PARADISE RIDGE MASTER PLANNED COMMUNITY

IMPLEMENTATION GUIDELINES FOR COMPLYING WITH THE TERMS AND CONDITIONS OF SECTION 401 AND 404 OF THE CLEAN WATER ACT

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CHAPTER 1. OVERVIEW

Introduction

This guideline is a living document that has been prepared to assist all those responsible for developing land in Paradise Ridge. These include owners, developers, planners, designers/engineers, contractors and any others associated with the development of the Paradise Ridge Master Planned Community. It is especially geared toward the Project Manager/Engineer hired by the Transferee (owner/developer or lessee) who will be managing the entire planning/design/construction/land development effort. It provides guidance and procedures on all aspects of planning, design, construction, and post-construction phases relevant to the implementation of "Best Management Practices" in Paradise Ridge. One of the main goals of these guidelines is to implement environmentally friendly land development procedures including protection, preservation, and maintenance of the wash corridors defined in the U.S. Army Corps of Engineers (USACE) 404 Individual Permit for Paradise Ridge. It also describes the penalties and violation notification process associated with non-compliance with these guidelines.

When this permit is transferred to a new owner/lessee, the Transferee will be responsible for compliance with Section 401 and 404 of the Clean Water Act and will be solely liable for any violations. This handbook is not intended to be used for compliance with any other environmental permitting requirements, plan approvals, etc., that may be required for the project. The transferee should familiarize themselves with the 401 & 404 Clean Water Act and all federal, state and land regulation that may apply to the activities on site.

Inside these Guidelines

Chapter 2 delineates the various project management responsibilities associated with implementation of the project including the "Best Management Practices". The transferee or designated consultant will be the primary reviewing authority for all planning, design, construction, and post-construction activities. It also describes the penalties associated with violations of the mitigation area/wash corridors identified in the USACE's 404 Individual Permit for Paradise Ridge and the process that will be followed regarding notification of violation.

Chapter 3 outlines the procedures to be followed during the various phases of the development project. It includes:

- Preconstruction phase guidance, construction documents, NPDES documents, site clearances, state and federal permits, procedures for obtaining easements and right of entry onto State Trust Lands.
- Construction phase procedures focus on the application of "Best Management Practices" to protect the environment and be in compliance with the various permits including the USACE 404 Individual Permit for Paradise Ridge.
- Post-construction phase guidelines outline the operation and maintenance of the "Best Management Practices" and the monitoring effort including inspection of USACE's 404 Individual Permit designated wash corridors.

Chapter 4 highlights the "Best Management Practices" (BMPs) that are relevant to Paradise Ridge during the pre-construction, construction, and post-construction phases.

Following Chapter 4, the guidelines includes:

- A list of references used in compiling this handbook. Project Managers/Engineers are encouraged to obtain a copy of the Drainage Design Manual for Maricopa County, Volume III, Erosion Control.

- Three figures display information about the riparian habitat wash corridors.

- Table 1 presents roles and responsibilities.
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Appendices include:

A	Clean Water Act Section 401 Water Quality Certification
B	Clean Water Act Section 404 Individual Permit, Terms and Conditions
C	Declaration of Restrictions
D	Storm Water Pollution Prevention Plan Checklist
E	Earth moving permit application from Maricopa County
F	Habitat Mitigation and Monitoring plan for the Paradise Ridge Dev. Project
G	Formats for Monitoring Reports
H	Natural and Reconstructed Wash Corridor Field Monitoring Data Sheet
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CHAPTER 2. PROJECT MANAGEMENT AND THE CLEAN WATER ACT

Appendix A. The transferee is required to sign original form.

This chapter describes the project management role in the context of implementing and complying with the terms and conditions of the Section 401 Water Quality Certification and the Section 404 Individual Permit.

Terms and Conditions

A copy of the terms and conditions associated with the 401 Water Quality Certification issued by the Arizona Department of Environmental Quality for Paradise Ridge is included in Appendix A. The Transferee and the Project Manager/Engineer are required to read this document and acknowledge their acceptance of the terms and conditions by signing and returning a form to ASLD.

A copy of the terms and conditions associated with the 404 Individual Permit issued by the USACE for Paradise Ridge is included as Appendix B. The Transferee and Project Manager/Engineer are also required to read this document and acknowledge their acceptance of the terms and conditions be signing and returning the form to ASLD. The forms are included in the "Acknowledgment Forms for Compliance with the Terms and Conditions of Section 401 and 404 of the Clean Water Act" (follows Table of Contents).

Project Management Responsibilities

ASLD has responsibility for compliance with the 401 Water Quality Certification and the 404 Individual Permit for all lands not sold, leased of transferred. The Transferee has responsibility for compliance with the 401 Water Quality Certification and the 404 Individual Permit for all lands that he owned or has leased within Paradise Ridge.

A Transferee of Project Manager/Engineer is responsible for obtaining the services of qualified consultants during pre-construction, construction and/or post-construction phases of development. If this occurs, it is strongly recommended that the Transferee or Project Manager/Engineer obtain the services of consultants familiar with the desert southwest during all phases of the project.

Permit Violations and Fines

Any Transferee or Project Manager/Engineer who violates the terms and conditions of the 401 Water Quality Certification and the 404 Individual Permit will be held accountable. The violator will be liable for any impact to other adjacent project developers within Paradise Ridge.

The 401 and 404 conditions are enforceable by the Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers. Violations of the conditions can result in penalties of $25,000 or more per day of violation. Criminal penalties may also be assessed.

The following procedures can be used by the tranferee to determine the nature and extent of the

violation of the terms and conditions of the 404 Individual Permit and to trigger a response and the requisite penalty.

Violation of mitigated areas less than 0.1 acres (4,356 square feet) will require:

- The Project Manager/Engineer will prepare within 24 hours of the event a report on the nature and extent of the violation and will include photographs of the violated area for their records.
- The Project Manager/Engineer will prepare a remedial plan within 5 working days.
- The Project Manager/Engineer will send a notice to the USACE or EPA regarding the nature and extent of the violation and the proposed remedial action.
- Any fines will be determined by USACE or EPA.
- A copy of the report will be submitted to ASLD for our records.

Violation of mitigated area greater than 0.1 acres will require:

- The Project Manager/Engineer will submit the notice of violation to the USACE immediately - within 24 hours of the event.
- The Project Manager/Engineer will prepare a remedial plan within 5 working days and submit notice to the USACE or EPA regarding the nature and extent of the violation and the proposed remedial action.
- Removal of the contractor from Paradise Ridge.
- Any fines will be determined by USACE or EPA.
- A copy of the report will be submitted to ASLD for our records.

CHAPTER 3. PROCEDURES

See Appendix D for a checklist summarizing the procedures included in this chapter.

PART 1. PRECONSTRUCTION PHASE

1. Preconstruction meeting on BMPs and Clean Water Act.
   A. Provide these guidelines to relevant planning, design, and construction personnel.
   B. Discussion of the baseline conditions, stormwater management criteria, the application of BMPs, and terms and conditions of the 401 certification and the 404 permit.

2. Read the 401 and 404 terms and conditions (see Appendices A and B). Sign and return the forms acknowledging responsibility within 48 hours of the preconstruction meeting.

3. Obtain construction/drainage easements and right-of-entry.
   A. Review and approval by ASLD. It is recommended that the application for right-of-entry or any easements by submitted a the same time the engineering plans are submitted for review and approval.
   B. Review and approval by City of Phoenix where required.

4. Record deed restriction over mitigation areas.
   A. For parcels containing preserved water of the United States and associated buffers, the deed restriction shall be recorded within 30 days following the issuance of the patent for preserved washes.
   B. For reconstructed mitigation areas, the deed restriction shall be recorded within 400 days following commencement of construction at parcel containing the reconstructed mitigation component.
   C. The USACE shall be provided a copy of the recorded deed restriction within 30 days following recordation.

5. Site Assessment
   A. Check for environmentally sensitive areas (e.g., natural washes, cultural resources), steep slopes, and flood hazard areas.
   B. Assess soil characteristics and erosion potential.
   C. Identify pollutant sources and risks associated with construction activities.
   D. Determine appropriate BMPs.
   E. Provide site assessment report to ASLD for our records.

6. Construction Documents Approvals
   A. Prepare construction documents, including grading and drainage plans.
   B. Obtain City of Phoenix approval.
   C. Obtain review and approval by others (e.g., Arizona Dept. Of Transportation)
   D. Provide copy to ASLD for our records.

7. Construction Activities under a National Pollution Discharge Elimination System (NPDES) Storm Water General Permit Approval.
   A. Prepare Storm Water Pollution Prevention Plan (SWPPP), including sequence of construction, schedule for implementation, and Notice of Intent (NOI). The

implementation schedule should include deadlines for specific steps in the sequence of construction, assign responsibilities, schedule regular times for reporting progress to management, and specify mechanism for proposing and incorporating revisions. See Reference 1 and Appendix E for the SWPPP checklist.

1. Obtain city of Phoenix approval of SWPPP.
2. Submit NOI to EPA and ADEQ 48 hours prior to construction (See Points of Contact).
3. Submit Storm Water Management Plan checklist to City of Phoenix 48 hours prior to construction.
4. A copy of the SWPPP and NOI will be available on-site for inspection (401 condition)
5. Submit copy of both SWPP and NOI to ASLD for our records.

B. Obtain an earth moving permit from Maricopa County Environmental Services Department. Must be obtained before City of Phoenix issues grading and drainage permit. A copy of this permit application is included in Appendix F.
   1. Obtain City of Phoenix review and approval.
   2. Submit application to Maricopa County Environmental Services Department.

C. Obtain an Arizona reclaimed wastewater reuse permit if wastewater treatment plant effluent is to be used for dust suppression (401 condition).

D. Obtain any other federal or state ground or surface water discharge permits if necessary for containment or discharge of contaminated water. Impoundment of construction vehicle wash water may require an Arizona Aquifer Protection Permit.

8. Site Clearance Approvals

A. Stake washes and establish clearing limits.
   1. Identify and stake outer limits of wash corridors.
      Legal descriptions will be used to stake the outer limits.
   2. Use plastic fencing on the outside boundaries of the natural wash corridors. The jurisdictional waters of the U.S. will be staked using pin flags and yellow tape. See Chapter 4 for details. All protective fencing shall be in place before any clearing or grubbing takes place.
   3. **Qualified Consultant** will inspect fencing and staking of the jurisdictional waters completed by other consultants.

B. Inventory and salvage plants. See Chapter 4, Design Guidelines and Highlights of BMPs, for plant salvage practices. Also see Appendix G
   1. Complete Landscape Inventory Plan. City of Phoenix must approve before site plan can be finalized.
   2. Complete Landscape Conservation and Salvage Plan.
   3. Plant salvage or removal operations will also comply with the Arizona Native Plant Law, including the "Notice of Intent to Clear Land". Contact the Arizona Department of Agriculture.
   4. Obtain City of Phoenix review and approval of Landscape Conservation and Salvage Plan. Submit prior to or concurrent with Grading and Drainage plans submittal.
   5. A designated consultant shall monitor salvage activities daily.

C. Cultural resource clearance

1. The permittee or transferee shall not conduct any ground disturbing activities (with the exception of necessary testing and/or data recovery) within a 50-foot radius around the site that have been determined to be eligible or potentially eligible for listing in the National Register of Historic Places until such a time that the Corps of Engineers issues written notification that the National Historic preservation Act issues have been satisfactorily resolved.
2. The permitttee/ transferee will have archaeological monitoring throughout the project site during initial mass grading activities.
3. The contractor is responsible for providing ASLD, USACE and SHPO with any cultural resource invstigation plans, testing reports or other proliminary field reports, final reports or other documentation which may be needed for USACE's use in completing the Section 106 process in consultation with the State Historic Preservation Office, ASLD, and other interested parties.

9. Review the mitigation bond for the preserved and reconstructed wash corridors.
   A. A mitigation bond will be required for the enhancement/construction and monitoring wash corridors.
   B. The mitigation bond will be required for 5 years (2 years to complete enhancement/construction of corridor and 3 years of monitoring).
   C. The cost will be calculated based on berm/cutoff wall construction, revegetation, installation of temporary drip irrigation, and monitoring.

10. Monthly 401/404 monitoring reports submitted to USACE and a copy to ASLD for our records.

PART 2. CONSTRUCTION

1. Copies of the 401 certification and the 404 permit kept on site.

2. Revise the sequence of construction, schedule for implementation, and SWPPP as necessary. Minimize the extent of disturbed areas and grading.

3. Submit the final construction documents and revised SWPPP to appropriate agencies.

4. Qualified archaeologist on-site to monitor all ground-disturbing activity.

5. Construction within riparian habitat wash corridors may only include storm drain outfalls, berms and cutoff walls, grade control and drop structures, and culverts and utilities across roadways.

6. Construct SWPPP BMPs and implement good house-keeping practices.
   A. BMPs may include perimeter control/diversion, slope protection, sediment trapping, drainageway and stream protection, temporary and permanent stabilization, vegetative controls, and non-sediment pollution control (e.g., dust control, hazardous materials).
   B. Good house-keeping controls may include equipment maintenance procedures, solid waste management, designated washdown areas, on-site/off-site tracking controls, sweeping roadways related to hauling, protected chemical and materials storage areas, and spill containment plan.

7. Keep records. Maintain the SWPPP along with completed inspection forms, other NPDES records, and monthly and annual monitoring reports in a three-ring notebook. Explain reasons for choosing specific BMPs and record the monitoring and evaluation policies necessary to ensure the BMPs are working correctly and efficiently.

8. Monitor and evaluate the effectiveness of the BMPs on a monthly basis and following significant storm events. Make sure potential pollutant sources are contained, that the facility site is accurate and updated to reflect current conditions, and that controls are in place and working as planned.

9. Modify BMPs as necessary to reflect changes in design, construction, opertions, maintenance, or if a BMP has proven to be ineffective.

10. Construction procedures must be consistent with the Arizona Department of Environmental Quality Policy for Protecting Water Quality During Facility Construction (See Appendix A).

11. Reconstructed and natural wash corridors will be completed within 1 years following commencement of construction.

12. Throughout the construction phase, the Transferee and/or its contractor will replace any tress that are inadvertently damaged or destroyed within the washes.

13. The Transferee and/or its Project Manager/Engineer will submit monthly and annual reports on 401/404 compliance to USACE and ASLD for our records. See Appendix H for the formats. Reports must be completed and submitted even if no work has been

initiated in the wash corridors.

14. Erect and maintain permanent signs along the perimeter of the wash corridors (see permit for details).

PART 3. POST-CONSTRUCTION

1. As-BUILT construction plans and documents submitted to City of Phoenix and the ASLD for our records.

2. SWPPP Notice of Termination (NOT) and all data used to complete will be provided to EPA, ADEQ, City of Phoenix and ASLD.

3. The Transferee or its Project Manager/Engineer notifies ASLD within 5 working days following project completion.

4. Monitor reconstructed and natural wash corridors quarterly until USACE accepts the mitigation.
   A. Riparian habitat
   B. Erosion, scour, deposition
   C. Structures (e.g., culverts, bridges, drop structures, pathways, berms, storm drain outfalls)

5. Permanent BMPs are monitored quarterly (e.g., retention basins, infiltration trenches/basins, and filter strips). Drywells should be inspected after every rainfall.

6. Formulate remedial plan and obtain approval if warranted.

7. Habitat mitigation annual reports

   Prepare annual reports in within one year of completing the construction of the phase of the project then report, then submit report to the USACE with a copy to ASLD for our records. In addition to reporting on the habitat component, the report should also address wash corridor components such as berms and cutoff walls, road and utility crossings, and flood control/conveyance structures. See Appendix H for the habitat monitoring activities report format.

8. Obtain an Arizona reclaimed wastewater reuse permit if reclaimed water is to be used to irrigate the golf course or any other turf.

9. Permanent stormwater conveyance and management facilities will be monitored and maintained following every major rainfall.

CHAPTER 4. DESIGN GUIDELINES AND HIGHLIGHTS OF BEST MANAGEMENT PRACTICES

Goal: Comply with provision of the Clean Water Act Section 401 and 404 for Paradise Ridge.

Part 1. PRECONSTRUCTION

The design procedures described below are based on the Paradise Ridge Master Drainage Report and City of Phoenix Drainage Manual. Also refer to the Habitat Mitigation and Monitoring report for the Paradise Ridge Development Project in Appendix G.

Preserved and Reconstructed Wash Corridors and Flood Control Channels Analysis and Design

Goal: Develop a sediment flow-through conveyance wash corridor that can safely convey the 100-year peak flow within a riparian habitat wash corridor.

1. Develop 1 foot contour base mapping along the wash corridor. Field survey channel sections as necessary.
2. Determine wash corridor boundaries.
3. Obtain Paradise Ridge Master Drainage Report.
4. Refer to the Paradise Ridge Master Drainage Report for pre-construction peak 100-year 24-hour flows. Develop hydrologic model for the watershed for the wash corridor for post-construction condition using the Corps of Engineers software HEC-1. Modify the pre-construction conditions model in the Report to develop the post-construction HEC-1 model. Include strategically placed detention basins as necessary to reduce post-construction peak 100-year flows to pre-construction levels.
5. Visit the wash corridor to establish channel and overbank roughness values as well as other hydraulic parameters. Take photographs and record observations.
6. Use the Corps of Engineers software HEC-RAS to perform a gradually varied flow analysis.
7. Design perimeter berms such that the top of berm is one foot above the 100-year water surface.
8. Analyze for scour using the procedures recommended in the Paradise Ridge Master Drainage Report and Standards Manual for Drainage Design and Floodplain Management in Tucson, Arizona. Design cutoff walls within the berms. The cutoff wall depth will extend below estimated scour depths by a factor of 1.3.
9. Analyze for deposition or scour using the Corps of Engineers software HEC-6. Design roadway crossings (culverts/bridges) and associated transitions on the basis of HEC-RAS and HEC-6 analyses.
10. Develop construction plans for wash corridors using 1 inch = 40 feet or 1 inch = 20 feet scale plan-profile sheets.
11. Bank protection in the vicinity of the culverts and within transition channels will consist of turf reinforcement (native vegetation underlain by geosynthetic fabric) or riprap. Harder materials such as concrete or soil cement will be used as a measure of last resort for flood protection purposes only.
12. Storm drain outfalls within wash corridors will consist of unobtrusive concrete headwalls or end sections with a limited amount of riprap at the outlet for energy dissipation purposes.
13. At roadway crossings drainage structures may consist of either a) a bridge spanning the wash corridor or b) a major culvert at the low flow channel and pipe(s) in the overbanks.

The intent of this design scheme is to keep the entire wash corridor effective as a conveyance and riparian habitat area immediately upstream and downstream of the crossing.

Structural Wash Corridors and Flood Control Channel Analysis and Design

Goal: Develop a sediment flow-through conveyance wash corridor that can safely convey the 100-year peak flow.

- Follow steps 1-4, 6, 9-11 for Natural and Reconstructed Riparian Wash Corridors Analysis and Design to perform analysis/design of structural/underground wash corridors.

Permanent Stormwater Management Facilities Design

Goal: Prevent pollution due to storm water runoff after construction.

A brief description of some of the facilities relevant to Paradise Ridge is provided below. Many of these facilities can be incorporated into the design of retention basins and other flood control facilities that are required by the City of Phoenix. The reference for some of the practices is noted in brackets.

- Wet detention ponds provide both quality and quantity control of storm water. A wet detention pond maintains a permanent pool where long-term treatment of pollutants occurs by physical, biological, and chemical processes. Sediment and particulate metals are removed by sedimentation and dissolved metals and nutrients are removed by physio-chemical action and biological uptake. Typically, a sediment forebay is included to capture heavy sediments that would otherwise fill in the permanent pool. The permanent pool allows infiltration and the growth of aquatic plants that enhance nutrient removal. The permanent pool will be designed to hold the "first flush" consisting of one inch of rainfall or the 2-year 24-hour stormwater runoff from the contributing drainage area. A basin that is used for retention only is an infiltration basin. Current guidelines and practice using City of Phoenix criteria allow a one-foot permanent pool and storm drain outfall one foot above basin bottom.
- Infiltration trenches and dry wells provide water quality control. An infiltration trench is an excavated trench, 3 to 12 feet deep, containing stone aggregate with, perhaps, pea gravel in the top layer. Pollutant removal is achieved by filtration through the surrounding soils. Trenches can achieve up to 90 percent removal of particulates, metals, organic compounds, and bacteria. Moderate removal of biochemical oxygen demand (BOD), nitrogen and phosphorus is also possible. Adding organic material and loam to the trench subsoil may enhance pollutant removal. The infiltration trench will be designed to hold the first flush consisting of one inch of rainfall from the contributing drainage area. Infiltration trenches are typically designed downstream of sheet flow conditions and small drainage areas for treatment of nuisance dry weather flows as well as treatment of the first flush.
- Filter strips may be provided at the downstream side of upland sheet flow for improving water quality. A filter strip is an area of herbaceous vegetation that serves to reduce sediment, particulate organics, and sediment adsorbed and dissolved contaminant loading in runoff. The minimum flow length for this purpose shall be 20 feet. Minimum filter strip flow length required to reduce dissolved contaminants shall be 30 feet. Rock protection placed at the outlet of culverts, pipes, conduits, or channels provide drainage way and stream protection by reducing the velocity and energy of water such that flows

will not erode the receiving downstream reach.

- Porous pavement is a practical application for parking lots.

Temporary Stormwater Management Facilities - Erosion and Sediment Control Design

Goals:

1. Effectively control sediment, minimize the loss of topsoil, protect water resources, and reduce disruption to native vegetation and natural wash corridors.
2. Reduce flow velocities to non-erosive velocities wherever possible.

The following measures are suggested by the City of Phoenix, Flood control District of Maricopa County, and ADEQ for erosion and sediment control design. The reference for the practice is noted in brackets.

- Stabilize the construction entrance at all points of ingress and egress to reduce or eliminate tracking of sediment onto public rights-of-way or streets. If a wash rack is included, provide a sediment trap to collect wash water runoff. [See BMP-37 in Reference 1] Impoundment of wash water may require an Arizona Aquifer Protection Permit.
- Provide temporary waterway crossings at washes that are not in the Paradise Ridge designated natural riparian wash corridors. [see BMP - 103 in Reference 1]
- Limit exposure of disturbed areas by retaining vegetation buffers and ground cover where possible. Protect trees and natural areas within construction site.
- Provide perimeter controls such as temporary diversion dike, drainage swale, etc. to divert off-site flows around the construction site. [See BMP 23 and 37 in Reference1]
- Reduce runoff velocities with check dams and rock outlet protection [See BMP 47 and 51 in Reference 1]
- Provide sediment trapping facilities such as straw bale barriers, silt fences, storm drain inlet protection, temporary sediment traps/basins, sand bag barrier, and gravel filter berms. Sediment traps/basins may be placed at location of permanent retention/detention basins. [See BMP 59, 63, 69, 75, 81, 87 and 91 in Reference 1]

Miscellaneous Design

- Design irrigation, drainage, and retention systems that efficiently use water and protect water quality.
- Water re-use strategies for irrigation should be utilized when economically feasible and environmentally and agronomically acceptable.
- Roadways, utility line crossings, golf course greens, berms bunkers, and fairways will be designed to allow normal storm water flows to pass unimpeded.
- Storm water retention/detention basin will be designed to impound storm water within project boundaries.
- Golf course design will direct irrigation water runoff through water quality basins such as filter strips or retention/infiltration facilities prior to entering the natural or reconstructed riparian habitat wash corridors.
- Extra PVC pipe sleeves will be installed at each wash crossing to allow future utility line installation and replacement. This eliminates further impact to washes.

The best management and other practices described below shall be in place prior to construction including any grading operations. The reference for the practice is noted in brackets.

General Practices

Goal: Good housekeeping

- Construction schedule – minimize the amount of denuded areas during the wet summer months (July, August, and September) and the winter months (November, December and January).
- Designated staging and material storage areas – above the 100-year storm water flood line and away from washes, low areas, drainages, and stream banks.
- Barriers between wash and construction site.

Dust Control

Goal: Minimize the generation of fugitive dust from the construction site.

- Schedule construction activities in phases to limit the amount of time and areas disturbed by clearing and earth-moving operations. [Se BMP 43 in Reference 1]

Protection from Hazardous Material

Goal: Proper storage, use, and disposal of dangerous, hazardous, and toxic waste and waste containers to minimize the potential for spills.

- Spill Prevention Plan with measures to limit the scope of the spill and minimize environmental damage.
- The contractor will take sufficient precautions to prevent discharges of fuel, oil bitumen, calcium chloride, fresh Portland cement, fresh Portland cement concrete, raw sewage, muddy water, chemicals or other harmful materials into the washes.
- Covered storage areas for construction materials.
- Chemical storage areas located away from low areas, drainage ways, and washes.
- Spill proof perimeter around the storage area.
- See Planning considerations for Protected Chemical and Materials Storage Area, BMP-101 in Reference 1.

Protection of Natural Wash Corridors/Vegetation

Goal: Preserve natural wash corridors in undisturbed condition except for the occasional flood control structure and roadway, utility, and sidewalk crossings.

- Wash corridors will be surveyed and staked using legal descriptions to establish the outer limits.
- Plastic netting or fencing will be used to exclude entry into the riparian-habitat wash corridors.
- Clearing limits of the jurisdictional waters of the U.S. will be staked every 10 feet using pin flags and bright yellow plastic tape strung flag-to-flag.

Cultural Resources

Goal: Compliance with Section 106 of the National Historic Preservation Act.

- Arrange for a qualified archaeologist to be present during all ground-disturbing activities

and during initial mass grading activities.

Protection of Wildlife

- Procedures will be developed to prevent harassment, harm, and elimination/removal of wildlife.

Tree and cactus salvage

Goal: Proper salvage techniques will be used to ensure survival.

- All plant salvage or removal operations will comply with the Arizona Native Plant Law and the City of Phoenix (1) Landscape Inventory Plan and (2) Landscape Conservation and Salvage Plan. Contractors will contact (1) the Arizona Department of Agriculture to obtain the necessary information concerning the Arizona Native Plant Law and the (2) City of Phoenix.
- Cacti and trees will be salvaged during their non-growing season.
- Significant trees and cacti that will imminently be damaged or destroyed by construction activities will be salvaged by a licensed salvager and replanted as close as possible to their original growing areas.
- Mark the north side of a cactus with chalk and replant the mark to the north. Cacti should be planted in such a way that the side of the plant which originally faced south, is facing south when it is transplanted. This will help prevent sunburn in its new location.
- After a cactus has been dug up, the roots should be cut back, leaving only enough stubs of three or four of the heaviest roots to hold the plant firmly upright when it is returned to the ground.
- Cacti should be put it an airy but shady place for several days until the cut surfaces have thoroughly dried or callused.
- Replant cacti in dry soil and do not water for several weeks. Do not water until new growth appears on the apex of the cactus. Do not water a wilted cactus unless it is known to be suffering from a lack of water.
- Trees should be trimmed (no more than 30% of the crown) before being boxed. Boxed trees need to be watered.

PART 2. CONSTRUCTION

General Practices

During the construction phase, the Transferee and its construction contractor will be required to

- Limit disturbance to the proposed limits of work.
- Perform inspection and maintenance activities in order to maintain the integrity of the work in progress and ensure that marked jurisdictional waters and riparian habitat wash corridors are protected.
- Erect barricades and warning signs to enhance adequate protection where needed.
- Conduct inspections and maintenance routinely with adequate personnel and equipment in order to maintain the drainage structures and fills in a satisfactory manner until the work is accepted and completed.
- Construct permanent stormwater conveyance and management facilities early in the construction schedule.
-

Construction work should not be performed during periods when soils are soft due to extended inundation or saturation.

Construction Materials Storage and Removal

- Construction debris will be stockpiled away from washes and outside the riparian habitat wash corridors.
- Excess materials removed from washes will be hauled to an upland location within Paradise Ridge project boundaries.

Protection from Hazardous Materials

- On-site spills will be removed and disposed of in a lawful manner. Any pollutant produced on-site by construction activity will be disposed of properly.
- Native soils should be used for fill where fill is required. Any off-site fill or surfacing materials will be obtained from an authorized local supplier. Native soils or native soil mixtures should be mixed with off-site materials for backfill and surfacing when possible.
- No discharge of dredged or fill material on-site will consist of unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material discharged shall be free from toxic pollutants in toxic amounts (Section 307 of the Clean Water Act) and be disposed of off-site in an authorized and appropriate manner.

Air Quality

- All contractors will comply with federal state, and local standards and control procedures for dust and emissions from vehicles and equipment.
- Contact Maricopa County to determine the type of permits that may be -required for construction equipment and fuel storage tanks.

Dust Control

Goal: The contractor, subcontractor(s), and any person(s) associated with the project will control dust in compliance with the requirements of Maricopa County Environmental Services and abide with the "Conditions to Permit".

- Permanent roads and parking areas should be paved as soon as possible after grading.

Where construction is phased, the early application of gravel or chemical stabilization may solve potential erosion and stability problems.

- Provide covers for trucks transporting materials that contribute dust.

Noise

Goal: Minimize noise impacts to adjacent residences and commercial areas.

Construction will take place during typical construction hours.

Cultural Resources

Goal: Compliance with Section 106 of the National Historic Preservation Act.

- If previously unidentified cultural resources, including human remains and burial goods, are discovered or suspected during clearing or construction, work will cease in that area. The archaeological monitor will immediately notify the USACE and simultaneously report such discoveries to the Arizona State Museum (pursuant to ARS § 41-844 and 41-865) and the ASLD.
- Qualified archaeologist will be present during all ground-disturbing activity.

Equipment Maintenance

- Establish a program of equipment maintenance procedures that will prevent job-site pollution and contamination of on-site soils and stormwater.
- See Reference 1, BMP-95 regarding equipment maintenance procedures.
-

Solid Waste Management

Goal: Routine collection and regular disposal of accumulated solid waste generated at the construction site.

- Provide adequate disposal facilities.
- Remove and dispose solid waste at authorized disposal areas on a regular basis.
- Sanitary facilities must be convenient and well maintained to avoid indiscriminate soiling of adjacent areas.
- Ensure that toxic wastes and construction chemicals are not disposed of in dumpster designated for clean construction debris or domestic waste.
- Develop a contingency plan in case toxic or hazardous materials are found on-site.

Sediment and Erosion Control Measures

Goals:

1. Maintenance of erosion and sediment control facilities established during pre-construction phase. This will involve periodic removal of sediment, cleaning and general repair/ replacement - especially after significant storm events. See the pre-construction section for a description of these BMPs.
2. Modification/revision of the SWPPP as necessary to adapt to changed construction

requirements. Installation of permanent erosion and sediment control facilities such as channels, storm drains, outlet protection, culverts/bridges, detention/retention facilities, slope/land stabilization, and landscaping.

Passive measures for stabilization and erosion control include:

- Stabilize disturbed areas with temporary ground cover such as vegetation, mulch, chemical (e.g., magnesium chloride or lignum sulfate) and fabric stabilizers, or other means (e.g., decomposed granite, wood chips)
- Use natural or synthetic matting in areas of concentrated channel flow and steep slopes. Provide slope protection and temporary stabilization. [See Reference 1, BNP-14 for design and sizing criteria]
- Terrace long or steep slopes at regular intervals.
- Slope benches
- Roughen slopes to increase the absorption of rainfall and slow runoff.
- Limit length of slopes to 50 feet. Construct mid-slope diversion (swales) on longer slopes to intercept runoff.
- Limit slopes to 3: 1, where practical.

Landscaping

Goal: Permanently stabilize the project area.

- Schedule landscaping and other work to be done immediately after the land has been graded to its final contour.
- Use native or drought-tolerant plant materials whenever feasible.

General Housekeeping Practices

- No construction will take place within washes when they are flowing.
- No mechanized equipment will cross washes when they are flowing.
- Construction materials including concrete, asphalt, and piping will consist of non-toxic materials that do not leach significant pollutants into surface waters.
- Materials obtained from on-site sources, aggregate crushed rock plants, or other potentially contaminated areas will be properly inspected to ensure they do not contain contaminants that might cause a violation of a State surface water quality standard.
- All washing activities (aggregate washing, portland cement) will occur away from washes, storm drains, sanitary sewers, street gutters, open ditches, or stormwater channels or receiving waters.
- Washes and flood basins will be promptly cleared of all false work, pilings, debris, and other obstructions placed or resulting from construction operations.
- Activities will be conducted and monitored to ensure pollution from concrete formation and equipment washing does not drain into the washes.

Wash Corridors - Plants and Irrigation

Goal: Plant density and species diversity will be augmented in the natural wash corridors and recreated in the reconstructed wash corridors.

- Non-vegetated, erodible slopes steeper than 3: 1, and greater than 5 vertical feet, require surface roughening, either stair-step grading, grooving, Burrowing, or tracking if they are to be stabilized with vegetation.
- All wash corridors will be enhanced with native Sonoran vegetation. Refer to the Habitat Mitigation and Monitoring Plan for the Desert Ridge Development.
- Salvaged trees and Saguaros may comprise up to 25% of the trees to be planted.
- No monotypical clustering of trees.
- Five-gallon plants will be utilized.
- The seed source for all nursery grown plants shall be identified to assure that only locally adapted native plants are utilized.
- Holes for each planting will be twice the size of the root ball.
- Planted trees will be marked with permanent tags so percent survival can be monitored.
- Saguaro will be planted with a palo verde as a nursery plant.
- Mesquite (planted) does well in semi-shaded conditions.
- Avoid planting in flood inundation zones because of scouring and long periods of inundation. Ensure that site selection for tree species is determined properly.
- Soils analysis is important prior to site selection. Salinity may be a limiting factor at sites that were once productive vegetation corridors along washes. Hidden subsurface caliche or clay layers may be limitations (high salinity and/or low permeability).
- Plant on loose, mounded and well-drained soils or similar substrates and not on highly compacted or saline soils.
- Seeds that are lightly covered with soil seem to generate more successfully than deeply buried seed.
- Separate irrigation emitters will be installed at each planting.

<u>Wash Corridors - Berms, Cutoff Walls, and Drainage Facilities</u>

Goal: Minimal disturbance of land and maximum use of mitigated areas.

- Staking of the jurisdictional waters of the U. S - must be maintained.
- Plastic netting or fencing must be maintained to exclude entry into the riparian habitat wash corridors.
- Absolutely no disturbance of the jurisdictional waters of the U. S except at roadway, sidewalk, and utility crossings.
- Prior to construction of the berms and cutoff walls, the inside limits (towards the wash) of the berms will be staked and temporarily fenced to establish the berm construction zone.

PART 3. POST-CONSTRUCTION

General Practices

- After construction is completed, areas of temporary disturbance will be re-graded to pre-existing grades and drainage patterns.
- Fills will be removed from the project site and disposed of in an appropriate manner. Procedures will be established in order to avoid future fill, alteration or damage to the area's natural desert washes and vegetation.
- Washes will be left in an environmentally acceptable condition with all trash and non-native materials removed from those reaches of the wash in which the project -took place.

Dust Control

- Restabilize the area after construction is completed.

Water Resources

- Plan irrigation patterns and/or program irrigation control systems to meet the needs of the plant materials in order to minimize overwatering.
- Use modem irrigation technologies that provide highly efficient water usage. Inspect systems regularly for leaks and monitor water usage.
- Manage water use effectively to prevent unnecessary depletion of local water resources. Chemicals and fertilizers, especially when used for maintenance of golf course turf and landscape vegetation will not cause or contribute to a violation of State Water Quality Standards.
- Runoff and seepage from the golf course, roadways, embankments, and other alterations of the environment will not cause a violation of State Water Quality Standards.

Use of Chemicals

- Fertilizer, herbicide, and insecticide chemicals used for the maintenance of turfed areas and landscape vegetation will be selected based on minimum environmental impacts (e.g., low residence times, low leachability, maximum feasible biodegradability).
- Application rates printed on product labels will be strictly followed.
- Chemicals, including pesticides and herbicides, will only be applied by a licensed individual.
- No chemical products will be stored within jurisdictional waters. No chemicals and fertilizers used for maintenance of golf course and landscape vegetation will be applied within jurisdictional waters.
- Excess chemicals must be stored (as directed on the label) for later use or transported to another site for immediate use.
- Excessive chemical concentrations and over spraying is prohibited.

MONITORING RIPARIAN HABITAT WASH CORRIDORS

Plants and Irrigation

- Protect new plants from competitive vegetation (weeds).
- Dead trees and Saguaros will be removed and replaced in order to meet the success criteria described below.
- A field inspection will be completed after initial planting to document as-built conditions.
- Permanent photo points will be established at a minimum of 2 discrete locations within each corridor.
- Plan irrigation patterns and/or program irrigation control systems to meet the needs of the plant materials in order to minimize overwatering.
- Water at appropriate times to minimize evaporation and reduce the potential for disease. [6) Inspect irrigation systems regularly for leaks and monitor water usage.
- Irrigation will be discontinued within 2 years after planting is completed.
- The riparian habitat wash corridors will be monitored for at least 3 years after irrigation is discontinued.

Drainage Infrastructure and Existing Channels within Wash Corridors

- Monitor, maintain, and repair berms and cutoff walls.
- Monitor scour, erosion, and lateral migration of existing natural wash within wash corridor.
- Monitor the performance and condition of flood control/conveyance facilities such as drop structures, bank stabilization works, culverts and associated wingwalls.
- Record changes in above three items with photographs and a written report for your records.

Success Criteria for Vegetation within the Wash Corridors and Mitigated Areas

- 80 percent of trees and saguaros surviving.
- Demonstrated increase in basal diameter of trees during period after irrigation ceased.
- Monitoring will continue annually until each element of mitigation accepted by USACE.
- USACE will be notified when success criteria have been achieved and maintained 3 years after irrigation discontinued.

Reporting

- First annual monitoring report due one year after date of the permit. Minimum elements of report will include:
  - A description of as-built conditions,
  - A list of individuals or companies who completed monitoring activities,
  - Results of the monitoring effort, including measured growth and percent survival,
  - Copies of color photographs taken from permanent photo points,
  - Copies of field notes,
  - Recommendations for additional plantings or other corrective measures,
  - Notification of completed mitigation commitments, and
  - Documentation of recorded temporary and perpetual easements for mitigation areas.

Maintenance

- Short-term maintenance of the wash corridors may include staking, fertilizing, weeding in the immediate area of the vegetation to be re-established, and maintenance of the

temporary irrigation system.

- Long-term management will not include pruning, removal of snags, mistletoe control, weeding, or plant litter removal.
- Clearing by hand all annual plant materials 10 feet from all walls along washes within the development.
- Clearing by hand all tumbleweeds and other non-native annuals from all wash corridors within the development.

MONITORING STORMWATER MANAGEMENT FACILITIES

- Monitoring and periodic maintenance of all permanent stormwater management facilities such as wet detention ponds, infiltration basins/trenches and filter strips will be essential to the proper functioning of these facilities over time. Drywells, in particular, should be inspected after every rainfall.
- Also, the permanent stormwater conveyance facilities such as channels, storm drains/inlets, storm drain/outfalls, culverts, and other facilities will be monitored and maintained.
- Record changes in observations and recommendations with photographs and a written report.
- Maintain this information for your records and submit a copy to ASLD for our records.

REFERENCES

1. Drainage Design Manual for Maricopa County, Arizona. Volume III Erosion Control. Prepared by Camp Dresser & McKee Inc., Phoenix, Arizona. Prepared for the Flood Control District of Maricopa County, Phoenix, Arizona. January 1993.

2. Urban Runoff, Pollution Prevention Practices. Developed by the Urban Runoff Technical Advisory Group for Arizona's Businesses. Sponsored by the Arizona Department of Environmental Quality, Phoenix, Arizona and the U.S. Environmental Protection Agency, Region IX, San Francisco, California. December 1997.

3. Urban Targeting and BMP Selection. An Information and Guidance Manual for State Nonpoint Source Program Staff Engineers and Managers. Prepared by Woodward-Clyde Consultants, Oakland, California. Prepared for the US. Environmental Protection Agency, Region V, Chicago, Illinois and Washington, D.C. Distributed by The Terrene Institute, Alexandra, Virginia (703-548-5473). November *1990.*

4. Clean Water Act 404 Individual Permit, Terms and Conditions. US. Army Corps of Engineers, Los Angeles District, Arizona-Nevada Area Office, Phoenix, Arizona. May 2002.

5. Clean Water Act 401 Water Quality Certification, State of Arizona. Arizona Department of Environmental Quality, Phoenix, Arizona. October 12, 2001.

6. "Environmental Principles for Golf Courses in the United States." US. Environmental Protection Agency.

7. Desert Botanical Garden, Phoenix, Arizona. Various pamphlets on cacti.

8. Paradise Ridge Master Drainage Report. Proposed by Entranco, April, 2001.

9. Standards Manual for Drainage Design and Floodplain Management in Tucson, Arizona. Prepared by Simons, Li and Associates, Inc. Prepared for the City of Tucson, Department of Transportation, Engineering Division. December 1989.

10. Construction General Permit, 63 Federal Register 785. February 17, 1998.

11. Filter Strip Code 393, Conservation Practice Standard. Natural Resources Conservation Service. March 1999.

FIGURES

TABLE 1
CLEAN WATER ACT COMPLIANCE WITH SECTIONS 401 AND 404
ROLES AND RESPONSIBILITIES

Permit approved on May 2, 2002

Time limit for completing authorized activities ends on June 30, 2007

US ARMYCORPS OF ENGINEERS

Roles and Responsibilities	Timeframe
Initiate Federal and State coordination if previously unknown historic or archaeological remains discovered	Within 30 days of sale or lease
Inspect authorized activity	Any time deemed necessary

ARIZONA STATE LAND DEPARTMENT

Roles and Responsibilities	
Hold preconstruction meetings to discuss special conditions and other relevant approvals and BMPs	Quarterly and any time deemed necessary
Provide copy of permit to all developers, contractor(s), subcontractor(s), foreperson(s) and construction representatives	Preconstruction meeting
Inspect authorized activity with USACE staff	Quarterly and any time deemed necessary
When the property sold, leased or transferred, obtain signature of the new owner; forward copy of permit to USACE to validate transfer.	Within 14 days from date signed
Request time extension to complete project	No later than May 1, 2007
Postcard returned to USACE when work is completed	Date work is completed
Notify ADEQ of project completion	Within 30 days following completion

DEVELOPERS/CONTRACTORS

Roles and Responsibilities	Timeframe
Have a preconstruction meeting and include ASLD	Within 60 days of sale/lease/transfer
Record deed restriction over mitigation areas • Subject to USACE Office of Counsel approval. • Evidence of recordation at Maricopa County Recorder submitted to ASLD. • Lease includes purpose and prohibitive use statements	Within 60days of auction date
Provide USACE evidence of recordation with Maricopa County Recorder	Within 10 days of recordation
Comply with all requirements and conditions in the letter of 401 water quality certification	Daily
Qualified archaeologist on site to monitor ground-disturbing activities.	Daily during ground-disturbing activities
Archaeological monitor notifies USACE if previously if previously unknown or historic archaeological remains are discovered; simultaneous notification to ASLD and Arizona State Museum	Immediately
Provide extra PVC sleeves at each wash crossing for future utility line installation and replacement	
Read 401 certification and 404 permit in their entirety. Sign forms to acknowledge understand contents and their responsibility to ensure compliance with all general and special conditions	Return signed form to ASLD within 48 hours of preconstruction meeting.
Copy of 401 certification and 404 permit kept on job site at all times during construction	
Prepare monitoring reports and annual mitigation report	Monthly and Annual (submittal date TBD)
Erect and maintain permanent signs at strategic locations along the perimeter of the wash corridors	Upon completion of berms, cutoff wall construction

Gannett Fleming

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Suite 250
4722 N. 24th Street
Phoenix, AZ 85016-4852

Office: (602) 553-8817
Fax: (602) 553-8816
www.gannettfleming.com

September 6, 2007

Via Email

RE: Desert Ridge & Paradise Ridge 404 Items

To Whom It May Concern:

The composition of the Desert Ridge and Paradise Ridge 404 Technical Review Team members remains essentially the same. However, some members have moved to other consultant firms. Also, the first flush treatment requirements have recently been updated and adopted by Maricopa County. Consequently, this package of information provides updates of a) the 404 Technical Review Team and b) the first flush requirements. This package also brings to your attention the requirement to record deed restrictions for 404 wash corridor mitigation areas.

In this regard, please review the following three attachments:

1. Updated 404 Technical Review Team Responsibilities Chart and Contact List for Desert Ridge and Paradise Ridge.
2. Updated information on Desert Ridge "First Flush" requirements for water quality treatment.
3. Requirement for recordation of a deed restriction for the mitigation areas as stated in Section b of the Desert Ridge 404 permit special conditions.

In case you may require any clarifications, please do not hesitate to give me a call at 602-553-8817.

Regards,

GANNETT FLEMING, INC.

Nasir Raza

Nasir Raza, P.E.
Member, Desert Ridge 404 Technical Review Team

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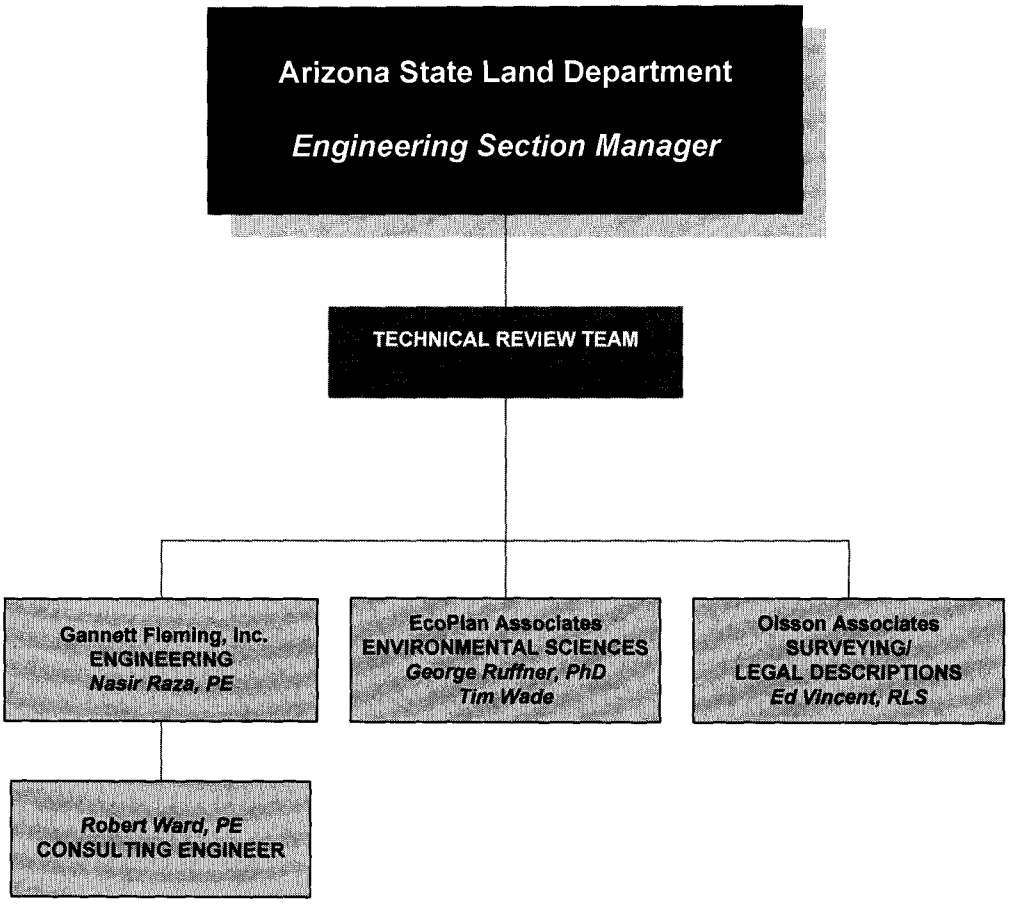
Attachments

ATTACHMENT 1

Updated 404 Technical Review Team Responsibilities Chart & Contact List for Desert Ridge and Paradise Ridge.

Desert Ridge™

RESPONSIBILITIES CHART



9/6/2007

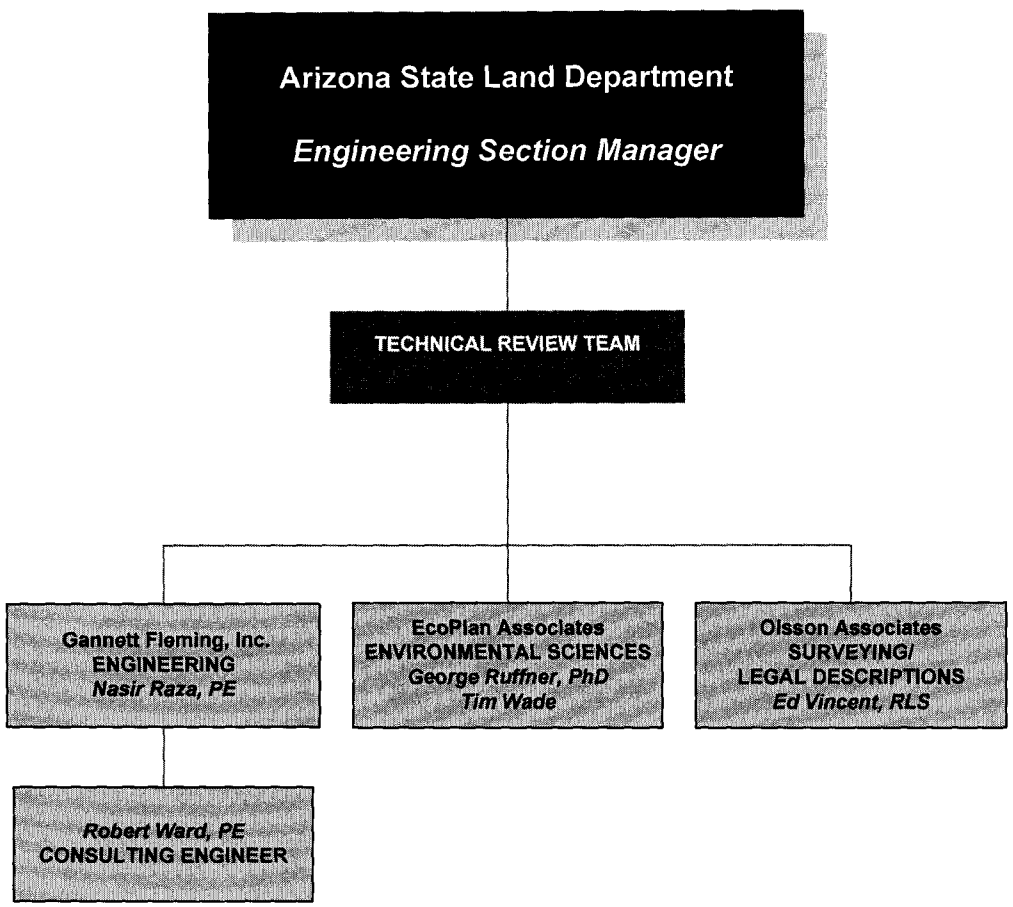
Desert Ridge

CONTACT LIST

Name	Firm Name	Address	Phone	Email
Lillian Moodey	AZ State Land Department	1616 W Adams Phoenix, AZ 85007	602-542-2643	lmoodey@land.az.gov
Nasir Raza, PE	Gannett Fleming, Inc.	4722 N 24th Street, Suite 250 Phoenix, AZ 85016	602-553-8817	sraza@gfnet.com
Robert L. Ward, PE	Robert L. Ward, P.E.	16123 E Tombstone Avenue Fountain Hills, AZ 85268	480-816-1252	rward.pe@cox.net
George Ruffner, PhD	EcoPlan Associates	127 E Goodwin Street Prescott, AZ 86303	480-733-6666 x117 480-510-7601 (cell)	gruffner@ecoplanaz.com
Tim Wade	EcoPlan Associates	127 E Goodwin Street Prescott, AZ 86303	480-733-6666 x133 623-764-4463 (cell)	twade@ecoplanaz.com
Ed Vincent, RLS	Olsson Associates	7250 N 16th Street, Suite 210 Phoenix, AZ 85020	480-333-4321	evincent@oaconsulting.com

PARADISE RIDGE

RESPONSIBILITIES CHART



9/6/2007

PARADISE RIDGE

CONTACT LIST

Name	Firm Name	Address	Phone	Email
Lillian Moodey	AZ State Land Department	1616 W Adams Phoenix, AZ 85007	602-542-2643	lmoodey@land.az.gov
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Tim Wade	EcoPlan Associates	127 E Goodwin Street Prescott, AZ 86303	480-733-6666 x133 623-764-4463 (cell)	twade@ecoplanaz.com
Ed Vincent, RLS	Olsson Associates	7250 N 16th Street, Suite 210 Phoenix, AZ 85020	480-333-4321	evincent@oaconsulting.com

APPENDIX A

CLEAN WATER ACT SECTION 401
WATER QUALITY CERTIFICATION

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

Jane Dee Hull
Governor

3033 North Central Avenue • Phoenix, Arizona 85012-2809
(602) 207-2300 • www.adeq.state.az.us

Jacqueline E. Schafer
Director

OCT 12 2001

Applicant: **Arizona State Land Department**
Attn: Michael Anable, Commissioner
1616 West Adams Street
Phoenix, Arizona 85007

Agent: Entranco
Attn: Ms. Barbara Wilson
7740 North 16th Street
Suite 200
Phoenix, Arizona 85020

Subject: **CWA 401 Water Quality Certification for: Paradise Ridge**, (Sections 15, 22, 27, 33 and 34, T4N, R4E), Phoenix, Maricopa County, Arizona, U.S. Army Corps of Engineers Public Notice/Application No. 1999-16129-RWF

Dear Mr. Anable:

The Arizona Department of Environmental Quality (ADEQ), Water Quality Division, has reviewed information submitted for water quality certification pursuant to Section 401 of the Clean Water Act (CWA) for Paradise Ridge, a mixed use master planned residential community. Section A of this document describes the activities to be certified. The references listed in Section B were used as the basis for certification. Section C lists the Approval Conditions.

ADEQ's review has determined that when the applicant adheres to the Conditions in Section C.1 through C.10, the certified activities should comply with State surface water quality standards. Subject to these conditions, this letter certifies that the activities in the Paradise Ridge development should not have a negative impact to the chemical, physical or biological integrity of jurisdictional waters of the U.S. (WUS).

A. DESCRIPTION OF ACTIVITIES TO BE CERTIFIED

1. The proposed Paradise Ridge master planned community is a 2,131 acre mixed use development located in Phoenix. The Pima Freeway (Loop 101) divides the project into north and south parcels (Figure 3. Proposed Project).

   Upgradient and east-northeast of the proposed Paradise Ridge development, ephemeral washes arise in the McDowell Mountains and generally flow in a southwest direction across Paradise Valley.

2. Construction of the Paradise Ridge master planned community will result in the impact of 33.4 acres of waters of the U.S. (WUS). Impact to jurisdictional waters

will result from the construction of single and multi-family housing, commercial developments, two golf courses, two resort hotels, an elementary school site, flood control facilities, trails, roadways and utilities.

3. Fill material will consist of native on-site soils, rock, concrete and other construction materials.

4. The applicant is proposing to mitigate the 33.4 acres of impacts to WUS resulting from the project by enhancing the vegetation along 55.9 acres of over-bank areas adjacent to the 15.5 acres of preserved washes, and re-vegetate 85.2 acres of reconstructed washes.

B. BASIS FOR CONDITIONAL STATE 401 WATER QUALITY CERTIFICATION

1. State of Arizona Water Quality Standards for Surface Waters, Arizona Administrative Code (A.A.C.) Title 18, Chapter 11, Section 108, Narrative Water Quality Standards, Section 109 Numeric Water Quality Standards, Appendix A. Designated Uses include: **Aquatic and Wildlife, ephemeral (A&We) and Partial Body Contact (PBC)** (A.A.C. R18-11-104, Appendix B).

2. ADEQ Water Quality Division Form 404-015, CWA 401 Certification Application signed April 26, 2001, and received by ADEQ on April 26, 2001 from Mr. Michael Anable, Commissioner Arizona State Land Department. Additional documents submitted with the application include the following:

   a. Applicant's Response to ADEQ Policy for Protecting Water Quality During Facility Construction.
   b. Maps and design drawings.
   c. Paradise Ridge, Prepared by Entranco Biological Resources Group, April 2001.

3. U.S. Army Corps of Engineers Public Notice/Application No. 1999-16129-RWF Comment period August 13, 2001 through September 12, 2001, and received by ADEQ on August 15, 2001.

C. CONDITIONS FOR STATE 401 WATER QUALITY CERTIFICATION

This State Water Quality Certification is issued by the ADEQ under the authority of Section 401(a) of the federal CWA (33 U.S.C. §1251 et seq.). The conditions listed

below are in addition to conditions in CWA 404 Permit No. 1999-16129-RWF issued by the U.S. Army Corps of Engineers (ACOE). These conditions are enforceable by the U.S. Environmental Protection Agency and ACOE. Civil penalties up to a maximum of $25,000 per day of violation may be levied if these certification conditions are violated. Criminal penalties may also be levied if a person knowingly violates any provision of the federal Clean Water Act. The following conditions are in addition to any special conditions developed by the ACOE for 404 Permit No. 1999-16129-RWF.

1. General Conditions

a. This Certification is only for the activities described in Section A of this Certification for 33.4 acres of impact to WUS within the Paradise Ridge development and is valid for the same period as the ACOE 404 permit. If project construction has not been started by the time specified in the ACOE 404 permit, the applicant shall notify as follows:

Arizona Department of Environmental Quality
Water Quality Division
Federal Permits and Program Development Unit
Attention: Surface Water Quality 401 Certification
3033 North Central Avenue, Phoenix, Arizona 85012
ADEQ File No. 4724, ACOE PN#1999-16129-RWF

ADEQ will have the option of extending, modifying or denying this Certification.

b. The Arizona State Land Department shall provide a copy of these State 401 Water Quality Certification Conditions to all appropriate contractors and subcontractors. The applicant shall also post a copy of these conditions in a water resistant location at the construction site where it may be seen by the workers.

c. This Certification is void if the construction is not consistent with the activities described in Section A of this Certification.

d. The Arizona State Land Department is responsible for the construction and maintenance of the project and any adverse cumulative impacts that it may cause.

2. Necessary Permits

The Arizona State Land Department is responsible for obtaining all other permits, certifications and licenses that may be required by federal, state or local authorities. Activities which may require other approvals include: construction activities disturbing greater than five acres of land [NPDES Stormwater Permit], use of reclaimed wastewater for dust control or irrigation [Reclaimed Water Permit], or dewatering of construction sites to a surface waterbody [NPDES Process Wastewater Permit].

3. Erosion Protection Measures

a. Erosion control and/or bank protection features (e.g., silt fences, straw bales, rip-rap, or mulching) shall be used, where appropriate, to minimize channel or bank erosion and soil loss. These features shall be maintained, as necessary, during pre-construction and construction periods. Denuded areas shall be revegetated as soon as possible with native plants and seed.

b. All pipe outlets and box culverts shall have end sections or headwalls that dissipate the water's energy to control erosion.

c. If construction operations are likely to create an erosion problem, operations shall cease until the problem is resolved or until reasonable control measures have been undertaken.

d. Earthen fill placed in locations subject to scour shall contain not more than ten percent (10%) of particles finer than 0.25 mm diameter (passing a No. 60 sieve, on a dry weight basis).

e. Upon completion of construction, the work area shall restore or maintain the stability of upstream and downstream segments of washes with respect to erosion and sedimentation.

4. Contaminated Soils and Materials

a. The Arizona State Land Department is responsible for ensuring construction material and/or fill, placed within the ordinary high water mark (OHWM), is free from substances that can cause or contribute to pollution of a surface water.

b. Debris (such as soil, silt, sand, rubbish, cement, asphalt, oil or petroleum products, organic materials, tires or batteries) derived from construction activities shall not be deposited at any site where it may be washed into WUS and shall be properly disposed of after completion of the work.

c. If water, other than reclaimed wastewater, is used for dust suppression, it shall not contain contaminants that could violate Surface Water Quality Standards.

5. Chemicals and Materials Handling

a. The Arizona State Land Department shall use designated areas for chemical and petroleum storage, solid waste containment, and equipment washing. These designated areas shall be located entirely outside of jurisdictional waters.

b. The Arizona State Land Department shall have a spill containment plan and an equipment maintenance plan available on site at all times.

6. Runoff

Runoff and seepage from roadways, embankments, golf courses and other alterations of the natural environment shall not cause a violation of Water Quality Standards.

7. Conditions Related to Flow Events

a. Work shall be performed during low water conditions when the area is naturally dewatered. When there is water flow within the construction area, construction activity shall cease and construction equipment relocated outside the OHWM of the watercourse.

b. Building pads which have been created by converting wash areas to dry land shall <u>not</u> be located within jurisdictional waters after completion of construction except as allowed by the 404 Permit. To the extent that pads are located in washes, provisions will be made to convey stormwater around the pads.

8. Construction Related Activities

   a. Construction materials, including concrete, asphalt, and piping, shall consist of materials that do not leach pollutants into surface waters. Activities shall be conducted and monitored to ensure that pollution from concrete formation and equipment washing does not drain into the washes.

   b. At bridged roadway crossings, only concrete pilings, concrete supporting walls, galvanized steel culverts, or aluminum shall be used in jurisdictional waters.

   c. After construction, the work area and all disturbed areas along the bank and streambed shall be restored to an environmentally acceptable condition. All construction residues, equipment and non-native materials shall be removed from and properly disposed of outside the OHWM.

   d. Rip-rap shall be washed outside of the OHWM of jurisdictional waters prior to placement to remove fines which may cause or contribute to a violation of the turbidity and/or narrative standards.

9. Conditions for Golf Courses and other Recreational Facilities

   a. The Arizona State Land Department is encouraged to develop and implement Best Management Practices, such as those found in "Environmental Principles of Golf Course Design", for the design, maintenance and operation of golf courses and other recreational facilities.

   b. The design of golf course irrigation, drainage and retention systems should provide for efficient use of water as well as the protection of water quality. Drainage and stormwater retention systems should be incorporated into the design as features of the course to help provide for both the short and long-term irrigation needs of turf and non-turf areas.

   c. Vegetated buffers should be established and maintained adjacent to ephemeral watercourses to reduce pollutant loads. Native vegetation shall be utilized to the fullest extent possible, given a reasonable likelihood of success.

d. For facilities utilizing potable water, Central Arizona Project water or groundwater for irrigation, direct runoff of irrigation water and overflows from runoff detention and/or retention areas into washes shall be limited to the extent practicable and shall not cause downstream erosion or flooding.

e. For facilities utilizing reclaimed wastewater for irrigation, direct runoff of reclaimed wastewater and overflow from effluent storage impoundments into WUS are prohibited without the proper permits including but not limited to Arizona's Reuse of Reclaimed Wastewater Permit or a federal NPDES permit.

Stormwater detention/retention basins shall be designed pursuant to the Paradise Ridge Hydrology and Master Drainage Report, April 2001, prepared for the Arizona State Land Department. These structures should as a minimum retain the "first flush" consisting of runoff from the contributing watershed from the ½-inch rainfall event.

f. Golf course greens, berms, bunkers, fairways, cart and crossing paths, located within jurisdictional waters shall be designed to allow normal storm flows to pass unimpeded. There shall be no significant change to the hydraulic conditions of the upstream or downstream waters as a result of these constructed features.

g. Turfed areas (e.g., golf courses) shall be located outside of jurisdictional waters, to the maximum extent practicable.

h. Chemicals and fertilizers, especially when used for maintenance of golf course turf and landscape vegetation within jurisdictional waters, shall not cause or contribute to a violation of State Water Quality Standards.

i. Fertilizer, herbicide and insecticide chemicals used for maintenance of turfed areas and landscape vegetation shall be selected based on minimum environmental impacts (i.e., low residence times, low leachability, and maximum feasible biodegradability). The process of selection of chemicals cannot be based solely on cost. Application rates printed on the product labels shall be strictly followed. Excess chemicals shall not be applied on recently treated areas and must either be stored (as directed) for later use or transported to another site for immediate use.

10. Standard Issues

Any discharge occurring as a result of activities certified for the construction of the Paradise Ridge development shall not cause a violation of Surface Water Quality Standards. Applicability of this condition is as defined in A.A.C. R18-11-102.

ADEQ CWA 401 Water Quality Certification of these activities to operate under the terms of the ACOE Individual CWA 404 Permit does not affect or modify in any way the obligations or liability of any person for any damages, injury, or loss, resulting from an impacted area discharge. The Department may modify or withdraw its determination if the information relied upon is inaccurate or not implemented as proposed. If, in the future, the Department determines that the terms and conditions of the Certification have been violated, or discharges from the activities have caused or contributed to a violation to the surface water quality standards, the Director may revoke the Certification. This Certification is not intended to waive any other federal, state or local laws.

Thank you for your cooperation and efforts to protect our finite and precious water resources.

Sincerely,

Authorized ADEQ Signature: Michele Robertson 10-12-01

Michele Robertson, R.G. Date
Water Permits Section Manager
Water Quality Division

Enclosure: Figure 3, Proposed Project (1 page)

cc: U.S. Army Corps of Engineers, Regulatory Branch, Attn: Ron Fowler, (1999-16128-RWF), 3636 North Central Avenue, Suite 760, Phoenix, Arizona 85012
Arizona State Land Department, Attn: V. Ottozawa-Catupron, Drainage & Engineering Section, 1616 West Adams Street, Phoenix, Arizona 85007
EcoPlan Associates, Inc., Attn: George A. Ruffner, PhD, 701 West Southern Avenue, Suite 203, Mesa, Arizona 85210
Mr. Tim Vendlinski, Manager, Wetlands Regulatory Office, USEPA (WTR-8)

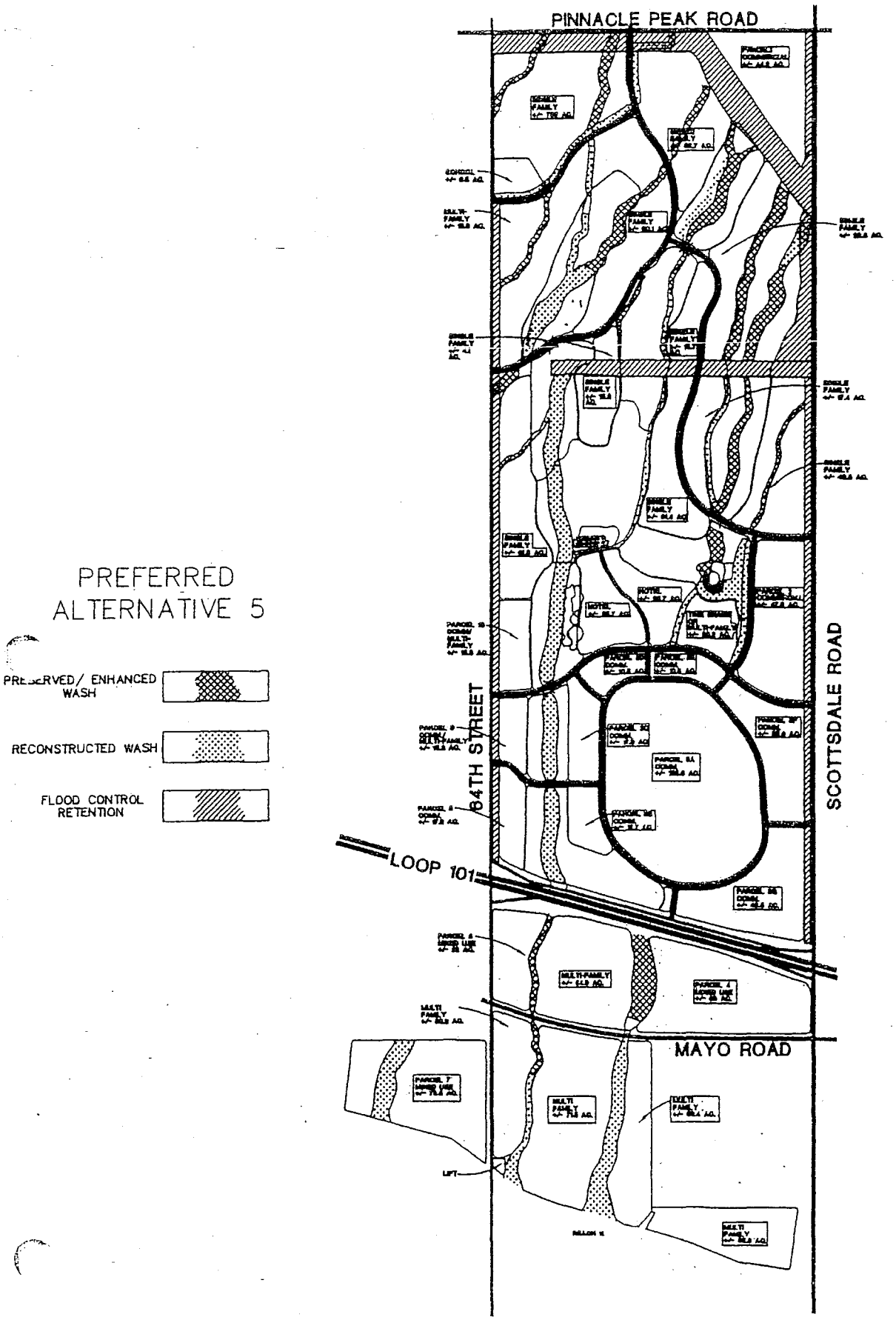

Figure 3 Proposed Project

APPENDIX B

CLEAN WATER ACT SECTION 404 INDIVIDUAL PERMIT

TERMS AND CONDITIONS

APPENDIX D

PROCEDURES CHECKLIST

PRE-CONSTRUCTION PHASE CHECKLIST

- ☐ Preconstruction meeting on BMPs and the Clean Water Act conducted by transferee or consultant.
  - ☐ Provide handbook to relevant planning, design, and construction personnel.
  - ☐ Discuss baseline conditions, stormwater management criteria, application of BMPs, and terms and conditions of the 401 certification and the 404 permit

- ☐ Terms and Conditions for Sections 401 and 404 of the Clean Water Act
  - ☐ Read the 401 and 404 terms and conditions
  - ☐ Sign each acknowledgment form. Return the originals with attachments to ASLD.

- ☐ Construction/drainage easements and right-or-entry
  - ☐ Review and approval by ASLD
  - ☐ Review and approval by City of Phoenix where required

- ☐ Record deed restriction over mitigation areas
  - ☐ Record with Maricopa County Recorder within 60 days of auction sale.
  - ☐ Submit evidence of recordation to USACE

- ☐ Site Assessment
  - ☐ Provide final for ASLD records

- ☐ Construction Documents Approvals
  - ☐ Draft
  - ☐ Review and approval by City of Phoenix
  - ☐ Review and approval by others (e.g., ADOT)
  - ☐ Provide final copy for ASLD records

- ☐ Storm Water Pollution Prevention Plan (SWPPP)
  - ☐ Review and approval by City of Phoenix
  - ☐ Submit NOI to EPA and ADEQ 48 hours prior to construction
  - ☐ Submit Storm Water Management Plan checklist to City of Phoenix 48 hours prior to construction.
  - ☐ Copy of SWPPP and NOI on-site

- ☐ Implementation Schedule
  - ☐ Set deadlines for specific steps in sequence of construction
  - ☐ Assign responsibilities
  - ☐ Schedule progress reports to management

- ☐ Earth moving permit
  - ☐ Review and approval by the City of Phoenix
  - ☐ Submit application to Maricopa County Environmental Services Dept.
  - ☐ Arizona reclaimed wastewater reuse permit if wastewater treatment plan effluent is to be used for dust suppression.
  - ☐ Obtain other federal or state ground or surface water discharge permits as necessary

- ☐ Site Clearance Approvals
  - ☐ Survey and fence outer boundaries of riparian habitat wash corridors and clearing limits established.
  - ☐ Stake jurisdictional waters
  - ☐ Complete inventory of plants. Submit Landscape Inventory Plan to City of Phoenix
  - ☐ Complete Landscape Conservation and Salvage Plan. Submit to city of Phoenix prior to or concurrent with grading and drainage plan submittal.
  - ☐ Contact Arizona Department of Agriculture regarding Arizona Native Plant Law
  - ☐ Complete Plant salvage
  - ☐ Monitor salvage activities daily

- ☐ Arrangements made for qualified archaeological monitor.

- ☐ Review the mitigation bond for the natural and reconstructed wash corridors

- ☐ 401 and 404 monthly monitoring report
  - ☐ Submit original to USACOE. See Appendix H for format.

CONSTRUCTION PHASE CHECKLIST

- ☐ Copy of 401 certification and 404 permit kept on-site

- ☐ Review and revise sequence of construction, schedule for implementation, and SWPPP as necessary
- ☐ Submit final construction documents and revised SWPPP to ASLD for our records.

- ☐ Minimize extent of disturbed areas and grading

- ☐ Archaeological monitor on site during ground-disturbing activities and initial mass grading.

- ☐ Construction in wash corridors
  - ☐ storm drain out falls
  - ☐ berms and cutoff walls
  - ☐ grade control and drop structures ,
  - ☐ culverts and utilities across roadways
  - ☐ maintain staking of jurisdictional washes and fencing along perimeter of wash corridors

- ☐ Construct SWPPP BMPs
  - ☐ perimeter control/diversion
  - ☐ slope protection
  - ☐ sediment trapping
  - ☐ drainageway and stream protection
  - ☐ temporary and permanent stabilization
  - ☐ vegetative controls
  - ☐ non-sediment pollution control

- ☐ Implement good house-keeping controls
  - ☐ equipment maintenance procedures
  - ☐ solid waste management
  - ☐ designated washdown areas
  - ☐ on-site/off-site tracking control
  - ☐ sweep roadways related to hauling
  - ☐ protected chemical and materials storage areas
  - ☐ spill containment plan

- ☐ Records kept to ensure the BMPs are working correctly and efficiently
  - ☐ three-ring notebook contains SWPPP, completed .inspection forms, other NPDES records, monthly and annual monitoring reports
  - ☐ monitor and evaluate effectiveness of the BMPs monthly basis and following significant storm events.
  - ☐ potential pollutant sources are contained
  - ☐ facility site plan is accurate and updated to reflect current conditions
  - ☐ controls are in place and working as planned
  - ☐ BMPs modified as necessary

- ☐ Construction procedures consistent with the Arizona Department of Environmental Quality Policy for Protecting Water Quality During Facility Construction.
- ☐ Mitigation activities associated with impacts of jurisdictional waters within each auction area completed within 1 year of the occurrence of the impact.
- ☐ Reconstructed and natural wash corridors completed within 2 years from the date of the auction of the land.
- ☐ Trees replaced that are inadvertently damaged or destroyed within the washes
- ☐ Monthly report on 401/404compliance submitted to USACOE
- ☐ Permanent signs erected along perimeter of wash corridors per the permit

POST-CONSTRUCTION PHASE CHECKLIST

- ☐ As-built construction plans and documents
  - ☐ Submittal to City of Phoenix
  - ☐ Submit to ASLD for our records

- ☐ SWPPP
  - ☐ Notice of Termination provided to EPA, ASLD, ADEQ and City of Phoenix.

- ☐ Reconstructed and natural wash corridors monitored quarterly
- ☐ Riparian habitat
- ☐ Erosion, scour, deposition
- ☐ Structures (e.g., culverts, bridges, drop structures, pathways, berms, storm drain outfalls)
- ☐ Permanent BMPs monitored quarterly (e.g., retention basins infiltration trenches/basins, and filter strips).
- ☐ Dry wells inspected after every rainfall.

- ☐ Remedial plan formulated as warranted
  - ☐ Review and approval by agencies as necessary

- ☐ Habitat mitigation annual reports
- ☐ Annual reports prepared in November
- ☐ Submit annual report to the Corps of Engineers
- ☐ Obtain an Arizona reclaimed wastewater reuse permit if reclaimed water is to be used to irrigate the golf course or any other turf.
- ☐ Monitor and maintain permanent storm water conveyance and management facilities following every major rainfall

APPENDIX E

STORM WATER POLLUTION PREVENTION PLAN CHECKLIST

EPA BASELINE CONSTRUCTION GENERAL PERMIT REQUIREMENTS PRE-CONSTRUCTION CHECKLIST
Storm Water Pollution Prevention Plans

1. A site description, including:

   - ☐ The nature of the activity?
   - ☐ Intended sequence of major construction activities
   - ☐ The total area of the site
   - ☐ The area of the site that is expected to undergo excavation
   - ☐ The runoff coefficient of the site after construction is complete
   - ☐ Existing soil or storm water data

   - ☐ A site map with:
     - ☐ Drainage patterns
     - ☐ Approximate slopes after major grading
     - ☐ Area of soil disturbance
     - ☐ Outline of areas which won't be disturbed
     - ☐ Location of major structural and non-structural controls
     - ☐ Areas where stabilization practices are expected to occur
     - ☐ Surface waters
     - ☐ Storm water discharge locations
     - ☐ The name of the receiving water(s)

2. A description of controls:

   2.1 Erosion and sediment controls, including:
   - ☐ Stabilization practices for all areas disturbed by construction
   - ☐ Structural practices for all drainage/discharge locations

   2.2 Storm water management controls, including:
   - ☐ Measures used to control pollutants occurring in storm water discharges after construction activities are complete.
   - ☐ Velocity dissipation devices to provide nonerosive flow conditions from the discharge point along the length of any outfall channel.

   2.3 Other controls including:
   - ☐ Waste disposal practices which prevent discharge of solid materials to waters of the U.S.?
   - ☐ Measures to minimize offsite tracking of sediments by construction vehicles
   - ☐ Measures to ensure compliance with State or local waste disposal, sanitary sewer, or septic system regulations

   2.4 ☐ Description of the timing during the construction when measures will be implemented.

3. Are State or local requirements incorporated into the plans?
4. Are maintenance procedures for control measures identified in the plan?
5. Identification of allowable non-storm water discharges and pollution prevention measures.
6. Contractor certification.
7. Plan certification.

EPA BASELINE CONSTRUCTION GENERAL PERMIT CHECKLIST
Storm Water Pollution Prevention Plan
Construction/Implementation Checklist

1. Maintain Records of Construction Activities, including:
   - ☐ Dates when major grading activities occur
   - ☐ Dates when construction activities temporarily cease on a portion of the site
   - ☐ Dates when construction activities permanently cease on a portion of the site
   - ☐ Dates when stabilization measures are initiated on the site

2. Prepare Inspection reports summarizing:
   - ☐ Name of inspector
   - ☐ Qualifications of inspector
   - ☐ Measures/areas inspected
   - ☐ Observed conditions
   - ☐ Changes necessary to the SWPPP

3. Report Releases of Reportable Quantities of Oil or Hazardous Materials (if they occur):
   - ☐ Notify National Response Center 800/424-8802 immediately
   - ☐ Notify permitting authority in writing within 14 days
   - ☐ Modify the pollution prevention plan to include:
     - -the date of release
     - -circumstances leading to the release
     - -steps taken to prevent reoccurrence of the release

4. Modify Pollution Prevention Plan as necessary to:
   - ☐ Comply with minimum permit requirements when notified by EPA that the plan does not comply
   - ☐ Address a change in design, construction operation or maintenance which has an effect on the potential for discharge of pollutants
   - ☐ Prevent reoccurrence of reportable Quantity releases of a hazardous material or oil

EPA BASELINE CONSTRUCTION GENERAL PERMIT CHECKLIST

Storm Water Pollution Prevention Plan
Final Stabilization /Termination Checklist

1. ☐ All soil disturbing activities are complete
2. ☐ Temporary erosion and sediment control measures have been removed or will be removed at an appropriate time

3. ☐ All areas of the construction site not otherwise covered by a permanent pavement or structure have been stabilized with a uniform perennial vegetative cover with a density of 70% or equivalent measures have been employed

POLLUTION PREVENTION PLAN FOR STORM WATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITIES EROSION AND SEDIMENT CONTROL SELECTION CHECKLIST

INSTRUCTIONS: This checklist includes the minimum sediment erosion control requirements under the USEPA General Permit (✓) each item and fill in the blanks below to evaluate compliance for each drainage area and location. Note: This checklist was prepared for the USEPA General Permit. Requirements for State General Permits may vary.

Stabilization Practices

☐ Stabilization will be initiated on all disturbed areas where construction activity will not occur for a period of more than 21 calendar days by the 14th day after construction activity has permanently or temporarily ceased.

Stabilization measures to be used include:

- ☐ Temporary Seeding
- ☐ Sod Stabilization
- ☐ Permanent Seeding
- ☐ Geotextiles
- ☐ Mulching
- ☐ Other_____

Structural Practices

☐ Flows from upstream areas will be diverted from exposed soils. Measures to be used include:

- ☐ Earth Dike
- ☐ Drainage Swale
- ☐ Interceptor Dike and Swale
- ☐ Pipe Slope Drain
- ☐ Other

Drainage locations serving less than 10 disturbed acres:

☐ Sediment controls will be installed

Sediment controls include:

- ☐ A Sediment Basin
- ☐ Sediment Trap
- ☐ Silt Fence or equivalent Silt Fence or equivalent controls along all side slope controls along the side slope and downslope boundaries and downslope boundaries

Drainage locations serving 10 or more disturbed acres:

☐ A Sediment Basin will be installed

☐ A Sediment Basin is not attainable on the site; therefore, the following sediment controls will be installed:

Sediment Trap

Silt Fence or equivalent controls along the sideslope and downslope boundaries

Sediment Basin Runoff Storage Calculation

_____acres area draining to the sediment basin

X

3,600 cubic feet of storage/acre

=

_____ cubic feet of storage required for the basin

3,600=

APPENDIX F

EARTHMOVING PERMIT APPLICATION FROM MARICOPA COUNTY

Guidance For Filling-Out
An Application For An Earthmoving Permit

The Application For An Earthmoving Permit Is At The End Of This Guidance

Section 1 – Applicant Information

Submit the **Appropriate Fee** for your Earthmoving Permit application, according to the following:

- If total surface area disturbed is 0.1 acre to less than 1 acre, submit $75.
- If total surface area disturbed is 1 acre or more, submit $36/acre plus $110 per site

Make checks payable to "Maricopa County Environmental Services Department" or "M.C.E.S.D."

A **Responsible Official** is one of the following:

- For a corporation, a corporate officer or any other person who performs similar policy or decision making functions for the corporation, or a duly authorized representative of such person, if the representative is responsible for the earthmoving operations in the subject application. Delegation of authority to such representative shall be approved in advance by the permitting authority.
- For a partnership or sole proprietorship, a general partner or the proprietor, respectively.
- For a municipality, state, Federal, or other public agency, the principle executive officer or ranking elected official of that entity.

Section 2 – Project Information – Drawing

Section 2 – Project Information – Drawing is self-explanatory. However, please remember, when calculating the amount of disturbed area for trenching, include the dimensions of the trench, stockpiling areas, and staging areas.

Section 3 – Dust Control Plan

An Earthmoving Permit must contain a **Dust Control Plan**. You may fill-out Section 3 of the Application For An Earthmoving Permit and submit it as your Dust Control Plan or you may write your own Dust Control Plan describing all control measures to be used during the project and submit it as your Dust Control Plan.

Water: Sources of fugitive dust, listed in Section 3, that include "Apply water" as a control measure require specifics about water availability and water application. If you choose to apply water as a control measure, you must fill-in the blanks, under both Water Availability and Water Application. For Water Availability, indicate which of the following will be utilized: water storage tank on-site; metered hydrant on-site; water not on-site, describe water source and state the distance from site to water source; water provided through irrigation; other – specify source. For Water Application, indicate which of the following will be utilized: apply water using a water truck – state number of trucks and number of gallons per truck; apply water using hoses; apply water using sprinklers.

Dust Suppressants: If you choose the control measure "dust suppressant(s) other than water", you must describe the method of dust suppressant(s) application. Express frequency in terms of how often the surface will receive a complete application of dust suppressant(s) (i.e., the frequency may be three applications per day). Express intensity in units such as gallons per minute. Also, include as an attachment:

- Product specifications or label instructions for approved usage
- Information on environmental impacts and approvals or certifications related to appropriate and safe use for ground application

Continued - Guidance For Filling-Out

An Application For An Earthmoving Permit

Continued - Section 3 – Dust Control Plan

Describing Major Project Phases: You may use the Project Information Drawing in Section 2 to show the various project phases, along with a time line depicting relative start and stop times. Indicate on the line provided for describing major project phases that you have shown the various project phases on the Project Information Drawing.

Bulk Material Handling And Hauling: Rule 310 defines "bulk material handling, storage, and/or transporting operation" as the use of equipment, haul trucks, and/or motor vehicles, such as but not limited to the loading, unloading, conveying, transporting, piling, stacking, screening, grading, or moving of bulk materials, which are capable of producing fugitive dust at an industrial, institutional, commercial, governmental, construction, and/or demolition site. When designing your Dust Control Plan, you must choose control measures for all bulk material handling and bulk material hauling that you will do onsite within the boundaries of the work site and that you will do off-site onto paved public roadways.

Open Storage Piles: The control measure options for open storage piles are included with bulk material handling control measure options, because an open storage pile is any accumulation (by stacking, loading, and unloading) of bulk material with a 5% or greater silt content that in any one point attains a height of 3 feet and covers a total surface area of 150 square feet or more. If you choose to construct wind barriers around open storage piles, as a control measure, you must construct the wind barriers around three sides of the open storage pile. The sides' length must be no less than equal to the length of the pile; the sides' distance from the pile must be no more than twice the height of the pile; the sides' height must be equal to the pile height, and the material of which the sides are made must be no more than 50% porous.

Spillage, Carry-Out, Erosion, And/Or Trackout: Rule 310, Subsection 308.3(b) requires spillage, carry-out, erosion, and/or trackout to be cleaned up at least at the end of the work day and immediately, if it extends more than 50 feet along a paved public roadway. You must specify, on the Dust Control Plan for any site that exits onto a paved public road, the control measures that you will use for both immediate clean-up and after-the-work-day clean-up.

Weed Abatement By Discing Or Blading: Watering, both prior to and during weed abatement by discing or blading, has been pre-designated as the primary control measure, since both are required by Rule 310, Subsection 308.8. You must choose a contingency control measure and at least one control measure to be implemented following weed abatement by discing or blading.

Vegetative Ground Cover: If you choose to "Establish vegetative ground cover" as a control measure, you must comply with the standards in Rule 310, Subsection 302.3:

- Maintain a flat vegetative cover (i.e., attached (rooted) vegetation or unattached vegetative debris lying on the surface with a predominant horizontal orientation that is not subject to movement by wind) that is equal to at least 50%; or
- Maintain a standing vegetative cover (i.e., vegetation that is attached (rooted) with a predominant vertical orientation) that is equal to or greater than 30%; or
- Maintain a standing vegetative cover (i.e., vegetation that is attached (rooted) with a predominant vertical orientation) that is equal to or greater than 10% and where the threshold friction velocity is equal to or greater than 43 cm/second when corrected for non-erodible elements; or
- Maintain a percent cover that is equal to or greater than 10% for non-erodible elements.

Surface Gravel, Recycled Asphalt, Or Other Suitable Material: If you choose to "Apply and maintain surface gravel, recycled asphalt, or other suitable material" as a control measure for unpaved haul/access roads, you must comply with the standards in Rule 310, Subsection 302.2:

- Do not allow visible dust emissions to exceed 20% opacity and either do not allow silt loading to be equal to or greater than 0.33 oz/ft2 or do not allow silt content to exceed 6%.

If you choose to "Apply and maintain surface gravel, recycled asphalt, or other suitable material" as a control measure for unpaved parking lots, you must comply with the standards in Rule 310, Subsection 302.1:

- Do not allow visible fugitive dust emissions to exceed 20% opacity and either do not allow silt loading to be equal to or greater than 0.33 oz/ft2 or do not allow silt content to exceed 8%.

Maricopa County
Environmental Services Department
Air Quality Division

1001 North Central Avenue
Phoenix, AZ 85004
(602) 506-6700 FAX (602) 506-0586

Application For An Earthmoving Permit

In order for Maricopa County to process an application for an Earthmoving Permit, all questions must be answered and the appropriate fee must be submitted.

FOR OFFICE USE ONLY
Dist #_____
NOV #_____
Permit #_____
Date Issued_____
Fee Paid_____
Approved By_____

Section 1 – Applicant Information

1. Applicant Must Be One Of The Following
Check All That Apply:
Property Owner____Developer____General/Prime Contractor____Lessee_____

2. Legal Business Name:_____
Applicant Address:_____
City/State/Zip:_____
Phone:_____ Fax #:_____
E-Mail Address:_____

3. Property Owner/Developer, If Not Applicant:_____
Address:_____
City/State/Zip:_____
Phone:_____ Fax #:_____
Contact Person:_____

4. Primary Project Contact:_____
Title:_____Company Name:_____
Pager #:_____Mobile #:_____On-Site #:_____

5. Signature of a Responsible Official of the Applicant:
I hereby certify that, based on information and belief formed after reasonable inquiry, the statements and information in the Application For An Earthmoving Permit, including Section 1-Applicant Information, Section 2-Project Information-Drawing, and Section 3-Dust Control Plan, are true, accurate, and complete.
A Responsible Official of the Applicant is the person who will be contacted or named in any enforcement action initiated by the Maricopa County Environmental Services Department or the Office of the Maricopa County Attorney.

Signature:_____

Printed Name:_____ Title:_____

Section 2 – Project Information-Drawing

6. **Type Of Project. Check All That Apply.**
   ☐Residential ☐Commercial/Industrial ☐Trenching ☐Site Preparation/Land Development
   ☐Weed Control ☐Demolition ☐ Import/Export(only) ☐Road Work

7. **Project Street Address:**_____
   City/Zip:_____

8. **Nearest Major Intersection:**_____

9. **Legal Description (From Phoenix Metropolitan Map Book):**
   Township:_____ Range:_____ Section: _____

10. **Size Of Area, In Acres, That Will Be Disturbed During The Duration Of This Permit, Including Staging And Stockpile Areas:**_____

11. **Project Start Date:**_____

12. **Does The Project Include Renovation Or Demolition Activities? Yes_____No_____**
    Renovation Or Demolition Activities: All facilities scheduled for renovation or demolition must be inspected by a certified Asbestos Hazard Emergency Response Act (AHERA) accredited asbestos building inspector. You must keep a copy of any reports of inspections, including laboratory test results of samples collected, for 2 years.
    NESHAP stands for national emission standards for hazardous air pollutants. National emission standards for hazardous air pollutants are described in 40 Code Of Federal Regulations (CFR) Part 61 and Part 63 (1998). If your facility is scheduled for renovation or demolition and is subject to the requirements of these Federal regulations, you must attach, to your Application For An Earthmoving Permit, a copy of the 10-day NESHAP notification.

    Is Asbestos Present? _____

    AHERA Determination Made By:_____ Date:_____

    10-Day NESHAP Notification Submittal Date (Attach Copy Of 10-Day NESHAP Notification):_____

    Renovation Or Demolition Start Date:_____

An Earthmoving Permit will not be issued, unless a drawing is submitted. Attach a separate page (8 ½" x 11") with a drawing showing all of the following elements:

- Entire project site boundaries
- Acres to be disturbed with linear dimensions
- Nearest public roads
- North arrow
- Planned exit locations onto paved public roadways

Section 3 – Dust Control Plan

- Put a check (✓) in the box in front of all the following sources of fugitive dust that you anticipate from your project.
- Write the letters "NA" in the box in front of all the following sources of fugitive dust that you do not anticipate implementing during your project.
- Unless already pre-designated, write the letter "P", for primary control measures that you will implement during your project, on the line in front of at least one of the listed control measures or work practices, under each checked box/source of fugitive dust. The control measures pre-designated with the letter "P" are required to be implemented.
- Write the letter "C", for contingency control measures that you will implement during your project, on the line in front of at least one of the listed control measures or work practices, under each checked box/source of fugitive dust.

☐ Unpaved Haul/Access Roads:

☐ Limit vehicle speed to 15 miles per hour or less and limit vehicular trips to no more than 20 per day. If this is chosen as the primary control measure, indicate number of vehicles traveled on haul roads: _____

☐ Apply water at a frequency and intensity to comply with Subsection 302.2 in Rule 310 (See Guidance-"Water")
Water Availability:_____
Water Application:_____

☐ Pave

☐ Apply and maintain surface gravel, recycled asphalt, or other suitable material so that the area meets the silt loading and silt content limits of Subsection 302.2 in Rule 310 (See Guidance-"Surface Gravel, Recycled Asphalt, Or Other Suitable Material")

☐ Apply and maintain dust suppressant(s) other than water using _____ at a frequency of _____ and an intensity of _____ (See Guidance-"Dust Suppressants")

☐ Other:_____

☐ Disturbed Surface Areas – Before Dust Generating Operations Occur:

☐ Pre-water site to the depth of cuts (See Guidance-"Water")
Water Availability:_____
Water Application:_____

☐ Phase work to reduce the amount of disturbed surface area at any one time. Describe major project phases (See Guidance-"Describing Major Project Phases")
_____

☐ Other:_____

☐ Disturbed Surface Areas – During Dust Generating Operations:

☐ Apply water (See Guidance-"Water")
Water Availability:_____
Water Application:_____

☐ Apply and maintain dust suppressant(s) other than water using _____ at a frequency of _____ and an intensity of _____ (See Guidance-"Dust Suppressants")

☐ Construct fences or 3 foot - 5 foot high wind barriers with 50% or less porosity (in combination with one of the above) Show locations on drawing in Section 2.

☐ Cease operations (as a contingency control measure only)

☐ Other:_____

☐ Disturbed Surface Areas – Temporary Stabilization Including Weekends, After Work Hours, Holidays, And Periods Up-To 8 Months:

- ☐ Apply water (See Guidance-"Water") or other dust suppressant (See Guidance-"Dust Suppressants") in sufficient quantity and frequency to establish and maintain a visible crust.
  Water Availability:_____
  Water Application_____
- ☐ Establish vegetative ground cover that complies with Subsection 302.3 in Rule 310 (See Guidance-"Vegetative Ground Cover")
  Describe vegetative ground cover_____
- ☐ Restrict vehicular access in combination with one of the above
- ☐ Other:_____

☐ Disturbed Surface Areas – Permanent Stabilization Required Within 8 Months Of Ceasing Dust Generating Operations:

- ☐ Restore area such that the vegetative ground cover and soil characteristics are similar to adjacent or nearby undisturbed native conditions
- ☐ Establish vegetative ground cover that complies with Subsection 302.3 in Rule 310 (See Guidance-"Vegetative Ground Cover")
  Describe vegetative ground cover:_____
- ☐ Pave or apply gravel
- ☐ Apply and maintain dust suppressant(s) other than water using _____ at a frequency of_____ and intensity of_____ (See Guidance-"Dust Suppressants")
- ☐ Other:_____

☐ Trackout From Work Sites With 5 Acres Or More Of Disturbed Surface Area Or With 100 Cubic Yards Or More Of Bulk Material Hauled On Or Off Site Per Day:

- ☐ Install a grizzly or wheel wash system at all access points
- ☐ At all access points, install a gravel pad at least 30 feet wide, 50 feet long, and 6 inches deep
- ☐ Pave starting from the point of intersection with a paved public roadway and extending for a centerline distance of at least 100 feet and a width of at least 20 feet
- ☐ Other:_____

☐ Spillage, Carry-Out, Erosion, And/Or Trackout:

If Extending More Than 50 Feet Along A Paved Public Roadway, Implement IMMEDIATELY:

- ☐ Operate a street sweeper or wet broom with sufficient water, if applicable, at the speed recommended by the manufacturer
- ☐ Manually sweep-up deposits
- ☐ Other (describe in detail): _____

If Extending Less Than 50 Feet Along A Paved Public Roadway, Implement NO LATER THAN THE END OF THE WORK DAY:

- ☐ Operate a street sweeper or wet broom with sufficient water, if applicable, at the speed recommended by the manufacturer
- ☐ Manually sweep-up deposits
- ☐ Other (describe in detail): _____

☐ Vehicle Use In Open Areas:

☐ Restrict trespass by installing signs
☐ Install physical barriers such as curbs, fences, gates, posts, signs, shrubs or trees to prevent access
☐ Other:_____

☐ Unpaved Parking Lots:

☐ Apply water at a frequency and intensity to comply with Subsection 302.1 in Rule 310 (See Guidance-"Water")
Water Availability:_____
Water Application:_____
☐ Apply and maintain gravel, recycled asphalt, or other suitable material such that the area meets the silt loading and silt content limits of Subsection 302.1 in Rule 310 (See Guidance-"Surface Gravel, Recycled Asphalt, Or Other Suitable Material")
☐ Pave
☐ Apply and maintain dust suppressant(s) other than water using _____ at a frequency of _____ and an intensity of _____ (See Guidance-"Dust Suppressants")
☐ Other:_____

☐ Bulk Material Handling And Open Storage Piles:

(Choose Primary Control Measure And Secondary Control Measure For Each Of The Following 2 Situations):

During Stacking, Loading, And Unloading Operations:

☐ Apply water at a frequency and intensity so as not to exceed 20% opacity (See Guidance-"Water")
Water Availability:_____
Water Application:_____
☐ Other (describe in detail):
_____

When Not Conducting Stacking, Loading, And Unloading Operations:

☐ Cover open storage piles with tarps, plastic, or other material
☐ Apply water to maintain a soil moisture content at a minimum of 12% or 70% of the optimum moisture content for compaction (See Guidance-"Water")
Water Availability:_____
Water Application:_____
☐ Apply water as needed to establish and maintain a visible crust (See Guidance-"Water")
Water Availability:_____
Water Application:_____
☐ Maintain a threshold friction velocity of at least 100 cm/sec
☐ Maintain vegetative cover meeting one of the requirements of Subsection 302.3 in Rule 310 (See Guidance-"Vegetative Ground Cover")
☐ Construct wind barriers (See Guidance-"Open Storage Piles"). This control measure must be used in combination with at least one of the above control measures, except covering.
☐ Other:_____

☐ Bulk Material Hauling On-Site Within The Boundaries Of The Work Site:

P Load all haul trucks such that the freeboard is not less than 3 inches; and
Prevent spillage or loss of bulk material from holes or other openings in the cargo compartment's floor, sides, and/or tailgates; and
Install a trackout control device that removes particulate matter from tires and the exterior surfaces of haul trucks and/or motor vehicles that traverse the work site

☐ Limit vehicular speeds to 15 miles per hour or less while traveling on the work site

☐ Apply water to the top of the load (See Guidance-"Water")
Water Availability:_____
Water Application:_____

☐ Cover haul trucks with a tarp or other suitable closure

☐ Other:_____

☐ Bulk Material Hauling Off-Site Onto Paved Public Roadways:

P Cover haul trucks with a tarp or other suitable closure; and
Load all haul trucks such that the freeboard is not less than 3 inches; and
Prevent spillage or loss of bulk material from holes or other openings in the cargo compartment's floor, sides, and/or tailgate(s); and
Before the empty haul truck leaves the site, clean the interior of the cargo compartment or cover the cargo compartment

☐ Other:_____

☐ Earthmoving Operations On Disturbed Surface Areas 1 Acre Or Larger:

☐ Apply water, while conducting earthmoving operations (See Guidance-"Water")
Water Availability:_____
Water Application:_____

☐ Other:_____

☐ Weed Abatement By Discing Or Blading:

P Pre-water site and apply water, while weed abatement by discing or blading is occurring (See Guidance-"Water")
Water Availability:_____
Water Application:_____

☐ Other:_____

Choose At Least One Of The Following, As A Primary Control Measure, To Be Implemented Following Weed Abatement By Discing Or Blading:

☐ Pave

☐ Apply gravel to establish and maintain either a threshold friction velocity of at least 100 cm/sec or a cover of at least 10% non-erodible elements

☐ Apply water (See Guidance-"Water") or other dust suppressant (See Guidance-"Dust Suppressants") to establish and maintain a visible crust
Water Availability:_____
Water Application:_____

☐ Establish vegetative ground cover meeting one of the requirements of Subsection 302.3 of Rule 310 (See Guidance-"Vegetative Ground Cover")

☐ Other:_____

APPENDIX G

HABITAT MITIGATION AND MONITORING PLAN FOR THE PARADISE RIDGE DEVELOPMENT PROJECT

Habitat Mitigation and Monitoring Plan for the Paradise Ridge Development Project

Submitted to:

U.S. Army Corps of Engineers
Regulatory Branch
3636 North Central Avenue, Suite 760
Phoenix, Arizona 85012

On Behalf of:

Arizona State Land Department
1616 West Adams Street
Phoenix, Arizona 85007

and

Landmark Land Company of Arizona, Inc.
7590 East Gray Road, Suite 103
Scottsdale, Arizona 85260

Prepared by:

ENTRANCO
7740 16th Street, Suite 200
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April 30, 2002

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1.0 INTRODUCTION - PLAN OVERVIEW

This mitigation plan has been prepared to address unavoidable impacts to 34.08 acres of Waters of the United States (WUS) associated with the auction and eventual development of approximately 2,131 acres in the Paradise Ridge Master Planned Community in northeast Phoenix, Maricopa County, Arizona. Jurisdictional waters, which represent approximately 2.3% of the total surface area of the site, are composed of approximately 43 acres of ephemeral watercourses and a 4.9-acre stock tank/detention area. The ephemeral washes flow in direct response to precipitation events, have a channel that is above the groundwater table at all times, and do not support self-sustaining populations of fish (Arizona Administrative Code, Title 18, Chapter 11, Article 1).

An initial function and value assessment was conducted based on water and habitat quality. (See *Xeroriparian Corridor Function and Value Assessment Paradise Ridge* in appendix A), and the jurisdictional waters in the project area were ranked as having high, medium, or low functions and values based on those criteria. With the agreement of the Arizona Department of Game and Fish and the ACOE, additional evaluations of these washes were conducted after the Function and Value assessment was completed. These evaluations added two new ranking criteria: 2-yr, 24-hr Hydrology (flow measured for individual segments, above and below tributary flows and wash stability (as indicated for individual segments from historical photographs). The original Function and Value ratings were then average with the new criteria to give the final weighted rankings as seen in Tables 2.4.3.a, 2.4.3.b, and 2.4.3.c. Based on these criteria, approximately 25.5 acres of jurisdictional waters have high functions and values, 20.1 acres have medium functions and values, and 2.3 acres have low functions and values. For purposes of this mitigation plan, the stock pond is included in the total 25.5 acres of high-ranking jurisdictional waters, but will be treated separately from the washes.

The WUS at Paradise Ridge have been classified as having a high, medium or low function and value based on habitat and hydrologic criteria. Approximately 20.61 wash acres and the 4.93 acre stock tank have a high ranking, 20.05 wash acres are rated medium, and 2.31 wash acres are rated low. Of the total 47.9 wash and stock tank acres, a total of 13.82 acres will be preserved in their natural state, and 34.08 acres will be impacted by development at Paradise Ridge (Table 1).

Mitigation will consist of (1) berming drainage channels adjacent to the existing preserved natural WUS's to create enhanced corridors of varying widths depending on their location and drainage function within the Paradise Ridge development. Most areas outside the WUS's will be left in their natural state but some augmenting of plant species may occur to replace unhealthy vegetation; and (2) the reconstruction of riparian wash corridors and the reconstruction of the stock tank. Jurisdictional washes ranked as having high function and value will be mitigated at a 6:1 mitigation to impact area ratio, medium-ranked washes will be mitigated at a 4:1 ratio, and low-ranked washes will be mitigated at a 2:1 ratio. The total credited mitigated area for Paradise Ridge is 137.9 acres (actual mitigated area is 165.29 acres) that consists of 63.68 acres (81.49 actual acres) of high value reconstructed washes, 69.67 acres (79.25 actual acres) of medium value washes, and 4.55 acres of low value washes (Tables 1, 1A, 1B, and 1C). The corridors will range from the natural WUS width to 350 feet wide, depending on its location within the Paradise Ridge development. All the preserved and enhanced natural wash corridors will encompass the WUS's and the reconstructed washes will encompass a reconstructed low flow channel, at a minimum the width of the impacted WUS.

Table 1. Total acres of WUS's, total WUS acres preserved, WUS acres impacted, and mitigation commitments at Paradise Ridge

TOTAL WUS ACRES AT PARADISE RIDGE		**47.89**	
	High	25.54	
	Medium	20.05	
	Low	2.30	
TOTAL WUS ACRES PRESERVED		**13.82**	
	High	12.00	
	Med.	2.50	
	Low	0.03	
TOTAL WUS ACRES IMPACTED		**34.08**	
	High	13.81	
	Medium	17.99	
	Low	2.27	
OVERALL MITIGATION RATIO (Pertaining to Acreage)		**4.85:1**	
	High	6.00:1	
	Medium	4.00:1	
	Low	2.00:1	
Mitigation			**Credited**
Riparian habitat associated with High Value Avoided Washes		35.65	17.83
Reconstructed & New High Value Washes/Stock Tank		45.85	45.85
		81.49	**63.68**
Riparian habitat associated with Medium Value Avoided Washes		19.14	9.57
Reconstructed & New Medium Value Washes		60.10	60.10
		79.25	**69.67**
Riparian habitat associated with Low Value Avoided Washes		0.00	00.00
Reconstructed and New Low Value Washes		4.55	4.55
		4.55	**4.55**
	TOTAL	**165.29**	**137.90**

Table 1A

REVISED MITIGATION PLAN
High Value 6 to 1

High Value Jurisdictional Washes Not Preserved or Reconstructed

Wash No.	Not Preserved	Reconstructed	Total Area	Mitigation Value
5	0.28	0.21	**0.49**	2.92
6C	0.25	0.35	**0.60**	3.57
8	0.87	0.17	**1.04**	6.16
8C	0.00	0.18	**0.18**	1.04
8D	0.00	0.09	**0.09**	0.52
8F	1.02	0.00	**1.02**	6.01
8G	0.00	0.48	**0.48**	2.81
9	1.64	0.50	**2.14**	12.62
10	0.19	0.03	**0.22**	1.29
10B	1.41	0.05	**1.46**	8.62
18A	0.46	0.04	**0.50**	2.96
Stock Tank	0.00	4.93	**4.93**	29.10
Roadway/Golf Crossings	0.00	0.66	**0.66**	3.87
Actual Subtotal	6.12	7.69	**13.81**	81.49
Credited Subtotal	n/a	n/a	n/a	63.68

Table 1B

Medium Value 4 to 1

Medium Value Jurisdictional Washes not Preserved or Reconstructed

Wash No.	Not Preserved	Reconstructed	Total Area	Mitigation Value
4	0.05	0.03	0.08	0.37
5A	0.70	0.00	0.70	3.09
5C	0.00	0.03	0.03	0.13
6	1.04	0.74	1.79	7.88
6A	0.00	0.36	0.36	1.58
6D	0.03	0.39	0.42	1.84
6E	0.17	0.15	0.32	1.40
7	0.46	0.80	1.26	5.54
7A	0.92	0.00	0.92	4.06
7B	0.90	0.22	1.12	4.94
8B	0.46	0.25	0.71	3.11
8E	0.15	0.00	0.15	0.66
8H	0.51	0.02	0.52	2.30
9A	2.01	0.00	2.01	8.85
9B	0.17	0.00	0.17	0.75
9C	0.02	0.00	0.02	0.11
9D	0.22	0.00	0.22	0.99
9E	0.04	0.00	0.04	0.16
9F	0.03	0.00	0.03	0.13
9G	0.19	0.00	0.19	0.85
10A	0.00	1.09	1.09	4.80
10C	0.32	0.00	0.32	1.39
13	0.19	0.00	0.19	0.84
14	0.12	0.00	0.12	0.52
15	0.26	0.40	0.66	2.89
17A	0.49	0.00	0.49	2.14
18	2.22	0.06	2.29	10.06
18B	0.06	0.00	0.06	0.25
20	0.21	0.00	0.21	0.93
21	0.00	0.59	0.59	2.58
Roadway/Golf Crossings	0.00	0.94	0.94	4.12
Actual Subtotal	11.94	6.05	18.00	79.25
Credited Subtotal	n/a	n/a	n/a	69.67

Table 1C

Low Value 2 to 1

Low Value Jurisdictional Washes Not Preserved or Reconstructed

Wash No.	Not Preserved	Reconstructed	Total Area	Mitigation Value
1	0.30	0.00	0.30	0.61
_3	0.55	0.17	0.71	1.43
5B	0.09	0.00	0.09	0.18
6B	0.12	0.00	0.12	0.23
9H	0.16	0.00	0.16	0.31
9I	0.03	0.00	0.03	0.06
11	0.02	0.00	0.02	0.03
12	0.12	0.00	0.12	0.23
15A	0.11	0.00	0.11	0.21
15B	0.01	0.00	0.01	0.01
16	0.11	0.02	0.13	0.25
17	0.03	0.00	0.03	0.06
19	0.31	0.02	0.34	0.67
20A	0.10	0.03	0.13	0.25
Roadway/Golf Crossings	0.00	0.00		0.00
Actual Subtotal	2.03	0.24	2.27	4.55
Credited Subtotal	n/a	n/a	n/a	4.55
Actual Grand Total	20.10	13.98	34.08	165.29
Credited Grand Total	n/a	n/a	n/a	137.90

Mitigation Ratio

Actual Mitigated Acres:	165.29	
Actual Mitigation ratio:	4.85	to 1
Credited Mitigated Acres:	137.90	
Credited Mitigation ratio:	4.05	to 1

High value washes will be mitigated at a 6.00:1 ratio for a total of 81.49 acres however, the credited amount of acres is 63.68. Of this total, 35.65 acres (17.83 credited acres) will be riparian habitat associated with avoided washes. 45.85 acres will consist of reconstructed washes and riparian habitat (corridors) and the reconstruction of the stock tank. The reconstructed wash corridor will be vegetated to the degree of plant density and species and structural diversity that replicates high value washes and assumes that vegetation will be clustered along and immediately adjacent to the reconstructed low flow channel. The more drought tolerant plants (e.g., creosote, foothills paloverde) will be planted on the margins of the planting areas (Table 1). High value wash corridors will range in width from fourteen feet, a reconstructed low flow channel, to three-hundred-fifty (350) feet wide depending on the corridors location within the Paradise Ridge development.

Approximately 17.99 acres of the WUS's within Paradise Ridge having a medium function and value will be impacted and they will be mitigated at a 4:1 ratio for a total of 79.25 acres, however, the credited amount of acres is 69.67. Of this, 19.14 acres (9.57 credited acres) will be riparian habitat associated with avoided washes and 60.10 acres will consist of reconstructed washes with associated riparian habitat. Reconstructed areas will be augmented with plantings at a density and diversity that will replicate high value washes (Table 1). The planting scheme will follow that as identified above. Medium value wash corridors will range in width from eight feet, a reconstructed low flow channel, to three-hundred (300) feet wide depending on the corridors location within the Paradise Ridge development.

Of the 2.30 acres of low value WUS's in Paradise Ridge, 2.27 acres will be impacted. They will be mitigated at a 2:1 ratio for a total of 4.55 acres and will consist of 0.03 acres of avoided washes and 4.52 acres of reconstructed washes and corridors. The reconstructed washes will be revegetated at a density and diversity that will replicate high value washes and will be planted in accordance with the scheme as identified above (Table 1). Low value wash corridors will range in width from five feet, a natural WUS, to fifty to seventy-five (50-75) feet wide depending on the corridors location within the Paradise Ridge development.

On-site mitigation will be phased in over the 20-year build-out of the proposed project as impacts occur to jurisdictional waters. Following each auction of parcels, the Arizona State Land Department (ASLD), its agents or assignees will initiate mitigation concurrent with the impacts associated with the development activities of each phase. Mitigation activities associated with impacts to jurisdictional waters within each auction parcel will be completed within one year of the occurrence of the impact. Assignees in subsequent auctions will implement mitigation within and adjacent to auctioned parcels as development occurs. Corridors will be maintained free of ground vegetation disturbances for the life of the project.

Plant Density and Species Diversity

The reconstructed wash corridors will emulate plant density and species diversity of the WUS impacted by the project activities. A minimum of 25 percent of the total number of woody plants (trees, shrubs and cacti) will be salvaged from the project area. The remainder of plants used to augment wash corridors within Paradise Ridge will be obtained from commercial sources. All nursery grown plants shall be identified to assure that only locally adapted native plants are utilized. Each reconstructed wash and associated corridor will have plant density and species diversity consistent with density and diversity of high value washes.

Segments of nine (9) high value washes will be avoided within Paradise Ridge (Washes 5, 6C, 8, 8D, 8F, 8G, 9, 10, 22). 35.65 acres of riparian habitat will be established along those nine high value wash segments.

Ten washes will be reconstructed to replicate high value washes (Washes 5, 6C, 8, 8C, 8F, 8G, 9, 10, Stock Tank Outlet and Scottsdale Road Channels). Total area of the corridors, excluding the newly constructed jurisdictional waters, will encompass 45.85 acres. The density of trees, shrubs, cacti, perennial forbs and annual forbs will be based on existing plant density associated with undisturbed high value washes at Paradise Ridge (Table 2). For example, 779 Ironwood (45.85 x 17) will be planted. Of these, a minimum of 195 will be salvaged from the project area. Vegetation will be clustered along and immediately adjacent to the reconstructed low flow channel, as occurs in existing natural high value wash corridors at Paradise Ridge. The more drought-tolerant plants (e.g., creosote, foothills paloverde) will be planted on the margins of the planting area.

Segments of nine (9) medium value washes will be avoided within Paradise Ridge (Washes 2, 5C, 6, 6A, 6D, 7, 8A, 8B, 15). Riparian Habitat totaling 19.14 acres will be established along the nine medium value wash segments.

Twelve washes will be reconstructed to replicate medium value washes (Washes 6, 6A, 6D, 7, 8B, 15, 21, and the Pinnacle Peak, Scottsdale Road, Deer Valley Detention Basin, Main North/South, and 64th Street Channels). Total area of corridors excluding the newly constructed jurisdictional waters will encompass 60.10 acres. The density of trees, shrubs, cacti, perennial forbs and annual forbs will be based on existing plant density within undisturbed high value washes at Paradise Ridge (Table 2). For example, 1022 Ironwood (60.10 x 17) will be planted. A minimum of 255 will be salvaged from the project area. Vegetation will be clustered along and immediately adjacent to the reconstructed wash channel, as occurs in existing natural high value wash corridors at Paradise Ridge. The more drought-tolerant plants (e.g., creosote, foothills paloverde) will be planted on the margins of the planting area.

One segment of a low value wash will be avoided (wash 9I) and one will be reconstructed to replicate a low value wash (64th Street Channel). Riparian Habitat totaling 4.55 acres will be established along this wash. For the reconstructed wash the density of trees, shrubs, cacti, perennial forbs and annual forbs will be based on existing plant density within undisturbed high value washes at Paradise Ridge (Table 2). For example, 77 Ironwood (4.55 x 17) will be planted. Of these, a minimum of 19 will be salvaged from the project area. Vegetation will be clustered along and immediately adjacent to the reconstructed low flow channel, as occurs in existing natural high value wash corridors at Paradise Ridge. The more drought-tolerant plants (e.g., creosote, foothills paloverde) will be planted on the margins of the planting area.

Maintenance

Short-term maintenance of the riparian habitat areas may include staking, fertilizing, and weeding in the immediate area of the vegetation to be re-established and maintenance of the irrigation system. Once vegetation becomes established and accepted by the USACOE, these practices will be discontinued. Long-term management of the wash corridors will not include pruning, removal of snags, mistletoe control, weeding or plant litter removal.

Monitoring

Monitoring reports will be submitted to the Corps of Engineers annually until success criteria for the project are met.

2.0 PROJECT DESCRIPTION

2.1 Location

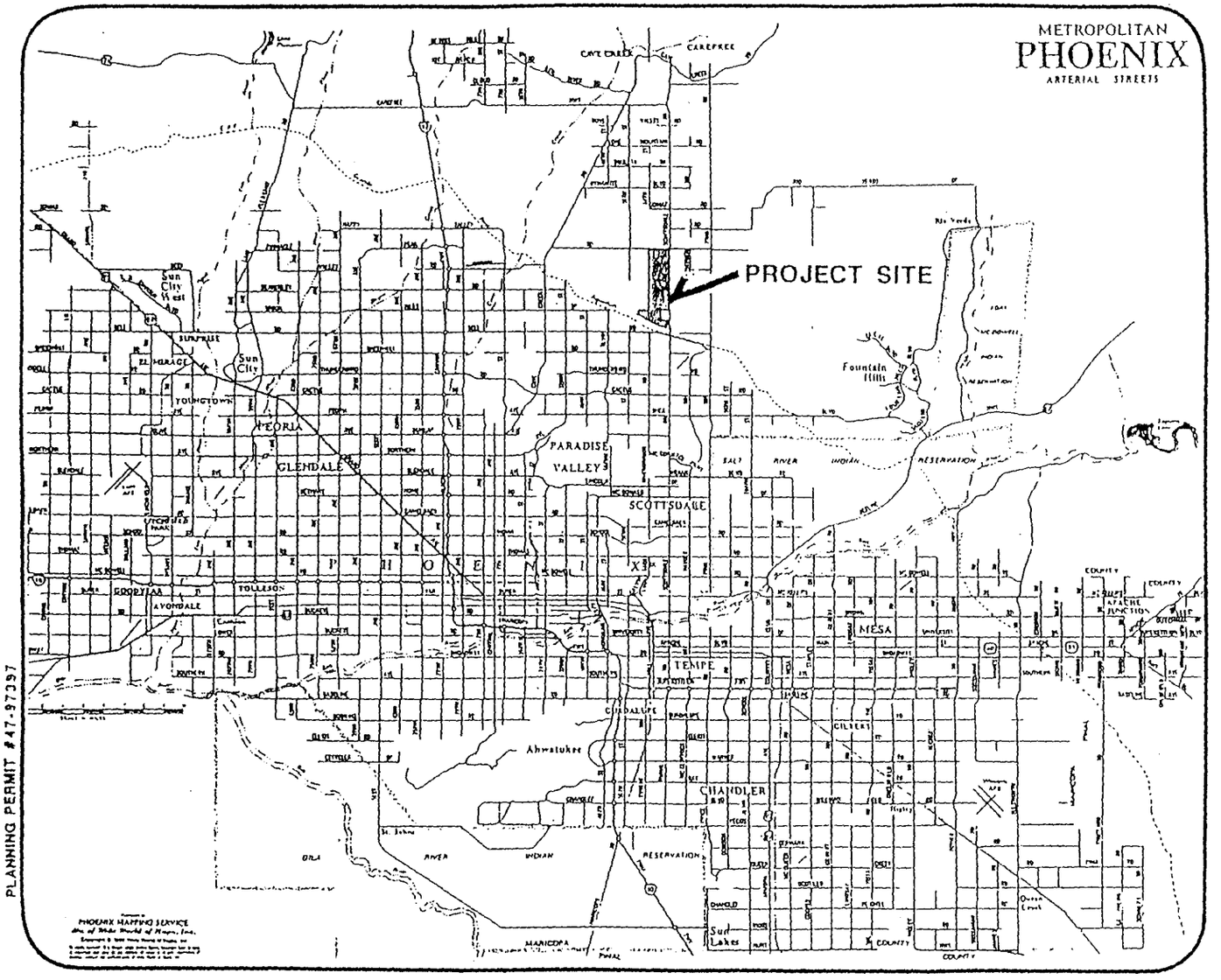
The project is located approximately 15 miles north-northeast of downtown Phoenix (Figure 1-Vicinity Map). The site is located within Sections 15, 22, 27, and portions of 33 and 34, in Township 4 North, Range 4 East, of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. The project area is generally bounded on the north by Pinnacle Peak Road, on the south by the Bureau of Reclamation Reach 11, on the east by Scottsdale Road, and on the west by the proposed future alignment of 64th Street and the Desert Ridge development. The project area also includes a small parcel located adjacent to the Mayo Hospital Campus west of the proposed 64th Street alignment. Power line easements run across the northern edge and northeast corner of the project area. Construction has commenced on the Pima Freeway, which bisects the southern third of the Paradise Ridge project.

2.2 Project Summary

As a master-planned community, Paradise Ridge seeks to create a unique community by creating a desirable theme and lifestyle that will appeal to all socioeconomic groups. To meet that objective adhered to with strict design guidelines and standards governing all phases and aspects of development must be created and adhered to for every parcel. Paradise Ridge is designed to include a mix of uses, including residential, commercial resorts, educational, and golf course facilities within the same community.

The project will include natural and reconstructed washes within, self-sustaining riparian corridors. The project also includes street side natural areas landscaped with Sonoran Desert plant materials (salvaged from on-site), pedestrian walkways, low water use landscaping, and water conserving features.

REGIONAL SITE LOCATION MAP



PLANNING PERMIT #47-97397

Paradise Ridge

NORTH

NO SCALE

Figure 1. Vicinity Map

Development of Paradise Ridge will occur in several phases. Although the exact location and timing of all the development phases is unknown at this time, development will begin south of the Pima Freeway with the 70-acre commercial parcel already under long-term lease. The multi-family land south of the Pima Freeway and the 39-acre commercial parcel south of Chauncey Ranch will follow shortly thereafter (see Figure 2). Development will then move north of the Pima Freeway, with the golf courses and associated resort facilities projected to be developed first. All development phasing will be dependent on the timing of property disposition by the ASLD, which in turn will be dependent upon market demand for ASLD land. The ASLD will determine through market analysis, when, where and how much property to sell at any one time, based on its statutory mandate of maximizing benefit to the Trust. Purchasers or lessees of portions of its land at public auction, subject to conditions imposed by the ASLD as part of the auction process, will complete actual development. The timing of land development activities by successful bidders will be based to a certain extent on proximity to infrastructure, the availability of capital for construction, and the general conditions of the local real estate market at that time. It is expected that Paradise Ridge, as currently planned, will be completed over a 10 to 20 year time frame.

Development of the 2,131 acres of Paradise Ridge is the subject of this mitigation plan. Activities regulated pursuant to Section 404 will include construction of road crossings and storm drains, utilities installation, wash reconstruction, grading for recreational amenities, and typical grading associated with developments, including building pads. Grading activity will mostly impact the narrow, discontinuous ephemeral washes and areas of uncontrolled sheet flooding. Most of the natural washes that are continuous across the project site will be avoided or will be reconstructed within continuous, sustainable corridors that will safely convey the peak 100-year stormwater flows.

The City of Phoenix will provide potable water, wastewater, and water reclamation facilities to the project area. These services are described in the *City of Phoenix, Peripheral Areas C and D Water, Wastewater, and Water Reclamation Plan.* Water for large turf areas and golf course irrigation will be obtained from the city's domestic potable water system, which will eventually be replaced by CAP and reclaimed water. The use of reclaimed water on-site will be addressed through the wastewater reuse permit program administered by the Arizona Department of Environmental Quality (ADEQ). Surface water would be discharged both to jurisdictional water and non-jurisdictional water on the Paradise Ridge project site. A National Pollutant Discharge Elimination System (NPDES) permit will be obtained, as required, pursuant to Section 402 of the Clean Water Act.

2.3 Responsible Parties

Project Development/Mitigation and Monitoring:

Arizona State Land Department
1616 W. Adams
Phoenix, Arizona 85007
602-542-3121
Contact: Ottozawa Chatupron

Compiler of Mitigation Plan:

Entranco,Inc.
7740 North 16th Street, Suite 200
Phoenix, Arizona 85020
602-889-7000
Contact: Barbara Wilson, Lesley McWhirter

Upon successful auction of each parcel, the mitigation obligation will be assigned to the purchaser or lessee by ASLD. An Implementation Handbook will be prepared that addresses mitigation responsibilities and methodologies for future assignees of the auction parcels within the project area.

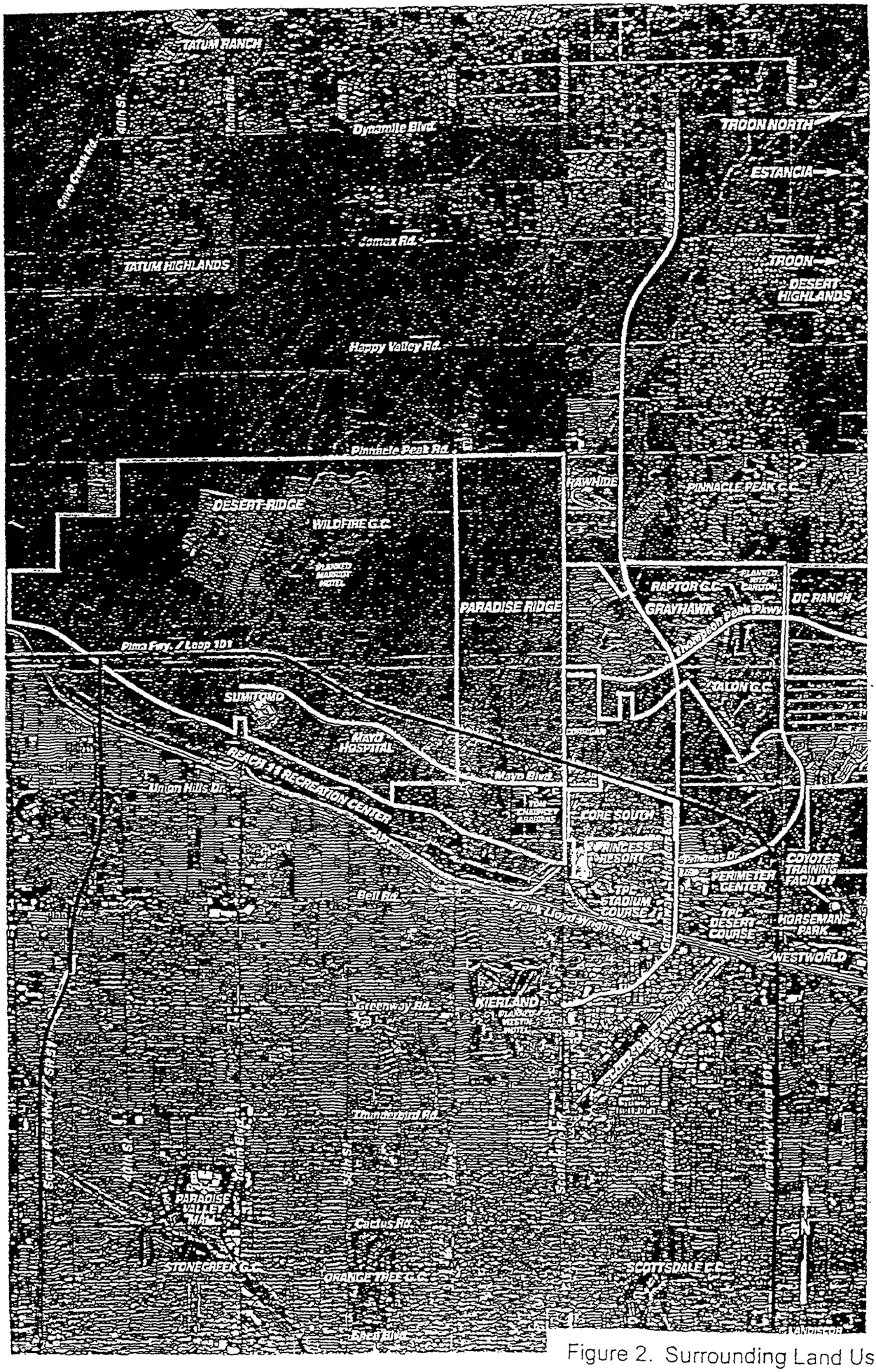


Figure 2. Surrounding Land Use Map

2.4 Waters of the United States to be Impacted

2.4.1 Acreage

There are 47.9 acres of WUS within the 2,131-acre project area. The proposed work will directly impact 34.08 acres of on-site WUS. The washes that cannot practicably be avoided at Paradise Ridge consist of 13.81acres of high-ranked washes (including the 4.9-acre stock pond), 17.99 acres of medium-ranked washes, and 2.27 acres of low-ranked washes.

Table 2.4. Acreages of Existing and Impacted WUS within the Paradise Ridge Master Planned Community, Phoenix, Maricopa County, Arizona.

Section	Existing WUS (acres)				Impacted WUS (acres)			
	High	Medium	Low	Total	High	Medium	Low	Total
Washes	20.61	20.05	2.31	42.97	8.88	17.99	2.27	29.15
Stock Tank	4.93	0		4.93	4.93	0	0	4.93
Total	25.54	20.05	2.31	47.90	13.81	17.99	2.27	34.08

2.4.2 Description

The Paradise Ridge Master Planned Community is located within two subdivisions of the Sonoran Desert Scrub biotic community: the Lower Colorado River Valley Sonoran desert scrub and the Arizona Upland Sonoran desert scrub. A transition area lies between the two subdivisions. The elevation ranges from 1,830 feet above mean sea level (MSL) at the northeast corner to 1,550 feet above MSL in the southwest portion of the project area. Precipitation averages less than eight inches per year, most of which comes either in the winter or in late summer. Representative plant species in Sonoran desert scrub communities include mesquite, cat claw acacia, creosote bush, paloverde, ironwood, and a variety of cacti. The project area has experienced considerable disturbance for many years, e.g., off-road vehicle travel, firewood collection, littering, and road and utility construction. In addition, cattle grazing have altered the natural vegetation. Consequently, typical characteristics of a Sonoran desert scrub community have been modified and the habitat value of the area is somewhat degraded.

Aquatic resources on the property are limited. There are no perennial or intermittent streams or any wetlands on the site. The terrain on Paradise Ridge lacks the defined ridges and washes associated more with upslope areas to the north. Instead, the project site is relatively flat with terrain that allows run off from the larger storm events to sheet flow across the site.

Paradise Ridge receives runoff from 3.31 square miles along the north property boundary, which is adjacent to Pinnacle Peak Road. Runoff from an additional 23.25 square miles is intercepted along the east property boundary at Scottsdale Road, thereby creating a total offsite

drainage area of 26.56 square miles. The drainage area intercepted by Paradise Ridge lies on pediment and alluvial plains. Although the majority of the upper pediment portion of the watershed has defined swales and washes, the lower alluvial plain (including Paradise Ridge) is characterized by hundreds of small braided washes which have bank full capacities ranging from approximately 25 cubic feet per second (cfs) to 250 cfs.

The majority of the watershed is still in a natural, undeveloped state. Although planning studies have been published for several regional drainage system concepts, none of the regional plans have yet been fully constructed. The Rawhide Wash watershed, which is the primary contributor of runoff into Paradise Ridge, is presently unregulated, with the exception of some minor diversion berms along the lower reaches of the watercourse.

New residential development is being undertaken in a manner that seeks to minimize disruptions to natural drainage patterns. As a result, the majority of offsite runoff that enters Paradise Ridge does so along historic drainage corridors. However, a noticeable exception occurs at the Deer Valley – Scottsdale Road intersection. A diversion channel has been constructed along the Deer Valley Road alignment, between Hayden Road and Scottsdale Road. This diversion channel intercepts runoff from approximately 5.98 square miles and directs a significant concentration of runoff into Paradise Ridge, near the intersection of Scottsdale Road and the Deer Valley Road alignment.

All hydrology and drainage information and criteria used in this mitigation plan have been obtained from the March 2001 report prepared by Robert L. Ward, P.E., entitled *Hydrology Analysis – Jurisdictional "404" Washes Master Drainage Plan for Paradise Ridge.*

2.4.3 Function and Values

A report entitled *Xeroriparian Function and Value Assessment for Paradise Ridge* ("Function and Value Assessment") was prepared by Entranco in November 2000 to assess the quality of the WUS within the project area. A rating system was developed, and the function and value of each wash was assessed based primarily on habitat quality and hydrologic criteria. Hydrologic functions, including carrying capacity and channel stability, were assessed and averaged, along with the habitat quality, to obtain a ranking for each wash. These criteria were applied to obtain a high, medium or low function and value ranking for the WUS (Appendix A). With the agreement of the Arizona Department of Game and Fish and the ACOE, additional evaluations of these washes were conducted after the Function and Value assessment was completed. These evaluations added two new ranking criteria: 2-yr, 24-hr Hydrology (flow measured for individual segments, above and below tributary flows and wash stability (as indicated for individual segments from historical photographs). The original Function and Value ratings were then average with the new criteria to give the final weighted rankings as seen in Tables 2.4.3.a, 2.4.3.b, and 2.4.3.c.

Habitat for plants and wildlife, as well as channel stability and flood flow transport and desynchronization, are the primary functions and values of the jurisdictional areas. Due to the enhanced availability of water, ephemeral washes typically have a higher density and diversity of plants compared to adjacent upland areas. The higher density and diversity of woody species, multiple substrate layers (i.e., under story, midstory, and over story), and larger individuals of plant species provide more resources for wildlife along ephemeral washes when compared with upland areas. Resources for wildlife commonly associated with xeric riparian areas include cover, food, and nesting substrates. Riparian areas also provide a corridor for

wildlife migration and movement. Likewise, the stability of the channel, as well as its capacity to carry water and desynchronize flood flows, is important criteria for the proper hydrologic function of washes.

Based on these criteria, approximately 25.5 acres of WUS have high functions and values, 20.1 acres have medium functions and values, and 2.3 acres have low functions and values. For purposes of this mitigation plan, the stock pond is included in the total 25.5 acres of high-ranking WUS, but will be treated separately from the washes.

3.0 MITIGATION PLAN

3.1 Proposed On-Site Mitigation

On-site mitigation within the Paradise Ridge project area will consist of the replacement of functions and values at a 6:1 mitigation to impact area ratio for high-ranked washes, a 4:1 ratio for medium-ranked washes, and a 2:1 ratio for low-ranked washes. 13.82 acres of the WUS within Paradise Ridge will be avoided by the project activities. Impacts to these washes will be further minimized by the establishment of Riparian Habitat (corridors). These corridors will range from 14 to 350 feet wide. These corridors will total approximately 54.79 acres (27.4 credited acres), not including the WUS. Reconstructed natural washes (including the stock tank area) with similar riparian habitat will provide an additional 110.50 acres. The total area of corridors, reconstructed natural washes with associated riparian habitat and flood control systems, is 165.29 acres (137.9 credited acres) (Table 3.1.a, Table 3.1.b and Table 3.1.c). The overall on-site, in-kind mitigation ratio is 4.85:1and the overall on-site credited, in-kind mitigation ratio is 4.05 :1.

The on-site mitigation areas are on lands under the jurisdiction of the ASLD. As the applicant, ASLD is responsible for all mitigation. Deed, lease, and/or other restrictions will be recorded on the avoided and reconstructed natural wash with associated corridors. As future dispositions are completed, the future owners, lessees, assignees of ASLD Land or ASLD will be charged with the responsibility for the long-term management of the mitigation areas, including the provision of irrigation water to the reconstructed wash corridors, as appropriate. Long-term management of the corridors will not include pruning, removal of snags, mistletoe control, weeding, or plant litter removal. There are currently no deed, lease and/or other restrictions or encroachments within the proposed mitigation areas.

<u>Avoided Washes</u>

The avoided washes will be preserved and will be enhanced by creating a riparian habitat along the perimeter of the wash. The mapping of the washes and corridors will be sufficiently wide to preserve the existing vegetation and to allow normal hydrology within the existing washes and adjacent overbanks (Figure 4.a - Natural Wash Corridor Typical Section). The avoided washes would remain undisturbed.

The interceptor channels and detention basins that will be constructed along Pinnacle Peak and Scottsdale Roads (Figure 3 – Proposed Project) will regulate inflows to the avoided washes. Flood protection measures will be constructed on the edge of the riparian habitat in order to contain the 100-year storm event within the corridors. These measures will consist of manmade berms with a vertical concrete or soil-cement cut-off wall that will extend below ground to prevent undercutting by scour. The cut-off walls will be covered with compacted earth. During 100-year discharges, overbank flow depths within the corridors would be approximately 2 feet.

Table 2.4.3 a

HIGH VALUE JURISDICTIONAL WASHES

> 2.5 TO 3.0

	Criterion 1 - Function & Value (as presented by Entranco and					Criterion 2 - 2-yr, 24-hr Hydrology (flow measured for individual segments, above and						Criterion 3 - Wash Stability (as indicated for individual segments from					Final Wash Ranking
	Wash Rankings			Weight = 100%		Wash Rankings				Weight = 50%		Wash Rankings			Weight = 50%		
Wash No.	3 High	2 Medium	1 Low	Area	Criterion Ranking	3 Significant >500 cfs	2 Influential 50 to 500 cfs	1 Minor 10 to 50 cfs	0 Insgnfcnt <10 cfs	Area	Criterion Ranking	3 Resistant or Permanent (>29 yrs)	2 Mostly Continuous (10 to 29 yrs)	1 Mostly Discontinuous (<10 yrs)	Area	Criterion Ranking	
5	2.2630	0.0000	0.0000	2.2630	3.0000	0.0000	2.2630	0.0000	0.0000	2.2630	2.0000	2.0970	0.1660	0.0000	2.2630	2.9266	2.7317
6C	1.4800	0.3970	0.1680	2.0450	2.6416	0.0000	2.0450	0.0000	0.0000	2.0450	2.0000	2.0450	0.0000	0.0000	2.0450	3.0000	2.5708
8	3.3080	0.2050	0.0000	3.5130	2.9416	0.5980	1.8060	0.8200	0.2810	3.5130	1.7746	2.9530	0.0000	0.5600	3.5130	2.6812	2.5848
8C	0.1760	0.0000	0.0000	0.1760	3.0000	0.0000	0.0000	0.1760	0.0000	0.1760	1.0000	0.1760	0.0000	0.0000	0.1760	3.0000	2.5000
8D	1.4770	0.0000	0.0000	1.4770	3.0000	1.4770	0.0000	0.0000	0.0000	1.4770	3.0000	1.4770	0.0000	0.0000	1.4770	3.0000	3.0000
8F	1.4190	0.0000	0.0000	1.4190	3.0000	1.4190	0.0000	0.0000	0.0000	1.4190	3.0000	1.4190	0.0000	0.0000	1.4190	3.0000	3.0000
8G	2.4050	0.0000	0.0760	2.4810	2.9387	2.4810	0.0000	0.0000	0.0000	2.4810	3.0000	2.3570	0.1240	0.0000	2.4810	2.9500	2.9569
9	2.3766	0.4294	0.0000	2.8060	2.8470	2.1045	0.0000	0.0000	0.7015	2.8060	2.2500	2.6660	0.0838	0.0562	2.8060	2.9301	2.7185
10	2.2580	0.0000	0.0640	2.3220	2.9449	1.9740	0.3480	0.0000	0.0000	2.3220	2.8501	2.2060	0.1160	0.0000	2.3220	2.9500	2.9225
10B	1.4600	0.0000	0.0000	1.4600	3.0000	0.0000	1.3140	0.0000	0.1460	1.4600	1.0000	1.3870	0.0730	0.0000	1.4600	2.9500	2.6875
18A	0.3763	0.1257	0.0000	0.5020	2.7496	0.0000	0.5020	0.0000	0.0000	0.5020	2.0000	0.5020	0.0000	0.0000	0.5020	3.0000	2.6248
22	0.1490	0.0000	0.0000	0.1490	3.0000	0.0000	0.1490	0.0000	0.0000	0.1490	2.0000	0.1490	0.0000	0.0000	0.1490	3.0000	2.7500
Wash Totals	19.148	1.157	0.308	20.613		10.054	8.427	1.004	1.129	20.613		19.434	0.563	0.616	20.613		
Stock Tank	4.9300	0.0000	0.0000	4.9300	3.0000	4.9300	0.0000	0.0000	0.0000	4.9300	3.0000	4.9300	0.0000	0.0000	4.9300	3.0000	3.0000
Grand total	24.0779	1.1571	0.3080	25.5430		14.9835	8.4270	1.0040	1.1285	25.5430		24.3640	0.5628	0.6162	25.5430		

Table 2.4.3 b

MEDIUM VALUE JURISDICTIONAL WASHES

> 1.5 < 2.5

	Criterion 1 - Function & Value (as presented by Entranco and					Criterion 2 - 2-yr, 24-hr Hydrology (flow measured for individual segments, above and						Criterion 3 - Wash Stability (as indicated for individual segments from					Final
	Wash Rankings			Weight = 100%		Wash Rankings				Weight = 50%		Wash Rankings			Weight = 50%		Wash
Wash No.	3 High	2 Medium	1 Low	Area	Criterion Ranking	3 Significant >500 cfs	2 Influential 50 to 500 cfs	1 Minor 10 to 50 cfs	0 Insgnfcnt <10 cfs	Area	Criterion Ranking	3 Resistant or Permanent (>29 yrs)	2 Mostly Continuous (10 to 29 yrs)	1 Mostly Discontinuous (<10 yrs)	Area	Criterion Ranking	Ranking
2	0.6720	0.0000	0.0000	0.6720	3.0000	0.0000	0.0000	0.6720	0.0000	0.6720	1.0000	0.0000	0.6720	0.0000	0.6720	2.0000	2.2500
4	0.0000	0.0830	0.0000	0.0830	2.0000	0.0000	0.0000	0.0000	0.0830	0.0830	0.0000	0.0830	0.0000	0.0000	0.0830	3.0000	1.7500
5A	0.0000	0.7640	0.0000	0.7640	2.0000	0.0000	0.0000	0.7640	0.0000	0.7040	1.0000	0.6400	0.1150	0.0000	0.7640	2.8495	1.9624
5C	0.0000	0.0670	0.0000	0.0670	2.0000	0.0000	0.0000	0.0670	0.0000	0.0670	1.0000	0.0670	0.0000	0.0000	0.0670	3.0000	2.0000
6	1.0830	0.9550	0.0760	2.1140	2.4763	0.0000	0.0000	1.1830	0.9310	2.1140	0.5596	2.1140	0.0000	0.0000	2.1140	3.0000	2.1281
6A	0.4700	0.0000	0.0000	0.4700	3.0000	0.0000	0.2700	0.0000	0.2000	0.4700	1.1489	0.2350	0.2350	0.0000	0.4700	2.5000	2.4122
6D	0.2900	0.2170	0.0000	0.5070	2.5720	0.0000	0.0000	0.0000	0.5070	0.5070	0.0000	0.5070	0.0000	0.0000	0.5070	3.0000	2.0360
6E	0.0000	0.2170	0.1020	0.3190	1.6803	0.0000	0.0000	0.0000	0.3190	0.3190	0.0000	0.3190	0.0000	0.0000	0.3190	3.0000	1.5901
7	1.6390	0.0900	0.0000	1.7290	2.9479	0.0000	0.0000	0.0000	1.7290	1.7290	0.0000	1.7290	0.0000	0.0000	1.7290	3.0000	2.2240
7A	0.9220	0.0000	0.0000	0.9220	3.0000	0.0000	0.0000	0.0000	0.9220	0.9220	0.0000	0.9220	0.0000	0.0000	0.9220	3.0000	2.2500
7B	0.8120	0.3110	0.0000	1.1230	2.7231	0.0000	0.0000	0.0000	1.1230	1.1230	0.0000	0.9470	0.0000	0.1760	1.1230	2.6866	2.0332
8A	0.0000	0.1270	0.0000	0.1270	2.0000	0.0000	0.0000	0.0000	0.1270	0.1270	0.0000	0.1270	0.0000	0.0000	0.1270	3.0000	1.7500
8B	0.7950	0.0000	0.0000	0.7950	3.0000	0.0000	0.0000	0.7950	0.0000	0.7950	1.0000	0.7160	0.0790	0.0000	0.7950	2.9006	2.4752
8E	0.0000	0.1510	0.0000	0.1510	2.0000	0.0000	0.0000	0.0000	0.1510	0.1510	0.0000	0.1510	0.0000	0.0000	0.1510	3.0000	1.7500
8H	0.0000	0.4080	0.1150	0.5230	1.7801	0.0000	0.0000	0.5230	0.0000	0.5230	1.0000	0.5230	0.0000	0.0000	0.5230	3.0000	1.8901
9A	1.8550	0.1540	0.0000	2.0090	2.9233	0.6040	0.0000	0.0000	1.4050	2.0090	0.9019	1.1060	0.9030	0.0000	2.0090	2.5505	2.3248
9B	0.0000	0.1710	0.0000	0.1710	2.0000	0.0000	0.0000	0.0000	0.1710	0.1710	0.0000	0.0860	0.0850	0.0000	0.1710	2.5029	1.6257
9C	0.0000	0.0240	0.0000	0.0240	2.0000	0.0000	0.0000	0.0000	0.0240	0.0240	0.0000	0.0240	0.0000	0.0000	0.0240	3.0000	1.7500
9D	0.2240	0.0000	0.0000	0.2240	3.0000	0.0000	0.0000	0.0000	0.2240	0.2240	0.0000	0.0000	0.2240	0.0000	0.2240	2.0000	2.0000
9E	0.0370	0.0000	0.0000	0.0370	3.0000	0.0000	0.0000	0.0000	0.0370	0.0370	0.0000	0.0000	0.0000	0.0370	0.0370	1.0000	1.7500
9F	0.0290	0.0000	0.0000	0.0290	3.0000	0.0000	0.0000	0.0000	0.0290	0.0290	0.0000	0.0000	0.0290	0.0000	0.0290	2.0000	2.0000
9G	0.1920	0.0000	0.0000	0.1920	3.0000	0.0000	0.0000	0.0000	0.1920	0.1920	0.0000	0.1920	0.0000	0.0000	0.1920	3.0000	2.2500
10A	0.8760	0.0000	0.2130	1.0890	2.6088	0.0000	1.0890	0.0000	0.0000	1.0890	2.0000	0.0000	0.7300	0.3590	1.0890	1.6703	2.2220
10C	0.0000	0.3150	0.0000	0.3150	2.0000	0.0000	0.0000	0.0000	0.3150	0.3150	0.0000	0.3150	0.0000	0.0000	0.3150	3.0000	1.7500
13	0.0000	0.1697	0.0203	0.1900	1.8929	0.0000	0.0000	0.0000	0.1900	0.1900	0.0000	0.1900	0.0000	0.0000	0.1900	3.0000	1.6965
14	0.0740	0.0000	0.0430	0.1170	2.2650	0.0000	0.0000	0.0000	0.1170	0.1170	0.0000	0.0589	0.0470	0.0111	0.1170	2.4085	1.7346
15	1.4995	0.1585	0.0000	1.6580	2.9044	0.0000	0.0000	0.0000	1.6580	1.6580	0.0000	1.6499	0.0081	0.0000	1.6580	2.9951	2.2010
17A	0.0000	0.4174	0.0696	0.4870	1.8571	0.0000	0.0000	0.0000	0.4870	0.4870	0.0000	0.4630	0.0240	0.0000	0.4870	2.9507	1.6662
18	0.7854	1.4996	0.0000	2.2850	2.3437	0.0000	0.4568	0.0000	1.8282	2.2850	0.3998	2.2187	0.0683	0.0000	2.2850	2.9701	2.0143
18B	0.0000	0.0570	0.0000	0.0570	2.0000	0.0000	0.0000	0.0000	0.0570	0.0570	0.0000	0.0570	0.0000	0.0000	0.0570	3.0000	1.7500
20	0.0000	0.2120	0.0000	0.2120	2.0000	0.0000	0.0000	0.0000	0.2120	0.2120	0.0000	0.2120	0.0000	0.0000	0.2120	3.0000	1.7500
21	0.5850	0.0000	0.0000	0.5850	3.0000	0.0000	0.0000	0.0000	0.5850	0.5850	0.0000	0.5850	0.0000	0.0000	0.5850	3.0000	2.2500
Wash Totals	12.840	6.568	0.639	20.047		0.604	1.816	4.004	13.623	20.047		16.245	3.219	0.583	20.047		

Table 2.4.3 c

LOW VALUE JURISDICTIONAL WASHES

< 1.5

	Criterion 1 - Function & Value (as presented by Entranco and					Criterion 2 - 2-yr, 24-hr Hydrology (flow measured for individual segments, above and						Criterion 3 - Wash Stability (as indicated for individual segments from					Final Wash Ranking
	Wash Rankings			Weight = 100%		Wash Rankings				Weight = 50%		Wash Rankings			Weight = 50%		
Wash No	3.000 High	2.000 Medium	1.000 Low	Area	Criterion Ranking	3 Significant >500 cfs	2 Influential 50 to 500 cfs	1 Minor 10 to 50 cfs	0 Insgnfcnt <10 cfs	Area	Criterion Ranking	3 Resistant or Permanent (>29 yrs)	2 Mostly Continuous (10 to 29 yrs)	1 Mostly Discontinuous (<10 yrs)	Area	Criterion Ranking	
1	0.0000	0.2320	0.0710	0.3030	1.7657	0.0000	0.0000	0.0000	0.3030	0.3030	0.0000	0.0000	0.2970	0.0060	0.3030	1.9802	1.3779
3	0.0000	0.2100	0.5030	0.7130	1.2945	0.0000	0.0000	0.0000	0.7130	0.7130	0.0000	0.7130	0.0000	0.0000	0.7130	3.0000	1.3973
5B	0.0000	0.0000	0.0920	0.0920	1.0000	0.0000	0.0000	0.0000	0.0920	0.0920	0.0000	0.0920	0.0000	0.0000	0.0920	3.0000	1.2500
6B	0.0000	0.0000	0.1160	0.1160	1.0000	0.0000	0.0000	0.1160	0.0000	0.1160	1.0000	0.0000	0.1040	0.0120	0.1160	1.8966	1.2241
9H	0.0000	0.1570	0.0000	0.1570	2.0000	0.0000	0.0000	0.0000	0.1570	0.1570	0.0000	0.0000	0.0790	0.0780	0.1570	1.5032	1.3758
9I	0.0000	0.0000	0.0610	0.0610	1.0000	0.0000	0.0000	0.0000	0.0610	0.0610	0.0000	0.0610	0.0000	0.0000	0.0610	3.0000	1.2500
11	0.0000	0.0000	0.0170	0.0170	1.0000	0.0000	0.0000	0.0000	0.0170	0.0170	0.0000	0.0115	0.0055	0.0000	0.0170	2.6765	1.1691
12	0.0000	0.0523	0.0647	0.1170	1.4470	0.0000	0.0000	0.0000	0.1170	0.1170	0.0000	0.0585	0.0000	0.0585	0.1170	2.0000	1.2235
14A	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15A	0.0000	0.0000	0.1050	0.1050	1.0000	0.0000	0.0000	0.0000	0.1050	0.1050	0.0000	0.0213	0.0000	0.0837	0.1050	1.4057	0.8514
15B	0.0000	0.0000	0.0050	0.0050	1.0000	0.0000	0.0000	0.0000	0.0050	0.0050	0.0000	0.0000	0.0000	0.0050	0.0050	1.0000	0.7500
16	0.0000	0.0000	0.1260	0.1260	1.0000	0.0000	0.0000	0.0000	0.1260	0.1260	0.0000	0.0381	0.0000	0.0879	0.1260	1.6048	0.9012
17	0.0000	0.0000	0.0290	0.0290	1.0000	0.0000	0.0000	0.0000	0.0290	0.0290	0.0000	0.0290	0.0000	0.0000	0.0290	3.0000	1.2500
19	0.0000	0.0000	0.3370	0.3370	1.0000	0.0000	0.0000	0.0000	0.3370	0.3370	0.0000	0.3370	0.0000	0.0000	0.3370	3.0000	1.2500
20A	0.0000	0.0000	0.1270	0.1270	1.0000	0.0000	0.0000	0.0000	0.1270	0.1270	0.0000	0.1204	0.0066	0.0000	0.1270	2.9480	1.2370
Wash Totals	0.000	0.651	1.654	2.305		0.000	0.000	0.116	2.189	2.305		1.482	0.492	0.331	2.305		
Wash Total	31.988	8.377	2.601	42.965		10.658	10.243	5.124	16.941	42.965		37.160	4.274	1.530	42.965		
Stock Tank	4.9300	0.0000	0.0000	4.9300	3.0000	4.9300	0.0000	0.0000	0.0000	4.9300	3.0000	4.9300	0.0000	0.0000	4.9300	3.0000	3.0000
Grand Total	36.918	8.377	2.601	47.895		15.588	10.243	5.124	16.941	47.895		42.090	4.274	1.530	47.895		

Table 3.1A

Category	Jurisdictional Ephermeral Wash Area (acres)				Jurisdictional Ephemeral Washes Not Impacted (acres)				Jurisdictional Ephemeral Washes Impacted (acres)			
	High	Medium	Low	Total	High	Medium	Low	Total	High	Medium	Low	Total
Washes	20.61	20.05	2.31	42.97	11.74	2.05	0.03	13.82	8.88	17.99	2.27	29.15
Stock Tank *	4.93	0.00	0.00	4.93	0.00	0.00	0.00	0.00	4.93	0.00	0.00	4.93
Total	25.54	20.05	2.31	47.90	11.74	2.05	0.03	13.82	13.81	17.99	2.27	34.08

* Stock Tank: Special area that will require reconstruction and is not a defined JD wash. It will be treated separately from the other JDs and brought up to a quality, high-level riparian habitat.

Table 3.1B

Category	Preserved/Enhanced Natural Wash Corridors (acres)	Reconstructed Riparian Wash Corridors (acres)	Stock Tank (acres)	Total Mitigated Area (acres)
Washes	54.79	105.57	0.00	160.36
Stock Tank *	0.00	0.00	4.93	4.93
Actual Total	54.79	105.57	4.93	165.29
Credited Total	27.40	105.57	4.93	137.90

* Stock Tank: Special area that will require reconstruction and is not a defined JD wash. It will be treated separately from the other JDs and brought up to a quality, high-level riparian habitat.

Table 3.1C

Category	High Value Preserved Enhanced Natural Wash and ReconstructedCorridors (acres)	Medium Value Preserved Enhanced Natural Wash and ReconstructedCorridors (acres)	Low Value Reconstructed Wash Corridors (acres)	Total Mitigated Area (acres)
Washes	76.56	79.25	4.55	160.36
Stock Tank *	4.93	0.00	0.00	4.93
Actual Total	81.49	79.25	4.55	165.29
Credited Total	63.68	69.67	4.55	137.90

* Stock Tank: Special area that will require reconstruction and is not a defined JD wash. It will be treated separately from the other JDs and brought up to a quality, high-level riparian habitat.

Reconstructed Wash Corridors

The reconstructed washes and corridors will be located throughout the project area (see Figure 3-Proposed Project), and will be designed and constructed to emulate the functions and values of the natural washes in form and character (Figure 4.b-Reconstructed Riparian Wash Corridor – Typical Section).

The reconstructed washes will include an excavated low-flow channel with a sandy bottom, and overbank areas along the side of the wash that will vary in width. The low-flow channel will reflect the species density and composition of the high-ranked washes in the project area. The adjacent overbank and upland areas will emulate natural corridors and will be re-vegetated with native Sonoran xeroriparian and upland vegetation. In the case of those areas adjacent to golfing features, the re-vegetation will include native grasses. Steps will be taken to eliminate the possibility of non-native grasses or landscaping materials gaining a foothold in the areas re-vegetated with native plants. The corridors will vary in width in order to contain the 100-year flood. Berms will be constructed beyond the corridor boundaries.

Flood Control Channels/Detention Basins

Flood control channels will have reinforced banks to minimize erosion, and will have natural sandy channel bottoms (Figure 4.c, Flood Control Channels and Detention Basins – Typical Section). The primary function of these flood control features is to convey peak flows during storm events. The flood control channels will be re-vegetated in the same manner as reconstructed washes. No long term maintenance or ground disturbance will occur following construction of these flood control features.

Stock Tank

Currently the stock tank is in a degraded condition, with erosion slumps cutting through the berm and siltation build-up in the bowl. 4-wheel drive automobiles, motorcycles and bicycle use, have impacted the washes that have been diverted to empty into the stock tank. Large areas surrounding the stock tank have been denuded of vegetation and the soils have been compacted due to the above-mentioned uses as well as earlier cattle ranching activities. As part of the proposed mitigation, the stock tank area will be re-vegetated by using riparian vegetation, the berm will be repaired and the excess silt will be removed from the bowl (see Figure 4.d). This excess silt will be deposited on an upland surface and will likely be graded during construction activities. The stock tank will be re-vegetated to improve functions and values. This area will serve as a golf feature and a small pond at or near the northern opening of the stock tank area. Native grasses will be used for the golf feature area of the stock tank. See Figure 4D for a picture of the existing stock pond and an example of what it might look like after reconstruction.

3.1.1 Existing Conditions

Washes in the project support a greater number of woody plant species compared with upland areas. Although many plant species are ubiquitous within the project area, plants like yellow and foothill paloverde, wolfberry, desert hackberry, ironwood, mesquite and triangleleaf bursage are more commonly found along ephemeral washes. No federally listed, proposed, or candidate species are known to occur along ephemeral washes or in adjacent upland habitats within the Paradise Ridge project site.

As discussed in Section 2.4.3, WUS within the project area were evaluated and ranked according to their current habitat and hydrologic functions and values. The characteristics of the project area are discussed in more detail in the Function and Value Assessment attached as Appendix A.

Table 3.1.1 shows the existing composition and density of native plant species in and adjacent to high-ranked washes within the project area.

3.1.2 Target Functions and Values

In Paradise Ridge, the avoided washes and associated riparian habitat will serve to minimize impacts to wildlife and hydrologic functions. Re-vegetation along the reconstructed washes will recreate native plant species diversity and wildlife values, as well as the hydrologic functions discussed previously. Within reconstructed washes and corridors, re-vegetation will emphasize species occurring along existing high-ranked washes within Paradise Ridge. Native cactus, including Saguaro, barrel cactus and buckhorn cholla, as well as native grasses, will also be planted to enhance habitat diversity. Upon completion, the functions and values of the reconstructed washes will emulate those associated with high-ranked washes.

Wildlife values refer to density and diversity of native wildlife species. Woody perennials along ephemeral washes provide food, cover, and other essential components of life history requirements of wildlife. Ephemeral washes, primarily those with dense vegetation, also provide corridors for movement of wildlife. Diversity within the habitat becomes critical because different plant species provide different resources for wildlife, ultimately resulting in a higher species diversity of wildlife. The avoided washes and reconstructed washes with associated riparian habitat will provide wildlife habitat and movement corridors for some species.

Hydrologic functions refer to channel stability, capacity to carry flows, and flood flow desynchronization. The reconstructed channels will be designed to maintain and enhance (100 year flood) the hydrologic functions of the washes. Revegetation within the reconstructed wash corridors will stabilize soils and reduce erosion.

3.1.3 Proposed Uses

The primary use of the on-site mitigation areas will be to mitigate unavoidable impacts to waters of the United States within Paradise Ridge. The mitigation areas will serve as wildlife habitat corridors and provide access for passive recreation.

3.2 Implementation Plan and Schedule

The Paradise Ridge project area is anticipated to be disposed of by the ASLD over the next 10-20 years. It is anticipated that the immediate project elements will include development of commercial parcels, multi-family parcels, residential parcels, tow golf courses and two resort hotels. Subsequent auctions will occur within Paradise Ridge at a rate that allows ASLD to meet its Trust responsibilities.

On-site mitigation will be phased in over the life of the project, concurrent with development impacts to WUS. The planting required under this plan within a specific auctioned parcel will be completed within one year of the initiation of construction activities within the parcel. As a condition of the disposition of properties in Paradise Ridge, the ASLD will require successful bidders to implement mitigation until all 165.29 acres (137.9 credited acres) have been preserved/enhanced or reconstructed. An Implementation Handbook will be prepared and delivered to each owner, or lessee, or assignee of the auction parcels to provide guidance on mitigation responsibilities and methodologies.

The ASLD may require mitigation activities to occur in an area off an auctioned parcel. In these instances, ASLD shall ensure that appropriate rights-of-entry have been included in auctions to allow successful bidders access to all affected properties.

The ASLD is able to place conditions on auctions for State Trust lands. It will specifically identify the areas of avoided washes and reconstructed natural washes with associated riparian habitat. Deed, lease and /or other restrictions as required by the special conditions of this permit shall be placed over the mitigation areas (Figure 3) within the patented and/or lease parcels to ensure such mitigation areas are protected in perpetuity. The minimum area comprised by the deed, lease and/or other restrictions will include the mitigated areas as specified in Table 3.1.b

The ASLD will require deed, lease and/or restrictions to be in accordance with the special conditions of this permit by development phase if necessary, before allowing the successful bidder, or its assignee, to obtain a grading permit from the City of Phoenix and any grading activities to proceed.

Development of the project will occur over a period of 10-20 years. Phasing development and mitigation over the duration of the project will minimize the temporal loss of habitat functions and values. No on-site mitigation will be implemented until after development begins.

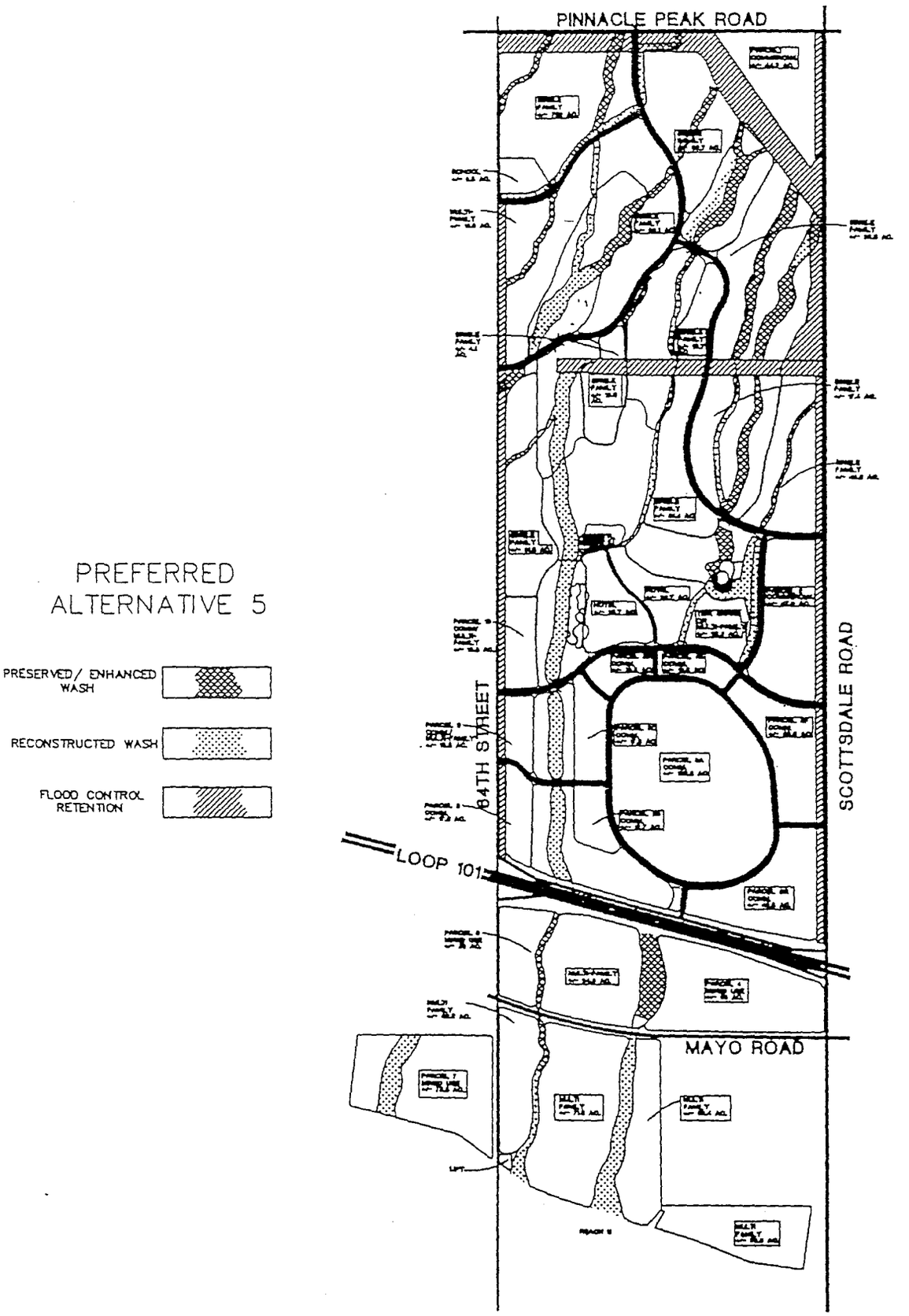
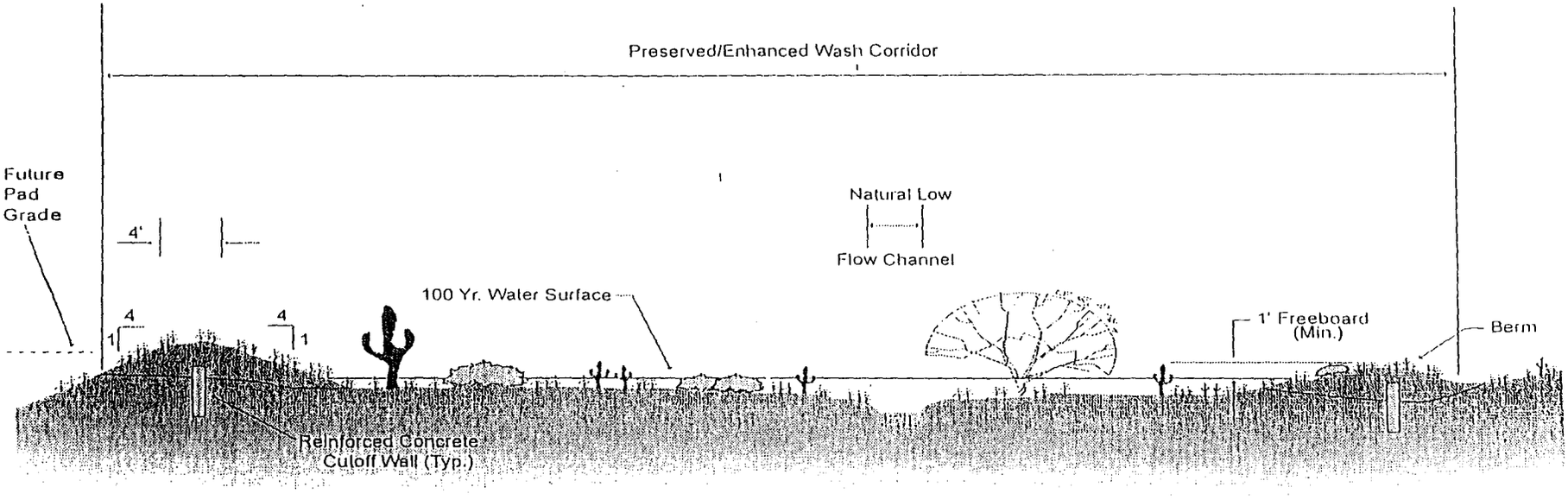


Figure 3. Proposed Project

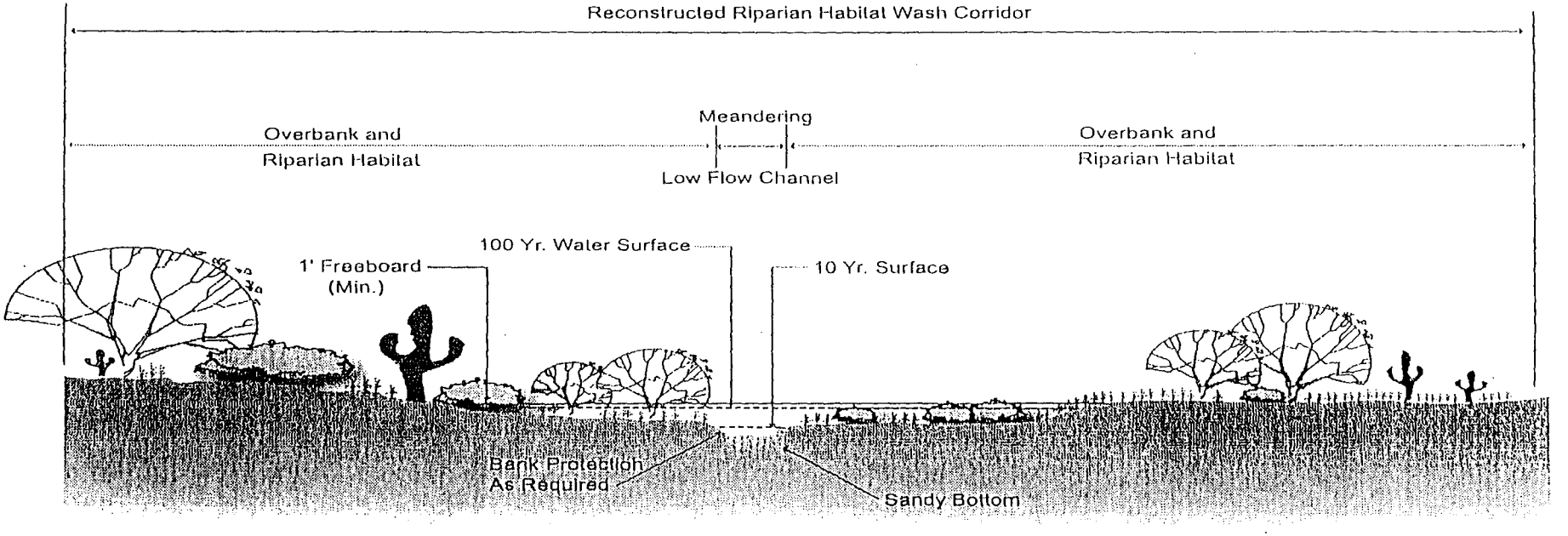
Figure 4A



Preserved/Enhanced Wash Corridor - Typical Section

Not to Scale

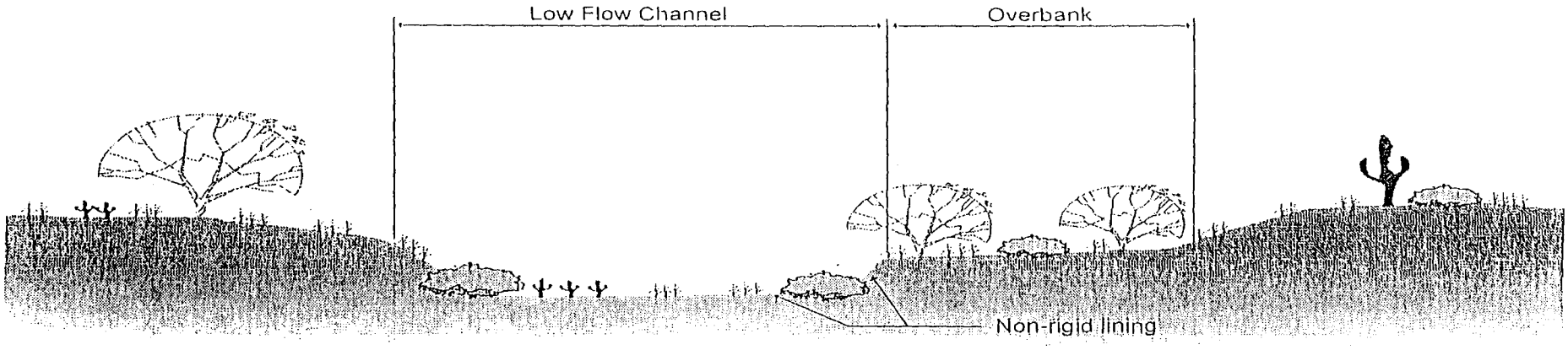
Figure 4B



Reconstructed Riparian Habitat Wash Corridor - Typical Section

Not to Scale

Figure 4C



Flood Control Channel/Detention Basin Typical Section

Not to Scale

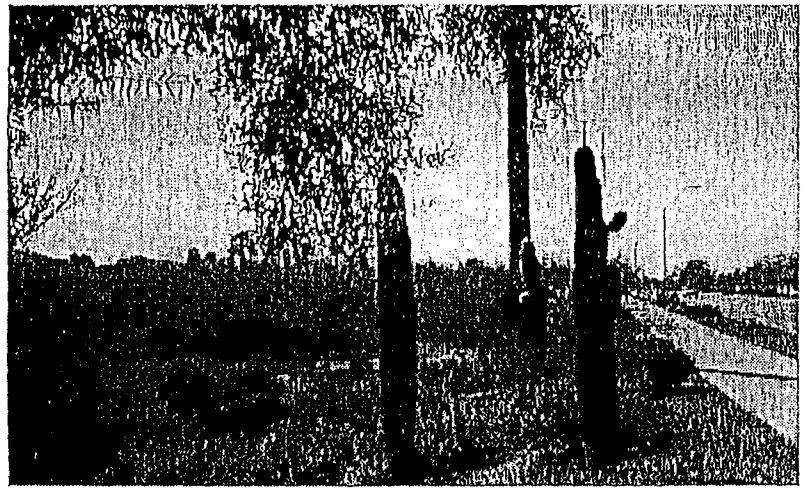
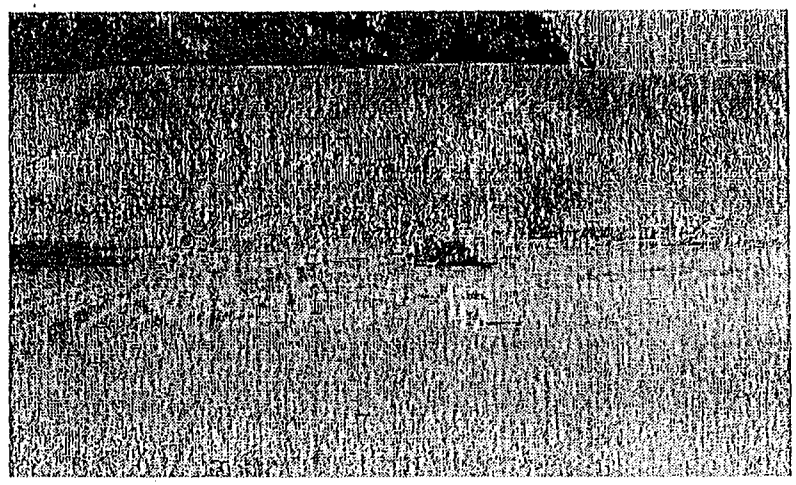


Figure 4D

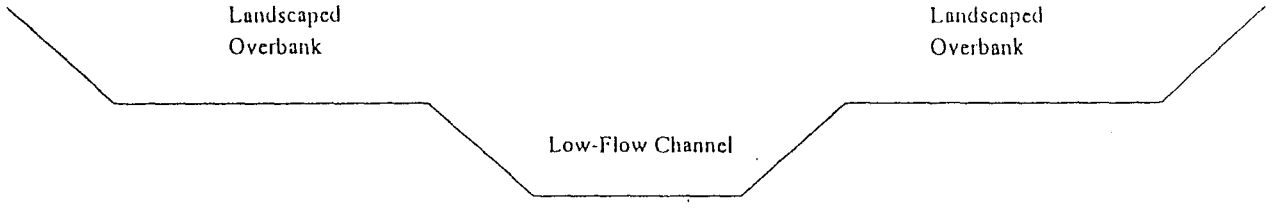


Existing Stock Tank

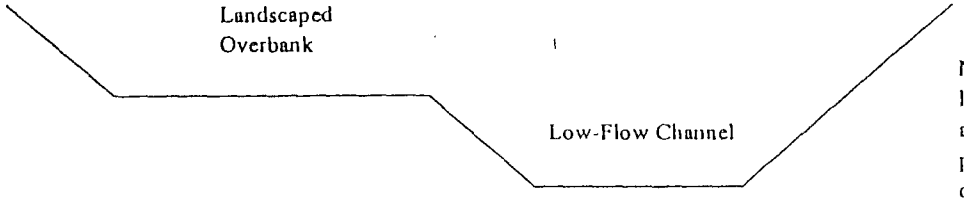
Figure 4D

Proposed Concept Stock Tank

Figure 5.0
Typical Cross-Sectional Geometry
Manmade Wash Corridors
Paradise Ridge

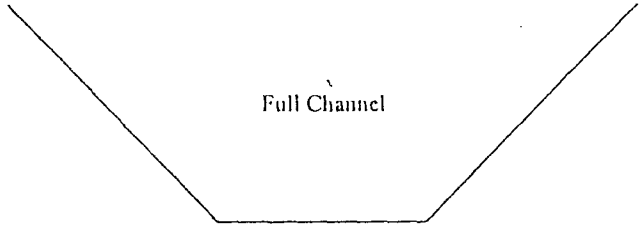


8-Point Section



6-Point Section

Note: Unless non-erodible velocities exist, the low-flow (and 4-point) channel banks may be armored and extended below the channel bed to prevent undercutting by scour. If adjacent development can tolerate a meandering low-flow channel, then the bank armoring may be moved from the low-flow channel to the overbank berm. Permeable armoring systems can also be considered.



4-Point Section

Table 3.1.1 Existing Plant Species Composition and Density within and adjacent to High-Ranked Washes and Target Plant Species Composition and Density within Reconstructed Natural Wash Corridors in the Paradise Ridge Master Planned Community, Phoenix, Maricopa County, Arizona

Species	Average Density of Plants Per Acre
Trees and Shrubs	
Wolfberry *Lycium torreyi)*	127
Canyon Ragweed *(Ambrosia ambrosioides)*	127
Creosote *(Larrea tridentata)*	111
Chuparosa *(Beloperone californica)*	75
Desert Broom (*Baccharis sarthoroides)*	34
Hackberry *(Celtis pallida)*	34
Yellow Paloverde *(Cercidium microphyllum)*	34
Catclaw Acacia *(Acacia greggii)*	31
Foothill Paloverde *(Cercidium floridum)*	26
Ironwood *(Olneya tesota)*	17
Honey Mesquite *(Prosopis glandulosa)*	13
Crown of Thorns *(Koeberlinia spinosa)*	11
Perennial Herbaceous Forbs	
Triangular-leaved Bursage *(Ambrosia deltoidea)*	646
Desert Hyacinth *(Dichelostemma pulchellum)*	63
Globe Mallow *(Sphaeralcea ambigua)*	58
Annual Herbaceous Forbs	
Desert Lupine *(Lupinus sparsiflorus)*	519
Desert Chickory *(Rafinesquia neomexicana)*	156
Baileya *(Baileya multiradiata)*	23
Desert Poppy *(Eschscholzia glyptosperma)*	11
Cacti	
Saguaro *(Carnegiea gigantea)*	17
Barrel Cactus *(Ferocactus wislizenii)*	17
Buckhorn Cholla *(Opuntia acanthocarpa)*	13
Hedgehog cactus *(Echinocereus engelmannii)*	11
Mammilaria (*Mammilaria microcarpa)*	11
Christmas Cholla *(Opuntia leptocaulis)*	11

3.3 Site Preparation and Irrigation Plan

Avoided washes with associated riparian habitat will be maintained from disturbances for the life of the project. Detention basins will not be placed within any avoided or reconstructed wash. All flood control measures will be constructed outside the avoided washes and associated riparian habitat areas. The berms will incorporate a vertical concrete or soil-cement cut-off wall, which will be covered with compacted earth.

Within reconstructed natural washes and corridors, the existing land will be mass-graded. Preceding grading, suitable trees and shrubs will be removed and salvaged for transplanting following construction.

A temporary drip irrigation system will be installed to accommodate irrigation demands within the reconstructed natural washes and corridors. The primary water source for irrigation will be the nearest water main. Separate emitters will be installed at each planting. Holes for each planting will be approximately twice the size of root balls. Irrigation will continue for at least two (2) years after planting has been completed. Irrigation will only be discontinued after the first two years and when the vegetation has become established.

3.4 Planting and Maintenance Plan

Table 3.4 identified the species composition and density of plantings in the reconstructed washes and corridors. Plant species composition will be entirely composed of native species, which currently occur in the project area. Plant stock will first be obtained from trees, shrubs and cacti salvaged from on-site. Nursery-grown plants will be utilized to supplement the plant stock.

Hydro seeding, which will consist on native vegetation will be undertaken to achieve the desired species composition and density of the herbaceous plants. Native grass seed will also be utilized to help reduce soil erosion.

The source for all nursery grown plants and seeds will be identified to assure that only locally adapted, native plants and seeds are utilized. Five gallon plants or larger will be utilized, and seeding methods recommended by the nurseries will be followed to achieve the desired herbaceous plant densities.

Deed, lease and/or other restrictions will restrict ground and vegetation disturbances within mitigation sites. The ASLD is the permittee and the party ultimately responsible for implementing the terms and conditions of the Section 404 permit. The ultimate landowner or lessee or its equivalent entity will accept responsibility for all deed, lease and/or other restrictions at Paradise Ridge. The ASLD or its equivalent entity will also be responsible for maintaining and monitoring elements as administrators of the trust account to be established for these purposes. Maintenance of the areas covered by deed, lease, and/or other restrictions would be the responsibility of the ultimate landowner or lessee or its equivalent entity.

Short-term maintenance of the reconstructed natural washes and corridors may include staking, fertilizing, and weeding in the immediate area of the vegetation to be re-established, and maintenance of the irrigation system. Once the vegetation becomes established and accepted by the Corps, these practices will be discontinued. Long-term management of the riparian habitat corridors will not include pruning, removal of snags, mistletoe control, weeding, or plant litter removal.

habitat corridors will not include pruning, removal of snags, mistletoe control, weeding, or plant litter removal.

4.0 MONITORING PLAN

4.1 Success Criteria

The success criteria for Paradise Ridge will be 80 percent survival of the plantings three years after irrigation has been discontinued. This criterion includes a demonstrated increase in basal diameter of trees during the period after irrigation has ceased. Basal diameter of saguaros will not be recorded. Success of mitigation plantings is expected because species adapted to local conditions will be used.

4.2 Monitoring

A field inspection will be completed after initial planting and seeding to document as-built conditions. Permanent photopoints will be established every 500 feet within each reconstructed wash and corridor. In subsequent years, photopoints will be re-visited and photographed during the monitoring period. Photopoints will be discontinued when the Corps has accepted mitigation within a segment of wash and associated corridor.

Planted trees and shrubs will be marked with permanent tags and counted so that percent survival can be monitored. Basal diameter of the tree stem(s) measured six inches from soil surface, canopy height, and maximum canopy width will be measured to determine growth rate. Ten percent of the trees planted within each mitigation area will be measured during monitoring. Due to the slow growth rate of saguaros, the height of each saguaro will not be measured. Condition and survival of this species will be based on visual observations. If monitoring results indicate that less than 80 percent of the trees, shrubs and saguaros are surviving, the Ultimate landowner or lessee or its equivalent entity will plant additional vegetation in order to achieve 80 percent survival.

Monitoring of the reconstructed washes and corridors will be conducted annually for five years following completion of the reconstruction washes and corridors. Monitoring reports will be prepared and submitted to the USACOE Phoenix Area Office for review. At a minimum, the monitoring reports will include:

- a description of as-built conditions (first year only for preserved/enhanced corridors)
- a list of individuals or companies who completed monitoring activities
- results of the monitoring effort, including measured growth and percent survival
- copies of color photographs taken from permanent photopoints
- copies of field notes
- recommendations for additional plantings or other corrective measures
- notification of completed mitigation commitments
- documentation of recorded temporary and perpetual easements for mitigation areas

The first monitoring report will be due one year after the date construction commences within a parcel. Project monitoring will continue annually thereafter for four years, until each element of the mitigation plan has been accepted by the USACOE. This process may be extended if the implementation period continues beyond what is anticipated to establish the plantings and meet success criteria. Notification will be made to the Corps when success criteria have been

Monitoring of the avoided washes and associated corridors will be conducted one time only, within one year after completion of the corridor improvements. The report will document as-built conditions and recordation of deed, lease and/or other restrictions. The report will include color photographs taken from photopoints every 500 feet. Recommendations for any corrective measures, as appropriate, will also be included.

4.3 Contingency Measures

Subsequent to the issuance of the permit and concurrent with construction activities in Paradise Ridge, which result in impacts to WUS, a trust account shall be established for the express purpose of funding continuing irrigation, maintenance, and monitoring activities. Successful bidders in all auctions will be required, as a condition of sale or lease, to deposit funds in the same trust account for the same express purposes. The amount of the deposit shall be equal to $50 per gross acre of land area included in each auction. Land area shall include any roadway, utility, drainage right-of-ways, easements, etc., necessary to serve the land area included in the auction. The funds shall be deposited in the trust account at the time of issuance of a City of Phoenix grading permit. Deposits shall be non-refundable. The trust account shall be administered as determined by ASLD.

4.4 Parcel 4 Mitigation

Permittee has previously leased Tract 2.03 of State Plat 34, Paradise Ridge ("Parcel 4"). As additional mitigation, Parcel 4 shall pay an in-lieu fee of $16,000.00 per acre, on a pro rata basis of impacted area, for the jurisdictional areas impacted by construction within Parcel 4, to the City of Phoenix or such other organization or municipality approved by the Corps of Engineers and permittee. The Parcel 4 shall, by cover letter accompanying the check, clearly state that the in-lieu fees are intended as mitigation for impacts to waters of the United States, and are only to be utilized for the purposes of acquiring and preserving a portion of the State Trust Lands within the City of Phoenix Sonoran Preserve in Maricopa County, Arizona, or other suitable site as determined by the Corps of Engineers and Arizona State Land Department. Parcel 4 shall provide the Corps of Engineers and the permittee with a copy of the check and transmittal letter that will serve as evidence that the funds have been satisfactorily transferred to the City of Phoenix or other approved organization or municipality prior to initiating construction of the crossings or utilities authorized under this permit. Ground disturbance activities within Tract 2.03 of State plat No. 34, Paradise Ridge (Parcel 4) may be commenced immediately by any Transferee who has complied with paragraph 4 of the General Conditions of this permit.

APPENDICES

A: Xeroriparian Corridor Function and Value Assessment for Paradise Ridge with Supporting Spreadsheets

B: Design Criteria for Washes and Crossings

C: Landscape Criteria for Reconstructed Natural Wash Corridors

D: Criteria for Trails within the Reconstructed Wash Corridors

APPENDIX A

XERORIPARIAN CORRIDOR FUNCTION AND VALUE ASSESSMENT FOR

PARADISE RIDGE

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November 2000

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A. Representative Photos for Rated Areas
B. Xeroriparian Wash Evaluation Map (Map Pocket)

ABSTRACT

The Function and Value Assessment focuses on the riparian corridors determined by the U.S. Army Corps of Engineers to be "waters of the United States" and regulated under Section 404 of the Clean Water Act. The qualitative rating for the function and value categories are divided into four general levels: Very High, High, Medium and Low ratings. The criteria are based on qualitative elements for the riparian corridor and generally do not assess the greater landscape. While the rating of the riparian corridors are divided into elements of separate categories of functions and values, the final assessment is given as a single rating based on the integration of all elements in all categories.

1.0 INTRODUCTION

Every watershed system is unique and the refinement of evaluation tools for assessing their functions and values is limited. Evaluation systems on landscape levels are qualitative by their very nature. While the washes on Paradise Ridge are ephemeral and therefore do not support true riparian vegetation, they none the less support habitat functions and values due to their position in the desert landscape. Ephemeral washes are an important feature in the desert environment because they supply resources for nesting, forage, and cover that can be found no where else in the surrounding landscape. For this evaluation, the xeroriparian washes will be defined as "Riparian habitats associated with an ephemeral water supply. These communities typically contain plant species also found in upland habitats, however, these plants are typically larger and/or occur at higher densities that in adjacent uplands" (SWCA 1993).

Paradise Ridge is located in the City of Phoenix, and is bordered by Pinnacle Peak Road on the North, Scottsdale Road on the east, the Desert Ridge Planned Community on the west, and Reach 11 of the Central Arizona Project canal on the south. The project site is 2,200 acres in size and covers all of Section 15, 22 and 27 and a portion of Sections 33 and 34, Township 4 North, Range 4 East, Gila and Salt River Meridian. The new Loop 101 Highway crosses the southern half of the project site.

This report will describe the regional conditions, past land uses, vegetation communities, and the evaluation criteria used to form a qualitative ranking system for the xeroriparian areas within the proposed development of Paradise Ridge (**Figure 1**).

2.0 REGIONAL CONDITIONS

Paradise Ridge is geographically bounded by New River Mountains to the north, the McDowell Mountains to the east, the Central Arizona Project (CAP) aqueduct to the south, and Union Hills to the west.

Most of the proposed Paradise Ridge development is within the Rawhide Wash alluvial fan. The Rawhide Wash is the main stem watercourse of an alluvial fan that lies in both Phoenix and Scottsdale. The fan is designated as an AO Zone on the current Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps. An AO Zone is defined as an area of 100-year shallow flooding where depths are between one and three feet.

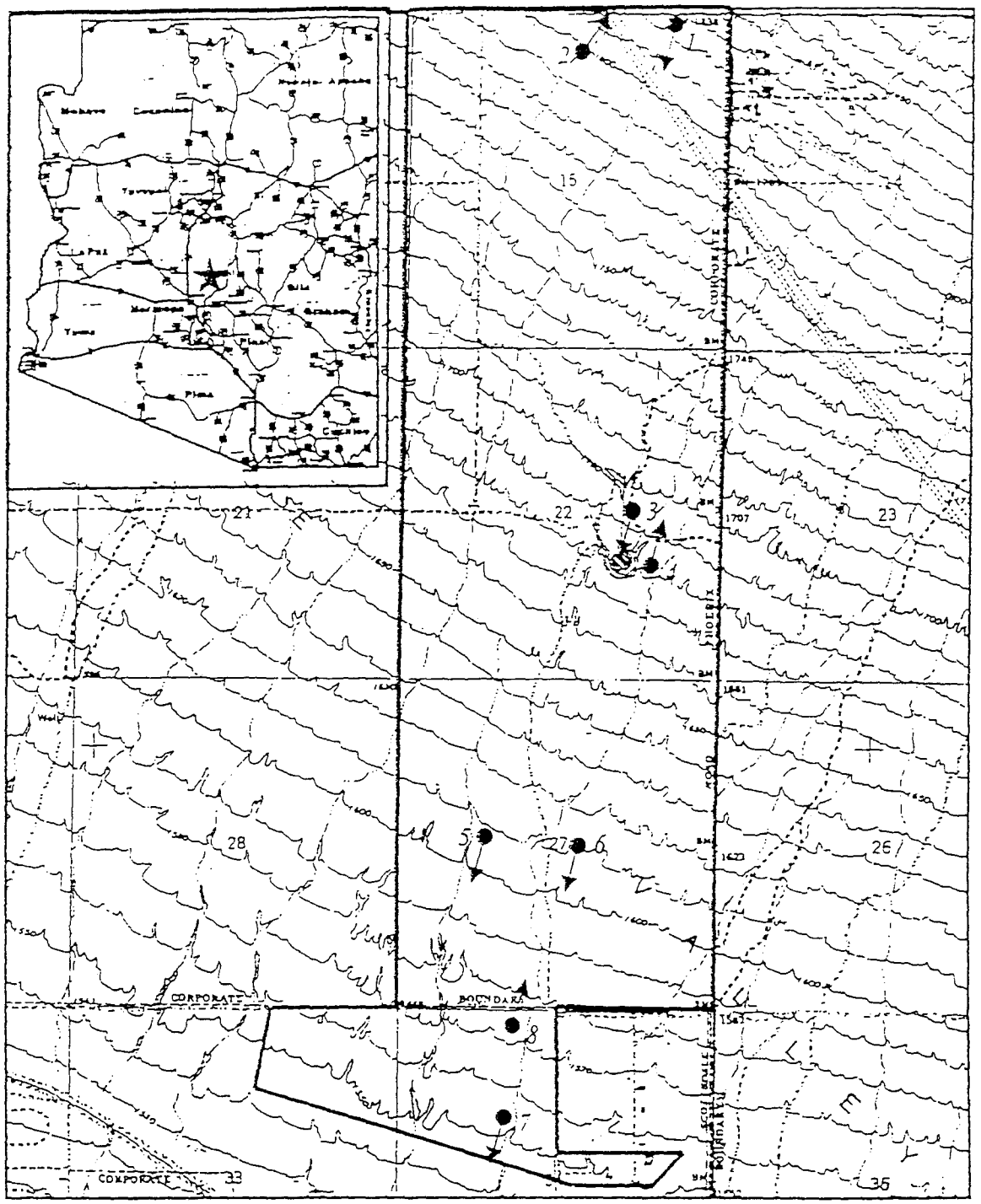

Figure 1. Location Map, Paradise Ridge Development Sections 15, 22, 27, 33, and 34, T4N, R4E, Maricopa County, Arizona.

Approximate Project Boundary

Photo Point Location and Direction (See Appendix A for Photos)

The overall watershed defined by Rawhide Wash itself has a drainage area of 19.8 square miles. Rawhide Wash starts just north of Dynamite Road in Scottsdale and the 96th Street alignment and moves in a southwesterly direction crossing into the City of Phoenix and terminating in the Bureau of Reclamation / Tournament Players Club basin. Only the northwest corner of the project area is outside the area designated as Rawhide Wash (**U.S. Army Corps of Engineers, 1999**). The flows associated with this wash emanate from intense rainfall in the confined upstream channels of the North Scottsdale drainage area.

Rain events that cause flooding usually consist of summer thunderstorms that last for relatively brief periods of time but generate substantial local rainfall that collects in desert washes. As rain falls in the mountain areas, the storm runoff quickly flows to the desert floor, conveying a combination of water and sediment materials. As the flood flows reach the desert floor areas, runoff is directed into the poorly defined channels in the alluvial fan areas. As debris is deposited and shifted by subsequent events, runoff creates new channels in different directions. This results in constantly changing flow paths. Currently, storm water runoff collects along the southern portion of Reach 11 of the CAP canal.

3.0 PROJECT AREA

All washes within the Paradise Ridge project area are "ephemeral watercourses, which flow in direct response to precipitation events, have a channel that is at all times above the groundwater table, and do not support self-sustaining populations of fish" (**Arizona Administrative Code, Title 18, Chapter 11, Article 1**).

Past land uses within the study area include grazing, illegal firearms range, off-road vehicle use, and illegal trash dumping. A review of the State Land Department records documented grazing as a land use from 1916 to modern times (**Graves 1993**). Evidence of use for grazing still exists in the center of Section 22, where an earthen-dam stock pond, with associated berms, collects water from multiple ephemeral water courses.

3.1 Vegetation

The study area contains representative examples of two subdivisions of the Sonoran Desert Scrub community present in Arizona and a transitional zone between the two (**Figure 2**). The two subdivisions are Lower Colorado River Valley (LCRV) and Arizona Upland (AU) (**Brown, 1994**). Both of these communities have characteristic large cacti in upland areas and a greater structural diversity of shrubs, trees, and perennial succulents along drainage courses, even in the most arid portions.

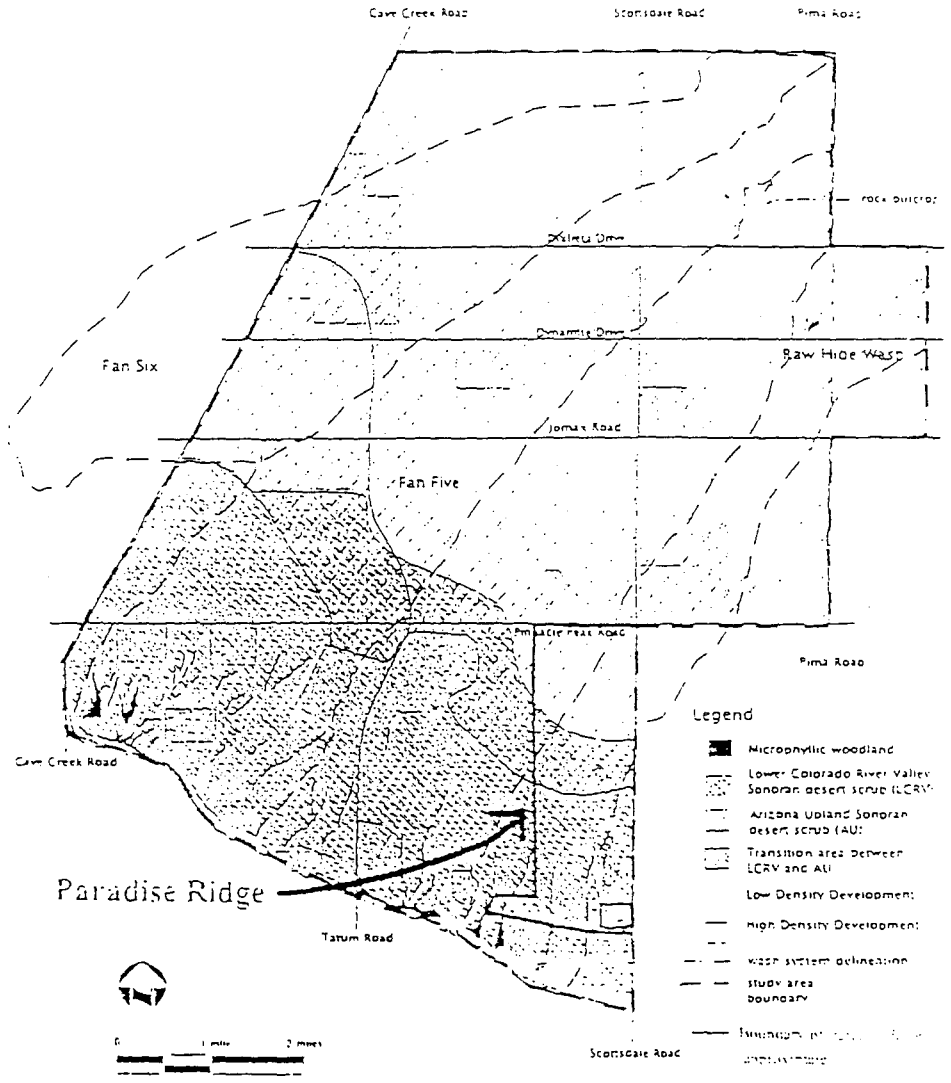

Figure 2

Vegetation Communities within the Project and Surrounding Area

Source: Northeast Phoenix AQ Zone Baseline Conditions Report
U.S. Army Corps of Engineers
May 1996

The project area is consistent with the general characteristics of Sonoran Desert scrub, as the greatest vegetation densities occur along the washes. Table 1 is a list of plants observed or with the potential to occur in the study area.

Table 1. Sonoran Plant Species Observed or with Potential to Occur in the Study Area

Common Name	Scientific Name	Occurs in AU Subdivision	Occurs in LCRV Subdivision	Observed On-site
Arizona barrel cactus	*Ferocactus wislizenii*	X		X
Anderson's thornbush	*Lycium andersonii*	X	X	1
Barrel cactus	*Ferocacius acanthodes*	X		X
Bigelow nolina	*Nolina bigelovii*	X		
Blue paloverde	*Cercidium floridum*	X	X	X
Brittle bush	*Encelia farinosa*	X	X	X
Buckhorn cholla	*Opuntia acanthocarpa*	X	X	X
Canyon ragweed	*Ambrosia ambrosioides*	X	X	X
Catclaw	*Acacia greggii*	X	X	X
Chain fruit cholla	*Opuntia fulgida*	X		
Christmas cholla	*Opuntia leptocaulis*	X		X
Chuparosa	*Justicia californica*	X	X	X
Cilindrillo	*Lycium berlandieri*	X	X	1
Cooper golden bush	*Ericameria cooperi*	X	X	
Creosote	*Larrea tridentata*	X	X	X
Crucifixion thorn	*Canotia holacantha*	X	X	
Desert broom	*Baccharis sarothroides*	X	X	X
Desert hackberry	*Celtis spinosa*	X		X
Desert lavender	*Hyptis emoryi*	X	X	
Desert marigold	*Baileya multiradata*	X	X	
Englemann's prickly pear	*Opuntia englemannii*	X		X
Fairy feather duster	*Calliandra eriophylla*	X	X	
Foothill paloverde	*Cercidium microphyllum*	X	X	X
Globe mallow	*Sphaeralcea ambigua*	X	X	
Ironwood	*Olneya tesota*	X	X	X
Mexican tea	*Ephedra trifurca*	X	X	
Mistletoe	*Phoradendron californicum*	X	X	X
Ocotillo	*Fouquieria splendens*	X	X	
Pencil cholla	*Opuntia arbuscula*	X		
Saguaro	*Carnegiea gigantea*	X	X	X
Smoke bush	*Psorothamnus spinosa*	X	X	
Sonora barrel cactus	*Ferrocactus covillei*	X		
Spanish dagger	*Yucca arizonicus*	X		
Spiny strawberry hedgehog cactus	*Echinocereus stramineus*	X		X
Sweetbush (Chuckwalla's Delight)	*Bebbia juncea*		X	X
Teddybear cholla	*Opuntia bigelovii*	X	X	X
Triangle-leaf bursage	*Ambrosia deltoidea*	X	X	X
Velvet mesquite	*Prosopis velutina*	X	X	X

AU – Arizona Upland
LCRV – Lower Colorado River Valley
1 – Specific Species Not Identified

The washes support numerous species of large trees, which include foothill paloverde (*Cercidium microphyllum*), blue paloverde (*C. floridum*), ironwood (*Olneya tesota*), and mesquite (*Prosopis*

sp.) and multiple underbrush species. Wash bottoms generally consist of decomposed granite and are typically devoid of vegetation due to hydrologic processes. Saguaros (*Carnegia giganteus*) are common in the inter-wash areas.

3.1.1 Lower Colorado River Valley Sonoran Desert Scrub

The northern limit of the LCRV subdivision runs from Palm Springs, California in the west, to northeast Phoenix in the east. The southern limit of this range wraps around the Gulf of California on both the east and west sides to just north of the California / Baja border. This subdivision is also referred to as the microphyllus desert due to the adaptation of small compound leaves on most dominant species found within it. These adaptations are important because this Sonoran region receives the least rainfall and experiences the most extreme temperatures. In areas between drainage courses, plant growth and diversity is typically sparse as a result of the intense competition between plants for scarce water resources.

Within the LCRV subdivision drainage courses vary from shallow runnel networks to deeper flow through channels (**Brown, 1994**). Plants vary by both species diversity and robustness within this area, and the species associated with microphyllic woodland (**Figure 2**), such as ironwood, mesquite, palo verde, and catclaw, occur more frequently in washes. As a result, these drainage areas have greater structural diversity and offer greater habitat richness than the areas between drainage courses. The LCRV subdivision occurs in the southern portion of the Paradise Ridge project area.

3.1.2 Transition Zone

Within the project area the LCRV subdivision and the AU subdivision meet and form a transition zone. This transition zone is difficult to accurately map because of the subtle and gradual transition. Characteristics of this transition include a gradual increase in trees and shrubs in the uplands between washes and runnels. A predominance of triangle-leaf bursage within areas closer to the north of the study area is characteristic of the transition zone as it enters the AU subdivision.

3.1.3 Arizona Upland Sonoran Desert Scrub

The northern limit of the AU subdivision runs south below the Mogollon Rim and abuts the edge of the LCRV subdivision to the east. To the west, the limit of the region undulates, following lower elevations and continuing south to Querobabi, Mexico. The AU subdivision receives substantially more precipitation than the LCRV subdivision and therefore has a greater diversity of plants. Within this region, the dominant plant species include paloverde, saguaro, crucifixion thorn, mesquite, and ironwood. The primary difference between this subdivision and the LCRV

subdivision is plant structural diversity. In the AU subdivision structural diversity is found throughout the landscape, while in the LCRV subdivision this occurs only adjacent to washes.

3.2 Wildlife

The Sonoran Desert has a large number of wildlife species. Common birds found within the project area include Gambel's quail (*Callipepla gambelii*), roadrunner (*Geococcyx californianus*), mourning dove (*Zenaida macroura*), Gila woodpecker (*Melanerpes uropygialis*), northern flicker (*Colaptes auratus*), black-throated sparrow (*Amphispiza bilineata*), and cactus wren (*Campylorhynchus brunneicapillus*). Common raptors include Harris hawk (*Parabuteo unicinctus*) and red-tailed hawk (*Buteo jamaicensis*). Small mammals include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*) and several species of ground squirrels (*Spermophilus* sp.) and pocket mice (*Perognathus* sp.). Javelina (*Tayassu tajacu*) are abundant in the area and use washes for shelter during the day.

Mule deer (*Odocoileus hemionus*) tracks and the jawbones were identified on the site. The McDowell Mountains have a well established population of mule deer, and while there is evidence of mule deer on the site, current land uses between the McDowell Mountains and the project area (i.e. Scottsdale Road) restrict their access to Paradise Ridge.

4.0 RELATIVE FUNCTIONS AND VALUES OF XERORIPARIAN AREAS

Many ecologists broaden the concept of riparian communities to include the banks of dry washes in deserts. A wash in the LCRV subdivision with its woodland trees is clearly distinct from the surrounding creosote bush flats. On a landscape scale, dry washes occupy less than five percent of the area within the subdivision of the Sonoran Desert, but support ninety percent of its bird life. Their value to wildlife is the result of the greater availability of water even though these washes may carry surface water for only a few hours a year (**Phillips and Comus, 2000**).

Dry washes share most of their defining characteristics with traditional "wet" riparian habitats. For example, they are chronically disturbed, unstable sites where water and nutrients are harvested and concentrated from larger areas. Finally they are corridors for the dispersal of plants (seeds) and animals (**Phillips and Comus, 2000**).

Three general categories of evaluation criteria were used for the relative functions and values assessment of jurisdictional washes within Paradise Ridge: Water Quality, Habitat Quality, and Recreational Quality. These categories and the elements that compose the functions and values are shown in **Table 2**.

TABLE 2. Typical Functions and Values of Aquatic Systems

WATER QUALITY	
	Groundwater Recharge / Discharge
	Nutrient Transformation
	Flood Flow Desynchronization
	Sediment Transport
HABITAT QUALITY	
	Threatened & Endangered Species
	General Wildlife Use
	Habitat Community
RECREATIONAL QUALITY	
	Consumptive Uses
	Non-Consumptive Uses

4.1 Water Quality Criteria

Groundwater recharge/discharge, nutrient transformation, flood flow desynchronization, and sediment stabilization were the Water Quality criteria used for evaluation purposes.

4.1.1 Groundwater Recharge/Discharge

The project area is located within the East Salt River Valley groundwater sub-basin within the Phoenix Active Management Area (AMA). Groundwater depth within the sub-basin is highly variable and reacts substantially to groundwater pumping. Water levels in the East Salt River Valley range from 100 feet to more than 400 below the ground surface (**USACOE, 1996**).

The absence of true riparian vegetation on the site confirms that groundwater is located below the shallow root zone of riparian plants. Due to the depth of groundwater, constrained deep below the soil surface, there is no opportunity for groundwater discharge. However, an important natural function of desert washes is their ability to recharge water to the underground aquifer (**Phyllis and Comus, 2000**). Wide, flat wash beds possess the greatest ability to recharge water to the subsurface. Even so, due to the depth to groundwater, recharge occurs on a minor scale within the project area.

4.1.2 Nutrient Transformation

Within a system of wash corridors nutrients may pass directly through the corridor, nutrients may accumulate in the soil, gradually filling in the wash bed, and nutrients may be absorbed and incorporated into biomass by corridor vegetation as it grows (**Forman and Godron, 1986**).

Within the xeroriparian wash system, washes with the greatest density of vegetation are assumed to have the greatest potential to absorb dissolved mineral nutrients.

4.1.3 Flood Flow Desynchronization

The ability of the dry washes to desynchronize flood flows is related to their ability to slow floodwater and detain some floodwater onsite. Decreased water velocities increase the opportunity for water to be recharged to the subsurface and/or detained at the surface in backwater channels. These processes provide water to the root zone of desert plants and decrease the entrenchment potential of floodwaters to existing wide, flat channels.

4.1.4 Sediment Stabilization

Sediment stabilization refers to the ability of the desert washes to bind soils and dissipate erosive forces. Vegetation is the primary soil binding mechanism (roots and decomposing organic matter) in these desert washes. Cut banks and exposed root systems are evidence of soil instability.

4.2 Habitat Quality Criteria

The Habitat Quality criteria used to evaluate onsite washes considered habitat functions and values with regard to threatened and endangered species, general wildlife use, and habitat community.

4.2.1 Threatened and Endangered Species

The threatened and endangered species criterion was based on the potential for the wash vegetation to support threatened and endangered species. The property is within Zone 3 habitat for the cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*) (pygmy-owl). Zone 3 habitat is defined as areas within the historic range of the pygmy-owl with a low potential of occupancy (**AGFD and USFWS, 2000**). Surveys for the pygmy-owl were completed in 1999 and 2000 by biologists with Entranco and no pygmy-owls were detected (**Entranco 1999 and 2000**). Therefore, this category was included for consideration, but there are no documented threatened or endangered species on or within the vicinity of the Paradise Ridge property.

4.2.2 General Wildlife Use

In terms of general wildlife use, the jurisdictional washes within Paradise Ridge function as corridors to onsite and offsite areas. Dense cover along ephemeral washes provides opportunities

for movement by small mammals such as rabbits and larger mammals such as javelina and coyote. In addition, water-retaining features, such as a stock pond, were thought to have a high general wildlife use function and value due to their ability to provide a water supply in a desert environment.

4.2.3 Habitat Community

Within Paradise Ridge, jurisdictional washes with a diversity of plant species, well-developed structure, and a high percentage of canopy cover are anticipated to provide a wider variety of resources, and, thus, support a larger habitat community than areas that either lack these habitat features or support them to a lesser degree. Ephemeral washes that provide cover, food, shelter, and nesting substrates have higher habitat function and value than those that are not well vegetated or do not have the appropriate structure.

4.3 Recreational Quality

The Recreational Quality criterion is purely a value that people place on the use of aquatic systems. While recreational use of the aquatic systems are important, it was thought to be of secondary importance to water quality and habitat.

Uncontrolled use of the site for recreational use has led to degradation of some washes and wash features For example, there is extensive evidence of use of the stock pond area for illegal fire arm and off-road vehicle use.

Off-road vehicle use has created multiple trails throughout the project area and has disturbed wash habitat as well as upland habitats. The two categories of recreational use considered were consumptive (active) and non-consumptive (passive).

4.3.1 Consumptive Uses

Off-road vehicle use, plant collecting, and illegal hunting are activities that are considered consumptive.

4.3.2 Non-Consumptive Uses

Hiking, bird watching, and photography are activities that are considered non-consumptive.

5.0 METHODS AND RATING SYSTEM

Prior to developing the rating system for the functions and values of jurisdictional washes within the Paradise Ridge property, Entranco personnel met with Tim Wade of the Arizona Game and Fish Department (AGFD) at the site to discuss the characteristics of desert washes. During this meeting, Entranco personnel calibrated their impressions of function and value of desert washes with the AGFD. The rating system, as it would be applied onsite, was developed as a result of this meeting.

A critical review of the general functions and values of jurisdictional waters of the United States (**Table 2**) was made to determine the quintessential functions of the washes on the Paradise Ridge site. Thus the larger list of functions was refined to cover those discriminating elements on the site. The refined functions used for this evaluation are shown on **Table 3**. Both the Groundwater Recharge / Discharge and Nutrient Transformation were taken out from the evaluation as flood flows generally pass through the site and the soils typically do not promote any ponding or groundwater transfer in either direction. One exception, however, is the stock pond that is roughly in the eastern – central portion of the site. The stock pond was evaluated separately and as a unique condition in the desert environment. The entire Recreation Quality criterion was taken out of the evaluation, as the function and value of onsite washes are impacted by recreational activity.

TABLE 3. Typical Functions of Washes on Paradise Ridge

WATER QUALITY	
	Flood Flow Desynchronization
	Sediment Transport
HABITAT QUALITY	
	Threatened & Endangered Species
	General Wildlife Use
	Habitat Community

The criteria to evaluate the qualitative rating for the function categories are divided into four general levels: Very High, High, Medium and Low ratings. A brief description of the criteria to determine a rating level of the relative function of a wash is provided below in **Table 4**.

The category for water quality is composed of the first two elements under each rating, which included consideration for flood flow desynchronization and sediment stabilization. The category for habitat is composed of the latter three elements under each rating, which included consideration for threatened & endangered species, general wildlife habitat and habitat community. For those xeroriparian areas within Paradise Ridge, the habitat category was given a greater dominance when determining the overall rating.

The character of a xeroriparian community changes along its length due to the typical braided geomorphological nature of washes in the desert southwest. "Plant communities, including riparian and non-riparian communities, do not occur in tightly bounded, discrete units (though they are nearly always depicted as such), but change gradually from one type to the next in a continuum" (SWCA 1993). The minimum length to designate a particular rating was considered in order to limit the potential for fragmentation of a habitat community. In addition, for purposes of keeping the evaluation easy to apply, the minimum length of a reach for a particular rating was 100 feet. This segment length is easily readable to the scale of the site and is a reasonable minimum length for continuity of a habitat type.

The application of the rating system to a particular wash was determined through the integration of the criteria, verses requiring that the evaluated reach meet all the listed criteria for a rating. Hence, if a wash had strong elements for most of the evaluation criteria of a particular rating, then the wash would be given that rating.

Table 4. Criteria for Wash Rating

VERY HIGH RATING	
	Flood waters are detained limited outlet
	Very stable riparian area; aggradation of sediments
	Presence of T&E species on site
	Long segments wide corridors connected beyond the site (regional links)
	Mature trees and shrub strata; dense stand; very wide corridor (> 20 ft)
HIGH RATING	
	Flood waters are slowed; low velocities (< 4 fps)
	Stable channels; balanced sediment transport
	Abundance of constituent T&E habitat elements; no T&E species present
	Long segments wide corridors within the site
	Mature trees; moderate stand; wide corridor (> 10 ft)
MODERATE RATING	
	Flood waters not channelized sheet flow; moderate velocities (4 to 9 fps)
	Stable channel; minor erosion
	Moderate constituent T&E habitat elements
	Short segments wide corridors
	Mature shrubs; dispersed tree; moderate corridor (5-10 ft)
LOW RATING	
	No flood waters are detained; high velocities (> 9 fps); erosion present
	Unstable channel; erosion of banks down-cutting
	No constituent habitat elements for T&E species
	Short segments fragmented and narrow corridors
	Bare ground and / or shrub only stratum; narrow corridor (< 5 ft)

The criteria were applied only to the xeroriparian corridors that have been determined by the U.S. Army Corps of Engineers to be "waters of the United States" and regulated under Section 404 of the Clean Water Act.

The criteria are based on qualitative elements for the washes on the Paradise Ridge site and generally do not assess the greater landscape. However, adjacent vegetation density was taken into consideration when rating washes found in the AU subdivision versus washes found in the LCRV subdivision. For example, a wash that would have received a low rating in the AU subdivision could have received a moderate or high rating in the LCRV subdivision due to the sparseness of adjacent vegetation within the LCRV subdivision. Therefore, it was assumed that an absence of vegetation cover in the inter-wash areas of the LCRV subdivision increases the value of the adjacent wash habitat.

While the rating of the riparian corridors are divided up into elements of separate categories of functions and values, the final assessment is given as a single rating based on the gestalt of all elements in all categories. In addition, for xeroriparian areas within Paradise Ridge, the habitat category was given a greater dominance when determining the overall rating.

The rating system was applied to a 1" = 400' scale aerial photograph depicting the limits of jurisdictional waters for the Paradise Ridge property (Appendix B). The ratings were ground truthed on August 31, 2000.

6.0 RESULTS

Wash criteria often overlap between ratings. Wide washes receive and convey larger volumes of water than narrower washes. These washes in turn generally support larger trees and a greater density and diversity of vegetation than narrower washes. In addition, wide washes often have multiple layers of plant development: overstory, midstory, and understory vegetation. Multiple layers of vegetation increase the value of the habitat by offering a wider variety of resources to wildlife such as food, shelter, and cover. So wider and higher vegetated washes received a higher rating. Representative photos of washes that received rankings of high, medium, and low are depicted in **Appendix A.** No examples of Very High rated areas were found on the site.
Table 5 shows the percentage of high, medium, and low wash ratings in linear feet and acreage.

Table 5. Ranking System – Linear Feet and Acreage

RANKING	LENGTH (Linear Feet)	AREA (Acreage)
VERY HIGH	0	N/A
HIGH	81,840	37.58
MEDIUM	44,406	9.08
LOW	32,244	2.97

The stock pond contains unique features that are found no where else on the project site. These unique features include wetland vegetation, such as willow and cottonwood, and ponding of water for extensive periods of time. The site, however, has not been maintained as a stock pond. The main pond area is now silted in. This has allowed runoff to form an outlet channel at the northeastern portion of the pond. This outlet has caused extensive erosion and down cutting of the upland area. The site has also experienced extensive impacts to the vegetation in and around the site due to the use of the pond embankment for off-road vehicle use, firearm target shooting, wildcat dumping and other activities. Due to these impacts, and taking into account that there are still areas of intact wetland vegetation, the stock pond was given a High rating.

The results of the xeroriparian corridor function and value assessment were field checked by Entranco personnel and Tim Wade of the Arizona Game and Fish on August 31, 2000. During the field review, Entranco personnel ground-truthed approximately 20 percent of the rated washes, and adjusted less than 5 percent of the ratings.

7.0 CONCLUSIONS

The future functions and values of the jurisdictional washes within and downstream of Paradise Ridge are dependent upon upstream and onsite development practices. For example, urbanization of the watershed upstream of the property has altered the baseline conditions of the flood hazards of the Paradise Ridge property. Runoff from impervious surfaces, such as roads and rooftops is about four times that of undeveloped desert due to the inability of these surfaces to absorb and store water. Over these same surfaces, rainwater can move more than eight times as fast as water in undeveloped desert lands.

The functions and values rating that has been assigned to the jurisdictional washes within Paradise Ridge is representative of wash conditions as they exist today. However, due to upstream development some of the washes that received a high or medium rating may have already lost their water supply and may be converted to a low rating in the future. Likewise, washes with a low or medium rating could receive a high rating in the future if the quantity and duration of water they receive increases due to the incorporation of development features that channel water to particular reaches.

8.0 REFERENCES

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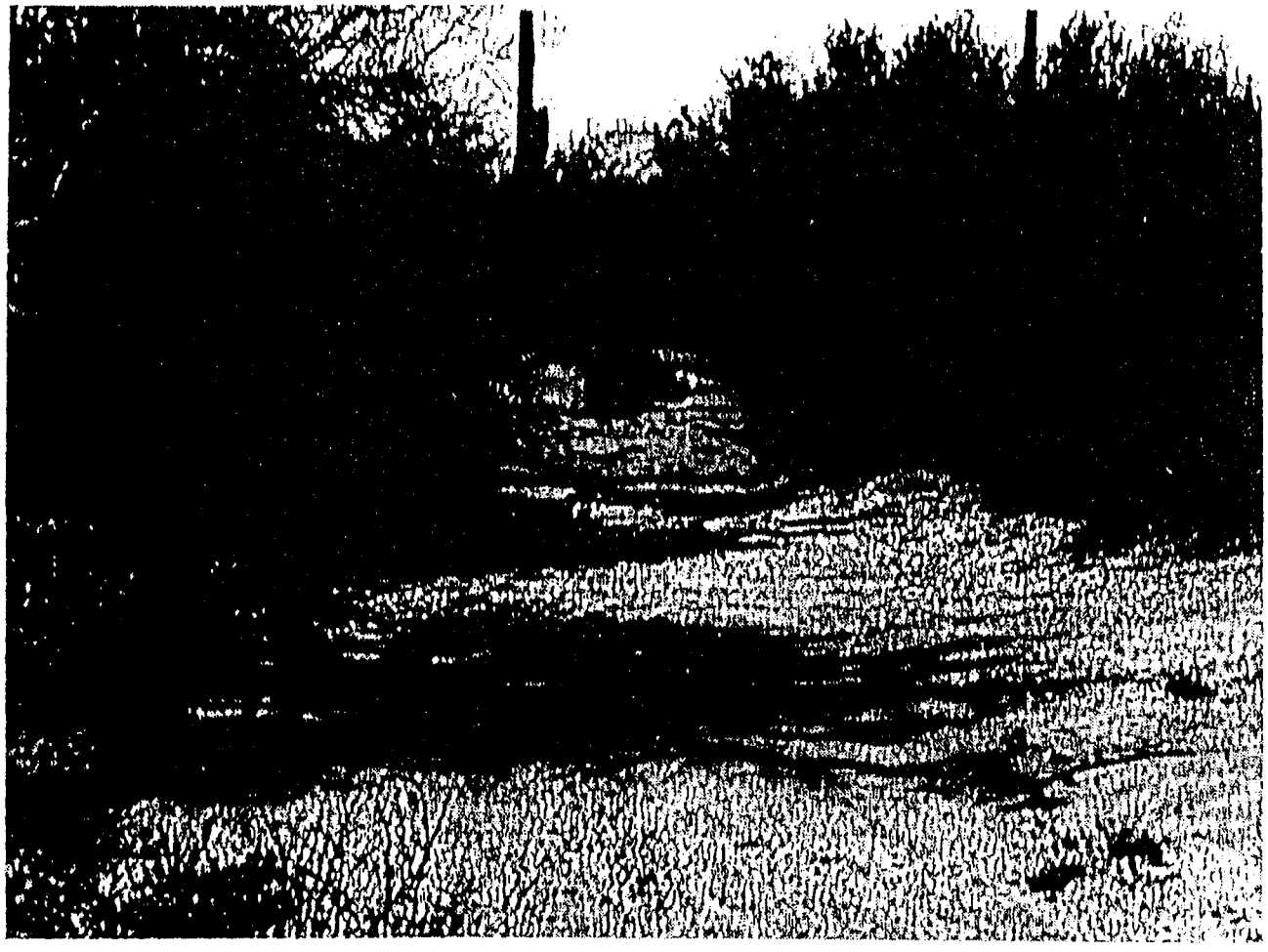
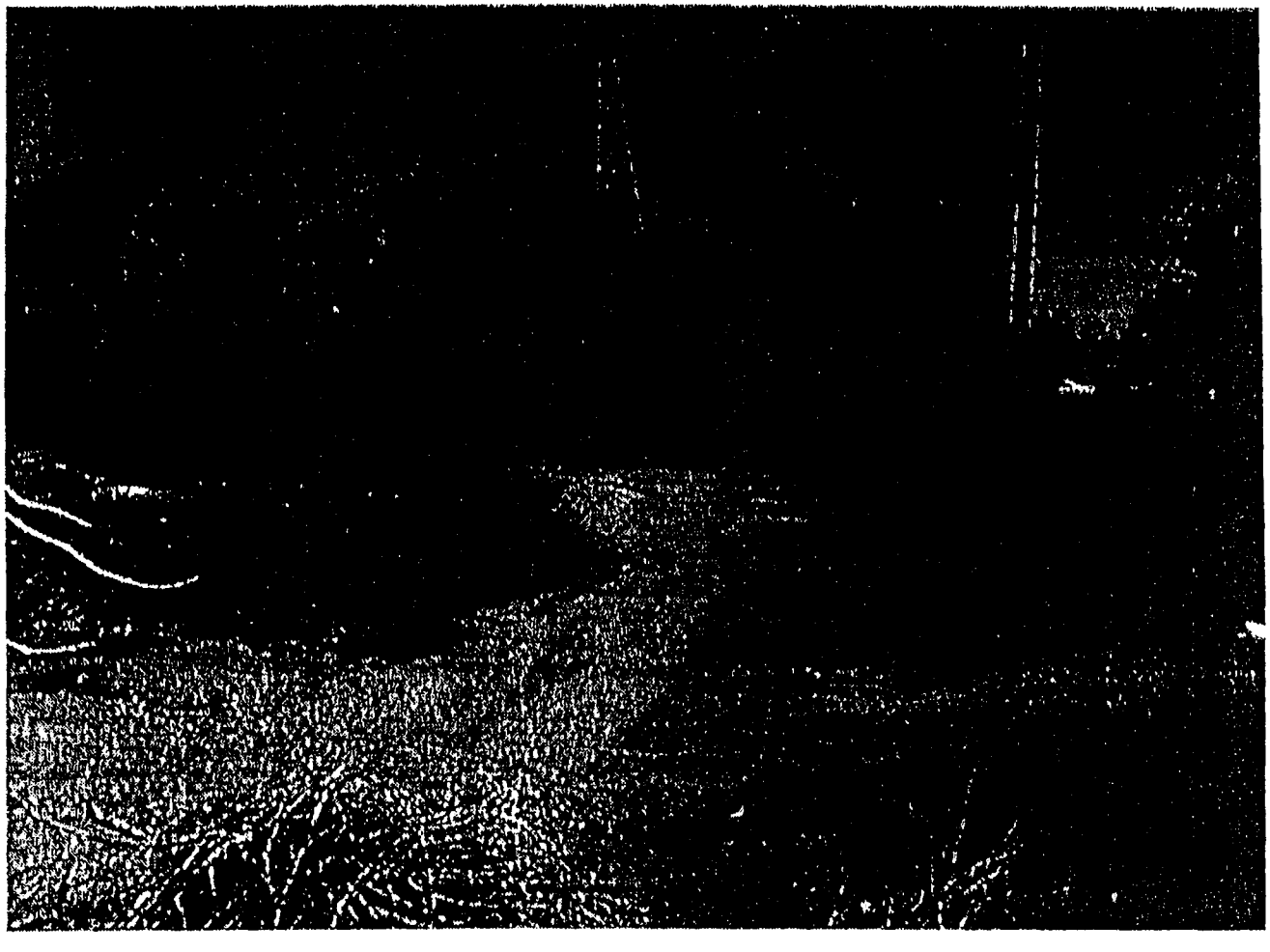
APPENDIX A

REPRESENTATIVE PHOTOS FOR RATED AREAS



High Wash Ranking

Moderate Wash Ranking



Low Wash Ranking

APPENDIX B

PARADISE RIDGE MASTER PLANNED COMMUNITY

Design Criteria for Washes, Road Crossings, and General Drainage Conditions

To ensure that the overall mitigation goals of this plan are achieved during site specific planning and design, minimum standards have been developed for washes and road crossings. Off-site runoff shall be passed through the Paradise Ridge development within four types of conveyance facilities. These are underground storm drains, natural wash corridors, reconstructed wash corridors, and washes constructed on new alignments. Roadway crossings shall consist of culverts and/or bridges.

Criteria for Washes

Minimum standards for each of the three wash types are as follows.

Underground Storm Drains

Storm drains, if needed, will be part of the final design and development of specific parcels within the project area. Storm drains will be sized in accordance with current design standards published by the City of Phoenix and the Flood Control District of Maricopa County. The intent of these criteria includes providing smooth transitions and ensuring sediment flow-through behavior.

Preserved/Enhanced Wash Corridors

The number of natural wash corridors, including location and width, has been established by the Master Drainage Plan. Design standards are as follows:

1. The natural wash corridor widths will vary in order to contain the peak 100-year flow event within the bermed area, as discussed in the Master Drainage Plan.
2. The existing natural low flow channel shall be preserved in its natural state except for the necessary at-grade (at natural wash flow line slope) roadway and multi-use path crossings.
3. The peak 100-year flow shall be contained within the wash corridor and shall satisfy flow depth (generally 2.0 foot or less flow depth in overbanks), velocity and sediment transport criteria stated in the Master Drainage Plan. Some corridors with large discharges may exceed the 2.0-foot flow depth criteria in order to conserve right-of-way.
4. Cutoff walls will be based on the 100- year flow and shall be placed a minimum of 20 feet from the top of the natural wash bank to address potential lateral migration and scour. Cutoff walls shall extend below potential scour depths with a safety factor of 1.3. Cumulative scour calculations shall include general, local, bend, anti-dune and low flow incisement scour.
5. Cutoff walls, privacy fences and multi-use paths shall be located a minimum distance of 20 feet from each side of the natural channel bank. Consequently, a minimum 20 foot wide strip of undisturbed natural riparian habitat shall be preserved on each side of the natural wash. In the case of those areas adjacent to golfing features, the re-vegetation could include grasses appropriate to golf course use in Arizona. Native grasses will be used if practicable. Steps

will be taken to eliminate the possibility of non-native grasses or landscaping materials gaining a foothold in the areas re-vegetated with native plants.

6. The low flow channel and over-bank areas shall require field survey and one-foot contour interval mapping as well as a detailed HEC-RAS hydraulic analysis and HEC-1 sediment transport analysis to ensure a channel that shall safely convey the 100-year flow in accordance with Federal Emergency Management Agency (FEMA) levee design freeboard criteria.

Reconstructed Natural Wash Corridors

The number of reconstructed wash corridors, including location and width, has been established by the Master Drainage Plan. Design standards are as follows.

1. The width and alignment of the reconstructed wash may be adjusted in order to maintain and/or reduce the lower frequency storm peak flows (less than the 100-year peak flow), flood volumes, flow velocities and preserve the integrity of the channel system in stable dynamic equilibrium. However, it shall be necessary to provide sufficient wash corridor area in order to meet the mitigation goals as stated within the Paradise Ridge Habitat Mitigation Plan.
2. The reconstructed low flow channel geometry shall generally be based on the channel forming discharge, which has been estimated at approximately the 10-year flow. The majority of over-banks of the low flow channel will be terraced to allow for planting with native vegetation and placement of geosynthetic reinforcement for erosion protection purposes. The reconstructed channels shall be constructed to appear natural except for necessary grade-control structures and crossings (roadway and multi-use path).
3. The peak 100-year flow shall be contained within the wash corridor and shall satisfy flow depth (equal to or less than 2.0 foot flow depth in overbanks), velocity and sediment transport criteria stated in the Master Drainage Plan.
4. Adequate setback distances or cutoff walls, based on the 100-year flow, shall be provided along the perimeter of wash corridors to address potential lateral migration and scour.
5. Comprehensive sediment transport and sediment deficit analyses, based on 100-year flow and cumulative storm frequency events, shall be required for estimating setback distances to building structures. Cutoff walls shall extend below potential scour depths with a safety factor of 1.3. Cumulative scour calculations shall include general, local, bend, anti-dune and low flow incisement scour.
6. Cutoff walls, privacy fences and multi-use paths shall be located a minimum distance of 20 feet from each side of the reconstructed channel bank. Consequently, a minimum 20 foot wide strip of undisturbed natural riparian habitat shall be preserved on each side of the reconstructed wash. In the case of those areas adjacent to golfing features, the re-vegetation could include grasses appropriate to golf course use in Arizona. Native grasses will be used if practicable. Steps will be taken to eliminate the possibility of non-native grasses or landscaping materials gaining a foothold in the areas re-vegetated with native plants.
7. The low flow channel and over-bank areas shall require field survey and one-foot contour interval mapping as well as a detailed HEC-RAS hydraulic analysis and HEC-1 sediment transport analysis to ensure a channel that shall safely convey the 100-year flow in accordance with FEMA levee design freeboard criteria.

Flood Control Channels/Detention Basins

1. Flood control channels/detention basins will have reinforced banks, where necessary to minimize erosion, and will have natural sandy channel bottoms
2. The primary function of the newly constructed washes is to convey peak flows during storm events.
3. No revegetation is proposed in the JDW washes constructed on new alignments.
4. Mitigation credit in most cases for washes constructed on new alignments will include either the wash bottom or the overbank and wash bottom.

Criteria for Roadway Crossings

The allowable roadway crossing type is determined based on the type of wash conveyance facility. Minimum roadway crossing standards for each conveyance facility are as follows.

Underground Storm Drains

Storm drains that pass under roadways shall be designed to the same standards enumerated above under Criteria for Washes. Storm drains that begin or end immediately upstream or downstream of the roadway shall also adhere to the following standards:

1. Unobtrusive energy dissipators, such as buried riprap or natural looking rock rapids, may be necessary at the downstream end of some drainage structures.
2. At drainage structure entrances, smooth channel-to-structure transitions shall be designed to minimize sediment deposition. Within the preserved/enhanced and reconstructed washes, these entrances shall be unobtrusive and not consist of concrete channel linings.
3. Reinforced turf with geosynthetics may be used within the banks (side slopes) of the approach and exit channel and exit channel transitions.

Preserved/Enhanced Wash Corridors

Design standards for roadway crossings of natural wash corridors are as follows.

1. A "flow-through" system shall be used to pass the peak 100-year flow across the roadway through drainage structures in accordance with current design standards published by the City of Phoenix and the Flood Control District of Maricopa County.
2. The proposed drainage structure at the "flow-through" roadway crossing shall consist of 1) a central structure for the conveyance of flows within the natural wash, and 2) storm drain conduit(s) (such as pipes) for conveyance of overbank flows (on each side of the central structure). At a minimum, the central structure shall span the entire low flow channel as measured between the top of the banks. This can be accomplished by the use of multiple cell structures. The storm drain conduit(s) on each side of the central structure shall prevent funneling of the overbank flows through the central roadway crossing structure. The central structure shall be sized to convey the entire 100-year peak flow as a safety measure in case the storm drain conduit(s) conveying overbank flows are clogged. The flow-lines of these structures shall be placed at or below the natural ground elevation.

3. Sediment transport and scour analyses shall be required to ensure the structural integrity of these drainage structures and a channel system that is in dynamic equilibrium (without significant sediment aggradation or degradation at the inlets and outlets).
4. Unobtrusive energy dissipaters, such as buried riprap or natural looking rock rapids, may be necessary at the downstream end of some drainage structures.

Reconstructed Natural Wash Corridors

Design standards for roadway crossings of natural wash corridors are as follows.

1. The peak 100-year flow across the roadway through drainage structures will be in accordance with current design standards published by the City of Phoenix and the Flood Control District of Maricopa County.
2. At drainage structure entrances, smooth channel-to structure transitions shall be designed to minimize flow disruption/turbulence. These entrances/exits shall be unobtrusive and not consist of concrete channel linings. Reinforced turf with geosynthetics may be used within the banks (side slopes) of the approach and exit channel transitions.
3. Sediment transport and scour analyses shall be required to ensure the structural integrity of these drainage structures and a channel system that is in dynamic equilibrium (without significant sediment aggradation or degradation at the inlets and outlets).
4. Unobtrusive energy dissipaters, such as buried riprap or natural looking rock rapids, may be necessary at the downstream end of some drainage structures.

Flood Control Channels/Detention Basins

1. The peak 100-year flow across the roadway through drainage structures will be in accordance with current design standards published by the City of Phoenix and the Flood Control District of Maricopa County.
2. Sediment transport and scour analyses shall be required to ensure the structural integrity of these drainage structures and a channel system that is in dynamic equilibrium (without significant sediment aggradation or degradation at the inlets and outlets).

APPENDIX C

PARADISE RIDGE MASTER PLANNED COMMUNITY

Landscape Criteria for Reconstructed Natural Wash Corridors

Vegetation

- Plant species composition will be entirely comprised of native species.
- Revegetation will include mesquite, ironwood, hackberry, foothill paloverde and yellow paloverde, wolfberry, saguaro, barrel cactus, buckhorn cholla, and triangular-leaved bursage, and other species identified in Table 3.1.1. Other adapted native plants and seeds may be utilized, upon approval by the Corps.
- Woody plant stock will be salvaged from on-site and supplemented with plants and seeds from local commercial nurseries. Seeding will be undertaken to achieve the desired species composition and density of the herbaceous plants. Native grass seed may also be utilized to help reduce soil erosion.
- The source for all nursery grown plants and seeds will be identified to assure that only locally-adapted, native plants and seeds are utilized.
- Five gallon containerized plants will be utilized to the extent possible based on availability.
- Seeding methods recommended by the nurseries will be followed to achieve the desired herbaceous plant densities.

On-Site Plant Salvage

- Salvaged plants, including trees, shrubs, and cacti shall be used on site.
- The contractor will use standard transplanting procedures when removing and relocating vegetation.

Irrigation

- A temporary drip irrigation system will be installed to accommodate irrigation demands within each of the reconstructed wash corridors.
- The primary water source for irrigation will be the nearest water main. It may be necessary to establish temporary water storage facilities to meet irrigation needs.
- Separate emitters will be installed at each planting. Holes for each planting will be approximately twice the size of root balls.
- Irrigation will continue for at least 2 years after plantings have been completed. Irrigation will be discontinued when the vegetation has become established, and it has been demonstrated that the vegetation can survive without supplemental watering.

Maintenance

- Short-term maintenance of the corridors may include staking, fertilizing, weeding in the immediate area of the vegetation to be re-established, and maintenance of the irrigation system.
- Once the vegetation becomes established and accepted by the Corps, these practices will be discontinued.

- Long-term maintenance of the corridors will not allow pruning, removal of snags, mistletoe control, weeding, or plant litter removal.

Successful Landscape

- 80 percent survival of trees, shrubs, and saguaros 3 years after irrigation has been discontinued.
- If less than 80 percent survival, the ultimate landowner or lessee or it equivalent entity will plant additional vegetation in order to achieve 80 percent survival.

APPENDIX D

PARADISE RIDGE MASTER PLANNED COMMUNITY

Criteria for Trails within the Riparian Habitat Wash Corridors

Soft-Surface Trails: Passive recreation uses only (e.g., hiking, bird watching, photography)

Criteria:

- Permitted along both sides of the wash
- Meander within natural and reconstructed wash corridors
- Located a minimum distance of 20 feet from the low-flow channel
- 8 feet wide
- Constructed of decomposed granite or similar non-toxic material
- Wash crossings are allowed

Hard-surface Trails: Passive recreation uses only (e.g., hiking, bird watching, photography, roller blading, bicycles)

Criteria:

- Located outside of the mitigation area
- 8 feet wide

Jane Dee Hull
Governor

ıael E. Anable
State Land
Commissioner

Arizona
State Land Department

1616 West Adams Street Phoenix, AZ 85007 www.land.state.az.us

May 31, 2002

Mark F. Sudol, Chief of Regulatory Branch, LA Dist.
USACOE-Los Angeles District
911 Wilshire Boulevard
Los Angeles, CA 90017

RE: Paradise Ridge 404 Permit

Dear Mr. Sudol:

With your help in working with the Arizona State Land Department ("ALSD") and the Corps of Engineers' Phoenix office, the issuance of a Clean Water Act section 404 permit for the Paradise Ridge development had been accomplished. I hope that through this process the Corps and ALSD have acquired a greater understanding of the requirements and restrictions placed on our agencies. This will be important as we continue to address issues affecting not only the Paradise Ridge permit, but also 404 permits ASLD or its transferees may require in the future.

Although I appreciate the Corps' work in drafting a 404 permit that recognizes the unique position of ASLD as a trustee and not an ordinary developer of land, I continue to have concerns about certain conditions, in the Paradise Ridge permit. I understand, however, that the Corps is willing to consider modifying these conditions, including special condition (i), which requires that an archeological monitor be present during initial grading throughout the Paradise Ridge development, even on those parcels that do not contain register-eligible archeological sites. I also understand that the Corps is willing to modify the language of special condition (a), to clarify that if a transferee/permitee violates the 404 permit, such violation will be solely the responsibility of that transferee/permitee and any remedial measures taken by the Corps will not affect other transferees/permitees in the Paradise Ridge development who have otherwise complied with the permit. I understand that you indicated to ASLD that this is the effect of the existing language of special condition (a), and ASLD accepted the permit on that basis. However, I appreciate the Corps' willingness to clarify the language as necessary to effectuate this understanding.

I would also appreciate your ongoing cooperation as we work toward developing mutually acceptable lease and deed restriction language to protect the mitigation areas within the Paradise Ridge development, and the establishment of the Sonoran Desert Preserve as a compensatory mitigation program with the City of Phoenix or other approved organization as the designated

entity to receive and administer the program funds. Please consider this letter as ASLD's notice to proceed with the amendments to the permit as described. Thank you for your help on those issues.

Sincerely,

Michael E. Anable
State Land Commissioner

MEA/pf

c: Ron Ruziska
Craig Mershon
Tim Sime
Cindy Lester

APPENDIX H

FORMAT FOR MONITORING REPORTS

FORMAT FOR 401/404 MONTHLY MONITORING REPORT
Permit Number:1999-16129-RWF

Project Name: _____

Owner/Lessee/Developer: _____

Project
Manager/Engineer: _____

Site Location: _____

Area: _____

Type of development: _____

Project Status

1. Natural Washes

Number of washes within project boundaries ____; number of acres___
- ☐ Stakes and ribbons marking jurisdictional waters are in place
- ☐ Fencing marking outer boundaries of wash corridors in place
- ☐ Replaced trees inadvertently damaged or destroyed during construction

Describe work in progress (e.g., berms, cutoff walls, sidewalk crossings, vegetation, etc.)

2. Reconstructed Washes

Number of reconstructed washes within project boundaries___ number of acres ____
Describe work in progress (e.g., berms, cutoff walls, sidewalk crossings, vegetation, etc.)

3. Note any erosion or sediment problems and steps taken to rectify situation

4. Note impacts of major storms

Signature
Project Manager_____ Date_____

Return report to: Engineering Section
Arizona State Land Department
1616 W. Adams Street
Phoenix, AZ 85007

FORMAT FOR ANNUAL REPORT TO THE USACE
HABITAT MONITORING ACTIVITIES WITHIN NATURAL AND RECONSTRUCTED WASH CORRIDORS
Permit Number: 1999-16129-RWF

Project Name: _____

Owner/Lessee/Developer: _____

Project Manager/Engineer: _____

SITE INFORMATION
Site Location

Area

Type of development

Monitoring conducted by

Date of observation

Dates of planting

MITIGATION AREA(S) DESCRIPTION OF AS-BUILT CONDITIONS

MAINTENANCE/SURVIVABILITY
(progress in achieving success criteria)

MONITORING METHODOLOGY

RESULTS

MAINTENANCE ACTIVITIES CONDUCTED ON SITE

FUNCTIONAL ANALYSIS OF SITE

MITIGATION COMMITMENTS COMPLETED

RECOMMENDATIONS/CORRECTIVE MEASURES

REPORT PREPARER(S)

ATTACHMENTS
Aerial map of mitigation areas
Copies of field data forms
Color copies of photos taken from permanent photo points
Documentation of recorded temporary and perpetual easements for mitigation areas

Return report to: Engineering Section
Arizona State Land Department
1616 W. Adams Street
Phoenix, AZ 85007

APPENDIX I

NATURAL AND RECONSTRUCTED WASH CORRIDOR FIELD MONITORING DATA SHEETS

NATURAL & RECONSTRUCTED WASH CORRIDOR
FIELD MONITORING DATA SHEET
Permit No. 1999-16129-RWF

Date:_____ Time:_____Observer (s): _____

Wash No.(s)_____County _____

Owner/Lessee/Developer _____
_____

Site Location
_____

Objective _____

Weather

Temperature_____ Cloud Cover%_____ Wind_____

General Climatic Conditions _____

Topographic Features

_____

_____

_____

Reconstructed Wash Corridor Y N Natural Wash Corridor Y N

Flow Characteristics

Dry _____ Recent flow evidence (wet rocks/mud) _____ Minimal Flow _____

Heavy Flow _____ Temporary water/puddles _____ Standing water/ponding _____

Terrain

Flat _____ Slightly sloped _____ Steep sloped _____ Depression _____

Substrate (check all that apply)

Rocky _____ Alluvium _____ Compact clays _____ Sandy soils _____

Land Features and Use

Special habitat features: (circle appropriate) springs, cliffs, caves, talus, cienega/marsh, snags, dead/down, cavities, eroded banks dead limbs, emergent vegetation (along channel), other

_____

_____

Date_____**Time** _____**Observer (s)**_____

_____

Signs of use (circle appropriate)

Grazing Intensity:	None	Lo	Med.	Hi	Unknown
Recreation Intensity:	None	Lo	Med.	Hi	Unknown
Evidence of Mining Activity:	Y	N	Unknown		
Evidence of Firewood Collection:	Y	N	Unknown		
Regeneration zone present:	Y	N	Species		_____
					_____
Emergent zone present	Y	N	Species		_____
					_____

Adjacent land

Adjacent Upland Vegetation:

_____

_____

_____

Adjacent Land Use (circle appropriate): dirt/paved road, trail, agriculture, industrial, mining, urban, grazing, firewood, campground, ranch, other _____

Human Activities Observed in Wash Corridors

_____Aircraft _____Loud Noises_____Vandalism _____Trash/Dumping _____Pollution

_____Squatters _____Water Diversion _____Wetland Fill _____Construction _____Recreation

_____ None

Vegetation

Dominant Plan Species present (%):

_____

_____

_____

_____

Associated plant species present (%):

_____

_____

_____

Uncommon and rare species present:

_____

_____

_____

Date_____**Time** _____**Observer (s)**_____

_____

Non-native species present: _____

Apparent health of vegetation: _____

Estimated canopy cover: _____

Number/description of woody and herbaceous layers: _____

_____

_____

Wildlife Observed
(indicate whether observation is visual sighting, vocalization, tracks or scat)

Mammals:

_____
_____
_____

Birds:

_____
_____
_____

Reptiles and Amphibians:

_____
_____
_____

Invertebrates:

_____
_____

T & E/Special Interest Spp:

_____
_____

Additional Observations/Comments:

Date_____**Time** _____**Observer (s)**_____

Photo Location No. _____

Average Tree Height	Tree Type

Average Bush	Bush Type

Photo Location No. _____

Average Tree Height	Tree Type

Average Bush	Bush Type

Date_____**Time** _____**Observer (s)**_____

Photo Location No. _____

Average Tree Height	Tree Type
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Average Bush	Bush Type
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Photo Location No. _____

Average Tree Height	Tree Type
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Average Bush	Bush Type
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

APPENDIX J

LIST OF AVAILABLE DOCUMENTS

PARADISE RIDGE DOCUMENTS AVAILABLE AT ASLD ENGINEERING SECTION

1. Paradise Ridge Individual Permit Application, Entranco, April 2001
   a. Alternatives Analysis
   b. Habitat Mitigation and Monitoring Plan
   c. Environmental Assessment 404 (b)(1) Evaluation
   d. Cultural Resources Correspondence

2. Paradise Ridge Master Planned Community 401 Certification Application Impact Analysis and Supplemental Documents, Landmark Land Company of Arizona, April 2001

3. Appendix A A-1 Paradise Ridge Final Development Plan Report, Entranco, April 2001

4. Appendix A A-2 Master Drainage Report (1994), Entranco, April 2001

5. Appendix B B-1 Traffic Report, Entranco, April 2001

6. Appendix B B-2 Noise Report, Entranco, April 2001

7. Appendix B B-3 Hydrology and Master Drainage Report (2001), Entranco, April 2001

8. Appendix B B-3 Hydrology and Master Drainage Report (2001) Plates, Entranco, April 2001

9. Appendix B B-4 Phase II Site and Area Analysis, Entranco, April 2001

10. Appendix B B-5 Cultural Resources Survey Report, Entranco, April 2001

11. Appendix B B-6 Phase I Environmental Site Assessment, Entranco, April 2001

12. Appendix C C-1 & C-2 1999 and 2000 Pygmy Owl Survey Report, Entranco, April 2001

13. Paradise Ridge Infrastructure Assessment and Cost Analysis, Drainage & Engineering Section, Arizona State Land Department, April 16, 1996

14. Paradise Ridge Traffic Impact Analysis (1st Submittal) Responses to City of Phoenix Review Comments, Kirkham Michael Consulting Engineers, July 3, 2001

15. Paradise Ridge Traffic Impact Analysis (2nd Submittal) Responses to City of Phoenix Review Comments, Kirkham Michael Consulting Engineers, August 21, 2001

16. Paradise Ridge Traffic Impact Analysis (1st Submittal) Responses to City of Scottsdale Review Comments, Kirkham Michael Consulting Engineers, October 18, 2001