

***Drainage Technical Memorandum***

To: City of Litchfield Park  
From: Michael Delmarter, P.E.  
Date: February 11, 2014  
Subject: Wigwam Redevelopment  
Parcel C – Located on Portions of the Wigwam Resort Property



***Purpose***

This memorandum has prepared to support the rezoning and general plan amendment effort for a 24.7 acre parcel of land located within the Wigwam Golf Course property in Litchfield Park, Arizona. This memorandum in intended to summarize the existing onsite and offsite drainage conditions affecting the property and proposed drainage concepts that will be further defined with the development of an overall site plan for the property.

***Property Description***

The 24.7 acre parcel of land is proposed to be carved out of the existing Wigwam Blue and Gold golf courses. Parcel C is located immediately north of the existing Wigwam Driving Range within a portion of Section 22, T.2N., R.1W., GSRBM.

***Existing Conditions***

The parcel is located in a portion of the Wigwam Resort property that is currently utilized for golf course purposes. It is located immediately north of the driving range and is bounded on the south side by a lined irrigation ditch. There are two golf course irrigation ponds located in the southwest portion of the parcel as well as a pump station for golf course irrigation purposes. The Litchfield Subdivision located immediately to the north and west of the golf course does not have stormwater retention facilities within the subdivision itself and discharges runoff directly to the golf course as sheet flow through the residential lots lining the golf course property.

FEMA has designated a Zone A floodplain over the area located upstream (on the west side) of the irrigation ditch. Zone A which is defined as a special flood hazard area subject to inundation by the 1% annual chance flood with no base flood elevation determined. While no detailed study is available, the floodplain boundary appears to indicate that the irrigation ditch ponds up to 2 feet of depth along the entire length of the ditch through the golf course.

The upstream watershed tributary to the ditch is approximately 200 acres and is approximately 50% low density residential subdivision/50% golf course mix. The stormwater storage requirement is calculated by the formula  $V = C \cdot I \cdot A$  where C equals the composite Runoff Coefficient, I = the precipitation value of 2.47 is based on NOAA Atlas 14, and A = the area in acres. Using a conservative composite C value of 0.50, it is estimated that approximately 20.5 acre feet of storage is provided behind the ditch for the 100 year-6 hour storm event.

The remainder of the site is located in FEMA Zone X shaded per FIRM Map 04013C21690L dated October 16, 2013. Zone X shaded is defined as Areas of 0.2% annual chance flood; areas of 1% annual flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

### ***Proposed Development***

Parcel C is proposed to be rezoned for residential/resort condominium uses. No specific site plan has been developed at this time.

### ***Proposed Drainage Conditions***

The proposed development will utilize surface drainage or storm drains to convey onsite generated stormwater runoff to retention basins. If these basins are incorporated into landscape areas, the maximum water depth will be 3 feet. Note: it is anticipated that stormwater storage will be incorporated into the adjacent golf course property with an easement /agreement between the property owners.

According to Lynn Thomas with the Maricopa County Flood Control District, development can occur within the Zone A floodplain as long as compensatory storage is provided for the displaced volume of storage within the original Zone A area. Since no specific site plan has yet been developed, the total amount of storage displaced cannot be determined at this time; however, there are several ways available to the developer to mitigate the storage requirement. Two of the options are described below:

Option 1 – reroute the irrigation ditch along the south side of the existing driving range – this will provide more than adequate compensatory storage that would also allow the development to discharge directly into the golf course.

Option 2 – provide a stage storage analysis of the existing Zone A floodplain to determine if the watershed's storage requirement could be met even if the proposed development displaced existing storage volume.

Both of these options would require coordination with the Flood Control District and FEMA. In order to remove the property from the Zone A floodplain, a conditional Letter of Map Revision (CLOMR) and a Letter of Map revision (LOMR) would need to be processed through FEMA.

The parcel will be required to retain the runoff generated by the 100 year-6 hour design storm event. The proposed C Value is assumed to be 0.90 for attached multi family product. Note: This value may be further refined using composite C values upon development of the final site plan for the parcel.

Therefore, the required retention for the Driving Range Parcel is  $= 22.9 * 2.47 / 12 * 0.9 = 4.24$  acre-feet. Note: Since the Zone A area is already providing the storage for the undeveloped parcel, it is anticipated that the additional runoff generated by this parcel can be incorporated into the compensatory storage calculations as described above.

## *Summary/Conclusions*

### Parcel C

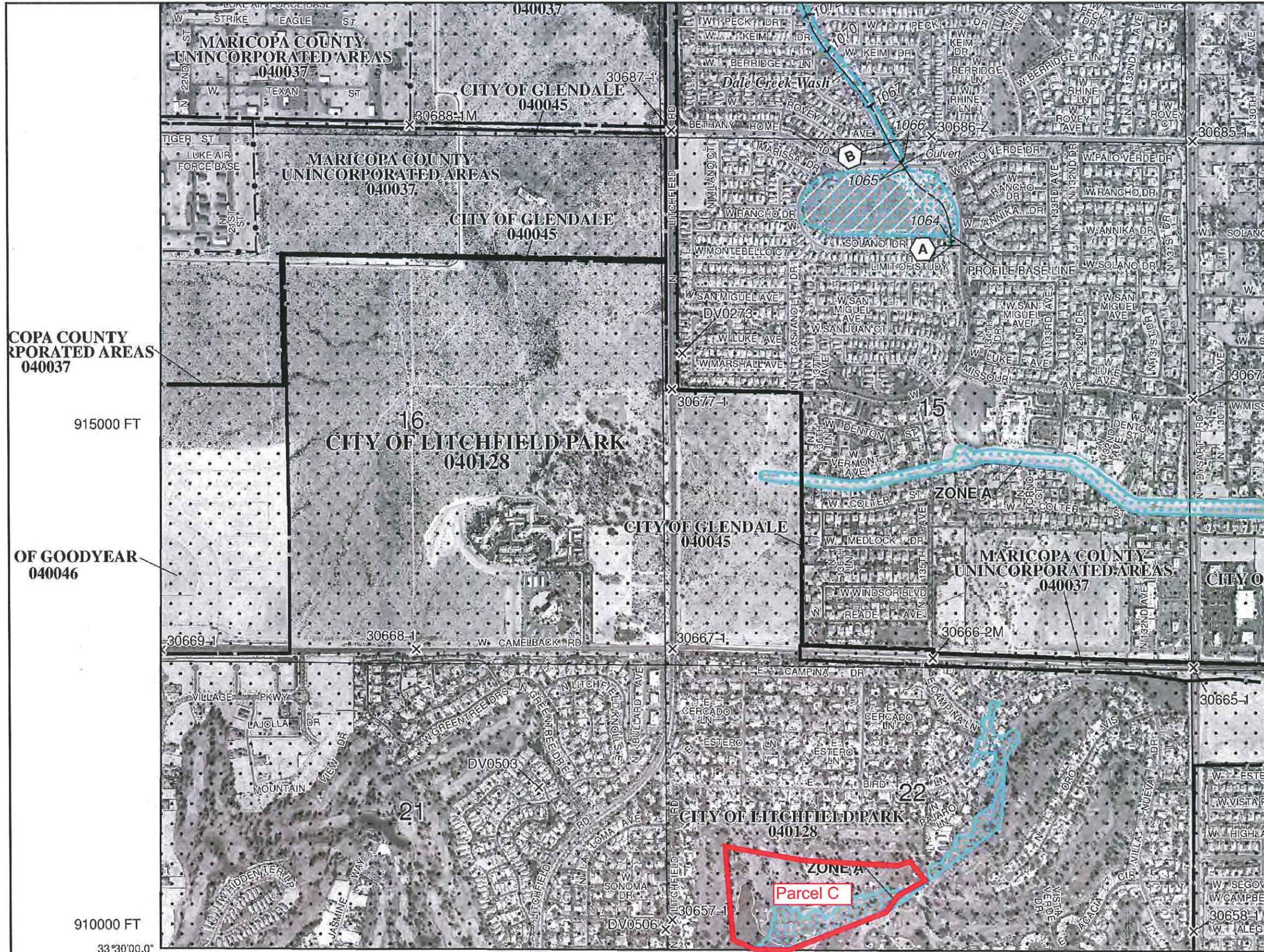
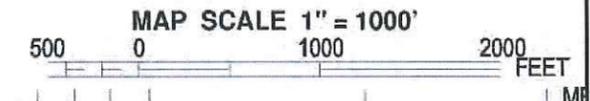
- Parcel is partially located in a FEMA Zone A floodplain, remainder in Zone X Shaded
- Compensatory storage must be provided for Zone A displaced volume or detailed study needs to be performed to analyze residual storage volume.
- Retention volume required for the Driving Range Parcel is 4.24 Acre-feet
- It may be possible to provide required storage in adjacent golf course

### General

- Retention facilities/basins will be required to bleed off or infiltrate within the Maricopa County 36 hour requirement.

### *Attachments:*

1. FEMA MAP
2. Assessor's Map showing approximate property limits



NFIP

PANEL 1690L

**FIRM**  
FLOOD INSURANCE RATE MAP  
MARICOPA COUNTY,  
ARIZONA  
AND INCORPORATED AREAS

PANEL 1690 OF 4425  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	1690	L
AVONDALE, CITY OF	040039	1690	L
EL MIRAGE, CITY OF	040041	1690	L
GLENDALE, CITY OF	040045	1690	L
GOODYEAR, CITY OF	040046	1690	L
LITCHFIELD PARK, CITY OF	040128	1690	L
PHOENIX, CITY OF	040051	1690	L

Notice to User: The Map Number shown below should be used when placing map orders, the Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER  
04013C1690L  
MAP REVISED  
OCTOBER 16, 2013

Federal Emergency Management Agency

COPA COUNTY  
RPORATED AREAS  
040037

915000 FT

OF GOODYEAR  
040046

910000 FT

33°30'00.0"

112°22'30.0"

373°00m E

374°00m E

JOINS PANEL 2155

375°00m E

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)

