JURISDICTIONAL WATERS DETERMINATION FOR THE PARCEL 210-34-022A ANALYSIS AREA, PINAL COUNTY, ARIZONA

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INTRODUCTION

WestLand Resources, Inc. (WestLand) was retained by Resolution Copper Mining, L.L.C. (RCM; the Applicant) to evaluate an approximately 560-acre private parcel (the Analysis Area) for the presence of potential waters of the U.S. (Waters). The area subject to this evaluation is identified as Parcel 210-34-022A by the Maricopa County Assessor's Office. This formal Jurisdictional Determination (JD) request is being submitted by WestLand on behalf of the Applicant. Agent Designation and Authorization for Federal Access documentation is included as ***Attachment 1***. Directions to the Analysis Area are provided as ***Attachment 2***.

This evaluation was conducted in general accordance with the June 5, 2007 *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* (the Guidebook) and its attachments (revised December 2008). The format of this memorandum has been developed to facilitate the completion of the *Approved Jurisdictional Determination Form* (the Form; Appendix B of the Guidebook). We have prepared an electronic database capable of producing a separate JD Form for each individual ephemeral drainage reach identified within the Analysis Area, per verbal guidance from (Corps) and experience with the Corps in evaluating past jurisdictional determinations. This technical memorandum provides supporting documentation for the information included on each JD Form. An electronic copy of the JD Forms is included for Corps use.

SECTION I: PROJECT LOCATION AND BACKGROUND INFORMATION

The 560-acre Analysis Area is northwest of and adjacent to the Magma Arizona Railroad Company (MARRCO) railroad line, approximately 6 miles southwest of Florence Junction, Pinal County, Arizona. The lands of the Analysis Area are privately owned by RCM and located in Section 3, Township 3 South, Range 9 East (***Figure 1***). Hydrologically, the Analysis Area occurs within the Middle Gila watershed, specifically the Lower Queen Creek subwatershed. The nearest designated downgradient traditionally navigable water (TNW) to the Analysis Area is the 6.9-mile reach of the Gila River between Powers Butte and Gillespie Dam. ***Figure 2*** provides an aerial overview of the intervening landscape between the Analysis Area and the TNW reach of the Gila River.

It should be noted that the potential flow path from the Analysis Area to the designated TNW reach of the Gila River at Powers Butte shares many segments and characteristics with a previously completed JD request, that for the Lost Dutchman Heights/Portalis Project (Corps File No. SPL-2008-00674-SDM; hereafter Lost Dutchman). The approved Lost Dutchman JD indicated a finding of "no significant nexus" between the evaluated ephemeral drainage features and the TNW reach of the Gila River between Powers Butte and Gillespie Dam. The most significant drainage feature in the Lost Dutchman significant nexus analysis (SNA) was Siphon Draw, with a watershed of over 45 square miles. By comparison, the ephemeral drainages in the Parcel 210-34-022A Analysis Area represent much smaller drainages with significantly smaller watersheds (maximum of 8.5 sq miles), at a much greater distance from the downstream TNW reach of the Gila River. Drainages within the Lost Dutchman Project Area lay approximately 91 river miles from the TNW, while those within the Parcel 210-34-022A Analysis Area lay approximately 112 river miles from the TNW.

As with the Lost Dutchman JD, all of the intervening reaches between the Analysis Area and the TNW are ephemeral until the flow path reaches the effluent-dominated reach of the Gila River downstream of its confluence with the Salt River. Also similar to the Lost Dutchman JD, no well-defined flowpath exists between the Analysis Area and downgradient drainages after the subject features are impounded at the Central Arizona Project (CAP) Canal, approximately 3.8 miles downgradient (southwest) of the Analysis Area. Residential development, active agriculture, and linear transportation features obscure or remove the path of any channelized flow immediately downgradient of the CAP Canal. An analysis of the topography in the area immediately west of the canal suggests that downgradient stormwater flow would be generally towards the ephemeral reach of Queen Creek in the vicinity of Rittenhouse Road. From this point the path of downgradient travel would again be similar to that of Siphon Draw: intercepted by the East Maricopa Floodway, and then discharging to an ephemeral reach of the Gila River at the floodway outfall.

Given the above, it would appear that the SNA completed for the Lost Dutchman property would greatly inform this SNA for the Parcel 210-34-022A Analysis Area.

SECTION II: SUMMARY OF FINDINGS

All of the potential surface water features within the Analysis Area are ephemeral drainages, flowing only briefly in direct response to storm events. No wetlands or other special aquatic sites were identified within the Analysis Area. The drainage features do not qualify as either TNWs (they have not been used, and are not susceptible for use, in interstate commerce) or relatively permanent waters (RPW; they do not flow continuously on a year-round or seasonal basis). Per the December 2008 Corps/Environmental Protection Agency (EPA) guidance entitled *Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States and Carabell v. United States* (the Guidance), the onsite ephemeral drainages were evaluated to determine whether or not they constitute non-navigable, non-RPW tributaries possessing a significant nexus with a TNW.

The significant nexus evaluation found that none of the ephemeral drainage features within the Analysis Area have more than an insubstantial or speculative effect on the physical, chemical, or biological integrity of the downgradient TNW reach of the Gila River between Powers Butte and Gillespie Dam. Accordingly, none of the ephemeral drainage features within the Analysis Area possess a significant nexus with a downgradient TNW. Therefore, all of the ephemeral drainage features considered in this analysis are non-jurisdictional.

Mapped ephemeral drainages within the Analysis Area are shown in ***Attachment 3***. In this evaluation, drainages have been grouped based on hydrologic characteristics and nature of flows. Drainages A and B, for example, are the two mainstem drainages within the Analysis Area, and for purposes of calculating discharge values, are considered together with their extremely limited tributary systems as distinct hydrologic units. For the purposes of determination of significant nexus, a JD Form for each individual relevant drainage reach is provided in the included electronic database. ***Attachment 4*** provides representative ground photographs of the characteristics of the evaluated drainages. Locations of these representative ground photographs are shown in the maps provided in ***Attachment 3***.

SECTION III: CLEAN WATER ACT ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs.

There are no TNWs or wetlands adjacent to TNWs in the Analysis Area. The nearest confirmed TNW is a stretch of the Gila River, located over 110 river miles from the Analysis Area.

B. CHARACTERISTICS OF TRIBUTARY AND ITS ADJACENT WETLANDS

1. Characteristics of Non-TNWs That Flow Directly or Indirectly into TNW

Prior to conducting a field visit, WestLand interpreted regional and site-specific available aerial photography (NAIP 2010) and the U.S. Geological Survey (USGS) topographical map for the Analysis Area (Magma 7.5-minute Quadrangle) to identify drainage systems and other potential areas of interest.

WestLand personnel visited the Analysis Area between June 18 and June 20, 2012 to assess site conditions and to document the physical characteristics of potentially jurisdictional features[1]. WestLand collected data for drainage features at field-determined intervals. Drainage characteristics were measured at selected points where appropriate, and photographs were taken at each data point, generally alternating between upgradient and downgradient views. Based upon the data collected during the field reconnaissance and review of aerial photographs and site topography, data points and photo locations were digitally transferred onto a recent aerial photograph using ArcGIS.

Analysis of the physical characteristics of the evaluated drainages was informed by the August 2008 delineation manual *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States,* the July 2010 update to the same, and the 2007 *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* and its attachments. Although wetlands were not identified within the Analysis Area, any wetland evaluations would have been conducted following the procedures described in the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) and the 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* to that document.

In Westland's judgment, using the practices typically utilized by the Corps in assessing ephemeral drainages in the arid southwest, an OHWM is present in approximately 11,979 linear feet of ephemeral

[1] In jurisdictional non-wetland waters, Corps regulations establish the lateral extent of federal jurisdiction using the ordinary high water mark (OHWM). The OHWM is defined at 33 CFR Part 328.3(e) as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." In ephemeral washes in the southwest, the Corps' practice has been to identify an OHWM by changes in substrate (e.g., "sandy-bottomed washes") and the destruction of terrestrial vegetation, with shelving and scour also being frequently used as evidence of an OHWM. The Guidance indicates that the presence of a reliable OHWM with a channel defined by bed and banks may be a physical indicator of flow and therefore relevant to a significant nexus analysis.

drainages within the Analysis Area. OHWM characteristics consisted mainly of evidence of sediment sorting and a change in substrate in the drainage as compared to the surrounding upland area. A clear, definable bed and bank was not visible for the majority of the length of the drainages within Analysis Area. Based on the observed width of the drainages, the estimated total area of potential non-wetland Waters in the Analysis Area is approximately 2.86 acres. No wetlands or other special aquatic sites were identified in the Analysis Area. The photos included in ***Attachment 4*** (which reference photo point locations reflected on ***Attachment 3***) document the drainage characteristics at the data point locations.

Lengths of each analyzed drainage feature were calculated using ArcGIS and included drainage meanderings. Drainage area (in acres) was calculated in ArcGIS using a combination of measured feature OHWM widths at known locations and aerial photography. Average widths were calculated by dividing calculated feature areas by total feature lengths. ***Figure 3*** shows an overview of the entire Analysis Area with all delineated drainage features containing characteristics of an OHWM. Consistent with the Guidance, the following sections analyze the factors relating to the potential for a hydrological, chemical or biological nexus between the drainages in the Analysis Area and the downgradient TNW.

Hydrological Nexus Factors

Hydrology

The natural topography within the Analysis Area has been altered by previous activities apparently related to unrealized construction plans for a residential community (see ***Figure 3***) which pre-date RCM's involvement with the property. It is apparent from historical aerial review that upland grading and pond excavation occurred on the southern portion of the Analysis Area between August 2006 and June 2007. Approximately 190 acres within the Analysis Area have been disturbed as a result of the construction activity. Currently, some portion of rainfall and minor upland flows may be detained as a function of the man-made ponds; however, the ponds are unlined earthen structures, and are not designed to retain surface flows.

The ephemeral drainages in the Analysis Area trend generally northeast to southwest, and consist of two main drainages, Drainage A and Drainage B, and their extremely minor tributaries (see ***Figure 3***). Both Drainages A and B come to a confluence with a larger, unnamed ephemeral drainage immediately to the west of the Analysis Area. Topographic and stream data maintained by the Natural Resources Conservation Service (NRCS) of the U.S. Department of Agriculture (USDA) indicates that stormwater flow through this larger, unnamed ephemeral drainage is impeded downgradient of the Analysis Area by a constructed earthen pond and further altered by rural residential development (USDA 2012). A distinct, channelized downgradient flowpath is difficult to discern between this point and the CAP Canal. The CAP Canal functions as a second impounding feature, detaining stormwater flows at the intersection of the canal and the raised bed of the MARRCO railroad (see ***Figure 2***). The inlet and outlet of a siphon passing beneath the CAP Canal are visible on aerial photography near this intersection. Given the numerous impoundments of and alterations to the ephemeral drainages between the Analysis Area, it is unclear what magnitude of storm event would be required to transmit stormwater flows the more than 3.5-mile distance from the Analysis Area drainages to the downgradient side of the CAP Canal.

As previously indicated, residential development, active agriculture, and linear transportation features obscure or remove the path of any channelized flow downgradient of the CAP Canal. Although a distinct flowpath cannot be distinguished as a result of these intervening constructed disturbances, the Analysis Area occurs entirely within the Lower Queen Creek subwatershed (USGS Hydrologic Unit Code [HUC] 1505010009) of the Middle Gila watershed. Analysis of the topography in the area immediately west of the canal and east of the Santan Mountains suggests that downgradient stormwater flow would be generally towards the ephemeral reach of Queen Creek in the vicinity of Rittenhouse Road (USDA 2012), approximately 9 aerial miles from the siphon beneath the CAP Canal. Downgradient flows from this point would be to the East Maricopa Floodway (EMF), also sometimes identified as the Roosevelt Canal, and then to an ephemeral reach of the Gila River, approximately 36 river miles from the Analysis Area (see ***Figure 2***).

All intervening drainages in the possible downgradient flow path from the Analysis Area to the TNW are classified as ephemeral in Arizona's surface water quality standards (A.A.C. Title 18, Chapter 11, Appendix B) except for one: the Gila River itself upgradient of and including the TNW, beginning at the confluence of the Gila and Salt Rivers. This stretch is classified as effluent-dependent (defined in the regulations as waters that would be ephemeral absent the discharge of wastewater). There are no perennial reaches between the Analysis Area and the downgradient TNW.

Distance to TNW

As described above, the nearest designated downgradient TNW to the Analysis Area is the reach of the Gila River between Powers Butte and Gillespie Dam. Assuming the general flow route described above, the drainages within the Analysis Area lie approximately 112 river miles (76 aerial miles) from this TNW.

Watershed Comparison to TNW

The watershed of the TNW reach of the Gila River, as measured at the Gillespie Dam, is 49,650 square miles. The largest drainage within the Analysis Area, Drainage A (of which Drainage A1 is a tributary), has an approximate watershed size of 8.53 square miles. This watershed represents approximately 0.0172 percent, or less than one hundredth of a percent, of the watershed of the downgradient TNW. The remaining drainage watersheds (0.0025 to 0.0610 square miles) within the Analysis Area range between 0.000005 and 0.0001 percent of the TNW reach of the Gila at Powers Butte.

Mean Annual Precipitation

No gages for the measurement of precipitation are located within the Analysis Area. Measures of the mean annual precipitation in the vicinity of the Analysis Area were obtained from the Western Regional Climate Center (WRCC), and are based on data collected at the National Climate Data Center (NCDC) station located in Superior (Station ID 028348) approximately 20 miles northeast of the Analysis Area (WRCC 2012). The records from this station show a mean annual precipitation of 18.32 inches between the years 1920 and 2006. The other nearest stations are Superstition Mountain (Station ID 028356) 11 miles to the north and Ashurst Hayden Dam (Station ID 020498) 11 miles to the south. These stations

show a mean annual precipitation of 11.99 inches and 10.31 inches, respectively. For the purposes of this evaluation, mean annual precipitation for the Analysis Area is conservatively assumed to be 18 inches. It should be noted that this value for mean annual precipitation is more representative of the upland area to the east of the Analysis Area than of the Analysis Area itself, where the mean annual precipitation is more likely in the range of 9 to 11 inches.

The vast majority of this precipitation comes in the form of rain, although light snow is possible. The mean annual snowfall recorded by the Superior Station was 1.4 inches. Mean annual snowfall recorded by the Superstition Station was 1.5 inches, while the Ashurst Station shows 0.0 inches. The snowfall in the vicinity of the Analysis Area generally functions in the same capacity as rainfall, usually melting and running off in the course of a single day. Snowfall in the area never forms a "snow pack" in the traditional sense of that term.

Flow Event Data

No gages for the measurement of flow are located within the Analysis Area. The nearest operating gage that could provide both daily and historic flow data is located on Queen Creek at Rittenhouse Road (Station ID 6707) and maintained by the Flood Control District of Maricopa County (FCDMC). This gage is approximately 9 aerial miles downgradient of the siphon beneath the CAP Canal. Although it is unclear if stormwater flows from this portion of the Lower Queen Creek subwatershed would report to the reach of Queen Creek above the gage, it is the nearest measure of flow that could be used as a potential proxy in an evaluation of coincident streamflow between the Analysis Area drainages and the downgradient TNW. The next closest downgradient gage would be on the EMF at Arizona Avenue (Station ID 6598) approximately 36 river miles (24 aerial miles) from the Analysis Area. Below the EMF at Arizona Avenue, there are three gaged locations on the flowpath of interest between the Analysis Area and the gage on the Gila River at Gillespie Dam, the downstream end of the TNW reach.

WestLand is aware that in documentation submitted in support of at least five previously approved jurisdictional determinations within Arizona (Wood, Patel & Associates, Inc. 2007, EcoPlan Associates, Inc. 2008, Cardno WRG 2009, CMX 2009, and WestLand 2011), other applicants evaluated the hydrologic connectivity (or lack thereof) of drainages on project sites with the nearest TNW by analyzing instances of possible coincident streamflow between the project drainages and the TNW. An approved JD (File No. SPL-2009-00315-MB) completed by WestLand on behalf of the Applicant for a site in Superior, Arizona contained such an evaluation prepared by JE Fuller Hydrology & Geomorphology, Inc. (JEF). This evaluation of potential hydrologic connectivity included much of the flowpath from the current Analysis Area to the downgradient TNW, specifically the flowpath between the reach of Queen Creek at Rittenhouse Road to the TNW reach of the Gila at Powers Butte. The coincident flow analysis contained in the JEF memorandum (JEF 2011) is relevant to the potential downgradient flowpath from the current Analysis Area and is discussed in the *Potential Hydrologic Connectivity to TNW* section below.

Estimated Onsite Peak Flows

In the absence of direct gage data for flows in Analysis Area drainages, WestLand utilized the USGS Regression Equations for Region 13 (USGS 1999) to estimate a peak discharge value for the 2-year return

interval (Q_2) storm event and the 100-year return interval (Q_{100}) storm event within the watershed of each of the identified relevant drainage reaches. The equations for the USGS method were developed based on the characteristics of the various physio-geographic regions of Arizona and recorded flow events at gage stations within each region. Although the USGS Regression Equations have a published lower watershed bound of 0.1 square miles (64 acres), these equations represent the best available estimate of flows within these watersheds in the absence of direct measurement and modeling for each tributary drainage. It is widely accepted that for watersheds less than 0.1 square miles in size, the USGS Regression Equations significantly overestimate potential peak discharge and provide a highly conservative estimate of the actual flows contributed by these tributary drainages. Values for peak discharges of the Q_2 and Q_{100} recurrence interval event for selected drainage features within the Analysis Area are provided below.

Drainage A and Drainage B are the mainstem drainage features within the Analysis Area, and their watersheds, therefore, include the watershed areas of their tributary drainages. The watershed of Drainage A, the largest watershed in the Analysis Area is 5,462 acres or 8.53 square miles. Using the Regression Equations for Region 13, the Q_2 recurrence interval event in Drainage A is estimated at 405 cubic feet per second (cfs), and the Q_{100} recurrence interval event at 4,456 cfs. The watershed of Drainage B, the second largest is approximately 839 acres or 1.31 square miles. The Q_2 and Q_{100} peak discharges for Drainage B are estimated at 144 cfs and 1,504 cfs, respectively. The remaining watershed sizes within the Analysis Area between 1.58 acres (0.0025 sq mi) and 39.05 acres (0.0610 sq mi).

Potential Hydrologic Connectivity to TNW

Given the discharge values calculated above using USGS Regression Equations, the ephemeral flow characteristics of the onsite drainages, the incidence of transportation losses through percolation (see below), and the presence of numerous constructed features (e.g. the CAP Canal, linear transportation features, urban development, active agriculture, gravel pit operations) along the route of downgradient flow, it is unlikely that flows in the Analysis Area reach the TNW stretch of the Gila River in anything less than a series of the most significant storm events (i.e., greater than the 100-year storm). As described above, the potential flow path from the Analysis Area to the TNW includes reaches of Queen Creek, the EMF, and the Gila River (see ***Figure 2***). The presence of the constructed impoundments and disturbances, coupled with the great distance to the downgradient TNW (112 river miles), vastly lessens, if not removes entirely, the possibility for a more than insubstantial hydrologic connection to exist between the Analysis Area and the downgradient TNW.

The Analysis Area is located in the Basin and Range physiographic province, characterized by generally northwest-southeast trending mountain ranges and intervening alluvial basins. The Analysis Area is situated within an alluvial fan terrace southwest of the Superstition Mountains. The alluvial deposits within and downgradient of the Analysis Area are composed of a surficial deposit (Q) overlying bedrock at the foot of the mountains and a deposit of younger alluvium (Qy) in the area of the Middle Gila River (NEMO 2009). The Q deposit in the area is primarily comprised of the Dunere-Mohall soil complex, mainly consisting of gravelly sandy, coarse sandy and sandy clay loams. These well-drained soils formed in alluvium from mixed sources including the volcanic, granitoid, and sedimentary rocks that comprise the Superstition Mountains (NEMO 2009). The components of this complex have a Natural Resource

Conservation Service (NRCS) hydrologic soil group rating of B. Group B soils consist of deep deposits of silt loam to loam with moderate infiltration rates, even when thoroughly wetted. The low runoff potential of the local soils and the low slope gradient of the downgradient alluvial fans and basin fills can be expected to contribute to the percolation of potential stormwater flows from the Analysis Area.

As described above, the Q_2 and Q_{100} peak discharge values for Drainage A (8.53 sq mi drainage area) are estimated at 405 cfs and 4,456 cfs, respectively. Even assuming the full and complete transmission of these flows to downgradient drainages, potential connectivity to the TNW reach of the Gila River at Powers Butte would be significantly impaired by the man-made impediments and great distance to the TNW reach, as described above. The evidence presented here strongly suggests that no hydrologic connectivity exists between the Analysis Area drainages and the TNW reach of the Gila River beginning at Powers Butte, even during a 100-year, 24-hour storm event.

As previously stated above, an approved JD (File No. SPL-2009-00315-MB) completed by WestLand on behalf of the Applicant for a site in Superior, Arizona contained an evaluation of potential coincident stream flow between the site and the TNW reach of the Gila at Powers Butte. This evaluation of potential hydrologic connectivity (JEF 2011) included much of the flowpath from the current Analysis Area to the downgradient TNW, specifically the flowpath between the reach of Queen Creek at Rittenhouse Road to the TNW reach of the Gila at Powers Butte, and is relevant to the potential downgradient flowpath from the current Analysis Area.

The JEF memorandum (2011) included in the approved JD for the Superior site (File No. SPL-2009-00315-MB) identified ten gaged locations between the Whitlow Ranch Dam on Queen Creek north of Florence Junction to the Gila River at the Gillespie Dam. Five of these gaged locations are relevant to the current Analysis Area and the locations and their associated gages (operated by the USGS and the FCDMC) are presented in ***Table*** 1. Based on the topography and defined watersheds (USDA 2012), the potential downgradient flowpath from the current Analysis Area would overlap the coincident flowpath analyzed for the Superior site in vicinity of the ephemeral reach of Queen Creek at Rittenhouse Road (***Figure 4***). For the current analysis, the flows recorded at the Rittenhouse gage (ID 6707; see ***Table 1***) were used as a proxy indicator of flows in the ungaged drainages of the Analysis Area, which likely greatly overestimates the frequency and duration of any potential flows from the Analysis Area due to the distance from the Analysis Area (14 miles), the numerous intervening constructed features (described above), and the relatively small size of the Analysis Area drainages and their associated watersheds (Drainage A is 8.5 sq miles) relative to the watershed of Queen Creek at Rittenhouse Road (more than 256 sq miles).

Table 1. Summary of Gages used in Coincident Flow Analysis

Gage Name	Operator	Gage ID	Dates of Operation
Queen Creek at Rittenhouse Rd.	FCDMC	6707	9/14/1993 to present
EMF at Arizona Ave.	FCDMC	6598	2/10/1989 to present
Gila at Maricopa Rd.	FCDMC	778	4/9/1995 to present
Gila River near Maricopa, AZ	USGS	09479350	5/19/1995 to present
Gila River near Laveen, AZ	USGS	09479500	1916, 1926, 1940-95
Gila River at 116th Ave.	FCDMC	6848	12/16/1998 to present
Gila at Estrella Parkway	FCDMC	6853	12/2/1992 to present
Gila River at Estrella Parkway near Goodyear, AZ	USGS	09514100	10/1/1992 to present
Gila River below Gillespie Dam, AZ (Low Water Gage)	USGS	09519501	10/1/1992 to present

As presented in the approved JD for the Superior site (File No. SPL-2009-00315-MB), data for the period of record for each gage was downloaded and overlain in a matrix for the coincident flow analysis. This analysis identified an overlapping period of concurrent operation of slightly more than 10 years, between the years 2000 and 2010 (JEF 2011). Mean daily flow rate data from the gages for these 10 years was then analyzed for instances of non-zero flow at each gage, and these instances correlated to identify potential concurrent flow in the path of interest. For the purposes of that analysis, potential concurrent flow was defined as recorded flow at all gages in the reach of interest in the same day.

Based on the analysis of gage data, no flow was present at the Rittenhouse Road gage (ID 6707) for approximately 99.5 percent of the 10-year period of record. Similarly, no flow was recorded for 97 percent of the period of record on Queen Creek at the CAP Canal (Gage 6723), and 96 percent of the period of record on the EMF at Arizona Avenue (Gage 6598), the point at which the EMF enters the Gila River. Analysis of the 10-year period of record identified no instances of potential concurrent flow within the reach of interest. Five different two-week periods of gage data associated with sizeable precipitation events in central Arizona were selected for analysis: January 2005, February 2005, January 2008, January 2010, and March 2010. In only one of these two-week periods, from January 17th through January 30th, 2010, was flow recorded at all gages within the reach of interest over a period of several days.

Although the data did not illustrate instances of coincident flow along the entire path of interest, the analysis of these five two-week periods did show instances of coincident flow in Queen Creek to the Gila River at the EMF outfall. The data suggested large transmission losses, likely due to percolation, in Queen Creek between the CAP Canal and the EMF, and within the EMF itself before the outfall to the Gila River. The data also suggested that those stormwater flows which do discharge to the Gila River from the EMF were lost through percolation into the alluvium of the Gila River and were not transmitted downstream (JEF 2011).

Given the discharge values calculated above using USGS Regression Equations, the ephemeral flow characteristics of the onsite drainages, the high transmission losses suggested by the gage data, and the

presence of numerous constructed features (e.g. the CAP Canal, linear transportation features, urban development, active agriculture, gravel pit operations) along the route of potential flow, it is highly unlikely that potential flows in the Analysis Area reach the TNW stretch of the Gila River in anything less than a series of the most significant storm events (i.e., greater than the 100-year storm). The runoff calculations and geomorphology of the flow path provide evidence that normal flows from the Analysis Area would not reach the Gila River for potential transmission to the TNW reach at Powers Butte. Although potential concurrent flow is infrequently present in Queen Creek and the EMF at Arizona Avenue (see ***Figure 4***), gage data suggest that these flows are not transmitted downstream, but rather lost to percolation before reaching the gage on the Gila River at Maricopa Avenue (see ***Figure 4***), less than 13 river miles downstream of the EMF and more than 59 river miles upstream of the TNW reach at Powers Butte. The evidence presented in the above discussion suggests that very little potential exists for hydrologic connectivity between the ephemeral drainages within the Analysis Area and the downstream TNW.

Physical/Chemical Nexus Factors

The great distance between the Analysis Area and the downgradient TNW, as well as the presence of several constructed impediments to flow, suggests there is no potential for the drainages within the Analysis Area to have a more than an insubstantial or speculative effect on the physical or chemical integrity of the TNW. Within the Analysis Area, no known significant potential sources of chemical pollutants currently exist. The most significant potential pollutant from this area is unconsolidated sediment from the graded pads and unpaved roads. Given the above, there are minimal existing sources of pollution on site that could potentially be transmitted downgradient by the Analysis Area drainages. Even if such sources did exist, as outlined above, there appears to be limited hydrologic connectivity between the Analysis Area drainages and the TNW reach of the Gila River (i.e., limited to events larger than the 100-year, 24-hour storm event). Therefore, the drainages in the Analysis Area are not expected to contribute pollutants at an amount or frequency that would affect the chemical integrity of the downgradient TNW.

In terms of physical parameters, any natural desert area likely contributes sediment to ephemeral drainages. The Analysis Area is no exception, where there has been ground disturbance which could increase sediment entering the onsite drainages. Based on the hydrologic connectivity analysis above, the numerous constructed impediments along the potential path of downgradient flow, and the great distance to the downgradient TNW, however, sediment transport to the TNW likely could occur only in events exceeding the 100-year, 24-hour event. Therefore, the drainages in the Analysis Area are not expected to contribute sediments at an amount or frequency that would affect the physical integrity of the downgradient TNW.

Biological/Ecological Nexus Factors

In discussing biological considerations, the Guidance notes that ephemeral tributaries in the arid west may provide habitat for wildlife and aquatic organisms in downgradient TNWs. WestLand's evaluation of the Analysis Area has not identified any species present in the onsite drainages that are supported by the

downgradient TNW reach of the Gila River. The drainages within the Analysis Area are all ephemeral and do not provide habitat or life cycle support functions for aquatic species. Winter (2007) notes that "nearly all streams need to have some contribution from ground water in order to provide reliable habitat for aquatic organisms." Moreover, the significant distance (approximately 100 river miles or 76 aerial miles) between the Analysis Area drainages and the downgradient TNW effectively limits the ability of the Analysis Area drainages to provide habitat for species that also use the TNW.

Native vegetation along the ephemeral drainages in the Analysis Area and between the Analysis Area and the Gila River, when it is still present, is generally xeroriparian in nature and characteristic of the Lower Colorado River subdivision of the Sonoran Desertscrub biotic community, as described by Brown (1994). These xeroriparian habitats support a variety of common plant species, most of which also occur within adjacent upland habitats. The xeroriparian habitats subject to this analysis are interrupted downgradient from the Project Area by constructed impoundments, active agriculture, and the urban development of the East Phoenix Valley. The drainages within the Analysis Area do not provide significant habitat or life cycle support functions for any species population found within the TNW reach of the Gila River beginning at Powers Butte. This lack of life cycle support can be extended to include potential contributions of nutrients and organic carbon to species within the TNW.

Headwater streams provide an input of dissolved organic matter and particulate matter that is transported downgradient to receiving waters (Wipfli et al. 2007). The drainages within the Analysis Area and those downgradient from the Analysis Area are ephemeral streams and do not contain aquatic resources that are dependent upon allochthonous inputs to establish and maintain the energy and nutrient dynamics of these systems. Desert streams depend more on nutrient inputs from surrounding land than on upstream inputs. The xeroriparian habitats associated with the downgradient ephemeral waters are not expected to be dependent upon energy or nutrient inputs from the Analysis Area. Almost all of the species found within these habitats are also found in adjacent uplands, and many of the species are able to fix nitrogen. These systems do not provide significant nutrient cycling and energy functions to downgradient habitats. Given these conditions, the drainages within the Analysis Area do not significantly affect the integrity of the aquatic habitat or the amount of nutrient transport to the TNW reach of the Gila River.

Although a full biological evaluation has not been completed for this significant nexus analysis, a preliminary screening analysis (***Attachment 6***) shows that two species listed as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS; USFWS 2012) have limited potential to occur on or within the vicinity of the Analysis Area: lesser long-nosed bat (*Leptonycteris yerbabuenae*) and the ocelot (*Leopardus [Felis] pardalis).* None of these species are aquatic or riparian, and there is no designated critical habitat within the Analysis Area or along the downgradient flow path to the nearest TNW. The drainages within the Analysis Area do not provide significant habitat or life cycle support functions for any species population found within the downgradient TNW reach of the Gila River. Based on the above, the Analysis Area drainages do not have more than an insubstantial or speculative effect on ecological or biological integrity of the TNW.

2. Characteristics of Wetlands Adjacent to Non-TNW That Flow Directly or Indirectly into TNW

As described above, no wetlands were identified within the Analysis Area.

C. SIGNIFICANT NEXUS DETERMINATION

Based on the information provided in Section III.B, none of the drainage features within the Analysis Area possesses a significant nexus with a designated TNW. The drainage features within the Analysis Area constitute non-navigable, non-RPW tributaries, which do not possess a significant nexus with a downgradient TNW. Therefore, none of the subject drainages are jurisdictional Waters.

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS

As described above, none of the ephemeral drainages within the Analysis Area have more than an insubstantial or speculative effect on the physical, chemical, or biological integrity of the downgradient TNW reach of the Gila River between Powers Butte and Gillespie Dam.

E. ISOLATED WATERS, THE USE, DEGRADATION, OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE CONNECTION

WestLand and the Applicant have analyzed the drainages in the Analysis Area using a significant nexus analysis under the Rapanos Guidance. None of the drainage features within the Analysis Area were considered as isolated waters.

F. NON-JURISDICTIONAL WATERS

All of the drainage features considered in this analysis are non-jurisdictional. A summary of drainage features possessing the physical characteristics of an OHWM is provided as ***Table 2***. All drainage features possessing OHWM characteristics are delineated on recent aerial photography in ***Attachment 3*** of this document.

Table 2. Summary of Drainage Features Evaluated

Drainage Feature ID	Lat/Long of Centerpoint	Length (ft)	Average Width (ft)	Area (ac)	Watershed Acreage (ac)
Unnamed Wash A	33.2036/-111.4136	4892	14.7	1.65	5461.50
Unnamed Wash A1	33.2038/-111.4125	149	4.6	0.02	39.05
Unnamed Wash B	33.1933/-111.4144	6161	7.8	1.11	838.64
Unnamed Wash B1	33.1941/-111.4117	370	5.3	0.04	1.58
Unnamed Wash B2	33.1961/-111.4088	407	4.2	0.04	10.08

REFERENCES

Arizona Department of Water Resources (ADWR). 2008. Section 8.1 Phoenix AMA. In *Arizona Water Atlas Volume 8: Active Management Area (AMA) Planning Area*. Available at: http://www.azwater.gov/AzDWR/StatewidePlanning/WaterAtlas/ActiveManagementAreas/documents/Volume_8_PHX_final.pdf Website accessed September 4, 2012.

Brown, D.E. (ed.). 1994. *Biotic communities: Southwestern United States and Northwestern Mexico*. University of Utah Press: Salt Lake City.

Cardno WRG. 2009. *Sonoran Solar Energy Project Significant Nexus Analysis*. Army Corps of Engineers File No. SPL-2009-00397-JD2. Cardno WRG, Scottsdale Arizona

CMX, LLC. 2009. *Jurisdictional Delineation Report Section 20*. Army Corps of Engineers File No. SPL-2009-00557-RWF. CMX, LLC, Phoenix Arizona.

EcoPlan Associates, Inc. 2008. *Lost Dutchman Heights, Apache Junction, Arizona: Significant Nexus Analysis* (Revised). Army Corps of Engineers File No. SPL-2008-00674-SDM. EcoPlan Associates, Inc., Arizona.

JE Fuller Hydrology and Geomorphology, Inc. (JEF). 2011. *Resolution Copper: Significant Nexus Evaluation*. JE Fuller Hydrology and Geomorphology, Inc., Phoenix, Arizona.

NEMO. 2009. Section 2: Physical Features. In *NEMO Watershed-Based Plan, Middle Gila Watershed*. Available at: http://nemo.srnr.arizona.edu/nemo/characterizations/MiddleGila/middle_gila_final_pdf/Middle%20Gila%20Section%202.pdf. Website accessed August 15, 2012.

USFWS. 2012. Federally Listed Threatened, Endangered, and Candidate Species for Pinal County, updated March 05, 2012.

USGS. 1999. *The National Flood-Frequency Program: Methods for Estimating Flood Magnitude and Frequency in Arizona*. U.S. Geological Survey Fact Sheet 111-98.

United States Department of Agriculture (USDA). 2012. Watershed Boundary Dataset for HUC 1505010009, Arizona. Available at: http://datagateway.nrcs.usda.gov/. Website accessed August 2012.

Western Regional Climate Center (WRCC). 2012. Period of Record Monthly Climate Summary for Superior, Arizona Station (028348). Available at: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?az8348. Website accessed August 14, 2012.

Westland Resources, Inc. 2011. *Jurisdictional Determination for the Resolution West Plant and East Plant Analysis Areas* (revised). Corps File No. SPL-2009-00315-MB. WestLand Resources, Inc., Tucson, Arizona.

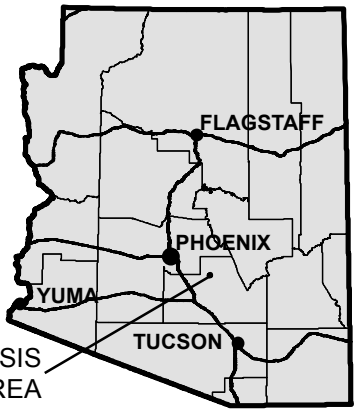
Winter, Thomas C. 2007. The Role of Ground Water in Generating Streamflow in Headwater Areas and in Maintaining Base Flow. *Journal of the American Water Resources Association*, 43(1):15-25.

Wipfli, Mark S., John S. Richardson, and Robert J. Naiman. 2007. Ecological Linkages Between Headwaters and Downgradient Ecosystems: Transport of Organic Matter, Invertebrates, and Wood Down Headwater Channels. *Journal of the American Water Resources Association*, 43(1):72-85.

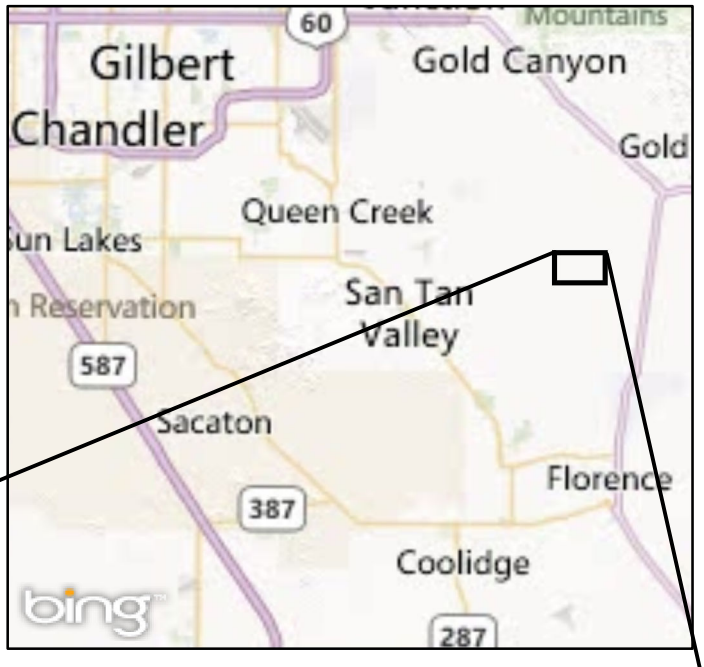
Wood, Patel & Associates. 2007. *Flow Characteristics of Washes at the Trillium Development, Maricopa, Arizona*. WP# 062878.01/Army Corps of Engineers File No. SPL-2008-00333-SDM-JD1. Wood, Patel & Associates, Phoenix, Arizona.

FIGURES

ARIZONA



PORTION OF PINAL COUNTY



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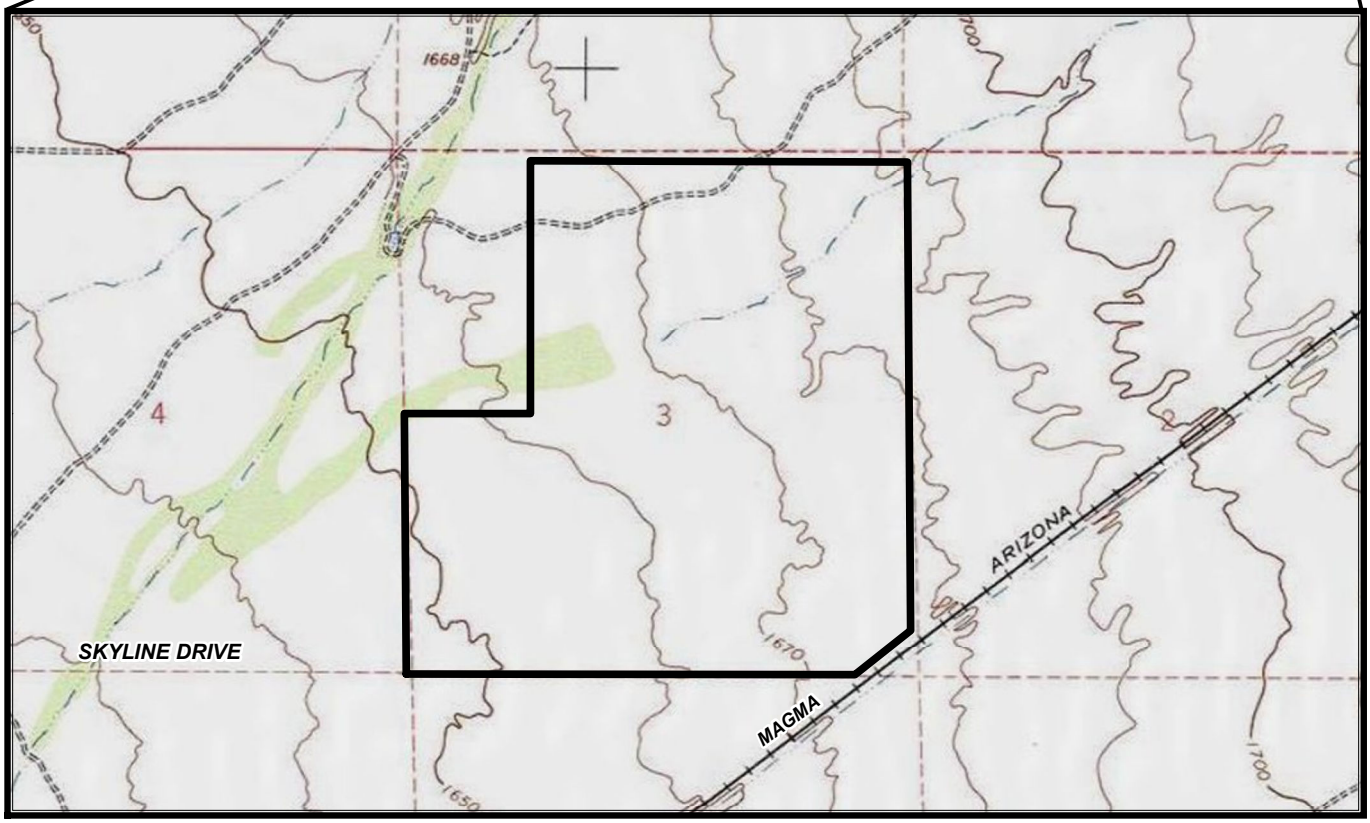


T3S, R9E, Portion of Section 3,
Pinal County, Arizona,
Magma USGS 7.5' Quadrangle
Image Source: USA Topo Maps

Legend

Analysis Area Boundary

N

0 1,000 2,000 Feet

WestLand Resources, Inc.
Engineering and Environmental Consultants

PARCEL 210-34-022A
ANALYSIS AREA
Jurisdictional Delineation

VICINITY MAP
Figure 1

Path: M:\Projects\807.76\Filer_Plan\mxd\Fig2_RegionalAerialOverview.mxd

Date: 1/10/2013 User: elizabethr

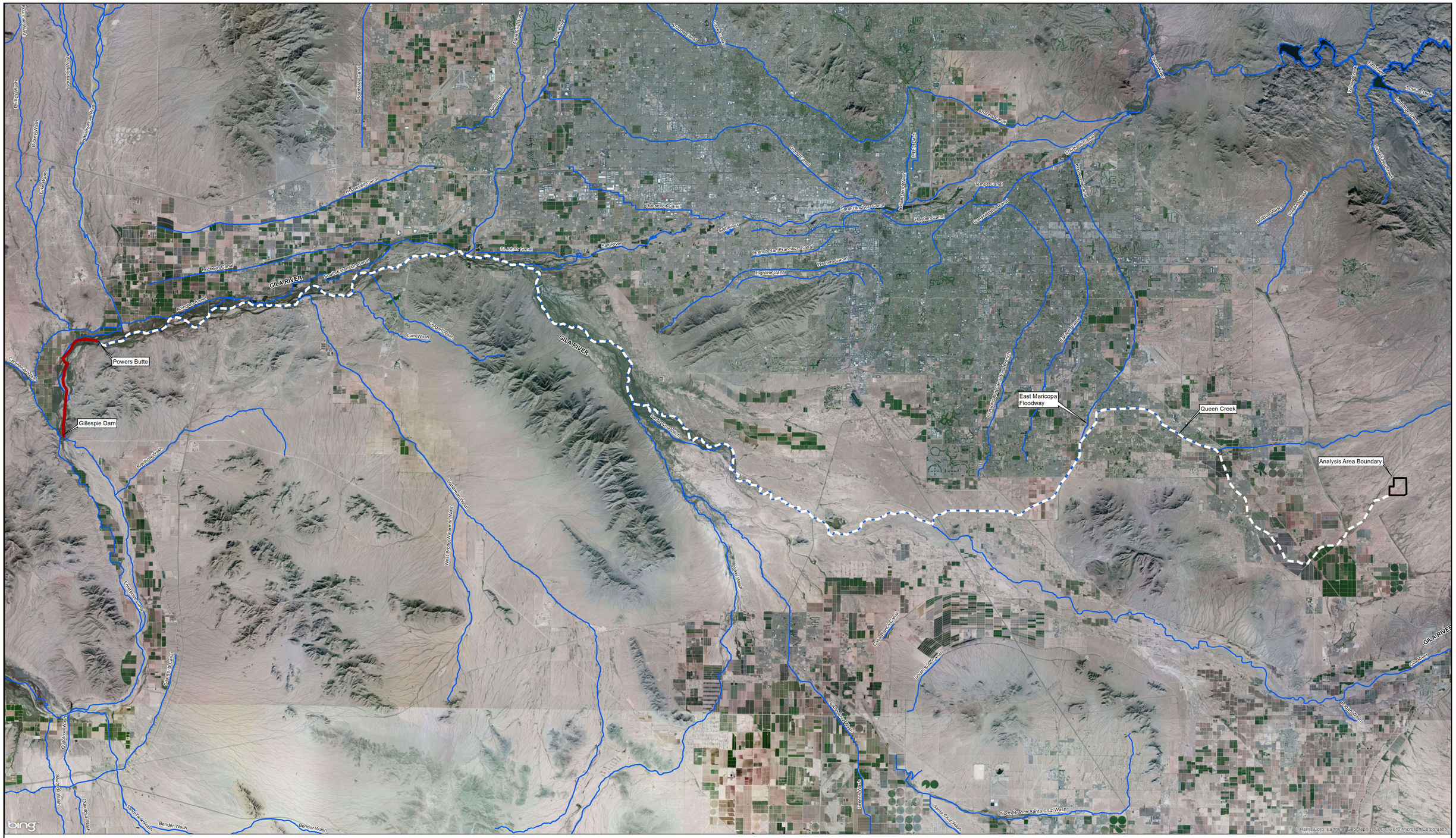


Image Source: BING - Microsoft Virtual Earth

WestLand Resources, Inc.
Engineering and Environmental Consultants

N

0 3 6 Miles

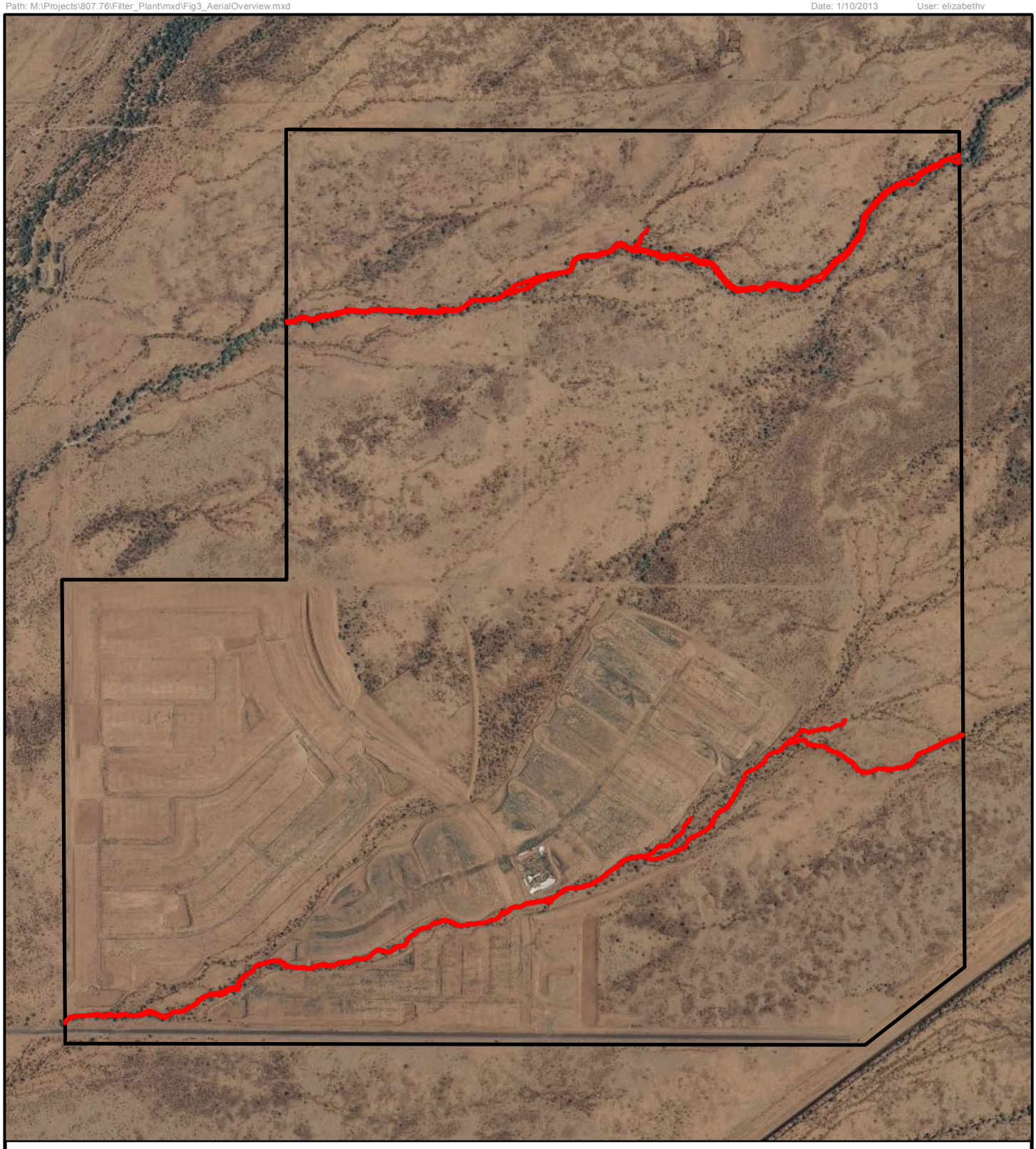
Legend

- Analysis Area Boundary
- Traditional Navigable Water (TNW)
- Potential Downgradient Flow Path
- Named Washes (ALRIS)

PARCEL 210-34-022A
ANALYSIS AREA
Jurisdictional Delineation

REGIONAL OVERVIEW
Figure 2

Path: M:\Projects\807.76\Filter_Plant\mxd\Fig3_AerialOverview.mxd Date: 1/10/2013 User: elizabethv



T3S, R9E, Portion of Section 3,
Pinal County, Arizona,
USGS 7.5' Quadrangle
Image Source: NAIP, 2010

Legend

- Ordinary High Water
- Analysis Area

N

0 400 800 Feet

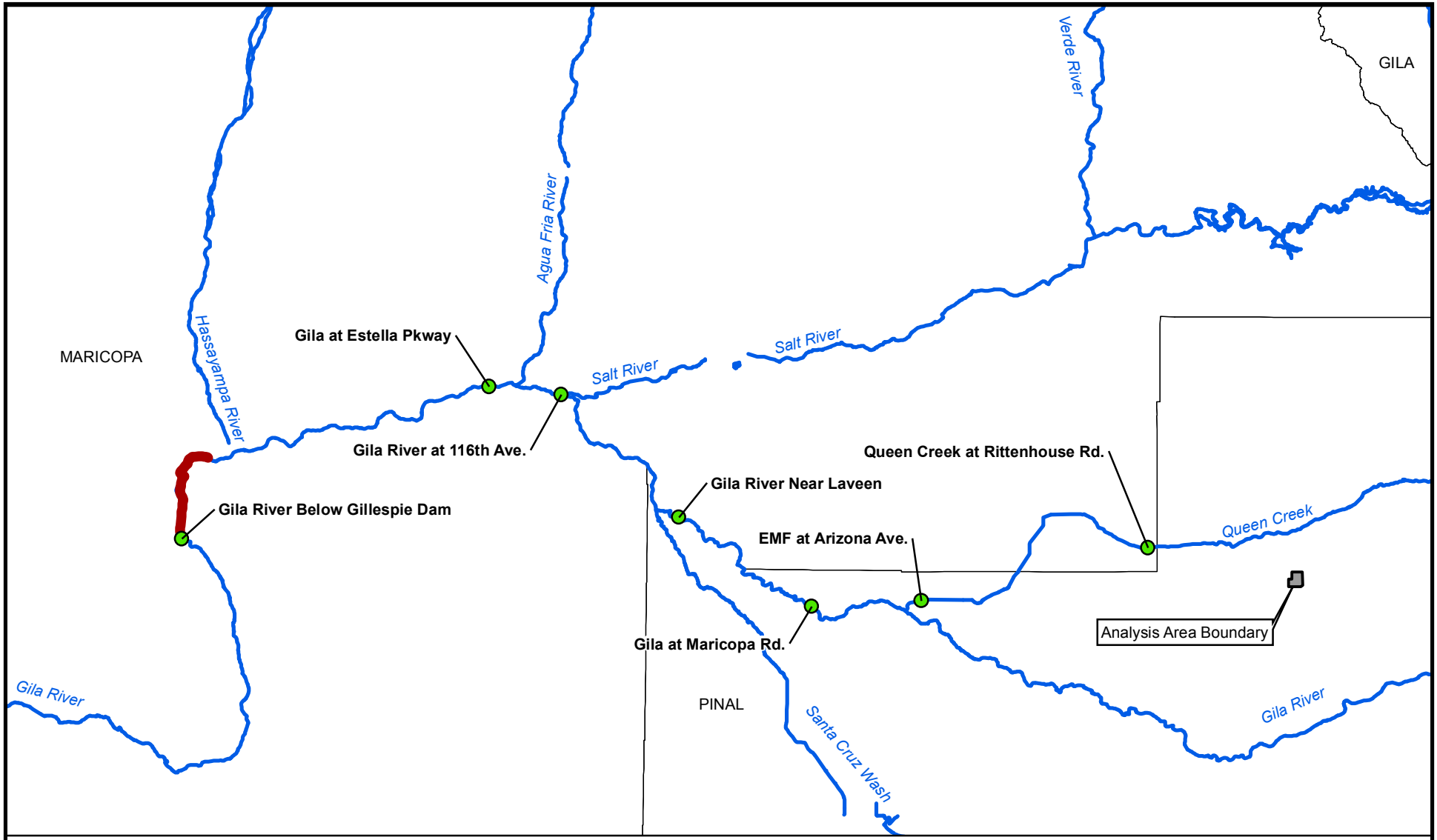
PARCEL 210-34-022A ANALYSIS AREA

Jurisdictional Delineation

DELINEATED DRAINAGE FEATURES

Figure 3

WestLand Resources, Inc.
Tucson • Phoenix • Flagstaff
4001 E. Paradise Falls Drive
Tucson, Arizona 85712 (520) 206-9585



Legend

- Stream Gage between Analysis Area and TNW
- Traditional Navigable Water (TNW)
- Analysis Area Boundary

N

0 5 10 Miles

WestLand Resources, Inc.
Tucson • Phoenix • Flagstaff
4001 E. Paradise Falls Drive
Tucson, Arizona 85712 (520) 206-9585

PARCEL 210-34-022A ANALYSIS AREA

Jurisdictional Delineation

GAGE LOCATIONS

Figure 4

ATTACHMENT 1

AGENT DESIGNATION AND AUTHORIZATION FOR FEDERAL ACCESS

January 11, 2013

Ms. Sallie McGuire
US ARMY CORPS OF ENGINEERS
3636 North Central Avenue, Suite 900
Phoenix, Arizona 85012

RE: JURISDICTIONAL WATERS DETERMINATION FOR THE PARCEL 210-34-022A ANALYSIS AREA, PINAL COUNTY, ARIZONA
AGENT DESIGNATION AND ACCESS AUTHORIZATION

Dear Ms. McGuire:

I am sending this letter to designate WestLand Resources, Inc. as my agent for the purposes of any necessary Clean Water Act Section 404 permitting at the above project. The agent contact information is:

Mr. Thomas Klimas
WestLand Resources, Inc.
4001 E. Paradise Falls Drive
Tucson, Arizona 85712
(520) 206-9585

The Analysis Area subject to this formal jurisdictional determination request is located completely on privately-held lands. The Owner of Record of the privately-held land within the Analysis Area is:

Name: Resolution Copper Company
Mailing Address: 102 Magma Heights
City/State/Zip Code: Superior, Arizona 85273
Telephone Number: 520-689-3313

ACCESS AUTHORIZATION:

I hereby authorize the Army Corps of Engineers and other federal employees the right to access the private property to conduct field investigations for preliminary jurisdictional delineation and for 404 Clean Water Act permitting purposes.

If you have any questions or require additional information, please do not hesitate to contact me.

Respectfully,

Victoria Peacey — 12/19/2012

Signature of Property Owner — Date

Ms. Victoria Peacey — (520)689-3313

Typed/Printed Name of Property Owner — Phone Number

Manager - Environmental Assessments

Title of Property Owner

cc: Mr. Thomas Klimas, WestLand Resources, Inc.

ATTACHMENT 2

DIRECTIONS TO SITE

Google

Directions to E Skyline Rd
45.8 mi – about **1 hour 5 mins**

A I-10 E

1.	Head **south** on **I-10 E**	go 0.2 mi total 0.2 mi
2.	Slight right onto **US-60 E** (signs for **Mesa - Globe**) About 24 mins	go 23.7 mi total 23.9 mi
3.	Take exit **195** for **Ironwood Dr**	go 0.4 mi total 24.2 mi
4.	Turn right onto **S Ironwood Dr** About 11 mins	go 7.5 mi total 31.7 mi
5.	Turn left onto **E Germann Rd** About 2 mins	go 1.0 mi total 32.7 mi
6.	At the traffic circle, continue straight to stay on **E Germann Rd** About 2 mins	go 1.0 mi total 33.7 mi
7.	Continue onto **N Schnepf Rd** About 10 mins	go 6.0 mi total 39.7 mi
8.	Continue onto **E Skyline Dr** About 14 mins	go 6.1 mi total 45.8 mi

B E Skyline Rd

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

ATTACHMENT 3

CWA SECTION 404 JURISDICTIONAL DETERMINATION

T3S, R9E, Portion of Section 3,
Pinal County, Arizona,
Magma USGS 7.5' Quadrangle
Image Source: USA Topo Maps

N

0 200 400 Feet
0 50 100 Meters

WestLand Resources, Inc.
Engineering and Environmental Consultants

SECTION 404 JURISDICTIONAL DELINEATION
U.S. Army Corps of Engineers, Los Angeles District
Application No. SPL -_____-_____-_____

Boundary of area surveyed for jurisdictional waters of the United States (Project Area/Analysis Area)

Ordinary High Water

Waters of the United States

Wetland Boundary
(If legend is blank no wetlands occur in survey area)

_____ Site Visit (Y/N) Date:_____
200' Scale *2010* Date of Photograph
_____ Corps Project Manager
Sheet *1* of *1*

PARCEL 210-34-022A
ANALYSIS AREA
Jurisdictional Delineation

CWA Section 404
Jurisdictional Determination
Attachment 3

ATTACHMENT 4

REPRESENTATIVE GROUND PHOTOGRAPHS

Data Point: 1
Feature: N/A
Width: N/A
View: Southwest

Overview photo located near western Analysis Area boundary. No OHWM development present.

Data Point: 1
Feature: N/A
Width: N/A
View: Northeast

Overview photo located near western Analysis Area boundary. No OHWM development present.

Data Point: 2
Feature: N/A
Width: N/A
View: East

Overview photo of northern portion of the Analysis Area.

Data Point: 2
Feature: N/A
Width: N/A
View: South

Overview photo of northern portion of the Analysis Area.

Data Point: 2
Feature: N/A
Width: N/A
View: West

Overview photo of northern portion of the Analysis Area.

Data Point: 3
Feature: N/A
Width: N/A
View: Southwest

Photo showing erosional feature. No OHWM development present.

Data Point: 3
Feature: N/A
Width: N/A
View: Northeast

Photo showing erosional feature. No OHWM development present.

Data Point: 4
Feature: N/A
Width: N/A
View: Southwest

Photo showing erosional feature near northern boundary of Analysis Area. No OHWM development present.

Data Point: 4
Feature: N/A
Width: N/A
View: Northeast

Photo showing erosional feature near northern boundary of Analysis Area. No OHWM development present.

Data Point: 5
Feature: A
Width: 8 feet
View: Downstream

Photo showing downgradient end of Feature A within the Analysis Area.

Data Point: 5
Feature: A
Width: 8 feet
View: Upstream

Photo showing downgradient end of Feature A within the Analysis Area.

Data Point: 6
Feature: A
Width: 9 feet
View: Downstream

Photo showing Feature A within the Analysis Area.

Data Point: 6
Feature: A
Width: 9 feet
View: Upstream

Photo showing Feature A within the Analysis Area.

Data Point: 7
Feature: A
Width: 12 feet
View: Downstream

Photo showing northern braid of Feature A at road crossing.

Data Point: 7
Feature: A
Width: 12 feet
View: Upstream

Photo showing northern braid of Feature A at road crossing.

Data Point: 8
Feature: A
Width: 5 feet
View: Downstream

Photo showing culvert and road crossing in southern braid of Feature A.

Data Point: 8
Feature: A
Width: 5 feet
View: Upstream

Photo showing culvert and road crossing in southern braid of Feature A.

Data Point: 9
Feature: A
Width: 11 feet
View: Downstream

Photo of Feature A, immediately upgradient of confluence with Feature A1.

Data Point: 9
Feature: A
Width: 11 feet
View: Upstream

Photo of Feature A, immediately upgradient of confluence with Feature A1.

Data Point: 10
Feature: A
Width: 12 feet
View: Downstream

Photo of Feature A showing detail of cow path crossing.

Data Point: 10
Feature: A
Width: 12 feet
View: Downstream

Photo of Feature A showing disturbance of banks from cow path crossing of drainage.

Data Point: 11
Feature: A
Width: 15 feet
View: Downstream

Photo of Feature A.

Data Point: 11
Feature: A
Width: 15 feet
View: Upstream

Photo of Feature A.

Data Point: 12
Feature: A
Width: 12 feet
View: Downstream

Photo of Feature A near upgradient end of feature within Analysis Area.

Data Point: 12
Feature: A
Width: 12 feet
View: Upstream

Photo of Feature A near upgradient end of feature within Analysis Area.

Data Point: 13
Feature: A1
Width: 2 feet
View: Downstream

Photo of Feature A1 showing poor OHWM development within feature.

Data Point: 13
Feature: A1
Width: 2 feet
View: Upstream

Photo of Feature A1 showing poor OHWM development within feature.

Data Point: 14
Feature: N/A
Width: N/A
View: West

Photo showing cow path between portions of Feature A. No OHWM development present.

Data Point: 14
Feature: N/A
Width: N/A
View: East

Photo showing cow path between portions of Feature A. No OHWM development present.

Data Point: 15
Feature: N/A
Width: N/A
View: West

Photo showing cow path between portions of Feature A. No OHWM development present.

Data Point: 15
Feature: N/A
Width: N/A
View: East

Photo showing cow path between portions of Feature A. No OHWM development present.

Data Point: 16
Feature: N/A
Width: N/A
View: West

Photo showing cow path between portions of Feature A. No OHWM development present.

Data Point: 16
Feature: N/A
Width: N/A
View: East

Photo showing cow path between portions of Feature A. No OHWM development present. Feature A visible in far left photo background.

Data Point: 17
Feature: N/A
Width: N/A
View: West

Photo showing erosional feature forming near western boundary of Analysis Area.

Data Point: 17
Feature: N/A
Width: N/A
View: East

Photo showing erosional feature forming near western boundary of Analysis Area.

Data Point: 18
Feature: N/A
Width: N/A
View: East

Overview photo near western boundary of Analysis Area.

Data Point: 19
Feature: N/A
Width: N/A
View: Southwest

Photo showing erosional feature forming in central portion of Analysis Area.

Data Point: 19
Feature: N/A
Width: N/A
View: Northeast

Photo showing cow path in central portion of Analysis Area.

Data Point: 20
Feature: N/A
Width: N/A
View: Southwest

Overview of central portion of Analysis Area.

Data Point: 20
Feature: N/A
Width: N/A
View: Northeast

Overview of central portion of Analysis Area.

Data Point: 21
Feature: N/A
Width: N/A
View: Southwest

Photo of erosional feature forming within Analysis Area. No OHWM development present.

Data Point: 21
Feature: N/A
Width: N/A
View: Northeast

Photo of erosional feature forming within Analysis Area. No OHWM development present.

Data Point: 22
Feature: N/A
Width: N/A
View: Southwest

Photo of erosional feature forming within Analysis Area. No OHWM development present.

Data Point: 22
Feature: N/A
Width: N/A
View: Northeast

Photo of erosional feature forming within Analysis Area. No OHWM development present.

Data Point: 23
Feature: N/A
Width: N/A
View: South

Photo of erosional feature forming within Analysis Area. No OHWM development present.

Data Point: 23
Feature: N/A
Width: N/A
View: North

Photo of erosional headcut forming within Analysis Area. No OHWM development present.

Data Point: 24
Feature: N/A
Width: N/A
View: West

Photo of erosional feature forming within Analysis Area. No OHWM development present.

Data Point: 24
Feature: N/A
Width: N/A
View: East

Photo of erosional feature forming near eastern edge of Analysis Area. Some sediment sorting beginning in base of feature.

Data Point: 25
Feature: N/A
Width: N/A
View: South

Overview photo of southern portion of Analysis Area. Soil disturbance caused by cattle is evident in the photograph.

Data Point: 25
Feature: N/A
Width: N/A
View: Northeast

Overview photo of southern portion of Analysis Area. Soil disturbance caused by cattle is evident in the photograph.

Data Point: 26
Feature: N/A
Width: N/A
View: West

Overview photo of southern portion of Analysis Area. Some limited gravel sorting apparent in base of feature.

Data Point: 26
Feature: N/A
Width: N/A
View: East

Overview photo of southern portion of Analysis Area. Some limited gravel sorting apparent in base of feature.

Data Point: 27
Feature: N/A
Width: N/A
View: Southwest

Overview photo of swale. No OHWM development present.

Data Point: 27
Feature: N/A
Width: N/A
View: Northeast

Overview photo of swale. No OHWM development present.

Data Point: 28
Feature: N/A
Width: N/A
View: Northeast

Overview photo of swale. No OHWM development present.

Data Point: 29
Feature: N/A
Width: N/A
View: Northeast

Overview photo of swale. No OHWM development present.

Data Point: 30
Feature: N/A
Width: N/A
View: Northeast

Overview photo of disturbed area. No OHWM development present.

Data Point: 31
Feature: N/A
Width: N/A
View: North

Overview photo looking at eastern edge of disturbed area.

Data Point: 32
Feature: N/A
Width: N/A
View: South

Overview photo looking over previously disturbed area.

Data Point: 33
Feature: N/A
Width: N/A
View: Southwest

Photo of swale within Analysis Area. No OHWM development present.

Data Point: 33
Feature: N/A
Width: N/A
View: Northeast

Photo of swale within Analysis Area. No OHWM development present.

Data Point: 34
Feature: N/A
Width: N/A
View: Northeast

Overview of erosional channel beginning to form.

Data Point: 35
Feature: N/A
Width: N/A
View: North

Photo of swale within Analysis Area. No OHWM development present.

Data Point: 36
Feature: N/A
Width: N/A
View: North

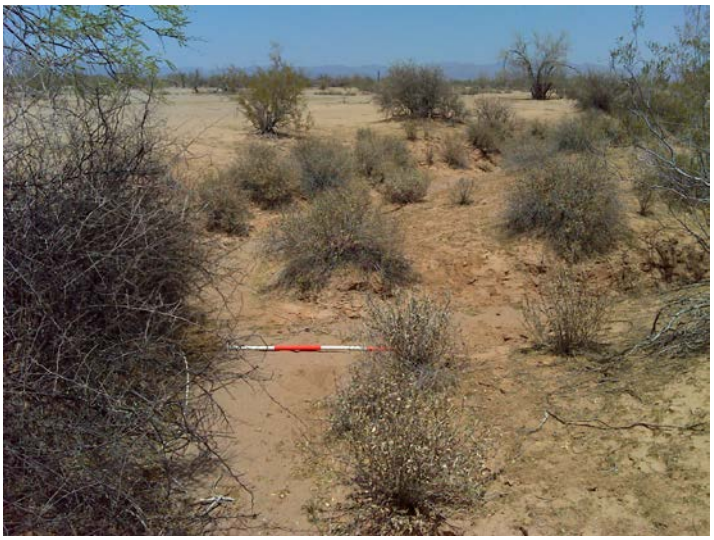
Photo of swale within Analysis Area. No OHWM development present.

Data Point: 37
Feature: N/A
Width: N/A
View: North

Photo of swale within Analysis Area. No OHWM development present.

Data Point: 38
Feature: N/A
Width: N/A
View: Northeast

Photo of swale within Analysis Area. No OHWM development present.



Data Point: 39
Feature: N/A
Width: N/A
View: Northeast

Photo of swale within Analysis Area. No OHWM development present.

Data Point: 40
Feature: N/A
Width: N/A
View: Northeast

Overview of erosional channel beginning to form.

Data Point: 41
Feature: N/A
Width: N/A
View: West

Overview of swale within Analysis Area.

Data Point: 42
Feature: B
Width: 9 feet
View: Downgradient

View of Feature B near its downgradient end within the Analysis Area.

Data Point: 42
Feature: B
Width: 9 feet
View: Upgradient

View of Feature B near its downgradient end within the Analysis Area.

Data Point: 43
Feature: B
Width: 12 feet
View: Upgradient

View of Feature B showing eroding unstable bank of feature.

Data Point: 44
Feature: B
Width: 6 feet
View: Upgradient

View of Feature B showing sandy bottom of drainage.

Data Point: 45
Feature: B
Width: 8 feet
View: Upgradient

View of Feature B showing sandy bottom of drainage and disturbance from cattle.

Data Point: 46
Feature: B
Width: 8 feet
View: Upgradient

View of Feature B upgradient of road crossing.

Data Point: 47
Feature: B
Width: 12 feet
View: Upgradient

View of Feature B at confluence of Feature B and Feature B1.

Data Point: 48
Feature: B
Width: 5 feet
View: Downgradient

View of Feature B at cow path crossing.

Data Point: 49
Feature: B
Width: 5 feet
View: Upgradient

View of Feature B upgradient of confluence of Feature B and Feature B2.

Data Point: 50
Feature: B
Width: 5 feet
View: Upgradient

View of upgradient end of Feature B within the Analysis Area.

Data Point: 51
Feature: B1
Width: 4 feet
View: Downgradient

View of upgradient end of OHWM characteristics within Feature B1.

Data Point: 52
Feature: B2
Width: 3 feet
View: Upgradient

View of Feature B2 near upgradient end of OHWM characteristics.

Data Point: 53
Feature: N/A
Width: N/A
View: Northeast

Overview photo near eastern Analysis Area boundary.

Data Point: 53
Feature: N/A
Width: N/A
View: Northwest

Overview photo near eastern Analysis Area boundary.

Data Point: 53
Feature: N/A
Width: N/A
View: Southeast

Overview photo near eastern Analysis Area boundary.

ATTACHMENT 5

SUPERIOR (028348)
PRECIPITATION DATA

SUPERIOR, ARIZONA

Period of Record General Climate Summary - Precipitation

Station:(028348) SUPERIOR														
From Year=1920 To Year=2006														
	Precipitation											Total Snowfall		
	Mean	High	Year	Low	Year	1 Day Max.		>= 0.01 in.	>= 0.10 in.	>= 0.50 in.	>= 1.00 in.	Mean	High	Year
	in.	in.	-	in.	-	in.	dd/yyyy or yyyymmdd	# Days	# Days	# Days	# Days	in.	in.	-
January	2.00	11.29	1993	0.00	1924	2.56	24/1943	5	4	2	0	0.3	6.4	1933
February	1.98	7.34	2005	0.00	1924	2.53	13/2005	5	4	1	0	0.5	7.5	1939
March	2.02	7.48	1992	0.00	1933	3.66	22/1954	5	4	2	0	0.3	6.0	1922
April	0.80	3.89	1952	0.00	1937	1.49	02/1999	3	2	1	0	0.1	2.5	1921
May	0.34	2.60	1992	0.00	1929	1.73	02/1941	2	1	0	0	0.0	0.0	1921
June	0.26	2.06	1955	0.00	1923	1.24	23/1972	1	1	0	0	0.0	0.0	1921
July	1.91	5.84	1921	0.04	1995	2.00	18/1976	7	4	1	0	0.0	0.0	1921
August	2.80	11.03	1963	0.47	1952	3.80	14/1990	8	5	2	1	0.0	0.0	1920
September	1.48	5.36	1983	0.00	1928	2.75	18/1946	4	3	1	0	0.0	0.0	1920
October	1.18	8.68	1972	0.00	1934	3.72	30/1959	3	2	1	0	0.0	0.0	1920
November	1.41	5.85	1931	0.00	1929	2.66	13/1941	4	2	1	0	0.0	3.0	1964
December	2.11	10.43	1965	0.00	1929	2.92	15/1967	5	4	2	1	0.2	4.5	1968
Annual	18.30	35.77	1978	4.90	2002	3.80	19900814	54	35	13	4	1.4	8.0	1976
Winter	6.09	23.65	1993	0.12	2006	2.92	19671215	16	11	4	1	1.0	9.0	1969
Spring	3.16	11.57	1941	0.01	1955	3.66	19540322	10	6	2	1	0.4	8.0	1976
Summer	4.97	11.22	1990	0.81	2002	3.80	19900814	16	10	3	1	0.0	0.0	1921
Fall	4.07	12.21	1972	0.20	1938	3.72	19591030	11	8	3	1	0.0	3.0	1964

Table updated on Jul 12, 2012

For monthly and annual means, thresholds, and sums:
Months with 5 or more missing days are not considered
Years with 1 or more missing months are not considered
Seasons are climatological not calendar seasons

Winter = Dec., Jan., and Feb. Spring = Mar., Apr., and May
Summer = Jun., Jul., and Aug. Fall = Sep., Oct., and Nov.

Western Regional Climate Center, wrcc@dri.edu

ATTACHMENT 6

SPECIAL STATUS SPECIES SCREENING ANALYSIS

Attachment 6. Special Status Species Screening Analysis for the Parcel 210-34-022A Analysis Area

Species and ESA Status*	Known Geographic Range and Habitat Preference(s)	Potential to occur within the Analysis Area
Plants		
Nichol Turk's head cactus (*Echinocactus horizonthalonius* var. *nicholii*) **Status:** Federal: Endangered (USFWS 1979a) Critical Habitat: No Recovery Plan: Yes (USFWS 1986a)	**Range:** In Arizona, known from three areas in southwest Pinal Co. and north central Pima Co. **Habitat:** Relatively open Sonoran desertscrub. Found in bedrock habitat at higher elevations and gravelly bajadas with limestone derived soils at lower elevations. **Elevation:** 2,000 – 3,600 ft. **Reference(s):** AGFD 2008; ARPC 2001	**Potential to Occur**: None. The Analysis Area is well outside the known, extremely limited distribution of this species as well as the elevation range.
Arizona hedgehog cactus (*Echinocereus var. arizonicus*) **Status:** Federal: Endangered (USFWS 1979b) Critical Habitat: No Recovery Plan: No	**Range:** Known from Pinal and Gila Counties, including the Pinal, Dripping Springs, Superstition, and Mescal Mountains and the highlands between Globe and Superior. **Habitat:** Rugged, steep-walled canyons, rocky areas on slopes; also found among shrubby vegetation in desert grasslands. Usually found in ecotone between chaparral and Madrean Evergreen Woodland. **Elevation:** 3,300 – 6,300 ft. **Reference(s):** AGFD 2003	**Potential to Occur**: None. The Analysis Area is well below the known elevation range for this species.
Acuña cactus (*Echinomastus erectocentrus* var. *acunensis)* **Status:** Federal: Candidate (USFWS 2011a) Critical Habitat: No Recovery Plan: No	**Range:** Maricopa, Pinal and far western Pima counties. **Habitat:** Bajadas, rocky hilltops, and well-drained knolls and gravel ridges between major washes. Associated with granite, andesite and limestone substrates. **Elevation:** 1,200 – 4,000a ft. **Reference(s):** AGFD 2011a; ARPC 2001	**Potential to occur**: None. The Analysis Area is outside of the known geographic range for this species.

Attachment 6. Special Status Species Screening Analysis for the Parcel 210-34-022A Analysis Area

Species and ESA Status*	Known Geographic Range and Habitat Preference(s)	Potential to occur within the Analysis Area
Fish		
Desert pupfish (*Cyprinodon macularius*) **Status:** Federal: Endangered (USFWS 1986b) Critical Habitat: Yes (USFWS 1986b) Recovery Plan: Yes (USFWS 1993a)	**Range:** Historically occurred throughout the lower Gila River basin in the U.S. and Mexico. No natural populations persist in Arizona; currently managed at discreet natural and artificial refuge sites. **Habitat:** Shallow waters of springs, small streams, and marshes. **Elevation:** < 4,920 ft. **Reference(s):** AGFD 2001a	**Potential to occur**: None. The Analysis Area does not support suitable aquatic habitat for this species and is outside of the known geographic range for this species.
Gila chub (*Gila intermedia*) **Status:** Federal: Endangered (USFWS 2005a) Critical Habitat: Yes (USFWS 2005a) Recovery Plan: No	**Range:** Endemic to Gila River Basin, including the San Pedro River. **Habitat:** Smaller headwater streams, pools, springs, and cienegas in a diversity of aquatic habitats (e.g., vegetated backwaters and deep pools, riffles, undercut banks). **Elevation:** 2,700–5,500 ft. **Reference(s):** AGFD 2002a	**Potential to occur**: None. The Analysis Area does not support suitable aquatic habitat for this species and are outside of this species' known geographic range for this species.

Attachment 6. Special Status Species Screening Analysis for the Parcel 210-34-022A Analysis Area

Species and ESA Status*	Known Geographic Range and Habitat Preference(s)	Potential to occur within the Analysis Area
Roundtail Chub (*Gila robusta*) **Status:** Federal: Candidate (USFWS 2009) Critical Habitat: No Recovery Plan: No	**Range:** Historically found throughout the larger tributaries of the greater Colorado R. Basin from Wyoming to Arizona. Extant in two tributaries of the Little Colorado R. (Chevelon and East Clear Creeks); Bill Williams R. basin (Boulder, Burro, Conger, Francis, Kirkland, Sycamore, Trout, and Wilder Creeks), Salt R. (Ash, Cherry, Salome creeks, Black R.), Verde R. (Fossil, Oak, Roundtree Canyon, West Clear, and Wet Beaver creeks), San Pedro R. basin (Aravaipa Creek), and Gila R. basin (Eagle Creek). Populations in the Lower Colorado R. Basin (i.e., Little Colorado, Bill Williams, and Gila R. populations) are considered a DPS and are a candidate species. **Habitat:** Mid-elevation streams and rivers of moderate temperatures. Adults use deep pools, up to 2.0 meters deep, adjacent to riffles and runs. Cover usually present; incl' large boulders, down dead woody debris, undercut banks, bedrock, and root masses. Found 1,000 to 7,500 ft, but most often between 2,000 to 5,000 feet elevation. **Elevation:** 1,000–7,500 ft. **Reference(s):** AGFD 2002b, USFWS 2009	**Potential to occur**: None; the Analysis Area does not include suitable habitat for aquatic species, including fish.

Attachment 6. Special Status Species Screening Analysis for the Parcel 210-34-022A Analysis Area

Species and ESA Status*	Known Geographic Range and Habitat Preference(s)	Potential to occur within the Analysis Area
Spikedace (*Meda fulgida*) **Status:** Federal: Endangered (USFWS 2012b) Critical Habitat: Yes (USFWS 2012b) Recovery Plan: Yes (USFWS 1990b)	**Range:** Historically found throughout the upper Gila River in Arizona and New Mexico. Currently found in Arizona in Aravaipa Creek and may still be present in the upper Verde River basin and the Gila River from the San Pedro River to the Ashurst-Hayden Dam. Recent reintroductions have occurred at Fossil Creek, Gila County; Hot Springs and Redfield canyons, Cochise and Graham Counties; and Bonita Creek in Graham County. **Habitat:** Found in mid-water runs, pools and swirling eddies. Often congregate at the downstream ends of riffles and eddies. They prefer moving water (~1-2 ft/s) that is ≤ 3.3 feet deep. In larger streams they are generally found only at mouths of creeks. Juveniles inhabit backwaters over silt and sand. Periodic scouring floods are important for spikedace to withstand exotic species invasions. This species is found below 6,000 feet with current occurrences between 1,620 to 4,500 ft. **Elevation:** 6,000 ft. **Reference(s):** AGFD 2002c, USFWS 2012b	**Potential to occur**: None. The Analysis Area does not support suitable aquatic habitat.
Gila topminnow (*Poeciliopsis occidentalis occidentalis)* **Status:** Federal: Endangered (USFWS 1967) Critical Habitat: No Recovery Plan: Yes (Draft : USFWS 1999)	**Range:** Historically distributed throughout the Gila River Basin. **Habitat:** Headwater springs, vegetated margins and backwater areas of intermittent to perennial streams and rivers. **Elevation:** 1,300-7,500 ft..; most populations < 5,000 ft. **Reference(s):** AGFD 2001b	**Potential to occur**: None. The Analysis Area does not support suitable aquatic habitat for this species.

Attachment 6. Special Status Species Screening Analysis for the Parcel 210-34-022A Analysis Area

Species and ESA Status*	Known Geographic Range and Habitat Preference(s)	Potential to occur within the Analysis Area
Loach minnow (*Tiaroga cobitis*) **Status:** Federal: Endangered (USFWS 2012b) Critical Habitat: Yes (USFWS 2012b) Recovery Plan: Yes (USFWS 1990a)	**Range:** Historically distributed throughout the Gila River Basin. **Habitat:** Turbulent, rocky riffles of mainstream rivers and tributaries. Sometimes associated with dense filamentous algae. Restricted almost exclusively to a bottom dwelling habitat. **Elevation:** 2,325-8,240 ft. **Reference(s):** AGFD 2010d	**Potential to occur**: None. No suitable aquatic habitat is present to support this species.
Razorback Sucker (*Xyrauchen texanus*) **Status:** Federal: Endangered (USFWS 1991) Critical Habitat: Yes (USFWS 1994) Recovery Plan: Yes (USFWS 1998, 2002a)	**Range:** Endemic to large rivers throughout the Colorado River Basin. Natural populations occur in Lake Mohave, Green River Basin, and upper Colorado River Basin. Designated critical habitat includes parts of the Colorado, Gila, Salt, and Verde rivers. **Habitat:** Found in a variety of slow-water habitats in medium to large rivers including backwaters. In impoundments, prefer depths of one meter over mud, sand, or gravel. Optimal temperatures occur between 71-77°F. Records in Arizona occur between 180-5,000 feet. **Elevation:** < 6,000 ft. **Reference(s):** AGFD 2002d	**Potential to occur**: None. The Analysis Area does not support suitable aquatic habitat for this species.
Reptiles		
Tucson shovel-nosed snake (*Chionactis occipitalis klauberi*) **Status:** Federal: Candidate (USFWS 2011a) Critical Habitat: No Recovery Plan: No	**Range:** Occurs from Pima County in the Avra and Santa Cruz Valleys and from western Pinal and a portion of Maricopa counties. **Habitat:** Creosote-mesquite flood plain habitats, with soils described as soft, sandy loams with sparse gravel. **Elevation:** 785-1,662 ft. **Reference(s):** AGFD 2010a	**Potential to occur**: Some potential to occur. The Analysis Area is within range and suitable habitat is present

Attachment 6. Special Status Species Screening Analysis for the Parcel 210-34-022A Analysis Area

Species and ESA Status*	Known Geographic Range and Habitat Preference(s)	Potential to occur within the Analysis Area
Desert Tortoise – Sonoran population (*Gopherus agasizzii*) **Status:** Federal: Candidate (USFWS 2011a) Critical Habitat: No Recovery Plan: No	**Range:** Occurs throughout Arizona's Sonoran desert with appropriate habitat. Eastern edge of range extends to the middle San Pedro River. **Habitat:** Found primarily on rocky slopes and bajadas of Mojave and Sonoran desertscrub; also found associated with caliche caves (shelter sites) along lower Sonoran desert washes. **Elevation:** 510 – 5,300 ft. **Reference(s):** AGFD 2010b	**Potential to occur**: Some potential to occur. The Analysis Area is within range and suitable habitat is present.
Northern Mexican garter snake (*Thamnophis eques megalops*) **Status:** Federal: Candidate (USFWS 2011a) Critical Habitat: No Recovery Plan: No	**Range:** Historic range included much of the greater Gila River Basin. Currently found in < 10% of former range and restricted to isolated, scattered populations. Considered extirpated from the Santa Cruz River between Tucson and Nogales. **Habitat:** Perennial cienegas, cienega-streams, riparian forests and woodlands; usually associated with dense vegetation. **Elevation:** 3,000 – 5,000 ft. **Reference(s):** Brennan and Holycross 2006, AGFD 2011b	**Potential to occur**: None. The Analysis Area does not support suitable aquatic habitat and are outside the known geographic range for this species.
Birds		
Southwestern willow flycatcher (*Empidonax traillii extimus*) **Status:** Federal: Endangered (USFWS 1995a) Critical Habitat: Yes Proposed: (USFWS 2011b) Final Rule: (USFWS 2005b) Final Rule: (USFWS 1997b) Recovery Plan: Yes (USFWS 2002b)	**Range:** A neotropical migrant that winters in Mexico and Central America and breeds throughout the greater southwestern U.S. Breeds very locally along the middle Gila, Salt, and Verde rivers; middle to lower San Pedro River; and upper San Francisco River near Alpine. **Habitat:** Cottonwood/willow and/or tamarisk riparian communities along rivers and streams; prefer riparian areas with dense under- and mid-story vegetation that is ≥ 10 ft. in height, with or without canopy cover, and in close proximity to surface water. **Elevation:** 75 – 9,200 ft. **Reference(s):** AGFD 2002e	**Potential to occur**: None. No suitable riparian habitat occurs within the Analysis Area.

Attachment 6. Special Status Species Screening Analysis for the Parcel 210-34-022A Analysis Area

Species and ESA Status*	Known Geographic Range and Habitat Preference(s)	Potential to occur within the Analysis Area
Yuma Clapper Rail (*Rallus longirostris yumanensis*) **Status:** Federal: Endangered (USFWS 1967) Critical Habitat: No Recovery Plan: No	**Range:** Lower Colorado River and tributaries from Gulf of California to Topock Marsh (Havasu National Wildlife Refuge) **Habitat:** Freshwater or brackish marshes. Prefer the tallest, densest stands of cattails and bulrushes and inhabit the area where standing water is replaced by moist soils. **Elevation:** < 4,500 ft. **Reference(s):** AGFD 2001c, Corman and Wise-Gervais 2005	**Potential to occur**: None. No suitable marsh habitat is present within the Analysis Area.
Yellow-billed cuckoo (*Coccyzus americanus*) **Status:** Federal: Candidate (USFWS 2001) Status Review: (USFWS 2011a) Critical Habitat: No Recovery Plan: No	**Range:** A late spring migrant from South America, cuckoos breed throughout the western U.S. They occur in west, central and southeastern Arizona. **Habitat:** Typically associated with rivers and streams supporting dense, humid, riparian woodlands (e.g., cottonwood, willow, tamarisk galleries, and mesquite bosques). In southeastern Arizona they are known to nest along intermittent streams supporting dense stands of mesquite and netleaf hackberry. **Elevation:** < 6,700 ft. **(**more typically < 5,000 ft.) **Reference(s):** AGFD 2011c, Corman and Wise-Gervais 2005	**Potential to occur**: None. The Analysis Area does not support suitable riparian habitat.
Mexican spotted owl (*Strix occidentalis lucida)* **Status:** Federal: Threatened (USFWS 1993b) Critical Habitat: Yes Final: (USFWS 2004) Recovery Plan: Yes (Draft: USFWS 2011c)	**Range:** Patchily distributed in forested area throughout Arizona. **Habitat:** Breed primarily on dense old growth mixed conifer forests. **Elevation:** 3,700 – 9,600 ft. (AZ) **Reference(s):** AGFD 2005	**Potential to Occur**: None. The Analysis Area is below the known elevation range for this species and well outside the designated critical habitat boundary.

Attachment 6. Special Status Species Screening Analysis for the Parcel 210-34-022A Analysis Area

Species and ESA Status*	Known Geographic Range and Habitat Preference(s)	Potential to occur within the Analysis Area
Mammals		
Lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*) **Status:** Federal: Endangered (USFWS 1988) Critical Habitat: No Recovery Plan: Yes (USFWS 1995c)	**Range:** A summer migrant that winters in Central America, Lesser Long-nosed bats are found locally in the U.S. only in southern Arizona and extreme southwestern New Mexico from April to late-September. Peripheral observations exist from the Phoenix area and the Pinaleño Mountains. **Habitat:** Sonoran desertscrub through semi-desert grasslands and into oak woodlands where columnar cacti and agaves occur. Roosts in caves, abandoned mines and occasionally old buildings. Forages at night on nectar, pollen, and possibly fruit of columnar cacti and agaves. **Elevation:** 1,200 – 7,300 ft. (most often < 5,500 ft.) **Reference(s):** AGFD 2011d	**Potential to occur**: Very low potential to occur. The Analysis Area occurs outside of the geographic ranges.
Ocelot (*Leopardus pardalis)* **Status:** Federal: Endangered (USFWS 1982) Critical Habitat: No Recovery Plan: Yes (Draft: USFWS 2010)	**Range:** Globally ranges from the southern U.S. to northern South America. In U.S., currently known from AZ and south Texas. **Habitat:** Areas with dense cover and avoids open areas. Desertscrub communities in Arizona, thickets in Texas, and humid tropical and coastal habitats in the southern U.S. **Elevation:** generally < 4,000 ft. **Reference(s):** AGFD 2010c	**Potential to occur**: Low potential. The Analysis Areas are within the known geographic range for this species though sightings are rare and species is transient. The Analysis Area does not contain the dense cover preferred by this species.

* U.S. Fish & Wildlife Service Categories:

Endangered - Taxa in danger of extinction throughout all, or a significant portion, of its range.
Threatened - Taxa likely to become Endangered in the foreseeable future throughout all, or a significant portion, of its range.
Candidate - Taxa for which sufficient data exist to support proposals to list, but formal proposals to list the species as Threatened or Endangered have not been made by the USFWS because this action is precluded by other listing activity.
Conservation Agreement - Taxa for which an agreement has been made with the USFWS to improve the status of the species and diminish threats to where listing is no longer necessary under the Endangered Species Act.
Delisted species - Taxa currently not listed under the ESA, but remains on the list published by USFWS for Pima or Pinal County as a delisted species ; these species were not considered under this screening.
Delisted species; Petitioned for relisting - Taxa currently not listed under the ESA, but remains on the list published by USFWS for Pima or Pinal County as a delisted species and may be relisted in the future; these species were not considered under this screening.

References used for Special Status Species Screening Analysis

[AGFD] Arizona Game and Fish Department. 2001a. *Cyprinodon macularius*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 4 pp.

_____. 2001b. *Poeciliopsis occidentalis*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 6 pp.

_____. 2001c. *Rallus longirostris yumanensis*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 10 pp.

_____. 2002a. *Gila intermedia*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 9 pp.

_____. 2002b. *Gila robusta*. Unpublished abstract compiled and edited by the Heritage Data Management System. Arizona Game and Fish Department, Phoenix, AZ. 6 pp.

_____. 2002c. *Meda fulgida*. Unpublished abstract compiled and edited by the Heritage Data Management System. Arizona Game and Fish Department, Phoenix, AZ. 5 pp.

_____. 2002d. *Xyrauchen texanus*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 5 pp.

_____. 2002e. *Empidonax traillii extimus.* Draft. Unpublished abstract compiled and edited by the Heritage Data Management System. Arizona Game and Fish Department, Phoenix, AZ. 6 pp.

_____. 2003. *Echinocereus var. arizonicus.* Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ.

_____. 2005. *Strix occidentalis lucida.* Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 11 pp.

_____. 2008. *Echinocactus horizonthalonius* var. *nicholii*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 7 pp.

_____. 2010a. *Chionactis occipitalis klauberi*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 5 pp.

_____. 2010b. *Gopherus agasizzii*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 11 pp.

_____. 2010c. *Leopardus pardalis*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 8 pp.

_____. 2010d. *Tiaroga cobitis*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 6 pp.

_____. 2011a. *Echinomastus erectocentrus* var. *acunensis*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 8 pp.

_____. 2011b. *Thamnophis eques megalops*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 7 pp.

_____. 2011c. *Coccyzus americanus occidentalis*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 6 pp.

_____. 2011d. *Leptonycteris curasoae yerbabuenae*. Unpublished abstract compiled and edited by the Heritage Data Management System. Arizona Game and Fish Department, Phoenix, AZ. 8 pp.

[ARPC] Arizona Rare Plant Committee. 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. Washington: U.S. Government Printing Office.

Brennan, T.C., and A.T. Holycross. 2006. Amphibians and reptiles in Arizona. Arizona Game and Fish Department, Phoenix, AZ.

Corman, T.E. and C. Wise-Gervais. 2005. Arizona Breeding Bird Atlas. Univ. of New Mexico Press. Albuquerque, New Mexico.

[USFWS] U.S. Fish & Wildlife Service. 1967. Native Fish and Wildlife: Endangered Species. Federal Register 32(48):4001.

_____. 1970. Part 17 - Conservation of Endangered Species and Other Fish or Wildlife (First List of Endangered Foreign Fish and Wildlife as Appendix A)

_____. 1979a. Determination that *Echinocactus horizonthalonius* var. *nicholii* is an Endangered Species. Federal Register 44(209): 61927-61929.

_____. 1979b. Determination that *Echinocereus triglochidiatus* var. *arizonicus* is an Endangered Species. Federal Register 44(208): 61556-61558.

_____. 1982. Endangered and Threatened Wildlife and Plants; Endangered Status for U.S. Population of the Ocelot. Federal Register 47(141): 31670-31672.

_____. 1986a. Recovery Plan for the Nichol Turk's Head cactus (*Echinocactus horizonthalonius* var. *nicholii*). U.S. Fish and Wildlife Service, Albuquerque, New Mexico. 68 pp.

_____. 1986b. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status and Critical Habitat for the Desert Pupfish. Federal Register 51(61): 10842-10851.

_____. 1988. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Two Long-nosed Bats. Federal Register 53(190): 38456-38460.

_____. 1990a. Loach Minnow Recovery Plan. Albuquerque, New Mexico. 38 pp.

_____. 1990b. Spikedace Recovery Plan. Albuquerque, New Mexico. 38 pp.

_____. 1991. Endangered and Threatened Wildlife and Plants; The Razorback Sucker (*Xyrauchen texanus*) Determined to be an Endangered Species. Federal Register 56(205): 54957-54967.

_____. 1993a. Desert Pupfish Recovery Plan. Phoenix, Arizona. 67 pp.

_____. 1993b. Endangered and Threatened Wildlife and Plants; Final Rule to List the Mexican Spotted Owl as Threatened Species. Federal Register 58(49): 14248-14271.

_____. 1994. Endangered and Threatened Wildlife and Plants; Determination of Critical Habitat for the Colorado River Endangered Fishes: Razorback Sucker, Colorado Squawfish, Humpback Chub, and Bonytail Chub; Final Rule. Federal Register 59(54): 13374-13400.

_____. 1995a. Endangered and Threatened Wildlife and Plants: Southwestern Willow Flycatcher; Final Rule. Federal Register 60(38): 10694-10715.

_____. 1995b (1994). Lesser Long-nosed Bat Recovery Plan. U.S. Fish and Wildlife Service, Albuquerque, New Mexico. 45 pp.

_____. 1997a. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Three Wetland Species Found in Southern Arizona and Northern Sonora, Mexico. Federal Register 62(3): 665-689.

_____. 1997b. Endangered and Threatened Wildlife and Plants; Final Determination of Critical Habitat for the Southwestern Willow Flycatcher. Federal Register 62(140): 39129-39147.

_____. 1998. Razorback sucker (*Xyrauchen texanus*) recovery plan. U.S. Fish & Wildlife Service, Region 6, Denver, Colorado. 81pp.

_____. 1999. Draft Revised Recovery Plan for the Gila Topminnow. USD1 Fish and Wildlife Service, Albuquerque, New Mexico. 89 pp.

_____. 2001. Endangered and Threatened Wildlife and Plants; 12-Month Finding for a Petition To List the Yellow-billed Cuckoo (*Coccyzus americanus*) in the Western Continental United States. Federal Register 66(143): 38611-38626.

_____. 2002a. Razorback sucker (*Xyrauchen texanus*) Recovery Goals: amendment and supplement to the Razorback Sucker Recovery Plan. U.S. Fish & Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

_____. 2002b. Southwestern Willow Flycatcher Recovery Plan. Albuquerque, New Mexico. i-ix + 210 pp., Appendices A-O.

_____. 2004. Endangered and Threatened Wildlife and Plants; Final Designation of Critical Habitat for the Mexican Spotted Owl; Final Rule. Federal Register 69(168): 53182-53298.

_____. 2005a. Endangered and Threatened Wildlife and Plants; Listing Gila Chub as Endangered With Critical Habitat; Final Rule. Federal Register 70(211): 66664-66721.

_____. 2005b. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Southwestern Willow Flycatcher (*Empidonax traillii extimus*). Federal Register 70(201): 60886-61009.

_____. 2009. Endangered and Threatened Wildlife and Plants; 12 Month Finding on a Petition to List a Distinct Population Segment of the Roundtail Chub (*Gila robusta*) in the Lower Colorado River Basin. Federal Register 74(128): 32352-32387.

_____. 2010. Endangered and Threatened Wildlife and Plants; Draft Ocelot (*Leopardus pardalis*) Recovery Plan, First Revision. Federal Register 75(165): 52547-52549.

_____. 2011a. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions. Federal Register 76(207): 66370-66439. [This most recent of candidate status reviews includes Acuña cactus, Rosemont talussnail, Tucson shovel-nosed snake, Sonoyta mud turtle, Mexican garter snake, yellow-billed cuckoo]

_____. 2011b. Endangered and Threatened Wildlife and Plants; Designation of Revised Critical Habitat for Southwestern Willow Flycatcher; Proposed Rule. Federal Register 76(157): 50542-50629.

_____. 2011c. Draft Recovery Plan for the Mexican Spotted Owl (*Strix occidentalis lucida*), First Revision. U.S. Fish and Wildlife Service. Albuquerque, New Mexico, USA. 399pp.

_____. 2012a. Federally Listed Threatened, Endangered, and Candidate Species for Pinal County, updated April 23. Arizona Ecological Field Services Office. Available at: http://www.fws.gov/southwest/es/arizona/Documents/CountyLists/Pinal.pdf. Accessed June 1, 2012.

_____. 2012b. Endangered and Threatened Wildlife and Plants; Endangered Status and Designations of critical Habitat for Spikedace and Loach Minnow. Federal Register 77(36): 10810 - 10932.