“The recipient may copyright any work that is subject to copyright and was developed, or for which ownership was purchased, under an award. The Federal awarding agency (ies) reserves a royalty-free, nonexclusive, and irrevocable right to reproduce, publish, or otherwise use the work for Federal purposes, and to authorize others to do so.”

(2) For recipients subject to the administrative standards set forth in OMB Circular A-102 and the Grants Management Common Rule, the following copyright provision, as implemented by 43 CFR 12.74, shall apply:

“The Federal awarding agency reserves a royalty-free, nonexclusive, and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use, for Federal Government purposes:

(a) The copyright in any work developed under a grant, subgrant, or contract under a grant or subgrant; and

(b) Any rights of copyright to which a grantee, subgrantee or a contractor purchases ownership with grant support.”

Rights to Data (Reclamation 08/03)

For recipients subject to the administrative standards set forth in OMB Circular A-110, the following provision, as implemented by 43 CFR 12.936(c), shall apply:

“The Federal Government has the right to:

(1) Obtain, reproduce, publish or otherwise use the data first produced under an award; and

(2) Authorize others to receive, reproduce, publish, or otherwise use such data for Federal purposes.”

III. General Provisions (June 2004)

Regulations and Guidance

The regulations at 43 CFR, Part 12, Subparts A, C, E, and F, are hereby incorporated by reference as though set forth in full text. The following Office of Management and Budget (OMB) Circulars, as applicable, and as implemented by 43 CFR Part 12, are also incorporated by reference, and made a part of this agreement. Failure of a recipient to comply with any provision may be the basis for withholding payments for proper charges made by the recipient and for termination of support. Copies of OMB Circulars are available on the Internet at http://www.whitehouse.gov/omb/grants/grants_circulars.html. The implementation of the circulars at 43 CFR Part 12 is available at http://www.access.gpo.gov/nara/cfr/cfr_table_search.html#page1.

a. Agreements with colleges and universities shall be in accordance with the following circulars:

Circular A-21, revised May 10, 2004, "Cost Principles for Educational Institutions"

Circular A-110, as amended September 30, 1999, "Uniform Administrative Requirements for Grants and Agreements with Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations"

Circular A-133, revised June 27, 2003, "Audits of States, Local Governments, and Non-Profit Organizations"

b. Agreements with State and local governments shall be in accordance with the provisions of the following circulars:

Circular A-87, as amended May 10, 2004, "Cost Principles for State, Local, and Indian Tribal Governments"

Circular A-102, as amended August 29, 1997, "Grants and Cooperative Agreements with State and Local Governments" (Grants Management Common Rule, Codification by Department of Interior, 43 CFR 12)

Circular A-133, revised June 27, 2003, "Audits of States, Local Governments, and Non-Profit Organizations"

c. Agreements made with nonprofit organizations shall be in accordance with the following circulars and provisions:

Circular A-110, as amended September 30, 1999, "Uniform Administrative Requirements for Grants and Agreements with Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations"

Circular A-122, revised May 10, 2004, "Cost Principles for Non-Profit Organizations"

Circular A-133, revised June 27, 2003, "Audits of States, Local Governments, and Non-Profit Organizations"

d. All agreements with organizations other than those indicated above shall be in accordance with the basic principles of OMB Circular A-110, and cost principles shall be in accordance with 48 CFR Subpart 31.2 titled "Contracts with Commercial Organizations" which is available on the Internet at http://www.access.gpo.gov/nara/cfr/cfr_table_search.html#page1.

Debarment and Suspension

The Department of the Interior regulations at 43 CFR 42—Governmentwide Debarment and Suspension (Nonprocurement), which adopt the common rule for the governmentwide system of debarment and suspension for nonprocurement activities, are hereby incorporated by reference and made a part of this agreement. By entering into this grant or cooperative agreement with the Bureau of Reclamation, the recipient agrees to comply with 43 CFR 42, Subpart C, and agrees to include a similar term or condition in all lower-tier covered transactions. These regulations are available at http://www.access.gpo.gov/nara/cfr/cfrhtml_00/Title_43/43cfr42_00.html.

Drug-Free Workplace

The Department of the Interior regulations at 43 CFR 43—Governmentwide Requirements for Drug-Free Workplace (Financial Assistance), which adopt the portion of the Drug-Free Workplace Act of 1988 (41 U.S.C. 701 et seq, as amended) applicable to grants and cooperative agreements, are hereby incorporated by reference and made a part of this agreement. By entering into this grant or cooperative agreement with the Bureau of Reclamation, the recipient agrees to comply with 43 CFR 43, Subpart B, if the recipient is not an individual, or with 43 CFR 43, Subpart C, if the recipient is an individual. These regulations are available at http://www.access.gpo.gov/nara/cfr/cfrhtml_00/Title_43/43cfr43_00.html.

Assurances Incorporated by Reference

- a. The provisions of the Assurances, SF 424B or SF 424D as applicable, executed by the Recipient in connection with this agreement shall apply with full force and effect to this agreement as if fully set forth in these General Provisions. Such Assurances include, but are not limited to, the promise to comply with all applicable Federal statutes and orders relating to nondiscrimination in employment, assistance, and housing; the Hatch Act; Federal wage and hour laws and regulations and work place safety standards; Federal environmental laws and regulations and the Endangered Species Act; and Federal protection of rivers and waterways and historic and archeological preservation.
- b. When required by 43 CFR 18—New Restrictions on Lobbying, recipients shall complete a Certification Regarding Lobbying form. This certification is incorporated by reference and made a part of this agreement. These regulations are available at http://www.access.gpo.gov/nara/cfr/cfrhtml_00/Title_43/43cfr18_00.html.

Covenant Against Contingent Fees

The recipient warrants that no person or agency has been employed or retained to solicit or secure this agreement upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide offices established and maintained by the recipient for the purpose of securing agreements or business. For breach or violation of this warranty, the Government shall have the right to annul this agreement without liability or, in its discretion, to deduct from the agreement amount, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee.

Contracting with Small and Minority Firms, and Women's Business Enterprises

It is a national policy to award a fair share of contracts to small and minority business firms. The Department of the Interior is strongly committed to the objectives of this policy and encourages all recipients of its grants and cooperative agreements to take affirmative steps to ensure such fairness.

- a. The grantee and subgrantee shall take all necessary affirmative steps to assure that minority firms, and women's business enterprises are used when possible.

b. Affirmative steps shall include:

- (1) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
- (2) Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;
- (3) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority business, and women's business enterprises;
- (4) Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority business, and women's business enterprises;
- (5) Using the services and assistance of the Small Business Administration, and the Minority Business Development Agency of the Department of Commerce as appropriate, and
- (6) Requiring the prime contractor, if subcontracts are to be let, to take the affirmative steps listed in b. (1) through (5) above.

Notice Regarding Buy American Act

In accordance with the annual Energy and Water Development Appropriations Act, please be advised that it is and has been the sense of Congress that, to the greatest extent practicable, all equipment and products purchased with funds made available in this Act should be American-made. This provision shall remain in effect unless revoked by a future specific act of Congress.

Resolving Disagreements

When entering into a cooperative agreement with a recipient, Reclamation commits itself to working with the recipient in a harmonious manner to achieve the objectives of the project successfully. When disagreements arise between the parties, they must be resolved according to the procedures discussed below:

- a. Reclamation shall attempt first to resolve disagreements with the recipient through informal discussion among the Grants or Contract Specialist, the Program Officer, and the recipient's Project Director.
- b. If the disagreement cannot be resolved through informal discussion between these parties, the Grants Specialist and the Program Officer shall document the nature of the disagreement and bring it to the attention of the Grants Officer.
- c. After reviewing the facts of the disagreement, as presented by the Grants and Program Offices, the Grants Officer will arrange a formal meeting. If agreement still cannot be reached, the parties will collectively decide on any varied approaches which might be used to resolve the disagreement. The parties shall be responsible for their individual expenses related to any approach utilized to resolve the disagreement. If attempts at resolving the disagreement fail, the Chief, Acquisition and Assistance Management Services, or the Regional Director, whichever is applicable, shall make a decision, which shall be final and conclusive.
- d. Nothing herein shall be construed to delay or limit Reclamation's right to take immediate and appropriate action, as set forth at 43 CFR Subpart 12.83 or 12.962, as applicable, in the event of material noncompliance by the recipient, and no attempts at informal resolution shall be necessary.

Any post award issue will be open for resolution in accordance with the above procedures, with the exception of disagreements regarding continuation of the agreement (termination must be in accordance with 43 CFR 12), or other matters specifically addressed by the agreement itself.

Lobbying Restrictions

In accordance with the annual Energy and Water Development Appropriations Act, please be advised that it is and has been the sense of Congress that none of the funds appropriated by this Act may be used in any way, directly or indirectly, to influence Congressional action on any legislation or appropriation matters pending before Congress, other than to communicate to Members of Congress as described in 18 U.S.C. 1913. This provision shall remain in effect unless revoked by a future specific act of Congress.

Electronic Funds Transfer (EFT)

In accordance with the Debt Collection Improvement Act of 1996, 31 CFR 208, effective January 2, 1999, all Federal payments to recipients must be made by EFT unless a waiver has been granted in accordance with 31 CFR 208.4. Upon award of a financial assistance agreement, Reclamation will provide the recipient with further instructions for implementation of EFT payments or a certification form to request exemption from EFT.

Endorsement of Commercial Products and Services

In accordance with 43 CFR 12.2(d), this provision applies to grants and cooperative agreements whose principal purpose is a partnership where the recipient contributes resources to promote agency programs, publicize agency activities, assists in fund-raising, or provides assistance to the agency. If the agreement is awarded to a recipient, other than a State government, a local government, or a federally-recognized Indian tribal government, and the agreement authorizes joint dissemination of information and promotion of activities being supported, the following provision shall be made a term and condition of the award:

Recipient shall not publicize or otherwise circulate, promotional material (such as advertisements, sales brochures, press releases, speeches, still and motion pictures, articles, manuscripts or other publications) which states or implies governmental, Departmental, bureau, or government employee endorsement of a product, service or position which the recipient represents. No release of information relating to this award may state or imply that the Government approves of the recipient's work products, or considers the recipient's work product to be superior to other products or services.

All information submitted for publication or other public releases of information regarding this project shall carry the following disclaimer:

“The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Government. Mention of trade names or commercial products does not constitute their endorsement by the U.S. Government.”

Recipient must obtain prior Government approval for any public information releases concerning this award which refer to the Department of the Interior or any bureau or employee (by name or title). The specific text, layout photographs, etc. of the proposed release must be submitted with the request for approval.

A recipient further agrees to include this provision in a subaward to any subrecipient, except for a subaward to a State government, a local government, or to a federally-recognized Indian tribal government.

APPENDIX C
CATEGORICAL EXCLUSION DETERMINATION BY BOR



United States Department of the Interior

BUREAU OF RECLAMATION

Phoenix Area Office

PO Box 81169

Phoenix, Arizona 85069-1169

MAY 27 2004

IN REPLY REFER TO:

PXAO-1500

ENV-6.00

MEMORANDUM

To: Area Manager, Phoenix, Arizona
Attention: PXAO-1000

From: Bruce D. Ellis *Bruce D. Ellis*
Chief, Environmental Resource Management Division

Subject: Categorical Exclusion Checklist (CEC) – El Rio Watercourse Master Plan Educational Pilot Project

The subject CEC is attached for your approval and signature. If you have any questions, please contact Ms. Sandra Eto at extension 3857.

Attachment

cc: LC-2624 (A. Jenkins)
PXAO-7000 (W. Doyle)
(w/att to ea)

Categorical Exclusion Checklist

Date: May 2004

Project: El Rio Watercourse Master Plan Educational Pilot Project

Nature of Action: Execution of a funding agreement for construction of a demonstration project

Exclusion Category: 516 DM 6 Appendix 9, 9.4, D.12. Conduct of programs of demonstration, educational, and technical assistance to water user organizations for improvement of project and on-farm irrigation water use and management.

Evaluation of criteria for Categorical Exclusion:

1. This action or group of actions would have a significant effect on the quality of the human environment. No Uncertain__ Yes__
2. This action or group of actions would involve unresolved conflicts concerning alternative uses of available resources. No Uncertain__ Yes__

Evaluation of exceptions to actions within Categorical Exclusion:

1. This action would have significant adverse effects on public health or safety. No Uncertain__ Yes__
2. This action would affect unique geographical features such as: Wetlands, wild or scenic rivers, refuges, floodplains, or prime and unique farmlands. No Uncertain__ Yes__
3. This action will have highly controversial environmental effects. No Uncertain__ Yes__
4. This action will have highly uncertain environmental effects or involve unique or unknown environmental risk. No Uncertain__ Yes__
5. This action will establish a precedent for future actions. No Uncertain__ Yes__

6. This action is related to other actions with individually insignificant, but cumulatively significant, effects. No X Uncertain__ Yes__
7. This action will adversely affect properties listed or eligible for listing, in the National Register of Historic Places. No X Uncertain__ Yes__
8. This action will adversely affect a species listed, or proposed to be listed, as threatened or endangered (T&E). No X Uncertain__ Yes__
9. This action threatens to violate Federal, State, local, or tribal law or requirements imposed for protection of the environment. No X Uncertain__ Yes__
10. This action will adversely affect Indian Trust Assets (ITA). No X Uncertain__ Yes__

NEPA Action - Categorical Exclusion X
 EA _____
 EIS _____

Explanation/remarks: Reclamation proposes to enter into a funding agreement pursuant to the Fish and Wildlife Coordination Act (Public Law 85-624), to provide partial funding for an educational pilot project sponsored by the Flood Control District of Maricopa County (FCDMC). The purpose of the El Rio Watercourse Master Plan (WCMP) Educational Pilot Project is to test the success and viability of replacing dense monocultural stands of saltcedar (*Tamarix ramosissima*) with species considered by the project proponents to be more diverse and suitable to a floodplain environment.

The pilot project is intended to serve as a demonstration for the eventual El Rio WCMP. The El Rio WCMP is a 17.5-mile flood control project on the Gila River that extends from the confluence of the Agua Fria River downstream (west) to the State Route 85 bridge. The purpose of the WCMP is to incorporate nonstructural flood control concepts with traditional flood control features. It is primarily focused on flood mitigation on the Gila River, and will likely have vegetation management components designed to improve hydraulics, water quality, water quantity, and habitat.

The El Rio WCMP Educational Pilot Project study area is located in the City of Goodyear, Arizona, south of the Gila River, within the Maricopa County owned and operated Estrella Mountain Regional Park (Figures 1 and 2). The project area comprises approximately 10 acres (Figure 3). The project consists of two phases. Phase One involves filling and grading

The Class III revealed no prehistoric or historic archaeological sites, and no artifacts were found. The cultural resource report stated this could be because: (1) the majority of the project area is located within the floodplain and consists of deep alluvium; and (2) the portion of the project area that is not located within the floodplain was previously disturbed from construction of Vineyard Avenue (Rodgers 2004). Consistent with a Programmatic Memorandum of Agreement for Negative Findings dated November 13, 1990, between Reclamation and the State Historic Preservation Officer, work on this project may proceed.

ITAs are legal interests in property held in trust by the United States for Indian Tribes or individuals. Reclamation has reviewed the proposed action for possible effects to ITAs. ITAs have not been identified within the project area and, thus, would not be adversely impacted by the proposed action.

The proposed activity is categorically excluded from additional environmental clearances based upon the following stipulations:

1. If previously unidentified cultural resources, especially human remains, or burials, are encountered during construction, work will cease immediately at the location, and personnel from our Cultural Resources Branch shall be notified at 602-216-3941.
2. The project proponent will obtain all necessary permits pursuant to the Clean Water Act, including but not limited to, a Section 404 permit for discharge of material into waters of the United States from the U.S. Army Corps of Engineers (Corps), and a 402 Stormwater Discharge Permit from the Arizona Department of Environmental Quality.
3. The project proponent will comply with the Arizona Native Plant Law regarding salvage of certain native plant species prior to land disturbing activities. Damage or removal of mature native trees shall be avoided to the greatest degree practicable.
4. Areas disturbed or damaged during construction of the project that are not needed for the project shall be revegetated with a native plant seed mix approved by the Arizona Game and Fish Department. If seeding occurs outside the months during normal precipitation, supplemental watering shall be applied.
5. The outer boundaries of the project area shall be cleared in a curvilinear fashion and shall avoid straight lines, to soften the visual appearance.
6. Fill material required for the project will be clean and free from any hazardous materials; it shall be obtained from a source that is in compliance with section 404 of the Clean Water Act.
7. Construction activities will be limited to daylight hours (sunrise to sunset). Dust abatement measures will be implemented.

8. If the parking area is not needed beyond the life of the pilot project by the project proponent, the parking area shall be returned to its original condition or graded as specified by the landowner. The area shall be scarified and revegetated with a native plant seed mix approved by the Arizona Game and Fish Department. If seeding occurs outside the months during normal precipitation, supplemental watering shall be applied.

9. Should the pilot project not be initiated until after a flood event occurs that wets the area, or should modification to the project area be contemplated subsequent to a flood event that wets the area, the project proponent shall notify Reclamation so that it may be determined whether or not additional SWF surveys are required prior to any land disturbing activities.

References Cited:

Rodgers, James B. 2004. An Archeological Inventory of the El Rio Pilot Study Area in Goodyear and Central Maricopa County, Arizona. Prepared for Flood Control District of Maricopa County. April 2, 2004. Phoenix, Arizona. 25 pp.

Preparer's Name and Title: Sandra Eto, Environmental Protection Specialist

Project Archaeologist concurrence with Item 7: Jordan Szepielak 5-27-04

Project Biologist concurrence with Item 8: Susan Sfera 5-27-04

ITA designee concurrence with Item 10: Jordan Szepielak 5-27-04

Concur: Bruce D. Ellis Date: 5/27/04
Chief, Environmental Resource Management Division

Approve: Cathy E. Date: 5/27/04
Area Manager

Categorical Exclusion No. PXAO-04-17 Date: MAY 27 2004

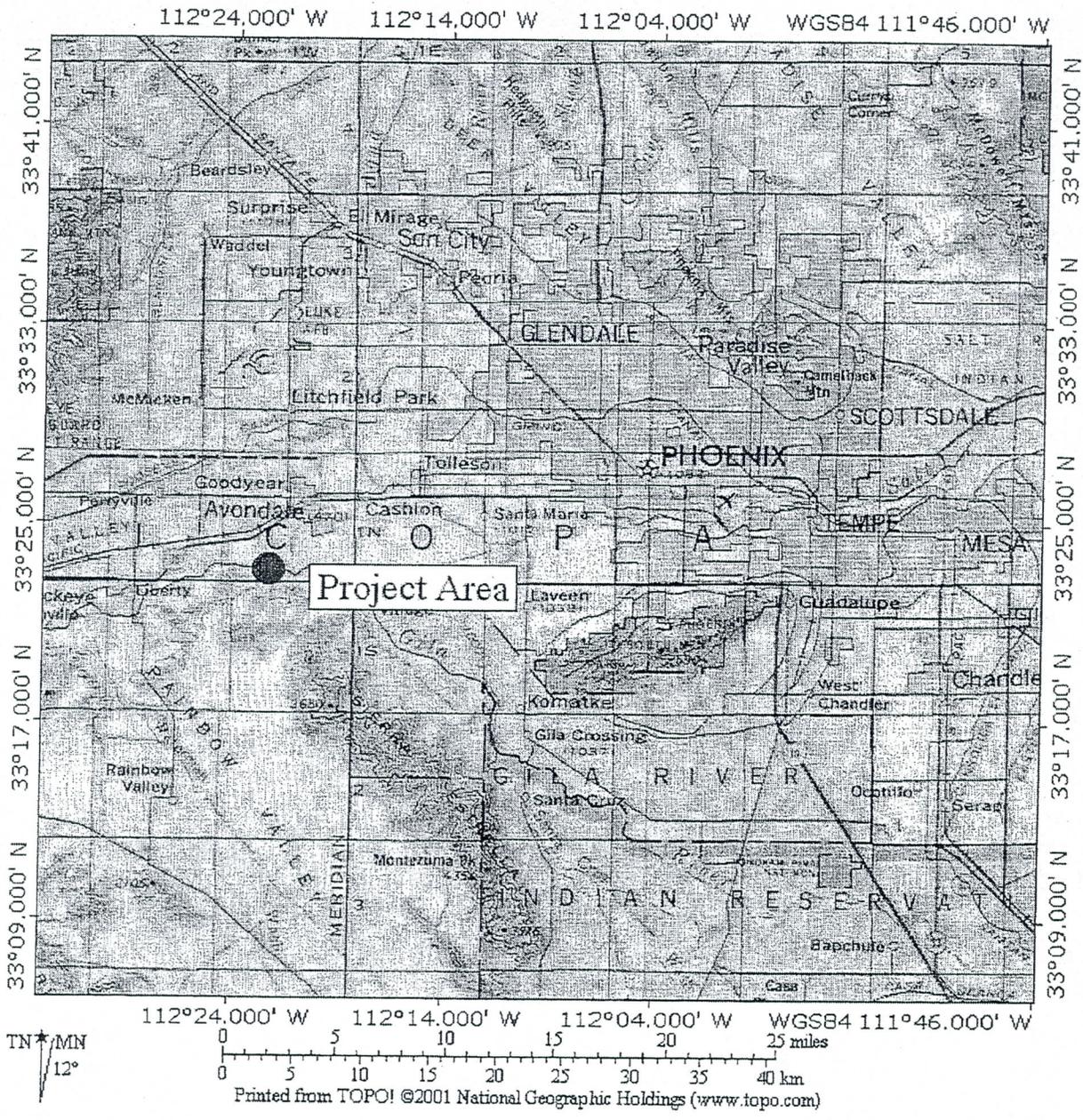


Figure 1. General Project Location
 El Rio Watercourse Master Plan Educational Pilot Project

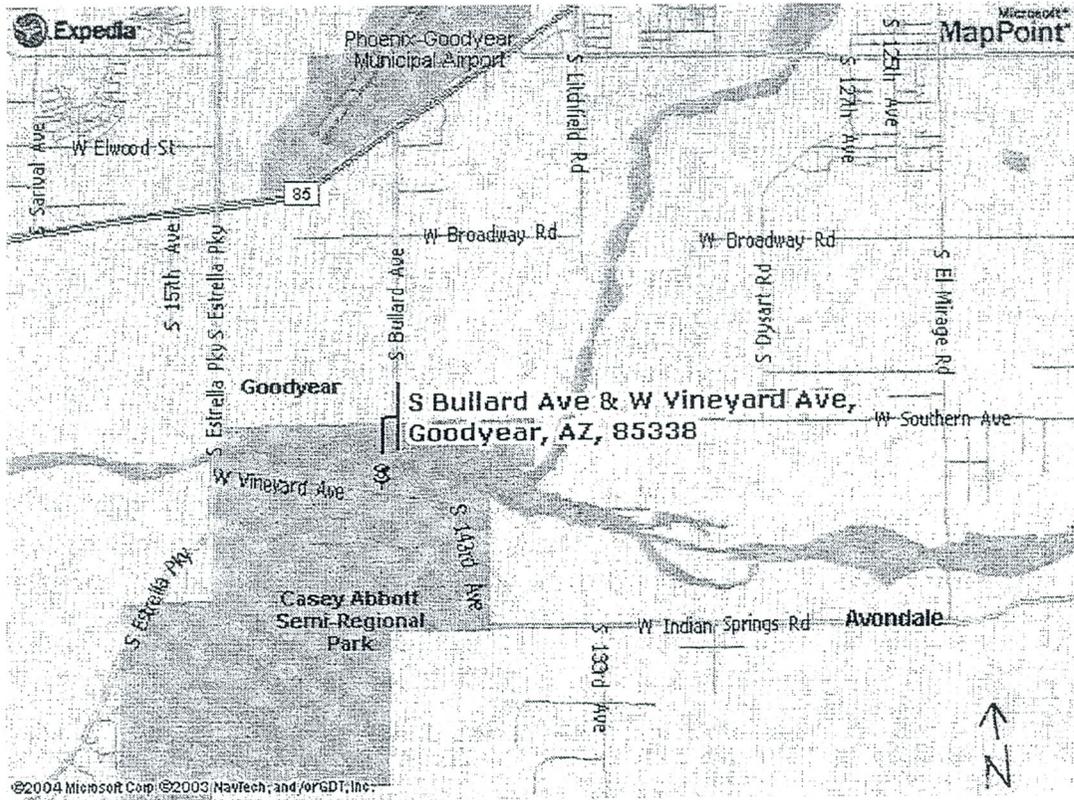


Figure 2. El Rio Watercourse Master Plan Education Pilot Project Area

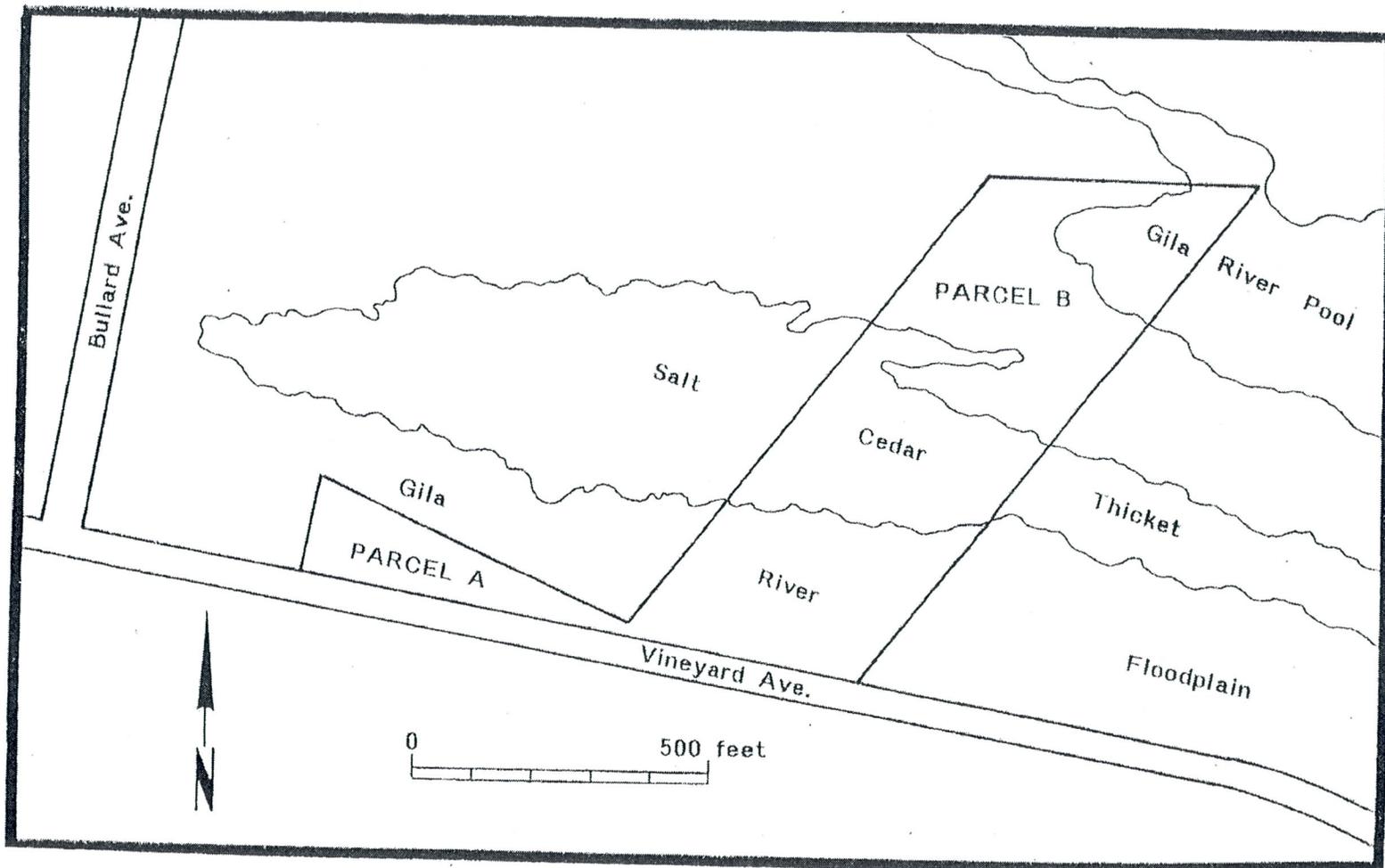


Figure 3. El Rio Watecourse Master Plan Education Pilot Project
Parcel A - Parking Area
Parcel B - Demonstration Area

APPENDIX D
EDUCATIONAL R&D PILOT 404 PERMIT BY USACOE



DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
ARIZONA-NEVADA AREA OFFICE
3636 NORTH CENTRAL AVENUE, SUITE 900
PHOENIX, ARIZONA 85012-1939

REPLY TO

November 1, 2005

Office of the Chief
Regulatory Branch

Mr. Robert B. Stevens
Environmental Planner
Flood Control District Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

File Number: 2005-01221-DE

Dear Mr. Stevens:

This is in reply to your April 5, 2005 letter concerning your proposal to develop the El Rio Pilot Project, to include construction of an informational kiosk and parking lot, removal of invasive species, and revegetation of approximately 10 acres with species historically native to the Gila River, in an effort to establish riverine habitat, provide for onsite education, and support the collection of research and operational data for flood mitigation studies in the Gila River within Section 33, T1N, R1W, Goodyear, Maricopa County, Arizona.

The Corps of Engineers has determined, under Section 404 of the Clean Water Act (33 U.S.C. 1344), that your proposed activity complies with the terms of Nationwide Permit No. 27, "Stream and Wetland Restoration Activities." You must comply with all terms and applicable conditions (General, Regional, and Section 401 conditions) described in Enclosure 1 and complete the compliance statement (Enclosure 2).

Furthermore, you must comply with the following **Special Conditions**:

- a. The permittee shall limit the area of disturbance within the Gila River to the 10-acre project area. Prior to commencement of construction, the boundary of the project area shall be delimited by the placement of temporary construction fencing, staking, and/or signage indicating the limits of the construction area.
- b. Materials, staging, storage, fueling, and maintenance of construction equipment shall be located outside of the Gila River in areas where potential spilled materials will not be able to enter the Gila River.
- c. Equipment shall not operate in the flowing waters of the Gila River. The Gila River shall be diverted from the work area, or the permittee shall perform work during low water conditions

when the area is naturally dewatered. The permittee shall suspend all operations when there is water within the project area, and remove all equipment from the Gila River.

d. The permittee shall allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished within the terms and conditions of the permit.

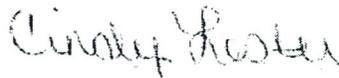
e. A copy of the permit shall be on the job site at all times during construction. The permittee shall provide a copy of this permit to all contractor(s), subcontractor(s), foreperson(s), and construction representative(s). The permittee shall require that all such contractor(s), subcontractor(s), foreperson(s), and construction representative(s) read this permit authorization in its entirety and acknowledge they understand its contents and their responsibility to ensure compliance with all General, Regional, Section 401, and Special Conditions contained herein.

This letter of verification is valid through March 19, 2007. All nationwide permits expire on March 19, 2007. If you either contract the work or begin construction on or before March 19, 2007 you will have an additional 12 months to complete the activity under the attached nationwide permit terms and conditions. If the work is not under construction or contract by March 19, 2007 the work will be subject to regulations in effect at the time when you re-apply for a permit. It is incumbent upon you to remain informed of changes to the nationwide permits. If the Corps of Engineers modifies, reissues, or revokes any nationwide permit at an earlier date, we will issue a public notice announcing the changes.

A nationwide permit does not grant any property rights or exclusive privileges. Also, it does not authorize any injury to the property or rights of others or authorize interference with any existing or proposed Federal project. Furthermore, it does not obviate the need to obtain other Federal, state, or local authorizations required by law.

Thank you for participating in our regulatory program. If you have questions, please contact Daisy Eldridge at (602) 640-5385 x 268.

Sincerely,



Cindy Lester P.E.
Chief, Arizona Section
Regulatory Branch

Enclosures

APPENDIX E
INTERGOVERNMENTAL AGREEMENT BETWEEN
MCPRD & FCDMC

When Recorded Return to:
CLERK OF THE BOARD
BASKET PICK UP

y



OFFICIAL RECORDS OF
MARICOPA COUNTY RECORDER
HELEN PURCELL
2005-0796497 06/13/05 15:54
11 OF 15
REITZD

COPY

Design, Rights-of-Way, Construction,
Construction Management, Operation and Maintenance
Of the
El Rio Educational Research and Development Project – Estrella Mountain Regional Park
Between the
Flood Control District of Maricopa County
And
Maricopa County through the Maricopa County Parks and Recreation Department

FCD 2005A004

Agenda Item C-69-05-125-2-00
C-30-05-042-2-00

This Agreement is entered into by and between the Flood Control District of Maricopa County, a municipal corporation and political subdivision of the State of Arizona, acting by and through its Board of Directors, hereinafter called the DISTRICT, and Maricopa County, a municipal corporation and political subdivision of the State of Arizona, through the Maricopa County Parks and Recreation Department, hereinafter called the COUNTY.

This Agreement shall become effective as of the date it has been executed by all parties.

DATE FILED WITH MARICOPA COUNTY RECORDER

June 13, 2005

STATUTORY AUTHORIZATION

1. The DISTRICT is empowered by Arizona Revised Statutes Section 48-3603, as revised, to enter into this Agreement and has authorized the undersigned to execute this Agreement on behalf of the DISTRICT.

2. The COUNTY is empowered by Arizona Revised Statutes Section 11-952 to enter into this Agreement, and has authorized the undersigned to execute this Agreement on behalf of the COUNTY.

BACKGROUND

3. The Board of Directors of the Flood Control District of Maricopa County (BOARD) approved DISTRICT Contract FCD 2001C024, authorizing the DISTRICT to undertake the El Rio Watercourse Master Plan (El Rio Study). The El Rio Study focuses on identifying and developing solutions to flooding problems along a 17-mile reach of the Gila River in central Maricopa County. Solutions that are identified by the El Rio Study will likely include both structural flood control projects, such as constructing levees, and non-structural flood control projects, such as vegetation management techniques to improve the hydraulics and flood water conveyance capacity.

Salt cedar, also known as tamarisk, is an invasive exotic species growing throughout the Gila River in the El Rio Study's area. Removing salt cedar from the Gila River would improve the conveyance capacity for storm water, and could reduce the size of the current 100-year floodplain. Thus, removing salt cedar has been identified as one potential mitigation solution in the El Rio Study.

Removal of salt cedar or other vegetation within Waters of the United States (WUS) is considered a regulated activity and requires a Clean Water Act Section 404 permit. Although salt cedar can create dense, monocultures which may result in low biodiversity comparatively, salt cedar stands provide food and cover for insects, birds, mammals and reptiles. Therefore, removing salt cedar is an environmental impact that requires mitigation in accordance with the CWA Section 404 permit.

Replacing the removed salt cedar community with vegetation that is more hydraulically efficient and ecologically diverse would be appropriate and dually beneficial mitigation. Studies demonstrating salt cedar removal techniques have been conducted throughout the southwest, however, studies that demonstrate the best way to revegetate the area with other desirable plants have not been widely conducted. Therefore, during the planning process of the El Rio Study, the need for a research project to determine the most effective method locally to replace the salt cedar community with beneficial plant species was recognized.

The purpose of the El Rio Educational Research and Development Project, hereinafter defined as the PROJECT, is to establish and document effective techniques to replace salt cedar with vegetation that improves flood conveyance and biological diversity within the Gila River. The PROJECT's results will help the DISTRICT with its federal and state permits for other flood control projects identified in the El Rio Study. The PROJECT has ancillary benefits including passive recreation and educational opportunities about floodplain management, river mechanics, and plant, wildlife, and river ecology.

The PROJECT will be located on a ten acre site in the Gila River in the Estrella Mountain Regional Park within TIN, R1W, S33 (Exhibit A). The location was chosen after evaluating several possible locations using specific criteria, which are documented in the "Project Proposal and Site Selection Report". The COUNTY owns and operates the Estrella Mountain Regional Park. The PROJECT features include an approximate nine acre re-vegetation site with 4 treatment sub-areas, a trail traversing through the re-vegetation site, and an approximate one acre parking lot with an educational kiosk.

The COUNTY has an interest in managing the Estrella Mountain Regional Park, which includes large portions of riparian and floodplain areas, in a manner that is environmentally responsible and enhances recreational and educational opportunities for the public. The data obtained from the PROJECT regarding treatment and management of non-native vegetative species will be valuable in managing Park resources throughout the County.

The DISTRICT and the COUNTY, hereinafter referred to collectively as the PROJECT PARTNERS or individually as the PROJECT PARTNER, desire to cooperate and cost share in the implementation of the PROJECT. The PROJECT is to be constructed by the DISTRICT contingent on funds being obtained from the U. S. Bureau of Reclamation through a cooperative agreement specific to the PROJECT. The PROJECT will be operated and maintained by the COUNTY using Parks and Recreation Department revenues and standard procedures for a minimum of five (5) years.

PURPOSE OF THE AGREEMENT

4. The purpose of this Intergovernmental Agreement is to identify and define the responsibilities of the DISTRICT and COUNTY for the design, permits, utility relocations, rights-of-way, construction, construction management, and operation and maintenance of the PROJECT.

TERMS OF AGREEMENT

5. The DISTRICT shall:

- 5.1 Be responsible for design, construction, and construction management of the PROJECT.
- 5.2 Fund one hundred percent (100%) of the PROJECT's design and construction costs, estimated to be \$120,000. The DISTRICT's financial responsibility for the DISTRICT's portion is subject to the successful execution of a cooperative agreement with the Bureau of Reclamation and receipt of funds from the Bureau.
- 5.3 Provide design plans and specifications for the PROJECT to the COUNTY for review and comment. The COUNTY shall provide comments within two (2) weeks of receipt of submittals. The DISTRICT shall resolve or incorporate the COUNTY'S comments in the plans and specifications whenever feasible.
- 5.4 Be responsible for obtaining the necessary permits required for the design and construction of the PROJECT. The PROJECT PARTNERS agree to issue any permits or rights of entry necessary to each other at no cost.
- 5.5 Provide a vegetation maintenance plan, site improvements (planning, design and construction) and document monitoring and treatment results.
- 5.6 Perform quarterly monitoring of the PROJECT, and inform the COUNTY of any maintenance needs or comments from the monitoring activity for a period of 5 years.

6. The COUNTY shall:

- 6.1 Be responsible for providing the 10-acre site for the PROJECT and any temporary construction easements necessary, including easements for parking construction equipment, for the construction of the PROJECT.
- 6.2 Provide comments on the DISTRICT's design to the DISTRICT. These comments shall be provided within two (2) weeks of receipt of submittals.
- 6.3 Be responsible for the operation and maintenance of the completed PROJECT, as well as any

associated operations and maintenance costs of the PROJECT. This shall include providing irrigation watering to the vegetation, trail maintenance, and general "house keeping" such as periodic removal of trash and debris, aesthetics maintenance, graffiti removal, vandalism repair and general site maintenance and repair, for a period of five (5) years.

- 6.4 After five (5) years the PROJECT will be considered complete and the COUNTY may make use of the facilities in a manner that it deems most appropriate.
- 6.5 Administer the PROJECT after construction completion, be responsible for public use of the PROJECT, and have the exclusive right to collect fees as part of the Maricopa County Parks and Recreation System.
7. Either PROJECT PARTNER may, with mutual written agreement of the other PROJECT PARTNER, delegate responsibilities to another party. Any delegation, however, shall not relieve the delegating PROJECT PARTNER of its original responsibilities as defined herein.
8. Any dispute, controversy, claim or cause of action arising out of or related to this Agreement shall be governed by Arizona law and may, but in no event need, be settled by submission with the consent of both PROJECT PARTNERS to binding arbitration in accordance with the rules of the American Arbitration Association and the Arizona Uniform Arbitration Act, and judgment upon any award rendered by the arbitrators may be entered in the Superior Court of Maricopa County, or any such dispute, controversy, claim or cause of action may be litigated in a court. The venue for any such dispute shall be Maricopa County, Arizona. Each PROJECT PARTNER waives the right to object to venue in Maricopa County for any reason.
9. Each PROJECT PARTNER (indemnitor) shall, to the extent permissible by law, indemnify, defend and save harmless the others (indemnitees) including, agents, officers, directors, governors and employees thereof, from and against any loss or expense incurred as a result of any claim or suit of any nature whatsoever, which arises out of indemnitor's negligent or wrongful acts or omissions pursuant to this agreement. Such indemnification obligation shall encompass any personal injury, death or property damages resulting from the indemnitor's negligent or wrongful acts or omissions, as well as reasonable attorney's fees, court costs, and other expenses relating to the defense against claims or litigation, incurred by the indemnitee. Indemnitees shall be liable for their own negligence or wrongful acts as provided by law.
10. All notices or demands upon any party to this Agreement shall be in writing and shall be delivered in person or sent by mail addressed as follows:

Flood Control District of Maricopa County
Chief Engineer and General Manager
2801 West Durango Street
Phoenix, AZ 85009-6399

Maricopa County Parks & Recreation Dept.
Director
411N. Central Ave., Ste. 470
Phoenix, AZ 85004

11. The payment and reimbursement obligations for the PROJECT Partners are as stated in paragraphs 5 and 6 above, and each party to this Agreement will pay for and not seek reimbursement from its PROJECT PARTNER for its own personnel and administrative costs associated with those obligations for this

PROJECT, including but not limited to the following unless specifically identified otherwise in this Agreement: design, rights-of-way acquisition, inspection, permitting, management and administration, and operation and maintenance. The DISTRICT and the COUNTY may cooperate and partner with each other in future projects when appropriate and mutually beneficial.

12. This Agreement shall expire five (5) years from the date of recording with the Maricopa County Recorder or upon completion of the PROJECT and after all funding obligations and reimbursements have been satisfied in accordance with this Agreement, whichever is the first to occur. However, by mutual written agreement of the PROJECT PARTNERS, this Agreement may be amended or terminated prior to its expiration per paragraph 16. The operation and maintenance, dispute, notification, and indemnification provisions of this Agreement shall survive the expiration of this Agreement.
13. This Agreement is subject to cancellation by either PROJECT PARTNER pursuant to the provisions of Arizona Revised Statutes Section 38-511.
14. Attached to this Agreement or contained herein are the written determinations by the appropriate attorneys for the PROJECT PARTNERS, that the PROJECT PARTNERS are authorized under the laws of the State of Arizona to enter into this Agreement and that it is in proper form.
15. If legislation is enacted after the effective date of this Agreement that changes the relationship or structure of either PROJECT PARTNER, the PROJECT PARTNERS agree that this Agreement shall be renegotiated at the written request of either PROJECT PARTNER.
16. This Agreement, including Exhibit "A", and any written amendments hereto that may be executed from time to time by the PROJECT PARTNERS, constitutes the entire agreement between the PROJECT PARTNERS pertaining to the subject matter hereof and contains all the agreements, promises and understandings between the PROJECT PARTNERS, and no verbal or oral agreements, promises, statements, assertions or representations by the PROJECT PARTNERS or any employees, agents, contractors or other representations of either, shall be binding upon the PROJECT PARTNERS. This Agreement cannot be changed, modified or amended, in whole or in part, except by a written amendment executed by the PROJECT PARTNERS in the same manner as this Agreement is executed.
17. This Agreement shall be construed and interpreted according to its plain meaning, and no presumption shall be deemed to apply in favor of, or against the PROJECT PARTNER drafting the Agreement. The PROJECT PARTNERS acknowledge and agree that each has had the opportunity to seek and utilize legal counsel in the drafting of, review of, and entry into this Agreement.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
A Municipal Corporation

Recommended by:

Timothy S. Phillips 5/19/05

Timothy S. Phillips, P.E. Date
Acting Chief Engineer and General Manager

Approved and Accepted:

By: May W Wilson JUN 08 2005
Chairman, Board of Directors Date

Attest:

By: Janet A. Canty JUN 08 2005
Clerk of the Board Date

The foregoing Intergovernmental Agreement IGA FCD 2005A004 has been reviewed pursuant to Arizona Revised Statutes Section 11-952, as amended, by the undersigned General Counsel, who has determined that it is in proper form and within the powers and authority granted to the Flood Control District of Maricopa County under the laws of the State of Arizona

John M. Lemmon 5/17/05
General Counsel Date

COUNTY OF MARICOPA

COUNTY OF MARICOPA, an Arizona municipal corporation

Recommended by:

William C. Scalzo Date
Director of Parks and Recreation Dept.

Approved and Accepted:

By: May W Wilson JUN 08 2005
Chairman, Board of Supervisors Date

Attest:

By: Janet Campbell JUN 08 2005
Clerk of the Board Date

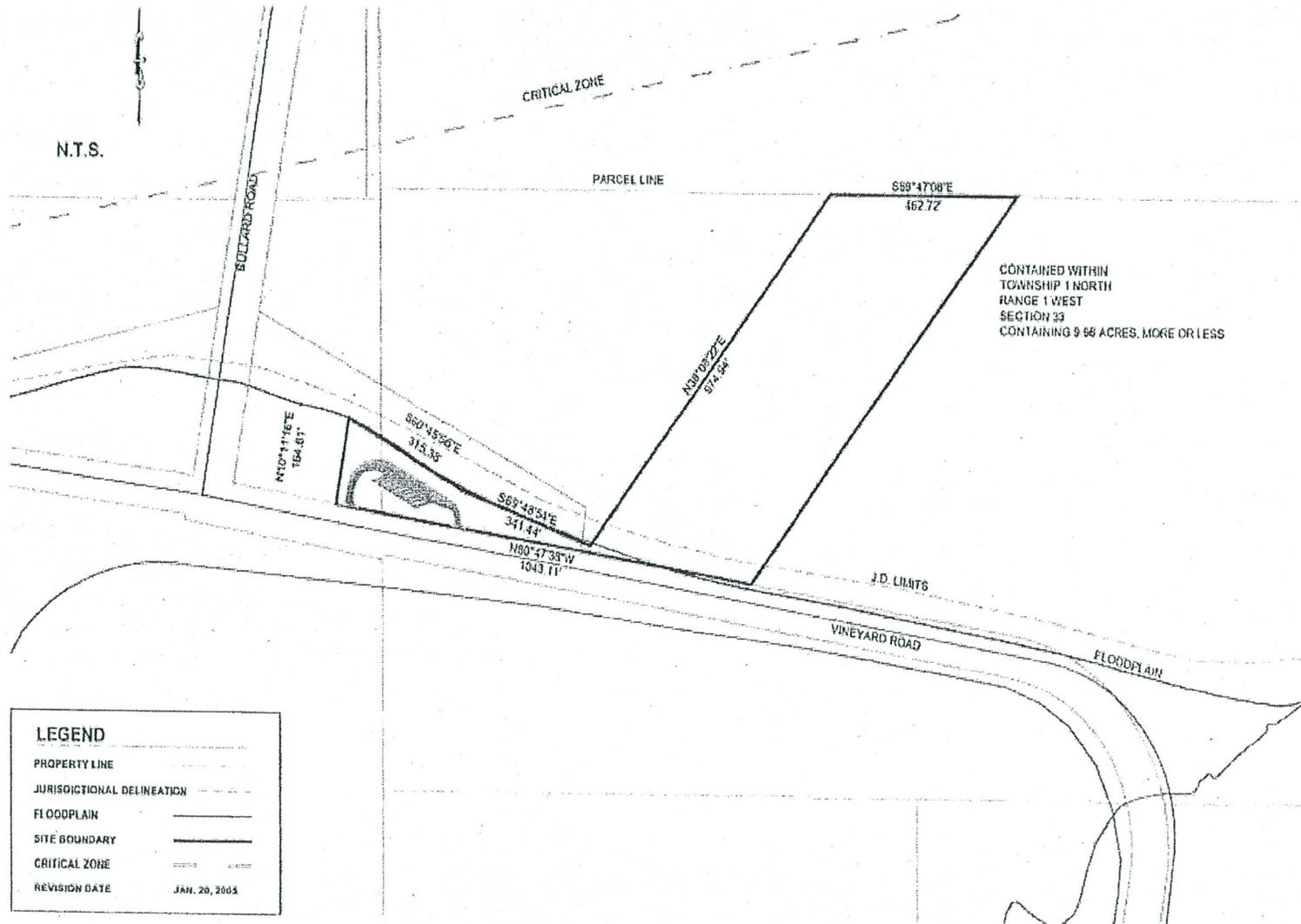
The foregoing Intergovernmental Agreement IGA FCD 2005A004 has been reviewed pursuant to Arizona Revised Statutes Section 11-952, as amended, by the undersigned attorney who has determined that it is in proper form and within the power and authority granted to the City of Surprise under the laws of the State of Arizona.

MARICOPA COUNTY

By: Kim J. East 5/31/05
County Attorney Date

EXHIBIT A - El Rio Educational Research and Development Project

Flood Control District of Maricopa County IGA #2005A004



APPENDIX F
INTERGOVERNMENTAL AGREEMENT BETWEEN
MCDOT & FCDMC

When Recorded Return to:
Contracts Branch
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ 85009-6399

Intergovernmental Agreement
for the
Construction of a Parking Lot
of the
El Rio Educational Research & Development Project
between
County of Maricopa
and the
Flood Control District of Maricopa County

IGA FCD 2005A010

Agenda Item C-69-06-021-2-00

This Agreement is entered into by and between the Flood Control District of Maricopa County, a municipal corporation and political subdivision of the State of Arizona, acting by and through its Board of Directors hereinafter called the DISTRICT, and County of Maricopa, a body politic, hereinafter called the COUNTY, acting through the Maricopa County Department of Transportation, hereinafter called MCDOT.

This Agreement shall become effective as of the date it has been executed by both parties.

DATE FILED WITH MARICOPA COUNTY RECORDER _____

STATUTORY AUTHORIZATION

1. The DISTRICT is empowered by Arizona Revised Statutes §48-3603, as revised, to enter into this Agreement and has authorized the undersigned to execute this Agreement on behalf of the DISTRICT.

2. The COUNTY is empowered by Arizona Revised Statutes §11-251 and §28-6701, *et seq*, to lay out, maintain, control, and manage public roads within the County, and enter into this Agreement.
3. Arizona Revised Statutes §11-951, *et seq*, provide that public agencies may enter into Intergovernmental Agreements (IGA) for the provision of services or for joint or cooperative action.

BACKGROUND

4. The COUNTY plans to improve Vineyard Avenue and 143rd Avenue from Estrella Parkway to Indian Springs Road. These improvements will improve access and mobility to the Phoenix International Raceway (PIR) during major race events at PIR. Part of the roadway improvements is located in the Maricopa County Estrella Mountain Regional Park (PARK).
5. The DISTRICT is planning to implement the El Rio Educational Research and Development (El Rio R&D) project, which is a revegetation research project identified in the El Rio Watercourse Master Plan (WCMP). The El Rio R&D project is also located in the PARK (Exhibit A). To enhance the benefits to the PARK, the El Rio R&D project includes constructing a 1.5 acre parking lot along Vineyard Avenue, an interpretive kiosk and signs, and a trail to the research plots. The parking lot is approximately 1.5 acres.
6. The COUNTY and the DISTRICT have determined that it would be mutually beneficial for the COUNTY to construct the parking lot element of the El Rio R&D project, hereinafter described as PROJECT, in conjunction with the roadway improvement project. The PROJECT consists of the following construction elements, subgrade preparation, paving, striping, drainage, placing two steel gates, underground sleeves for future electrical and water connections, and other miscellaneous items of work as required for the completion of the parking lot. Design plans for the parking lot was included in MCDOT's design plans for the Vineyard Avenue/143rd Avenue project. The Vineyard Road/143rd Avenue Project bids were opened on May 4, 2005. The line item bid for the subject PROJECT provided by the COUNTY's selected contractor for the Vineyard Road/143rd Avenue Project was \$45,500.

PURPOSE OF AGREEMENT

7. The purpose of this IGA is to identify and define the responsibilities of the COUNTY and the DISTRICT for the cost sharing, the design, construction, and construction management for the construction of the PROJECT.

TERMS OF AGREEMENT

8. The COUNTY agrees to:

8.1. Construct the PROJECT on Vineyard Avenue at a site approximately 350 feet east of Bullard Avenue (Exhibit A). Work will include subgrade preparation, paving, striping drainage, placing two (2) steel gates, underground sleeves for future electrical and water connections, and other miscellaneous items of work required for completion of the PROJECT.

8.2. Invite the DISTRICT to participate in the final inspection of the PROJECT. The COUNTY's contractor shall account and bill for the PROJECT separately from the Vineyard Road/143rd Avenue Project. Upon completion and acceptance of work on the PROJECT by the COUNTY and the

DISTRICT, the COUNTY will invoice the DISTRICT for the PROJECT'S actual cost within 30-days from inspection and PROJECT acceptance, which shall not exceed 10% of the original bid of \$45,500. Costs above the original contractor's bid of \$45,500 shall only include additional time and material costs attributed to the PROJECT construction.

9. **The DISTRICT agrees to:**

9.1. Participate in the final inspection of the PROJECT.

9.2. Upon receipt of proper invoice pursuant to Paragraph 8.2, reimburse MCDOT for 100% of the PROJECT costs. The DISTRICT shall journal voucher the invoiced amount within 60-days of receiving the PROJECT invoice from the COUNTY.

GENERAL TERMS AND CONDITIONS

10. In the case of any dispute over any items in this Agreement, the parties agree to use their best efforts and enter into good faith negotiations to resolve the disputed matters. However, this shall not limit the rights of the parties to seek any remedies provided by law.
11. Each party to this Agreement (indemnitor) shall, to the extent permissible by law, indemnify, defend and hold harmless other parties (indemnitees) indirectly involved in this Agreement, including agents, officers, directors, governors and employees thereof, from and against any loss or expense incurred as a result of any claim or suit of any nature whatsoever, which arises out of indemnitor's negligent or wrongful acts or omissions pursuant to this Agreement. Such indemnification obligation shall encompass any personal injury, death or property damages resulting from the indemnitor's negligent or wrongful acts or omissions, as well as reasonable attorney's fees, court costs, and other expenses relating to the defense against claims or litigation, incurred by the indemnitee. Indemnitee shall be liable for its own negligence or wrongful acts as provided by law.
12. All notices or demands upon any party to this Agreement shall be in writing and shall be delivered in person, or sent by mail, addressed as follows:

Flood Control District of Maricopa County
Chief Engineer and General Manager
2801 West Durango Street
Phoenix, AZ 85009-6399

Maricopa County Department of Transportation
Director of Public Works, Transportation Director and County Engineer
2901 W. Durango Street
Phoenix, Arizona 85009-6399
13. This Agreement shall expire two (2) years from the date of recording with the County Recorder or upon completion of the PROJECT and after all funding obligations and reimbursements have been satisfied in accordance with this Agreement, whichever is the first to occur. However, by mutual written agreement of all parties, this Agreement may be amended or terminated.
14. This Agreement is subject to cancellation by any party pursuant to the provisions of Arizona Revised Statutes §38-511.

15. Attached to this Agreement or contained herein are the written determinations by the appropriate attorneys for the parties to this Agreement, that these agencies are authorized under the laws of the State of Arizona to enter into this Agreement, and that it is in proper form.
16. If legislation is enacted after the effective date of this Agreement that changes the relationship or structure of one or more parties to this Agreement, the parties agree that this Agreement shall be renegotiated at the written request of either party.
17. The parties agree to retain all books, accounts, reports, files and other records relating to this Agreement and to make such available at all reasonable times for inspection and audit by the parties to this Agreement, or their agents, during the term of and for a period in accordance with the State approved Retention Schedule or five years, whichever is longer, after completion of this Agreement.
18. This Agreement shall not be construed to imply authority to perform tasks, or accept any responsibility, not expressly set forth herein.
19. This Agreement shall be strictly constructed against creation of a duty or responsibility unless the intention to do so is clearly and unambiguously set forth herein.
20. This Agreement shall not be modified or extended except by written instrument adopted in accordance with the requirements for adopting a new Agreement.
21. This Agreement does not grant authority to control the subject roadway, except to the extent necessary to perform the tasks expressly undertaken pursuant to this Agreement.
22. This Agreement has been arrived at by negotiation and shall not be construed against either party or against the party who prepared the last draft.
23. Each party to this Agreement will pay for and not seek reimbursement for its own personnel and administrative costs associated with this PROJECT, including but not limited to the following unless specifically identified otherwise in this Agreement: construction, construction management, operation, maintenance, permitting, management, and administration.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
A Municipal Corporation

Recommended by:

Timothy S. Phillips, P.E. Date
Acting Chief Engineer and General Manager

Approved and Accepted by:

Chairman, Board of Directors

Attest by:

Clerk of the Board Date

The foregoing Intergovernmental Agreement IGA FCD 2005A010 has been reviewed pursuant to Arizona Revised Statutes §11-952, as amended, by the undersigned General Counsel, who has determined that it is in proper form and within the powers and authority granted to the Flood Control District of Maricopa County under the laws of the State of Arizona.

General Counsel Date

MARICOPA COUNTY

Recommended by:

Michael S. Ellegood, P.E. Date
Director of Public Works,
Transportation and County Engineer

Approved and Accepted by:

Max Wilson Date
Chairman, Board of Supervisors

Attest by:

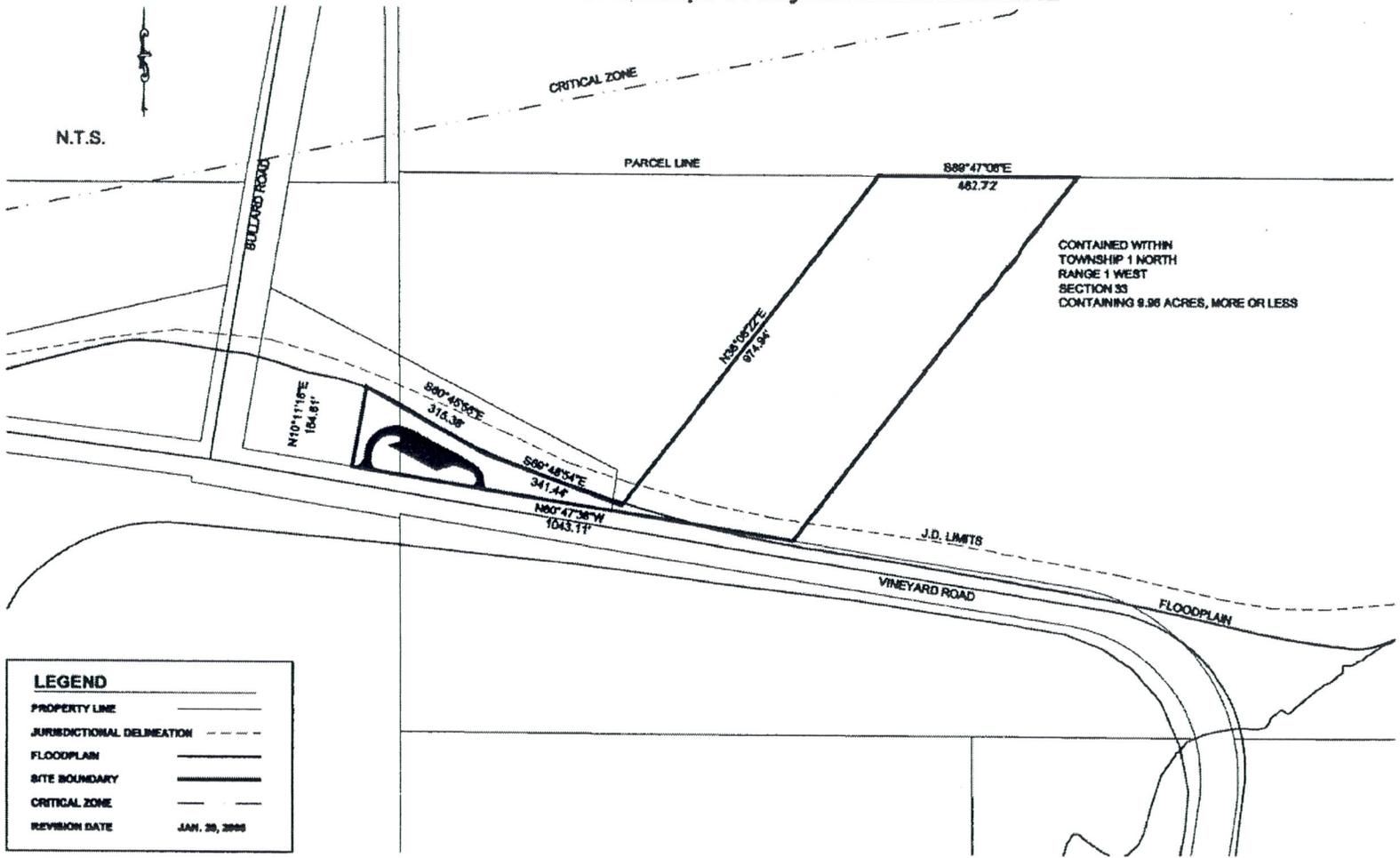
Clerk of the Board Date

The foregoing Intergovernmental Agreement IGA FCD 2005A010 has been reviewed pursuant to Arizona Revised Statutes §11-952, as amended, by the undersigned attorney, who has determined that it is in proper form and within the powers and authority granted to the County under the laws of the State of Arizona.

Deputy County Counsel Date

EXHIBIT A - El Rio Educational Research and Development Project

Flood Control District of Maricopa County Resolution #2005R002



| LEGEND | |
|----------------------------|---------------|
| PROPERTY LINE | ————— |
| JURISDICTIONAL DELINEATION | - - - - - |
| FLOODPLAIN | ————— |
| SITE BOUNDARY | ————— |
| CRITICAL ZONE | - - - - - |
| REVISION DATE | JAN. 28, 2006 |

IGA FCD 2005A010

PCN 126.02.20

Page 7 of 7

APPENDIX G
IMPLEMENTATION MECHANISMS WORKING PAPER

El Rio Watercourse Master Plan Implementation Mechanism:

Working Paper

Background on El Rio Watercourse Master Plan

Due to impending development pressures along the Gila River, the record of historic flood events and the increased need for health and safety measures, the Flood Control District of Maricopa County (District) in cooperation with the City of Avondale, City of Goodyear and the Town of Buckeye and under the authority of Arizona Revised Statutes (ARS) 48-3609.01, initiated the El Rio Watercourse Master Plan (WMP).

The El Rio project area of the Gila River commences at the confluence with the Agua Fria River and extends west approximately 17.5 miles to State Route (SR) 85. The goals of the El Rio WMP are to:

- Identify flood and erosion hazards along the river
- Define river characteristics
- Preserve the natural flood function of the river
- Incorporate public and private interests, issues and concerns
- Minimize future expenditures of public funds for flood control and emergency management
- Consider environmental and landscape characteristics of the river
- Consider multiple-use activities of floodplain areas
- Utilize public-private partnerships to the implement plan

Recommended Alternative

The purpose of the El Rio WMP is to examine the benefits, opportunities, and impacts of a range of flood control management plans and to suggest a recommended alternative that addresses the flood and erosion hazards. The recommended alternative was selected after considering public safety, social, economic, and environmental factors.

The recommended alternative combines a structural and non-structural flood control approach. The structural element consists of a “soft structural” (landscaped and buried) levee that closely follows the 100-year floodway alignment. The soft structural levee will run the entire length of the river’s north bank, and portions of the south bank. The non-structural alternative, including set-asides and regulations, will be applied to river segments located along the south bank where flow-resistant hard rock formations occur and bank protection is not required.

The recommended alternative also outlines plans for vegetation management (removal and replacement of salt cedar with native species) as another means to improve flood conveyance, and as a way to develop higher quality habitat. In addition, the recommended alternative identifies opportunities for open water and marsh creation and development of regional multi-use recreation amenities.

Purpose of Working Paper

The complexity of the El Rio WMP presents execution challenges that need to be addressed through the development of a coordinated implementation strategy.

This working paper:

- Outlines implementation issues and the need for a coordinated implementation mechanism
- Summarizes the evaluation process of existing implementation mechanisms
- Recommends further exploration of a special district as the means to implement El Rio, including a preliminary examination of the financial, governance and regulatory structure of the special district
- Suggests next steps for selecting and refining a special district concept as the implementation mechanism for El Rio

Implementation Issues

The El Rio WMP presents a comprehensive approach that includes engineering, environmental, landscape, social and economic considerations. Proposed improvements will result in flood protection for greater public safety along the river corridor, increased recreation opportunities in the region and improvements in environmental resources. While these differing elements are seemingly distinct in purpose, they need to be implemented in a coordinated fashion to best achieve the overall El Rio goals.

The recommended alternative combines flood control features to protect public safety and enhancements, designed to increase El Rio's value to the community and meet the requests of stakeholders (see Table One).

One implementation challenge is the District's inability to pay for the enhancements outlined in the El Rio WMP. The District is able to fund or provide cost share on flood control features, such as levees. However, under current state statute, the District is unable to cost share on the enhancement features of the El Rio WMP. It should be noted that certain enhancements provide some component of flood protection or fulfill a

mitigation requirement, which may allow the District to participate in cost share agreements.

Table One: El Rio WMP Flood Control Features vs. Enhancements

| Flood Control Features | Enhancements |
|----------------------------------|----------------------------------|
| Levee | Landscaping treatment of levee |
| Grade control structures | Recreational facilities/trails |
| Salt cedar/vegetation management | Re-vegetation/native plantings |
| Open water/wetland creation | Recreational open water creation |

Other challenges to implementation include:

- Project expense: Total project cost, including enhancements, is estimated at \$150 million in 2006 dollars;
- Long-term coordination among multiple jurisdictions: The project will take 10-20 years to fully implement and requires the cooperation of several entities, including the Cities of Avondale and Goodyear, Town of Buckeye, Maricopa County Planning and Development, Maricopa County Parks, Arizona Game and Fish, Non-Governmental Organizations (e.g., Audubon Society, The Nature Conservancy, etc.) and the Buckeye Water Conservation and Drainage District, and;
- The need for an annual revenue stream for maintenance: One of the biggest challenges to successful implementation is maintaining and securing the project infrastructure after it is built.

Evaluation Criteria and Process

To realize El Rio’s multi-faceted goals, an implementation strategy must provide cost share on flood control improvements, fund enhancements, ensure compliance with the WMP, apply for and hold regulatory permits, assume ownership, liability and responsibility for improvements and provide maintenance and site security. In addition, an implementation strategy should allow public-private partnerships to fund project

features, efficiently facilitate coordination among multiple jurisdictions, and provide a means to maintain project continuity.

As part of the planning process, the El Rio project team and its stakeholders explored dozens of implementation mechanisms (see “Comparison of El Rio Watercourse Master Plan Implementation Mechanisms” in appendix).

The following summarizes the evaluation process. The El Rio team and stakeholders:

- Researched and compiled existing implementation mechanisms
- Reviewed El Rio’s goals
- Considered the four key components of the overall El Rio Implementation Strategy: Funding; Programs and Policies; Regulatory Compliance and Community Outreach (see “El Rio Watercourse Master Plan Implementation Plan Overview” memo).
- Conducted a fatal flaw analysis, including identifying conditions that the implementation mechanism must meet:
 - Must enhance rather than duplicate local authority
 - Must fund enhancements
 - Must apply in unincorporated county
 - Must have local community acceptance
- Developed evaluation criteria based on the four key components of the overall El Rio implementation strategy
 - *Funding Opportunities* to include mechanisms for generating financial resources for capital funding of flood protection and enhancement improvements as well as maintenance funding of both.
 - *Programs and Policies* to include:
 - *Governance*: A representative body – appointed or elected – that has the ability to make and enforce decisions and monitor compliance with the WMP.
 - *Maintenance/Security/Liability*: Capacity to oversee maintenance, security and assume ownership and liability for project area.

- *Regulatory Compliance* to include the ability to manage and enforce compliance with local, state and federal regulations such as an El Rio regional 404 permit for implementation of the Recommended Alternative.
- *Community Outreach* to include the ability to use resources to fund education and participation efforts for stakeholders, elected officials and the public.
- Ranked implementation mechanisms as “substantially meets” or “substantially does not meet” the evaluation criteria.
- Decided that options that met four out of five of the criteria would be considered strong candidates to use to implement the El Rio WMP.

Evaluation Results

The evaluation process found that no single existing implementation mechanism could sufficiently meet four out of the five criteria. Implementation mechanisms outlined in current state statute or agency policy typically provided a means for funding but not for ensuring compliance with the WMP. For example, instituting a local sales tax in the vicinity of El Rio would raise revenues to fund the project. Establishing a sales tax, however, would not provide oversight of development in the area. Other existing implementation options, such as creating a zoning overlay district, encourage land uses that are consistent with the WMP, but do not fund the construction of plan elements such as levees or trails. See “Comparison of El Rio Watercourse Master Plan Implementation Mechanisms” in the appendix for detailed evaluation results.

Recommendations

The following recommendations emerged from the implementation mechanism evaluation and stakeholder workgroup processes:

- 1) Formation of an implementation committee to determine the appropriate means to implement the El Rio WMP, including continued discussions on the development of a special district.
- 2) Creation of a Memorandum of Understanding between all stakeholder agencies and jurisdictions to formalize the implementation process.

- 3) Further exploration of the concept of a special district with funding, ownership, regulatory compliance and maintenance authorities.

Recommendation #1: Form an implementation committee

Creating an implementation committee with an explicitly defined role would facilitate the implementation of the El Rio WMP. The implementation committee would develop the implementation strategy, determine the appropriate implementation mechanisms (such as a special district), provide policy direction and offer general guidance for regulatory compliance and coordination of projects. The committee would also be responsible for the design of funding programs and funding activity management. See “El Rio Implementation Planning and Funding Strategies Report” for more details on the structure and responsibilities of the implementation committee.

Prior to the establishment of an implementation mechanism or formal strategy, the implementation committee would serve as the communication channel for activities impacting the El Rio project area. The committee could discuss and coordinate real-time development projects, such as master plan communities; regulatory and permitting issues, including sand and gravel operations; and updates to general and/or recreation plans. The work of the implementation committee is critical to assuring effective coordination of all the activities needed to fully implement the El Rio WMP.

Recommendation #2: Execute a Memorandum of Understanding between El Rio WMP stakeholders

The purpose of the El Rio WMP Implementation Memorandum of Understanding (MOU) is to formalize the implementation process and ensure an on-going commitment of full participation from each project stakeholder. The MOU would outline the coordination of technical data, land use information and implementation strategies needed to determine the appropriate means to execute the El Rio WMP.

Key agreements and stakeholder responsibilities specified in the MOU could include:

- Commitment of a dedicated staff representative to serve on the implementation committee
- Attendance and full participation in bi-monthly implementation committee meetings
- Investigation and collaboration regarding funding opportunities
- Coordination of technical reviews and recommendations
- Providing updates of permitting issues and development plans in the WMP area
- Assurance that key staff and elected officials are aware of WMP recommendations
- Incorporation of WMP recommendations into general plans and other related documents

Recommendation #3: Further explore the creation of an El Rio special district

A new implementation option, an El Rio Special District, was identified through stakeholder workgroups. The special district would be a unit of local government that would complement existing government. The type of special district conceived of in the El Rio WMP implementation workgroups is not authorized under current legislation and would require changes to state statute.

Purpose of the El Rio Special District

The El Rio Special District would be similar in structure to a community facilities district, but would have unique elements that would allow it to achieve the flood protection, recreation and environmental goals identified in the El Rio WMP. It would also differ from a community facilities district in its ability to apply across the multiple city, county and agency jurisdictions within the El Rio WMP.

The El Rio Special District would provide cost-share on flood control improvements, fund enhancements, ensure compliance with the WMP, apply for and hold regulatory permits, assume ownership, liability and responsibility for improvements and provide maintenance and site security. In addition, the special district would provide the method

to efficiently facilitate coordination among multiple jurisdictions and provide a means to maintain project continuity.

Special district benefits

The El Rio Special District could effectively meet the flood control, recreational and environmental needs of the area by:

- Providing clear division of labor and responsibilities
- Encouraging regional identification with the project area
- Increasing transparency: Because of its well-defined purpose, the benefits of a special district are readily apparent to constituents who understand where their money is going and why.
- Coordinating development and management of infrastructure and services across jurisdictional boundaries
- Providing sufficient funding to implement the El Rio WMP in 10-20 years

Special District Design Elements

During two workgroups, the stakeholders discussed the structure of four elements of the special district: funding, physical boundaries, powers and duties and governance. The following discussion outlines some of the possible ways of structuring each element of the special district, including constraints on the development of the district. The discussion of the design elements is preliminary and is intended to be refined by the future work of the implementation committee.

Funding

Funding mechanisms considered included 404 mitigation banking, statewide conservation sales tax for which the district could apply for funding, countywide watercourse sales tax, secondary property tax, grant opportunities, user fees, bonding and a sales tax. Impact fees were discussed and ruled out because of legal questions.

The stakeholders also suggested that the following limitations are considered when choosing a funding mechanism:

- Must employ a mutually-acceptable method of determining benefited boundaries
- The city/town councils will want greater controls and elected official involvement with special district administration if funds are raised through taxation
- Must not create an excessive tax burden that would stop growth and development

Physical Boundaries

Options discussed for the physical limits of the special district include the 100-year floodplain; 500-year floodplain; a specified distance from project area; city boundaries, or municipal planning areas. The stakeholders, however, suggested that the total funding needed and type of funding source selected will most likely “set” the district boundary. One concern regarding physical boundaries is the potential for “double-dipping” with other projects in the area, such as freeway construction.

Powers and Duties

At implementation work sessions, stakeholders discussed allowing the special district to have the following authorities: land use; bonding; taxing; ability to enter into intergovernmental agreements, contracts and development agreements; the power to exercise eminent domain; and the authority to acquire and enforce regulatory permits.

Governance structure

A variety of organizational frameworks were explored by the project stakeholders. A few possibilities included a governing board comprised of existing elected officials; individuals appointed by elected officials; independently elected board members or area land owners.

El Rio WMP stakeholders raised the following points concerning an organizational structure for a special district:

- An advisory board might be needed to address technical issues
- The funding mechanism may drive the governance structure
- A “hybrid” board of council members, land owners/developers and irrigation districts should be considered

Next Steps

The El Rio WMP study reach of the Gila River is unique among watercourses in Maricopa County. It boasts a diverse natural environment of high scenic quality, for which there is overwhelming public opinion that the existing scenic character of the river should be enhanced.

The El Rio WMP project area is also one of the fastest growing areas in Maricopa County. In the past, traditional development practices associated with such rapid growth have looked to maximize developable land. Such practices often result in uncoordinated flood control measures.

Thus, an aggressive implementation schedule is needed to enable the recommendations of the El Rio WMP to be successfully implemented either before, or in conjunction with, development. A suggested timetable for implementation is as follows:

- The first implementation committee meeting should be scheduled in May, 2006, which is within a month of the end of the El Rio WMP planning phase. Agenda items for that meeting could include discussion of bylaws for the group, roles and responsibilities of committee members and the development of a memorandum of understanding for cooperation. Bi-monthly meetings should be held thereafter.
- The MOU should be completed and signed by September, 2006.
- An El Rio Special District concept report should be developed by December, 2006. The concept report could include the subsequent elements:
 - Mission statement
 - Goals/objectives
 - Refinement of district structure
 - Funding
 - Physical boundaries
 - Powers and duties
 - Governance
 - Land use plan

- Necessary legislative changes
- Financial plan/economic pro forma
 - Staffing
 - Capital
 - Maintenance
 - Assessed valuation within district boundaries

This working paper is part of the overall implementation approach designed for the El Rio WMP. Information regarding other funding options and more detailed information concerning the implementation strategy is contained within three related documents: El Rio Watercourse Master Plan Implementation Plan Overview memo; El Rio Implementation Planning and Funding Strategies Report; and, the Project Proposal and Site Selection Report for the El Rio WMP Programmatic Pilot.

Appendices

El Rio WMP Implementation Mechanism Evaluation Matrix
Stakeholder group agendas and meeting minutes

Comparison of El Rio Watercourse Master Plan Implementation Mechanisms

| Option | Description | F | C | Go | RC | M | Strengths | Weaknesses/Unknowns |
|-------------------------------|---|---|---|----|----|---|--|---|
| Business Improvement District | Assess residents within set boundaries for additional services such as park maintenance | √ | √ | o | o | √ | <ul style="list-style-type: none"> Establishes a partnership between property owners and businesses for the purpose of improving the business climate in a defined area | <ul style="list-style-type: none"> Few established businesses in project area; usually used for downtown revitalization Public resistance to adding layers of taxes for services the gov't should already provide |
| Community Facilities District | A.R.S. 48-701.12.b | √ | o | √ | ? | √ | <ul style="list-style-type: none"> Drainage and flood control is clearly included in the definition of "public infrastructure" Only requires 25% of contiguous or non-contiguous landowners to seek a formation resolution Would be a quasi-municipal corporation that could enter into contracts, hold real estate, levy and assess costs on land benefited Landowners may opt to do their own construction work if they meet the low bid On dissolution the property held goes to public entities | <ul style="list-style-type: none"> If formed by a county, it cannot issue general obligation bonds or assess property taxes Encouraging property owners to form district can be time consuming and difficult Not clear if they can cross multiple jurisdictions Not clear if the district can hold permits (e.g., 404, etc) Projects require financial and feasibility report May be limited in the scope of services it can provide, such as recreational and environmental enhancements |
| County Improvement District | A.R.S. 48-909 | √ | ? | √ | √ | o | | <ul style="list-style-type: none"> Only applicable in unincorporated county |
| Development Agreement | Legal contract between gov't and property owners that includes financing for flood protection and habitat improvements. | √ | √ | o | o | o | <ul style="list-style-type: none"> Private funding by affected parties; reduces burden to taxpayers Greater certainty for property owners in development process Allows local government to enforce more development conditions than are typically required | <ul style="list-style-type: none"> Multiple property owners and jurisdictions can complicate consistent application May need to use in conjunction with special assessment district to pay for maintenance |

Comparison of El Rio Watercourse Master Plan Implementation Mechanisms

| Option | Description | F | C | Go | RC | M | Strengths | Weaknesses/Unknowns |
|--|--|---|---|----|----|---|--|---|
| Flood Control Zone | A.R.S. 48-3604 | √ | o | √ | ? | √ | <ul style="list-style-type: none"> • Simple to form by Flood Control District Board of Directors • Can finance projects for zone either by taxes or general obligation bonds | <ul style="list-style-type: none"> • Property not benefited must be deleted, and it can be difficult to show/prove benefits to all property in a large zone area |
| Flood Protection District | A.R.S. 48-2811 | √ | o | √ | ? | √ | <ul style="list-style-type: none"> • Only requires five or more titleholders to petition Board of Supervisors, who must determine the district is “necessary and feasible” • Supervisors may levy tax to cover estimated annual expenditures, or district may bond or have a special election and levy a special assessment • Revenue bonds can be paid by assessments and are a lien on real property • Can levy (but not lien) against State Trust Lands | <ul style="list-style-type: none"> • All lands included should be subject to flooding • The statute requires dividing district into three or five divisions, each electing one director, who must be an elector/landowner • Provisions for subdividing into tracts of not less than 40 acres and assessing each subdivision to the extent benefited (determined by two appraisers and the district engineer) could be contentious or confusing |
| Local Option Taxes (e.g., Sales and Use Tax) | Additional tax on sales of goods and services that stays local | √ | o | o | o | o | <ul style="list-style-type: none"> • Dedicated funding source for a specified period of time • Generally more popular than an additional property tax | <ul style="list-style-type: none"> • Difficulties in determining boundaries of taxing district • Revenue can be difficult to predict • Tax is considered regressive • Not clear if statutory authority exists in all jurisdictions |

Comparison of El Rio Watercourse Master Plan Implementation Mechanisms

| Option | Description | F | C | Go | RC | M | Strengths | Weaknesses/Unknowns |
|--|---|---|---|----|----|---|--|--|
| Mitigation Banking | A mitigation bank is a stream or wetland that has been restored or preserved for the purpose of providing compensation for unavoidable impacts to aquatic resources permitted under Section 404 of the Clean Water Act. | √ | o | o | √ | ? | <ul style="list-style-type: none"> • Aids with 404 compliance issues • Provide potential funding source through sale of credits • Implements the WCMP’s non-structural recommendations by encouraging mitigation for other projects to occur in El Rio project area | <ul style="list-style-type: none"> • Regulatory hurdles to establishment of bank • Need party to assume management and liability of bank • Only addresses recommendations of WCMP in limited parts of the project area |
| Municipal Improvement Districts | A.R.S. 48-572 – article 2 (community facilities district is also included in this section) | √ | o | √ | ? | ? | <ul style="list-style-type: none"> • Drainage and flood control is clearly included in legislation • Can join with other entities to administer improvements | <ul style="list-style-type: none"> • Not clear if enhancements can be funded • Not clear if the district could hold permits |
| Multiple Intergovernmental Agreements (IGAs) | A formal contract for services between jurisdictions/entities for services or payment to join forces to plan, finance and deliver a service within the boundaries of all participating jurisdictions. | ? | ? | √ | √ | √ | <ul style="list-style-type: none"> • Eliminate duplication of efforts • Would reduce need for new legislation • Pooled financial resources increase “purchasing power” | <ul style="list-style-type: none"> • Time consuming to develop • Cumbersome to administer • Not clear how additional revenue to fund the project will be collected • Poorly drafted agreements which do not provide adequate definitions of expected service levels and responsibilities can cause friction • Difficult to distribute costs and services equitably among participating agencies |

Comparison of El Rio Watercourse Master Plan Implementation Mechanisms

| Option | Description | F | C | Go | RC | M | Strengths | Weaknesses/Unknowns |
|--------------------------------|---|---|---|----|----|---|---|---|
| Overlay District | A zoning district that is applied on top of an existing zoning district. Can add or remove restrictions from the underlying zoning district. Purpose is to deal with issues unique to a particular area that traditional zoning doesn't address | o | o | o | √ | o | <ul style="list-style-type: none"> Ensures consistency of development with WCMP guidelines and planning objectives Versatile and flexible – examples include specific plans, conservation of recreation corridors, extractive resources area regulations and watershed protection guidelines | <ul style="list-style-type: none"> No funding mechanism Difficult to implement across jurisdictions Additional zoning may increase likelihood of legal challenges |
| Recreational Corridor District | A.R.S. 48-6001 All of the affected municipal governments and property owners who own more than 50 percent of the property within the district must support before approval is granted. | √ | ? | √ | ? | √ | <ul style="list-style-type: none"> Is authorized to construct and maintain flood conveyance and recreational facilities Can enter into contracts and acquire properties Can levy against property owners in district – the assessment is based on the benefit received by the land District may issue bonds | <ul style="list-style-type: none"> Funding is through assessments Property owners can seek judicial review of assessments Improvements are only funded by people/entities that own property in the floodplain/floodway |
| Riparian Buffers | Zoning that protects an undisturbed, naturally vegetated strip of land along a river, stream, etc. | o | o | o | o | o | <ul style="list-style-type: none"> Consistent with non-structural components of WMP | <ul style="list-style-type: none"> Not consistent with current development practices Can raise takings issues |
| Special Natural Area District | Similar to overlay district zoning. The regulations of the natural area district supplement or modify those of the zoning districts on which it is superimposed. | o | o | √ | o | o | <ul style="list-style-type: none"> Created in areas where outstanding natural features are to be protected Ensures building development is in accordance with area plans | <ul style="list-style-type: none"> Not currently available in Arizona Focuses on preservation of areas; limited multi-use concept |

Comparison of El Rio Watercourse Master Plan Implementation Mechanisms

| Option | Description | F | C | Go | RC | M | Strengths | Weaknesses/Unknowns |
|-----------------------|---|---|---|----|----|---|--|--|
| Tax Increment funding | The taxable value of property within project area is determined the year the plan is adopted – “base year.” In successive years, the district receives all revenues in excess of base year revenue. | √ | 0 | 0 | 0 | √ | <ul style="list-style-type: none"> As property values increase, more tax increment funding becomes available Encourages development by capturing the increased property tax, and re-funneling that money back into the project itself, rather than into the jurisdiction’s general revenues | <ul style="list-style-type: none"> Arizona repealed TIF enabling legislation in 1999; one of only a handful of states that doesn’t allow TIFs Funding mechanism; does not meet regulatory compliance and governance needs Gov’t invests money upfront and usually has a large cost share responsibility |
| Watershed Council | Citizen and stakeholder based voluntary group that seeks consensus on issues facing a particular river system | 0 | √ | 0 | 0 | 0 | <ul style="list-style-type: none"> Council’s power is derived from consensus of members Aids in coordination between gov’t entities Provides “bottom-up” solutions at local level using existing institutions Avoids private property disputes by focusing on voluntary action instead of regulation | <ul style="list-style-type: none"> No regulatory or legislative power Consensus can breakdown over time Time-consuming to secure adequate representation by all stakeholders Lack of funding source; reliant on grants |
| User fees | Municipal sewer fees, recreational fees, licenses or permits, etc. | √ | 0 | 0 | 0 | 0 | <ul style="list-style-type: none"> Local governments have broad authority to implement; do not need special authorization Funded by those directly using the service | <ul style="list-style-type: none"> Can be an inconsistent and inadequate source of revenue, especially for recreation fees |

Legend

√ - Substantially meets criteria

0- Does not substantially meet criteria

Comparison of El Rio Watercourse Master Plan Implementation Mechanisms

Evaluation Criteria

F - Funding Options: Mechanism for generating financial resources for capital projects and maintenance

C- Community Outreach: Ability to use resources to fund education and participation efforts for stakeholders, elected officials and the public

Go- Governance: A representative body – appointed or elected – that has the ability to make and enforce decisions and monitor compliance with Plan

RC- Regulatory Compliance: Ability to manage and enforce compliance with federal, state and local regulations (e.g., holder of 404 permit).

M- Maintenance/Security/Liability: Provide annual revenue stream for maintenance and security. Can assume ownership and liability for project area.



EL RIO WATERCOURSE MASTER PLAN

SPECIAL DISTRICT WORKGROUP MEETING AGENDA

LOCATION: Adobe Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ
DATE: Thursday, December 29th, 2005
TIME: 9:30 – 11:30 am

1. 9:30 - Introductions
2. 9:35 - Meeting Purpose
 - Review of Special District work task and efforts to date.
 - Dialogue and input from attendees regarding possible Special District recommendation including evaluation and design elements.
3. 9:40 – Special District Overview and Status
 - Review of approach
 - Review of information generated to date.
4. 10:00 – Open Discussion on Special District Concept and Elements
 - Purpose
 - Fatal Flaws
 - Evaluation Criteria
 - Funding
 - Community Outreach
 - Governance
 - Regulatory Compliance
 - Maintenance
 - Design Elements
 - Powers and Duties
 - Governance Structure
 - Physical Boundaries
 - Funding Mechanism
5. 11:20 – Summary /Next Steps
6. 11:30 - Adjourn

**El Rio Watercourse Master Plan
Implementation Mechanism Workgroup
December 29, 2005
Meeting Summary**

Attendees:

Brian Dalke, City of Goodyear
Pat Ellison, Stantec
Mollyann Garrett, City of Goodyear
Don Harris, Maricopa County Parks
Paula Illardo, City of Goodyear
Scott Lowe, Town of Buckeye
Jen Pokorski, Flood Control District of Maricopa County
Chris Reams, City of Avondale
Carroll Reynolds, Town of Buckeye
Chuck Williams, CL Williams Consulting
Doug Williams, Flood Control District of Maricopa County

Meeting Purpose: Gather input regarding the design of implementation mechanism options, including a possible Special District recommendation.

Comments from participants (arranged by category) are as follows:

Implementation Mechanism Evaluation Criteria

- Evaluate the ability to fund environmental rehabilitation
- Ability to engage private sector representation and commercial/retail development
- Complete a land-use zoning study
- Authority over issuing activity permits

Special Assessment District Purpose

- Consider the need for regulation and maintenance of park facilities, such as a ranger position with policing authority
- Designate boundaries (city planning area; specified distance from El Rio project area, etc.)

Special District Fatal Flaws

- Do not override local authority
- Sand and gravel – gain their cooperation/support
- Regional acceptance and community support is critical
- Reduce/remove impact to other special districts – no interference
- Needs mechanism for rebuilding/maintenance/future improvements – whether or not a sunset clause is in place

Special District Design Elements – Governance Structure

- Create an advisory board for technical issues
- Need to address how it will be funded before governance can be determined; governance directly relates to the funding structure

- Create hybrid of council members, land owners/developers and irrigation districts.
- Independently elected board

Special District Design Elements – Funding Structure

- Impact fees
 - May not be legal or require a legislation change for unincorporated county areas
 - Tough to justify because benefited parties must be proven
 - Will raise cost of house
 - Cities might need to make up shortfall
- Important to avoid stopping growth and development because of excessive tax burden
- 404 mitigation banking
- Statewide conservation sales tax
 - Look at Arkansas and Missouri as a model; the special district would be able to apply to the state for funding
 - Usually sporting items are taxed
- Secondary property tax
- Bonds
- Property tax
- Grant opportunities; create parallel 501(c)3 to accept donations; funds
- The city/town councils would want greater controls/involvement with special district administration if funds are raised through taxation
- Overlapping funding sources are needed; perhaps phase-in of user fees.
- How should the benefited group be determined?
 - Distance from project
 - Project users
 - Look into the regional park model of usership to determine benefited parties

Special District Design Elements – Physical Boundaries

- City boundaries with regional usage – package it so it's sellable
- In general, the group “leans” toward using existing city boundaries and including the unincorporated county and public lands between the cities in the district
- Recognize “double-dipping” concerns with other projects, such as Lower Hassayampa Watercourse Master Plan and transportation projects which will be competing for dollars
- Base it on the amenity's increase to property value; Phoenix has done studies
- The overall cost may dictate the boundaries; need economic pro forma

Other Comments

- Prefer that one group manages and funds project rather than a series of intergovernmental agreements
- Might be a possibility of a public-private venture where a firm could provide management and oversight

- Special district should have ability to own property and generate revenue
- Public must have access; concerns if HOA's foot bill
- Should have a mix of public and private representation on the governing board

Action Items/Next Steps

- Determine cost estimate for enhancements
- Schedule a follow up meeting to further discuss special district option



EL RIO WATERCOURSE MASTER PLAN

IMPLEMENTATION MECHANISM SPECIAL DISTRICT WORKGROUP MEETING AGENDA

LOCATION: Buckhorn-Mesa Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ

DATE: Thursday, February 23rd, 2006

TIME: 9:30 – 11:30 am

1. 9:30 - Introductions
2. 9:35 - Meeting Purpose
 - Review of Implementation Mechanism/Special District work task and efforts to date
 - Dialogue and input from attendees regarding possible Special District recommendation including evaluation and design elements
 - Determine next steps
3. 9:40 - Implementation Mechanism/Special District Overview and Status
 - Review of approach
 - Review of El Rio Implementation Memo
 - Review of Draft Special District Working Paper
4. 10:00 - Facilitated Open Discussion on Implementation Mechanism/Special District Concept and Elements
 - Design Elements
 - Funding Mechanisms
 - Powers and Duties
 - Governance Structure
 - Physical Boundaries
 - Opportunities/Constraints for El Rio implementation/establishment of Special District
 - Next Steps
 - Implementation Committee
 - Memorandum of Understanding
 - Other
5. 11:20 - Summary
6. 11:30 - Adjourn

**El Rio Watercourse Master Plan
Implementation Mechanism Workgroup
February 23, 2006
Meeting Summary**

Attendees:

Myra Curtis, Town of Buckeye
Brian Dalke, City of Goodyear
Dan Davis, City of Avondale
Pat Ellison, Stantec
Don Harris, Maricopa County Parks
John Hathaway, Flood Control District of Maricopa County
Russ Haughey, Arizona Game and Fish Department
Matt Holm, Maricopa County Planning and Development
Paula Illardo, City of Goodyear
Nicole Kelley, Flood Control District of Maricopa County
Scott Lowe, Town of Buckeye
Jen Pokorski, Flood Control District of Maricopa County
Scot Schlund, Stantec
Joe Schmitz, City of Goodyear
Jessica White, Flood Control District of Maricopa County
Chuck Williams, CL Williams Consulting

Meeting Purpose: Review of implementation mechanism/special district efforts to date; gather input from attendees regarding possible Special District recommendation including evaluation and design elements; and determine next steps toward implementation of El Rio WCMP.

Implementation Efforts to Date

El Rio WCMP to be finalized by end of April. The District will approach cities for adoption from February to March. The District will ask the County Board of Supervisors to adopt the plan in mid-April.

Russ Haughey, Arizona Game & Fish, said that the District may want to consider making a presentation to the Arizona Game & Fish commission as well. Game & Fish is concerned that their lands are managed for wildlife/habitat enhancement. Any vegetation management (i.e., salt cedar removal) must improve the value of the habitat to wildlife.

Open Discussion

- Is this a flexible/conceptual plan? Yes, the WCMP is flexible. The WCMP makes recommendations to improve flood conveyance and identifies opportunities for recreational amenities and enhancement of visual and environmental resources.
- There are many competing funding needs in the area, including money currently designated for the I-10 widening project. The timing of implementation will be critical.
- There is uncertainty surrounding funding requirements and capital maintenance.

- Implementation must focus on teamwork and partnerships.
- How does implementation sit within adoption? Councils will want to know the potential next steps and whether or not this plan will just 'sit on the shelf' or not.
- Will the District be in charge of continued communication between all involved parties? If not, who will facilitate communication? Will the District facilitate even if it doesn't lead the effort?
- Is there an option where the District is centrally responsible for maintenance or is that prohibited because of funding restrictions?
- Since development won't wait on the completion of this plan, should the District continue to maintain control while cooperation with individual entities evolves?
- 404 mitigation requirements could help pay for enhancements
- Is there potential to institute a watercourse tax to County property owners? If so, it will be necessary to prove that watercourse plans are for 'public need' not just recreational use.
- Concern about expanding boundaries because the project covers such a broad region, not just small parts of cities, and too small of an area won't generate enough funding.
- Unincorporated County issues may affect implementation of a special district or overlay zone. County Attorney's office says that we need 100% property owner approval/cooperation in order to move forward.
- What about a county-wide tax for watercourses similar to library or county parks?
- Utilize development agreements/assessments on landowners that are benefited by project

Next Steps

- Send edits on special district white paper to Jen within two weeks
- Memorandum of Understanding would be a good start to keep the stakeholders at the table, coordinate on-going projects and further explore implementation and maintenance mechanisms.
- Group needs to determine how to proceed before implementation mechanism is selected. Could FCD provide overall jurisdiction for corridor?
- Contact individuals involved in creating the Recreational Corridor District legislation that is being used to implement the West Valley Recreation Corridor/Agua Fria WCMP project.
- Determine how to incorporate WCMP recommendations in general plans or specific plans

Action Items

- Schedule one more meeting of the implementation committee.
- Send list of contact information for implementation meeting attendees.
- Review implementation mechanism/special district draft white paper.
- Determine if the El Rio WCMP recommendations should be presented to the parks commission and Arizona Game and Fish commission

Contact List

| Name | Company | Phone Number | Email |
|------------------|--------------------------------|---------------------|--|
| Myra Curtis | Town of Buckeye | 623-327-1813 | mcurtis@buckeyeaz.gov |
| Scott Lowe | Town of Buckeye | 623-327-3403 | slowe@buckeyeaz.gov |
| Carroll Reynolds | Town of Buckeye | 623-386-4691 | creynolds@buckeyeaz.gov |
| Paula Illardo | City of Goodyear | 623-882-7070 | pilardo@goodyearaz.gov |
| Brian Dalke | City of Goodyear | 623-882-7070 | bdalke@goodyearaz.gov |
| Joe Schmitz | City of Goodyear | 623-882-7952 | jschmitz@goodyearaz.gov |
| Dan Davis | City of Avondale | 623-478-3050 | ddavis@avondale.org |
| Russ Haughey | Arizona Game & Fish | 480-324-3550 | rhaughey@azgfd.gov |
| Matt Holm | Maricopa County Planning & Dev | 602-506-7162 | matthewholm@mail.maricopa.gov |
| Don Harris | Maricopa County Parks | 623-935-6101 | donharris@mail.maricopa.gov |
| John Hathaway | FCD | 602-506-0503 | joh@mail.maricopa.gov |
| Jen Pokorski | FCD | 602-506-4695 | jmp@mail.maricopa.gov |
| Jackie Meck | BWCDD | 623-386-2196 | jmeck@bwccd.com |



EL RIO WATERCOURSE MASTER PLAN

IMPLEMENTATION WORKGROUP MEETING AGENDA

LOCATION: New River Conference Room
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, AZ

DATE: Thursday, April 13, 2006

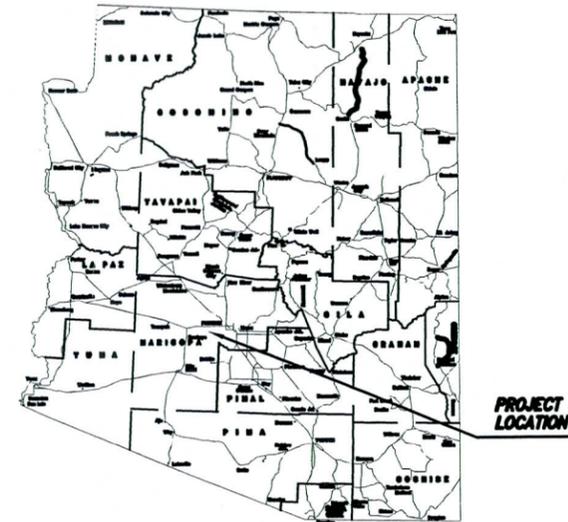
TIME: 9:30 – 11:30 am

1. 9:30 - Introductions
2. 9:35 - Meeting Purpose
 - Review of implementation efforts to date
 - Dialogue and input regarding implementation process and mechanism
 - Determine how to collaboratively complete the transition from the planning phase to the implementation phase of the El Rio WCMP
 - Establish next steps
3. 9:40 - Implementation Overview and Status
 - Review of approach and deliverables
4. 9:50 - Open Discussion on Implementation Process and Mechanism
 - Implementation Committee
 - Participants
 - Makeup/membership
 - Purpose/goals
 - Schedule
 - Forum/meeting locations
 - Other
 - Memorandum of Understanding
 - Purpose
 - Elements
 - Timetable
 - Signers
 - Other
 - Next Steps
 - Tentative Meeting Date
 - Location
 - Agenda Items
 - Other
5. 11:20 - Summary/Action Items
6. 11:30 - Adjourn

APPENDIX H
EDUCATIONAL R&D PILOT DESIGN PLANS



SITE DEVELOPMENT PLANS FOR
EL RIO EDUCATIONAL
RESEARCH AND DEVELOPMENT
PILOT PROJECT
 RESOLUTION NO. 2005 R002



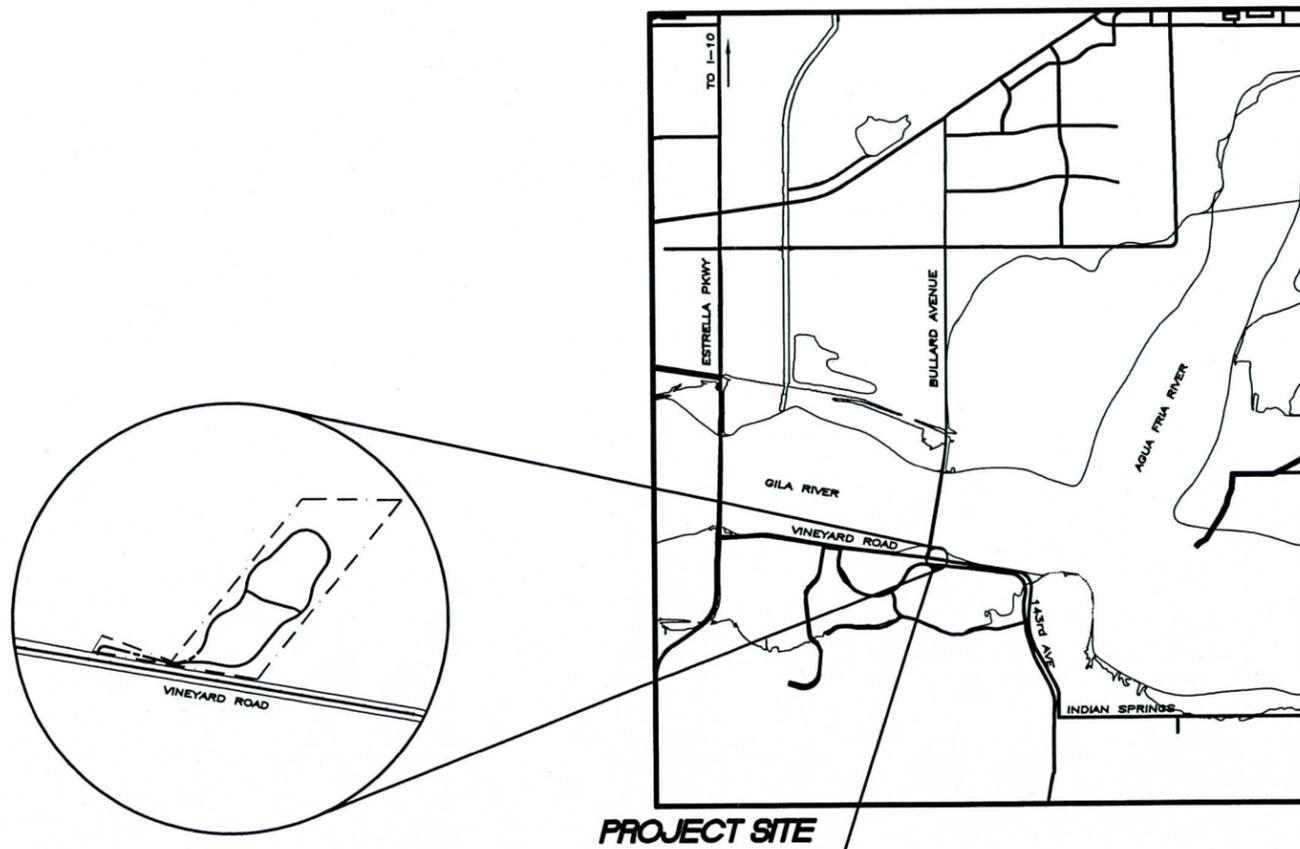
SITE LOCATION MAP

NTS

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY

| | | |
|----------|------------------|--------------|
| MEMBER | FULTON BROCK | DISTRICT I |
| MEMBER | DON STAPLEY | DISTRICT II |
| MEMBER | ANDY KUNASEK | DISTRICT III |
| CHAIRMAN | MAX W. WILSON | DISTRICT IV |
| MEMBER | MARY ROSE WILCOX | DISTRICT V |

CHIEF ENGINEER
 TIMOTHY S. PHILLIPS, P.E.



PROJECT SITE

VICINITY MAP

NTS

SHEET INDEX

| | |
|-------------|---|
| SHEET 1 | COVER |
| SHEET 2 | SPECIFICATIONS |
| SHEET 3 | GEOMETRIC SHEET |
| SHEET 4-5 | GRADING PLAN |
| SHEET 6 | SITE PROFILES SHEET |
| SHEET 7 | ACCESS ROAD/TRAIL PROFILE |
| SHEET 8-10 | HARDSCAPE PLANS |
| SHEET 11 | HARDSCAPE DETAILS |
| SHEET 12-13 | KIOSK DESIGN |
| SHEET 14 | VEGETATION TREATMENT DIAGRAM |
| SHEET 15-19 | PLANTING PLANS |
| SHEET 20 | PLANTING DETAILS |
| SHEET 21-25 | IRRIGATION PLANS |
| SHEET 26 | IRRIGATION DETAILS |
| SHEET 27 | PROJECT PURPOSE & MONITORING GUIDELINES |

FLOOD CONTROL DISTRICT OF
MARICOPA COUNTY CONTACTS

| | |
|--------------------|------------------------|
| THERESA PINTO | PHONE NO: 602-506-8127 |
| JOHN HATHAWAY | PHONE NO: 602-506-4973 |
| DIANA STUART | PHONE NO: 602-506-4766 |
| ESTRELLA MTN. PARK | PHONE NO: 623-932-3811 |

APPROVAL

THESE PLANS WERE APPROVED AS TO FORM AND CONTENT BY
 THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ON THIS
 THE _____ DAY OF _____, 2006.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SURVEY INFORMATION

TOPOGRAPHY PROVIDED BY STANTEC BASED ON MCDOT VINEYARD
 ROAD PROJECT NO. T191. BOUNDARY SHOWN IS FOR PROJECT
 DELINEATION ONLY AND DOES NOT REPRESENT A RECORDED
 DOCUMENT.



Charles L. Williams



CIVIL ENGINEERING AND RESOURCE MANAGEMENT

4720 W. Moverick Lane, Suite 103
 Lakeside, Arizona 85929
 Phone: (928) 368-2248 Fax: (928) 368-8704



EDAW INC.

455 NORTH 3RD STREET
 SUITE 272
 PHOENIX, ARIZONA 85004
 TEL 602 393 3791
 FAX 602 393 3795



GENERAL NOTES

1. ALL LANDSCAPE WORK TO CONFORM TO THE MARICOPA ASSOCIATION OF GOVERNMENTS (M.A.G.) "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" AND DETAILS DATED 2004 AND CURRENT REVISIONS THROUGH 2006. IF ANY DISCREPANCIES EXIST BETWEEN THE DRAWINGS AND THE DOCUMENTS LISTED ABOVE THE DRAWINGS SHALL PREVAIL OR SHALL BE AS DETERMINED BY THE OWNER'S REPRESENTATIVE.
2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VISIT AND INSPECT THE JOB SITE PRIOR TO BIDDING, TO THOROUGHLY STUDY THESE CONTRACT DOCUMENTS IN THEIR ENTIRETY, AND TO FULLY AND COMPLETELY ESTIMATE THE EXTENT OF THE PROJECT WORK TO BE COMPLETED. NO ADDITIONAL COMPENSATION WILL BE PERMITTED FOR FAILURE TO COMPLETELY ASCERTAIN ALL ASPECTS OF THE PROJECT.
3. CONTRACTOR SHALL REVIEW AND FIELD VERIFY LOCATION OF ALL EXISTING UTILITIES AND SUBSURFACE SYSTEMS PRIOR TO STARTING ANY EXCAVATIONS OR UNDERGROUND WORK.
4. CONTRACTOR SHALL VERIFY WITH OWNER'S REPRESENTATIVE ALL LANDSCAPE WORK SEQUENCING AND SCHEDULING AND SHALL SUBMIT VERIFICATION THAT ALL PLANT MATERIAL HAS BEEN SECURED AND IS AVAILABLE FOR REVIEW PRIOR TO STARTING ANY WORK.
5. REFER TO DRAWING PLANS AND DETAILS FOR SITE IMPROVEMENT INFORMATION. CONTRACTOR IS RESPONSIBLE TO VERIFY ALL EXISTING SITE UTILITIES OR OTHER SUBSURFACE CONDITIONS.
6. ROUGH GRADING AND LANDSCAPING SUBGRADE TO BE PROVIDED TO THE LANDSCAPE CONTRACTOR BY OTHERS.
7. NO PLANT SUBSTITUTIONS, TYPE OR QUANTITY DEVIATIONS FROM THE APPROVED LANDSCAPE PLAN(S) WITHOUT PRIOR APPROVAL FROM THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY (FCDMC).
8. THE ENGINEER WILL DETERMINE THE NUMBER AND LOCATION OF THE REQUIRED COMPACTION TESTS FOR STRUCTURE BACKFILL.
9. ALL PLANT MATERIAL AND SPECIFICATIONS TO CONFORM TO THE ARIZONA NURSERYMEN'S ASSOCIATION STANDARDS.
10. ALL LANDSCAPE PLANT MATERIAL TO BE IN COMPLIANCE WITH THE CURRENT DEPARTMENT OF WATER RESOURCES LOW WATER USE APPROVED PLANT LIST.
11. PROJECT LIMITS DESIGNATED ON THE PLANS ARE FOR GENERAL REFERENCE TO PROVIDE AN APPROXIMATE LIMITS OF THE SITE IMPROVEMENTS. THE LIMIT DESIGNATION INDICATED ON THE PLANS IS TYPICALLY OFFSET SLIGHTLY TO THE OUTSIDE OF THE ACTUAL SITE LIMITS. (FIELD VERIFY, SEE PLANS)
12. THE FLOOD CONTROL DISTRICT IS NOT RESPONSIBLE FOR LIABILITY ACCRUED DUE TO DELAYS AND/OR DAMAGE TO UTILITIES IN CONJUNCTION WITH THIS CONSTRUCTION.
13. ANY WORK PERFORMED WITHOUT THE APPROVAL OF THE FLOOD CONTROL DISTRICT AND/OR THE ENGINEER AND ALL WORK AND MATERIALS NOT IN CONFORMANCE WITH THE SPECIFICATIONS IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
14. PRIOR TO FINAL APPROVAL AND ACCEPTANCE OF THE WORK, THE CONTRACTOR WILL BE REQUIRED TO CLEAN ADJACENT (OFF-PROJECT) ROADWAYS USED DURING THE COURSE OF CONSTRUCTION.
15. TRAFFIC CONTROL SHALL BE MAINTAINED IN ACCORDANCE WITH M.A.G. SPECIFICATION 401, PAR VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES 91988 EDITION INCLUDING REVISION 3 DATED SEPTEMBER 3, 1993.
16. FACILITIES WHICH ARE NOT SPECIFICALLY LOCATED WITH ACTUAL HORIZONTAL AND VERTICAL CONTROLS ARE APPROXIMATE AND TO THE BEST AVAILABLE INFORMATION.
17. THE CONTRACTOR WILL DETERMINE THE EXACT LOCATION AND/OR ELEVATION OF EXISTING UTILITIES WHICH PERTAIN TO AND AFFECT THE CONSTRUCTION OF THIS PROJECT.
18. UTILITY LOCATIONS SHOWN ON PLANS WERE COMPILED BASED ON THE BEST INFORMATION AVAILABLE. UTILITY LOCATIONS ARE NOT INTENDED TO BE EXACT OR COMPLETE. PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES WITH BLUE STAKE (602-263-1100) TWO WORKING DAYS PRIOR TO CONSTRUCTION.
19. ALL MATERIALS AND WORKMANSHIP SHALL BE TRUE TO TYPE, FORM, FINISH AND OF THE HIGHEST STANDARDS OF THE TRADE. DAMAGED OR INFERIOR MATERIALS SHALL BE REMOVED FROM THE SITE WITHOUT DELAY.
20. CONTRACTOR SHALL NOT VARY SUBSTANTIALLY FROM PLAN WITHOUT PRIOR APPROVAL OF THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY. THE CONTRACTOR SHALL MAKE NECESSARY IN FIELD ADJUSTMENTS TO AVOID OBSTRUCTIONS OR COMPENSATE FOR DIFFERENCES BETWEEN THE SITE AND PLAN. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR REVISIONS OR MAJOR DEPARTURES FROM THE PLAN WITHOUT APPROVAL OF THE OWNER'S REPRESENTATIVE.

LANDSCAPE NOTES

1. VERIFY ALL LAYOUT AND GRADING WITH THE OWNER'S REPRESENTATIVE PRIOR TO STARTING CONSTRUCTION.
2. LANDSCAPE AREAS ARE DEFINED AS ALL NON-PAVED SITE AREAS SHOWN ON THE PLANS WHICH ARE BOUNDED BY ADJACENT PROPERTY LIMITS OR WALLS, ROADWAY PAVEMENTS, THE LIMIT OF SITE WORK IMPROVEMENTS OR DISTURBANCE OF R.O.W. FRONTAGES AND ALL AREAS OUTSIDE THESE LIMITS WHICH ARE DISTURBED BY AN CONSTRUCTION ACTIVITY UNDER THIS CONTRACT.
3. ALL EXISTING LANDSCAPE AREAS OUTSIDE THE SITE AREA DEFINED ABOVE WHICH ARE DISTURBED BY ANY ACTIVITY UNDER THIS CONTRACT SHALL BE RESTORED OR REPAIRED TO EQUAL OR BETTER CONDITION AND TO THE SATISFACTION OF THE FCDMC. (SEE RESTORATION NOTES).
4. RESTORATION OF LANDSCAPE AREAS OUTSIDE THE SITE AREA DEFINED ABOVE WILL BE BASED ON LIMIT OF DISTURBANCE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LIMITS OF RESTORATION AND PROVIDE ALL LABOR AND MATERIALS NECESSARY TO COMPLETE THE REQUIRED REPAIR WORK AS NOTED AND IN ACCORDANCE WITH M.A.G. SECTION 107.9.
5. THE CONTRACTOR SHALL PROVIDE FLAGGED AND/OR STAKED LAYOUT OF ALL PLANTING LOCATIONS FOR REVIEW AND ADJUSTMENT, IF NECESSARY, BY THE OWNER'S REPRESENTATIVE PRIOR TO STARTING ANY IRRIGATION OR PLANT PIT EXCAVATIONS. PLAN PLANT LOCATIONS ARE AT CENTERLINE OF SYMBOL SHOWN. LANDSCAPE QUANTITIES INDICATED ARE FOR GENERAL REFERENCE ONLY. IF DISCREPANCIES EXIST BETWEEN THE QUANTITIES INDICATED AND THE SYMBOLS SHOWN ON THE PLANS, THE SYMBOL QUANTITY SHALL PREVAIL. THE CONTRACTOR IS RESPONSIBLE TO VERIFY QUANTITIES AND MATERIALS NECESSARY TO COMPLETE THE WORK IN ACCORDANCE WITH THE SYMBOLS SHOWN ON THE PLANS. CONTRACTOR SHALL VERIFY ALL QUANTITIES AND MATERIALS AND PROVIDE HIS OWN QUANTITY TAKE-OFFS.
7. ALL PLANTED AND IRRIGATED LANDSCAPE AREAS SHALL HAVE FINISH GRADED ON-SITE SOIL SURFACES AS INDICATED ON THE DRAWINGS AND AS SPECIFIED. ALL SURFACES SHALL CONSIST OF EXISTING ON-SITE SOILS, ROCK AND NATURAL AGGREGATE MATERIALS. CONTRACTOR SHALL PREPARE SAMPLES OF FINISH GRADING FOR APPROVAL PRIOR TO THE START OF ANY PREPARATIONS OR ACQUIRING ANY MATERIALS ASSOCIATED WITH LANDSCAPE PLANNING INSTALLATIONS. SAMPLES SHALL BE PROVIDED FOR REVIEW SUBJECT TO ADJUSTMENT AS DIRECTED BY THE OWNER'S REPRESENTATIVE. APPROVED SAMPLES SHALL BE PROTECTED AND MAINTAINED AS THE CONTROL FOR ALL OTHER FINISH GRADE AREAS.
8. SITE GRADING IMPROVEMENTS OR INSTALLATION OF THE LANDSCAPE AND IRRIGATION SYSTEM INCLUDING ADDITION OF GROUND PLANE MATERIALS SHALL NOT IMPEDE THE FLOW OF EXISTING DRAINAGE PATTERNS OR FACILITIES NOR DECREASE THE VOLUME OF ANY DETENTION/RETENTION CELLS.
9. THE CONTRACTOR IS RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL ABOVE AND UNDERGROUND UTILITIES AND SUB-SURFACE STRUCTURES, INCLUDING THE PREVENTION OF ANY DEBRIS AND SEDIMENT FROM ENTERING ANY DRAINAGE STRUCTURES OR FACILITIES. EROSION CONTROL AND SEDIMENTATION PROTECTION METHODS SHALL BE IN PLACE AND APPROVED PRIOR TO THE START OF ANY EARTHWORK OR EXCAVATIONS.
10. TALL POT PLANTS WILL BE SUPPLIED TO THE CONTRACTOR BY THE FCDMC. CONTRACTOR SHALL BE RESPONSIBLE FOR PICK UP AND TRANSPORT FROM FCDMC YARD AND INSTALLATION IN ACCORDANCE WITH THE DETAILS AND SPECIFICATIONS.



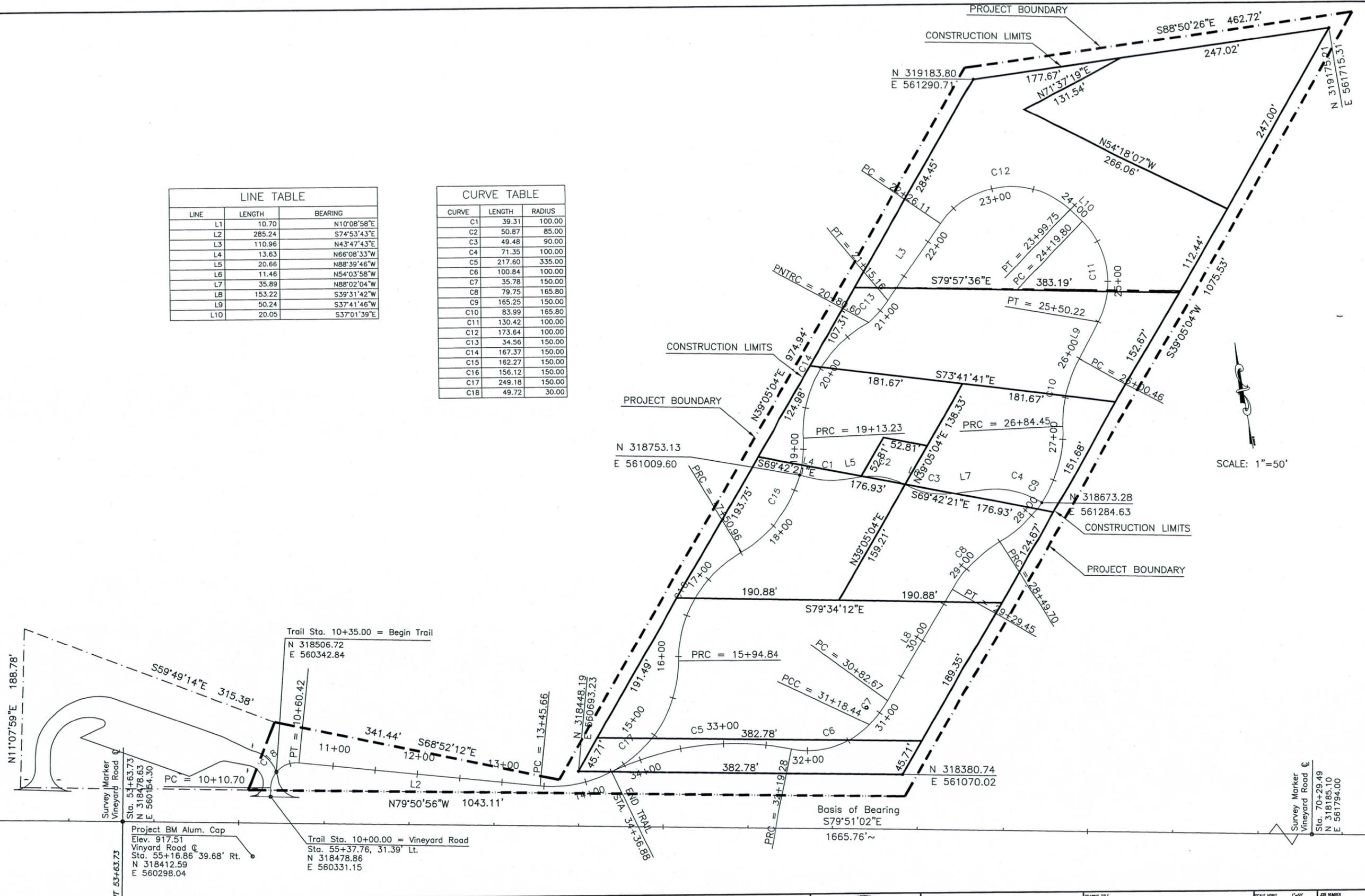
CW C.L. WILLIAMS CONSULTING, INC.
 CIVIL ENGINEERING AND RESOURCE MANAGEMENT
 4720 W. Maverick Lane, Suite 103
 Lakeside, Arizona 85929
 Phone: (928) 368-2248 Fax: (928) 368-8704

| | | | | | |
|---|-----|--------------|--------|----------------|-------|
| DRAWING TITLE | | SCALE HORIZ. | 1"=10' | JOB NUMBER | FCDMC |
| EL RIO EDUCATIONAL RESEARCH AND DEVELOPMENT PILOT PROJECT | | SCALE VERT. | N/A | DRAWING NUMBER | 2 |
| DES. BY: | JAW | DATE: | --- | | |
| CHK. BY: | JAW | | --- | | |
| REV. BY: | TKM | | --- | | |
| APP. BY: | CLW | | --- | | |

NOTES AND SPECIFICATIONS

| LINE TABLE | | |
|------------|--------|-------------|
| LINE | LENGTH | BEARING |
| L1 | 10.70 | N10°08'58"E |
| L2 | 285.24 | S74°53'43"E |
| L3 | 110.96 | N43°47'43"E |
| L4 | 13.63 | N66°08'33"W |
| L5 | 20.66 | N88°39'46"W |
| L6 | 11.46 | N54°03'58"W |
| L7 | 35.89 | N88°02'04"W |
| L8 | 153.22 | S39°31'42"W |
| L9 | 50.24 | S37°41'46"W |
| L10 | 20.05 | S37°01'39"E |

| CURVE TABLE | | |
|-------------|--------|--------|
| CURVE | LENGTH | RADIUS |
| C1 | 39.31 | 100.00 |
| C2 | 50.87 | 85.00 |
| C3 | 49.48 | 90.00 |
| C4 | 71.35 | 100.00 |
| C5 | 217.60 | 335.00 |
| C6 | 100.84 | 100.00 |
| C7 | 35.78 | 150.00 |
| C8 | 79.75 | 165.80 |
| C9 | 165.25 | 150.00 |
| C10 | 83.99 | 165.80 |
| C11 | 130.42 | 100.00 |
| C12 | 173.64 | 100.00 |
| C13 | 34.56 | 150.00 |
| C14 | 167.37 | 150.00 |
| C15 | 162.27 | 150.00 |
| C16 | 156.12 | 150.00 |
| C17 | 249.18 | 150.00 |
| C18 | 49.72 | 30.00 |



SCALE: 1"=50'

CALL TWO WORKING DAYS BEFORE YOU STAKE
1-800-STAKE-IT
 1-800-762-5348
 BLUE STAKE CENTER
 (OUTSIDE MARICOPA COUNTY)



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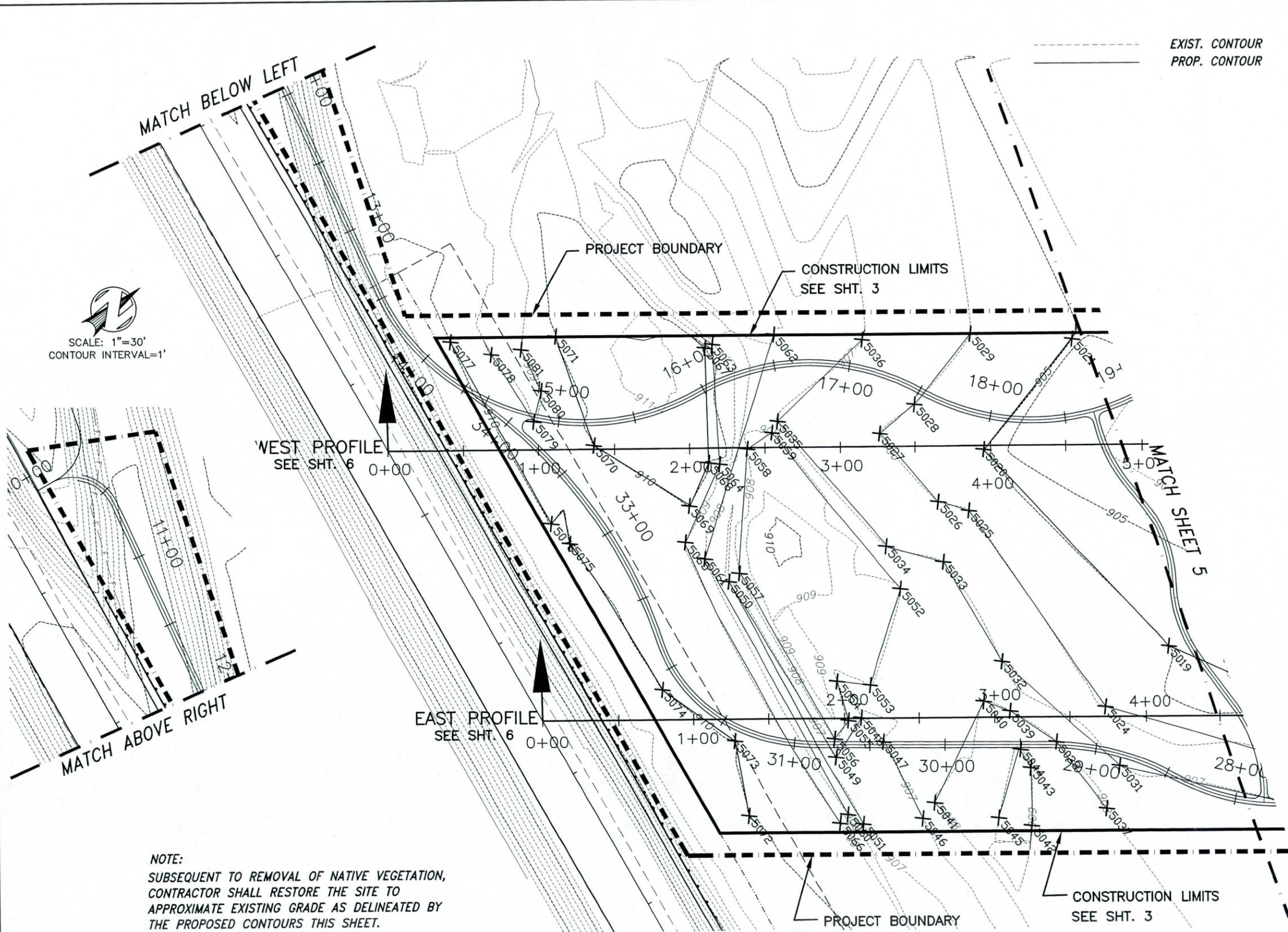
DRAWING TITLE
EL RIO EDUCATIONAL RESEARCH AND DEVELOPMENT PILOT PROJECT
GEOMETRIC SHEET

| | | | |
|--------------|--------|----------------|-------|
| SCALE HORIZ. | 1"=50' | JOB NUMBER | FCDMC |
| SCALE VERT. | N/A | DRAWING NUMBER | |
| DES. BY: | AMA | DATE | |
| CHK. BY: | AMA | | |
| REV. BY: | CLW | | |
| APP. BY: | CLW | | |

CONTOUR POINT DATA TABLE

| Number | Northing | Easting | Elevation |
|--------|-----------|-----------|-----------|
| 5000 | 318928.16 | 561492.70 | 901.00 |
| 5001 | 319025.55 | 561362.39 | 901.00 |
| 5002 | 319092.56 | 561226.31 | 902.00 |
| 5003 | 318915.02 | 561481.79 | 902.00 |
| 5004 | 319067.09 | 561188.56 | 903.00 |
| 5005 | 318901.10 | 561472.66 | 903.00 |
| 5006 | 319010.59 | 561224.37 | 903.00 |
| 5007 | 319001.58 | 561149.99 | 903.00 |
| 5008 | 318853.10 | 561431.53 | 904.00 |
| 5009 | 318897.94 | 561376.62 | 904.00 |
| 5010 | 318944.79 | 561297.85 | 904.00 |
| 5011 | 318949.99 | 561229.26 | 904.00 |
| 5012 | 318919.57 | 561122.44 | 904.00 |
| 5013 | 318892.84 | 561081.60 | 904.00 |
| 5014 | 318880.71 | 561063.07 | 904.00 |
| 5015 | 318859.52 | 561035.17 | 904.00 |
| 5016 | 318835.17 | 561412.58 | 905.00 |
| 5017 | 318847.03 | 561332.18 | 905.00 |
| 5018 | 318780.84 | 561339.00 | 905.00 |
| 5019 | 318690.78 | 561162.76 | 905.00 |
| 5020 | 318680.79 | 560982.97 | 905.00 |
| 5021 | 318773.98 | 560963.00 | 905.00 |
| 5022 | 318751.82 | 561358.57 | 905.00 |
| 5023 | 318753.50 | 561345.52 | 906.00 |
| 5024 | 318632.32 | 561167.45 | 906.00 |
| 5025 | 318647.02 | 561008.38 | 906.00 |
| 5026 | 318635.10 | 560990.86 | 906.00 |
| 5027 | 318634.66 | 560930.87 | 906.00 |
| 5028 | 318664.99 | 560930.35 | 906.00 |
| 5029 | 318723.74 | 560917.24 | 906.00 |
| 5030 | 318712.10 | 561328.90 | 907.00 |
| 5031 | 318614.20 | 561203.85 | 907.00 |
| 5032 | 318599.06 | 561100.73 | 907.00 |
| 5033 | 318611.81 | 561024.14 | 907.00 |
| 5034 | 318589.35 | 560924.15 | 907.00 |
| 5035 | 318587.44 | 560881.21 | 907.00 |
| 5036 | 318665.77 | 560874.33 | 907.00 |
| 5037 | 318589.38 | 561220.47 | 908.00 |
| 5038 | 318592.56 | 561165.14 | 908.00 |
| 5039 | 318581.91 | 561129.78 | 908.00 |
| 5040 | 318572.56 | 561113.68 | 908.00 |
| 5041 | 318504.25 | 561145.36 | 908.00 |
| 5042 | 318544.05 | 561197.94 | 909.00 |
| 5043 | 318568.07 | 561167.82 | 909.00 |
| 5044 | 318570.80 | 561154.01 | 909.00 |
| 5045 | 318530.57 | 561180.19 | 909.00 |
| 5046 | 318491.44 | 561148.48 | 907.00 |
| 5047 | 318504.04 | 561092.22 | 907.00 |
| 5048 | 318502.64 | 561070.31 | 907.00 |
| 5049 | 318472.90 | 561080.19 | 907.00 |
| 5050 | 318493.29 | 560943.73 | 907.00 |
| 5051 | 318458.40 | 561125.98 | 907.00 |
| 5052 | 318578.38 | 561020.13 | 908.00 |
| 5053 | 318521.37 | 561057.31 | 908.00 |
| 5054 | 318505.86 | 561041.22 | 908.00 |
| 5055 | 318494.90 | 561066.25 | 908.00 |
| 5056 | 318480.06 | 561069.99 | 908.00 |
| 5057 | 318502.12 | 560943.88 | 908.00 |
| 5058 | 318559.56 | 560882.59 | 908.00 |
| 5059 | 318579.54 | 560884.71 | 908.00 |
| 5060 | 318454.45 | 561114.52 | 908.00 |
| 5061 | 318490.80 | 560921.87 | 908.00 |
| 5062 | 318622.81 | 560834.50 | 908.00 |
| 5063 | 318586.84 | 560813.46 | 909.00 |
| 5064 | 318539.12 | 560878.96 | 909.00 |
| 5065 | 318488.12 | 560905.11 | 909.00 |
| 5066 | 318446.84 | 561115.81 | 909.00 |
| 5067 | 318581.65 | 560812.36 | 910.00 |
| 5068 | 318534.00 | 560873.67 | 910.00 |
| 5069 | 318505.77 | 560887.83 | 910.00 |
| 5070 | 318482.86 | 560816.15 | 910.00 |
| 5071 | 318510.49 | 560743.39 | 910.00 |
| 5072 | 318402.96 | 561073.30 | 910.00 |
| 5073 | 318427.88 | 561028.80 | 910.00 |
| 5074 | 318412.81 | 560971.86 | 910.00 |
| 5075 | 318428.41 | 560856.98 | 910.00 |
| 5076 | 318427.59 | 560839.02 | 910.00 |
| 5077 | 318454.14 | 560701.73 | 910.00 |
| 5078 | 318469.67 | 560725.70 | 909.00 |
| 5079 | 318462.65 | 560778.47 | 909.00 |
| 5080 | 318479.64 | 560765.69 | 909.00 |
| 5081 | 318487.09 | 560735.73 | 909.00 |

EXIST. CONTOUR
PROP. CONTOUR



SCALE: 1"=30'
CONTOUR INTERVAL=1'

NOTE:
SUBSEQUENT TO REMOVAL OF NATIVE VEGETATION,
CONTRACTOR SHALL RESTORE THE SITE TO
APPROXIMATE EXISTING GRADE AS DELINEATED BY
THE PROPOSED CONTOURS THIS SHEET.



CW C.L. WILLIAMS CONSULTING, INC.
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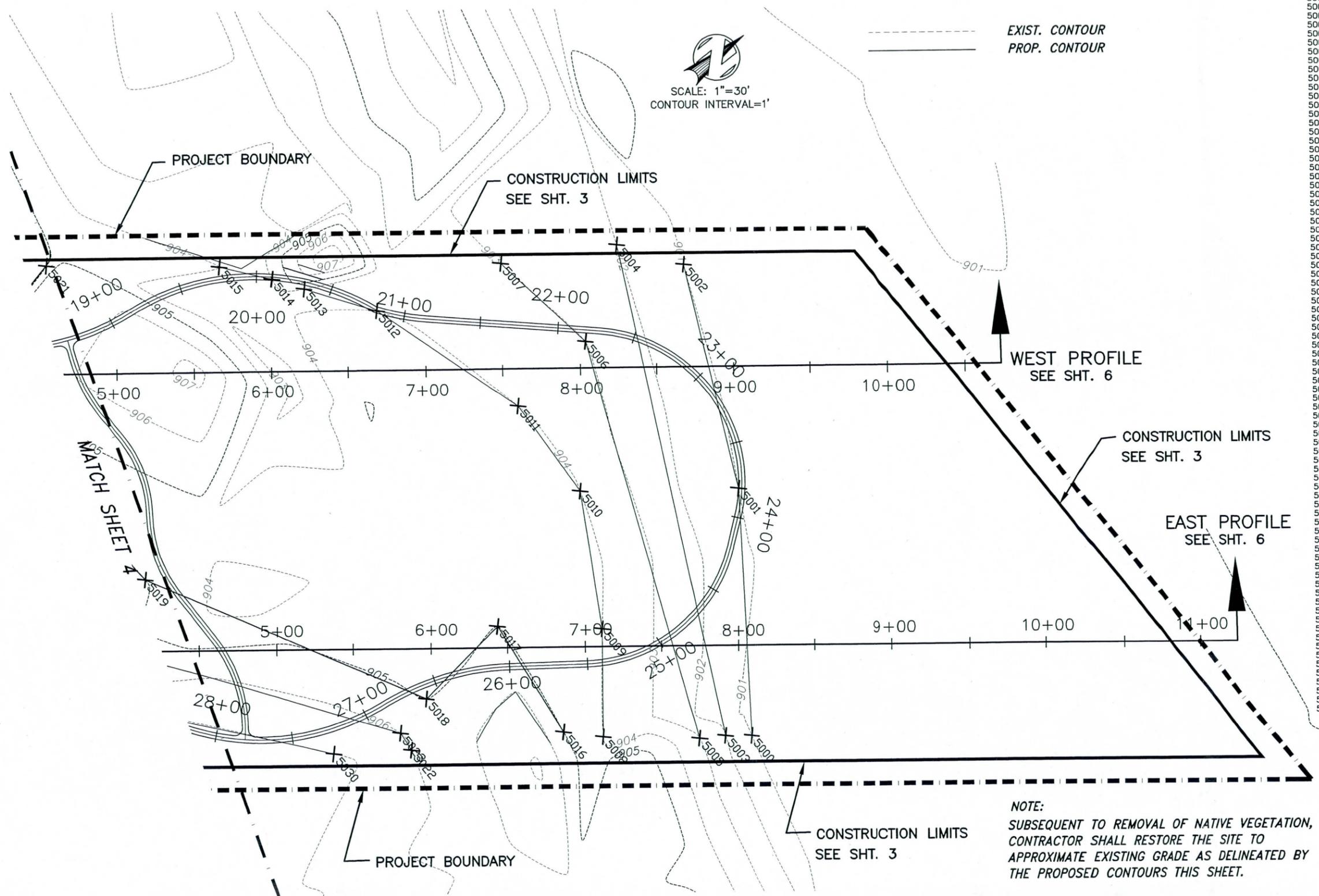
DRAWING TITLE
**EL RIO EDUCATIONAL
RESEARCH AND DEVELOPMENT
PILOT PROJECT**
GRADING SHEET

| | | | |
|--------------|--------|-----------------|--|
| SCALE HORIZ. | 1"=30' | JOB NUMBER | |
| SCALE VERT. | N/A | | |
| DES. BY: | AWA | DATE: | |
| CHK. BY: | AWA | DRAWING NUMBER: | |
| APP. BY: | CLW | | |

4
of 27

SCALE: 1"=30'
CONTOUR INTERVAL=1'

--- EXIST. CONTOUR
— PROP. CONTOUR



CONTOUR POINT DATA TABLE

| Number | Northing | Easting | Elevation |
|--------|-----------|-----------|-----------|
| 5000 | 318928.16 | 561492.70 | 901.00 |
| 5001 | 319025.55 | 561362.39 | 901.00 |
| 5002 | 319092.56 | 561226.31 | 901.00 |
| 5003 | 318915.02 | 561481.79 | 902.00 |
| 5004 | 319067.09 | 561188.56 | 902.00 |
| 5005 | 318901.10 | 561472.66 | 903.00 |
| 5006 | 319010.59 | 561224.37 | 903.00 |
| 5007 | 319001.58 | 561149.99 | 903.00 |
| 5008 | 318853.10 | 561431.53 | 904.00 |
| 5009 | 318897.94 | 561376.62 | 904.00 |
| 5010 | 318944.79 | 561297.85 | 904.00 |
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| 5012 | 318919.57 | 561122.44 | 904.00 |
| 5013 | 318892.84 | 561081.60 | 904.00 |
| 5014 | 318880.71 | 561063.07 | 904.00 |
| 5015 | 318859.52 | 561035.17 | 904.00 |
| 5016 | 318835.17 | 561012.58 | 905.00 |
| 5017 | 318847.03 | 561332.18 | 905.00 |
| 5018 | 318780.84 | 561339.00 | 905.00 |
| 5019 | 318690.78 | 561162.76 | 905.00 |
| 5020 | 318680.79 | 560982.97 | 905.00 |
| 5021 | 318773.98 | 560963.00 | 905.00 |
| 5022 | 318751.82 | 561358.57 | 905.00 |
| 5023 | 318753.50 | 561345.52 | 906.00 |
| 5024 | 318632.32 | 561167.45 | 906.00 |
| 5025 | 318647.02 | 561008.38 | 906.00 |
| 5026 | 318635.10 | 560990.86 | 906.00 |
| 5027 | 318634.66 | 560930.67 | 906.00 |
| 5028 | 318664.99 | 560930.35 | 906.00 |
| 5029 | 318723.74 | 560917.24 | 906.00 |
| 5030 | 318712.10 | 561328.90 | 907.00 |
| 5031 | 318614.20 | 561203.85 | 907.00 |
| 5032 | 318599.06 | 561100.73 | 907.00 |
| 5033 | 318611.81 | 561024.14 | 907.00 |
| 5034 | 318589.35 | 560992.15 | 907.00 |
| 5035 | 318587.44 | 560881.21 | 907.00 |
| 5036 | 318665.77 | 560874.33 | 907.00 |
| 5037 | 318589.38 | 561220.47 | 908.00 |
| 5038 | 318592.56 | 561165.14 | 908.00 |
| 5039 | 318581.91 | 561129.78 | 908.00 |
| 5040 | 318572.56 | 561113.68 | 908.00 |
| 5041 | 318504.25 | 561145.36 | 908.00 |
| 5042 | 318544.05 | 561197.94 | 909.00 |
| 5043 | 318568.07 | 561167.82 | 909.00 |
| 5044 | 318570.80 | 561154.01 | 909.00 |
| 5045 | 318530.57 | 561180.19 | 909.00 |
| 5046 | 318491.44 | 561148.48 | 907.00 |
| 5047 | 318504.04 | 561092.22 | 907.00 |
| 5048 | 318502.64 | 561070.31 | 907.00 |
| 5049 | 318472.90 | 561080.19 | 907.00 |
| 5050 | 318493.29 | 560943.73 | 907.00 |
| 5051 | 318458.40 | 561125.98 | 907.00 |
| 5052 | 318578.38 | 561020.13 | 908.00 |
| 5053 | 318521.37 | 561057.31 | 908.00 |
| 5054 | 318505.86 | 561041.22 | 908.00 |
| 5055 | 318494.90 | 561066.25 | 908.00 |
| 5056 | 318480.06 | 561069.99 | 908.00 |
| 5057 | 318502.12 | 560943.88 | 908.00 |
| 5058 | 318559.56 | 560882.59 | 908.00 |
| 5059 | 318579.54 | 560884.71 | 908.00 |
| 5060 | 318454.45 | 561114.52 | 908.00 |
| 5061 | 318490.80 | 560921.87 | 908.00 |
| 5062 | 318622.81 | 560834.50 | 908.00 |
| 5063 | 318586.84 | 560813.46 | 909.00 |
| 5064 | 318539.12 | 560878.96 | 909.00 |
| 5065 | 318488.12 | 560905.11 | 909.00 |
| 5066 | 318446.84 | 561115.81 | 909.00 |
| 5067 | 318581.65 | 560812.36 | 910.00 |
| 5068 | 318534.00 | 560873.67 | 910.00 |
| 5069 | 318505.77 | 560887.83 | 910.00 |
| 5070 | 318482.86 | 560816.15 | 910.00 |
| 5071 | 318510.49 | 560743.39 | 910.00 |
| 5072 | 318402.96 | 561073.30 | 910.00 |
| 5073 | 318427.88 | 561028.80 | 910.00 |
| 5074 | 318412.81 | 560971.86 | 910.00 |
| 5075 | 318428.41 | 560856.98 | 910.00 |
| 5076 | 318427.59 | 560839.02 | 910.00 |
| 5077 | 318454.14 | 560701.73 | 910.00 |
| 5078 | 318469.67 | 560725.70 | 909.00 |
| 5079 | 318462.65 | 560778.47 | 909.00 |
| 5080 | 318479.64 | 560765.69 | 909.00 |
| 5081 | 318487.09 | 560735.73 | 909.00 |

NOTE:
SUBSEQUENT TO REMOVAL OF NATIVE VEGETATION,
CONTRACTOR SHALL RESTORE THE SITE TO
APPROXIMATE EXISTING GRADE AS DELINEATED BY
THE PROPOSED CONTOURS THIS SHEET.

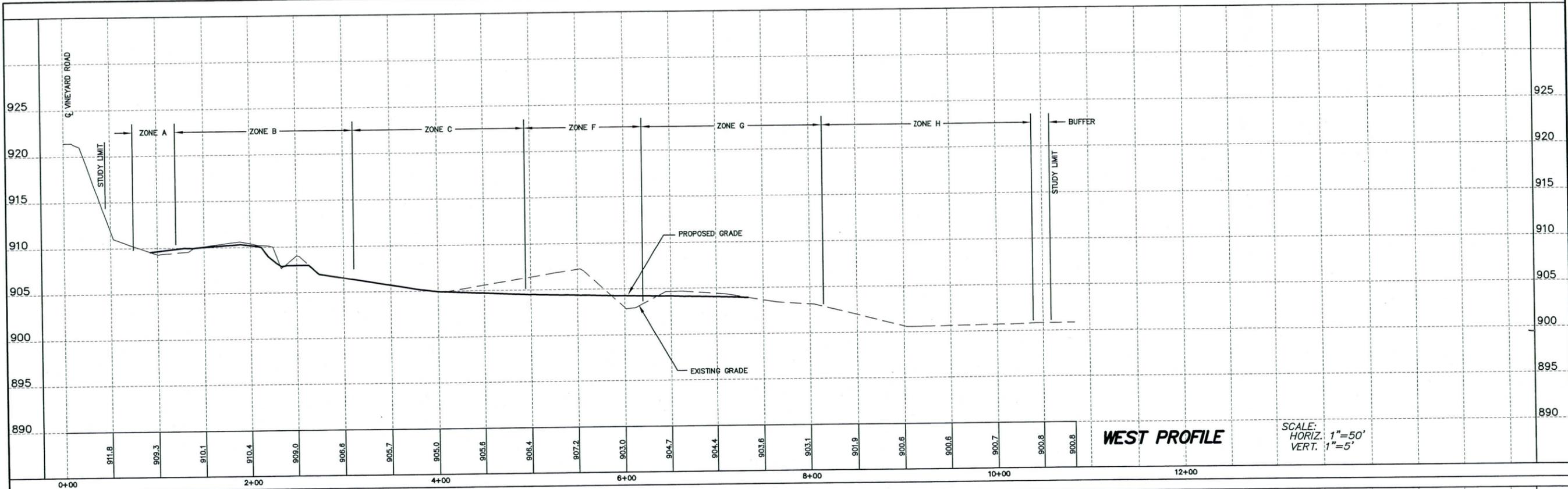
CALL TWO WORKING DAYS
BEFORE YOU DIG
1-800-STAKE-IT
1-800-782-5348
BLUE STAKE CENTER
(OUTSIDE MARICOPA COUNTY)



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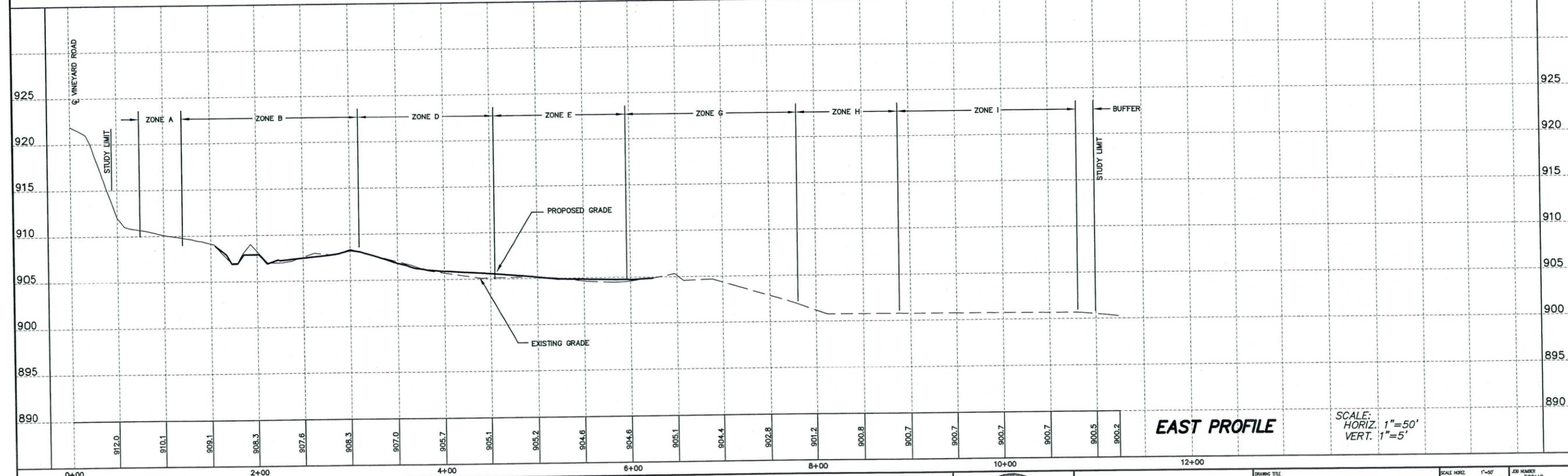
DRAWING TITLE
**EL RIO EDUCATIONAL
RESEARCH AND DEVELOPMENT
PILOT PROJECT**
GRADING SHEET

| SCALE HORIZ. | SCALE VERT. | JOB NUMBER | DRAWING NUMBER |
|--------------|-------------|-------------------|----------------|
| 1"=30' | N/A | --- | --- |
| DES. BY: JMA | DATE: --- | 5 of 27 | |
| CHK. BY: JMA | DATE: --- | | |
| REV. BY: KMK | DATE: --- | | |
| APP. BY: CLW | DATE: --- | | |



WEST PROFILE

SCALE:
HORIZ. 1"=50'
VERT. 1"=5'



EAST PROFILE

SCALE:
HORIZ. 1"=50'
VERT. 1"=5'

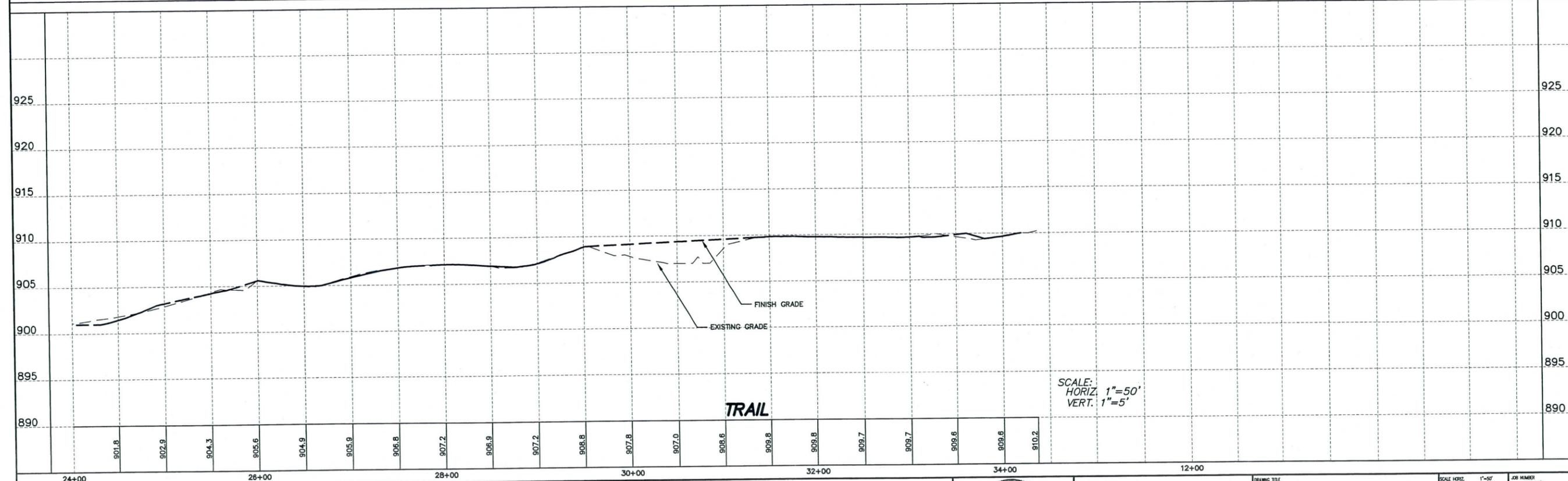
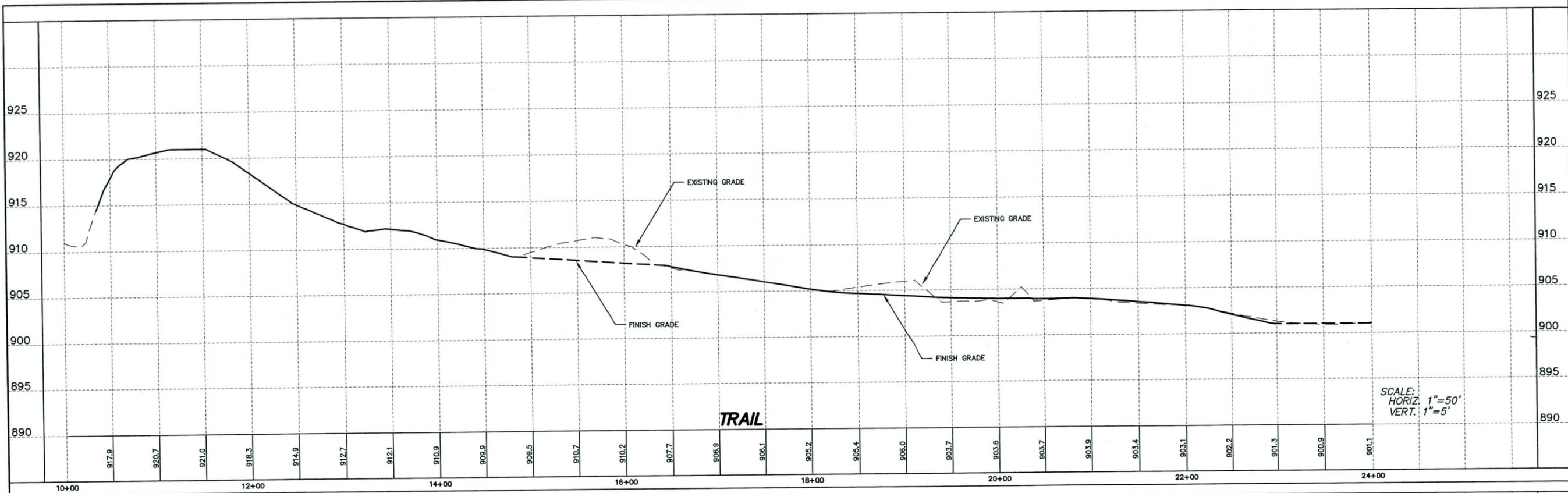
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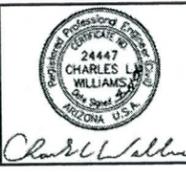
C.W. C.L. WILLIAMS CONSULTING, INC.
CIVIL ENGINEERING AND RESOURCE MANAGEMENT
4720 W. Maverick Lane, Suite 103
Lakeside, Arizona 85929
Phone: (928) 368-2248 Fax: (928) 368-8704

DRAWING TITLE
**EL RIO EDUCATIONAL
RESEARCH AND DEVELOPMENT
PILOT PROJECT**
GROUND PROFILES

| | | | |
|--------------|--------|----------------|-------|
| SCALE HORIZ. | 1"=50' | JOB NUMBER | FCDMC |
| SCALE VERT. | 1"=5' | DRAWING NUMBER | 6 |
| DES. BY: | JAA | DATE | |
| CHK. BY: | JAA | | |
| REV. BY: | FSK | | |
| APP. BY: | CLW | | |



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 (OUTSIDE MARICOPA COUNTY)



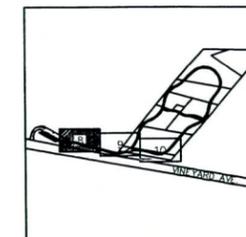
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 Lakeside, Arizona 85929
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DRAWING TITLE
**EL RIO EDUCATIONAL
 RESEARCH AND DEVELOPMENT
 PILOT PROJECT**
 ACCESS ROAD/TRAIL PROFILE

| | | | |
|--------------|--------|----------------|-------|
| SCALE HORIZ. | 1"=50' | JOB NUMBER | FCDMC |
| SCALE VERT. | 1"=5' | DRAWING NUMBER | |
| DES. BY: | JAA | DATE | |
| CHK. BY: | JAA | | |
| APP. BY: | CLW | | |

7
of 27

EL RIO
WATERCOURSE
MASTER PLAN



KEYMAP

EDAW

455 NORTH 3RD STREET
SUITE 272
PHOENIX ARIZONA
85004
TEL 602 393 3791
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SEAL:



DATE: 04/14/2006
JOB NO.: 05220023.01
DRAWN BY: EN
CHECKED BY: JH

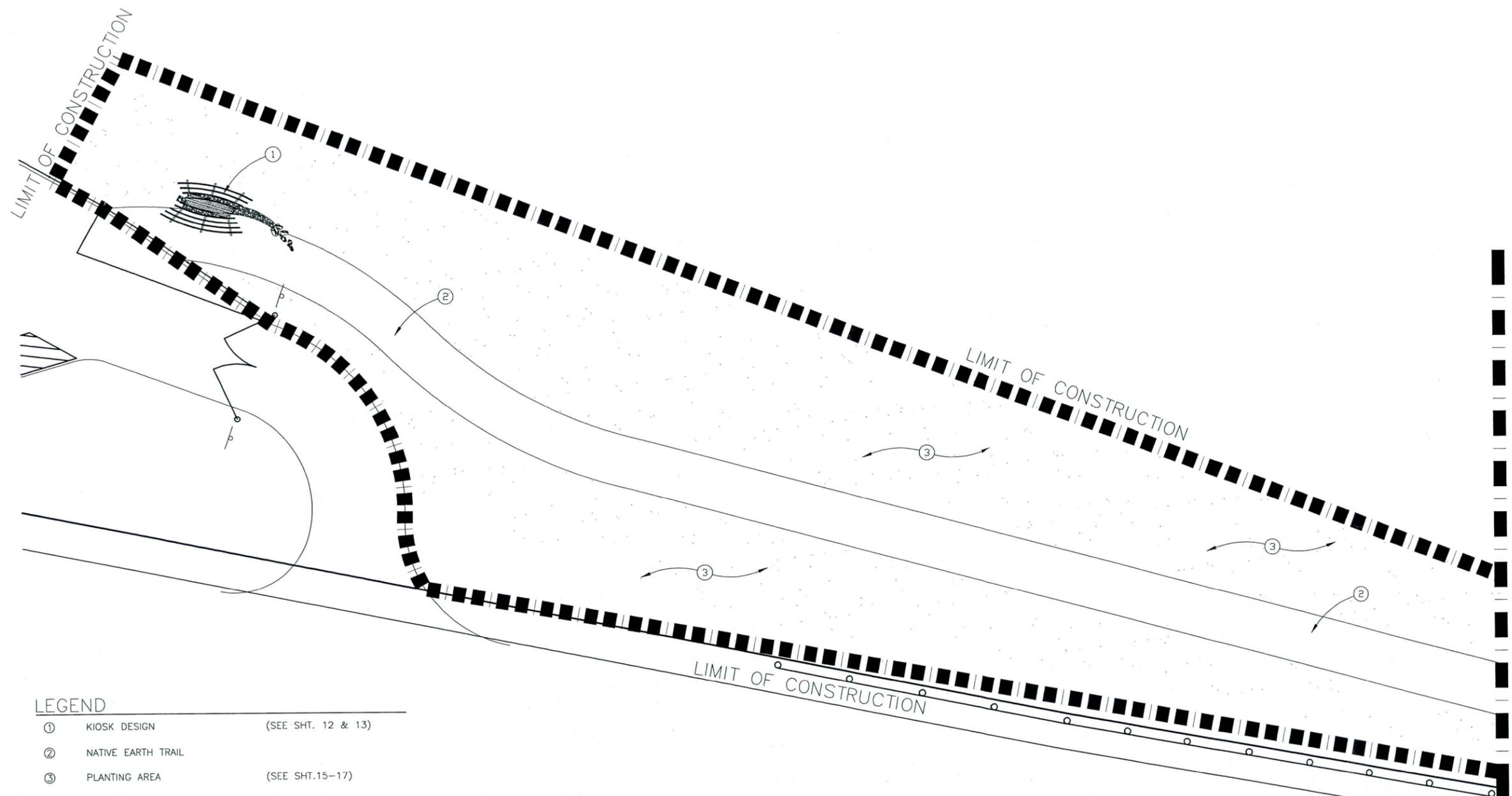
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**HARDSCAPE
PLAN**

SHEET NO.:

8

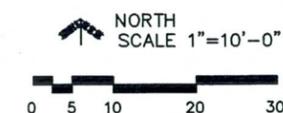
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CONSTRUCTION DOCUMENTS

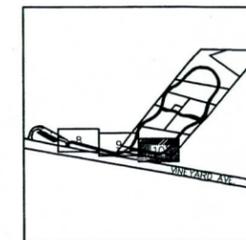


LEGEND

- ① KIOSK DESIGN (SEE SHT. 12 & 13)
- ② NATIVE EARTH TRAIL
- ③ PLANTING AREA (SEE SHT.15-17)



EL RIO
WATERCOURSE
MASTER PLAN



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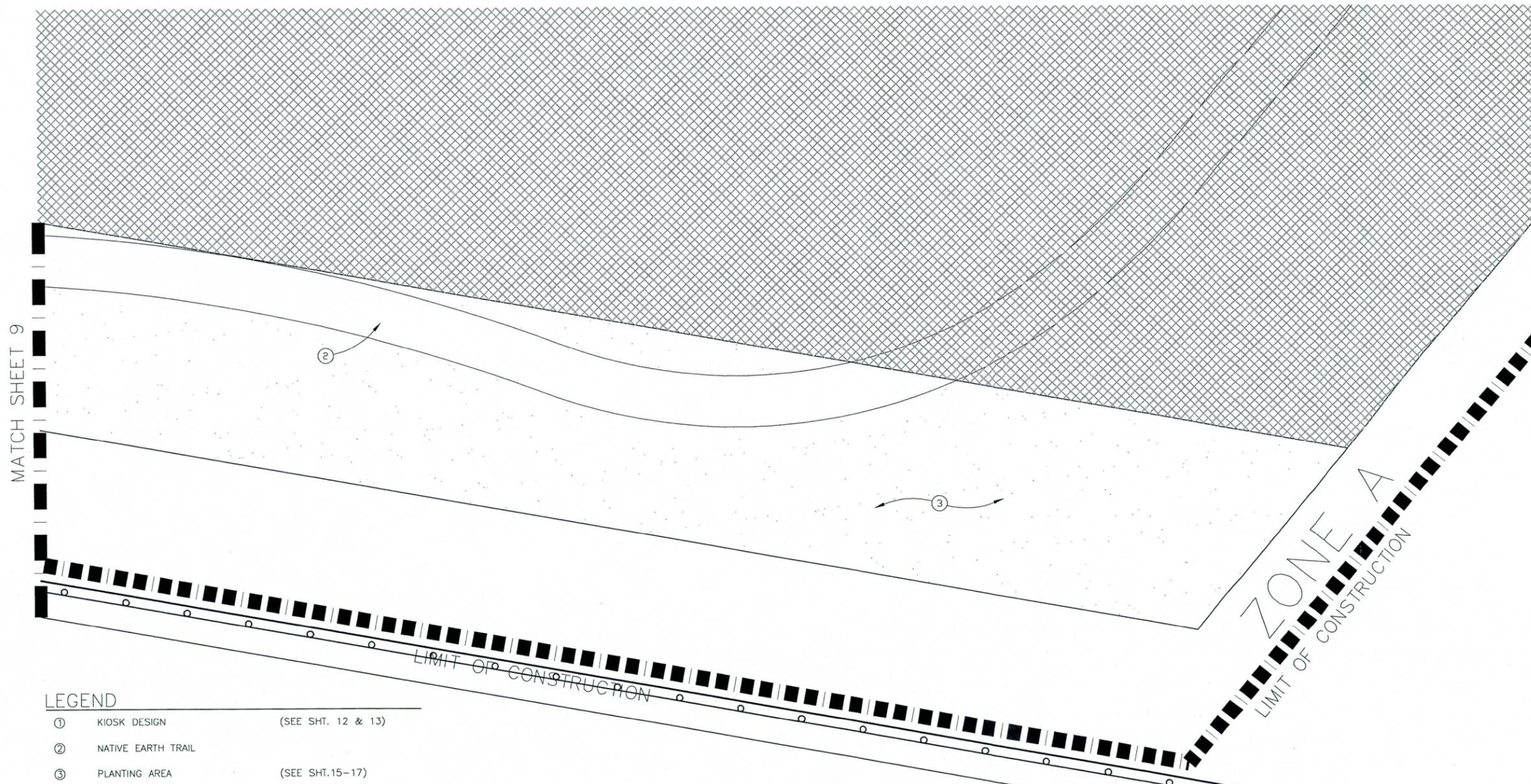
DATE: 04/14/2006
JOB NO.: 05220023.01
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DRAWING TITLE:
**HARDSCAPE
PLAN**

SHEET NO.:
10

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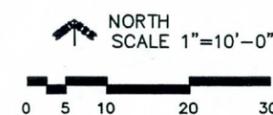
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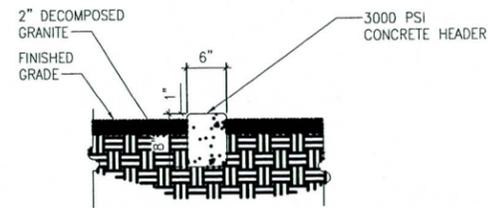
MATCH SHEET 9

LEGEND

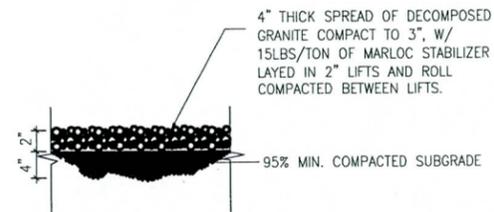
- ① KIOSK DESIGN (SEE SHT. 12 & 13)
- ② NATIVE EARTH TRAIL
- ③ PLANTING AREA (SEE SHT. 15-17)



EL RIO
WATERCOURSE
MASTER PLAN

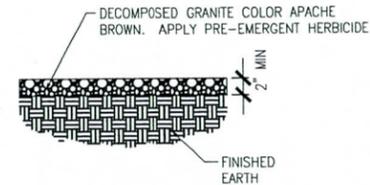


1 6" CONCRETE HEADER
SCALE: N.T.S. dt--conthead



2 STABILIZED DG
SCALE: N.T.S. STABDG

NOTE: PRIOR TO DECOMPOSED GRANITE PLACEMENT,
A PRE-EMERGENT HERBICIDE SHALL BE APPLIED
PER MANUFACTURER'S PRINTED INSTRUCTIONS.



3 DECOMPOSED GRANITE
SCALE: N.T.S. DG

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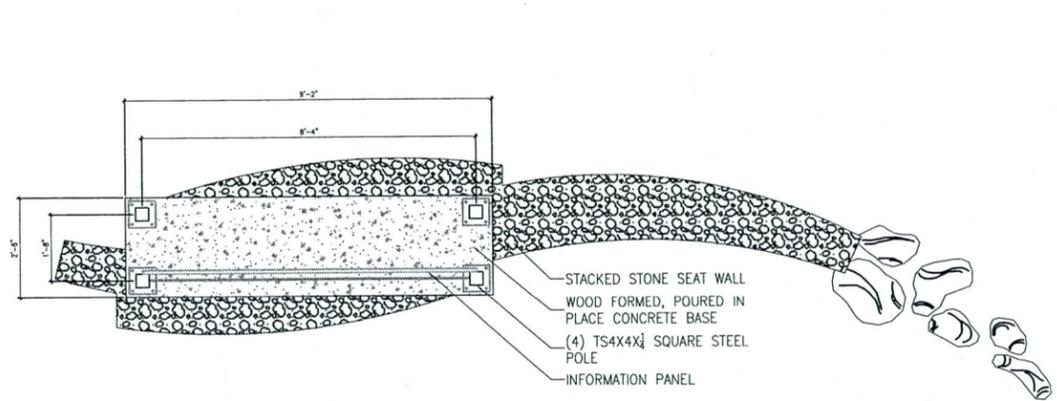


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JOB NO.: 05220023.01
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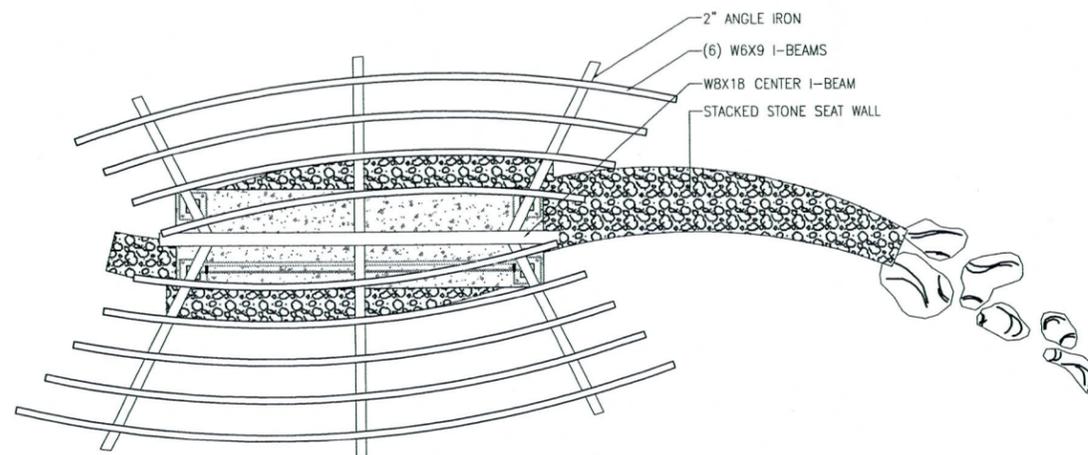
DRAWING TITLE:
**HARDSCAPE
DETAILS**
SHEET NO.:

11
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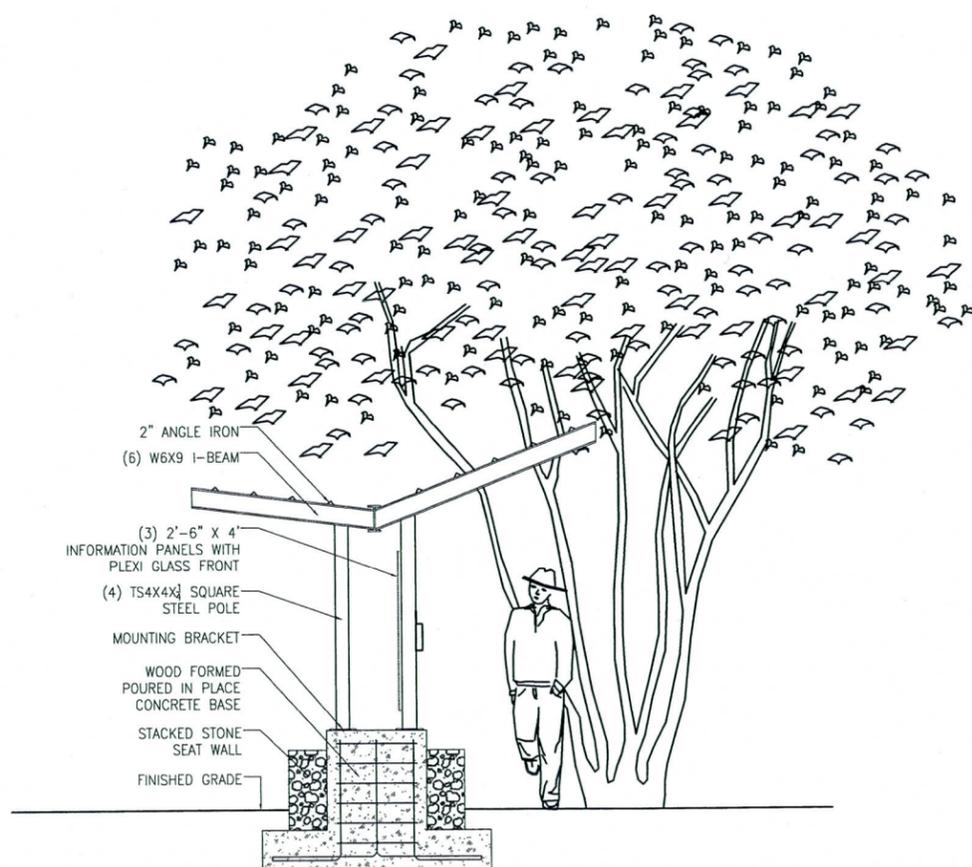
CONSTRUCTION DOCUMENTS



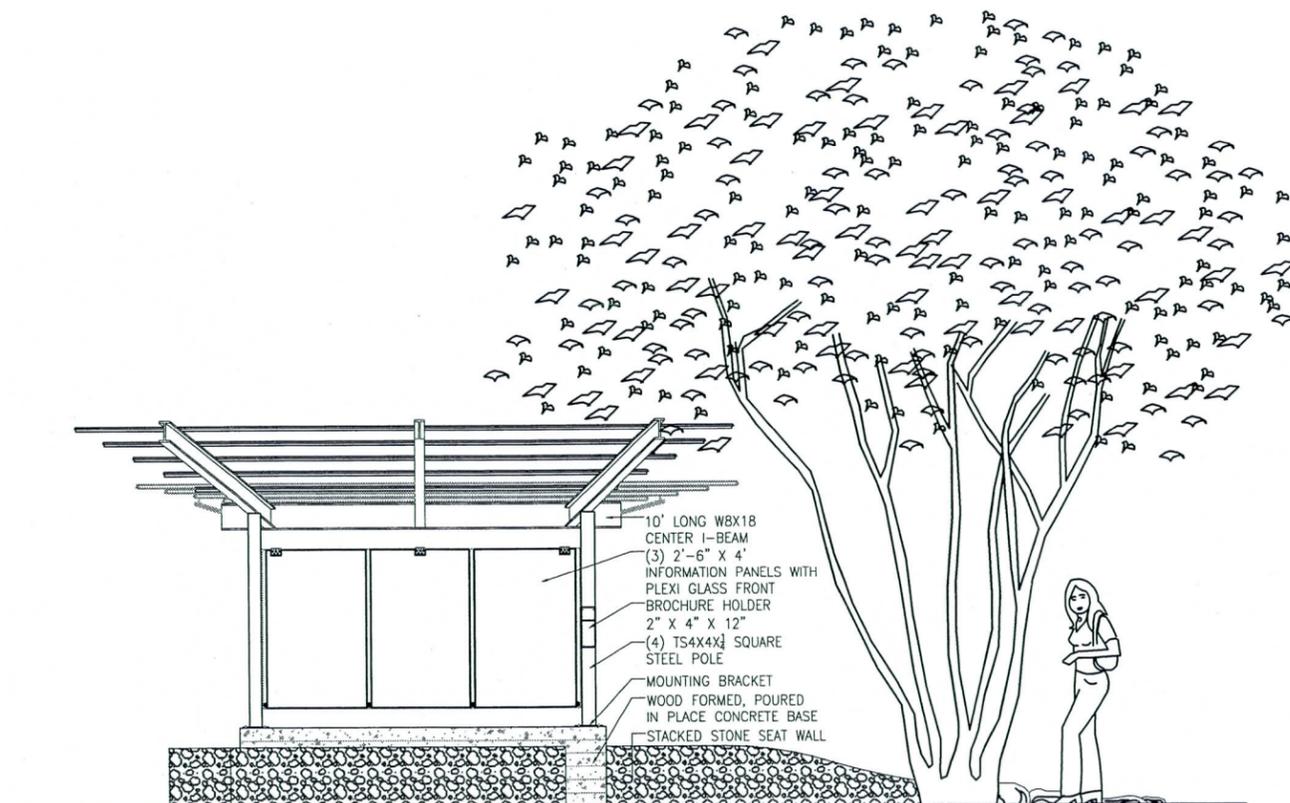
1 PLAN VIEW (W/O SHADE STRUCTURE)
SCALE: 1/2" = 1'-0"



2 PLAN VIEW (W/ SHADE STRUCTURE)
SCALE: 1/2" = 1'-0"



3 SECTION CUT
SCALE: 1/2" = 1'-0"



4 ELEVATION
SCALE: 1/2" = 1'-0"

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SEAL:



DATE: 04/14/2006
JOB NO.: 05220023.01
DRAWN BY: EN
CHECKED BY: JH

DRAWING TITLE:

KIOSK DESIGN

SHEET NO.:

12

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CONSTRUCTION DOCUMENTS

TREATMENT ZONES:

ZONE A - REMOVE ALL TAMARISKS. GATEWAY VEGETATION TREATMENT TO BE DESIGNED BY ED&W. PLANTING MAY INCLUDE QUAIL BUSH, FOUR WING SALT BUSH, CREOSOTE AND SCREW BEAN MESQUITE

ZONE B - REMOVE ALL EXISTING VEGETATION. PLANT WITH IRONWOOD, BLUE PALO VERDE, VELVET MESQUITE, QUAILBUSH AND FOUR WING SALT BUSH

ZONE C - REMOVE ALL EXISTING VEGETATION. PLANT WITH VELVET MESQUITE WITH A DENSITY OF 50 STEMS/ACRE (0.68 Ac)

ZONE D - REMOVE ALL EXISTING VEGETATION. PLANT WITH VELVET MESQUITE WITH A DENSITY OF 100 STEMS/ACRE (0.55 Ac)

ZONE E - REMOVE ALL EXISTING VEGETATION. PLANT WITH VELVET MESQUITE WITH A DENSITY OF 150 STEMS/ACRE (0.56 Ac)

ZONE F - REMOVE ALL EXISTING VEGETATION. PLANT WITH VELVET MESQUITE WITH A DENSITY OF 200 STEMS/ACRE (0.45 Ac)

ZONE F1 - REMOVE ALL EXISTING VEGETATION. PLANT WITH VELVET MESQUITE WITH A DENSITY OF 500 STEMS/ACRE (0.06 Ac)

ZONE G - REMOVE ALL EXISTING VEGETATION. PLANT WITH FREMONT COTTONWOOD AND VELVET MESQUITE

ZONE H - REMOVE ALL EXISTING VEGETATION. PLANT WITH FREMONT COTTONWOOD, GOODING WILLOW AND SANDBAR WILLOW

ZONE I - AREA TO OBTAIN BORROW MATERIAL FOR SITE. OPEN WATER/DRY COBBLE

SCALE: 1"=50'

15' NO DISTURBANCE ZONE

PROJECT BOUNDARY

PROJECT BOUNDARY

15' NO DISTURBANCE ZONE

PROJECT BOUNDARY

15' NO DISTURBANCE ZONE

ZONE I

ZONE H

ZONE G

ZONE F
ZONE F1

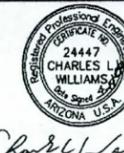
ZONE E

ZONE C

ZONE D

ZONE B

ZONE A

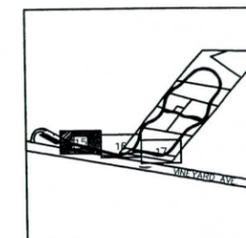


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EL RIO EDUCATIONAL RESEARCH AND DEVELOPMENT PILOT PROJECT
VEGETATION TREATMENT DIAGRAM

| SCALE | DATE | BY | CHKD | APP'D | JOB NUMBER |
|------------|-----------|---------|-----------|------------|------------|
| SCALE: N/A | DATE: --- | BY: --- | CHKD: --- | APP'D: --- | 14 |
| | | | | | of 27 |

EL RIO
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DATE: 04/14/2006
JOB NO.: 05220023.01
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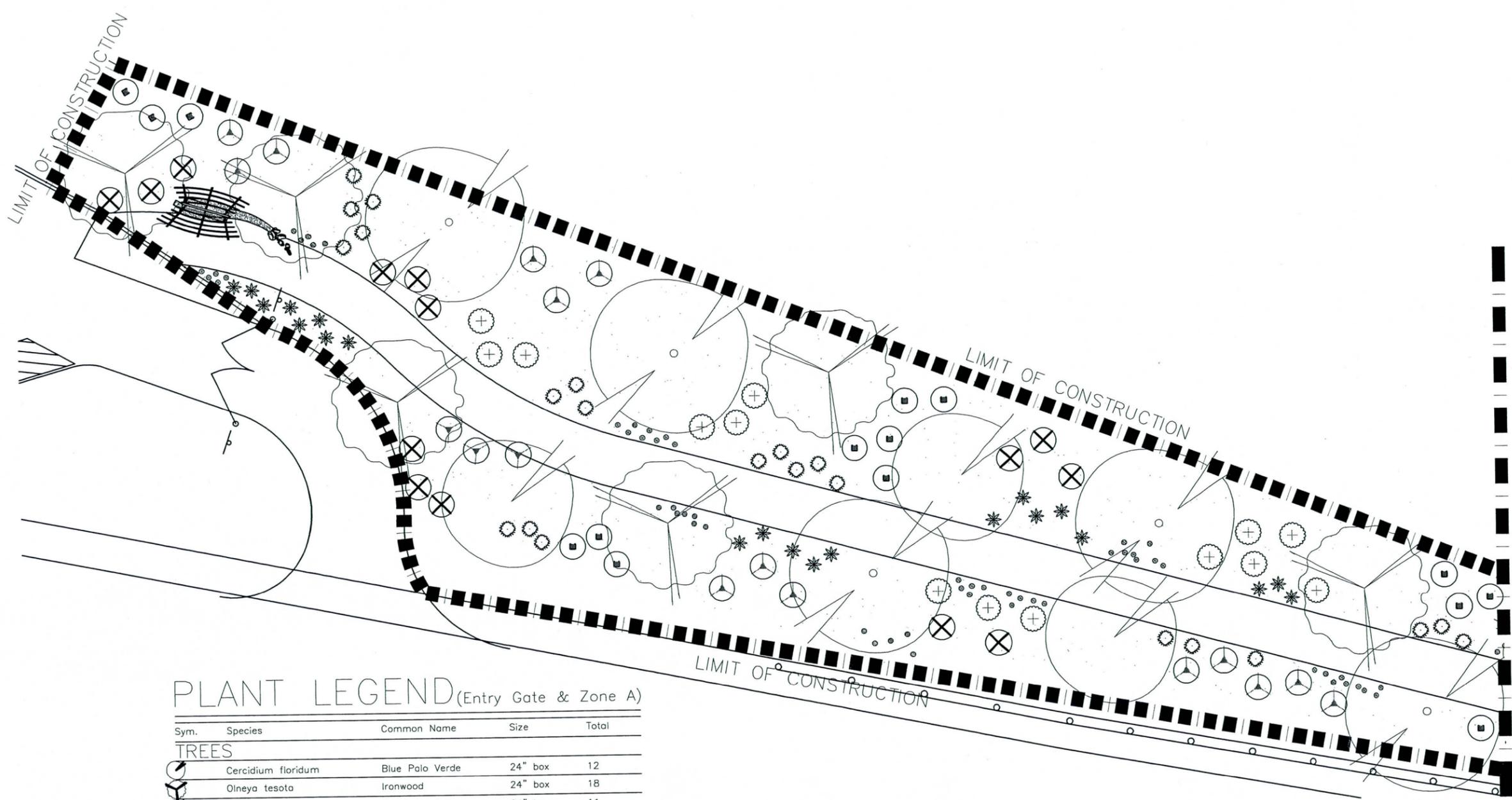
DRAWING TITLE:
PLANTING PLAN

SHEET NO.:

15

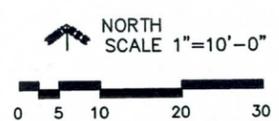
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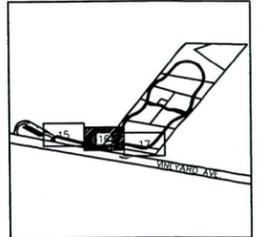


PLANT LEGEND (Entry Gate & Zone A)

| Sym. | Species | Common Name | Size | Total |
|---------------------|--------------------------------|----------------------|---------|-------|
| TREES | | | | |
| | <i>Cercidium floridum</i> | Blue Palo Verde | 24" box | 12 |
| | <i>Olneya tesota</i> | Ironwood | 24" box | 18 |
| | <i>Prosopis velutina</i> | Velvet Mesquite | 24" box | 11 |
| SHRUBS | | | | |
| | <i>Calliandra californica</i> | Baja Fairy Duster | 5 Gal. | 17 |
| | <i>Encelia farinosa</i> | Brittlebush | 5 Gal. | 38 |
| | <i>Justicia californica</i> | Chuparosa | 5 Gal. | 29 |
| | <i>Larrea tridentata</i> | Creosote Bush | 5 Gal. | 45 |
| ACCENTS | | | | |
| | <i>Dasyirion wheeleri</i> | Desert Spoon | 5 Gal. | 47 |
| | <i>Muhlenbergia capillaris</i> | Pink Muhly | 5 Gal. | 43 |
| GROUNDCOVERS | | | | |
| | <i>Dalea frutescens</i> | Black Dalea | 5 Gal. | 76 |
| | <i>Dalea greggii</i> | Trailing Indigo Bush | 5 Gal. | 119 |



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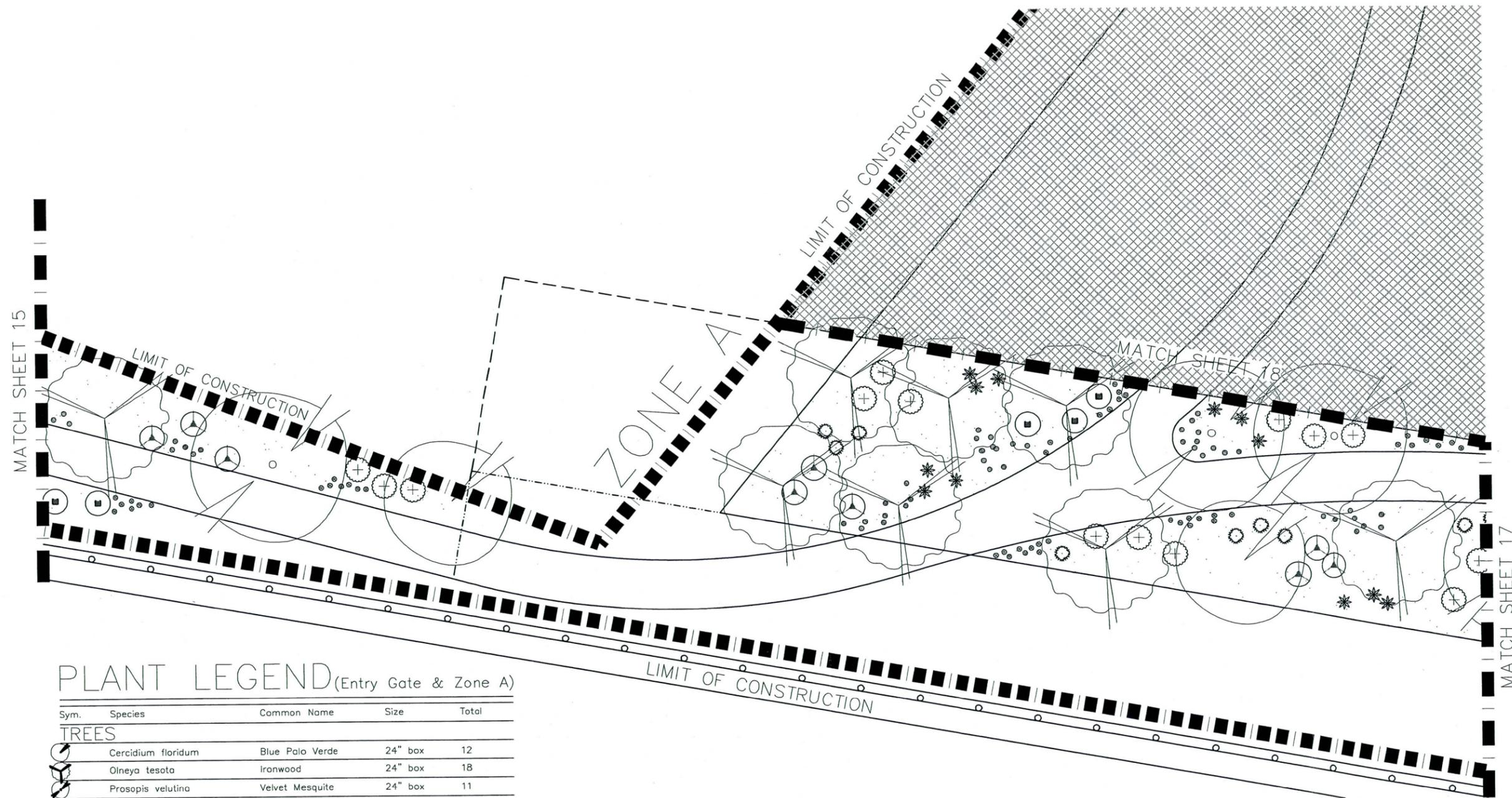
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CHECKED BY: JH

DRAWING TITLE:
PLANTING PLAN

SHEET NO.:
16

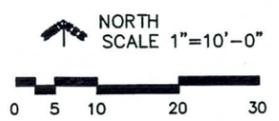
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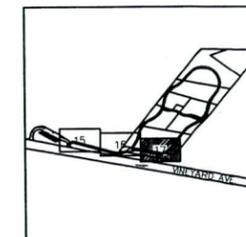


PLANT LEGEND (Entry Gate & Zone A)

| Sym. | Species | Common Name | Size | Total |
|---------------------|--------------------------------|----------------------|---------|-------|
| TREES | | | | |
| | <i>Cercidium floridum</i> | Blue Palo Verde | 24" box | 12 |
| | <i>Olneya tesota</i> | Ironwood | 24" box | 18 |
| | <i>Prosopis velutina</i> | Velvet Mesquite | 24" box | 11 |
| SHRUBS | | | | |
| | <i>Calliandra californica</i> | Baja Fairy Duster | 5 Gal. | 17 |
| | <i>Encelia farinosa</i> | Brittlebush | 5 Gal. | 38 |
| | <i>Justicia californica</i> | Chuparosa | 5 Gal. | 29 |
| | <i>Larrea tridentata</i> | Creosote Bush | 5 Gal. | 45 |
| ACCENTS | | | | |
| | <i>Dasyirion wheeleri</i> | Desert Spoon | 5 Gal. | 47 |
| | <i>Muhlenbergia capillaris</i> | Pink Muhly | 5 Gal. | 43 |
| GROUNDCOVERS | | | | |
| | <i>Dalea frutescens</i> | Black Dalea | 5 Gal. | 76 |
| | <i>Dalea greggii</i> | Trailing Indigo Bush | 5 Gal. | 119 |



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DATE: 04/14/2006
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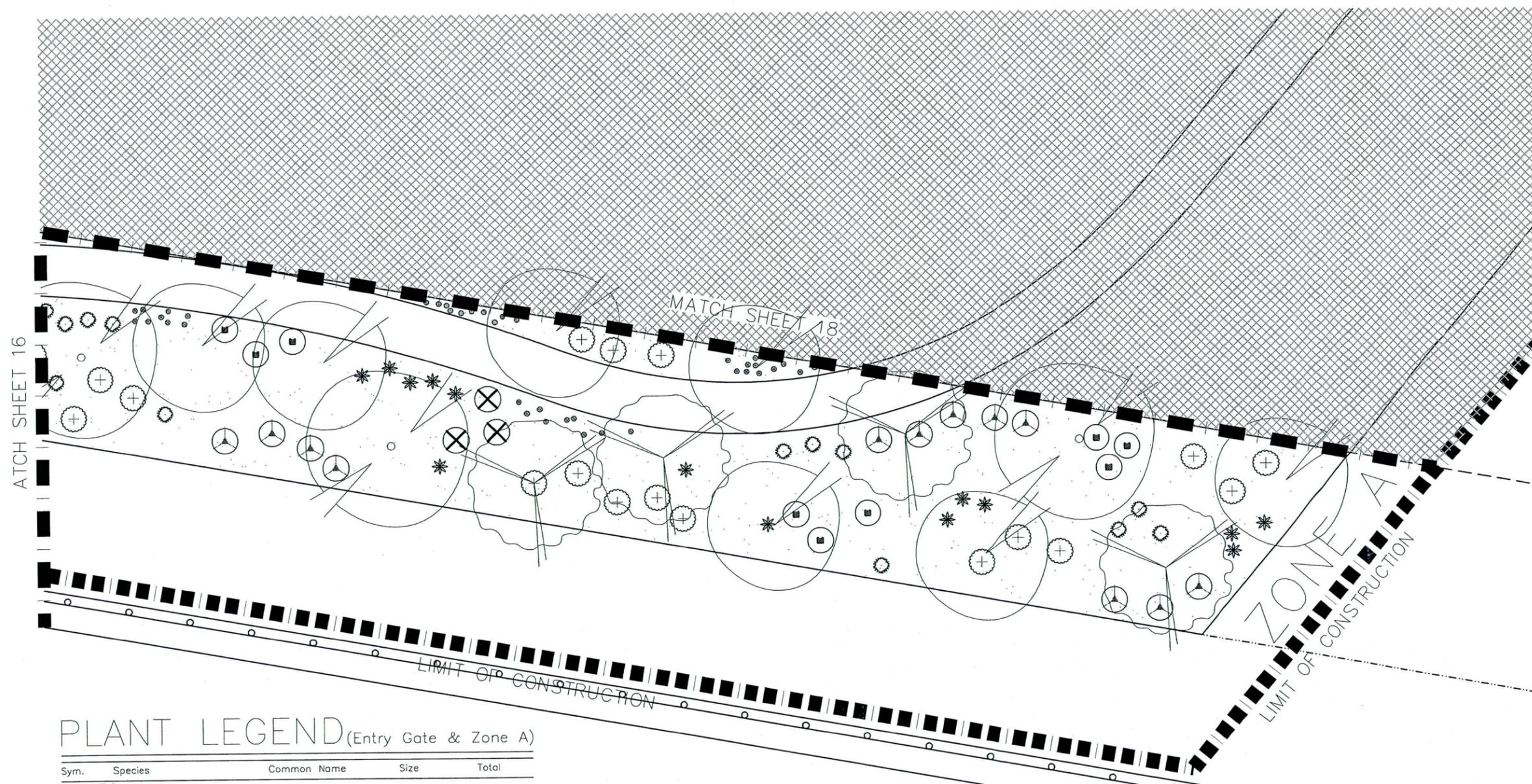
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17

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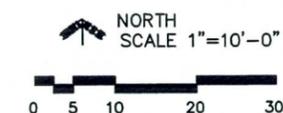
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ATCH SHEET 16

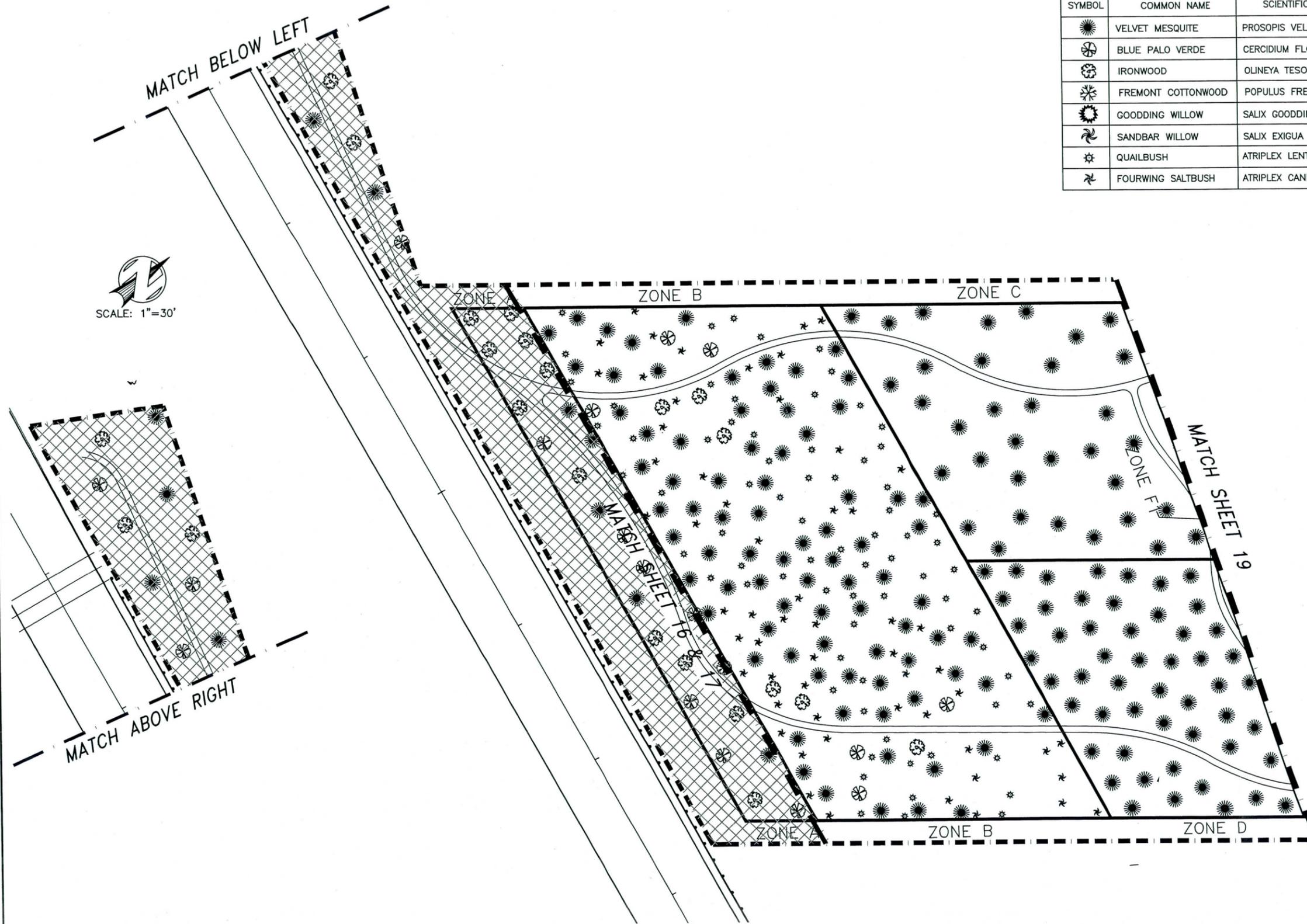
PLANT LEGEND (Entry Gate & Zone A)

| Sym. | Species | Common Name | Size | Total |
|---------------------|--------------------------------|----------------------|---------|-------|
| TREES | | | | |
| ⊕ | <i>Cercidium floridum</i> | Blue Palo Verde | 24" box | 12 |
| ⊕ | <i>Olneya tesota</i> | Ironwood | 24" box | 18 |
| ⊕ | <i>Prosopis velutina</i> | Velvet Mesquite | 24" box | 11 |
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| ⊗ | <i>Calliandra californica</i> | Baja Fairy Duster | 5 Gal. | 17 |
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| ⊕ | <i>Larrea tridentata</i> | Creosote Bush | 5 Gal. | 45 |
| ACCENTS | | | | |
| * | <i>Dasyirion wheeleri</i> | Desert Spoon | 5 Gal. | 47 |
| ⊕ | <i>Muhlenbergia capillaris</i> | Pink Muhly | 5 Gal. | 43 |
| GROUNDCOVERS | | | | |
| ● | <i>Dalea frutescens</i> | Black Dalea | 5 Gal. | 76 |
| ● | <i>Dalea greggii</i> | Trailing Indigo Bush | 5 Gal. | 119 |



| SYMBOL | COMMON NAME | SCIENTIFIC NAME | SIZE | PLANT TOTALS PER ZONE | | |
|--------|--------------------|----------------------|-------|-----------------------|----|----|
| | | | | B | C | D |
| | VELVET MESQUITE | PROSOPIS VELUTINA | 5 GAL | 81 | 34 | 52 |
| | BLUE PALO VERDE | CERCIDIUM FLORIDUM | 5 GAL | 6 | | |
| | IRONWOOD | OLINEYA TESOTA | 5 GAL | 6 | | |
| | FREMONT COTTONWOOD | POPULUS FREMONTII | 5 GAL | | | |
| | GOODDING WILLOW | SALIX GOODDINGII | 5 GAL | | | |
| | SANDBAR WILLOW | SALIX EXIGUA | 5 GAL | | | |
| | QUAILBUSH | ATRIPLEX LENTIFORMIS | 1 GAL | 74 | | |
| | FOURWING SALTBUCH | ATRIPLEX CANESCENS | 1 GAL | 58 | | |

SCALE: 1"=30'



CALL TWO WORKING DAYS BEFORE YOU DIG
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1-800-782-5348
BLAKE STAKE CENTER
(OUTSIDE MARICOPA COUNTY)



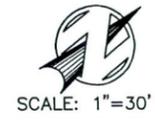
Charles L. Williams

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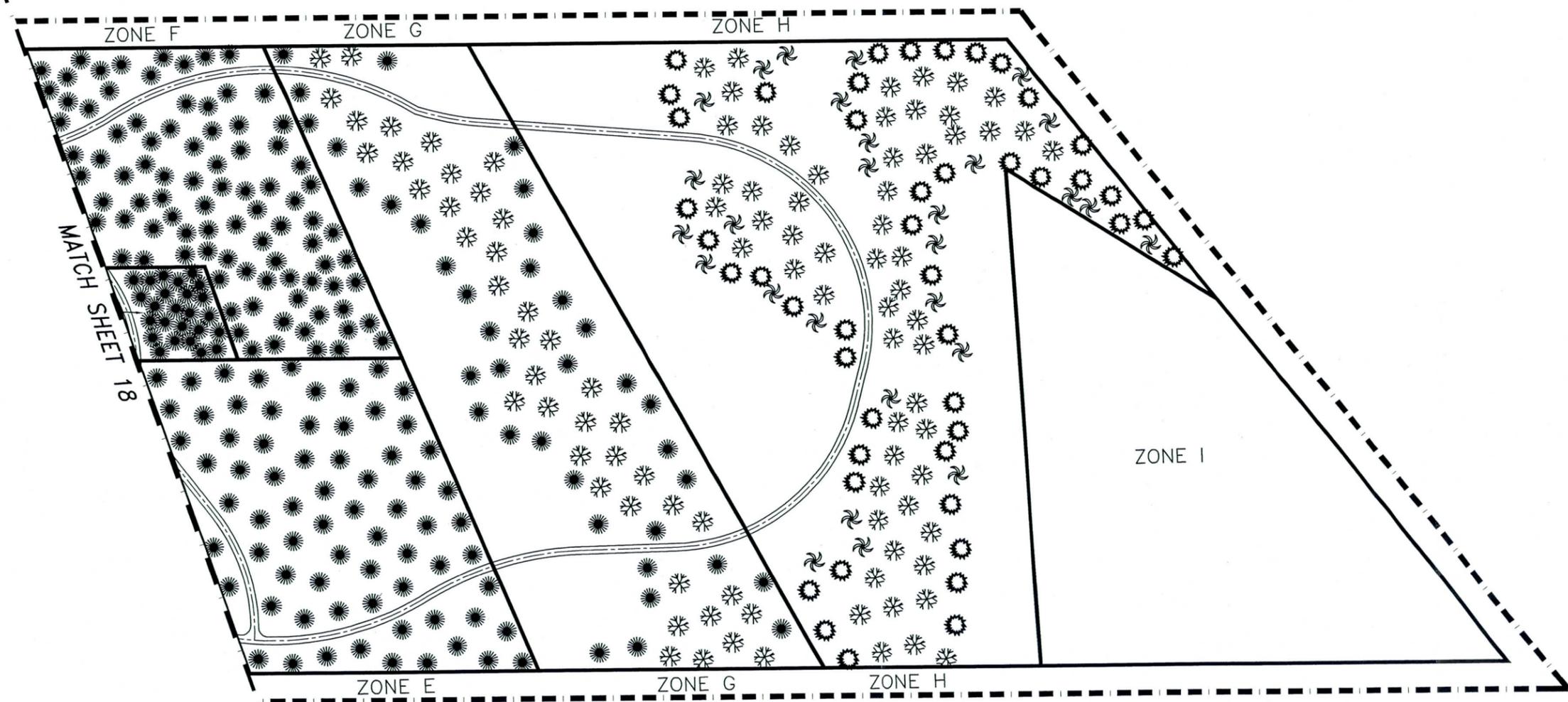
DRAWING TITLE
**EL RIO EDUCATIONAL
RESEARCH AND DEVELOPMENT
PILOT PROJECT**
PLANTING PLAN

| SCALE HORIZ. | 1"=30' | JOB NUMBER |
|--------------|--------|------------|
| SCALE VERT. | N/A | |
| DES. BY: | JWA | DATE |
| CHK. BY: | JWA | DATE |
| REV. BY: | DKK | DATE |
| APP. BY: | CLK | DATE |

DRAWING NUMBER
18
of 27



| SYMBOL | COMMON NAME | SCIENTIFIC NAME | SIZE | PLANT TOTALS PER ZONE | | | | |
|--------|--------------------|----------------------|-------|-----------------------|----|----|----|----|
| | | | | E | F | F1 | G | H |
| | VELVET MESQUITE | PROSOPIS VELUTINA | 5 GAL | 70 | 90 | 25 | 36 | |
| | BLUE PALO VERDE | CERCIDIUM FLORIDUM | 5 GAL | | | | | |
| | IRONWOOD | OLINEYA TESOTA | 5 GAL | | | | | |
| | FREMONT COTTONWOOD | POPULUS FREMONTII | 5 GAL | | | | 42 | 57 |
| | GOODDING WILLOW | SALIX GOODDINGII | 5 GAL | | | | | 46 |
| | SANDBAR WILLOW | SALIX EXIGUA | 5 GAL | | | | | 28 |
| | QUAILBUSH | ATRIPLEX LENTIFORMIS | 1 GAL | | | | | |
| | FOURWING SALTBUCH | ATRIPLEX CANESCENS | 1 GAL | | | | | |



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 BLUE STAKE CENTER
 (OUTSIDE MARICOPA COUNTY)



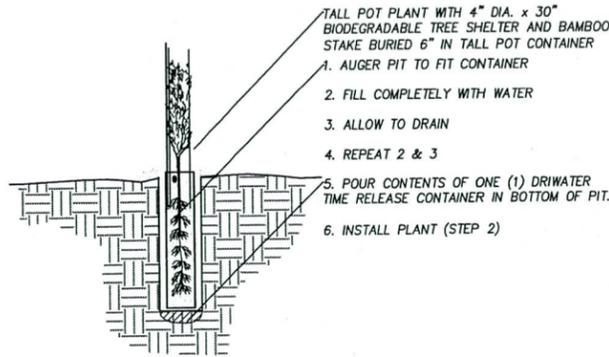
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 LAKESIDE, ARIZONA 85929
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DRAWING TITLE
**EL RIO EDUCATIONAL
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 PILOT PROJECT**
PLANTING PLAN

| | | | |
|--------------|--------|------------|--|
| SCALE HORIZ. | 1"=30' | JOB NUMBER | |
| SCALE VERT. | N/A | | |
| DES. BY: | JWA | DATE | |
| CHK. BY: | JWA | | |
| REV. BY: | HR | | |
| APP. BY: | CLW | | |

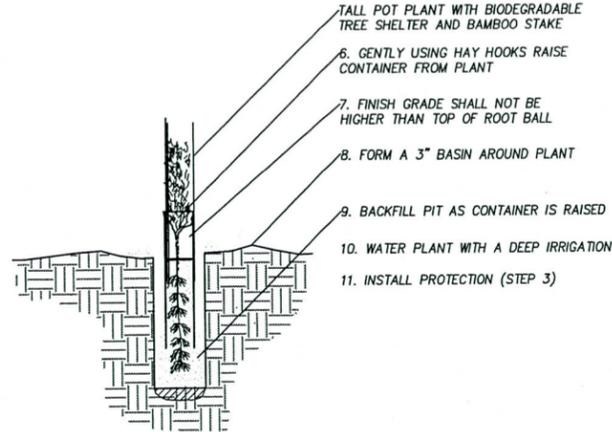
19
of 27

NOTE:
TALL POT PLANT TO BE PROVIDED BY FLOOD CONTROL DISTRICT OF MARICOPA COUNTY (FCDMC) CONTRACTOR SHALL BE RESPONSIBLE TO PICK UP AT FCDMC YARD, TRANSPORT AND INSTALL PER DETAILS.



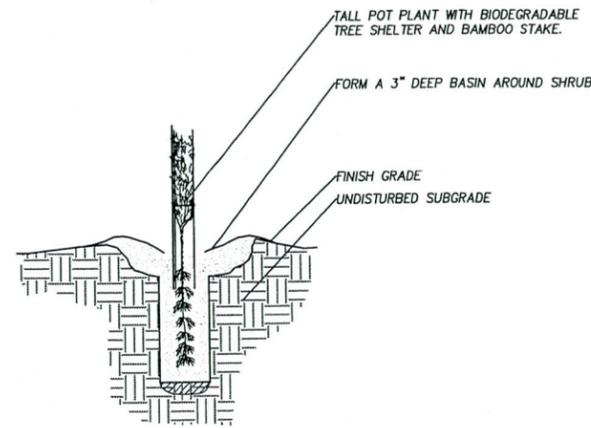
1. AUGER PIT TO FIT CONTAINER
2. FILL COMPLETELY WITH WATER
3. ALLOW TO DRAIN
4. REPEAT 2 & 3
5. POUR CONTENTS OF ONE (1) DRI-WATER TIME RELEASE CONTAINER IN BOTTOM OF PIT.
6. INSTALL PLANT (STEP 2)

1 TALL POT PLANTING DETAIL (STEP 1)
NTS



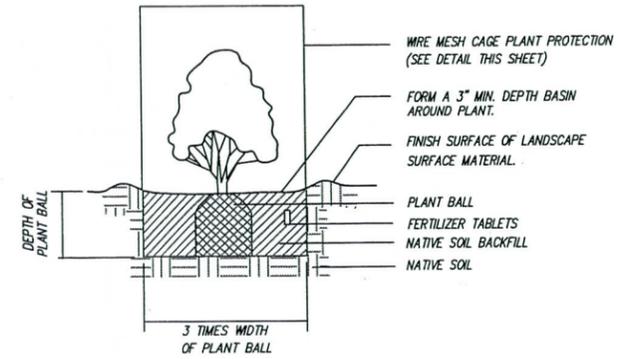
7. FINISH GRADE SHALL NOT BE HIGHER THAN TOP OF ROOT BALL
8. FORM A 3" BASIN AROUND PLANT
9. BACKFILL PIT AS CONTAINER IS RAISED
10. WATER PLANT WITH A DEEP IRRIGATION
11. INSTALL PROTECTION (STEP 3)

2 TALL POT PLANTING DETAIL (STEP 2)
NTS



12. FORM A 3" DEEP BASIN AROUND SHRUB
13. FINISH GRADE UNDISTURBED SUBGRADE

3 TALL POT PLANTING DETAIL (STEP 3)
NTS

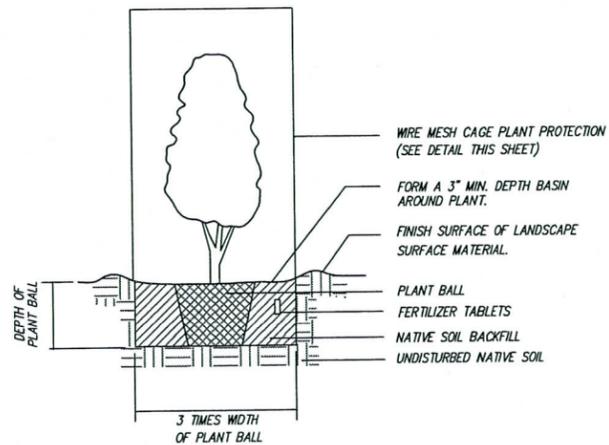


14. WIRE MESH CAGE PLANT PROTECTION (SEE DETAIL THIS SHEET)
15. FORM A 3" MIN. DEPTH BASIN AROUND PLANT.
16. FINISH SURFACE OF LANDSCAPE SURFACE MATERIAL.
17. PLANT BALL
18. FERTILIZER TABLETS
19. NATIVE SOIL BACKFILL
20. NATIVE SOIL

4 SHRUB PLANTING DETAIL
NTS

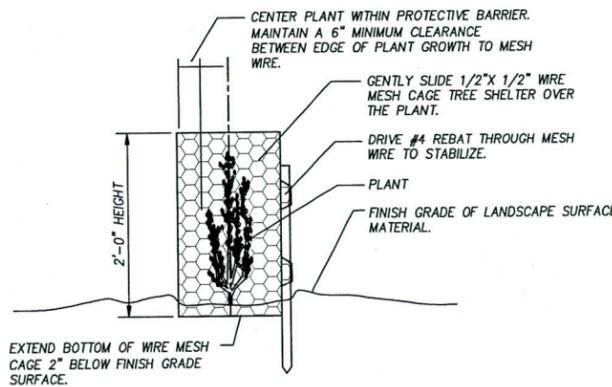
NOTE:
IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE NECESSARY DEPTH TO WHICH THE STAKE SHALL BE DRIVEN TO PROVIDE MAXIMUM SUPPORT AND INSURE STABILITY OF ALL CAGES.

STAKES SHALL BE LOCATED AND INSTALLED SO AS TO NOT CONTACT THE ROOT BALL OR DAMAGE IRRIGATION SYSTEM WHEN DRIVEN INTO POSITION.



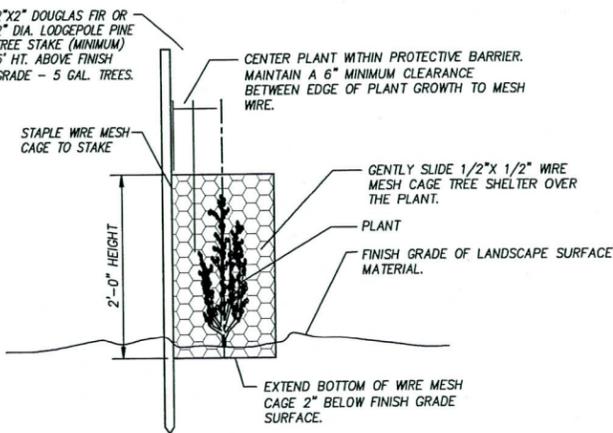
21. WIRE MESH CAGE PLANT PROTECTION (SEE DETAIL THIS SHEET)
22. FORM A 3" MIN. DEPTH BASIN AROUND PLANT.
23. FINISH SURFACE OF LANDSCAPE SURFACE MATERIAL.
24. PLANT BALL
25. FERTILIZER TABLETS
26. NATIVE SOIL BACKFILL
27. UNDISTURBED NATIVE SOIL

5 TREE PLANTING DETAIL
NTS



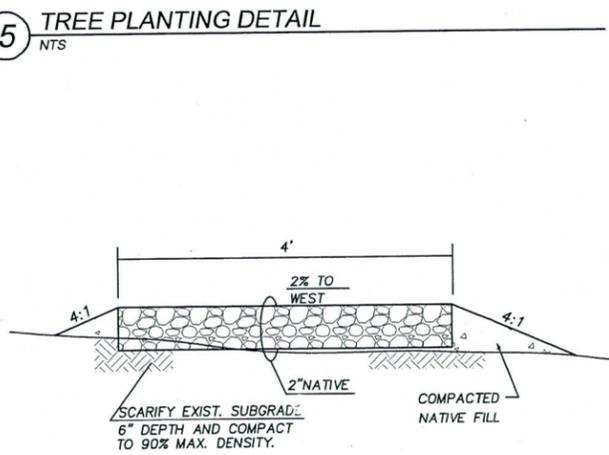
28. CENTER PLANT WITHIN PROTECTIVE BARRIER. MAINTAIN A 6" MINIMUM CLEARANCE BETWEEN EDGE OF PLANT GROWTH TO MESH WIRE.
29. GENTLY SLIDE 1/2" X 1/2" WIRE MESH CAGE TREE SHELTER OVER THE PLANT.
30. DRIVE #4 REBAR THROUGH MESH WIRE TO STABILIZE.
31. PLANT
32. FINISH GRADE OF LANDSCAPE SURFACE MATERIAL.

6 PLANT PROTECTION (SHRUB)
NTS



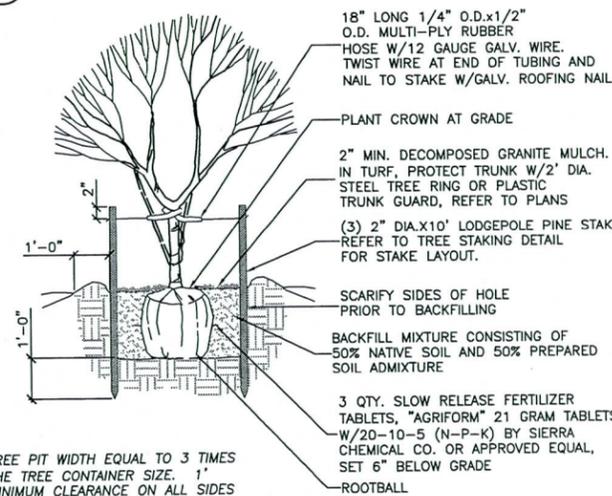
33. 2" X 2" DOUGLAS FIR OR 2" DIA. LODGEPOLE PINE TREE STAKE (MINIMUM) 5' HT. ABOVE FINISH GRADE - 5 GAL. TREES.
34. CENTER PLANT WITHIN PROTECTIVE BARRIER. MAINTAIN A 6" MINIMUM CLEARANCE BETWEEN EDGE OF PLANT GROWTH TO MESH WIRE.
35. STAPLE WIRE MESH CAGE TO STAKE
36. GENTLY SLIDE 1/2" X 1/2" WIRE MESH CAGE TREE SHELTER OVER THE PLANT.
37. PLANT
38. FINISH GRADE OF LANDSCAPE SURFACE MATERIAL.
39. EXTEND BOTTOM OF WIRE MESH CAGE 2" BELOW FINISH GRADE SURFACE.

7 PLANT PROTECTION (TREE)
NTS



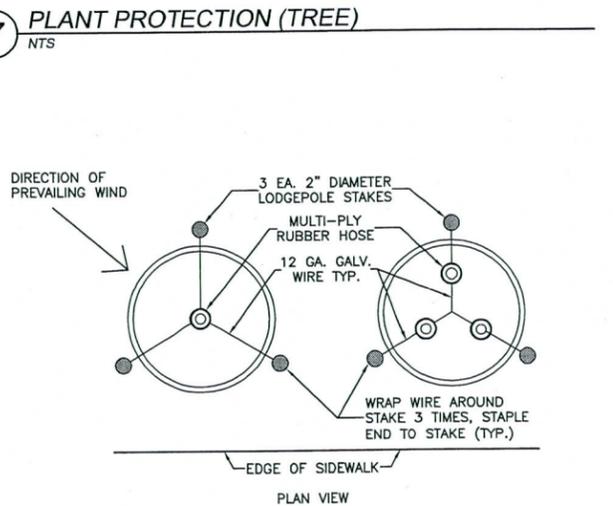
40. SCARIFY EXIST. SUBGRADE 6" DEPTH AND COMPACT TO 90% MAX. DENSITY.
41. 2" NATIVE
42. COMPACTED NATIVE FILL

9 PATHWAY CROSS SECTION
NTS



43. 18" LONG 1/4" O.D. X 10' LODGEPOLE PINE STAKE (MINIMUM) 5' HT. ABOVE FINISH GRADE - 5 GAL. TREES.
44. PLANT CROWN AT GRADE
45. 2" MIN. DECOMPOSED GRANITE MULCH. IN TURF. PROTECT TRUNK W/ 2" DIA. STEEL TREE RING OR PLASTIC TRUNK GUARD, REFER TO PLANS
46. (3) 2" DIA. X 10' LODGEPOLE PINE STAKES. REFER TO TREE STAKING DETAIL FOR STAKE LAYOUT.
47. SCARIFY SIDES OF HOLE PRIOR TO BACKFILLING
48. BACKFILL MIXTURE CONSISTING OF 50% NATIVE SOIL AND 50% PREPARED SOIL ADMIXTURE
49. 3 QTY. SLOW RELEASE FERTILIZER TABLETS, "AGRIFORM" 21 GRAM TABLETS W/20-10-5 (N-P-K) BY SIERRA CHEMICAL CO. OR APPROVED EQUAL, SET 6" BELOW GRADE
50. ROOTBALL

10 TREE PLANTING DETAIL (24" BOX)
NTS



51. DIRECTION OF PREVAILING WIND
52. 3 EA. 2" DIAMETER LODGEPOLE STAKES
53. MULTI-PLY RUBBER HOSE
54. 12 GA. GALV. WIRE TYP.
55. WRAP WIRE AROUND STAKE 3 TIMES, STAPLE END TO STAKE (TYP.)
56. EDGE OF SIDEWALK

11 TREE STAKING (24" BOX)
NTS

CALL TWO WORKING DAYS BEFORE YOU DIG
1-800-STAKE-IT
1-800-782-5348
BLUE STAKE CENTER
(OUTSIDE MARICOPA COUNTY)

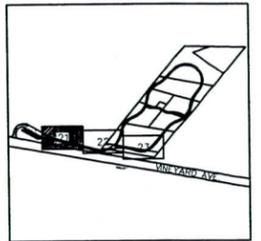


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CHARLES L. WILLIAMS
Professional Engineer
STATE OF ARIZONA

CW C.L. WILLIAMS CONSULTING, INC.
CIVIL ENGINEERING AND RESOURCE MANAGEMENT
4720 W. Maverick Lane, Suite 103
Lakeside, Arizona 85929
Phone: (928) 368-2248 Fax: (928) 368-8704

EL RIO EDUCATIONAL RESEARCH AND DEVELOPMENT PILOT PROJECT
PLANTING DETAILS

| | | | |
|--------------|--------|----------------|-------|
| SCALE HORIZ. | 1"=10' | JOB NUMBER | FCDMC |
| SCALE VERT. | N/A | DRAWING NUMBER | |
| DES. BY: | JWA | DATE | |
| CHK. BY: | JWA | | |
| REV. BY: | KAK | | |
| APP. BY: | CLW | | |



KEYMAP

EDAW

455 NORTH 3RD STREET
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85004
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FAX 602 393 3795
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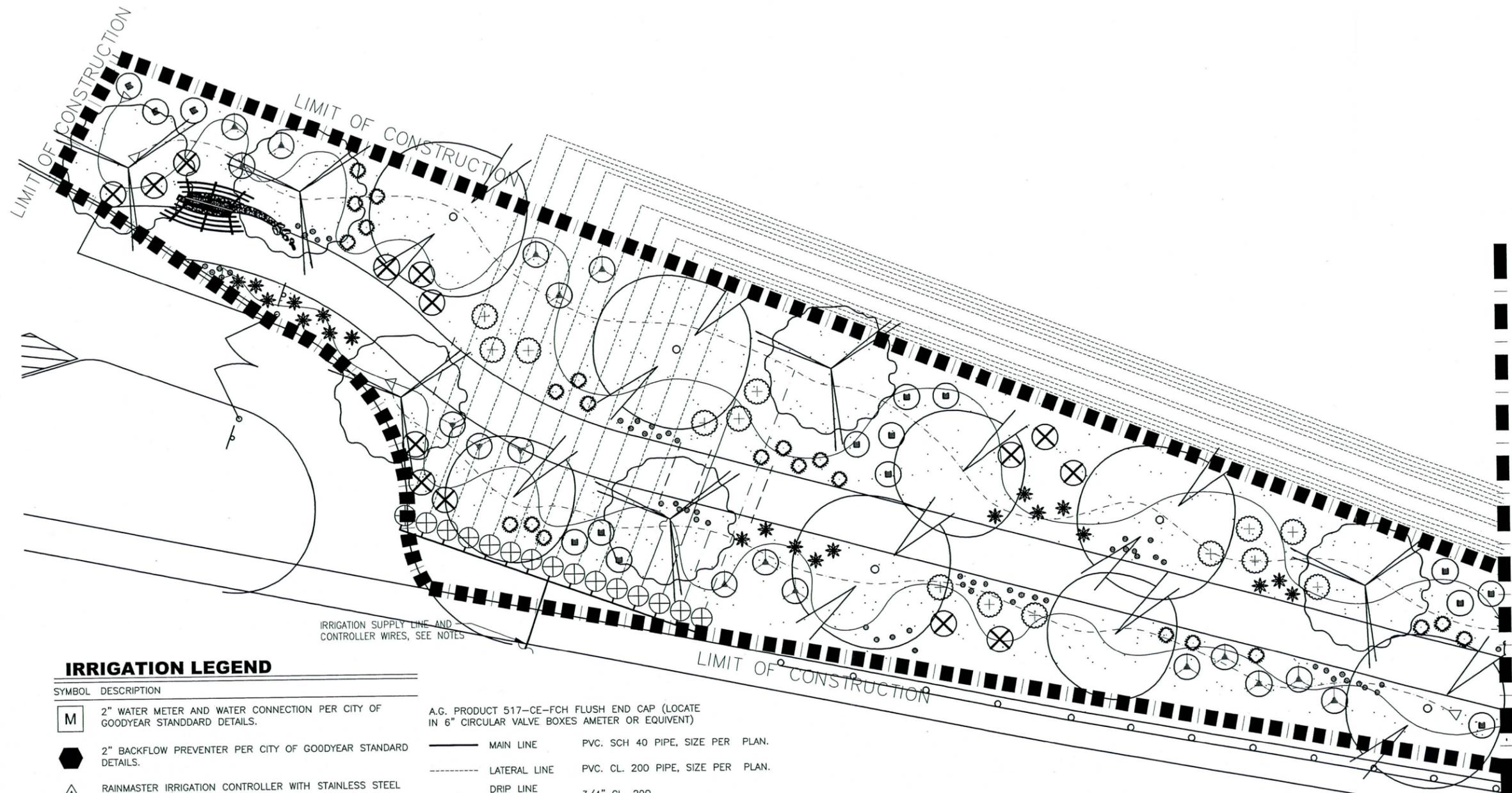
DATE: 04/14/2006
JOB NO.: 05220023.01
DRAWN BY: EN
CHECKED BY: JH

DRAWING TITLE:
IRRIGATION PLAN

SHEET NO.:
21

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CONSTRUCTION DOCUMENTS



MATCH SHEET 22

IRRIGATION LEGEND

| SYMBOL | DESCRIPTION |
|--------|--|
| M | 2" WATER METER AND WATER CONNECTION PER CITY OF GOODYEAR STANDARD DETAILS. |
| ⬢ | 2" BACKFLOW PREVENTER PER CITY OF GOODYEAR STANDARD DETAILS. |
| ⚠ | RAINMASTER IRRIGATION CONTROLLER WITH STAINLESS STEEL PEDESTAL. EAGLE MODEL NO.: RME24EG-SPT STAINLESS STEEL PEDESTAL INSTALL ON A 4" CONCRETE PAD PADLOCK LATCH AC ON/OFF SWITCH GFI RECEPTACLE LIGHTNING/SURGE PROTECTION CONTRACTOR IS RESPONSIBLE FOR ALL ELECTRICAL CONNECTIONS FOR A COMPLETE AND FUNCTIONAL CONTROLLER. |
| ⊗ | NIBCO T-113-IRR BRASS GATE VALVE(SIZE AS PER LINE SIZE) (LOCATE IN 10" VALVE BOX, AMETEK OR EQUIVANT) AND PRESSURE REGULATOR. |
| ⊕ | RAINBIRD 100-GB 1" REMOTE CONTROL DRIP VALVE ASSEMBLY W/ WILKINS 500 Y SRB FILTER. INSTALL PER MANUFACTURES SPECIFICATIONS. PROVIDE EXPANSION COILS AT EACH WIRE CONNECTION. |
| □ | 1" RAINBIRD #44LRC QUICK COUPLER VALVE WITH #44LRC KEY |
| ⊖ | BOWSMITH EMITTERS SEE EMITTER NOTES |

| | | |
|---------|--------------------|------------------------------------|
| — | MAIN LINE | PVC. SCH 40 PIPE, SIZE PER PLAN. |
| - - - - | LATERAL LINE | PVC. CL. 200 PIPE, SIZE PER PLAN. |
| — | DRIP LINE (SHRUBS) | 3/4" CL. 200 |
| - - - - | DRIP LINE (TREES) | 3/4" CL. 200 |
| == | PIPE SLEEVE | SEE SHEET 26, DETAIL #8 FOR SIZING |
| ≡≡ | WIRE SLEEVE | SEE SHEET 26, DETAIL #9 FOR SIZING |

| | |
|-------|------------------|
| A1 | VALVE REFERENCE |
| 1" | VALVE SIZE |
| 00.00 | GALLONS PER MIN. |

UF DIRECT BURIAL SOLID COPPER, 12 GA. COMMON, 12 GA. CONTROL

NOT SHOWN CONTROL WIRE

NOTES:

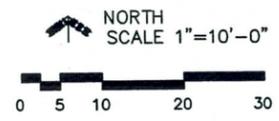
MAINLINE AND DRIP LINE SHOWN ARE DIAGRAMATIC, REFER TO DETAILS FOR EXACT CONFIGURATION.

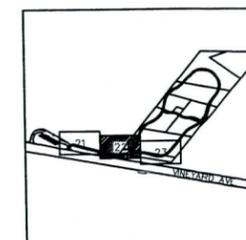
PROVIDE IRRIGATION EQUIPMENT AND MATERIALS AS SPECIFIED OR AS APPROVED BY OWNER.

ALL LATERAL FROM DRIP VALVE TO PRESSURE REGULATOR SHALL BE 1" UNLESS OTHERWISE NOTED.

PROVIDE PIPE AND WIRE SLEEVING UNDER ALL ROAD CROSSINGS, CONCRETE HEADERS, WALKS, AND TRAIL CROSSINGS. REFER TO DETAIL 8 AND 9, SHEET 26 FOR SIZING.

NOTE:
Irrigation supply line (2" size) and control wires to be supplied to south edge of the site by the Maricopa County Parks Department. The Contractor is to extend the supply line and control wires to new valve locations. Control wires are to be place in a 3/4" schedule 80 conduit to and between each valve boxes to prevent rodent damage. Control system is a two wire system by Tucer. Control valves are to have decoder solenoids per manufacturer recommendation. Station numbers are to be coded as 1200 series (i.e. 1201, 1202, etc) and coordinated with Maricopa County Parks Department.





KEYMAP

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DATE: 04/14/2006
JOB NO.: 05220023.01
DRAWN BY: EN
CHECKED BY: JH

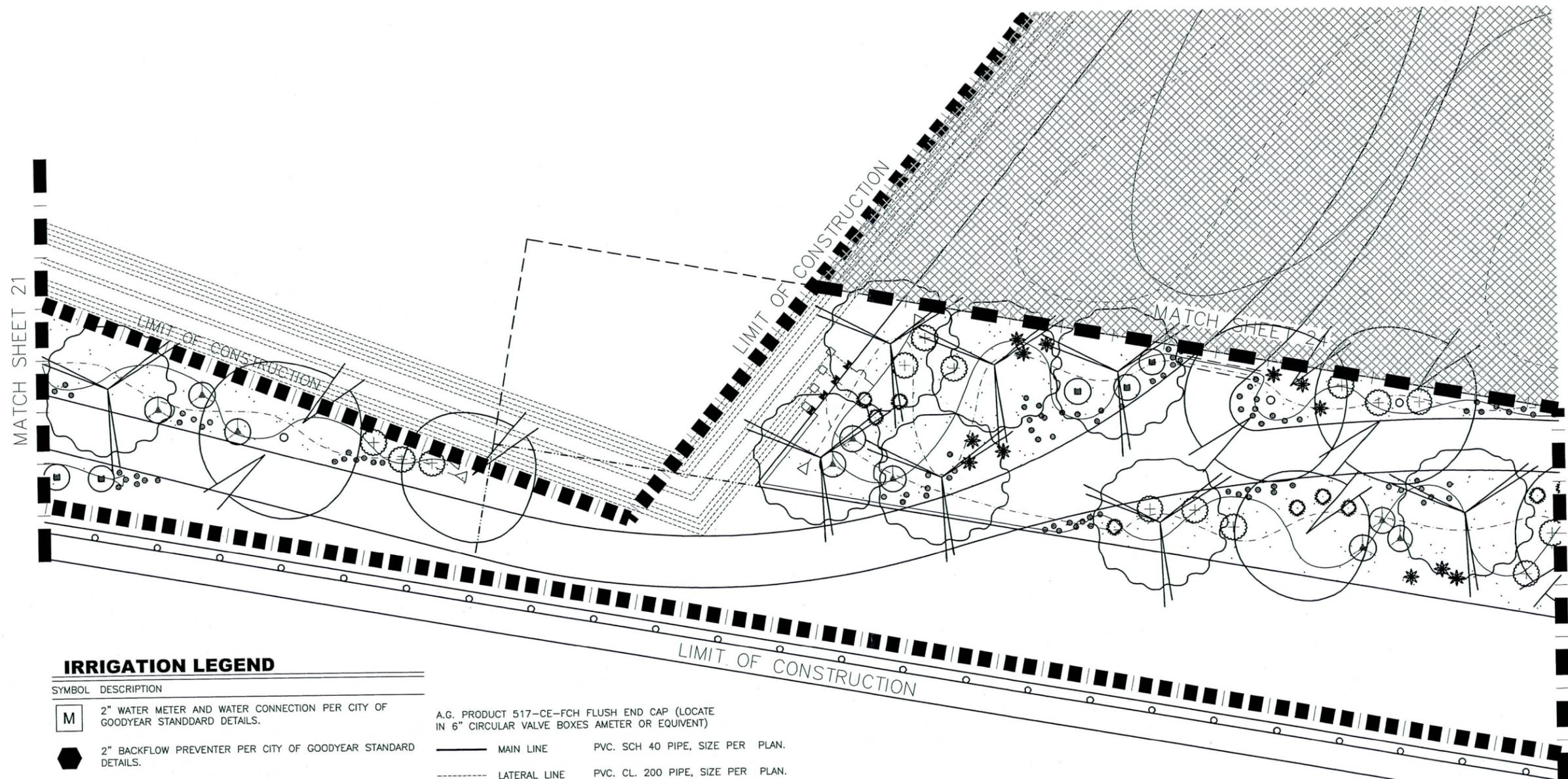
DRAWING TITLE:
IRRIGATION PLAN

SHEET NO.:

22

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CONSTRUCTION DOCUMENTS



IRRIGATION LEGEND

SYMBOL DESCRIPTION

- M** 2" WATER METER AND WATER CONNECTION PER CITY OF GOODYEAR STANDARD DETAILS.
- ⬢** 2" BACKFLOW PREVENTER PER CITY OF GOODYEAR STANDARD DETAILS.
- △** RAINMASTER IRRIGATION CONTROLLER WITH STAINLESS STEEL PEDESTAL. EAGLE MODEL NO.: RME24EG-SPT STAINLESS STEEL PEDESTAL INSTALL ON A 4" CONCRETE PAD PADLOCK LATCH AC ON/OFF SWITCH GFI RECEPTACLE LIGHTNING/SURGE PROTECTION CONTRACTOR IS RESPONSIBLE FOR ALL ELECTRICAL CONNECTIONS FOR A COMPLETE AND FUNCTIONAL CONTROLLER.
- ⊗** NIBCO T-113-IRR BRASS GATE VALVE(SIZE AS PER LINE SIZE) (LOCATE IN 10" VALVE BOX, AMETEK OR EQUIVANT) AND PRESSURE REGULATOR.
- ⊕** RAINBIRD 100-GB 1" REMOTE CONTROL DRIP VALVE ASSEMBLY W/ WILKINS 500 Y SRB FILTER. INSTALL PER MANUFACTURES SPECIFICATIONS. PROVIDE EXPANSION COILS AT EACH WIRE CONNECTION.
- 1" RAINBIRD #44LRC QUICK COUPLER VALVE WITH #44LRC KEY
- ⊖** BOWSMITH EMITTERS SEE EMITTER NOTES

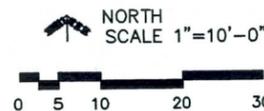
- A.G. PRODUCT 517-CE-FCH FLUSH END CAP (LOCATE IN 6" CIRCULAR VALVE BOXES AMETER OR EQUIVANT)
- MAIN LINE PVC. SCH 40 PIPE, SIZE PER PLAN.
- LATERAL LINE PVC. CL. 200 PIPE, SIZE PER PLAN.
- DRIP LINE (SHRUBS) 3/4" CL. 200
- DRIP LINE (TREES) 3/4" CL. 200
- == PIPE SLEEVE SEE SHEET 26, DETAIL #8 FOR SIZING
- == WIRE SLEEVE SEE SHEET 26, DETAIL #9 FOR SIZING

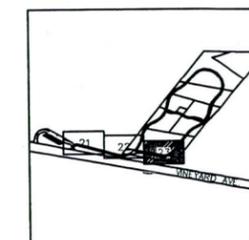
| | |
|-------|------------------|
| A1 | VALVE REFERENCE |
| 1" | VALVE SIZE |
| 00.00 | GALLONS PER MIN. |

UF DIRECT BURIAL SOLID COPPER, 12 GA. COMMON, 12 GA. CONTROL
NOT SHOWN CONTROL WIRE

NOTES:
MAINLINE AND DRIP LINE SHOWN ARE DIAGRAMATIC, REFER TO DETAILS FOR EXACT CONFIGURATION.
PROVIDE IRRIGATION EQUIPMENT AND MATERIALS AS SPECIFIED OR AS APPROVED BY OWNER.
ALL LATERAL FROM DRIP VALVE TO PRESSURE REGULATOR SHALL BE 1" UNLESS OTHERWISE NOTED.
PROVIDE PIPE AND WIRE SLEEVING UNDER ALL ROAD CROSSINGS, CONCRETE HEADERS, WALKS, AND TRAIL CROSSINGS. REFER TO DETAIL 8 AND 9, SHEET 26 FOR SIZING.

NOTE:
Irrigation supply line (2" size) and control wires to be supplied to south edge of the site by the Maricopa County Parks Department. The Contractor is to extend the supply line and control wires to new valve locations. Control wires are to be place in a 3/4" schedule 80 conduit to and between each valve boxes to prevent rodent damage. Control system is a two wire system by Tucor. Control valves are to have decoder solenoids per manufacturer recommendation. Station numbers are to be coded as 1200 series (i.e. 1201, 1202, etc) and coordinated with Maricopa County Parks Department.





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SEAL:



DATE: 04/14/2006
JOB NO.: 05220023.01
DRAWN BY: EN
CHECKED BY: JH

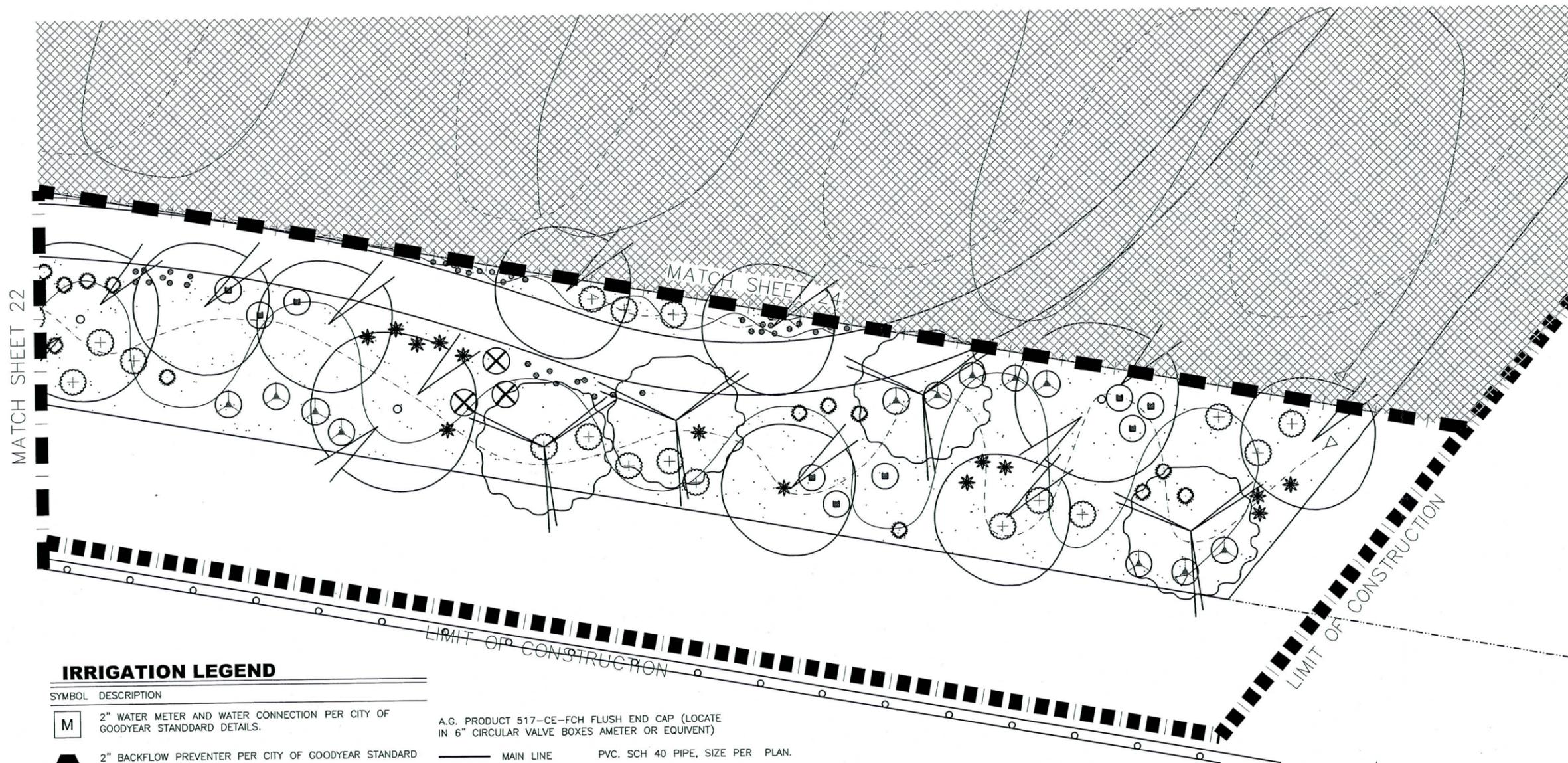
DRAWING TITLE:
IRRIGATION PLAN

SHEET NO.:

23

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CONSTRUCTION DOCUMENTS



IRRIGATION LEGEND

SYMBOL DESCRIPTION

- M** 2" WATER METER AND WATER CONNECTION PER CITY OF GOODYEAR STANDARD DETAILS.
- ⬢** 2" BACKFLOW PREVENTER PER CITY OF GOODYEAR STANDARD DETAILS.
- ⚠** RAINMASTER IRRIGATION CONTROLLER WITH STAINLESS STEEL PEDESTAL. EAGLE MODEL NO.: RME24EG-SPT STAINLESS STEEL PEDESTAL INSTALL ON A 4" CONCRETE PAD PADLOCK LATCH AC ON/OFF SWITCH GFI RECEPTACLE LIGHTNING/SURGE PROTECTION CONTRACTOR IS RESPONSIBLE FOR ALL ELECTRICAL CONNECTIONS FOR A COMPLETE AND FUNCTIONAL CONTROLLER.
- ⊗** NIBCO T-113-IRR BRASS GATE VALVE(SIZE AS PER LINE SIZE) (LOCATE IN 10" VALVE BOX, AMETEK OR EQUIVANT) AND PRESSURE REGULATOR.
- ⊕** RAINBIRD 100-GB 1" REMOTE CONTROL DRIP VALVE ASSEMBLY W/ WILKINS 500 Y SRB FILTER. INSTALL PER MANUFACTURES SPECIFICATIONS. PROVIDE EXPANSION COILS AT EACH WIRE CONNECTION.
- 1" RAINBIRD #44LRC QUICK COUPLER VALVE WITH #44LRC KEY
- ⚡** BOWSMITH EMITTERS SEE EMITTER NOTES

- A.G. PRODUCT 517-CE-FCH FLUSH END CAP (LOCATE IN 6" CIRCULAR VALVE BOXES AMETER OR EQUIVANT)
- MAIN LINE PVC. SCH 40 PIPE, SIZE PER PLAN.
- - - -** LATERAL LINE PVC. CL. 200 PIPE, SIZE PER PLAN.
- DRIP LINE (SHRUBS) 3/4" CL. 200
- - - -** DRIP LINE (TREES) 3/4" CL. 200
- ==** PIPE SLEEVE SEE SHEET 26, DETAIL #8 FOR SIZING
- ==** WIRE SLEEVE SEE SHEET 26, DETAIL #9 FOR SIZING

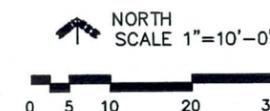
| | |
|-------|------------------|
| A1 | VALVE REFERENCE |
| 1" | VALVE SIZE |
| 00.00 | GALLONS PER MIN. |

NOT SHOWN CONTROL WIRE UF DIRECT BURIAL SOLID COPPER, 12 GA. COMMON, 12 GA. CONTROL

NOTES:

- MAINLINE AND DRIP LINE SHOWN ARE DIAGRAMATIC, REFER TO DETAILS FOR EXACT CONFIGURATION.
- PROVIDE IRRIGATION EQUIPMENT AND MATERIALS AS SPECIFIED OR AS APPROVED BY OWNER.
- ALL LATERAL FROM DRIP VALVE TO PRESSURE REGULATOR SHALL BE 1" UNLESS OTHERWISE NOTED.
- PROVIDE PIPE AND WIRE SLEEVING UNDER ALL ROAD CROSSINGS, CONCRETE HEADERS, WALKS, AND TRAIL CROSSINGS. REFER TO DETAIL 8 AND 9, SHEET 26 FOR SIZING.

NOTE:
Irrigation supply line (2" size) and control wires to be supplied to south edge of the site by the Maricopa County Parks Department. The Contractor is to extend the supply line and control wires to new valve locations. Control wires are to be placed in a 3/4" schedule 80 conduit to and between each valve boxes to prevent rodent damage. Control system is a two wire system by Tucor. Control valves are to have decoder solenoids per manufacturer recommendation. Station numbers are to be coded as 1200 series (i.e. 1201, 1202, etc) and coordinated with Maricopa County Parks Department.



MATCH SHEET 22

MATCH SHEET 24

LIMIT OF CONSTRUCTION

LIMIT OF CONSTRUCTION

MATCH BELOW LEFT

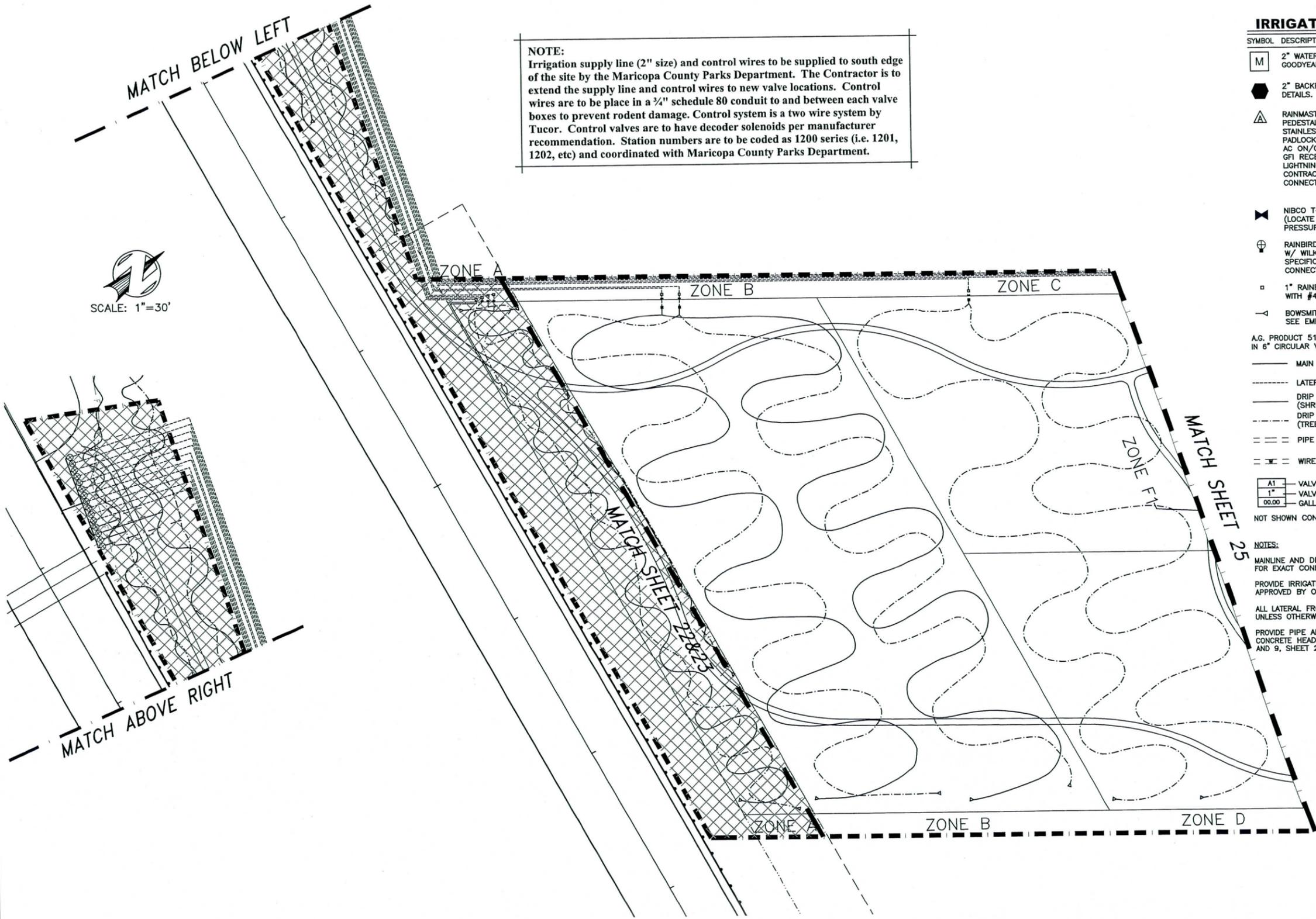


NOTE:
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IRRIGATION LEGEND

| SYMBOL | DESCRIPTION |
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| M | 2" WATER METER AND WATER CONNECTION PER CITY OF GOODYEAR STANDARD DETAILS. |
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| ⊕ | RAINBIRD 100-GB 1" REMOTE CONTROL DRIP VALVE ASSEMBLY W/ WILKINS 500 Y SRB FILTER. INSTALL PER MANUFACTURERS SPECIFICATIONS. PROVIDE EXPANSION COILS AT EACH WIRE CONNECTION. |
| □ | 1" RAINBIRD #44LRC QUICK COUPLER VALVE WITH #44LRC KEY |
| ⌵ | BOWSMITH EMITTERS SEE EMITTER NOTES |
| A.G. PRODUCT 517-CE-FCH FLUSH END CAP (LOCATE IN 6" CIRCULAR VALVE BOXES AMETER OR EQUIVANT) | |
| — | MAIN LINE PVC. SCH 40 PIPE, SIZE PER PLAN. |
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| — | DRIP LINE (SHRUBS) 3/4" CL. 200 |
| - - - | DRIP LINE (TREES) 3/4" CL. 200 |
| - - - | PIPE SLEEVE SEE SHEET 26, DETAIL #8 FOR SIZING |
| - - - | WIRE SLEEVE SEE SHEET 26, DETAIL #9 FOR SIZING |
| A1 | VALVE REFERENCE |
| 1" | VALVE SIZE |
| 00.00 | GALLONS PER MIN. |
| NOT SHOWN | CONTROL WIRE U.F. DIRECT BURIAL SOLID COPPER, 12 GA. COMMON, 12 GA. CONTROL |

NOTES:
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CALL TWO WORKING DAYS BEFORE YOU DIG
1-800-STAKE-IT
1-800-782-5348
FIELD STAKE CENTER
(OUTSIDE MARICOPA COUNTY)



C.L. WILLIAMS CONSULTING, INC.
CIVIL ENGINEERING AND RESOURCE MANAGEMENT
4720 W. MAVERICK LANE, SUITE 103
LAKESIDE, ARIZONA 85929
Phone: (928) 368-2248 Fax: (928) 368-8704

DRAWING TITLE
EL RIO EDUCATIONAL RESEARCH AND DEVELOPMENT PILOT PROJECT
IRRIGATION PLAN

| | | | |
|--------------|--------|------|--|
| SCALE HORIZ. | 1"=30' | DATE | |
| SCALE VERT. | N/A | DATE | |
| DES. BY: | JAA | DATE | |
| CHK. BY: | JAA | DATE | |
| REV. BY: | SKK | DATE | |
| APP. BY: | CLW | DATE | |

DRAWING NUMBER
24
of 27

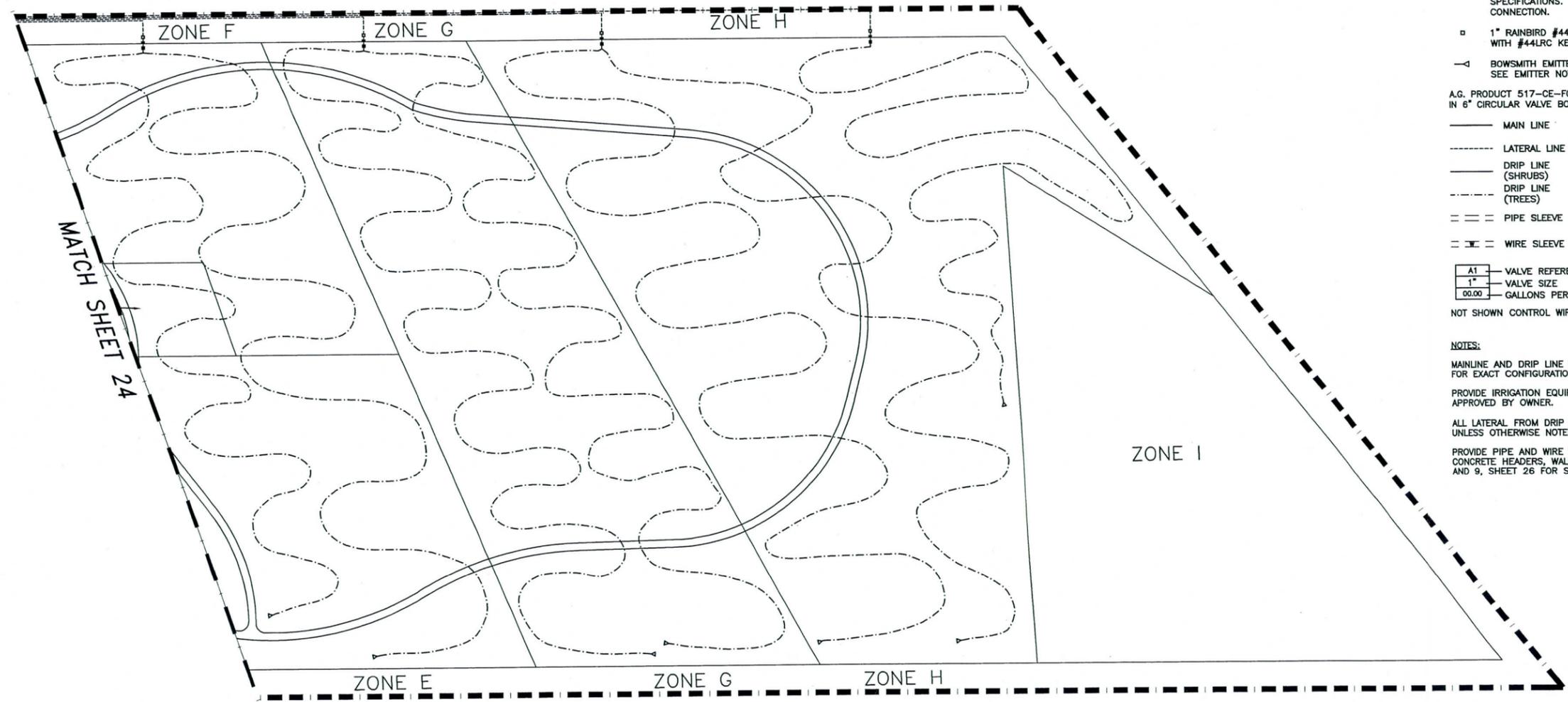
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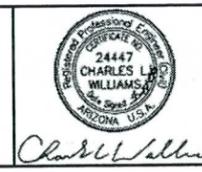
IRRIGATION LEGEND

- | SYMBOL | DESCRIPTION |
|-----------|--|
| M | 2" WATER METER AND WATER CONNECTION PER CITY OF GOODYEAR STANDARD DETAILS. |
| ⬢ | 2" BACKFLOW PREVENTER PER CITY OF GOODYEAR STANDARD DETAILS. |
| ⚠ | RAINMASTER IRRIGATION CONTROLLER WITH STAINLESS STEEL PEDESTAL. EAGLE MODEL NO.: RME24EG-SPT. STAINLESS STEEL PEDESTAL INSTALL ON A 4" CONCRETE PAD. PADLOCK LATCH. AC ON/OFF SWITCH. GFI RECEPTACLE. LIGHTNING/SURGE PROTECTION. CONTRACTOR IS RESPONSIBLE FOR ALL ELECTRICAL CONNECTIONS FOR A COMPLETE AND FUNCTIONAL CONTROLLER. |
| ⚡ | NIBCO T-113-IRR BRASS GATE VALVE(SIZE AS PER LINE SIZE) (LOCATE IN 10" VALVE BOX, AMETEK OR EQUIVANT) AND PRESSURE REGULATOR |
| ⊕ | RAINBIRD 100-GB 1" REMOTE CONTROL DRIP VALVE ASSEMBLY W/ WILKINS 500 Y SRB FILTER. INSTALL PER MANUFACTURES SPECIFICATIONS. PROVIDE EXPANSION COILS AT EACH WIRE CONNECTION. |
| □ | 1" RAINBIRD #44LRC QUICK COUPLER VALVE WITH #44LRC KEY |
| ← | BOWSMITH EMITTERS SEE EMITTER NOTES |
| ⊕ | A.G. PRODUCT 517-CE-FCH FLUSH END CAP (LOCATE IN 8" CIRCULAR VALVE BOXES AMETEK OR EQUIVANT) |
| — | MAIN LINE PVC. SCH 40 PIPE, SIZE PER PLAN. |
| - - - | LATERAL LINE PVC. CL 200 PIPE, SIZE PER PLAN. |
| — | DRIP LINE (SHRUBS) 3/4" CL 200 |
| - - - | DRIP LINE (TREES) 3/4" CL 200 |
| — — — | PIPE SLEEVE SEE SHEET 26, DETAIL #8 FOR SIZING |
| - - - | WIRE SLEEVE SEE SHEET 26, DETAIL #9 FOR SIZING |
| A1 | VALVE REFERENCE |
| 1" | VALVE SIZE |
| 00.00 | GALLONS PER MIN. |
| NOT SHOWN | CONTROL WIRE UF DIRECT BURIAL SOLID COPPER, 12 GA. COMMON, 12 GA. CONTROL |

NOTES:
 MAINLINE AND DRIP LINE SHOWN ARE DIAGRAMATIC, REFER TO DETAILS FOR EXACT CONFIGURATION.
 PROVIDE IRRIGATION EQUIPMENT AND MATERIALS AS SPECIFIED OR AS APPROVED BY OWNER.
 ALL LATERAL FROM DRIP VALVE TO PRESSURE REGULATOR SHALL BE 1" UNLESS OTHERWISE NOTED.
 PROVIDE PIPE AND WIRE SLEEVING UNDER ALL ROAD CROSSINGS, CONCRETE HEADERS, WALKS, AND TRAIL CROSSINGS. REFER TO DETAIL 8 AND 9, SHEET 26 FOR SIZING.



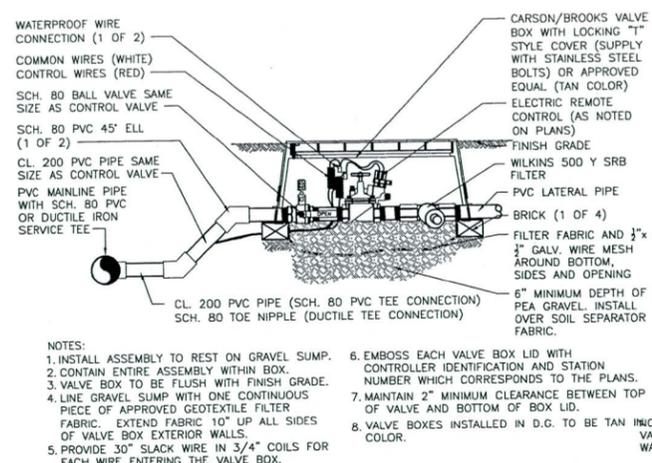
CALL TWO WORKING DAYS BEFORE YOU DIG
1-800-STAKE-IT
 1-800-722-5348
 BLUE STAKE OWNER
 (OUTSIDE MARICOPA COUNTY)



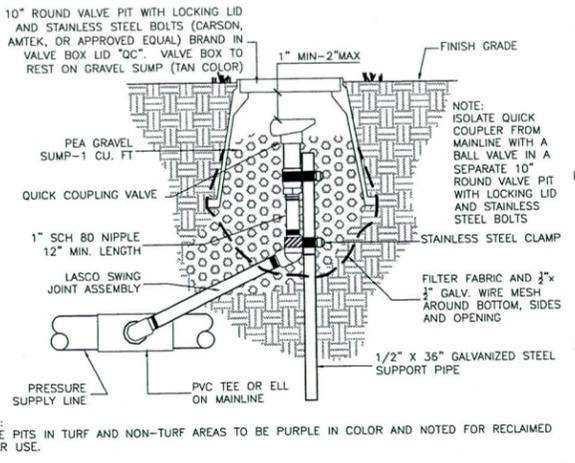
C.L. WILLIAMS CONSULTING, INC.
 CIVIL ENGINEERING AND RESOURCE MANAGEMENT
 4720 W. Maverick Lane, Suite 103
 Lakeside, Arizona 85929
 Phone: (928) 368-2248 Fax: (928) 368-8704

DRAWING TITLE
EL RIO EDUCATIONAL RESEARCH AND DEVELOPMENT PILOT PROJECT
PLANTING PLAN

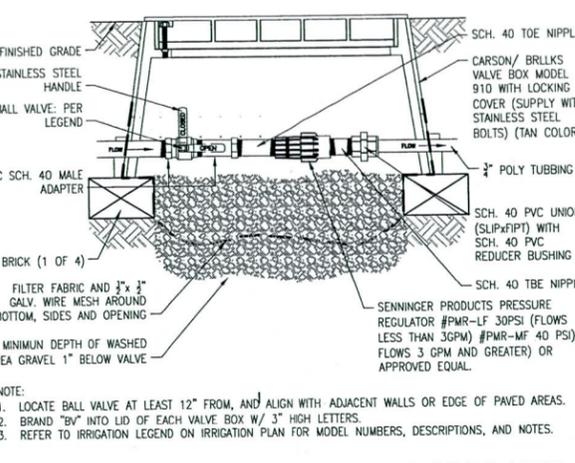
| SCALE HORIZ. | SCALE VERT. | 1"-30' | N/A | JOB NUMBER |
|--------------|-------------|--------|-----|-------------|
| DES. BY: | JAK | --- | --- | 25 of 27 |
| DRW. BY: | JAK | --- | --- | |
| REV. BY: | KAK | --- | --- | |
| APP. BY: | QW | --- | --- | |



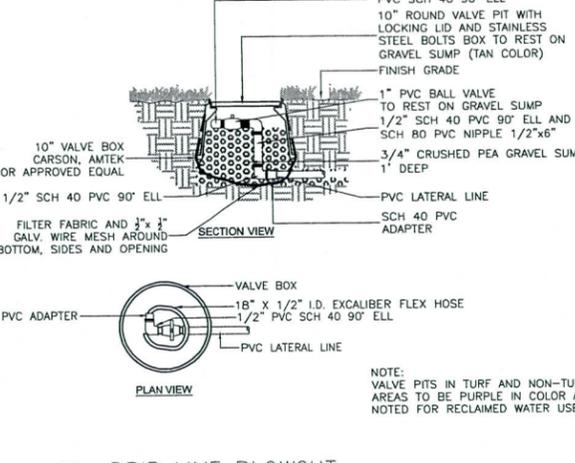
1 REMOTE CONTROL DRIP VALVE
SCALE: N.T.S. DT-DRIP VALVE.dwg



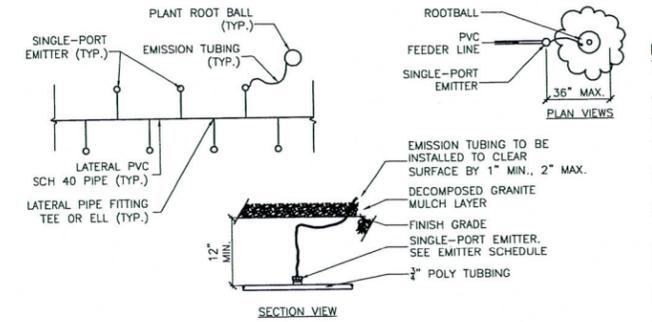
2 QUICK COUPLING VALVE
SCALE: N.T.S. DT-QUICK COUPLER.dwg



3 BALL VALVE AND PRESSURE REGULATOR
SCALE: N.T.S. DT-BV & PR.dwg



4 DRIP LINE BLOWOUT
SCALE: N.T.S. DRIPBLOW



5 SINGLE-PORT EMITTER
SCALE: N.T.S. DT-MULTI EMITTER.dwg

| PLANT TYPE | PLANT SIZE | EMITTERS PER PLANT | GPH PER EMITTER | NUMBER OF OUTLETS | TOTAL GPH PER PLANT |
|--------------|--------------|--------------------|-----------------|-------------------|---------------------|
| TREES | 15 GAL | 3 SINGLE | 2 GPH | 4 | 8 GPH |
| TREES | 24" BOX | 3 SINGLE | 2 GPH | 5 | 10 GPH |
| TREES | 36" BOX | 5 SINGLE | 2 GPH | 6 | 12 GPH |
| SHRUBS | 5 GAL PLANTS | 2 SINGLE | 1 GPH | 1 | 1 GPH |
| SHRUBS | 1 GAL PLANTS | 1 SINGLE | 1 GPH | 1 | 1 GPH |
| GROUND COVER | 1 GAL PLANTS | 1 SINGLE | 1 GPH | 1 | 1 GPH |
| CACTI | | 1 SINGLE | .6 GPH | .6 | .6 GPH |

NOTE:
ALL EMISSION POINTS TO BE LOCATED ON THE UPHILL SIDE OF PLANT MATERIAL

6 EMITTER SCHEDULE
SCALE: N.T.S. DT-EMITTER SCHEDULE.dwg

NOTE:
ALL PIPE SLEEVES TO BE SCH. 40 PVC AND SHALL BE INSTALLED WITH A MINIMUM OFF SET AT THE JOINTS TO PERMIT EASY INSTALLATION AND REMOVAL OF IRRIGATION LINES. ALL PLASTIC LINES SHALL BE INSTALLED IN SLEEVES UNDER PAVED AREAS. SLEEVES SHALL EXTEND AT LEAST 12" BEYOND THE EDGES OF THE PAVEMENT. SIZE OF SLEEVES SHALL BE AS SHOWN:

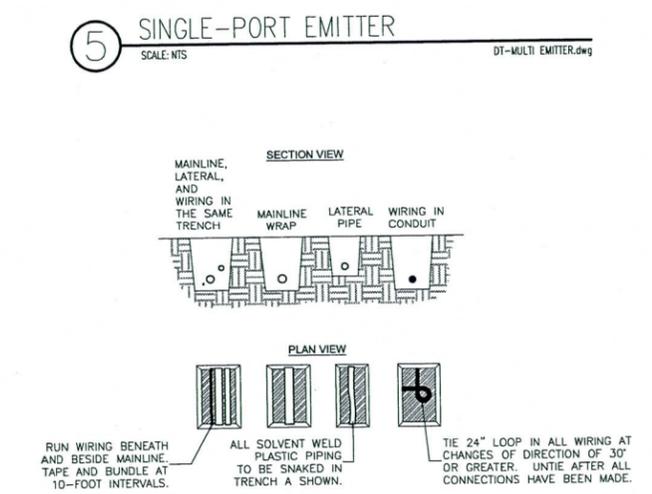
| PIPE SIZE | O.D. | SCH. 40 SLEEVE SIZE | I.D. |
|---------------------------|-------|---------------------|-------|
| CL. 315 3/4"-Class 315 | 0.840 | 2" | 2.067 |
| CL. 200 3/4" | 1.050 | 2" | 2.067 |
| 1" | 1.315 | 2-1/2" | 2.469 |
| 1-1/2" | 1.900 | 3" | 3.068 |
| 2" | 2.375 | 4" | 4.026 |
| 2-1/2" | 2.875 | 4" | 4.026 |
| 3" | 4.520 | 6" | 6.065 |
| 4" | 5.730 | 8" | 7.981 |

7 PIPE SLEEVING CHART
SCALE: N.T.S. DT-PIPE SLEEVING CHART.dwg

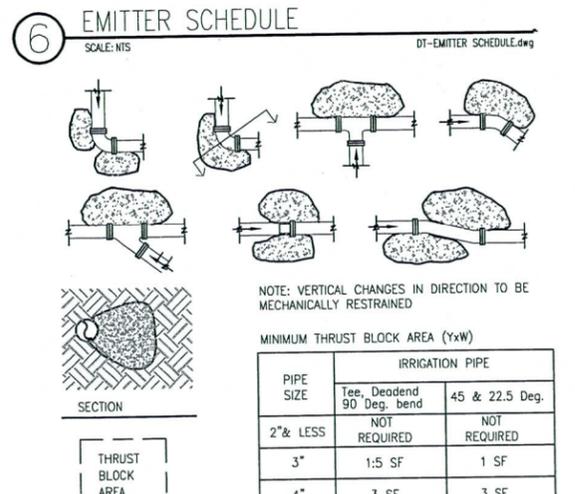
NOTE:
ALL WIRE SLEEVES TO BE SCH. 40 PVC AND SHALL BE INSTALLED WITH A MINIMUM OFF SET AT THE JOINTS TO PERMIT EASY INSTALLATION AND REMOVAL OF CONTROL AND COMMON WIRES. ALL WIRES SHALL BE INSTALLED IN SLEEVES UNDER PAVED AREAS. SLEEVES SHALL EXTEND AT LEAST 12" BEYOND THE EDGES OF THE PAVEMENT. SIZE OF SLEEVES SHALL BE AS SHOWN:

| WIRE SIZE (AWG) | MAXIMUM NUMBER OF WIRES TO BE INSTALLED IN A SCH. 40 SLEEVE. | | | | | | WIRE SIZE (AWG) | |
|-----------------|--|------|----|--------|----|--------|-----------------|----|
| | 1/2" | 3/4" | 1" | 1-1/2" | 2" | 2-1/2" | | 3" |
| 18 | 6 | 12 | 20 | 35 | 49 | 80 | 110 | 18 |
| 16 | 5 | 10 | 16 | 30 | 42 | 67 | 97 | 16 |
| 14 | 4 | 6 | 10 | 18 | 25 | 40 | 56 | 14 |
| 12 | 3 | 5 | 7 | 15 | 20 | 33 | 50 | 12 |
| 10 | 1 | 3 | 6 | 13 | 16 | 27 | 40 | 10 |

8 WIRE SLEEVING CHART
SCALE: N.T.S. DT-WIRE SLEEVING CHART.dwg



9 TRENCHING AND WIRE DETAIL
SCALE: N.T.S. DT-TRENCHING.dwg



10 THRUST BLOCK DETAIL
SCALE: N.T.S. DT-THRUST BLOCK

IRRIIGATION INVENTORY

| PARTS | QUANTITY | UNITS | COMMENTS |
|-----------------------------------|----------|-------|---------------------------------|
| REMOTE CONTROL DRIP VALVE | 15 | EA. | REFER TO DETAIL 1 FOR ALL PARTS |
| QUICK COUPLING VALVE | 11 | EA. | REFER TO DETAIL 2 FOR ALL PARTS |
| BALL VALVE AND PRESSURE REGULATOR | 11 | EA. | REFER TO DETAIL 3 FOR ALL PARTS |
| DRIP LINE BLOWOUT | 27 | EA. | REFER TO DETAIL 4 FOR ALL PARTS |
| SCHEDULE 40 PIPE | 7,850 | LF | REFER TO DETAIL 7 FOR ALL PARTS |
| 3/4" POLY TUBING | | | |
| TREE | 11,200 | LF | |
| SHRUB | 3,750 | LF | |
| MICRO TUBING | | | REFER TO DETAIL 5 FOR ALL PARTS |
| TREE | 3,070 | LF | |
| SHRUB | 2,750 | LF | |
| SINGLE PORT EMITTERS | | | REFER TO DETAIL 5 FOR ALL PARTS |
| TREE | 1,300 | EA. | |
| SHRUB | 960 | EA. | |

11 IRRIGATION INVENTORY
SCALE: N.T.S.

EDAW
455 NORTH 3RD STREET
SUITE 272
PHOENIX ARIZONA
85004
TEL 602 393 3791
FAX 602 393 3795
www.edaw.com

| REV. | COMMENT | DATE |
|------|---------|------|
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DATE: 04/14/2006
JOB NO.: 05220023.01
DRAWN BY: EN
CHECKED BY: JH

DRAWING TITLE:
IRRIGATION DETAILS
SHEET NO.:

2. NOTES SHEET

Project Goals and Objectives
The goal of the El Rio Educational Research and Development Pilot Project (ERED) is to design and implement a Gila River riparian habitat restoration project at the Estrella Mountain Regional Park...

- Specific Project Objectives include the following:
1) Provide information on how riparian restoration can improve hydraulic efficiency
2) Provide information on ecological sustainability
3) Improve riparian habitat structure and diversity
4) Increase habitat area
5) Emphasize educational outreach
6) Develop and implement relevant, cost-effective maintenance and monitoring
7) Ensure the applicability of results to larger restoration projects
8) Ensure the cost-effectiveness of the Project

The Project is designed to inform managers and the public about the efficacy of riparian restoration for sustainably improving floodplain hydraulic efficiency and habitat quality. Managers and the public should recognize that the Project site is likely to be flooded by the Gila River at any time in the future. The design contains diverse treatments that, if the plantings remain undisturbed by flooding for several years, are likely to persist, at least in part, and be appropriately reshaped through future floods...

Project Location: The Project area is located in a portion of Section 33, Township 1 North, Range 1 West of the Gila and Salt River Meridian, Maricopa County, Arizona immediately downstream from the confluence of the Agua Fria River in Maricopa County, Arizona, at an elevation of approximately 1000-1020'. The Project area covers 5.2 acres +/- of Gila River margin and channel.

Climate: The existing climate of the study site is continental and arid with mid-winter low temperatures in the low 40's (°F) and summertime highs in excess of 100° F (Table 1). Total average annual precipitation is 9" (193 mm), with pronounced winter and monsoonal summer peaks, mostly falling as rain, with little snow. Westerly winds prevail from March-June, including the driest time of year (May-June), thereby creating severe drought conditions. Pan evaporation rates exceed 8" by (2.443 mm). For these reasons, two irrigation applications/day (down and back) are recommended for plantings from May through September, and one/day during the other months.

Table 1. Mean monthly weather data from Sky Harbor (Phoenix) International Airport, 1993-2004. Data from http://www.weather.gov/NOHRMS/DisplayNOHRMS.asp?DisplayCode=KPHX&SiteCode=Chandler&StationCode=AZX&Info=none&IAF=PHX

Table with 12 columns: Month (Jan-Dec), High Temp (°F), Low Temp (°F), Precip (in), Wind Velocity (mph), and Wind Direction (from). Data shows seasonal temperature and precipitation trends.

Gila River Hydrography: The Gila River in the vicinity of the Project area is named as U.S. Geological Survey Subbasin 150701, and has a drainage area of approximately 7,850 acres (3182.8 ha).

The Gila River has been extensively modified by human activities, particularly upstream impoundments, groundwater extraction, and agricultural practices. These human impacts have decreased flow and water quality. Because of the arid but highly variable climate and the bimodal precipitation pattern, the Gila River is prone to erratic flooding, both in winter and in summer (Fig. 1). The most recent extreme low event was the mid-January 1999 winter storm, when flows exceeded 162,000 cfs (4,556 m³/sec). Peak flows appear to have declined over the past decade, however, extreme events may occur at any time, potentially strongly affecting the Project area.

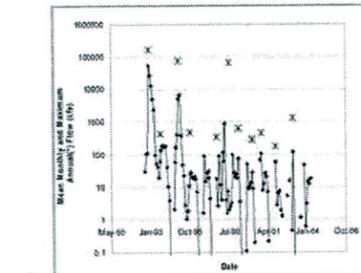


Fig. 1. Gila River mean monthly and annual maximum flows at USGS Streamflow Gauging Station 09514100: Gila River at Estrella Parkway, near Goodyear, Arizona. Data courtesy of the U.S. Geological Survey.

Existing Vegetation: The existing vegetation on the study site is strongly zoned with native desert shrub and woodland vegetation at highest elevations (above ca. 910'), largely non-native deciduous and evergreen riparian shrub and (Tamarix ramosissima) at middle elevations (900-910'), and weedy native and non-native annual and deciduous species at lowest elevations (868-900'). A quasi-perennial grass/shrub portion of the Gila River occupies the lowest elevations, and may provide useful habitat for nesting shorebirds.

Soils: Soils on the site vary from gravel/cobble in sections which have sustained recent flows and are without present vegetation, to fluvial and alluvial sands deposited approximately 2' in height in the existing stranding vegetation, up to gravel/cobble desert soils at higher elevations on the site. Small fluvial cobble occupies the channel floor across the site, with sand deposits perched on top of the cobble and oriented parallel to the channel throughout. Desert alluvial deposits and rounded materials make up the substrate at the highest elevations on the south side of the study area.

PLANTING DESIGN SHEET

Concepts
Restoration Criteria: Riparian zones form geomorphically and ecologically critical links between riverine and terrestrial ecosystems, particularly in arid regions. Riparian zones may be regarded as keystone ecosystems, having a disproportionately large impact on regional ecological systems...

Site Preparation: Pushing out tamarisk rootzooks with a land-mover has been demonstrated to be the most efficient and least environmentally damaging method for controlling tamarisk. Tamarisk rootzooks are commonly located 2-3' below the surface, necessitating a 'deep pass' (3' depth) for site clearing...

Planting Holes: Following removal of tamarisk from the specified plots, the contractor shall auger a 12" hole to a depth of 6" for each planted tree and shrub. This will break up the underlying soil structure, and the resulting planting hole will allow seedlings and sapling roots to grow in an unimpeded fashion during the first few years of establishment. Strategic and/or specific selected bare holes is recommended during the augering process...

Planting Design: The individual planting holes will be staggered in location per the planting plan, so that the site design more or less resembles a natural, randomly planted stand rather than an agricultural field. Thus, planting lines are expected to meander and not line up precisely.

Planting Stock: The contractor shall revegetate the pilot site using native plant species or rooted cuttings that have been gathered within 50 miles of the site. This will prevent additional non-native species introduction in the area, and should assure the best growth from locally-adapted stock. Velvet mesquite (Prosopis velutina), ironwood (Oryza lucida), saltbush (Atriplex confertifolia) and flowering saltbush (Atriplex canescens) should be propagated in pots prior to planting, whereas Fremont cottonwood (Populus fremontii), Goodding willow (Salix gooddingii), and sandbar willow (Salix exigua) plantings are planted as poles, as these species regenerate vigorously from bare stems. Those plantings are best performed in early spring.

Plants to be grown from seed or rooted cuttings should be grown in five-gallon pots for at least several months prior to planting. Tree and shrub propagules should be at least 1.5' tall, and preferably 3' tall at the time of the initial planting. Species to be planted from bare poles should be cut, immediately placed in water for 24-48 hours, and transported promptly to the site and planted. Saltgrass and other grass and herb species will be experimentally planted in discrete, watered patches, and reseeded as necessary for the first year two years to determine the feasibility of restoring this effort.

Table 2: Plant species to be used for replanting, architecture, expected mature plant height, number required including 10 percent additional for replacement of failed plants, and type of propagule to be used. Note that saltgrass is experimental here, with mixed propagule types. The total number of propagules does not include the plants needed for Treatment Zone A, which is being designed separately from this effort.

Table with 5 columns: Plant Common Name, Scientific Name, Mature Plant Architecture and Expected Height (ft), Total No. of Propagules, and Propagule Type. Lists species like Velvet Mesquite, Fremont Cottonwood, Goodding Willow, Sandbar Willow, and Ironwood.

Planting Training: The contractor shall plant the propagules in early to mid-March, at a rate of approximately 1000'. The small planting should take place at least one week after the irrigation system has been installed, tested, and run to flush salts from the augered holes.

Fertilization of Propagules: Each planting hole shall receive two tablets of slow-release nutrients, one at 2' depth, and one at 2' depth, to ensure that propagules have sufficient nutrients for the first year of growth.

Protection of Planted Propagules: All planted trees are to be encircled with 3' hog wire fencing to deter rabbits, beaver, or other herbivores from eating the propagules. Trees are to be fenced individually, with the hogwire sleeves held in place with iron rebar or 1" wire staples.

Planting Density: A key question to be addressed in the Project is: "what density of velvet mesquite is needed to prevent tamarisk invasion within the stand?" This question will be experimentally addressed by planting different densities of velvet mesquite in Treatment Zones C-F, and by using open portions of zones B and G as bare ground treatments. Mesquite density will vary from 9 in Zone B, to 50/ac in Zone C, to 100/ac in Zone D, to 150/ac in Zone E, and to 200/ac in Zone F. A 50 x 50 high-density planting will be included in Zone F1 in cottonwood and Goodding willow in Zones G and H will be approximately 20' in center. Planting density for velvet mesquite will vary by prescribed density in Zones C-F. Planting density for sandbar willow will be 10' on center, ironwood and Dune pine willow will be planted on an experimental basis in Zone B. These plantings will assess rapid, non-competitive growth for the first five years after planting, with sufficient and dependable irrigation, survival should exceed 80 percent. The proposed number of propagules (Table 2) includes 10 percent more trees than are initially used, for replacement of failed propagules.

After the second growing season of growth for velvet mesquite, experimental planting of tamarisk seeds will be conducted in zones B-F. Tamarisk invasion will be experimentally tested by planting tamarisk seeds on 10 replicates each of control (no planting, disturbance, or water), disturbed soil without water, and disturbed soil with water. One hundred tamarisk seeds will be planted on each replicate, and watered and irrigated as appropriate. Survival and growth rates will be monitored over the next 2 or more years. The controls (no disturbance, under or out on dry soil from the mesquite canopy) will be placed on adjacent unvegetated areas in Zones B and G. Note that this experiment will require that irrigation lines be added to the present system after year 2.

Natural riparian vegetation is strongly zoned with respect to stage elevation and stream channel geomorphology. Such zonation is highly dynamic both compositionally and architecturally. The recommended planted tree densities vary by density desired, while planted shrub densities are to be 10' on center. This spacing will assure that density conforms to that desired for addressing key management questions. In non-competitive growth for the first five years after planting, survival will be expected to exceed 80 percent. The plant replacement of 15-20 percent more trees than are initially used, for replacement of failed propagules.

Treatment Array: A suite of restoration treatment zones (patches) are designated to test the utility of several desert and desert-riparian plant species in improving hydraulic efficiency and riparian restoration. Because this is a relatively small restoration site, well within the context of a larger floodplain, and has sustained high flows, it is assumed that the existing pattern of vegetation distribution reflects the near-maximal hydraulic efficiency that a tamarisk-dominated floodplain can achieve...

Treatment Types: A total of 10 treatment zones (A-I) are proposed for the Project (Table 2). The Plan involves complete eradication of tamarisk in the Project area, and planting various combinations of species across the elevation (depth to groundwater) gradient on the site. A central experiment will involve planting six monocultures of velvet mesquite, varying in density from 0 to 500 plants/ac, to determine the density needed to prevent tamarisk invasion. The array of treatments proposed here will greatly increase the abundance and cover of native riparian plant species, and will help inform managers and the public as to the costs, challenges, and sustainability of riparian habitat restoration. Each of the treatment zones described below will be subjected to a suite of restoration activities, with various levels of clearing and planting among the treatments, as described below.

Treatment A - Gateway treatment with native vegetation. This zone will be done by others.

Treatment B - Mixed desert saltbush and shrub-forest woodland. This habitat type is common along floodplain margins throughout the Southwest. The species to be planted here include quailbush and fourwing saltbush at a density of 10' on center, and velvet mesquite at a density of approximately 10' on center, but leaving presently open areas unvegetated. Experimental planting of ironwood and pine verde is recommended if water table is 4' below the surface; however, only 6 plants of each shall be planted in this pilot effort, and their success monitored to determine whether they may be useful in future restoration efforts. Open areas in Zone B will be used for experimental planting of twenty 3 x 3 plots of watered or unwatered tamarisk seedlings (10 replicates of each in Year 3, with monitoring of tamarisk growth and survivorship for three subsequent years).

Treatment C - Low-density Mesquite Bosque. This treatment zone will be cleared of tamarisk, an irrigation system will be established, planting holes will be augered, and a monoculture of velvet mesquite propagated at a density of 50 plants/ac, on approximately 25' centers. A total of approximately 34 velvet mesquite will be planted on this Treatment Zone. This treatment zone is likely to have greatly improved hydraulic efficiency in comparison with the existing, non-native tamarisk stand, but may be subject to subsequent tamarisk invasion.

Treatment D - Moderate-density Mesquite Bosque. This treatment zone will be cleared of tamarisk, an irrigation system will be established, planting holes will be augered, and a monoculture of velvet mesquite propagated at a density of 100 plants/ac, on approximately 20' centers. A total of approximately 52 velvet mesquite will be planted on this Treatment Zone. This treatment zone will have substantially improved hydraulic efficiency in comparison with the existing, non-native tamarisk stand, and after it becomes established, may sustain subsequent tamarisk invasion.

Treatment E - Moderate/high-density Mesquite Bosque. This treatment zone will be cleared of tamarisk, an irrigation system will be established, planting holes will be augered, and a monoculture of velvet mesquite propagated at a density of 150 plants/ac, on approximately 18' centers. A total of approximately 70 velvet mesquite will be planted on this Treatment Zone. This treatment zone will have moderately improved hydraulic efficiency in comparison with the existing, non-native tamarisk stand, and after it becomes established, may sustain low levels of subsequent tamarisk invasion.

Treatment F - High-density Mesquite Bosque. This treatment zone will be cleared of tamarisk, an irrigation system will be established, planting holes will be augered, and a monoculture of velvet mesquite propagated at a density of 200 plants/ac, on approximately 15' centers. A total of approximately 80 velvet mesquite will be planted on this Treatment Zone. This treatment zone will have somewhat improved hydraulic efficiency in comparison with the existing, non-native tamarisk stand, and after it becomes established, is unlikely to sustain low levels of subsequent tamarisk invasion.

Treatment F1 - Very High-density Mesquite Bosque. This treatment zone will be cleared of tamarisk, an irrigation system will be established, planting holes will be augered, and a monoculture of velvet mesquite propagated at a density of 500 plants/ac, on approximately 7.5' centers. A total of approximately 25 velvet mesquite will be planted on this Treatment Zone. This treatment zone is not likely to have an improved hydraulic efficiency in comparison with the existing, non-native tamarisk stand, but after it becomes established it is unlikely to sustain subsequent tamarisk invasion.

Treatment G - Gallery Riparian Forest with Peripheral Mesquite. This treatment is likely to have more-or-less uniform cover of Fremont cottonwood, with a peripheral line of velvet mesquite. This treatment zone is likely to have much improved hydraulic efficiency in comparison with the existing, non-native tamarisk stand if the irrigation is sufficient and unimpeded, we expect the Fremont cottonwood to grow rapidly over the first 5 yr. to >25'.

Treatment H - Gallery riparian forest, with Riparian Shrub Understorey. This Treatment Zone will be planted with riparian shrub/understorey trees and shrubs. Fremont cottonwood and Goodding willow trees will be planted on approximately 20' centers throughout the Zone, and shrubs will be planted on approximately 10' centers. This treatment zone is likely to have somewhat improved hydraulic efficiency in comparison with the existing, non-native tamarisk stand. Once established, it may prove resistant to subsequent tamarisk invasion.

Treatment I - Open water / cobblebar habitat. Borrow-pit excavation of this treatment zone is likely to enhance the persistence of open water on the site. The existing ponded channel of the Gila River attracts numerous wading, shore, and open water birds, and additional open water will increase the attractiveness of the site to waterbirds. The area will remain unvegetated, and this treatment zone is not likely to change its hydraulic efficiency as a result of these restoration actions.

Treatment I - Open water / cobblebar habitat. Borrow-pit excavation of this treatment zone is likely to enhance the persistence of open water on the site. The existing ponded channel of the Gila River attracts numerous wading, shore, and open water birds, and additional open water will increase the attractiveness of the site to waterbirds. The area will remain unvegetated, and this treatment zone is not likely to change its hydraulic efficiency as a result of these restoration actions.

DRIFT EL RIO PILOT EDUCATION PROJECT MAINTENANCE AND MONITORING PLAN

The maintenance of restored landscapes often has proven challenging. Several critical elements are emphasized here, but successful restoration requires good and frequent site visits and communication from the maintenance staff to the Project Manager. This communication shall take place in the form of regular site inspections, a written semi-annual report for the first two years, written reports within 60 days of each major flooding event, and written annual reports after the first two years. The Project Manager should tour the site at least quarterly for the first two years, and semi-annually thereafter. It is generally important for the maintenance staff and other personnel to remain vigilant and communicate with the Project Manager, and for the Project Manager to act promptly to assess and rectify problems as they arise.

Parking Lot Maintenance: The parking lot will be inspected for trash and minor maintenance on a weekly basis and repairs completed as necessary.

Soil Maintenance: EDADV WILL FILL IN THE DETAILS AS NEEDED HERE

Trail Maintenance: The trail system will be visually inspected monthly and repair will be completed as necessary.

Pre-clearing Stand Assessment: As hydraulic efficiency is a key concern for the Project Managers, and as post-treatment storm density will be the modeling variable most related to potential hydraulic efficiency, we strongly recommend that the Project Managers assess the hydraulic efficiency of the existing stand throughout the Treatment Zones prior to clearing. That assessment should include a mapping component, so that determination of hydraulic efficiency can be related to aerial photographs of the Gila River floodplain elevation in the area. We recommend measuring stream diameter at 0, 1 and 2 m above the ground at 200 randomly selected points in each Treatment Zone, and precisely marking each point on the aerial photo of that Zone.

Post-clearing Maintenance Activities: Incompletely excavated tamarisk rootzooks and pushed piles of tamarisk are likely to contain living rootzook material that will send up stems, develop new shoots, sprout and send up new shoots, and reappear, especially for the first 1-2 years after site clearing. The Maricopa County Parks Department will monitor cleared areas, and either mechanically remove resprouted tamarisk, or apply appropriate and approved chemicals to the resprouted tamarisk for the first three years following site clearing.

Irrigation System Maintenance: The irrigation system will be visually inspected on a monthly basis and will be repaired as necessary. Note that the experimental planting of tamarisk seeds will require at least 30 additional small diameter irrigation lines to be added to the present system after year 2.

Weeding: The contractor shall evaluate quarterly, and, when necessary, weed the irrigation drip ring lines and planting sites to remove seedling tamarisk that germinate here. Removal should be monitored quarterly and reported to the Project Manager, and weeding shall be conducted as deemed necessary, at least annually.

Fencing: Fencing initially placed around each propagule will be monitored quarterly for the first three years, repaired or replaced as needed. These maintenance activities will be annually reported to the Project Manager. As the tree species grow, the fencing will need to be expanded on an as needed basis, but it is important to keep provide sufficient space around the trunk so that the fencing does not restrict growth.

Monitoring Propagule Survival: The Flood Control District shall evaluate the survival of each propagule quarterly through the first three years of the Project, initially after 60 days after flooding events, and on a regular semi-annual schedule thereafter, if possible. The cause of death shall be documented for each propagule lost, and the results of these mortality data summarized by treatment zone and species. A report shall be made to the Project Manager detailing survivorship by treatment zone and species, and sources of mortality. Data are to be presented in electronic and hardcopy forms.

Monitoring Propagule Growth: A sample of 24 randomly selected individuals of each species (where possible) shall be designated, growth-monitored, and tagged with numbered metal markers in each treatment zone. In the case where fewer than 24 plants of a given species are planted in a treatment zone, all individuals shall be monitored for growth and reproduction.

Measurements will include: a qualitative assessment of plant health; reproductive status; and quantitative measurement of basal stem circumference and circumference at 3' height; length of three randomly selected shoots, and total plant height or length to the end of the longest shoot (not the end of the leaf stem on that shoot). Measurements will be made at the time of initial planting, at the end of the first growing season, and in spring and fall each year thereafter, until the Project Manager deems that sufficient information on growth rates has been determined.

Data will be recorded and presented electronically and in hard copy form to the Project Manager on a semi-annual schedule for the first two years, and annually thereafter. Presentation of survival, growth, and sources of mortality data are to contain statistically appropriate measures of variation.

Experimental Test of Mesquite Stand Susceptibility to Tamarisk Invasion: In the first and fourth years of the restoration effort, we encourage the Project Managers to undertake an experiment to determine the response of the established velvet mesquite stands to invasion by seedling tamarisk. We recommend constructing irrigation lines to twenty 3 x 3 plots in each of the velvet mesquite monocultures, and to open areas in Zone B. Ten replicates will be watered but otherwise left unimpeded, and the growth and survivorship of tamarisk and other colonizers will be monitored for two years. The other 10 watered plots in each Zone will receive a total of 100 female tamarisk seeds and the growth and survivorship of those seeds will be monitored for two years. In addition, 10 unwatered control plots should be established in each zone, and additional 10 plots should be established in tamarisk dominated stands adjacent to the Project area, with the same monitoring over a 2-year period. This experiment should be repeated every five years as the stands develop, to determine how stand age affects tamarisk invasion.

Repeat Photography: Repeated photography is the most compelling way to demonstrate restoration Project success. It is recommended acquiring pre-treatment aerial photos of the site, and annual aerial photographs thereafter for at least a decade. Permanent photo-points are to be established on each treatment zone, to demonstrate the change in vegetation over time. Photographs should be taken digitally and archived under the direction of the Project Manager.

Replacement of Propagules: Propagules that perish are to be replaced from the excess stock maintained in the nursery. Propagules should be replaced no more than twice at an individual planting hole, so that site may not prove suitable for that species. If propagules have three times, the Project Manager shall take appropriate action, either using a different species or abandoning the planting hole. Replacement activity is to be presented to the Project Manager in the reports.

Fertilization of Propagules: Appropriate levels and types of fertilizer shall be applied annually or as needed each year to each propagule. Single slow-release tablets placed 5' below the surface near the propagule base are generally sufficient for this purpose. It is likely that desert shrubs and densely rooted mesquites will cause to need fertilizer as they mature, however, the contractor shall fairly assess the nutrient needs of

the propagules, and recommend appropriate fertilization strategy to the Project Manager.

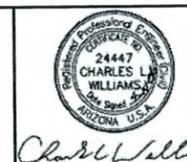
Contingency Planning: Flooding is anticipated to occur on the site, but of unknown future times and frequency. Therefore, the Project Manager should have a well-framed plan for site physical (trails, rootzooks, rock, etc.) damage assessment, as well as planning survivorship when flooding occurs. A thorough assessment of flood impacts and implications for restoration practices along the Gila River will be useful for future management. Gila River flooding may provide an excellent opportunity to assess hydraulic efficiency, but taking advantage of those opportunities would mean instrumenting the various zones with flow velocity sensors prior to flooding.

Other unanticipated contingencies that may affect Project success include vandalism, highway accidents, water pollution, irrigation system failure, arrival of additional non-native species, colonization of the site by endangered species, loss of funding, and unforeseen lawsuits. The Project Manager is advised to consider these and other possible influences on the site, and develop and active plans for dealing with these challenges.

Research Opportunities: When implemented, the Project will make an excellent research site, and the managers are advised to make the site available to geomorphologists, plant ecologists, restoration ecologists, and other ecosystem scientists. Peer-reviewed publications arising from research on the site will enhance the value of the Project within the scientific community, and increase the credibility of the Project in the eyes of the public.

To the extent that the Project may help understanding of relationships between restoration treatments and hydraulic efficiency, it may be appropriate to consult with geomorphologists) to determine appropriate instrumentation and monitoring schedules for sediment deposition and flow dynamics among and within treatment zones.

Avian monitoring is appropriate at this site, however, the funding and administrative mechanisms to accomplish bird monitoring will be worked out by the Project management team. If avian monitoring is conducted, we recommend that qualified willow flycatcher biologist conduct the work, and that a timed count (10 minute/treatment zone) of all birds encountered in each treatment zone be conducted between sunrise and 10:00 a.m. Three times a month in April, May and June, and quarterly thereafter, for at least a decade. Nest searches are appropriate. A similar, larger (10+ ac) control (tamarisk-dominated) plot should also be monitored.



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EL RIO EDUCATIONAL RESEARCH AND DEVELOPMENT PILOT PROJECT PROJECT PURPOSE AND MONITORING GUIDELINES

Table with columns: SCALE HORIZ, SCALE VERT, INITIAL, DATE, DRAWING NUMBER, JOB NUMBER, FCDC/MC. Includes drawing number 27 of 27.

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