CITY OF ALBUQUERQUE

Planning Department
David Campbell, Director

Mayor Timothy M. Keller

May 13, 2019

Vincent Carrica, P.E.
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, NM, 87109

RE: Maverik – Unser/Los Volcanes
551 Silver Creek Rd. NW
Grading and Drainage Plan & Drainage Report
Engineer's Stamp Date: 05/02/19
Hydrology File: K10D023D

Dear Mr. Carrica:

Based upon the information provided in your resubmittal received 05/02/2019, the Grading & Drainage Plan and Drainage Report are approved for Building Permit and for action by the DRB on Site Plan for Building Permit.

Please attach a copy of this approved plan in the construction sets for Building Permit processing along with a copy of this letter. Prior to approval in support of Permanent Release of Occupancy by Hydrology, Engineer Certification per the DPM checklist will be required.

If the project total area of disturbance (including the staging area and any work within the adjacent Right-of-Way) is 1 acre or more, then an Erosion and Sediment Control (ESC) Plan and Owner's certified Notice of Intent (NOI) is required to be submitted to the Stormwater Quality Engineer (Curtis Cherne, PE, ccherne@cabq.gov, 924-3420) 14 days prior to any earth disturbance.

As a reminder, please provide a Drainage Covenant for the proposed detention ponds per Chapter 17 of the DPM prior to Permanent Release of Occupancy. Please submit this on the 4th floor of Plaza de Sol. A $25 fee will be required.

If you have any questions, please contact me at 924-3995 or rbrissette@cabq.gov .

Sincerely,

Renée C. Brissette

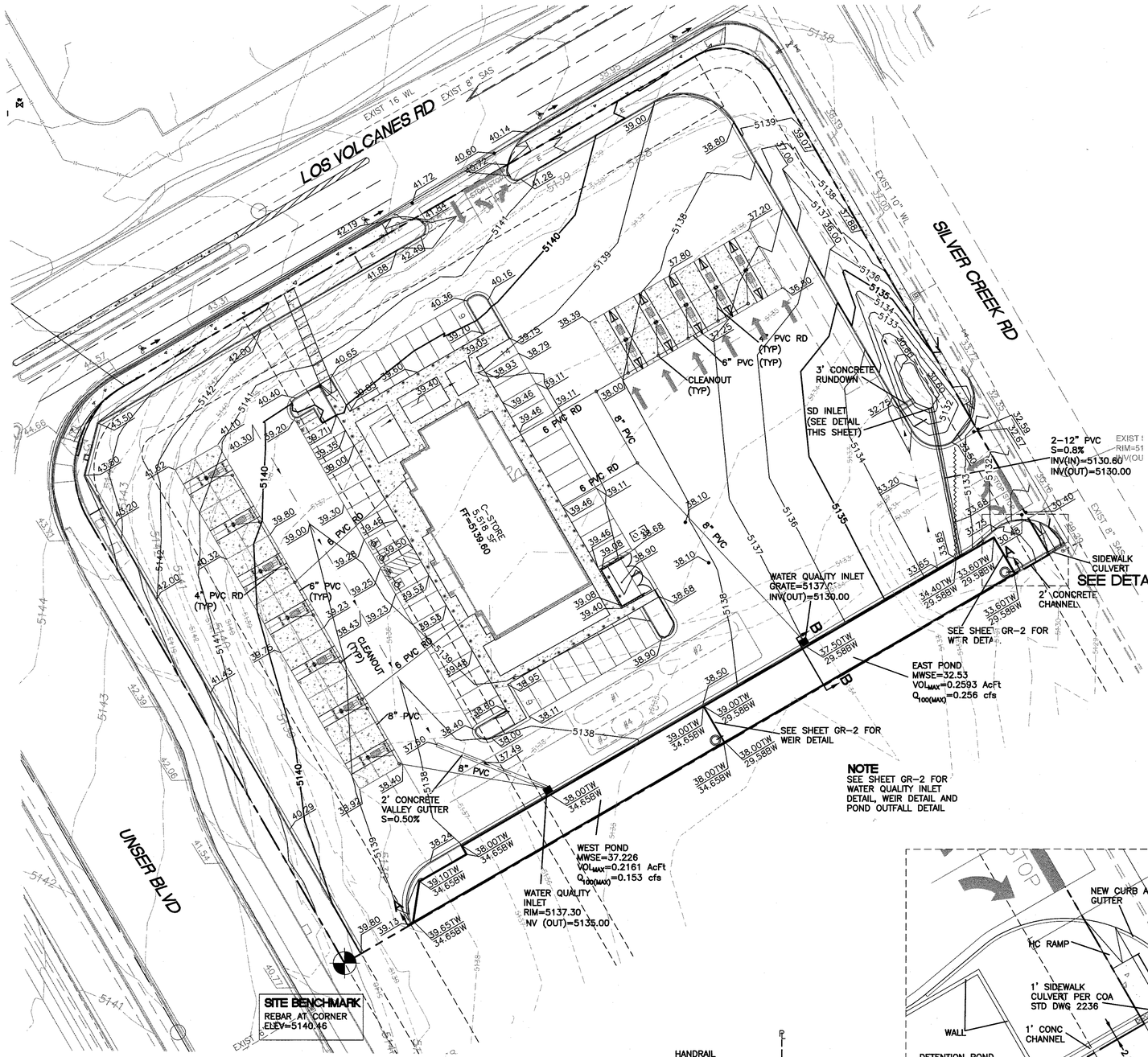
Renée C. Brissette, P.E. CFM
Senior Engineer, Hydrology
Planning Department

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov



LEGEND

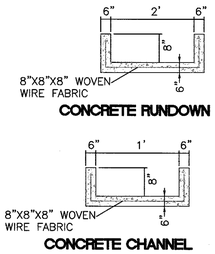
- CURB & GUTTER
- BOUNDARY LINE
- EASEMENT
- RIGHT-OF-WAY
- BUILDING
- SIDEWALK
- RETAINING WALL
- 5010 CONTOUR MAJOR
- 5011 CONTOUR MINOR
- 48.25 SPOT ELEVATION
- FLOW ARROW
- EXISTING CURB & GUTTER
- EXISTING BOUNDARY LINE
- 5010 EXISTING CONTOUR MAJOR
- 5011 EXISTING CONTOUR MINOR
- 48.25 EXISTING SPOT ELEVATION

N

GRAPHIC SCALE

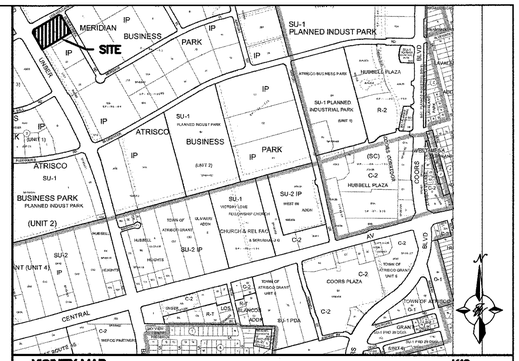
20 0 10 20

(IN FEET)
1 inch = 20 ft.

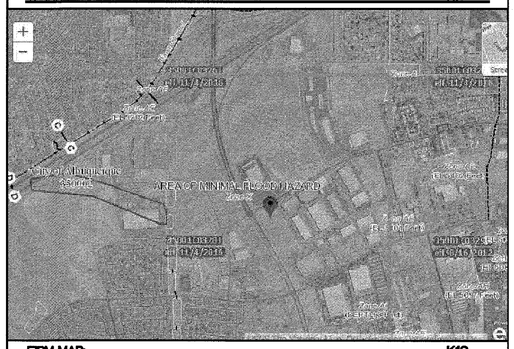


CONCRETE RUNDOWN

CONCRETE CHANNEL

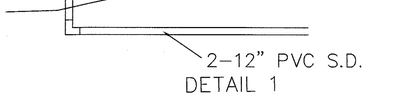


VICINITY MAP: K10

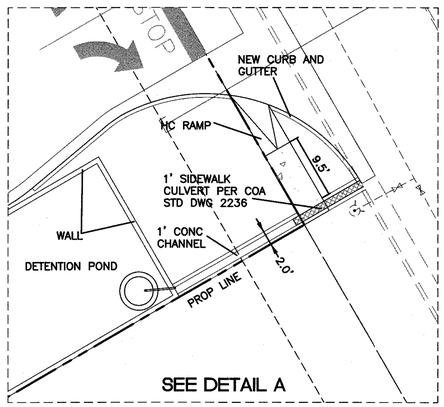


FIRM MAP: K10

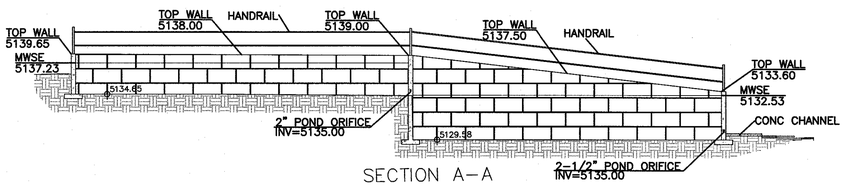
LEGAL DESCRIPTION:
TRACT L-1-A-1, ATRISCO BUSINESS PARK



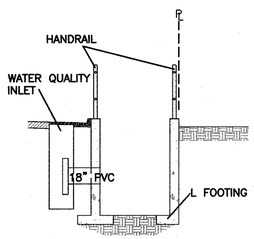
DETAIL 1



SEE DETAIL A



SECTION A-A



SECTION B-B

MAVERIK

ENGINEER'S SEAL

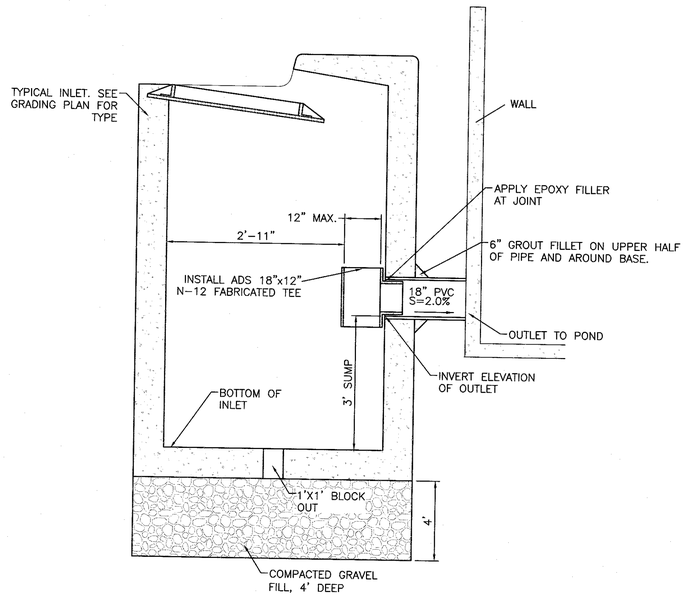
RONALD R BOHANNAN NEW MEXICO 7868 REGISTERED PROFESSIONAL ENGINEER

RONALD R. BOHANNAN
P.E. #7868

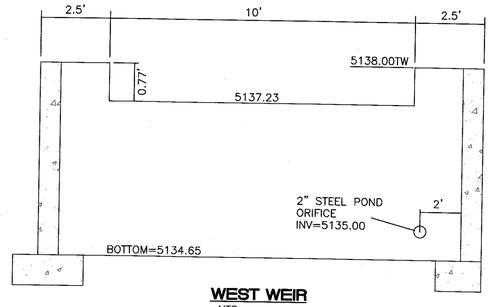
MAVERIK STORE #NM-0115
UNSER AND LOS VOLCANES
GRADING AND DRAINAGE PLAN

TIERRA WEST, LLC
5571 MIDWAY PARK PL NE
ALBUQUERQUE, NEW MEXICO 87109
(505) 858-3100
www.tierrawestllc.com

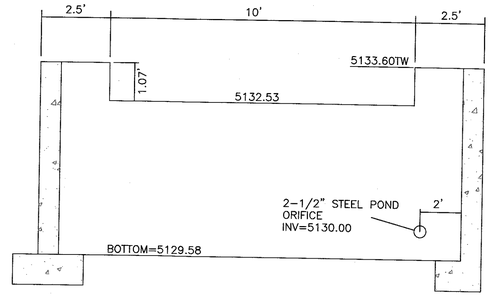
DRAWN BY: pm
DATE: 5-2-19
DRAWING
SHEET #: GR-1
JOB #: 2018042



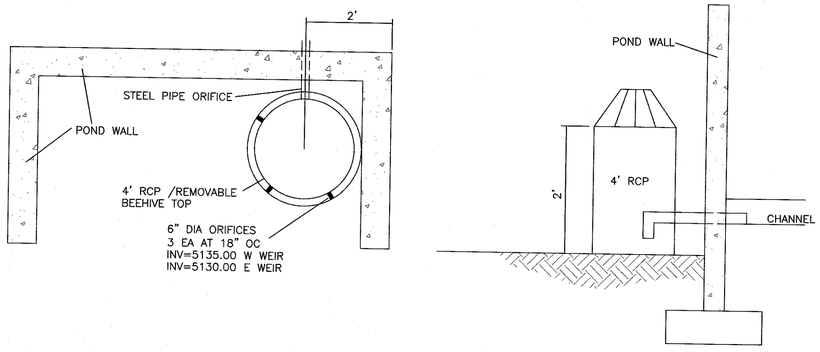
TYPICAL WATER QUALITY INLET DETAIL
NTS



WEST WEIR
NTS



EAST WEIR
NTS



POND OUTFALL DETAIL
NTS

ENGINEER'S SEAL

RONALD R BOHANNAN NEW MEXICO 7868 REGISTERED PROFESSIONAL ENGINEER

RONALD R. BOHANNAN
P.E. #7868

MAVERIK

MAVERIK STORE #NM-0115
UNSER AND LOS VOLCANES
GRADING DETAILS

TIERRA WEST, LLC
5571 MIDWAY PARK PL NE
ALBUQUERQUE, NEW MEXICO 87109
(505) 858-3100
www.tierrawestllc.com

DRAWN BY: pm
DATE: 5-2-19
DRAWING:
SHEET #: GR-2
JOB #: 2018042

DRAINAGE REPORT

For

551 Silver Creek Rd.
ALBUQUERQUE, NEW MEXICO

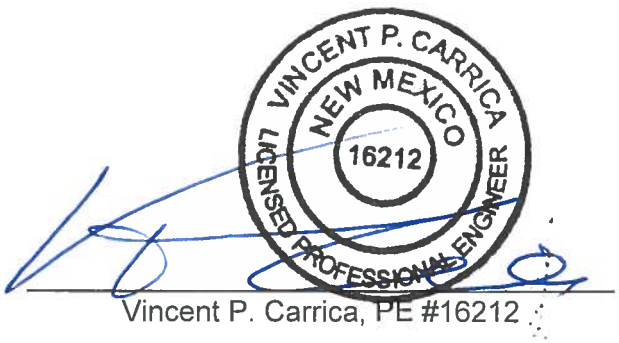
Prepared by

Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, New Mexico 87109

Prepared for

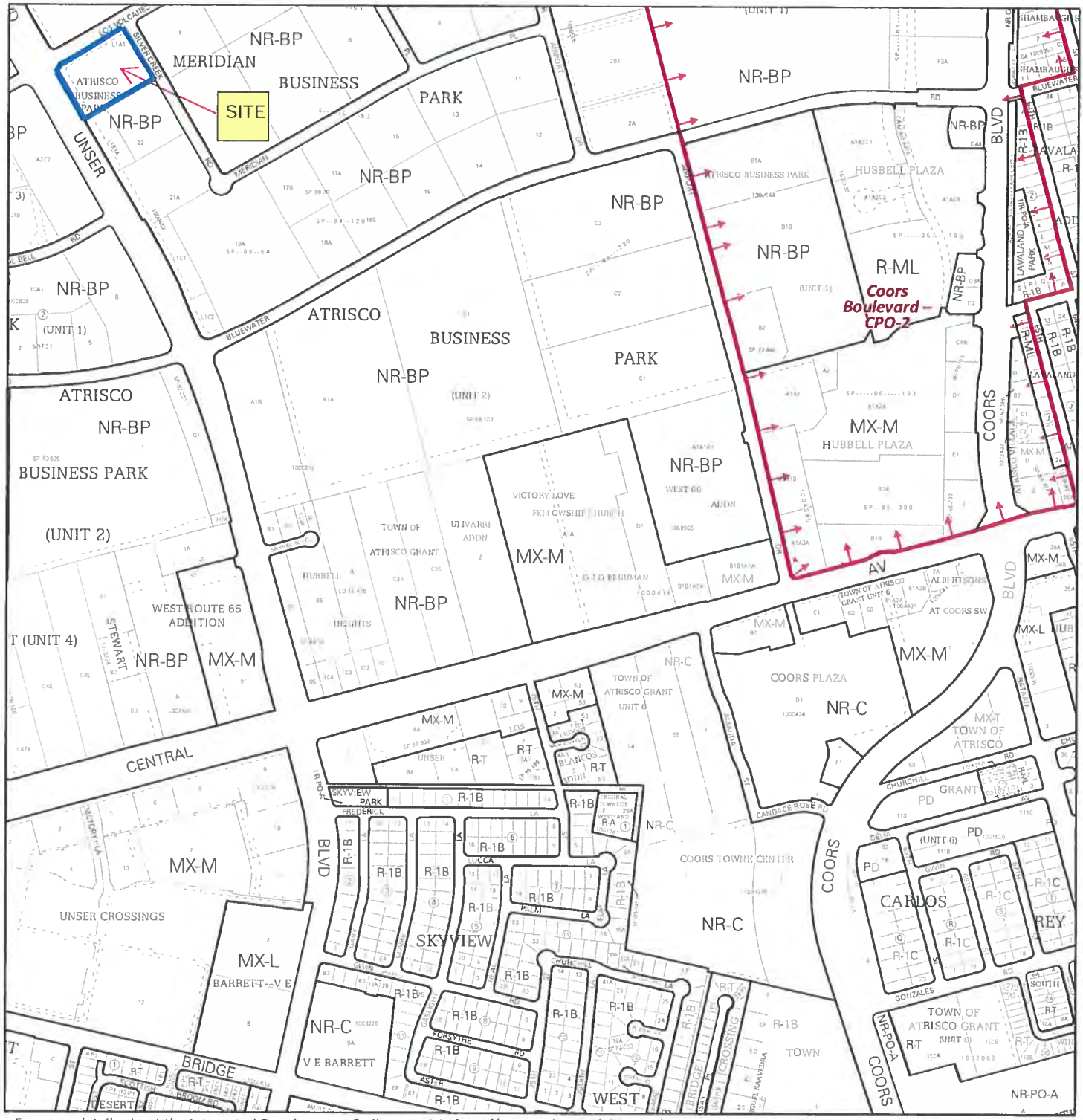
Maverik
Albuquerque, NM

April 29, 2019



Vincent P. Carrica, PE #16212

TABLE OF CONTENTS



For more details about the Integrated Development Ordinance visit: http://www.cabq.gov/planning/codes-policies-regulations/integrated-development-ordinance

IDO Zone Atlas May 2018

Albuquerque Geographic Information System

IDO Zoning information as of May 17, 2018

The Zone Districts and Overlay Zones are established by the Integrated Development Ordinance (IDO).

Zone Atlas Page:

K-10-Z

Easement

Escarpment

Petroglyph National Monument

Areas Outside of City Limits

Airport Protection Overlay (APO) Zone

Character Protection Overlay (CPO) Zone

Historic Protection Overlay (HPO) Zone

View Protection Overlay (VPO) Zone

Feet

0 250 500 1,000

LOCATION

The proposed commercial development is located off Silver Creek Rd south of Interstate 40, east of Unser Blvd at the corner of Los Volcanes and Silver Creek Rd in southwest Albuquerque. It is comprised of approximately 3.06 acres zoned NR-BP. This report represents a drainage management and grading plan for approval by the City of Albuquerque, for Site Plan, grading and Building Permit submittal.

DRAINAGE BASIN DESIGNATION

The drainage basins for proposed conditions are as indicated on the BASIN MAP included in this report. The site is broken into six onsite drainage basins and one upland offsite basin.

EXISTING DRAINGE CONDITIONS

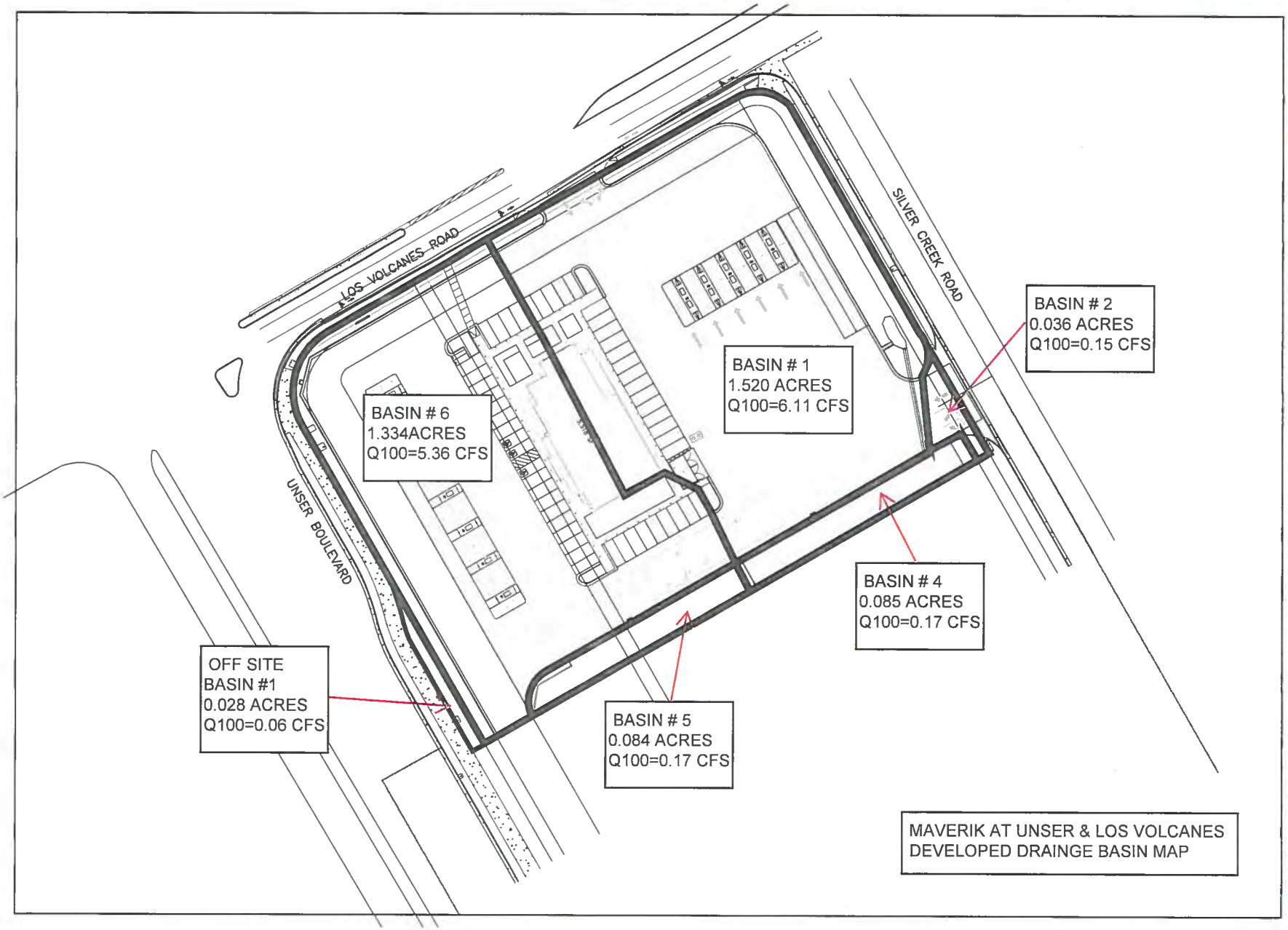
The site is currently vacant with an earthen detention pond constructed in the southeast corner of the site. It drains predominantly northwest to southeast. Runoff from a small upland basin that is within Unser Blvd right-of-way drains onto the site. This runoff is combined with the onsite runoff and routed through an existing detention pond before being released to Silver Creek Rd, which then drains to the south per the Atrisco Business Park Master Drainage Plan for fully developed conditions, dated February of 1992.

FIRM MAP

The site is not located in a flood plain as is shown on designated Flood Hazard Zone Map No. 35001C0328J dated 11/4/2016.

DESIGN-CRITERIA

The drainage plan presented in this report was prepared in accordance with the City of Albuquerque Drainage Ordinances and the Development Process Manual DPM. The hydrological analysis is based on the 100-year frequency, 6-hour duration storm. The plan will also include retention of the first flush in on-site drainage ponds. See attached Weighted E Table for excess precipitation values calculated for this site.


LOS VOLCANES ROAD
SILVER CREEK ROAD
UNSER BOULEVARD
BASIN # 6
1.334ACRES
Q100=5.36 CFS
BASIN # 1
1.520 ACRES
Q100=6.11 CFS
BASIN # 2
0.036 ACRES
Q100=0.15 CFS
BASIN # 4
0.085 ACRES
Q100=0.17 CFS
OFF SITE
BASIN #1
0.028 ACRES
Q100=0.06 CFS
BASIN # 5
0.084 ACRES
Q100=0.17 CFS
MAVERIK AT UNSER & LOS VOLCANES
DEVELOPED DRAINGE BASIN MAP

National Flood Hazard Layer FIRMette

FEMA

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) Zone A, V, A99
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee. See Notes. Zone X
- Area with Flood Risk due to Levee Zone D

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard Zone X
- Effective LOMRs
- Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/31/2019 at 6:28:05 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

DEVELOPED-DRAINAGE CONDITIONS

The site is proposed to be developed with a single user, Maverik C-Store. No offsite flows will enter the site with the exception of the small upland basin in the Unser Blvd righ-of-way, which will continue to be routed through the subject site. Runoff from the site will be routed through two onsite drainage ponds and will then discharge to Silver Creek roadway with a controlled discharge rate equal to or less than the allowable 0.1 cfs per acre. This is in compliance with the Atrisco Business Park Master Drainage Plan for fully developed conditions dated February of 1992. The drainage ponds will retain the first flush retention volumes as required by the drainage ordinance.

Refer to enclosed Weighted E computation spreadsheet for developed runoff conditions. Storm drain capacities are listed in a table in the appendix.

SUMMARY

The proposed grading and drainage plan for the proposed development of the existing undeveloped property includes surface flows and an onsite storm drain to convey runoff to detention ponds before discharging to the Silver Creek Roadway at a controlled discharge rate of equal to or less than 0.1 cfs per acre.

VOLUME CALCULATIONS

Maverik @ Unser & Los Volcanes

West Pond

Ab - Bottom Of The Pond Surface Area
At - Top Of The Pond Surface Area
D - Water Depth
Dt - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = Ab * D + 0.5 * C * D^2
C = (At - Ab) / Dt

Ab =	3,655.00	T.O.P.=	5138
At =	3,655.00	B.O.P. =	5135
Dt =	3.00		
C =	0.00		
B Elev. =	5,135.00		

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)	
5134.65	0	0	0	
5135.00	0.35	0.0294	0.000	DI Invert
5135.50	0.50	0.0713	0.068	
5136.00	1.00	0.1133	0.101	
5136.50	1.50	0.1552	0.125	DI Rim
5137.00	2.00	0.1972	0.145	
5137.50	2.50	0.2391	0.163	
5138.00	3.00	0.2811	0.179	Emergency Overflow
5138.50	3.50	0.3230	0.194	

Orifice Equation
Q = CA SQRT(2gH)

C =	0.6
Diameter (in)	2
Area (ft^2)=	0.021816616
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

VOLUME CALCULATIONS

Maverik @ Unser & Los Volcanes

East Pond

Ab - Bottom Of The Pond Surface Area
At - Top Of The Pond Surface Area
D - Water Depth
Dt - Total Pond Depth
C - Change In Surface Area / Water Depth

Volume = Ab * D + 0.5 * C * D^2
C = (At - Ab) / Dt

Ab =	3,705.00	T.O.P.=	5133
At =	3,705.00	B.O.P. =	5129.58
Dt =	3.42		
C =	0.00		
B Elev. =	5,130.00		

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)	
5129.58	0	0	0.000	
5130.00	0.42	0.0424	0.000	DI Invert
5130.50	0.50	0.0849	0.103	
5131.00	1.00	0.1275	0.155	
5131.50	1.50	0.1700	0.194	DI Rim
5132.00	2.00	0.2125	0.226	
5132.50	2.50	0.2551	0.254	
5133.00	3.00	0.2976	0.279	Emergency Overflow
5133.50	3.50	0.3401	0.302	

Orifice Equation
Q = CA SQRT(2gH)

C =	0.6	
Diameter (in)	2.5	
Area (ft^2)=	0.034088462	
g =	32.2	
H (Ft) =	Depth of water above center of orifice	
Q (CFS)=	Flow	

Maverik @ Unser & Los Volcanes

Weighted E Method

Zone #1

Developed Basins

												100-Year			10-Year			2-Year		
Basin	Area (sf)	Area (acres)	Area (sq miles)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
1	66226.00	1.520	0.00238	0%	0	15%	0.228	0%	0	85%	1.292	1.775	0.225	6.11	1.087	0.138	3.91	0.614	0.078	2.19
2	1578.00	0.036	0.00006	0%	0	15%	0.005	0%	0	85%	0.031	1.775	0.005	0.15	1.087	0.003	0.09	0.614	0.002	0.05
3	58095.00	1.334	0.00208	0%	0	15%	0.200	0%	0	85%	1.134	1.775	0.197	5.36	1.087	0.121	3.43	0.614	0.068	1.92
4	3705.00	0.085	0.00013	0%	0	100%	0.085	0%	0	0%	0.000	0.670	0.005	0.17	0.220	0.002	0.06	0.010	0.000	0.00
5	3655.00	0.084	0.00013	0%	0	100%	0.084	0%	0	0%	0.000	0.670	0.005	0.17	0.220	0.002	0.06	0.010	0.000	0.00
OS-1	1236.00	0.028	0.00004	0%	0	100%	0.028	0%	0	0%	0.000	0.670	0.002	0.06	0.220	0.001	0.02	0.010	0.000	0.00
Total	134495.00	3.088	0.00482										0.439	12.02		0.265	7.58		0.148	4.17

Equations:

Weighted E = Ea*Aa + Eb*Ab + Ec*Ac + Ed*Ad / (Total Area)

Volume = Weighted D * Total Area

Flow = Qa * Aa + Qb * Ab + Qc * Ac + Qd * Ad

TIERRA WEST, LLC

Project MAVERIK @ UNSER/LOS VOLCANES Date 3-29-19

Project No. WEIR CALCS

Meeting Purpose _____ Sheet No 1 of ___

Attendees _____

OVERFLOW WEIRS

- BROAD CRESTED WEIR $Q = 1.6LH^{3/2} \Rightarrow H = \left(\frac{Q}{1.6L}\right)^{2/3}$

WEST OVERFLOW:

$L = 10ft$

$Q = 6cfs$

$H_{REQ} = \left(\frac{6}{1.6(10)}\right)^{2/3} = 0.52ft \leq H_{PROV.} = 0.77ft$ ✓

EAST OVERFLOW

$L = 10ft$

$Q = 12cfs$

$H_{REQ} = \left(\frac{12}{1.6(10)}\right)^{2/3} = 0.83ft \leq H_{PROV.} = 1.07ft$ ✓

3ft RUNDOWN

$Q = \frac{1.49}{n} A R^{2/3} S^{1/2}$ $L = 6ft$ $W = 3ft$ $S = \frac{32.75 - 30.60}{6} = 35.83\%$

$n = .013$ $H = 0.67ft$

$Q = \frac{1.49}{.013}(2.01)(0.46)^{2/3}(.36)^{1/2}$ $A = 2.01ft^2$ $WP = 4.34ft$ $R = \frac{2.01}{4.34} = 0.46$

$Q_{PROV.} = 82.4cfs \geq Q_{REQ.} = 6.11cfs$ ✓

SIDE WALK CULVERT, 12"

$Q = 1.6LH^{3/2}$ $L = 1ft$ $H = 0.5ft$

$Q_{PROV.} = 1.6(1)(0.5)^{3/2} = 0.57cfs \geq Q_{REQ} = 0.30cfs$ ✓

2ft CHANNEL

$Q = 1.6LH^{3/2}$ $L = 2ft$ $H = 0.5ft$

$Q_{PROV} = 1.6(2)(0.5)^{3/2} = 1.14cfs \geq Q_{REQ} = 0.30cfs$ ✓

5571 Midway Park Place NE • Albuquerque, NM 87109 • (505) 858-3100 • (505) 858-1118 Fax • 1-800-245-3102 • twllc@tierrawestllc.com

```
**************************************************************
*                  Maverik @ UNSER & LOS VOLCANES            *
**************************************************************
* 100-YEAR, 24-HR STORM  (UNDER PROPOSED CONDITIONS) W/ routing *
**************************************************************
START               TIME=0.0
*
*
RAINFALL            TYPE=2 RAIN QUARTER=0.0 IN
                    RAIN ONE=1.87 IN RAIN SIX=2.20 IN
                    RAIN DAY=2.66 IN DT=0.05 HR
*
*
*BASIN 1
*
COMPUTE NM HYD      ID=1 HYD NO=100.1 AREA=0.00238 SQ MI
                    PER A=0.00 PER B=15.00 PER C=0.00 PER D=85.00
                    TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD           ID=1 CODE=1
*
*
*BASIN 2
*
COMPUTE NM HYD      ID=2 HYD NO=100.2 AREA=0.00006 SQ MI
                    PER A=0.00 PER B=15.00 PER C=0.00 PER D=85.00
                    TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD           ID=2 CODE=1
*
*
*BASIN 3
*
COMPUTE NM HYD      ID=3 HYD NO=100.3 AREA=0.00208 SQ MI
                    PER A=0.00 PER B=15.00 PER C=0.0 PER D=85.00
                    TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD           ID=3 CODE=1
*
*
*BASIN 4
*
COMPUTE NM HYD      ID=4 HYD NO=100.4 AREA=0.00013 SQ MI
                    PER A=0.00 PER B=100.00 PER C=0.0 PER D=0.00
                    TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD           ID=4 CODE=1
*
*
*BASIN 5
*
COMPUTE NM HYD      ID=5 HYD NO=100.5 AREA=0.00013 SQ MI
```

```
                    PER A=0.00 PER B=100.00 PER C=0.0 PER D=0.00
                    TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD           ID=5 CODE=1
*
*
ADD HYD             ID=20 HYD NO=100.20 ID=3 ID=5
*
*
*BASIN OS-1 (OFFSITE BASIN)
*
COMPUTE NM HYD      ID=7 HYD NO=100.7 AREA=0.00004 SQ MI
                    PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
                    TP=-0.1333 HR MASS RAINFALL=-1
PRINT HYD           ID=7 CODE=1
*
*
ADD HYD             ID=20 HYD NO=100.20 ID=3 ID=5
ADD HYD             ID=21 HYD NO=100.21 ID=20 ID=7
*
*
*ROUTE BASIN 3, 5 & OS-1 THROUGH DETENTION WEST POND
*
*
ROUTE RESERVOIR     ID=55 HYD NO=200.1 INFLOW ID=21 CODE=24
                    OUTFLOW (CFS) STORAGE(AC-FT) ELEVATION(FT)
                    0.000          0.0294             35.00
                    0.068          0.0713             35.50
                    0.101          0.1133             36.00
                    0.125          0.1552             36.50
                    0.145          0.1972             37.00
                    0.163          0.2391             37.50
                    0.179          0.2811             38.00
                    0.194          0.3230             38.50
*
PRINT HYD           ID=55  CODE=1
*
*
ADD HYD             ID=22 HYD NO=100.22 ID=1 ID=4
ADD HYD             ID=24 HYD NO=100.24 ID=22 ID=55
*
*
*ROUTE BASIN 1 & 4 AND OUTFLOW FROM WEST POND THROUGH DETENTION EAST POND
*
*
ROUTE RESERVOIR     ID=56 HYD NO=200.2 INFLOW ID=24 CODE=24
                    OUTFLOW (CFS) STORAGE(AC-FT) ELEVATION(FT)
                    0.000          0.0424             30.00
                    0.103          0.0849             30.50
```

```
                0.155          0.1275             31.00
                0.194          0.1700             31.50
                0.226          0.2125             32.00
                0.254          0.2551             32.50
                0.279          0.2976             33.00
                0.302          0.3401             33.50
*
PRINT HYD       ID=56  CODE=1
*
*
ADD HYD         ID=57 HYD NO=100.57 ID=2 ID=56
*
*
PRINT HYD       ID=57  CODE=1
*
*
FINISH
```

AHYMO PROGRAM SUMMARY TABLE (AHYMO-S4) - Ver. S4.01a, Rel: 01a

RUN DATE (MON/DAY/YR) =03/19/2019

INPUT FILE = C:\Users\Vince\Desktop\hymoMaverik.txt

USER NO.= AHYMO_Temp_User:20122010

COMMAND	IDENTIFICATION	TIME TO PEAK (HOURS)	CFS PER ACRE	FROM HYDROGRAPH NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	PAGE = 1 NOTATION
START										
				TIME=	0.00					
RAINFALL	TYPE= 2			NOAA 14						
				RAIN24=	2.660					
COMPUTE NM HYD		1.500	4.175	100.10	1	0.00238	6.36	0.277	2.17912	PER IMP= 85.00
COMPUTE NM HYD		1.500	4.408	100.20	2	0.00006	0.17	0.007	2.17912	PER IMP= 85.00
COMPUTE NM HYD		1.500	4.177	100.30	3	0.00208	5.56	0.242	2.17912	PER IMP= 85.00
COMPUTE NM HYD		1.500	2.519	100.40	4	0.00013	0.21	0.006	0.83873	PER IMP= 0.00
COMPUTE NM HYD		1.500	2.519	100.50	5	0.00013	0.21	0.006	0.83873	PER IMP= 0.00
ADD HYD		1.500	4.079	100.20	3& 5 20	0.00221	5.77	0.248	2.10011	
COMPUTE NM HYD		1.500	2.765	100.70	7	0.00004	0.07	0.002	0.83873	PER IMP= 0.00
ADD HYD		1.500	4.079	100.20	3& 5 20	0.00221	5.77	0.248	2.10011	
ADD HYD		1.500	4.056	100.21	20& 7 21	0.00225	5.84	0.249	2.07766	
ROUTE RESERVOIR		2.450	0.106	200.10	21 55	0.00225	0.15	0.249	2.07766	AC-FT= 0.216
ADD HYD		1.500	4.089	100.22	1& 4 22	0.00251	6.57	0.282	2.10957	
ADD HYD		1.500	2.186	100.24	22&55 24	0.00476	6.66	0.531	2.09206	
ROUTE RESERVOIR		2.550	0.084	200.20	24 56	0.00476	0.26	0.531	2.09206	AC-FT= 0.259
ADD HYD		1.550	0.109	100.57	2&56 57	0.00482	0.34	0.536	2.08613	
FINISH										

```
      AHYMO PROGRAM (AHYMO-S4)                    - Version: S4.01a - Rel: 01a
           RUN DATE (MON/DAY/YR) = 03/19/2019
           START TIME (HR:MIN:SEC) = 08:24:59     USER NO.=
AHYMO_Temp_User:20122010
           INPUT FILE = C:\Users\Vince\Desktop\hymoMaverik.txt


    ************************************************************
    *                  Maverik @ UNSER & LOS VOLCANES                  *
    ************************************************************
    * 100-YEAR, 24-HR STORM  (UNDER PROPOSED CONDITIONS) W/ routing *
    ************************************************************
    START               TIME=0.0
    *
    *
    RAINFALL            TYPE=2 RAIN QUARTER=0.0 IN
                        RAIN ONE=1.87 IN RAIN SIX=2.20 IN
                        RAIN DAY=2.66 IN DT=0.05 HR

                   24-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR CONVECTIVE
AREAS (NM & AZ) - D1
                   DT =   0.050000 HOURS       END TIME =    24.000002 HOURS
                     0.0000  0.0022  0.0045  0.0069  0.0096  0.0123  0.0154
                     0.0197  0.0264  0.0336  0.0412  0.0494  0.0578  0.0664
                     0.0753  0.0844  0.0946  0.1052  0.1168  0.1387  0.1657
                     0.2020  0.2430  0.2937  0.3614  0.4375  0.5689  0.7733
                     1.1234  1.3695  1.5635  1.6610  1.7465  1.8079  1.8568
                     1.8994  1.9306  1.9592  1.9828  1.9979  2.0087  2.0183
                     2.0273  2.0352  2.0426  2.0499  2.0568  2.0625  2.0659
                     2.0692  2.0724  2.0754  2.0784  2.0813  2.0842  2.0870
                     2.0896  2.0923  2.0949  2.0974  2.0999  2.1023  2.1046
                     2.1069  2.1092  2.1115  2.1136  2.1158  2.1179  2.1199
                     2.1220  2.1240  2.1260  2.1280  2.1299  2.1318  2.1337
                     2.1356  2.1374  2.1392  2.1411  2.1428  2.1446  2.1463
                     2.1481  2.1498  2.1514  2.1531  2.1548  2.1564  2.1580
                     2.1596  2.1612  2.1628  2.1643  2.1658  2.1674  2.1689
                     2.1704  2.1718  2.1733  2.1747  2.1762  2.1776  2.1790
                     2.1804  2.1818  2.1832  2.1845  2.1859  2.1872  2.1885
                     2.1899  2.1912  2.1924  2.1937  2.1950  2.1963  2.1975
                     2.1988  2.2000  2.2013  2.2026  2.2038  2.2051  2.2064
                     2.2077  2.2089  2.2102  2.2115  2.2128  2.2141  2.2153
                     2.2166  2.2179  2.2192  2.2204  2.2217  2.2230  2.2243
                     2.2256  2.2268  2.2281  2.2294  2.2307  2.2319  2.2332
                     2.2345  2.2358  2.2371  2.2383  2.2396  2.2409  2.2422
                     2.2434  2.2447  2.2460  2.2473  2.2486  2.2498  2.2511
                     2.2524  2.2537  2.2549  2.2562  2.2575  2.2588  2.2601
                     2.2613  2.2626  2.2639  2.2652  2.2664  2.2677  2.2690
```

2.2703	2.2716	2.2728	2.2741	2.2754	2.2767	2.2779
2.2792	2.2805	2.2818	2.2831	2.2843	2.2856	2.2869
2.2882	2.2894	2.2907	2.2920	2.2933	2.2946	2.2958
2.2971	2.2984	2.2997	2.3009	2.3022	2.3035	2.3048
2.3061	2.3073	2.3086	2.3099	2.3112	2.3124	2.3137
2.3150	2.3163	2.3176	2.3188	2.3201	2.3214	2.3227
2.3239	2.3252	2.3265	2.3278	2.3291	2.3303	2.3316
2.3329	2.3342	2.3354	2.3367	2.3380	2.3393	2.3406
2.3418	2.3431	2.3444	2.3457	2.3469	2.3482	2.3495
2.3508	2.3521	2.3533	2.3546	2.3559	2.3572	2.3584
2.3597	2.3610	2.3623	2.3636	2.3648	2.3661	2.3674
2.3687	2.3699	2.3712	2.3725	2.3738	2.3750	2.3763
2.3776	2.3789	2.3802	2.3814	2.3827	2.3840	2.3853
2.3865	2.3878	2.3891	2.3904	2.3917	2.3929	2.3942
2.3955	2.3968	2.3980	2.3993	2.4006	2.4019	2.4032
2.4044	2.4057	2.4070	2.4083	2.4095	2.4108	2.4121
2.4134	2.4147	2.4159	2.4172	2.4185	2.4198	2.4210
2.4223	2.4236	2.4249	2.4262	2.4274	2.4287	2.4300
2.4313	2.4325	2.4338	2.4351	2.4364	2.4377	2.4389
2.4402	2.4415	2.4428	2.4440	2.4453	2.4466	2.4479
2.4492	2.4504	2.4517	2.4530	2.4543	2.4555	2.4568
2.4581	2.4594	2.4607	2.4619	2.4632	2.4645	2.4658
2.4670	2.4683	2.4696	2.4709	2.4722	2.4734	2.4747
2.4760	2.4773	2.4785	2.4798	2.4811	2.4824	2.4837
2.4849	2.4862	2.4875	2.4888	2.4900	2.4913	2.4926
2.4939	2.4952	2.4964	2.4977	2.4990	2.5003	2.5015
2.5028	2.5041	2.5054	2.5067	2.5079	2.5092	2.5105
2.5118	2.5130	2.5143	2.5156	2.5169	2.5182	2.5194
2.5207	2.5220	2.5233	2.5245	2.5258	2.5271	2.5284
2.5297	2.5309	2.5322	2.5335	2.5348	2.5360	2.5373
2.5386	2.5399	2.5412	2.5424	2.5437	2.5450	2.5463
2.5475	2.5488	2.5501	2.5514	2.5527	2.5539	2.5552
2.5565	2.5578	2.5590	2.5603	2.5616	2.5629	2.5642
2.5654	2.5667	2.5680	2.5693	2.5705	2.5718	2.5731
2.5744	2.5757	2.5769	2.5782	2.5795	2.5808	2.5820
2.5833	2.5846	2.5859	2.5872	2.5884	2.5897	2.5910
2.5923	2.5935	2.5948	2.5961	2.5974	2.5987	2.5999
2.6012	2.6025	2.6038	2.6050	2.6063	2.6076	2.6089
2.6102	2.6114	2.6127	2.6140	2.6153	2.6165	2.6178
2.6191	2.6204	2.6217	2.6229	2.6242	2.6255	2.6268
2.6280	2.6293	2.6306	2.6319	2.6332	2.6344	2.6357
2.6370	2.6383	2.6395	2.6408	2.6421	2.6434	2.6447
2.6459	2.6472	2.6485	2.6498	2.6510	2.6523	2.6536
2.6549	2.6562	2.6574	2.6587	2.6600		

*
*
*BASIN 1

```
    *
    COMPUTE NM HYD       ID=1 HYD NO=100.1 AREA=0.00238 SQ MI
                         PER A=0.00 PER B=15.00 PER C=0.00 PER D=85.00
                         TP=-0.1333 HR MASS RAINFALL=-1

         K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
         UNIT PEAK =   7.9869    CFS   UNIT VOLUME =   0.9978       B =   526.28
 P60 = 1.8700
         AREA =     0.002023 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


         K =  0.130992HR    TP =  0.133300HR    K/TP RATIO =  0.982685     SHAPE
CONSTANT, N =  3.593298
         UNIT PEAK =  0.87598    CFS   UNIT VOLUME =   0.9867       B =   327.08
 P60 = 1.8700
         AREA =     0.000357 SQ MI    IA =   0.50000 INCHES    INF =   1.25000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD            ID=1 CODE=1

                                      PARTIAL HYDROGRAPH   100.10


        RUNOFF VOLUME =     2.17912 INCHES     =       0.2766 ACRE-FEET
        PEAK DISCHARGE RATE =       6.36 CFS  AT   1.500 HOURS   BASIN AREA =
0.0024 SQ. MI.



    *
    *
    *BASIN 2
    *
    COMPUTE NM HYD       ID=2 HYD NO=100.2 AREA=0.00006 SQ MI
                         PER A=0.00 PER B=15.00 PER C=0.00 PER D=85.00
                         TP=-0.1333 HR MASS RAINFALL=-1

         K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
         UNIT PEAK =  0.20135    CFS   UNIT VOLUME =   0.9490       B =   526.28
 P60 = 1.8700
         AREA =     0.000051 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
```

```
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


         K =  0.130992HR    TP =  0.133300HR    K/TP RATIO =  0.982685     SHAPE
CONSTANT, N =  3.593298
         UNIT PEAK =  0.22084E-01CFS   UNIT VOLUME =   0.8758       B =   327.08
 P60 = 1.8700
         AREA =     0.000009 SQ MI    IA =   0.50000 INCHES    INF =   1.25000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=2 CODE=1

                                       PARTIAL HYDROGRAPH   100.20


        RUNOFF VOLUME =     2.17912 INCHES     =       0.0070 ACRE-FEET
        PEAK DISCHARGE RATE =       0.17 CFS  AT   1.500 HOURS   BASIN AREA =
0.0001 SQ. MI.



    *
    *
    *BASIN 3
    *
    COMPUTE NM HYD      ID=3 HYD NO=100.3 AREA=0.00208 SQ MI
                        PER A=0.00 PER B=15.00 PER C=0.0 PER D=85.00
                        TP=-0.1333 HR MASS RAINFALL=-1

         K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
         UNIT PEAK =   6.9802    CFS   UNIT VOLUME =   0.9975       B =   526.28
 P60 = 1.8700
         AREA =     0.001768 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


         K =  0.130992HR    TP =  0.133300HR    K/TP RATIO =  0.982685     SHAPE
CONSTANT, N =  3.593298
         UNIT PEAK =  0.76556    CFS   UNIT VOLUME =   0.9848       B =   327.08
 P60 = 1.8700
         AREA =     0.000312 SQ MI    IA =   0.50000 INCHES    INF =   1.25000
```

```
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=3 CODE=1

                                        PARTIAL HYDROGRAPH   100.30


        RUNOFF VOLUME =     2.17912 INCHES      =       0.2417 ACRE-FEET
        PEAK DISCHARGE RATE =       5.56 CFS  AT   1.500 HOURS   BASIN AREA =
0.0021 SQ. MI.



    *
    *
    *BASIN 4
    *
    COMPUTE NM HYD      ID=4 HYD NO=100.4 AREA=0.00013 SQ MI
                        PER A=0.00 PER B=100.00 PER C=0.0 PER D=0.00
                        TP=-0.1333 HR MASS RAINFALL=-1

         K =  0.130992HR    TP =  0.133300HR    K/TP RATIO =  0.982685     SHAPE
CONSTANT, N =  3.593298
         UNIT PEAK =  0.31898    CFS   UNIT VOLUME =   0.9613       B =   327.08
 P60 = 1.8700
         AREA =     0.000130 SQ MI    IA =   0.50000 INCHES    INF =   1.25000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=4 CODE=1

                                        PARTIAL HYDROGRAPH   100.40


        RUNOFF VOLUME =     0.83873 INCHES      =       0.0058 ACRE-FEET
        PEAK DISCHARGE RATE =       0.21 CFS  AT   1.500 HOURS   BASIN AREA =
0.0001 SQ. MI.



    *
    *
    *BASIN 5
    *
    COMPUTE NM HYD      ID=5 HYD NO=100.5 AREA=0.00013 SQ MI
```

```
                    PER A=0.00 PER B=100.00 PER C=0.0 PER D=0.00
                    TP=-0.1333 HR MASS RAINFALL=-1

         K =  0.130992HR    TP =  0.133300HR    K/TP RATIO =  0.982685     SHAPE
CONSTANT, N =  3.593298
         UNIT PEAK =  0.31898    CFS   UNIT VOLUME =   0.9613       B =   327.08
 P60 = 1.8700
         AREA =     0.000130 SQ MI    IA =   0.50000 INCHES    INF =   1.25000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=5 CODE=1

                                      PARTIAL HYDROGRAPH   100.50


        RUNOFF VOLUME =     0.83873 INCHES      =       0.0058 ACRE-FEET
        PEAK DISCHARGE RATE =       0.21 CFS  AT   1.500 HOURS   BASIN AREA =
0.0001 SQ. MI.



    *
    *
    ADD HYD                         ID=20 HYD NO=100.20 ID=3 ID=5

    *
    *
    *BASIN OS-1 (OFFSITE BASIN)
    *
    COMPUTE NM HYD      ID=7 HYD NO=100.7 AREA=0.00004 SQ MI
                        PER A=0.00 PER B=100.00 PER C=0.00 PER D=0.00
                        TP=-0.1333 HR MASS RAINFALL=-1

         K =  0.130992HR    TP =  0.133300HR    K/TP RATIO =  0.982685     SHAPE
CONSTANT, N =  3.593298
         UNIT PEAK =  0.98149E-01CFS   UNIT VOLUME =   0.8758       B =   327.08
 P60 = 1.8700
         AREA =     0.000040 SQ MI    IA =   0.50000 INCHES    INF =   1.25000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=7 CODE=1

                                      PARTIAL HYDROGRAPH   100.70
```

RUNOFF VOLUME = 0.83873 INCHES = 0.0018 ACRE-FEET
PEAK DISCHARGE RATE = 0.07 CFS AT 1.500 HOURS BASIN AREA = 0.0000 SQ. MI.

```
*
*
ADD HYD                         ID=20 HYD NO=100.20 ID=3 ID=5

ADD HYD                         ID=21 HYD NO=100.21 ID=20 ID=7

*
*
*ROUTE BASIN 3, 5 & OS-1 THROUGH DETENTION WEST POND
*
*
ROUTE RESERVOIR     ID=55 HYD NO=200.1 INFLOW ID=21 CODE=24
                        OUTFLOW (CFS) STORAGE(AC-FT) ELEVATION(FT)
                                0.000          0.0294             35.00

                                0.068          0.0713             35.50

                                0.101          0.1133             36.00

                                0.125          0.1552             36.50

                                0.145          0.1972             37.00

                                0.163          0.2391             37.50

                                0.179          0.2811             38.00

                                0.194          0.3230             38.50
```

* * * * * * * * * * * * * * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	35.00	0.029	0.00
1.20	0.80	35.11	0.038	0.01
2.40	0.19	37.23	0.216	0.15
3.60	0.01	37.09	0.205	0.15
4.80	0.02	36.93	0.192	0.14
6.00	0.03	36.80	0.180	0.14

7.20	0.03	36.67	0.170	0.13
8.40	0.03	36.55	0.160	0.13
9.60	0.03	36.44	0.150	0.12
10.80	0.03	36.33	0.141	0.12
12.00	0.03	36.23	0.133	0.11
13.20	0.03	36.14	0.125	0.11
14.40	0.03	36.05	0.117	0.10
15.60	0.03	35.96	0.110	0.10
16.80	0.03	35.88	0.103	0.09
18.00	0.03	35.81	0.097	0.09
19.20	0.03	35.74	0.092	0.08
20.40	0.03	35.68	0.086	0.08
21.60	0.03	35.62	0.082	0.08
22.80	0.03	35.57	0.077	0.07
24.00	0.03	35.52	0.073	0.07
25.20	0.00	35.45	0.067	0.06
26.40	0.00	35.38	0.061	0.05
27.60	0.00	35.32	0.057	0.04
28.80	0.00	35.28	0.053	0.04
30.00	0.00	35.23	0.049	0.03
31.20	0.00	35.20	0.046	0.03
32.40	0.00	35.17	0.044	0.02
33.60	0.00	35.14	0.042	0.02
34.80	0.00	35.12	0.040	0.02
36.00	0.00	35.10	0.038	0.01
37.20	0.00	35.09	0.037	0.01
38.40	0.00	35.08	0.036	0.01
39.60	0.00	35.06	0.035	0.01
40.80	0.00	35.06	0.034	0.01
42.00	0.00	35.05	0.033	0.01
43.20	0.00	35.04	0.033	0.01
44.40	0.00	35.03	0.032	0.00

PEAK DISCHARGE = 0.153 CFS - PEAK OCCURS AT HOUR 2.45
MAXIMUM WATER SURFACE ELEVATION = 37.226
MAXIMUM STORAGE = 0.2161 AC-FT INCREMENTAL TIME= 0.050000HRS

*
PRINT HYD ID=55 CODE=1

PARTIAL HYDROGRAPH 200.10

RUNOFF VOLUME = 2.07766 INCHES = 0.2493 ACRE-FEET
PEAK DISCHARGE RATE = 0.15 CFS AT 2.450 HOURS BASIN AREA = 0.0023 SQ. MI.

```
*
*
ADD HYD                          ID=22 HYD NO=100.22 ID=1 ID=4

ADD HYD                          ID=24 HYD NO=100.24 ID=22 ID=55

*
*
*ROUTE BASIN 1 & 4 AND OUTFLOW FROM WEST POND THROUGH DETENTION EAST POND
*
*
ROUTE RESERVOIR     ID=56 HYD NO=200.2 INFLOW ID=24 CODE=24
                        OUTFLOW (CFS) STORAGE(AC-FT) ELEVATION(FT)
                                0.000          0.0424             30.00

                                0.103          0.0849             30.50

                                0.155          0.1275             31.00

                                0.194          0.1700             31.50

                                0.226          0.2125             32.00

                                0.254          0.2551             32.50

                                0.279          0.2976             33.00

                                0.302          0.3401             33.50


  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *

    TIME      INFLOW    ELEV      VOLUME    OUTFLOW
    (HRS)     (CFS)     (FEET)    (AC-FT)   (CFS)

     0.00       0.00     30.00       0.042      0.00
     1.20       0.93     30.12       0.053      0.03
     2.40       0.37     32.54       0.259      0.26
     3.60       0.16     32.47       0.253      0.25
     4.80       0.16     32.37       0.244      0.25
     6.00       0.17     32.28       0.236      0.24
     7.20       0.17     32.19       0.229      0.24
     8.40       0.16     32.11       0.222      0.23
     9.60       0.16     32.02       0.215      0.23
    10.80       0.15     31.94       0.207      0.22
    12.00       0.15     31.86       0.200      0.22
    13.20       0.14     31.77       0.193      0.21
    14.40       0.14     31.69       0.186      0.21
```

15.60	0.13	31.61	0.179	0.20
16.80	0.13	31.53	0.173	0.20
18.00	0.12	31.45	0.166	0.19
19.20	0.12	31.37	0.159	0.18
20.40	0.11	31.29	0.153	0.18
21.60	0.11	31.22	0.146	0.17
22.80	0.11	31.15	0.140	0.17
24.00	0.10	31.08	0.134	0.16
25.20	0.06	30.98	0.126	0.15
26.40	0.05	30.87	0.117	0.14
27.60	0.04	30.77	0.108	0.13
28.80	0.04	30.67	0.099	0.12
30.00	0.03	30.58	0.091	0.11
31.20	0.03	30.49	0.084	0.10
32.40	0.02	30.41	0.077	0.08
33.60	0.02	30.34	0.072	0.07
34.80	0.02	30.29	0.067	0.06
36.00	0.01	30.24	0.063	0.05
37.20	0.01	30.20	0.060	0.04
38.40	0.01	30.17	0.057	0.04
39.60	0.01	30.15	0.055	0.03
40.80	0.01	30.12	0.053	0.03
42.00	0.01	30.10	0.051	0.02
43.20	0.01	30.09	0.050	0.02
44.40	0.00	30.07	0.049	0.02
45.60	0.00	30.06	0.048	0.01
46.80	0.00	30.05	0.047	0.01
48.00	0.00	30.04	0.046	0.01
49.20	0.00	30.04	0.046	0.01
50.40	0.00	30.03	0.045	0.01
51.60	0.00	30.03	0.045	0.01
52.80	0.00	30.02	0.044	0.00

PEAK DISCHARGE = 0.256 CFS - PEAK OCCURS AT HOUR 2.55
MAXIMUM WATER SURFACE ELEVATION = 32.550
MAXIMUM STORAGE = 0.2593 AC-FT INCREMENTAL TIME= 0.050000HRS

*
PRINT HYD ID=56 CODE=1

PARTIAL HYDROGRAPH 200.20

RUNOFF VOLUME = 2.09206 INCHES = 0.5311 ACRE-FEET
PEAK DISCHARGE RATE = 0.26 CFS AT 2.550 HOURS BASIN AREA = 0.0048 SQ. MI.

```
    *
    *
    ADD HYD                          ID=57 HYD NO=100.57 ID=2 ID=56

    *
    *
    PRINT HYD           ID=57  CODE=1

                                        PARTIAL HYDROGRAPH   100.57


        RUNOFF VOLUME =     2.08613 INCHES     =       0.5363 ACRE-FEET
        PEAK DISCHARGE RATE =       0.34 CFS  AT   1.550 HOURS   BASIN AREA =
0.0048 SQ. MI.



    *
    *
    FINISH

        NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 08:24:59
```