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**PRELIMINARY DRAINAGE REPORT
FOR
AIRPORT SPECTRUM
ANNEXATION AND PUD CONCEPT PLAN**

November 2017

Prepared for:
BERT A GETZ TRUST
6730 N. SCOTTSDALE ROAD, SUITE 250
PARADISE VALLEY, AZ 85253
(480) 991-0500

Prepared by:
CLASSIC CONSULTING ENGINEERS & SURVEYORS
619 N. CASCADE AVENUE SUITE 200
COLORADO SPRINGS CO 80903
(719) 785-0790

Job no. 2429.00

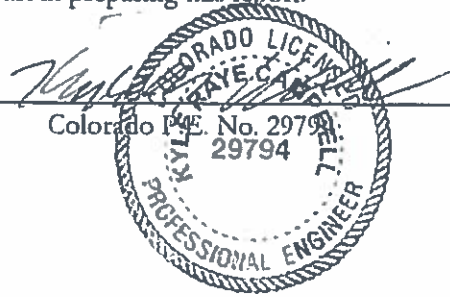


**PRELIMINARY DRAINAGE REPORT FOR
AIRPORT SPECTRUM ANNEXATION AND PUD CONCEPT PLAN**

Engineer's Statement

This report and plan for the preliminary drainage design of Airport Spectrum was prepared by me (or under my direct supervision) and is correct to the best of my knowledge and belief. Said report and plan has been prepared in accordance with the City of Colorado Springs Drainage Criteria Manual and is in conformity with the master plan of the drainage basin. I understand that the City of Colorado Springs does not and will not assume liability for drainage facilities designed by others. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

SIGNATURE (Affix Seal):



3-22-18

Date



PRELIMINARY DRAINAGE REPORT FOR AIRPORT SPECTRUM ANNEXATION AND PUD CONCEPT PLAN

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REFERENCE MATERIAL FROM D.B.P.S.

DRAINAGE MAP



PRELIMINARY DRAINAGE REPORT FOR AIRPORT SPECTRUM ANNEXATION AND PUD CONCEPT PLAN

PURPOSE

This document is the Preliminary Drainage Report for Airport Spectrum. The purpose of this report is to preliminarily identify onsite and offsite drainage patterns, determine a schematic storm sewer system that safely routes developed storm water runoff to adequate full spectrum detention and water quality facilities and releases to the adjacent channel in accordance with all applicable master drainage plans. This report serves as the overall Airport Spectrum project drainage guideline. Separate Preliminary and/or Final Drainage Reports are required with any site development that will detail exact drainage calculations, water quality facilities, basin fees, etc.

At this time, only annexation and rezoning (Concept PUD) is proposed and no specific on-site uses have been identified.

GENERAL DESCRIPTION

Airport Spectrum is a 59.54 acre development within the east half of Section 1, Township 15 South, Range 66 West of the 6th Principal Meridian in El Paso County, Colorado. An overall annexation area of 78.955 acres is proposed that includes existing Powers Boulevard. The site is located on the south side of Milton E. Proby Parkway just west of Powers Boulevard. The existing Clear View Estates Subdivisions and large lot El Paso County single-family homes and open space (owned by Frank Watson) sits directly west of the site, with Powers Blvd. bordering the east side of the site. The proposed development will include land uses permitted in the OC and PBC Zone Districts, a proposed public roadway servicing the site (Globe Street), and an approximate 20.00 acre open space/floodplain tract. Phasing of the development will be determined by market conditions. Site access is proposed from Milton E. Proby Parkway to the north (signalized intersection and right-in/right-out) with no access along Powers Boulevard to the east. The Windmill Gulch Channel is within and borders the proposed site along the western edge.

The average soil condition of the entire site reflects Hydrologic Group "A" (Blakeland loamy sand) as determined by the "Soil Survey of El Paso County Area," prepared by the National Cooperative Soil Survey (see map in Appendix).

EXISTING DRAINAGE CONDITIONS/PREVIOUS DRAINAGE STUDY

The site is located within the Windmill Gulch Drainage Basin and was last studied in the "Windmill Gulch Drainage Basin Planning Study," by Wilson & Company, last revised February 1992. The runoff from the existing land sheet



flows directly west into the adjacent Windmill Gulch Channel, which drains from north to south. The entire landscape covered in native grasses with some shrubs and trees along the westerly boundary. The existing topography slopes generally from east to west between 3 and 6% with small areas up to 4:1. The existing Windmill Gulch Channel contains a FEMA designated 100-year floodplain that is outside of the proposed development area. A large portion of the Airport Business Park to the east is tributary to an existing concrete box culvert under Powers Blvd. that discharges onto the proposed site. Per the Airport Master Drainage Study, a regional storm water quality/detention facility will be installed at the east side of the existing box culvert as development warrants. This facility will restrict the tributary runoff to at or below historic release rates. Therefore, the Airport Spectrum site will only be required to convey historic off-site flows through the site.

The Drainage Basin Planning Study provides recommendations for the entire stretch of Windmill Gulch from the Fountain Creek discharge point to the upper limits of the basin. The recommendations were based upon the 24-hour 100-year storm event for all future improved conditions, the proposed site being always planned as commercial development (See D.B.P.S. information located in Appendix). Per the selected Alternative #2 in the D.B.P.S. and the preliminary plan/profile sheets, minimal channel improvements are required for the portion of the channel adjacent to the proposed site. Per the D.B.P.S. "due to the sensitive nature of this portion of the channel, about 2,200 feet should be left in its natural state except for a meandering low flow channel and the addition of 3 grade control structures and 3 drop structures to prevent stream degradation." The environmentally sensitive areas are further described as beginning "approximately 1,200 feet south of Drennan (Milton E. Proby) Road. At this point, the rangeland swale transitions into a riparian area with cottonwood trees and a flowing channel fed by springs. The area can be described as a narrow strip of herbaceous wetland surrounded by several groves of cottonwood trees." There is a planned large regional detention facility (DBPS ACT #2, Pond 3) located in-line within the Windmill Gulch channel downstream of the proposed site (see preliminary drainage map). The D.B.P.S. improvements within the proposed site are the aforementioned check and drop structures and an extension (60" RCP) of the Powers Blvd. culvert to the channel. Therefore, two scenarios could take place:

1. If downstream future regional detention facility is not in place prior to any Airport Spectrum development, on-site full spectrum detention with stormwater quality will be required on-site prior to release into the adjacent Windmill Gulch Channel.
2. If the downstream future regional detention facility is constructed prior to any Airport Spectrum development, only on-site stormwater quality will be required.

Approximately $Q_{100} = 240$ cfs enters the site as historic flow under Milton E. Proby Parkway.



PROPOSED DRAINAGE CONDITIONS

Developed runoff from the future Airport Spectrum development areas will be conveyed via surface drainage and public and private storm sewer systems to various storm water quality facilities located throughout the development based upon the scenario that downstream regional full spectrum detention is constructed. These facilities will be designed and installed per the latest City of Colorado Springs drainage criteria and detailed with site specific final drainage reports. For the purposes of discussing the schematic water quality and storm sewer system, the developable area was broken down into three parcels as shown on the Drainage Map included in the Appendix. A very conceptual site layout is also reflected that is subject to modification as development takes place.

Developed Area 1 will be treated by private water quality facilities throughout the development, located adjacent to buildings and within parking lot medians/islands or possibly a shared centrally located facility. A storm sewer system within the proposed Globe Street will combine and convey the treated storm-water from the water quality facilities to the south. Maintenance of all of the water quality facilities will be privately completed, either by the individual property owners or a business association or other entity associated with the development. The storm sewer collection system in Globe Street will be public.

Developed Area 2 will be treated by larger water quality facilities prior to direct releasing into the adjacent Windmill Gulch Channel. As previously mentioned, detention of developed runoff is required (either on-site or regional downstream facility) as mentioned above. Adequate erosion protection and stilling basins will be installed at all outfall locations into the existing channel. Maintenance of all of the water quality facilities will be privately completed, either by the individual property owners or a business association or other entity associated with the development.

Developed Area 3 includes the runoff from the public roadway that is intercepted by the proposed public storm sewer within the roadway. A storm water quality facility will treat the roadway and adjacent developed runoff. Detention is required (either on-site or downstream regional facility) and maintenance of the water quality facility will be privately completed (if on-site), either by the individual property owner or a business association or other entity associated with the development. Adequate erosion protection and stilling basins will be installed at all outfall locations into the existing channel.

A 60" RCP storm sewer as recommended in the D.B.P.S. will be installed at the terminus of the existing box culvert crossing of Powers Blvd. into the site. The 60" RCP will convey the tributary runoff directly into the existing Windmill Gulch channel. This pipe will carry the easterly historic flows from the airport business park. As a potential for perched groundwater was identified, additional geotechnical information will be needed for final design.

WINDMILL GULCH CHANNEL IMPROVEMENTS

As previously mentioned, the proposed site is adjacent to a portion of the Windmill Gulch channel. The D.B.P.S. recommends minimal channel improvements in order to limit disturbance to the environmentally sensitive area and because significant channel modification is not necessary due to the ultimate developed flow rates and channel characteristics. As shown on the Drainage Map, the D.B.P.S. recommends a total of 3 drop structures and 3 grade control check structures along the project boundary. One of the drop structures (northern most) is located outside of the project boundary on an adjacent large lot and shall be installed by that owner when development of the land occurs. The other check structures and drop structures are located within the project boundary and will be constructed as recommended in the D.B.P.S. Channel improvement construction drawings and design report will be processed with City of Colorado Springs Water Resources for review and approval prior to construction.

Confirmation of the adequacy of existing downstream facilities is required. The following options for handling development stormwater flows from this site are:

1. Detain stormwater on-site and release only historic flows into the Windmill Gulch Channel (either temporary or permanent). Exact locations and sites of the facilities will be determined once land uses are shown on the "Preliminary Drainage Plan" in the Appendix.
2. Analyze planned downstream detention facility (Pond 3) to ascertain if volume capacity is available to allow developed flows from this site (as well as drainage corridor analysis to Pond 3). This facility has only been schematically sized and designed. A more detailed analysis will be required as on-site development takes place and if this option is selected. Per the DBPS, a 78 AC-FT facility is proposed.
3. Construct both on-site facilities and Pond 3 to detain developed flows. This would be dependent upon timing of Pond 3 construction, and may result in a slightly smaller regional pond facility.

As all three options listed above are viable, the approach to be utilized will be selected at a later time and detailed in subsequent final drainage reports.

Regardless of the option selected, full spectrum detention with stormwater quality treatment is required with any site development.

Addressing the requirements of the Four Step Process will be provided in future final drainage reports or MDDP's, if required.



EROSION CONTROL PLAN

Erosion control measures will be installed per the approved grading/erosion control plans (at the time of preparation and completion) and in accordance with the City of Colorado Springs Drainage Criteria Manual. No grading is proposed at this time and the preliminary grading plan is for reference only, not construction.

FLOODPLAIN STATEMENT

Portions of this site are located within a floodplain as determined by the Flood Insurance Rate Maps (F.I.R.M.) Map Number 08041C 0763F effective date, March 17, 1997 (See Appendix). Limits are included on the Drainage Map in Appendix. No development (other than storm sewer discharge points and channel improvements) is proposed within the floodplain.

DRAINAGE AND BRIDGE FEES

The Airport Spectrum development is located in the Windmill Gulch Basin. Fees or use of existing credits are due prior to plat recordation. Prior to issuance of building permits a plat will need to be recorded and appropriate drainage facility and erosion control assurances will need to be posted. Drainage structures/facilities recommended in the Drainage Basin Planning Study, including channel drop and check structures and 60" extension of Powers Blvd. culvert, are to be considered 'reimbursable'.

SUMMARY

Runoff for the proposed Airport Spectrum development is collected in on-site storm sewer systems and routed to multiple storm water quality facilities throughout the development. The treated runoff from the various water quality facilities is to be released into the adjacent Windmill Gulch Channel at various locations. Per the Drainage Basin Planning Study, a proposed regional full spectrum detention facility is anticipated downstream of the proposed site. The D.B.P.S. assumed commercial land use for the entire development, therefore anticipated proposed runoff rates will be in accordance with prior analysis. Channel improvements will be installed as previously described and recommended in the D.B.P.S. This report shows schematically a series of water quality facilities and a storm sewer collection main. Preliminary/Final drainage reports are required with any development within the Airport Spectrum site that will detail actual facility construction and storm water drainage patterns, including adherence to providing full spectrum detention facilities. This report/development is in compliance with the Windmill Gulch Drainage Basin Planning Study, and the City of Colorado Springs Drainage Criteria Manual.



PREPARED BY:

Classic Consulting Engineers & Surveyors, LLC

Kyle R. Campbell, P.E.
Division Manager

ag/2429.00/REPORTS/PDR ANNEX AND PUD CONCEPT.docx



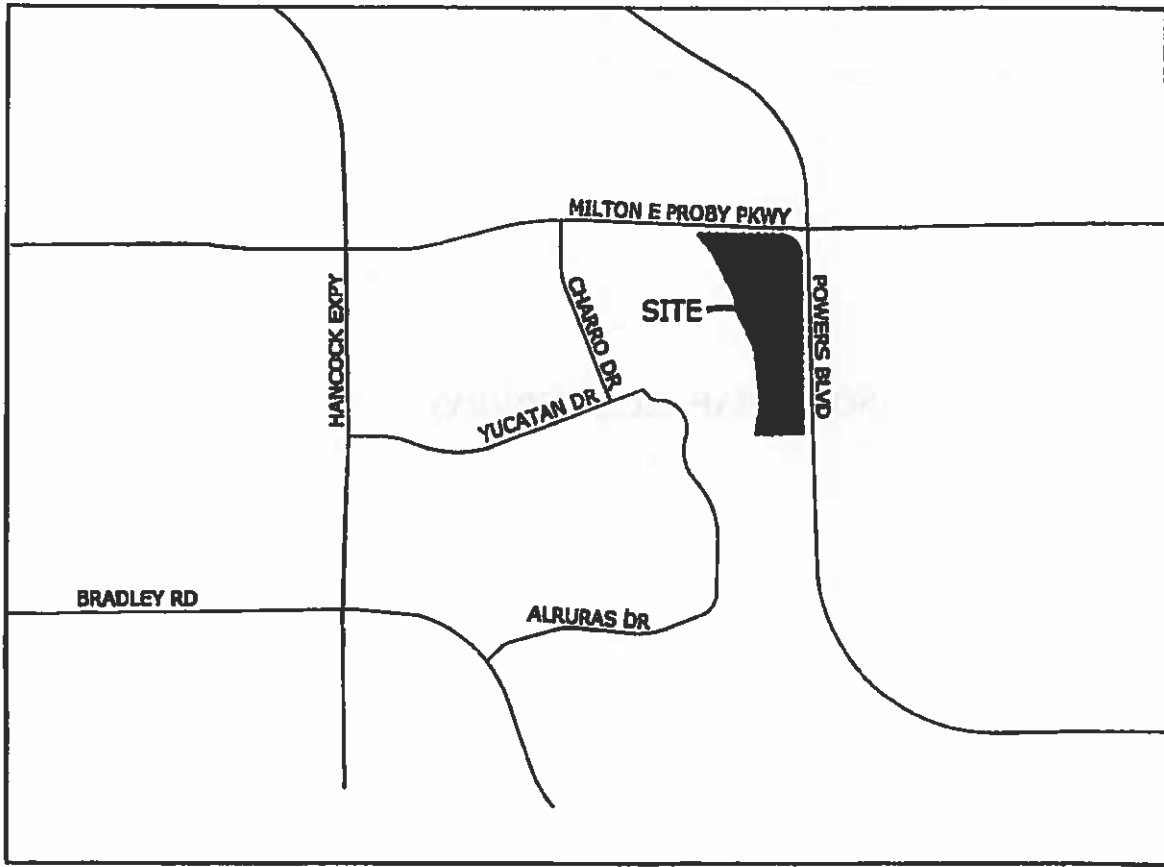
REFERENCES

1. City of Colorado Springs/County of El Paso Drainage Criteria Manual dated October 1991.
2. "Windmill Gulch Drainage Basin Planning Study," prepared by Wilson & Company, last revised February 1992.
3. Drainage Criteria Manual (Volume 3) latest revision April 2008, Urban Drainage and Flood Criteria District.



APPENDIX

VICINITY MAP

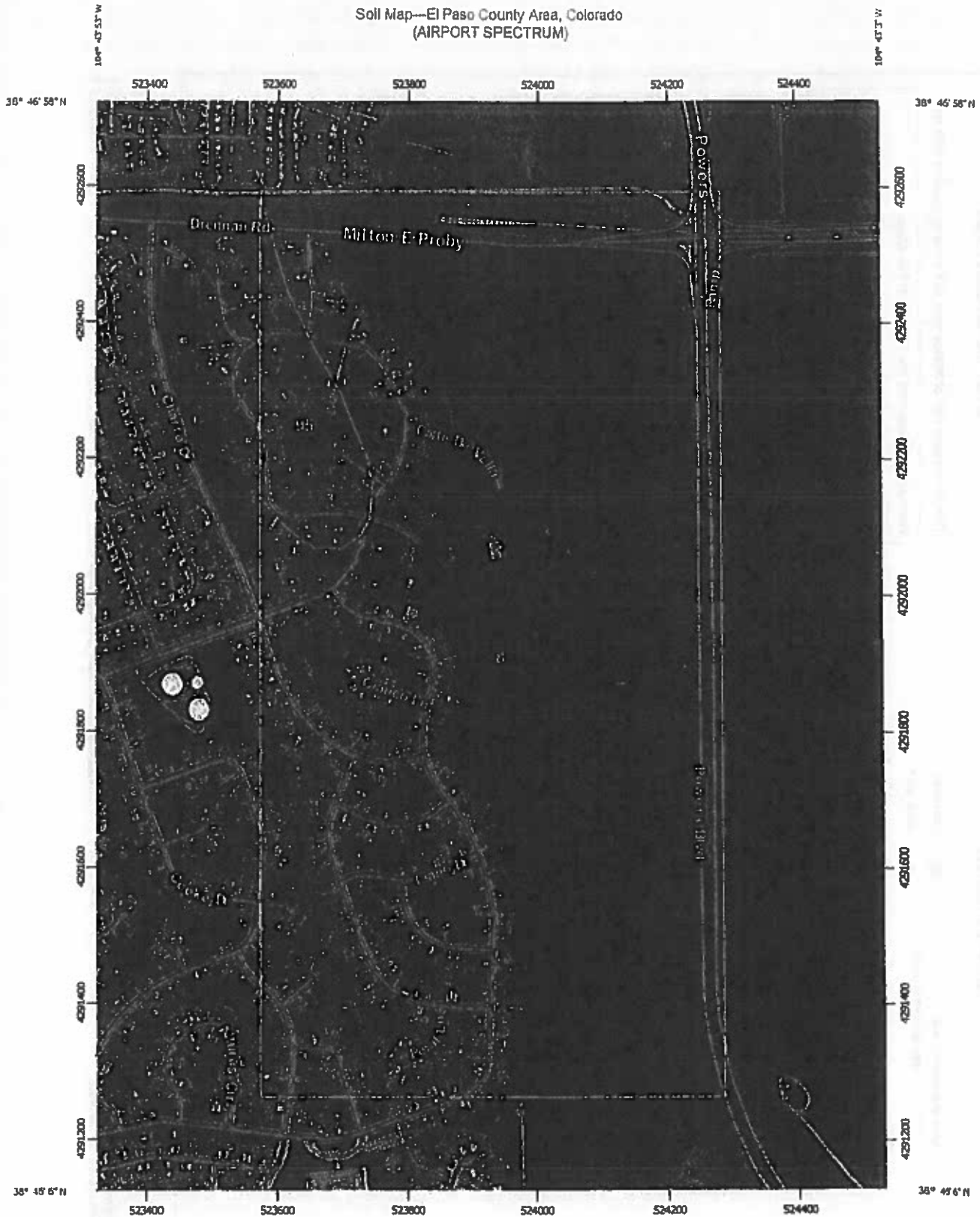


VICINITY MAP
NOT TO SCALE

SOILS MAP (S.C.S SURVEY)



Soil Map—El Paso County Area, Colorado
(AIRPORT SPECTRUM)








































Map Scale: 1:7,800 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

 Area of Interest (AOI)	 Spoil Area
 Soils	 Stony Spot
 Soil Map Unit Polygons	 Very Stony Spot
 Soil Map Unit Lines	 Wet Spot
 Soil Map Unit Points	 Other
Special Point Features	 Special Line Features
 Blowout	Water Features
 Borrow Pit	 Streams and Canals
 Clay Spot	Transportation
 Closed Depression	 Rails
 Gravel Pit	 Interstate Highways
 Gravelly Spot	 US Routes
 Landfill	 Major Roads
 Lava Flow	 Local Roads
 Marsh or swamp	Background
 Mine or Quarry	 Aerial Photography
 Miscellaneous Water	
 Perennial Water	
 Rock Outcrop	
 Saline Spot	
 Sandy Spot	
 Severely Eroded Spot	
 Sinkhole	
 Slide or Slip	
 Sodic Spot	

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilssurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 12, Sep 29, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 15, 2011—Jun 17, 2014

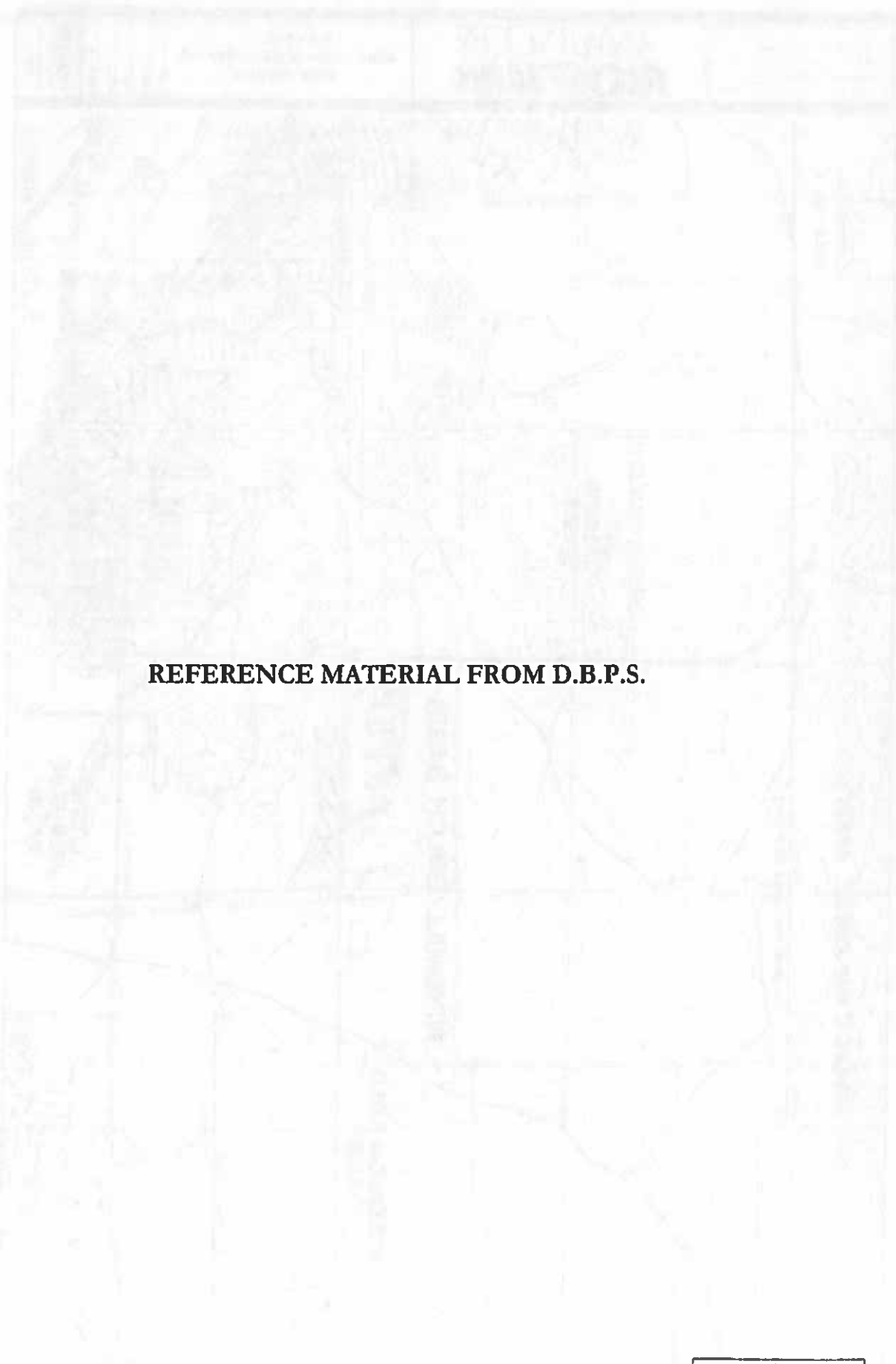
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

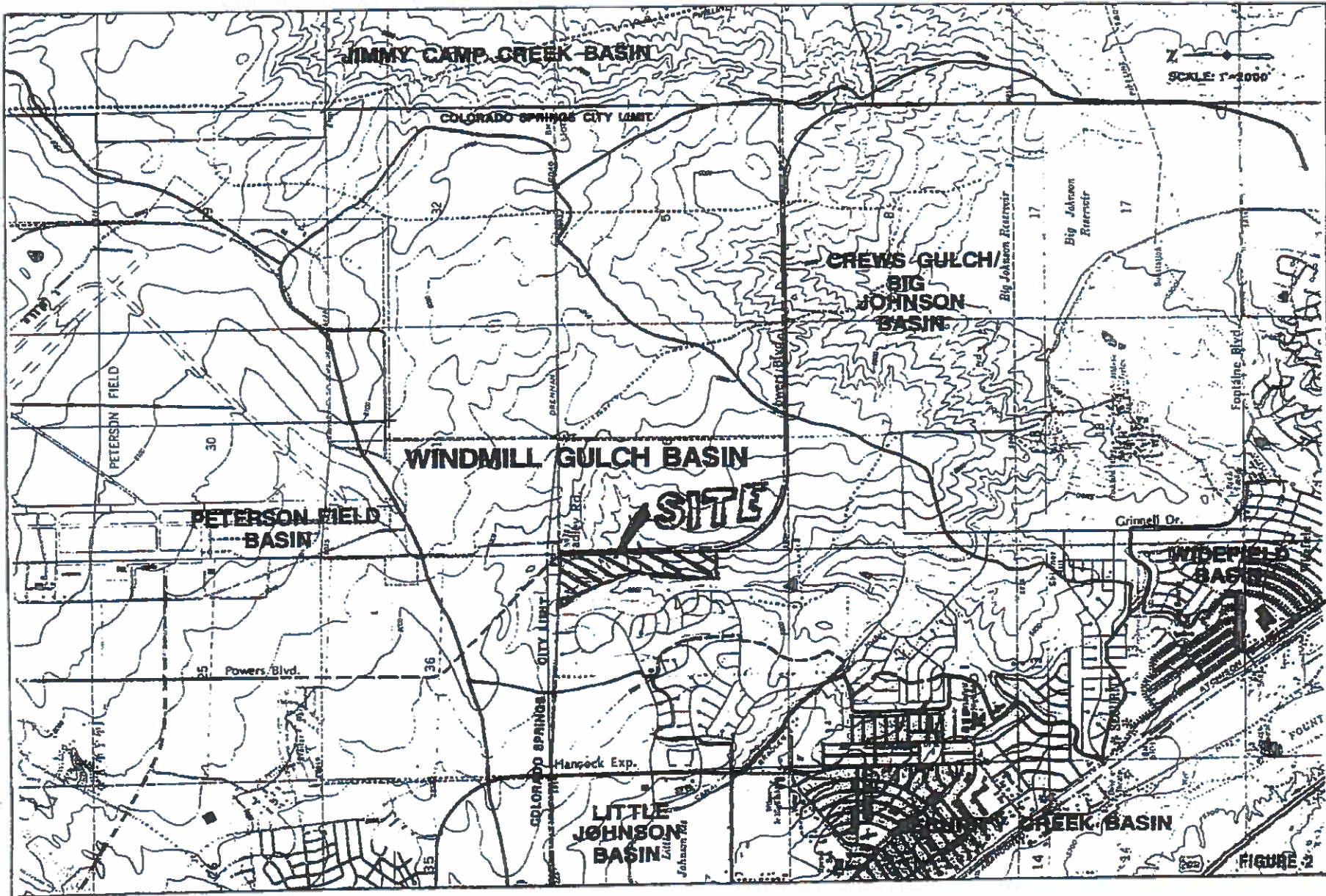
El Paso County Area, Colorado (CO825)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8 'A'	Blakeland loamy sand, 1 to 9 percent slopes	223.2	94.9%
95 'B'	Truckton loamy sand, 1 to 9 percent slopes	12.1	5.1%
Totals for Area of Interest		235.3	100.0%

F.E.M.A. MAP





REFERENCE MATERIAL FROM D.B.P.S.



**WILSON
& COMPANY**

WINDMILL GULCH
DRAINAGE BASIN PLANNING STUDY
LOCATION MAP

**WILSON
& COMPANY**
COLORADO ENGINEERS
COLORADO

FIGURE 2

DATE	
SCALE	
PROJECT	
DRAWN BY	
CHECKED BY	
DATE	

TABLE 1
2-HOUR RAINFALL DISTRIBUTION

TIME (MIN)	10-YEAR STORM			100-YEAR STORM		
	RAINFALL DIST. (%)*	ACCUM. DIST. (%)	CUMULATIVE RAINFALL (%)	RAINFALL DIST. (%)*	ACCUM. DIST. (%)*	CUMULATIVE RAINFALL (%)
5	2.0	2.0	0.0173	1.0	1.0	0.0087
10	3.7	5.7	0.0493	3.0	4.0	0.0346
15	8.2	13.9	0.1201	4.6	8.6	0.0744
20	15.0	28.9	0.2498	8.0	16.6	0.1436
25	25.0	53.9	0.4659	14.0	30.6	0.2647
30	12.0	65.9	0.5696	25.0	55.6	0.4810
35	5.6	71.5	0.6180	14.0	69.6	0.6021
40	4.3	75.8	0.6551	8.0	77.6	0.6713
45	3.8	79.6	0.6880	6.2	83.8	0.7249
50	3.2	82.8	0.7156	5.0	88.8	0.7682
55	3.2	86.0	0.7433	4.0	92.8	0.8028
60	3.2	89.2	0.7710	4.0	96.8	0.8374
65	3.2	92.4	0.7986	4.0	100.8	0.8720
70	3.2	95.6	0.8263	2.0	102.8	0.8893
75	3.2	98.8	0.8539	2.0	104.8	0.9066
80	2.5	101.3	0.8755	1.2	106.0	0.9170
85	1.9	103.2	0.8920	1.2	107.2	0.9273
90	1.9	105.1	0.9084	1.2	108.4	0.9377
95	1.9	107.0	0.9248	1.2	109.6	0.9481
100	1.9	108.9	0.9412	1.2	110.8	0.9585
105	1.9	110.8	0.9576	1.2	112.0	0.9689
110	1.9	112.7	0.9741	1.2	113.2	0.9792
115	1.7	114.4	0.9888	1.2	114.4	0.9896
120	1.3	115.7	1.0000	1.2	115.6	1.0000
	115.7			115.6		

* % OF 1-HOUR RAINFALL

D. Land Use











Existing land uses in the Windmill Gulch drainage basin were determined by examining current development plans supplemented with field reconnaissance. Currently most of the development is occurring in the western and southern portion of the basin with the eastern and northern areas remaining in their natural state or currently being developed as airport land. Presently, only about 15% of the basin is fully developed.

Proposed land use for the area was determined through examination of current development plans and through discussions with El Paso County Planning Department officials and City of Colorado Springs officials. The properties currently owned by the City of Colorado Springs were assumed to be developed into airport uses which included commercial/business developments in addition to runway and open space. All other undeveloped areas were assumed to be fully developed using projected densities. The land use map is a composite of this land use information. There is not a time frame or date associated with this ultimate projected land use.

NOTE:
 THIS DRAWING WAS USED TO IDENTIFY FUTURE HYDROLOGIC
 PARAMETERS AND THEREBY DEVELOP DEVELOPED STORMWATER
 RUNOFF CONDITIONS. IT IS NOT INTENDED TO BE CONSIDERED
 AS A LAND USE PLANNING DOCUMENT.

SCALE: 1"=8000'

LEGEND

-  1-2 DU/AC
-  3-4 DU/AC
-  4-5 DU/AC
-  > 6 DU/AC
-  MULTI-FAMILY
-  INDUSTRIAL
-  COMMERCIAL / BUSINESS PARK
-  AIRPORT
-  SCHOOL
-  OPEN SPACE

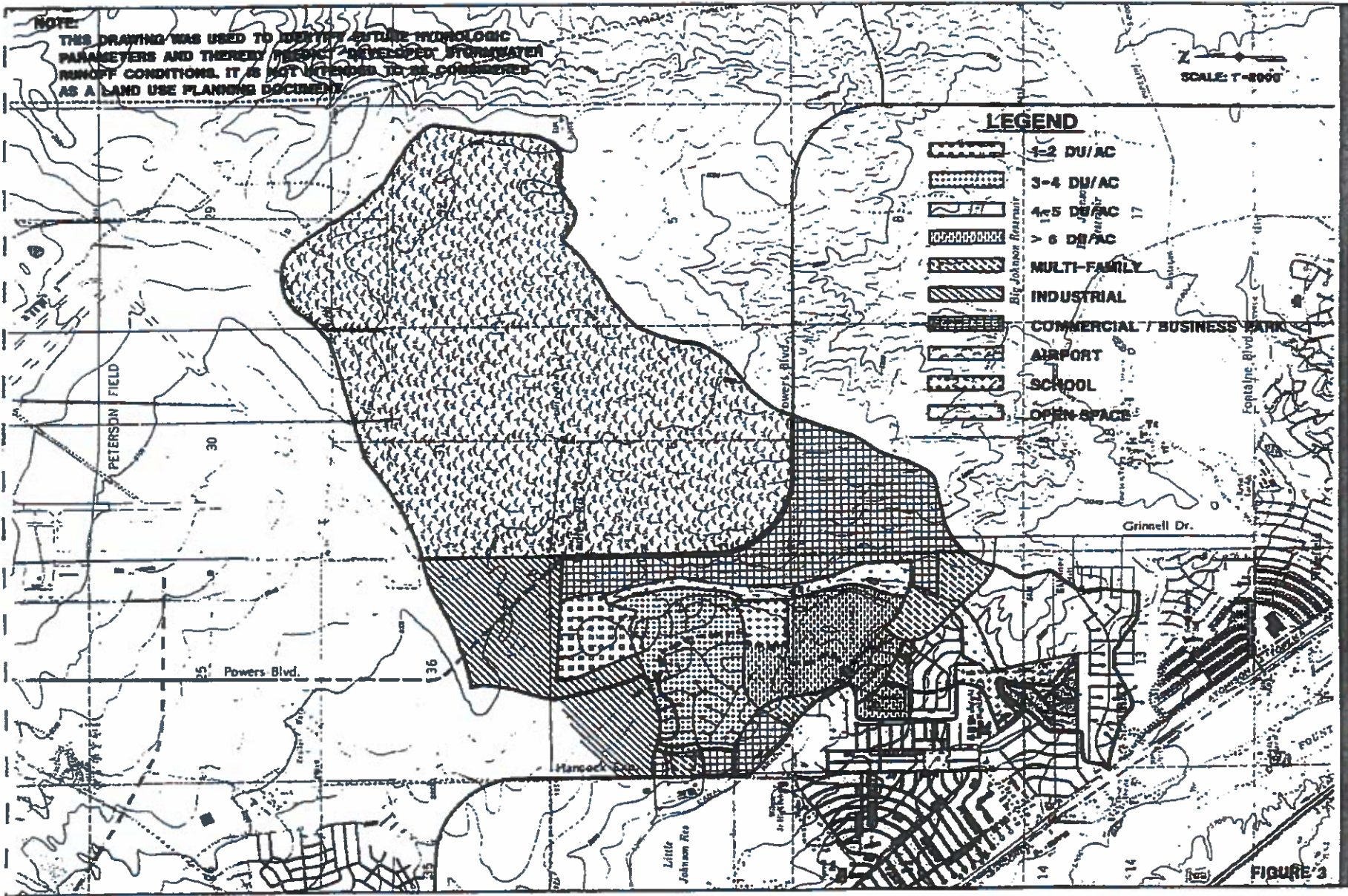


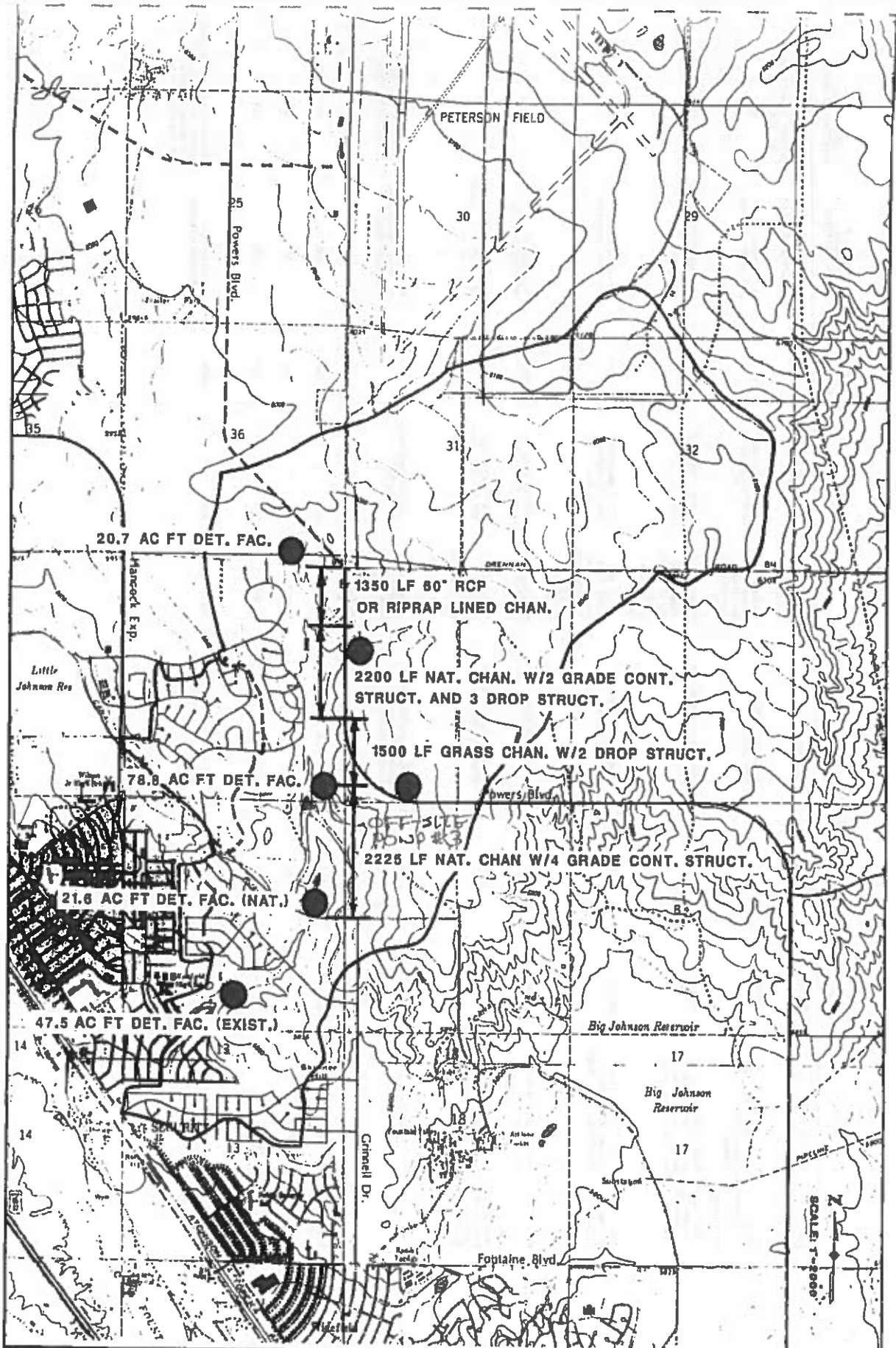
FIGURE 3

**WILSON
& COMPANY**

WINDMILL GULCH
 CRAWDAKE BASIN PLANNING STUDY
 LAND USE MAP

WILSON
& COMPANY
 CONSULTING ENGINEERS
 CHICAGO, ILL.

DATE	
BY	
CHECKED BY	
SCALE	
PROJECT NO.	
DRAWING NO.	



WILSON & COMPANY
 ENGINEERS
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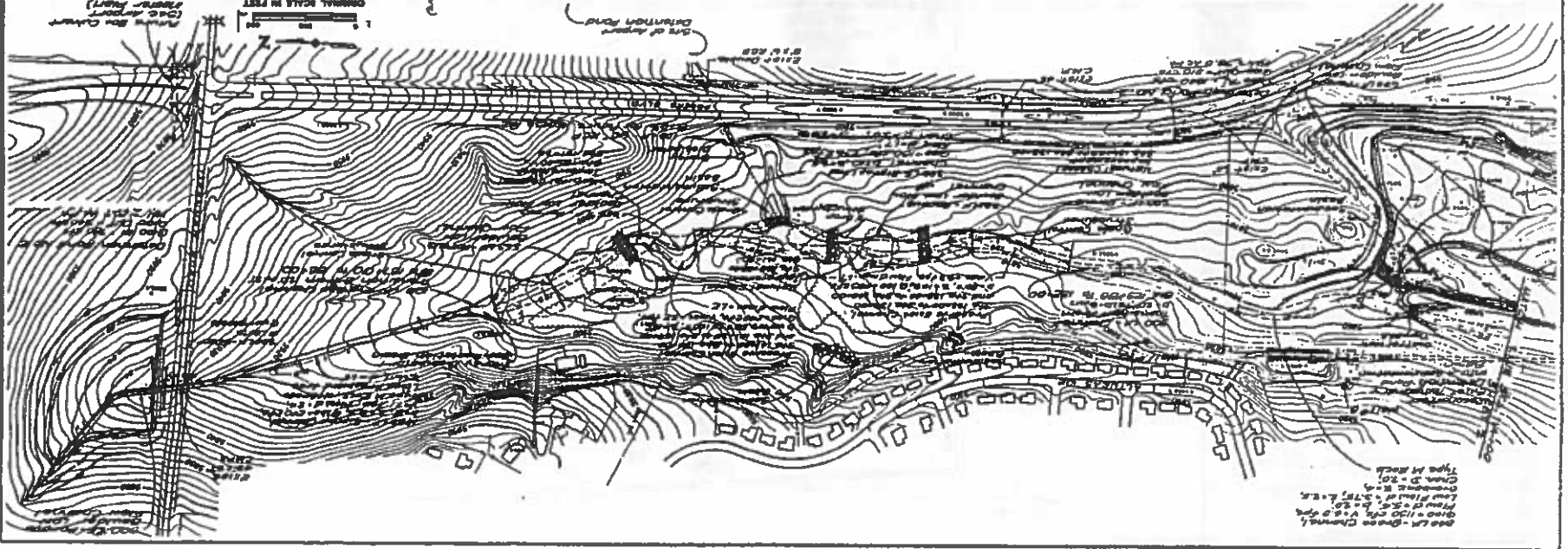
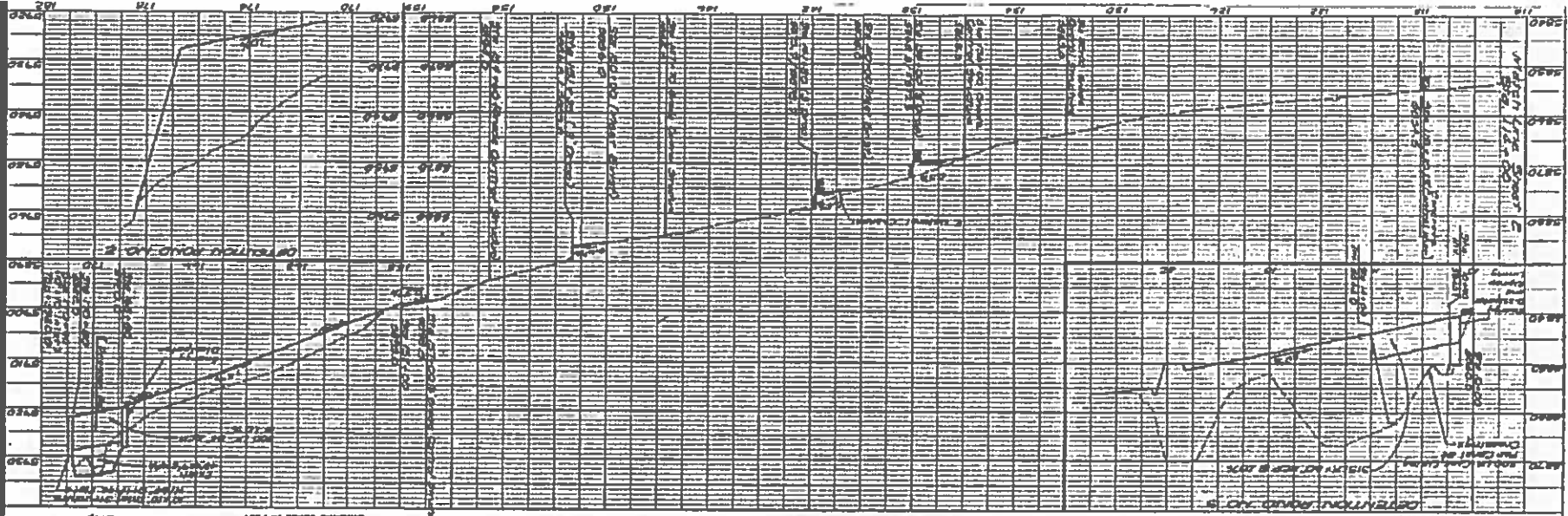
WINDMILL GULCH
 DRAINAGE BASIN PLANNING STUDY
 ALTERNATIVE 2

WILSON
 & COMPANY

10000
WILSON
& COMPANY
 5
 07-820
 100, 1000
 115
 100

WINDHOL OUTLET
DRAINAGE BASIN PLANNING STUDY
 PRELIMINARY DESIGN - 3
 1. PLANNING PART
 2. SITE PLAN PART

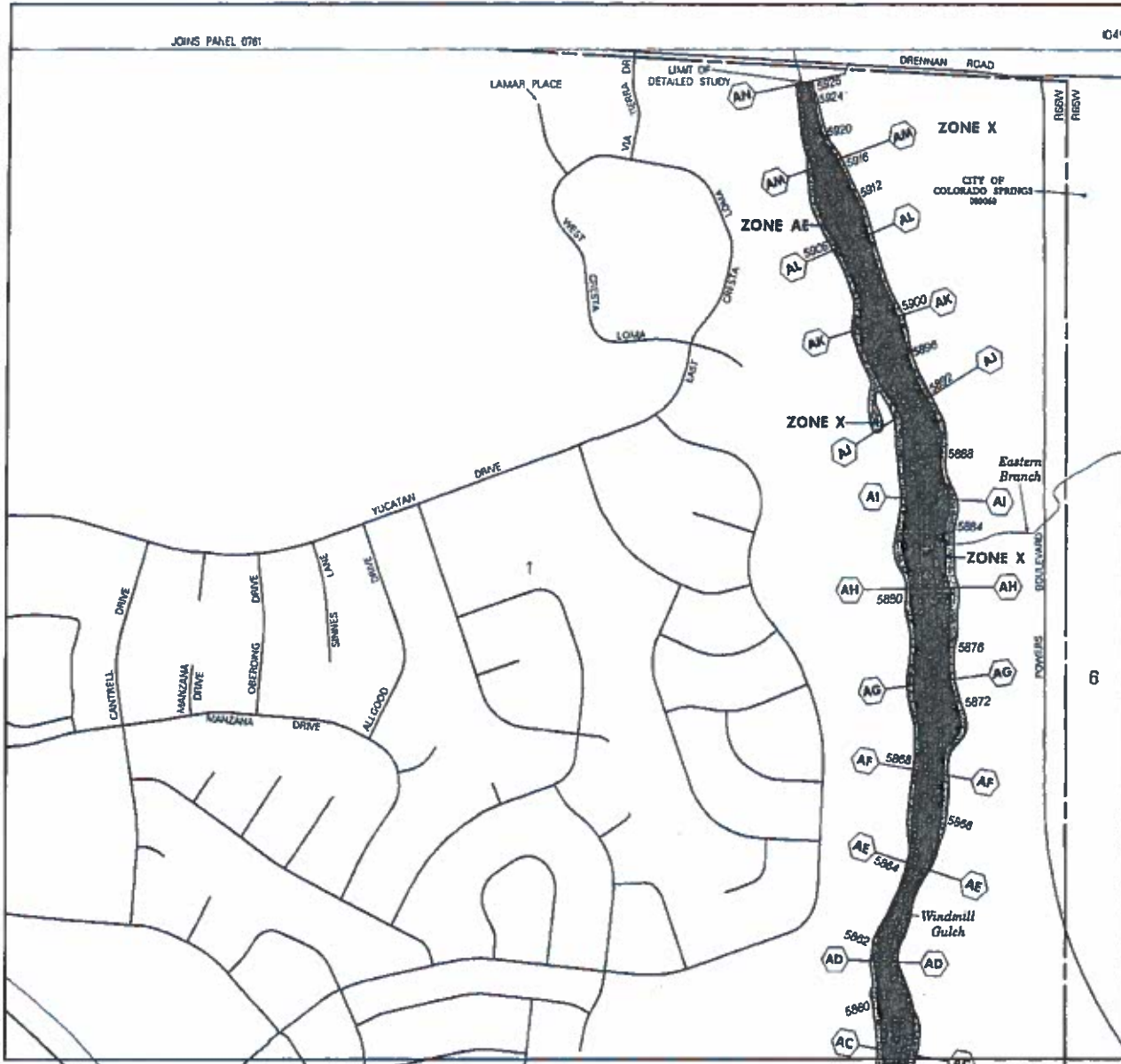
WILSON
& COMPANY



10000
WILSON
& COMPANY
 5
 07-820
 100, 1000
 115
 100

JOHNS PANEL 0761

04°43'07"
38°46'52"



NATIONAL FLOOD INSURANCE PROGRAM

**FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY,
COLORADO AND
INCORPORATED AREAS**

PANEL 763 OF 1300
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLORADO SPRINGS, CITY OF	060000	0763	F
EL PASO COUNTY, UNINCORPORATED AREAS	060000	0763	F
FOUNTAIN CITY OF	060001	0763	F

**MAP NUMBER
08041C0763 F**

**EFFECTIVE DATE:
MARCH 17, 1997**



Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using FIRM On-Line. The 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.fema.gov

DRAINAGE MAP

CLASSIC CONSULTING ENGINEERS & SURVEYORS
1000 WEST 10TH AVENUE
DENVER, COLORADO 80202
TEL: 303.733.1111
WWW.CLASSICCONSULTING.COM

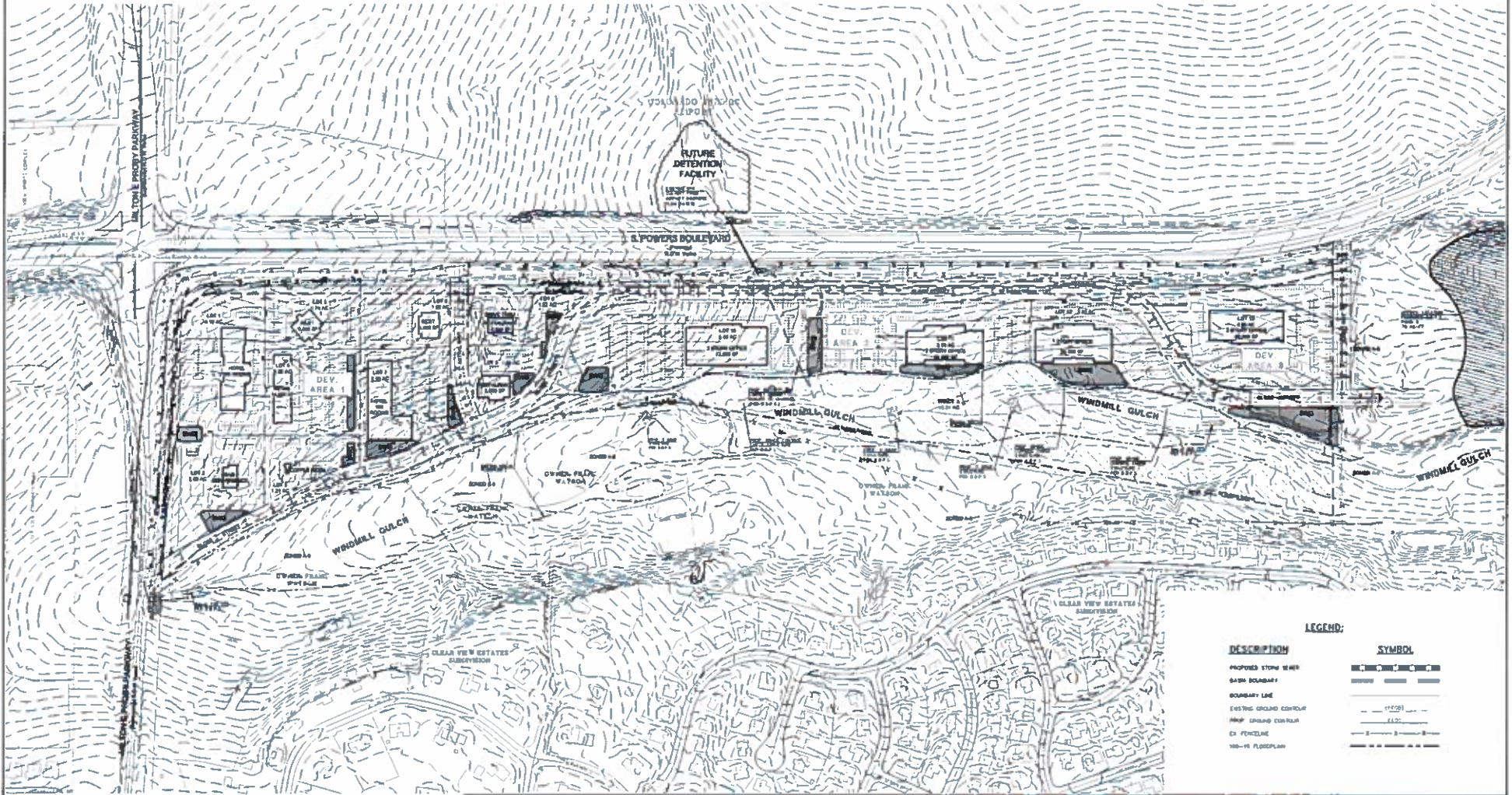


AIRPORT SPECTRUM

CITY OF COLORADO SPRINGS, COUNTY OF EL PASO, STATE OF COLORADO

PRELIMINARY DRAINAGE PLAN

JANUARY 2018



LEGEND:

DESCRIPTION	SYMBOL
PROPOSED STORM WATER BASIN BOUNDARY	
BOUNDARY LINE	
EXISTING GROUND CONTOUR	
PROPOSED GROUND CONTOUR	
EXISTING FENCELINE	
100-YR FLOODPLAIN	

48 HOURS BEFORE YOU DIG,
CALL UTILITY LOCATORS
811
UTILITY NOTIFICATION OF COLORADO
(800) 485-4848

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN ON THIS AIRPORT SPECTRUM. ONLY THE EXISTENCE OF UTILITIES IS INDICATED. THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION AND DEPTH OF UTILITIES BEFORE CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY HIS FAILURE TO LOCATE, LOCATE AND PROTECT ANY AND ALL UNDERGROUND UTILITIES.

NO.	REVISION	DATE

PREPARED UNDER MY SUPERVISION FOR THE ON BEHALF OF CLASSIC CONSULTING ENGINEERS AND SURVEYORS, L.L.C.

PREPARED BY: CARROLL, C. J. (CJ) 1/18/18

CLASSIC
CONSULTING
ENGINEERS & SURVEYORS

AIRPORT SPECTRUM			
PRELIMINARY DRAINAGE PLAN			
DESIGNED BY: MAL	SCALE: (H) 1" = 150'	DATE: 01/28/2018	CLASSIC CONSULTING ENGINEERS & SURVEYORS, L.L.C.
DRAWN BY: MAL	CHECKED BY: MAL	DATE: 01/28/2018	
CHECKED BY: MAL	DATE: 01/28/2018	DATE: 01/28/2018	