NORTHRIDGE INDUSTRIAL SECOND ADDITION

DRAINAGE REPORT

POE & ASSOCIATES, INC.
CONSULTING ENGINEERS
5940 E. Central, Suite 200 • Wichita, KS 67208-6242
Phone 316/685-4114 • FAX 316/685-4444

APRIL 2007

Adopted: February 23, 2007

WICHITA

Public Works, Engineering Division
Final Drainage Plan Submittal Checklist

Reviewer: Timothy R. Austin, P.E. Date: 23 April 2007

Subdivision Name: Northridge Industrial Second Addition Location: SW 1/4, Section 27-T26S-R1E

Total Land Area Of Ownership: 25.0 Acres

Type: ____Residential ____Commercial ✓ Industrial ____Recreation ____Municipal ____Other

Applicant: A-L Enterprises Contact: Leslie G. Rudd, President Phone #: ____

Engineer: Poe & Associates, Inc. Contact: Jason P. Dickman, P.E. Phone # (316) 685-4114

Please check the appropriate box: I = Included; NA = Non-Applicable; R= Required prior to development

(If "NA" is checked, an explanation must be entered)

	Applicant			Engr	
Tab 1. Project Narrative	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Site Location Map, using USGS Map	✓			✓	
B. Discussion of development, existing conditions, and proposed impacts on stormwater, wetland, riparian, and flood plain	✓			✓	
C. Discussion of offsite conditions	✓			✓	
D. Summary of runoff calculations (pre/post development) No increase in peak discharge for all storm series	✓			✓	
E. Narrative description of the type and function of the permanent best management practices that are incorporated into the site design	✓			✓	
F. Copy of the plat	✓			✓	
G. Preliminary grading plan (The final grading plan shall be sealed, signed and dated prior to Engineering receiving the final sanitary sewer plans. One plan sheet and PDF shall be submitted to the Subdivision Engineer.)	✓			✓	
H. Professional Engineer seal, signature and date on cover of report	✓			✓	
I. CD of drainage plan in PDF format (one file) and one paper copy bound with this checklist included behind the cover	✓			✓	

	Applicant			Engr	
Tab 2. Existing Conditions Runoff Calculations	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Copy of applicable orthophoto showing proposed project boundaries (preferable in color)	✓			✓	
B. Runoff Method (Rational, Hydrograph Method, or other approved methods by Engineering)	✓			✓	
C. Existing topography (no greater than 2-foot contours, 1-foot recommend)	✓			✓	
D. Total Site Area and Total Impervious Area (acres)	✓			✓	
E. Benchmarks used for site control	✓			✓	
F. Streams, creeks, and waterway labeled	✓			✓	
G. Predominant soils from USDA soil surveys, and/or on site soil borings	✓			✓	
H. Location and boundaries of natural features such as wetlands, lakes, and ponds with the normal water elevation noted	✓			✓	
I. Location of existing roads, buildings, parking lots and other impervious areas.	✓			✓	

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J. Location of existing utilities (e.g., water, sewer, gas, electric) and easements	✓			✓	
K. Location of existing conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow	✓			✓	
L. Flow paths	✓			✓	
M. Location and dimensions of existing channels, bridges or culvert crossings	✓			✓	
N. Existing conditions hydrologic analysis for runoff rates, volumes and velocities showing methodologies used and supporting calculations (2, 5, 10, 25 & 100 year, 24-hour storm events) or Critical Duration	✓			✓	
O. Assumed pre-developed runoff curve numbers	✓			✓	
P. Existing time of concentrations used in calculations	✓			✓	
Q. Evaluate immediate downstream drainage capacity, not to exceed more than 0.25 miles downstream of site	✓			✓	
R. Existing structural elevations (e.g., invert of pipes, manholes, etc.)	✓			✓	
S. Cross-section data for open channels	✓			✓	
T. Ground water elevations, if applicable	✓			✓	

	Applicant			Engr	
Tab 3. Post-Development Hydrologic Analysis	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Proposed (post-development) conditions hydrologic and hydraulic analysis for runoff rates, volumes, HGL, and velocities showing the methodologies used and supporting calculations for all applicable design storms (2, 5, 10, 25 & 100 year, 24-hour storm events)	✓			✓	
B. Proposed time of concentrations used in calculations	✓			✓	
C. Assumed post-developed runoff curve numbers	✓			✓	
D. Proposed contours for detention facilities (to equal area used in outlet rating curves)	✓			✓	
E. Preliminary sizing calculations for stormwater controls including contributing drainage area, storage, and outlet configuration	✓			✓	
F. Stage-storage-discharge or outlet rating curves and inflow and outflow hydrographs for storage facilities	✓			✓	
G. Final analysis of potential upstream/downstream impact/effects of project, where necessary	✓			✓	
H. Existing and proposed structural elevations (e.g., invert of pipes, manholes, etc.)	✓			✓	
I. Design water surface elevations and normal pool elevation for ponds.	✓			✓	
J. Typical detail for outlet structures, embankments, spillways, grade control structures, conveyance channels, etc. To include height, width, elevation, and/or diameter.	✓			✓	
K. Proposed limits of clearing and grading	✓			✓	
L. Location of existing and proposed roads, buildings, parking lots and other impervious areas.	✓			✓	
M. Location of existing and proposed utilities (e.g., water, sewer) and easements	✓			✓	
N. Location of existing and proposed conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow	✓			✓	
O. Preliminary location and dimensions of proposed channel modifications, such as bridge or culvert crossings	✓			✓	

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P. Preliminary selection and location of stormwater controls	✓			✓	
Q. Emergency overflow structure's flow path	✓			✓	
R. Detention facility provides one-foot of freeboard above the HWL and emergency outfall shown (top of berm elevation shown)	✓			✓	
S. The 100-year 24-hour HWL delineated on the plan for detention pond	✓			✓	
T. Lowest opening elevations table on the plat for structures located adjacent to channels or ponds	✓			✓	
U. Stormwater Management Facilities located within a Reserve	✓			✓	
V. Maintenance responsibility of stormwater management facility shall be specified in the platters text. (e.g. HOA, Lot Owners Association, or lot)	✓			✓	
W. Off-site drainage easements or agreements required, where necessary	✓			✓	

	Applicant			Engr	
Tab 4. Floodplain Submittal	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Provide source of flood profile		✓	No changes to floodplain or floodway limits		✓
B. Nearest base flood elevations	✓			✓	
C. Delineation of pre-developed regulatory floodplain/floodway limits	✓			✓	
D. Delineation of post-developed regulatory floodplain and floodway limits		✓	No changes to floodplain or floodway limits		✓
E. Floodplain boundary determination per elevation (project limits shown)		✓	No changes to floodplain or floodway limits		✓
F. Provide source of floodway data table and discharges		✓	No changes to floodplain or floodway limits		✓
G. Provide all hydrologic and hydraulic study information for site-specific floodplain studies, unnumbered Zone A area elevation determinations and flood plain map revisions or required permits		✓	No changes to floodplain or floodway limits		✓
H. Provide regulatory floodway and four natural profile models (10,50,100, and 500-yr) for existing and future watershed conditions		✓	No changes to floodplain or floodway limits		✓
I. Location of floodplain/floodway limits and relationship of site to upstream/downstream properties (floodplain limits to be per elevation and scaled location)		✓	No changes to floodplain or floodway limits		✓
J. Flood plains and floodways located within a Reserve, where necessary	✓			✓	

	Applicant			Engr	
Tab 5. Federal, State and Local Permits (to be provided prior to construction unless otherwise specified)	**I/R**	**NA**	**Explanation / Location in Plan**	**I/R**	**NA**
A. US Army Corps of Engineers - Regulatory program permits (404 water quality certification)		✓	Not Required		✓
B. Kansas Department of Agriculture - Division of Water Resources Permits (Stream Obstruction, Channel Change, Flood Plain Fill, Levee, Water Appropriations, Dam safety permit, etc.)		✓	Not Required		✓
C. Federal Emergency Management Agency (FEMA) Letter of Map Changes (LOMA, LOMR, LOMR-f, CLOMR, etc.) Shall be included and approved when project modifies the limits of the floodway.		✓	Not Required		✓
D. Kansas Department of Transportation		✓	Not Required		✓
E. Sedgwick County Right-of-way Permit		✓	Not Required		✓

Consulting Engineer Initials JPD

Tab 1. Project Narrative

A. Site location map, using USGS Map

The Northridge Industrial Second Addition is an approximate 25-acre tract of land located at the southeast quarter of Section 27-T26S-R1E in the City Wichita, Sedgwick County, Kansas. The site is bounded on the north by 45th Street North, on the east by Hillside Avenue, on the south by 37th Street North, and on the west by Union Pacific Railroad. See Exhibit 1-1 for USGS Map.

B. Discussion of development, existing conditions, and proposed impacts

The property is currently zoned to allow limited industrial types of use. The site is anticipated on being developed as a limited industrial subdivision, with warehouse facilities proposed on this site. Typically, this type of development will increase the impervious area of the property over the existing land use. Such would be true with this addition. Assumptions for design flows in a limited industrial area include an impervious area of 72% within the proposed development.

Developed conditions will take advantage of the natural grades on the site as the site develops. Detention in Drainage Area 1 is not proposed for reasons later explained in this report. A detention facility within Drainage Area 2 will ensure that developed flows are at or below current flows exiting the site. Drainage Area 3 is offsite drainage that will not be developed and will still sheet-flow into Drainage Area 2 after development.

Presently, the site is a made up of vacant land. An un-named tributary connecting to the I-135 Drainage Canal drains northeast to southwest through the southeast corner of the site. The land has natural slopes ranging from less than 1% to roughly 3%. According to the NRCS Soil Survey, the predominant soil type is a Farnum loam series material. See Exhibit 1-2 for NRCS Soil Survey map and information showing existing soil types and descriptions.

The un-named tributary drains through the site and enters a triple 7'x5' RCB structure under 37th Street North. The box conveys the drainage into a drainage channel south of 37th Street North, through Cruiser Lake detention area northeast of 29th Street North and Hydraulic Avenue, and then ultimately to the I-135 Drainage Canal.

The southeast corner of the site is within a FEMA Floodway and shall be platted with a reserve encompassing the 100-year Floodway. Refer to Exhibit 1-3 for proposed plat and Exhibit 1-4 for FIRM Panel 0218E, Wichita, Sedgwick County, Kansas, February 2, 2007. Any impact on storm water shall be addressed in the summary of runoff calculations text. The site does not contain wetland or riparian areas, and thus the intended development has no impact in that regard.

C. Discussion of offsite conditions

Undeveloped areas lie to the east and north of the site. Commercial and industrial uses lie to the west and south. The original, modern land use for the site was a mixture of commercial, industrial, and agricultural uses.

The upstream drainage basin for the un-named tributary contains over 754 acres. See Exhibit 1-5 for delineation of the entire drainage basin. Land use within the drainage basin varies from agricultural, open space, limited industrial and commercial, and residential in character. Upstream, storm water is directed to the site via residential storm sewers with detention ponds at the northeast end to natural open channel flow with various detention areas. The natural channel conveys storm water onto the subject property. Storm water is presently conveyed through the site in a natural channel to an RCBC under 37th Street North.

8.68 acres of undeveloped land lies to the north of the proposed development and will sheet-drain through DA-2.

D. Summary of runoff calculations

DA-1, 2, & 3 Existing Flows (cfs) (24-Hour Storm) CN= 70.8 Area(Ac)= 30.30					DA1, 2, & 3 Developed Flows (cfs) (24-Hour Storm) CN= 78.8 Area(Ac)= 30.30				
2-Year	5-Year	10-Year	25-Year	100-Year	2-Year	5-Year	10-Year	25-Year	100-Year
18.64	31.20	41.39	55.68	78.45	57.61	81.00	98.86	122.90	159.17
Increase for Developed Condition					38.97	49.80	57.47	67.22	80.72

The box structure under 37th Street North was designed as part of some previous 37th Street North improvements. Calculations indicate that the box was designed for a drainage basin of 754 acres and has a maximum capacity of approximately 1,354 cfs. The current Q_{100} based on existing conditions is actually about 1,050 cfs (The information shown in the Hydrograph Report attached herewith as Exhibit 1-6). Therefore, the RCB is currently not at full capacity and can handle additional flows up to a maximum of 1,354 cfs. The site drainage is split into two areas, DA-1 and DA-2 as shown on the attached drainage plan, Exhibit 1-7. DA-3 is undeveloped and drains through DA-2. Each area was evaluated based on existing and proposed conditions.

Using the SCS Method, Q_{100} for DA-1 assuming existing conditions is estimated to be over 15 cfs. The Q_{100} in DA-1 for the fully developed industrial site is estimated to be approximately 34 cfs. Also, Q_{100} for DA-1, DA-2, and DA-3 assuming existing conditions is estimated to be about 78 cfs. The Q_{100} from DA-1, DA-2, and DA-3 after the development of that part of the industrial site within DA-2 is estimated to be about 159 cfs. Some runoff will have to be rerouted to keep developed flows from DA-1 at or below the existing 15 cfs. Detention storage will be provided to reduce developed flows from DA-2 to match the existing 78 cfs after the site is fully developed.

Time of concentration for the entire drainage basin is estimated to be approximately 129 minutes based upon the TR-55 method. On-site existing T_c is estimated to be about 32

minutes for DA-1 and around 56 minutes for DA-2. DA-3 has an existing T_c of about 40 minutes. Developed T_c for DA-1 and DA-2 is 15 minutes, and DA-3 remains 40 minutes. On-site detention is not recommended for DA-1, as any detention would likely cause some minor flooding at the adjacent commercial property to the south due to possible infiltration. The south property has had water problems in the past when ponding occurs to the north. The added post-developed flow from DA-1 would have to be routed to the west side of the site and combined with DA-2 and DA-3 runoff. The existing runoff from all of the drainage areas ultimately ends up at the 37th Street RCB. With that, routing DA-1's increased flow of 15 cfs to DA-2 will not affect overall off-site drainage. Therefore, the overall addition of 81 cfs from the site will be detained in a pond within DA-2. It is assumed that immediate downstream capacities reflect the same maximum capacity of the RCB under 37th Street North. The final design of on-site drainage systems shall comply with current City of Wichita design criteria.

E. Narrative description of permanent best management practices

The contractor shall provide stabilized construction entrance prior to any street paving. A buffer of 10 feet of undisturbed native vegetation shall be maintained around perimeter of site where possible. Earthwork stockpiles shall be maintained away from any ponds. Fuel storage and refueling of equipment shall not be allowed around any ponds, drainage channels, or other waterways. Sediment barriers will be placed at storm sewer inlets and rock rip-rap at outlets. Sediment barriers (type determined by owner or contractor) shall be used to prevent sediment from flowing off site. Disturbed earth shall be stabilized where construction activity ceases for at least 21 days with owner's choice of mulch, temporary seed (Rye grass) during the planting season or other suitable BMP device. BMP devices shall be in place until there is a good stand of grass. Disturbed portions of the site where construction activities permanently cease shall be stabilized with permanent seed no later than 21 days after the last construction activity in that area (during the planting season only). The permanent seed shall consist of fescue or grass chosen by the owner. BMP devices shall be used at back of curb/edge of pavement until vegetation is 75% established.

F. Copy of plat

A copy of the plat is attached as Exhibit 1-3.

G. Preliminary grading plan

A Preliminary grading plan is found on Exhibit 1-8.

H. Professional Engineer Seal

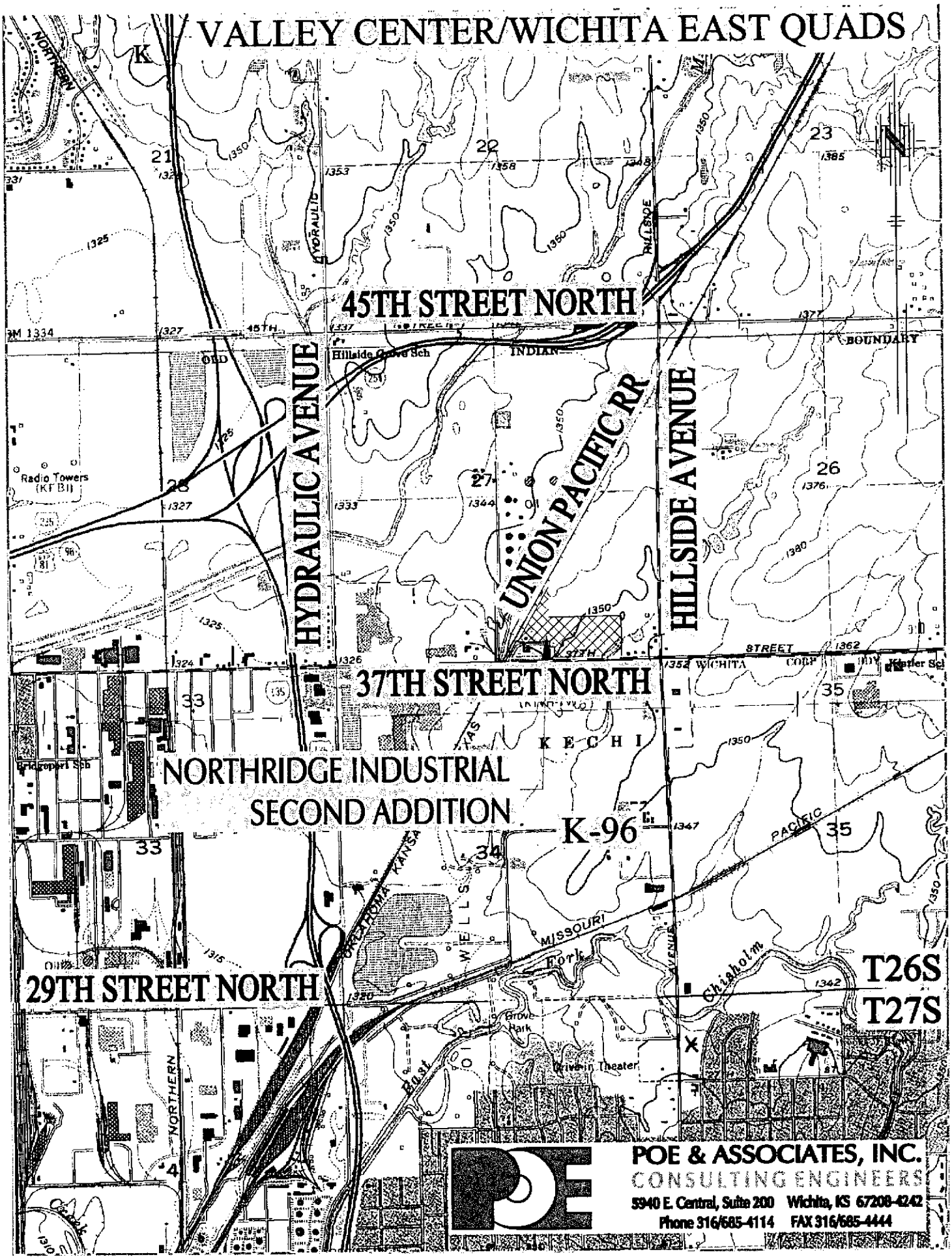
A signed and dated Professional Engineer's seal is located on the cover of this report.

I. CD of drainage plan

A CD of this report in full is attached herewith.

NORTHRIDGE INDUSTRIAL SECOND ADDITION

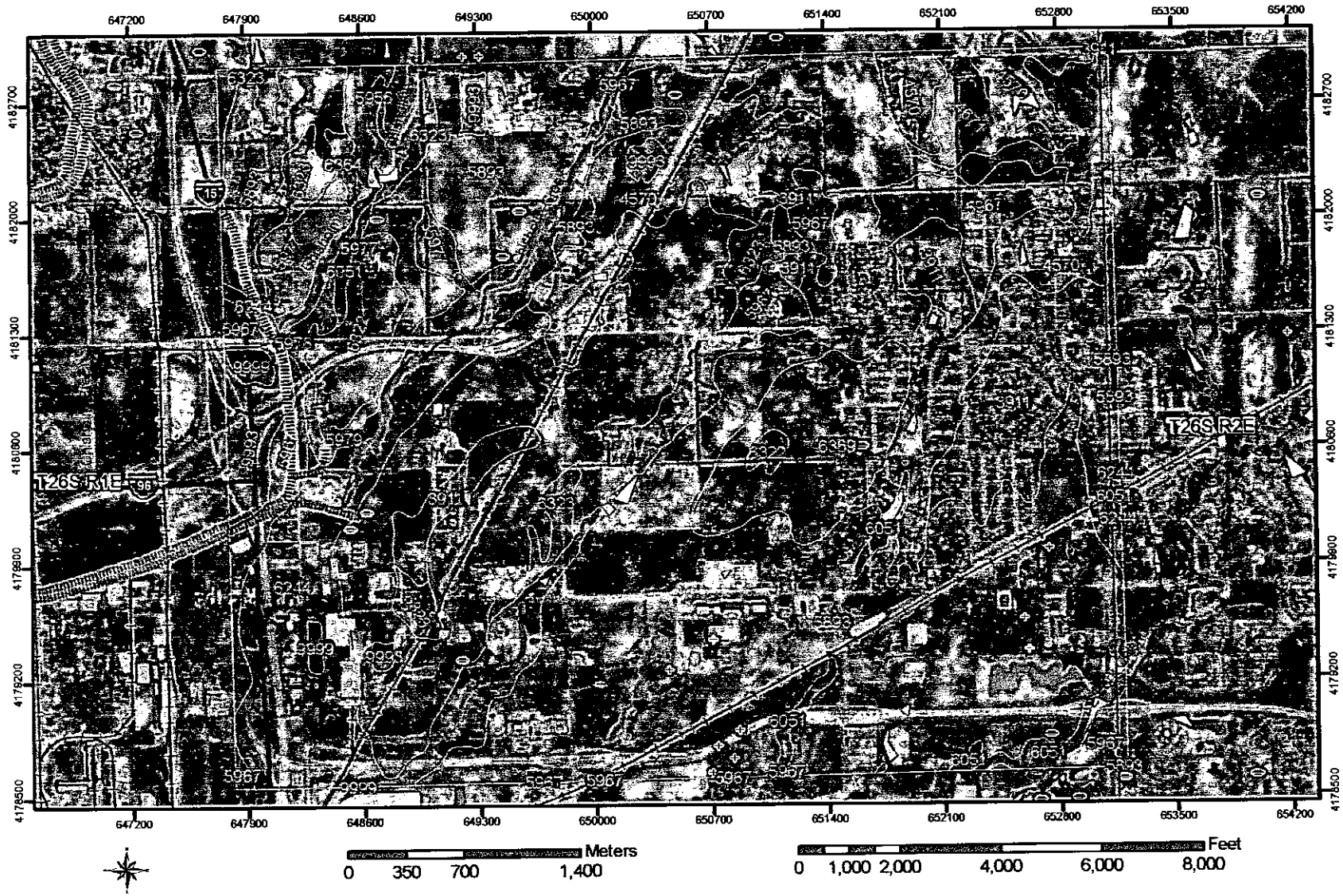
EXHIBIT 1-1


VALLEY CENTER/WICHITA EAST QUADS
45TH STREET NORTH
37TH STREET NORTH
29TH STREET NORTH
HYDRAULIC AVENUE
HILLSIDE AVENUE
UNION PACIFIC RR
NORTHRIDGE INDUSTRIAL
SECOND ADDITION
K-96
T26S
T27S
POE & ASSOCIATES, INC.
CONSULTING ENGINEERS
5940 E. Central, Suite 200 Wichita, KS 67208-4242
Phone 316/685-4114 FAX 316/685-4444

NORTHRIDGE INDUSTRIAL SECOND ADDITION

EXHIBIT 1-2

SOIL SURVEY OF SEDGWICK COUNTY, KANSAS



USDA Natural Resources Conservation Service

Web Soil Survey 1.1
National Cooperative Soil Survey

MAP LEGEND

- Soil Survey Areas
- Soil Map Units
- Interstate Highways
- Roads
- Rails
- Water
- Hydrography
- Oceans
- Escarpment, bedrock
- Escarpment, non-bedrock
- Gulley
- Levee
- Slope
- Blowout
- Borrow Pit
- Clay Spot
- Depression, closed
- Eroded Spot
- Gravel Pit
- Gravelly Spot
- Gulley
- Lava Flow
- Landfill
- Marsh or Swamp
- Miscellaneous Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Slide or Slip
- Sinkhole
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Perennial Water
- Wet Spot

MAP INFORMATION

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov

Coordinate System: UTM Zone 14

Soil Survey Area: Sedgwick County, Kansas
Spatial Version of Data: 1
Soil Map Compilation Scale: 1:24000

Map comprised of aerial images photographed on these dates:
10/1/1991; 3/20/1996

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 Summary

Sedgwick County, Kansas

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3911	Rosehill silty clay, 1 to 3 percent slopes	389.6	6.7
4570	Clime silty clay, 3 to 7 percent slopes	558.4	9.6
4671	Irwin silty clay loam, 1 to 3 percent slopes	64.3	1.1
5893	Farnum loam, 1 to 3 percent slopes	3,027.9	52.2
5956	Shellabarger sandy loam, 1 to 3 percent slopes	8.7	0.2
5967	Tabler silty clay loam, 0 to 1 percent slopes	343.0	5.9
5977	Vanoss silt loam, 1 to 3 percent slopes	90.6	1.6
5978	Vanoss silt loam, 3 to 7 percent slopes	22.0	0.4
5979	Vanoss silt loam, 3 to 7 percent slopes, eroded	13.1	0.2
6051	Elandco silt loam, frequently flooded	75.4	1.3
6244	Elandco silt loam, rarely flooded	546.7	9.4
6322	Blanket silt loam, 0 to 1 percent slopes	109.3	1.9
6323	Blanket silt loam, 1 to 3 percent slopes	190.3	3.3
6364	Milan clay loam, 3 to 6 percent slopes, eroded	12.0	0.2
6369	Milan loam, 1 to 3 percent slopes	225.7	3.9
9993	Pits	99.9	1.7
9999	Water	18.9	0.3

NORTHRIDGE INDUSTRIAL SECOND ADDITION

EXHIBIT 1-3

NOFN

State of Kansas) ss
Sedgwick County)

I, the undersigned licensed land surveyor in aforesaid county and state, do hereby certify that, under the supervision of the undersigned, we, Poe and Associates, Inc. have surveyed and platted "NORTHRIDGE INDUSTRIAL SECOND ADDITION", Wichita, Sedgwick County, Kansas and that the accompanying plat is a true and correct exhibit of the property surveyed, described as follows:

Beginning at a point on the South line of the Southeast Quarter of Section 27, Township 26 South, Range 1 East of the Sixth Principal Meridian, Sedgwick County, Kansas, located 622.285 feet West of the Southeast corner of said Southeast Quarter; thence West 1141.415 feet; thence North 700 feet to a point 1776.84 feet West of the East line of said Southeast Quarter; thence East parallel to the South line of said Southeast Quarter to a point 622.285 feet West of the East line of said Southeast Quarter; thence South 700 feet to the point beginning.

And also:
A tract in the Southeast Quarter of Section 27, Township 26 South, Range 1 East of the Sixth Principal Meridian, Sedgwick County, Kansas, described as follows:
Beginning at the intersection of the South line of Section 27 and the East right-of-way line of the Chicago, Rock Island & Pacific Railway Company's right-of-way; thence N89°30'E, for 699.1 feet; thence N0°20'W, 1181.4 feet to the intersection with the East right-of-way line of the Chicago, Rock Island & Pacific Railway; thence S30°10'W, 1373.2 feet to the point of beginning.

Except for a tract, commencing at the Southeast corner of the Southeast Quarter of said Section 27; thence N89°42'40"E 105.80 feet to a point on the East line of said railroad right-of-way being the point of beginning; thence N89°42'40"E 779.21 feet on the South line of said Section 27; thence N00°17'20"W 226.14 feet; thence S89°42'40"W 80.00 feet; thence N00°27'11"W 94.00 feet; thence S89°42'40"W 510.00 feet to a point on the East line of said railroad right-of-way; thence S30°15'48"W 371.75 feet to the point of beginning.

Existing public dedications, rights of way, and easements being vacated by virtue of K.S.A. 12-512(b).

WILLIAM P. FOX LICENSED LS-799 KANSAS LAND SURVEYOR

______________________, Surveyor
William P. Fox, L.S. # 799

State of Kansas) ss
Sedgwick County)

Know all men by these presents that we, the undersigned, have caused the land described in the surveyor's certificate to be platted into Lots and a Block, to be known as "NORTHRIDGE INDUSTRIAL SECOND ADDITION", Wichita, Sedgwick County, Kansas. The Streets are hereby dedicated to and for the use of the publick.The utility easements are hereby granted as indicated for constructing, maintaining, operating, and repairing utilities. The access controls are hereby granted to the appropriate governing body as shown hereon. Reserve A is for drainage improvements. The Reserve shall be owned and maintained by the owner. The governing body shall have the right of access to inspect the improvements, to maintain the improvements if nessecary, and to assess said maintenance costs to the owner. ~~The minimum building pad elevation is 160.0 City Datum~~ or 1347.4 NGVD29 Datum.

HIGHER

A drainage plan has been developed for the plat. All drainage easements and/or right-of-ways shall remain at established grades, or as modified with the approval of the applicable public agency, and unobstructed to allow for the conveyance of stormwater.

A-L Enterprises, a Kansas General Partnership

____
Leslie G. Rudd, President

State of Kansas) ss
Sedgwick County)

BE IT REMEMBERED that on this ____ day of ______________, 2007, before me, the undersigned, a notary public in and for the County and State came Leslie G. Rudd, President of A-L Enterprises, to me personally known to be the same person who executed this instrument and such person duly acknowledged the execution of the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

____
Notary Public

____
My appointment expires:

State of K ID
Sedgwick C

This plat o
County, Ka
County Met

Dated this
Wichita/Se

Darrel A. D

John L. Sc

State of Ka
City of Wic

This plat a
Council of
2007. At t

Carl Brewer

Karen Suble

Entered on

Don Brace

State of Ka
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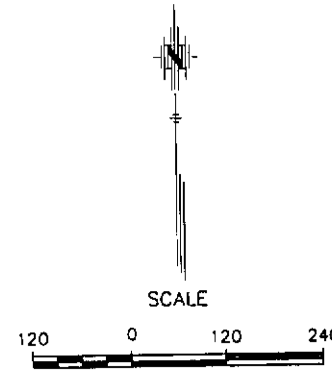
This is to c
of Deeds of
2007, and

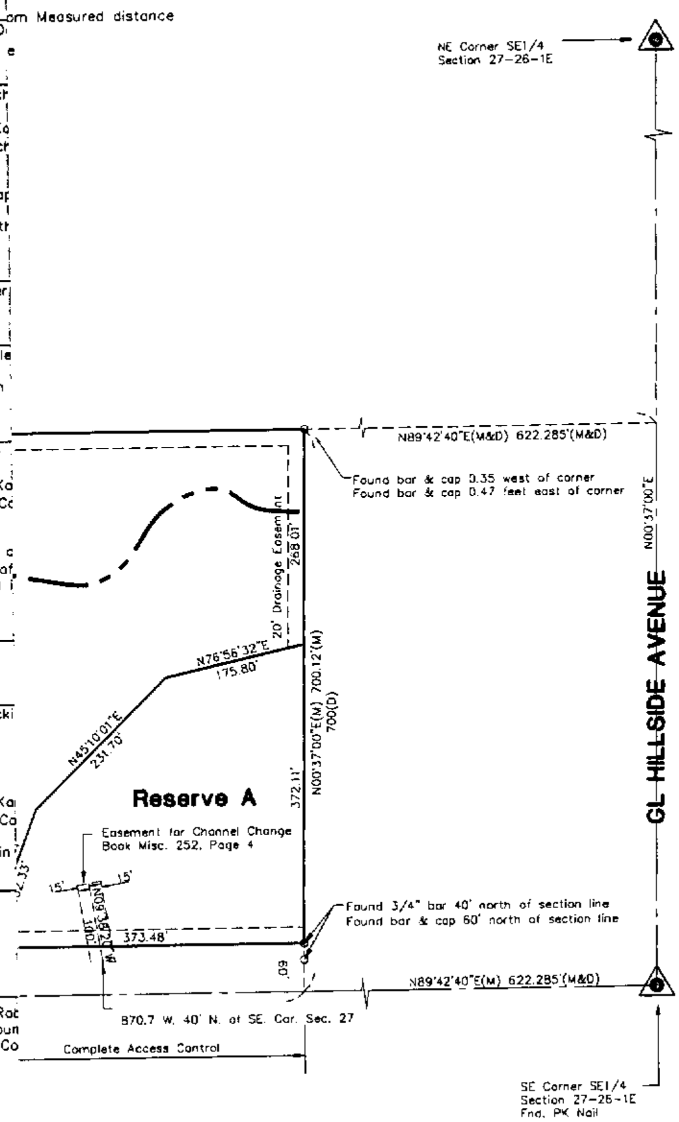
Bill Meek

Tonya Bucki

State of Ka
Sedgwick Co
Reviewed in

Tricia L. Ro
Deputy Coun
Sedgwick Co





POE & ASSOCIATES, INC.
CONSULTING ENGINEERS
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Phone 316/685-4114 ▪ FAX 316/685-4444

NORTHRIDGE INDUSTRIAL SECOND ADDITION
WICHITA, SEDGWICK COUNTY, KANSAS

State of Kansas)
Sedgwick County) ss

I, the undersigned licensed land surveyor in aforesaid county and state, do hereby certify that, under the supervision of the undersigned, we, Poe and Associates, Inc. have surveyed and platted "NORTHRIDGE INDUSTRIAL SECOND ADDITION", Wichita, Sedgwick County, Kansas and that the accompanying plat is a true and correct exhibit of the property surveyed, described as follows:

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And also;
A tract in the Southeast Quarter of Section 27, Township 26 South, Range 1 East of the Sixth Principal Meridian, Sedgwick County, Kansas, described as follows;
Beginning at the intersection of the South line of Section 27 and the East right-of-way line of the Chicago, Rock Island & Pacific Railway Company's right-of-way; thence N89°30'E, for 699.1 feet; thence N0°22'W, 1181.4 feet to the intersection with the East right-of-way line of the Chicago, Rock Island & Pacific Railway; thence S30°10'W, 1373.2 feet to the point of beginning.

Except for a tract, commencing at the Southeast corner of the Southeast Quarter of said Section 27; thence N89°42'40"E 105.80 feet to a point on the East line of said railroad right-of-way being the point of beginning; thence N89°42'40"E 779.21 feet on the South line of said Section 27; thence N00°17'20"W 226.14 feet; thence S89°42'40"W 80.00 feet; thence N00°27'11"W 94.00 feet; thence S89°42'40"W 510.00 feet to a point on the East line of said railroad right-of-way; thence S30°15'48"W 371.75 feet to the point of beginning.

Existing public dedications, rights of way, and easements being vacated by virtue of K.S.A. 12-512(b).

WILLIAM P. FOX
LICENSED
L.S.-799
Kansas
LAND SURVEYOR

William P. Fox, L.S. # 799 , Surveyor

State of Kansas)
Sedgwick County) ss

Know all men by these presents that we, the undersigned, have caused the land described in the surveyor's certificate to be platted into Lots and a Block, to be known as "NORTHRIDGE INDUSTRIAL SECOND ADDITION", Wichita, Sedgwick County, Kansas. The Streets are hereby dedicated to and for the use of the publick.The utility easements are hereby granted as indicated for constructing, maintaining, operating, and repairing utilities. The access controls are hereby granted to the appropriate governing body as shown hereon. Reserve A is for drainage improvements. The Reserve shall be owned and maintained by the owner. The governing body shall have the right of access to inspect the improvements, to maintain the improvements if nessecary, and to assess said maintenance cost to the owner. The minimum building pad elevation is 1360.0 city Datum or (1347.9) NGVD29 Datum.

A drainage plan has been developed for the plat. All drainage easements and/or right-of-ways shall remain at established grades, or as modified with the approval of the applicable public agency, and unobstructed to allow for the conveyance of stormwater.

A-L Enterprises, a Kansas General Partnership

HIGHER

Leslie G. Rudd, President

State of Kansas)
Sedgwick County) ss

BE IT REMEMBERED that on this ____ day of _____, 2007, before me, the undersigned, a notary public in and for the County and State came Leslie G. Rudd, President of A-L Enterprises, to me personally known to be the same person who executed this instrument and such person duly acknowledged the execution of the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

Notary Public

My appointment expires:

State of Kansas)
Sedgwick County) ss

This plat of "NORTHRIDGE INDUSTRIAL SECOND ADDITION", Wichita, Sedgwick County, Kansas has been submitted to and approved by the Wichita/Sedgwick County Metropolitan Area Planning Commission, Wichita, Kansas

Dated this ____ day of _____, 2007.
Wichita/Sedgwick County Metropolitan Area Planning Commission.

_____, Chair
Darrel A. Downing

_____, Secretary
John L. Schlegel

State of Kansas)
City of Wichita) ss

This plat approved and all dedications shown hereon accepted by the City Council of the City of Wichita, Kansas, this ____ day of _____, 2007. At the Direction of the City Council.

_____, Mayor
Carl Brewer

_____, City Clerk
Karen Sublett

Entered on transfer record this ____ day of _____, 2007.

_____, County Clerk
Don Brace

State of Kansas)
Sedgwick County) ss

This is to certify that this instrument was filed for record in the Register of Deeds office at ____ o'clock ____ .m., on the ____ day of _____, 2007, and is duly recorded.

_____, Register of Deeds
Bill Mertz

_____, Deputy
Tonya Buckingham

State of Kansas)
Sedgwick County) ss

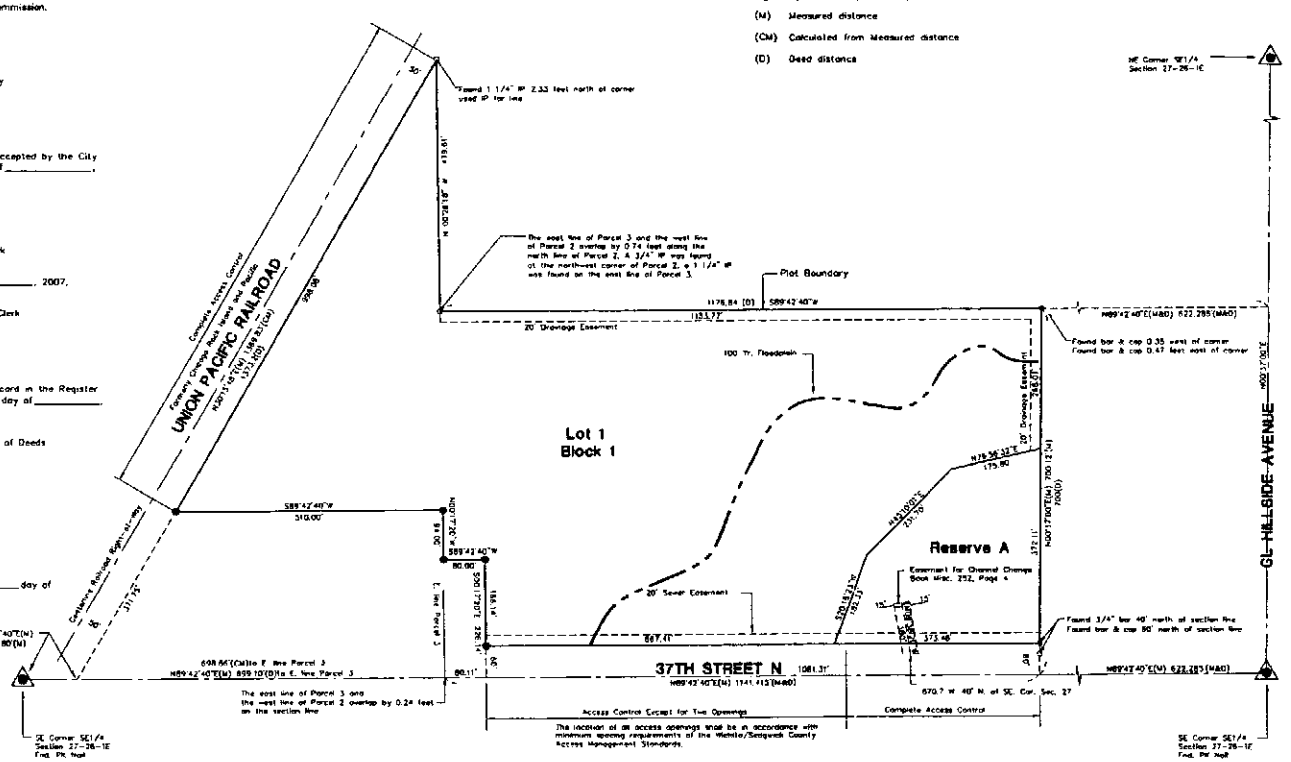
Reviewed in accordance with K.S.A. 58-2005 on this ____ day of _____, 2007

Tricia L. Robello, L.S. # 1246
Deputy County Surveyor
Sedgwick County, Kansas

LEGEND

- ▲ Section corner found
- ○ Point found
- ● 5/8" bar w/POE cap set
- (M) Measured distance
- (CM) Calculated from Measured distance
- (D) Deed distance

SCALE
120 0 120 240



BENCH MARKS

City of Wichita Datum

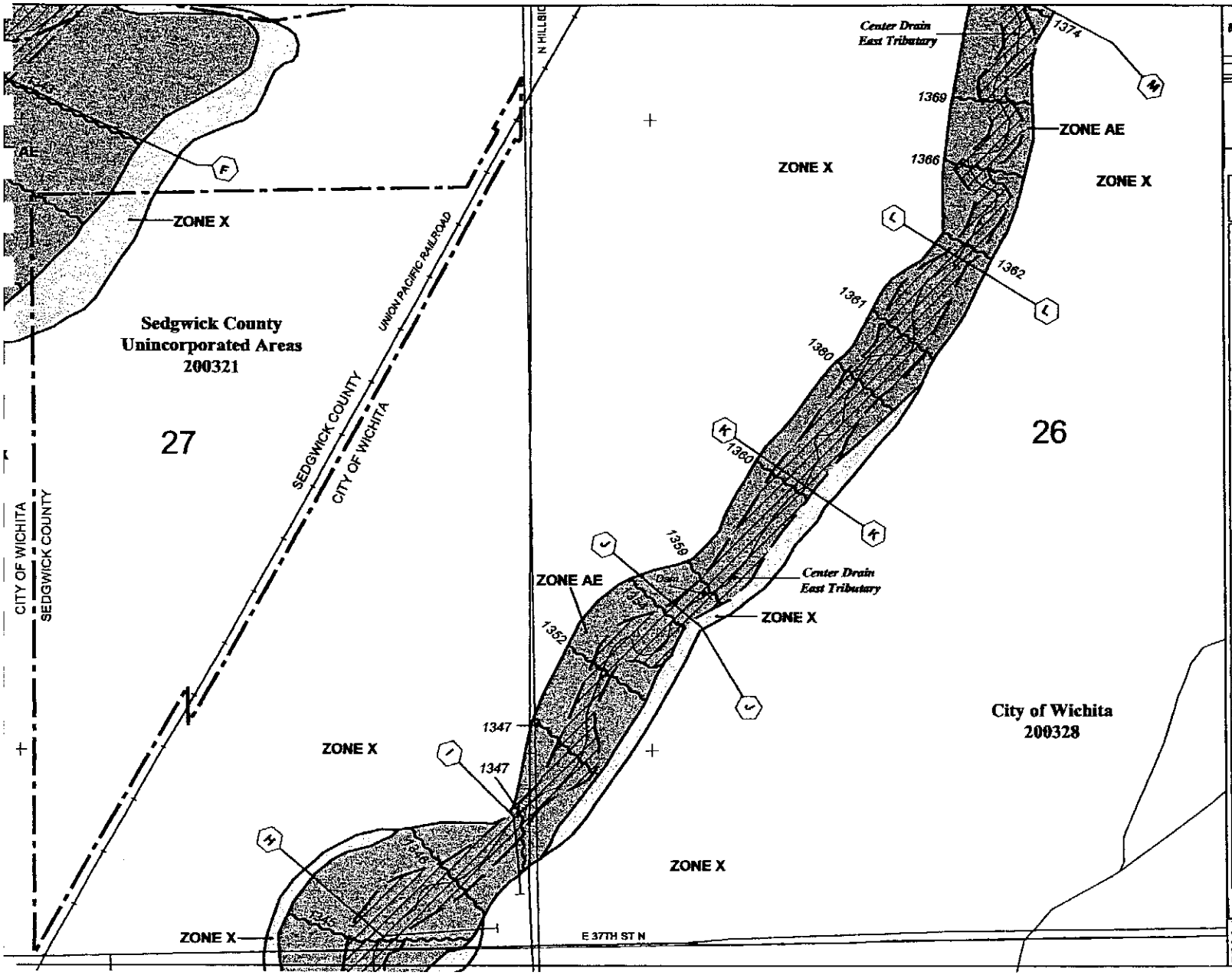
1. City of Wichita Disc on Concrete traffic signal pole base @ S.E. corner of 37th & Hillside.
Elev. = 165.35
Elev. = 1352.75 NGVD29 Datum

2. City of Wichita Disc 2.5" W. of E. end of N. hubguard of 3-RCB under 37th St. W. of centerline of Hillside.
Elev. = 157.85 COW Datum
Elev. = 1345.25 NGVD29 Datum

3. "□" cut on median curb @ centerline of Poplar 54' S. of centerline of 37th.
Elev. = 163.64
Elev. = 1351.04 NGVD29 Datum

4. "□" cut on N.E. corner concrete pad for electric transformer box W. of yellow building @ 2525 E. 38th St., Suite B.
Elev. = 154.80
Elev. = 1342.20 NGVD29 Datum

POE & ASSOCIATES, INC.
CONSULTING ENGINEERS
9948 E. Central, Suite 200 • Wichita, KS 67208-4242
Phone 316/685-4114 • FAX 316/685-4444



MAP SCALE 1" = 500'

500 1000 FEET

0 150 300 METERS

PANEL 0218E

FIRM

FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS AND INCORPORATED AREAS

PANEL 218 OF 700

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BEL AIRE, CITY OF	200864	0218	E
SEDGWICK COUNTY	200321	0218	E
WICHITA, CITY OF	200328	0218	E

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
20173C0218E

EFFECTIVE DATE
FEBRUARY 2, 2007

Federal Emergency Management Agency

DRAINAGE PLAN FOR
NORTHRIDGE INDUSTRIAL SECOND ADDITION
WICHITA, SEDGWICK COUNTY, KANSAS

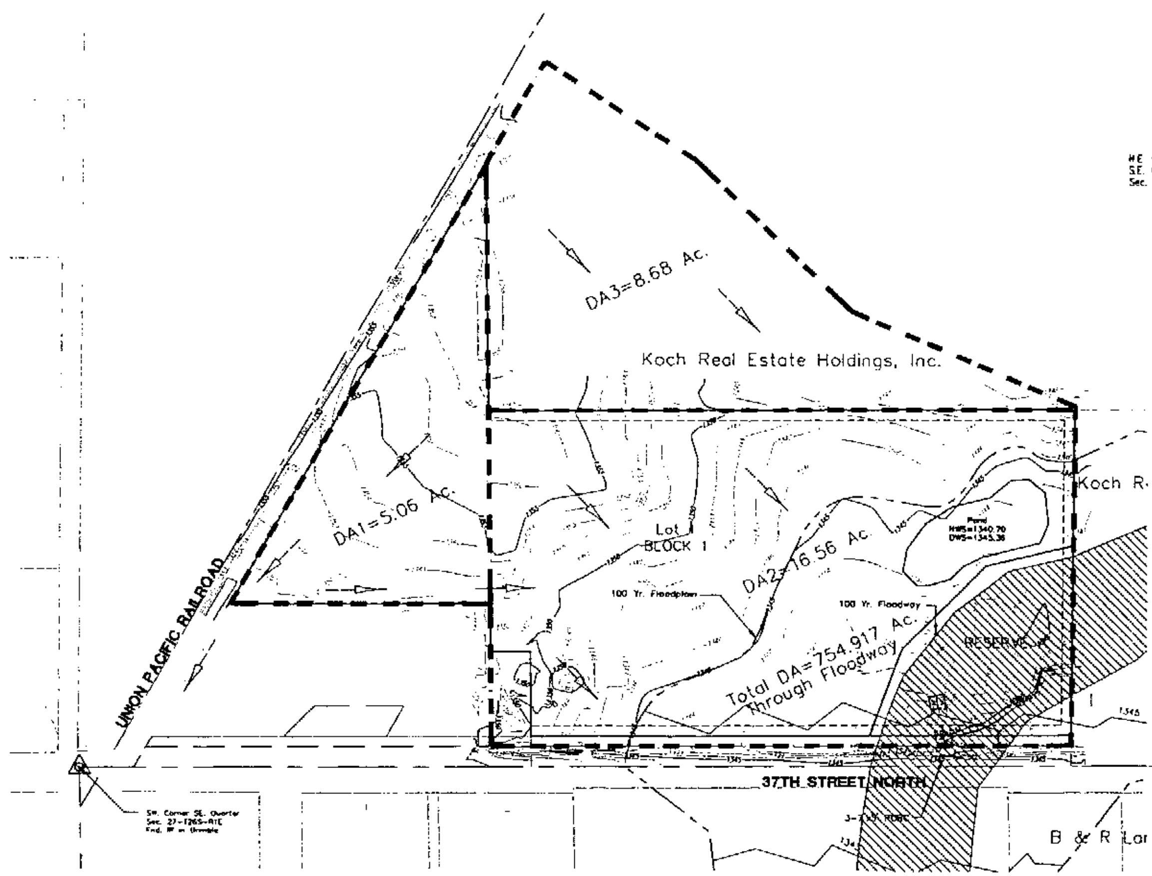
LEGAL DESCRIPTION:

Beginning at a point on the South line of the Southeast Quarter of Section 27, Township 26 south, Range 1 East of the Sixth Principal Meridian, Sedgwick County, Kansas, located 622.285 feet west of the Southeast corner of said Southeast Quarter; thence west 1141.415 feet; thence north 700 feet to a point 1776.84 feet west of the East line of said Southeast Quarter; thence east parallel to the South line of said Southeast Quarter to a point 622.285 feet west of the East line of said Southeast Quarter; thence south 700 feet to the point beginning.

And also:
A tract in the Southeast Quarter of Section 27, Township 26 South, Range 1 East of the Sixth Principal Meridian, Sedgwick County, Kansas, described as follows: Beginning at the intersection of the South line of Section 27 and the East right-of-way line of the Chicago, Rock Island & Pacific Railway Company's right-of-way; thence N 89°30' E, for 699.1 feet; thence N0°20'W, 1181.4 feet to the intersection with the East right-of-way line of the Chicago, Rock Island & Pacific Railway; thence S30°10'W, 1373.2 feet to the point of beginning

NOTES:

1. Cross-drainage agreement required for subsequent sub-divisions
2. Detention ponds shall not be required in DA-1 to reduce developed flows. The added flows shall be routed to DA-2.
3. Site grading and drainage plans to be designed by a licensed professional engineer.
4. The drainage plan will need to be updated and filed with city engineering at the time of building permit(s)
5. Minimum Pad Elevation = 1347.40 (MSL)
6. If the property is divided into more than one lot when developed, a revised drainage plan for the entire lot must be prepared that indicates how cross lot drainage and required detention will be provided.
7. Storm sewer easements will be provided as needed to allow drainage to discharge across adjacent lots.
8. Off-site drainage will cross the north line of DA-2. If the existing drainage pattern is altered, a revised drainage plan must be provided and approved, that indicates how the storm water will be directed across this site.
9. The revised drainage plan must be approved by the appropriate governing body prior to building permits being issued.
10. Any storm water detention areas shown will be revised when the final plans for the development are completed but the runoff amounts will be at or below the post development discharge rates.
11. Some of the detention ponding may normally be dry and will be provided in areas used for parking. A detailed plan will be provided at the time of development.

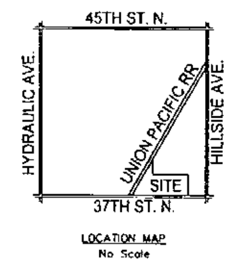


SCALE

120 0 120 240

LEGEND

- ▲ Section corner found
- ○ Point found
- ● 5/8" bar w/POE cap set



LOCATION MAP
No Scale

CALCULATION NOTES.

1. Determination of Q's was made using the SCS method.
2. Curve Numbers weighted based on hydrologic soil groups.

Area #	Area	CN undeveloped	CN developed	Undeveloped Q_2	Undeveloped Q_5	Undeveloped Q_{10}	Undeveloped Q_{25}	Undeveloped Q_{100}	Developed Q_2	Developed Q_5	Developed Q_{10}	Developed Q_{25}	Developed Q_{100}
1	5.06	69.0	88.0	3.46	5.94	7.97	10.83	15.35	13.20	18.06	21.71	26.57	33.82
2	16.56	72.2	86.9	10.34	16.90	22.18	29.55	41.05	41.51	57.36	69.32	85.25	109.05
3	8.68	69.0	69.0	5.93	10.19	13.67	18.59	26.33	5.93	10.19	13.67	18.59	26.33
ALL	30.30	70.8	78.8	18.64	31.20	41.39	55.68	78.45	57.61	81.00	98.86	122.90	159.17

JASON F. DICKMAN
LICENSED
18137
KANSAS
PROFESSIONAL ENGINEER

BENCH MARKS

MSL Datum

1. City of Wichita Disc on Concrete traffic signal pole base @ S.E. corner of 37th & Hillside. Elev. = 1352.75
2. City of Wichita Disc 2.5' W. of E. end of N. hubguard of 3-RCB under 37th St. W. of centerline of Hillside. Elev. = 1345.25
3. "□" cut on median curb @ centerline of Poplar 54' S. of centerline of 37th. Elev. = 1351.04
4. "□" cut on N.E. corner concrete pad for electric transformer box W. of yellow building @ 2525 E. 36th St., Suite B. Elev. = 1342.20

No.	Date	By	Approved	Revision
△				
△				
△				
△				

NORTHRIDGE INDUSTRIAL SECOND ADDITION
DRAINAGE PLAN
CITY OF WICHITA, KANSAS
JAMES L. ARMOUR P.E. - CITY ENGINEER

POE & ASSOCIATES, INC.
CONSULTING ENGINEERS
3940 E. Central, Suite 200 • Wichita, KS 67208-4242
Phone 316/685-4114 • FAX 316/685-4444

FINAL

Designed By: J. Dickman
Drawn By: S. Schmidt
Drawing File: P:\822\drainage2nd2007.dwg
Date: 4/23/2007

Sheet 1 of 1

LOT GRADING PLAN
NORTHRIDGE INDUSTRIAL SECOND ADDITION
WICHITA, SEDGWICK COUNTY, KANSAS

LEGAL DESCRIPTION:

Beginning at a point on the South line of the Southeast Quarter of Section 27, Township 26 south, Range 1 East of the Sixth Principal Meridian, Sedgwick County, Kansas, located 822.285 feet west of the Southeast corner of said Southeast Quarter; thence west 1161.415 feet; thence north 700 feet to a point 1776.84 feet west of the East line of said Southeast Quarter; thence east parallel to the South line of said Southeast Quarter to a point 822.285 feet west of the East line of said Southeast Quarter; thence south 700 feet to the point beginning.

And also:
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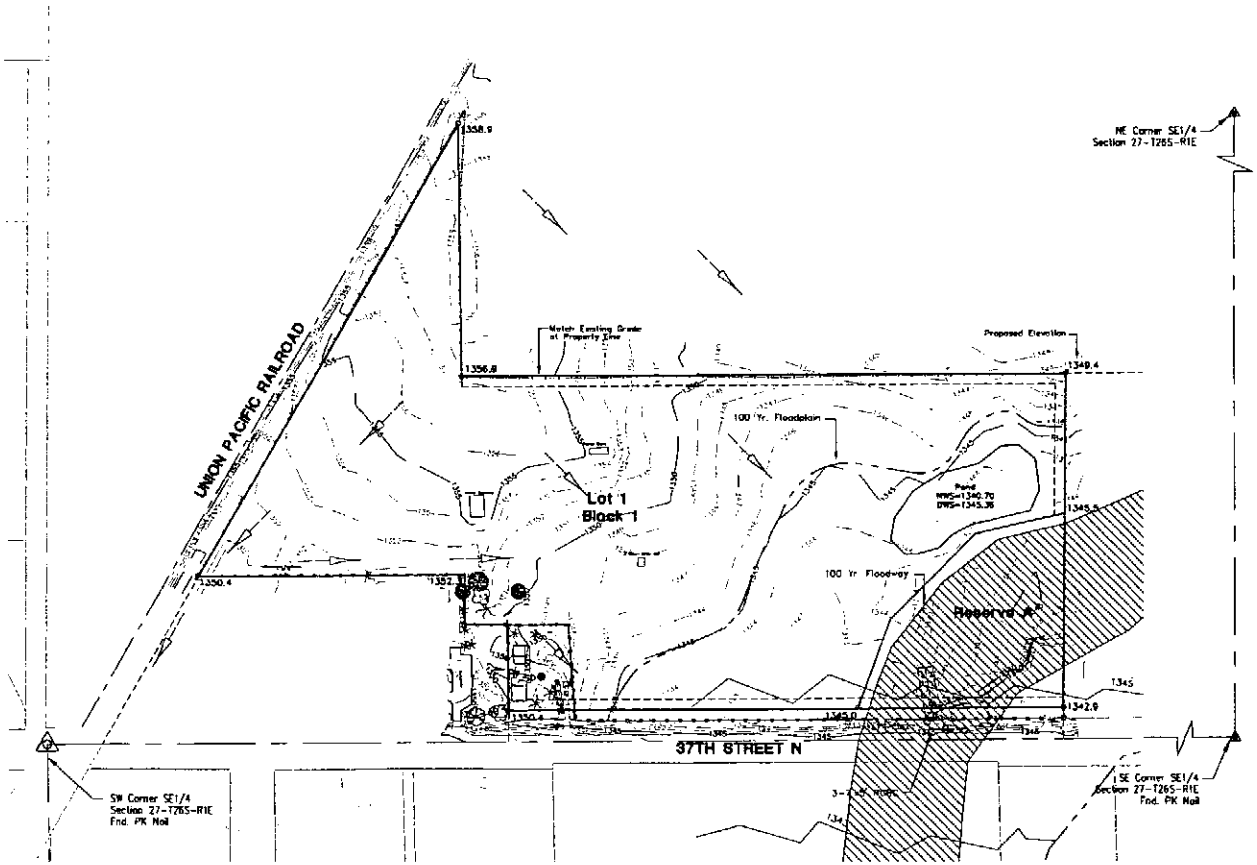
NOTES:

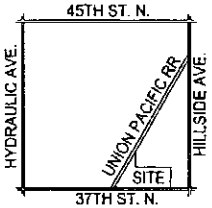
1. Detailed site grading plans will be submitted when applying for building permits.
2. Site grading and drainage plans to be designed by a licensed professional engineer.
3. Minimum Pad Elevation = 1347.40 (MSL)



SCALE
120 0 120 240

LEGEND

- ▲ Section corner found
- D Point found
- ● 5/8" bar w/POE cap set



LOCATION MAP
No Scale

BENCH MARKS

MSL Datum

1. City of Wichita Disc on Concrete traffic signal pole base @ S.E. corner of 37th & Hillside.
   Elev. = 1352.75
2. City of Wichita Disc 2.5' W. of E. end of N. hubguard of 3-RGB under 37th St. W. of centerline of Hillside.
   Elev. = 1345.25
3. "□" cut on median curb @ centerline of Poplar 54' S. of centerline of 37th.
   Elev. = 1351.04
4. "□" cut on N.E. corner concrete pad for electric transformer box W. of yellow building @ 2525 E. 36th St., Suite B.
   Elev. = 1342.20

JOHN P. DICKMAN LICENSED 18137 KANSAS PROFESSIONAL ENGINEER

POE & ASSOCIATES, INC.
CONSULTING ENGINEERS
5940 E. Central, Suite 200 • Wichita, KS 67208-4242
Phone 316/685-4114 • FAX 316/685-4444

Pond Report

Hydraflow Hydrographs by Intelisolve

Thursday, May 3 2007, 4:16 PM

Pond No. 1 - Detention Pond

Pond Data

Bottom LxW = 275.0 x 125.0 ft | Side slope = 4.0:1 | Bottom elev. = 1340.70 ft | Depth = 5.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1340.70	34,375	0.000	0.000
0.25	1340.95	35,179	0.200	0.200
0.50	1341.20	35,991	0.204	0.404
0.75	1341.45	36,811	0.209	0.613
1.00	1341.70	37,639	0.214	0.826
1.25	1341.95	38,475	0.218	1.045
1.50	1342.20	39,319	0.223	1.268
1.75	1342.45	40,171	0.228	1.496
2.00	1342.70	41,031	0.233	1.729
2.25	1342.95	41,899	0.238	1.967
2.50	1343.20	42,775	0.243	2.210
2.75	1343.45	43,659	0.248	2.458
3.00	1343.70	44,551	0.253	2.711
3.25	1343.95	45,451	0.258	2.969
3.50	1344.20	46,359	0.263	3.233
3.75	1344.45	47,275	0.269	3.502
4.00	1344.70	48,199	0.274	3.776
4.25	1344.95	49,131	0.279	4.055
4.50	1345.20	50,071	0.285	4.340
4.75	1345.45	51,019	0.290	4.630
5.00	1345.70	51,975	0.296	4.925

Culvert / Orifice Structures

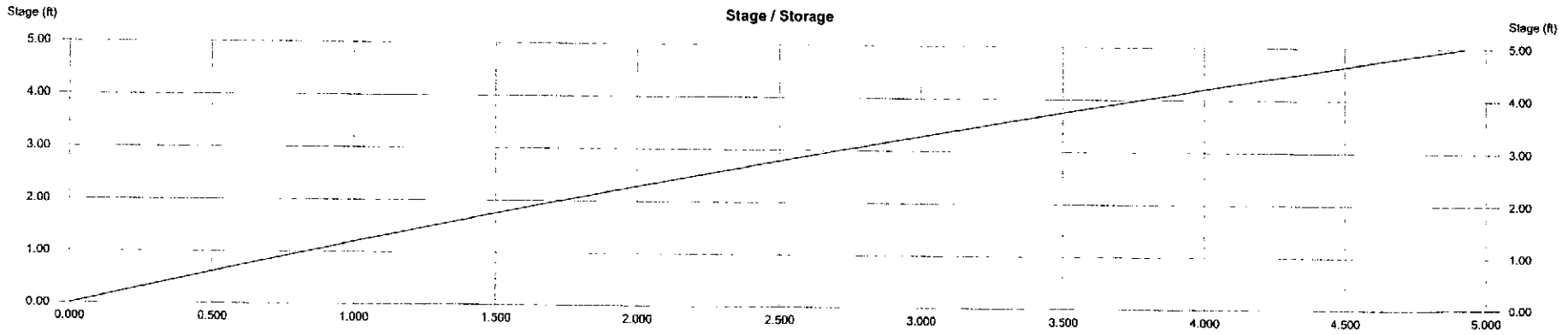
	[A]	[B]	[C]	[D]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	0.00
N-Value	= .000	.000	.000	.000
Orif. Coeff.	= 0.00	0.00	0.00	0.00
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 2.50	0.00	0.00	0.00
Crest El. (ft)	= 1340.70	0.00	0.00	0.00
Weir Coeff.	= 2.60	0.00	0.00	0.00
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

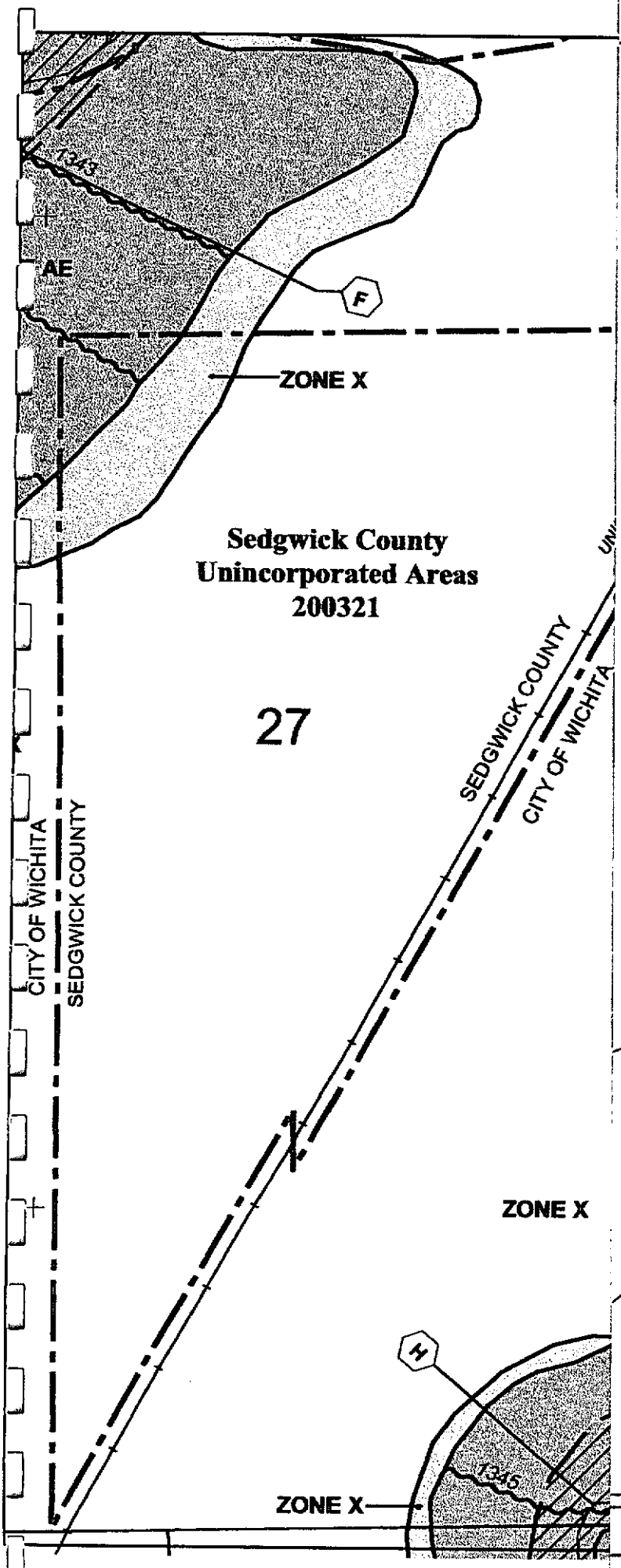
Exfiltration = 0.000 in/hr (Wet area) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control



NORTHRIDGE INDUSTRIAL SECOND ADDITION

EXHIBIT 1-4



MAP SCALE 1" = 500'

500 1000 FEET

0 150 300 METERS

PANEL 0218E

FIRM

FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS
AND INCORPORATED AREAS

PANEL 218 OF 700

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BEL AIRE, CITY OF	200864	0218	E
SEDGWICK COUNTY	200321	0218	E
WICHITA, CITY OF	200328	0218	E

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.

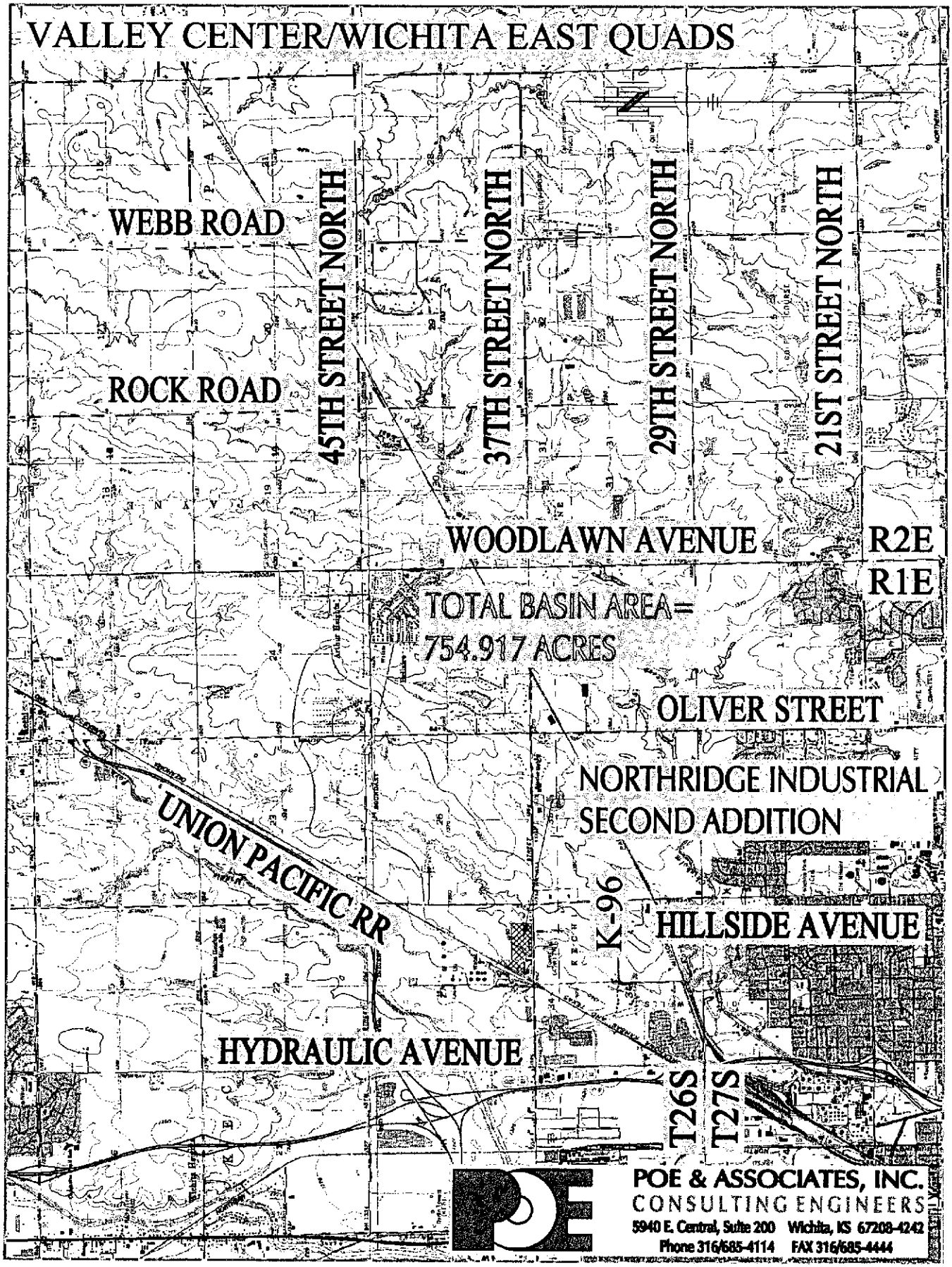
MAP NUMBER
20173C0218E

EFFECTIVE DATE
FEBRUARY 2, 2007

Federal Emergency Management Agency

NORTHRIDGE INDUSTRIAL SECOND ADDITION

EXHIBIT 1-5


VALLEY CENTER/WICHITA EAST QUADS
WEBB ROAD
ROCK ROAD
45TH STREET NORTH
37TH STREET NORTH
29TH STREET NORTH
21ST STREET NORTH
WOODLAWN AVENUE
R2E
R1E
TOTAL BASIN AREA=
754.917 ACRES
OLIVER STREET
NORTHRIDGE INDUSTRIAL
SECOND ADDITION
UNION PACIFIC RR
K-96
HILLSIDE AVENUE
HYDRAULIC AVENUE
T26S
T27S
POE & ASSOCIATES, INC.
CONSULTING ENGINEERS
5940 E. Central, Suite 200 Wichita, KS 67208-4242
Phone 316/685-4114 FAX 316/685-4444

NORTHRIDGE INDUSTRIAL SECOND ADDITION

EXHIBIT 1-6

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-------	146.44	254.99	-------	422.71	559.04	750.04	898.24	1049.52	Basin
2	SCS Runoff	-------	1.846	3.456	-------	5.939	7.970	10.83	13.06	15.35	Existing DA No. 1
3	SCS Runoff	-------	5.963	10.34	-------	16.90	22.18	29.55	35.25	41.05	Existing DA No. 2
4	SCS Runoff	-------	3.168	5.930	-------	10.19	13.67	18.59	22.42	26.33	Existing DA No. 3
5	Combine	2, 3, 4	10.37	18.64	-------	31.20	41.39	55.68	66.87	78.45	Existing DA-1, 2 & 3
6	SCS Runoff	-------	9.595	13.20	-------	18.06	21.71	26.57	30.20	33.82	Proposed DA No. 1
7	SCS Runoff	-------	29.82	41.51	-------	57.36	69.32	85.25	97.17	109.05	Proposed DA No. 2
8	Combine	4, 6, 7	40.71	57.61	-------	81.00	98.86	122.90	141.01	159.17	Prop. DA-1 & 2 with Exist. DA-3
9	Reservoir	8	11.64	18.44	-------	28.67	36.85	48.13	56.76	65.47	East Detention Outlet

NORTHRIDGE INDUSTRIAL SECOND ADDITION

EXHIBIT 1-7

NOON

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NOTES:

1. Cross-drainage agreement required for subsequent sub-divisions.
2. Detention ponds shall not be required in DA-1 to reduce developed flows. The added flows shall be routed to DA-2.
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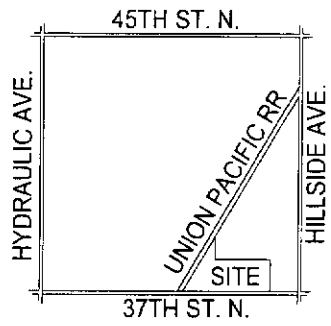
11. Some of the detention ponding may normally be dry and will be provided in areas used for parking. A detailed plan will be provided at the time of development.

SCALE
120 0 120 240

N.E. Cor.
S.E. Quarter
Sec. 27-T26S-R1E

LEGEND

- ▲ Section corner found
- ○ Point found
- ● 5/8" bar w/POE cap set



LOCATION MAP
No Scale

S.E. Cor.
S.E. Quarter
Sec. 27-T26S-R1E
Fnd. PK Nail

CALCULATION NOTES:

1. Determination of Q's was made using the SCS method.

2. Curve Numbers weighted based on hydrologic soil groups.

				Undeveloped			
Area #	Area	CN undeveloped	CN developed	Q_2	Q_5	Q_{10}	Q_{25}
1	5.06	69.0	88.0	3.46	5.94	7.97	10.83
2	16.56	72.2	86.9	10.34	16.90	22.18	29.55
3	8.68	69.0	69.0	5.93	10.19	13.67	18.59
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BENCH MARKS

MSL Datum

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   Elev. = 1352.75
2. City of Wichita Disc 2.5' W. of E. end of N. hubguard of 3-RCB under 37th St. W. of centerline of Hillside.
   Elev. = 1345.25
3. "□" cut on median curb @ centerline of Poplar 54' S. of centerline of 37th.
   Elev. = 1351.04
4. "□" cut on N.E. corner concrete pad for electric transformer box W. of yellow building @ 2525 E. 36th St., Suite B.
   Elev. = 1342.20

No	Date	By	Approved	Revision

NORTHRIDGE INDUSTRIAL SECOND ADDITION
DRAINAGE PLAN
CITY OF WICHITA, KANSAS
JAMES L. ARMOUR P.E.- CITY ENGINEER

POE & ASSOCIATES, INC.
CONSULTING ENGINEERS
5940 E. Central, Suite 200 ■ Wichita, KS 67208-4242
Phone 316/685-4114 ■ FAX 316/685-4444

FINAL

Designed By: J. Dickman
Drawn By: S. Schmidt
Drawing File: P:\822\drainage2nd2007.dwg
Date: 4/23/2007

Sheet 1 of 1

NORTHRIDGE INDUSTRIAL SECOND ADDITION

EXHIBIT 1-8

NOON

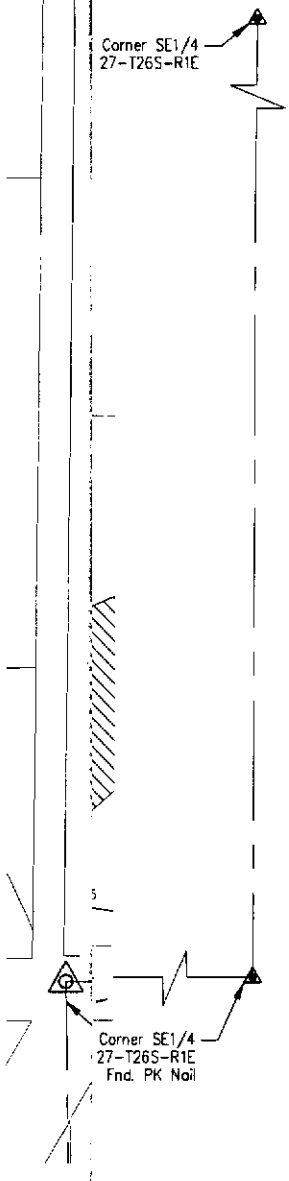
LEGAL DESCRIPTION:

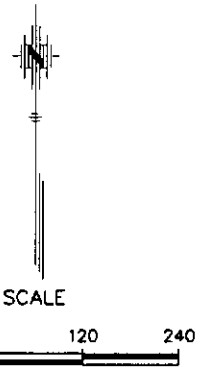
Beginning at a point on the South line of the Southeast Quarter of Section 27, Township 26 south, Range 1 East of the Sixth Principal Meridian, Sedgwick County, Kansas, located 622.285 feet west of the Southeast corner of said Southeast Quarter; thence west 1141.415 feet; thence north 700 feet to a point 1776.84 feet west of the East line of said Southeast Quarter; thence east parallel to the South line of said Southeast Quarter to a point 622.285 feet west of the East line of said Southeast Quarter; thence south 700 feet to the point beginning.

And also:
A tract in the Southeast Quarter of Section 27, Township 26 South, Range 1 East of the Sixth Principal Meridian, Sedgwick County, Kansas, described as follows: Beginning at the intersection of the South line of Section 27 and the East right-of-way line of the Chicago, Rock Island & Pacific Railway Company's right-of-way; thence N 89°30' E, for 699.1 feet; thence N0°20'W, 1181.4 feet to the intersection with the East right-of-way line of the Chicago, Rock Island & Pacific Railway; thence S30°10'W, 1373.2 feet to the point of beginning.

NOTES:

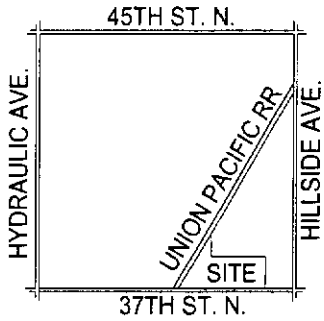
1. Detailed site grading plans will be submitted when applying for building permits.
2. Site grading and drainage plans to be designed by a licensed professional engineer.
3. Minimum Pad Elevation = 1347.40 (MSL)





LEGEND

- ▲ Section corner found
- O Point found
- ● 5/8" bar w/POE cap set



LOCATION MAP
No Scale

BENCH MARKS

MSL Datum

1. City of Wichita Disc on Concrete traffic signal pole base @ S.E. corner of 37th & Hillside.
   Elev. = 1352.75
2. City of Wichita Disc 2.5' W. of E. end of N. hubguard of 3-RCB under 37th St. W. of centerline of Hillside.
   Elev. = 1345.25
3. "□" cut on median curb @ centerline of Poplar 54' S. of centerline of 37th.
   Elev. = 1351.04
4. "□" cut on N.E. corner concrete pad for electric transformer box W. of yellow building @ 2525 E. 36th St., Suite B.
   Elev. = 1342.20

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Tab 2. Existing Conditions Runoff Calculations

A. Copy of orthophotograph showing proposed boundaries

See Exhibit 2-1 for aerial photograph showing proposed site boundaries.

B. Runoff method

The runoff method used to determine storm water flows was the SCS hydrograph method. Supporting data and calculation results are shown on Exhibit 2-2.

C. Existing topography

The existing topography is shown on the drainage plan as seen on Exhibit 1-7.

D. Total site area and total impervious area

The total area Northridge Industrial Second Addition encompasses is 25 acres. The total impervious area for the developed condition, based on limited industrial land use, is estimated at 72% of the total site area. Therefore, the total impervious area on this site will be 18 acres.

E. Benchmarks used for site control

The benchmarks used for site control are listed on the drainage plan, which is Exhibit 1-7.

F. Streams, creeks, and waterways labeled

Exhibit 1-7 shows all water features within the site. Features include the un-named tributary located in the southeast corner of the site. This waterway is part of a mapped FEMA floodway as shown on the FIRM in Exhibit 1-4.

G. Predominate soils from USDA soil surveys

The predominant soil type is a Farnum loam series (5893/Fb) material, which is found in 100% of DA-1 and DA-3 and accounts for nearly 51% of DA-2. DA-2 is also made up of over 42% of Blanket silt loam (6323/Bb) soil and the remaining 7% consists of Elandco silt loam (6244/Ea) material. See Exhibit 1-2 for NRCS Soil Survey map and information showing existing soil types and descriptions. The Farnum and Elancdo soils are classified as Hydrologic Group B soils and the Blanket soil is a Hydrologic Group C soil. These Hydrologic Groups are used to select curve numbers for the runoff calculations in both the existing and developed conditions.

H. Location and boundaries of natural features

The existing site does not contain wetlands, lakes, or ponds.

I. Location of existing roads, buildings, parking lots, and other impervious areas

Currently, DA-1 has a gravel/dirt trail running from the southwest corner to the north end of the area and around an existing monitoring well. DA-2 contains a home site with a detached garage. The home site is within a chain-link fence running along the perimeter of the site. The entrance to the home is a gravel drive leading to an improved parking area at the garage. The northwest quadrant of DA-2 contains a small metal building and a small horse barn. The structures in DA-2 shall be cleared prior to any construction. All other areas within the plat are vacant land with good grass cover and various concentrations of trees and brush.

J. Location of existing utilities

DA-1 has a monitoring well near the north end of the area. DA-2 has an open brick-lined well in the middle of the west half of the area. Also, the home site contains a septic tank manhole with cleanouts near the home and garage; one water well, a gas service meter, and electric power service lines. All utilities serving the home site shall be removed/abandoned prior to construction. Another electric power line runs from the metal building at the west end of DA-2 to the south property line. The above information is shown on the drainage plan, Exhibit 1-7.

K. Location of existing conveyance systems

Flow across the site is overland flow for both DA-1 and DA-2. The southeast corner of DA-2 contains a natural channel that carries the flow from the overall drainage basin lying to the north and east. This basin ultimately drains off-site into the existing culvert located near the southeast corner of the addition.

L. Flow paths

The drainage plan shows the general flow paths for each drainage area on the site. DA-1 drains to the southwest from the north corner of the area to the southwest corner. The flow runs along the west side of the east line of the railroad right-of-way. Then, the north ditch of 37th Street North carries the drainage to the existing culvert under 37th Street North, then off-site to the south. The flow path in DA-2 is generally to the east into the existing channel at the southeast corner. DA-2 flows are then routed offsite through the existing culvert and to the south across 37th Street North.

M. Location and dimensions of existing channels, bridges or culvert crossings

The natural channel at the southeast corner of DA-2 is approximately two-feet wide at the bottom with 4:1 side slopes. The average depth of the defined channel in this area is about five feet. This channel drains offsite to a triple 7' by 5' RCB.

N. Existing conditions hydrologic analysis

The analysis was completed using the SCS Hydrograph method. The 2, 5, 10, 25, & 100 year, 24-hour storm events were evaluated and the information appear in Exhibit 2-2. The results are summarized in the following table.

	24-Hour Storm Flows (cfs)				
Area/Frequency	2-Year	5-Year	10-Year	25-Year	100-Year
DA-1	3.46	5.94	7.97	10.83	15.35
DA-2	10.34	16.90	22.18	29.55	41.05
DA-3	5.93	10.19	13.67	18.59	26.33
DA-1, 2, & 3	18.64	31.20	41.39	55.68	78.45

O. Assumed pre-developed runoff curve numbers

For the existing condition, the curve numbers were weighted based on area of their respective hydrologic soil groups over the site. The results are shown in the table below, to include those for the developed condition as required by Tab 3, Section C.

DRAINAGE AREA NO. 1		Hydrologic	Area		Percent of Areas	CURVE NUMBER	
Soil Information		Group	Square Feet	Acres	Total	Existing	Developed
Farnum loam, 1-3% slopes (Fb)	5893	B	220370	5.059	100.00%	69.0	88.0
		TOTALS	220370	5.059	100.00%	69.0	88.0

DRAINAGE AREA NO. 2		Hydrologic	Area		Percent of Areas	CURVE NUMBER	
Soil Information		Group	Square Feet	Acres	Total	Existing	Developed
Farnum loam, 1-3% slopes (Fb)	5893	B	364373	8.365	50.52%	69.0	88.0
Elandco silt loam, rarely flooded (Ea)	6244	B	51491	1.182	7.14%	55.0	55.0
Blanket silt loam, 1-3% slopes (Bb)	6323	C	305431	7.012	42.34%	79.0	91.0
		TOTALS	721294	16.559	100.00%	72.2	86.9

DRAINAGE AREA NO. 3		Hydrologic	Area		Percent of Areas	CURVE NUMBER	
Soil Information		Group	Square Feet	Acres	Total	Existing	Developed
Farnum loam, 1-3% slopes (Fb)	5893	B	378101	8.680	100.00%	69.0	69.0
		TOTALS	378101	8.680	100.00%	69.0	69.0

DRAINAGE AREA NO. 1, 2, & 3 COMBINED		Hydrologic	Area		Percent of Areas	CURVE NUMBER	
Soil Information		Group	Square Feet	Acres	Total	Existing	Developed
Farnum loam, 1-3% slopes (Fb)	5893	B	220370	5.059	16.70%	69.0	69.0
Farnum loam, 1-3% slopes (Fb)	5893	B	364373	8.365	27.61%	69.0	88.0
Elandco silt loam, rarely flooded (Ea)	6244	B	51491	1.182	3.90%	55.0	55.0
Blanket silt loam, 1-3% slopes (Bb)	6323	C	305431	7.012	23.14%	79.0	91.0
Farnum loam, 1-3% slopes (Fb)	5893	B	378101	8.680	28.65%	69.0	69.0
		TOTALS	1319765	30.298	100.00%	70.8	78.8

P. Existing times of concentration used in calculations

Area	T_c (min)
Basin	128.9
DA-1	31.9
DA-2	56.4
DA-3	39.8

Q. Evaluation of immediate downstream drainage capacity

The downstream capacity south of the triple 7' x 5' RCB shall be considered adequate to accommodate the full flow capacity of the culvert under 37th Street North, which would be greater than or equal to 1,354 cfs.

R. Existing structural elevations

The existing triple 7' by 5' RCB under 37th Street North has a downstream flow line of 1337.69 (MSL Datum).

S. Cross-section data for open channels

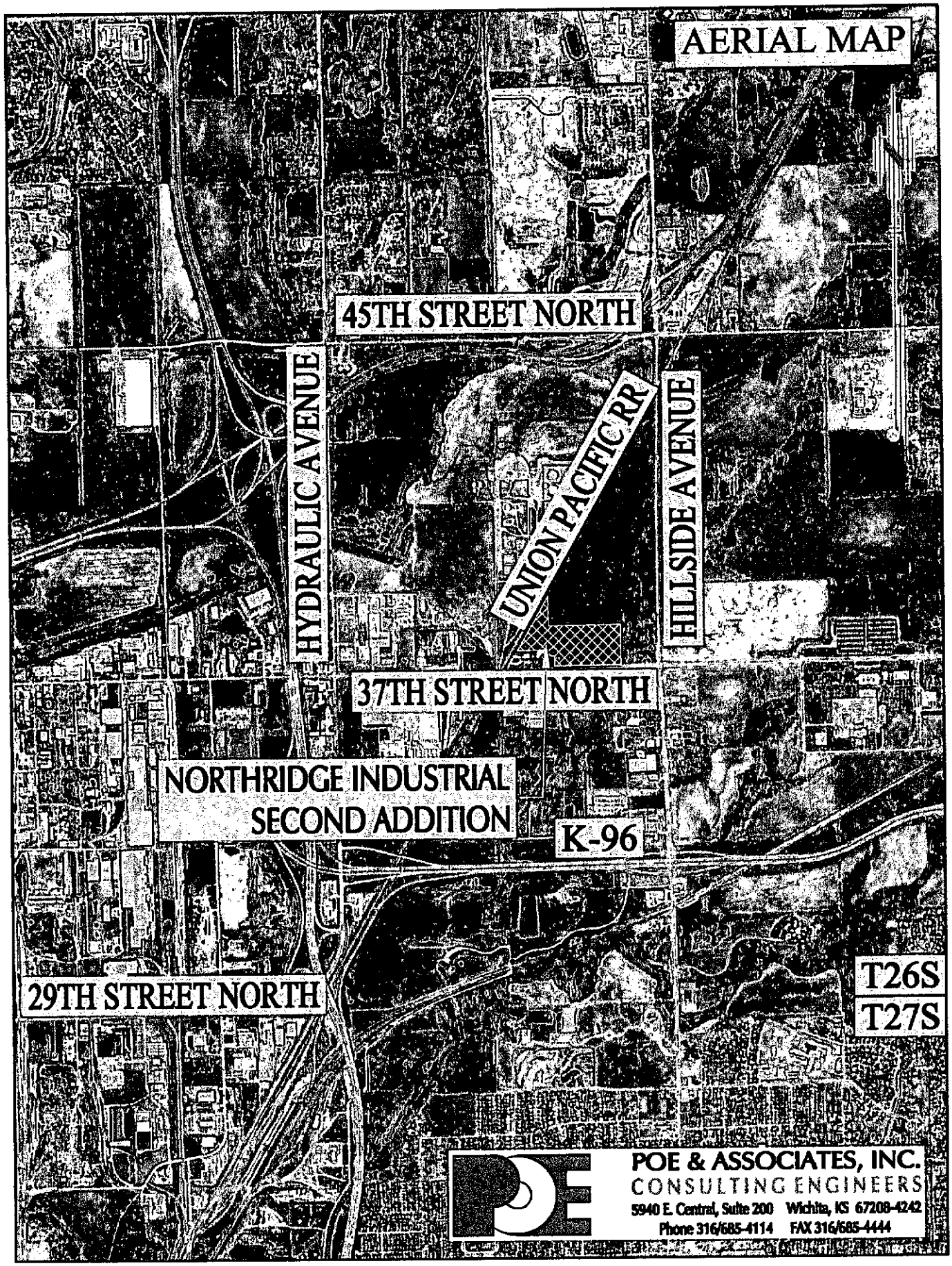
The channel in the southeast corner of DA-1 has an approximate cross-sectional area of 110.0 square feet at average depth of five feet.

T. Ground water elevations

The ground water elevation is not a concern for this development.

NORTHRIDGE INDUSTRIAL SECOND ADDITION

EXHIBIT 2-1


AERIAL MAP
45TH STREET NORTH
HYDRAULIC AVENUE
UNION PACIFIC RR
HILLSIDE AVENUE
37TH STREET NORTH
NORTHRIDGE INDUSTRIAL
SECOND ADDITION
K-96
29TH STREET NORTH
T26S
T27S
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NORTHRIDGE INDUSTRIAL SECOND ADDITION

EXHIBIT 2-2

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	254.99	6	792	75.001	----	------	------	Basin
2	SCS Runoff	3.456	6	738	0.441	----	------	------	Existing DA No. 1
3	SCS Runoff	10.34	6	750	1.654	----	------	------	Existing DA No. 2
4	SCS Runoff	5.930	6	738	0.757	----	------	------	Existing DA No. 3
5	Combine	18.64	6	744	2.852	2, 3, 4	------	------	Existing DA-1, 2 & 3
6	SCS Runoff	13.20	6	720	0.933	----	------	------	Proposed DA No. 1
7	SCS Runoff	41.51	6	720	2.929	----	------	------	Proposed DA No. 2
8	Combine	57.61	6	720	4.618	4, 6, 7	------	------	Prop. DA-1 & 2 with Exist. DA-3
9	Reservoir	18.44	6	744	4.617	8	1342.70	1.733	East Detention Outlet

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

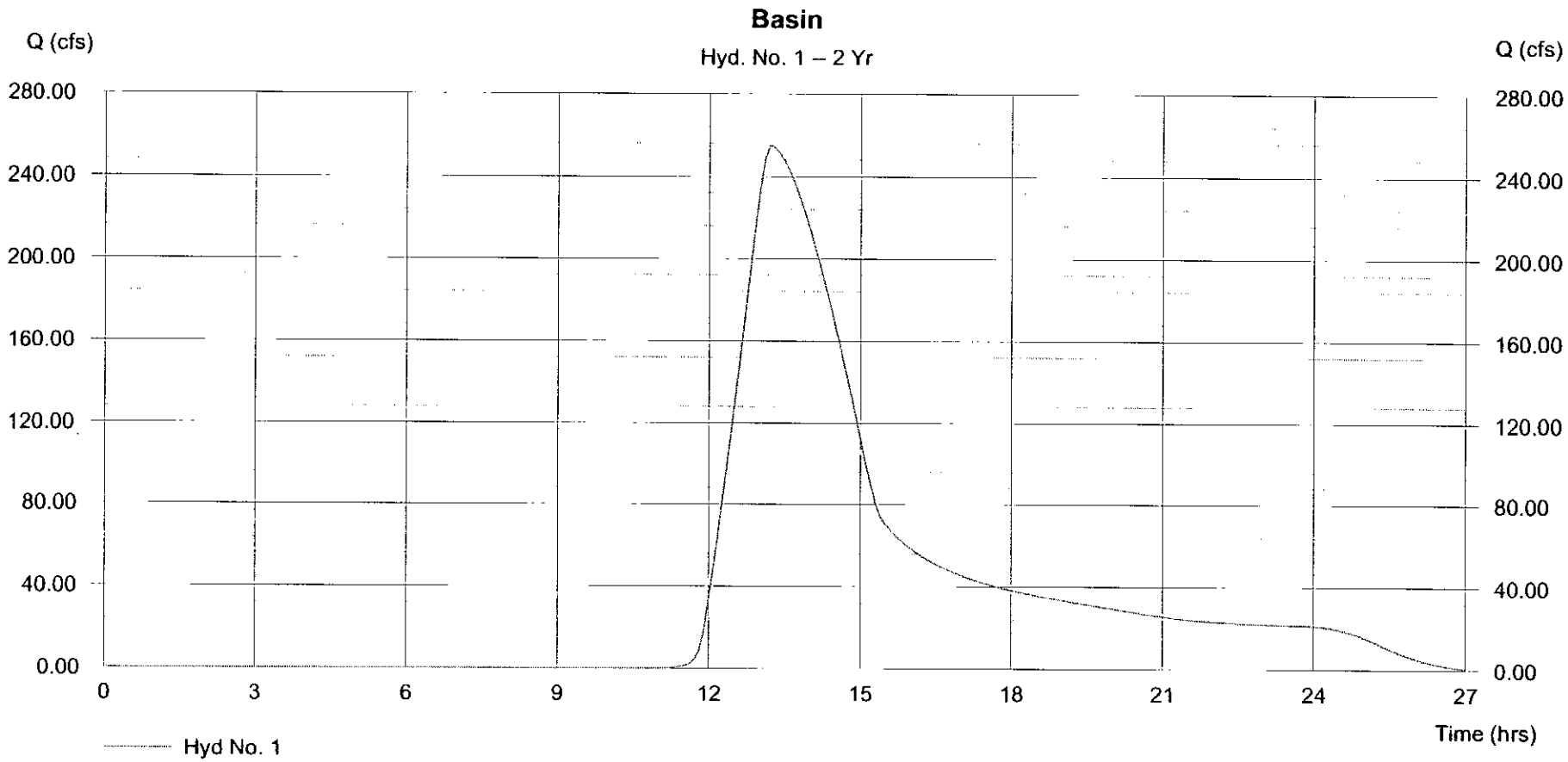
Thursday, May 3 2007, 4:2 PM

Hyd. No. 1

Basin

Hydrograph type	= SCS Runoff	Peak discharge	= 254.99 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 754.917 ac	Curve number	= 71.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 128.90 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 75.001 acft



TR55 Tc Worksheet

Hyd. No. 1
Basin

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 300.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.60		0.00		0.00		
Land slope (%)	= 0.53		0.00		0.00		
Travel Time (min)	**= 55.11**	**+**	**0.00**	**+**	**0.00**	**=**	**55.11**
Shallow Concentrated Flow							
Flow length (ft)	= 2940.30		0.00		0.00		
Watercourse slope (%)	= 1.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	= 1.61		0.00		0.00		
Travel Time (min)	**= 30.37**	**+**	**0.00**	**+**	**0.00**	**=**	**30.37**
Channel Flow							
X sectional flow area (sqft)	= 30.00		0.00		0.00		
Wetted perimeter (ft)	= 22.62		0.00		0.00		
Channel slope (%)	= 0.54		0.00		0.00		
Manning's n-value	= 0.030		0.015		0.015		
Velocity (ft/s)	= 4.41		0.00		0.00		
Flow length (ft)	= 11491.0		0.0		0.0		
Travel Time (min)	**= 43.42**	**+**	**0.00**	**+**	**0.00**	**=**	**43.42**

Total Travel Time, Tc ..... **128.90 min**

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

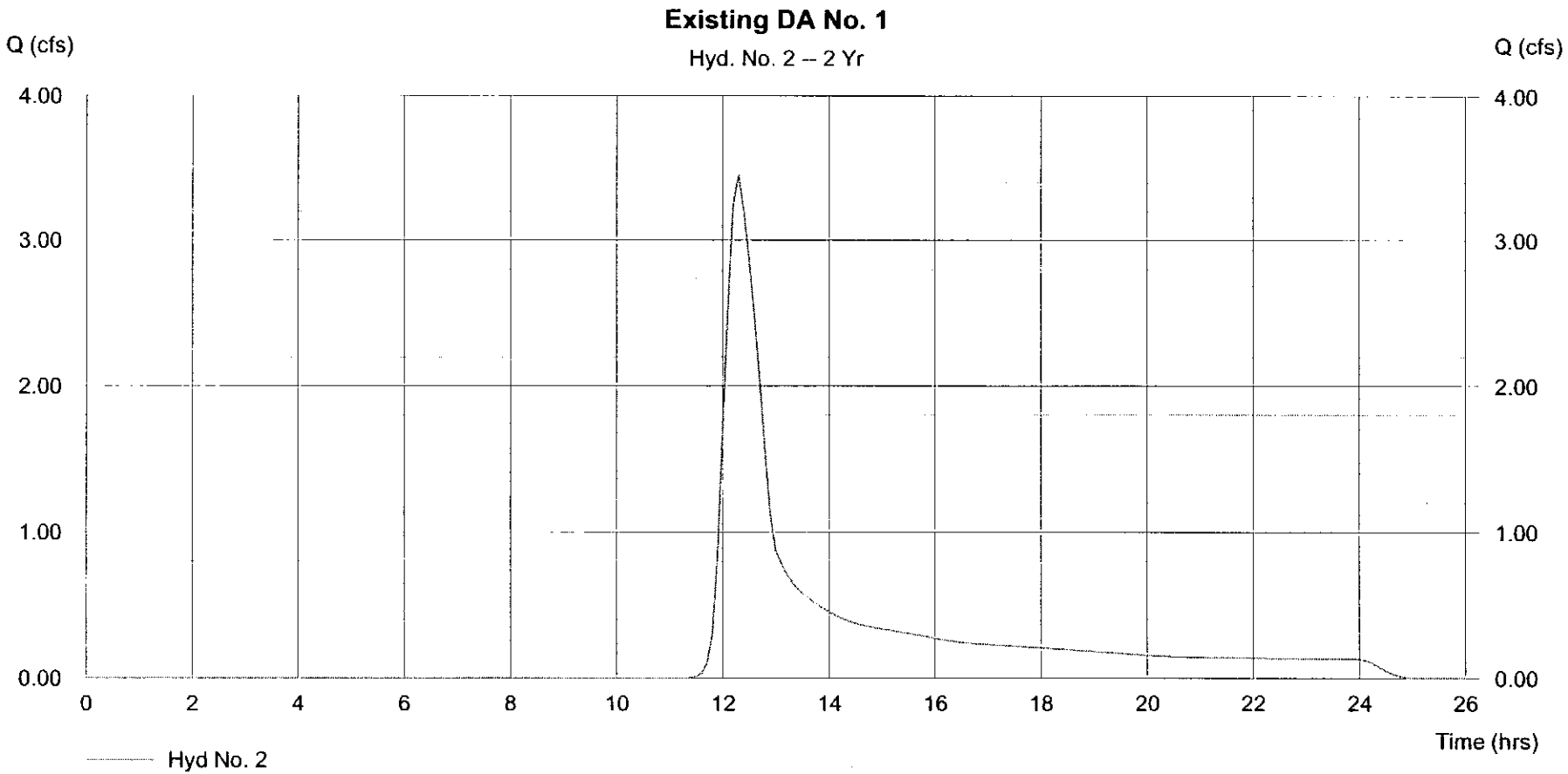
Thursday, May 3 2007, 4:2 PM

Hyd. No. 2

Existing DA No. 1

Hydrograph type	= SCS Runoff	Peak discharge	= 3.456 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 5.059 ac	Curve number	= 69
Basin Slope	= 0.9 %	Hydraulic length	= 980 ft
Tc method	= USER	Time of conc. (Tc)	= 31.90 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 0.441 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

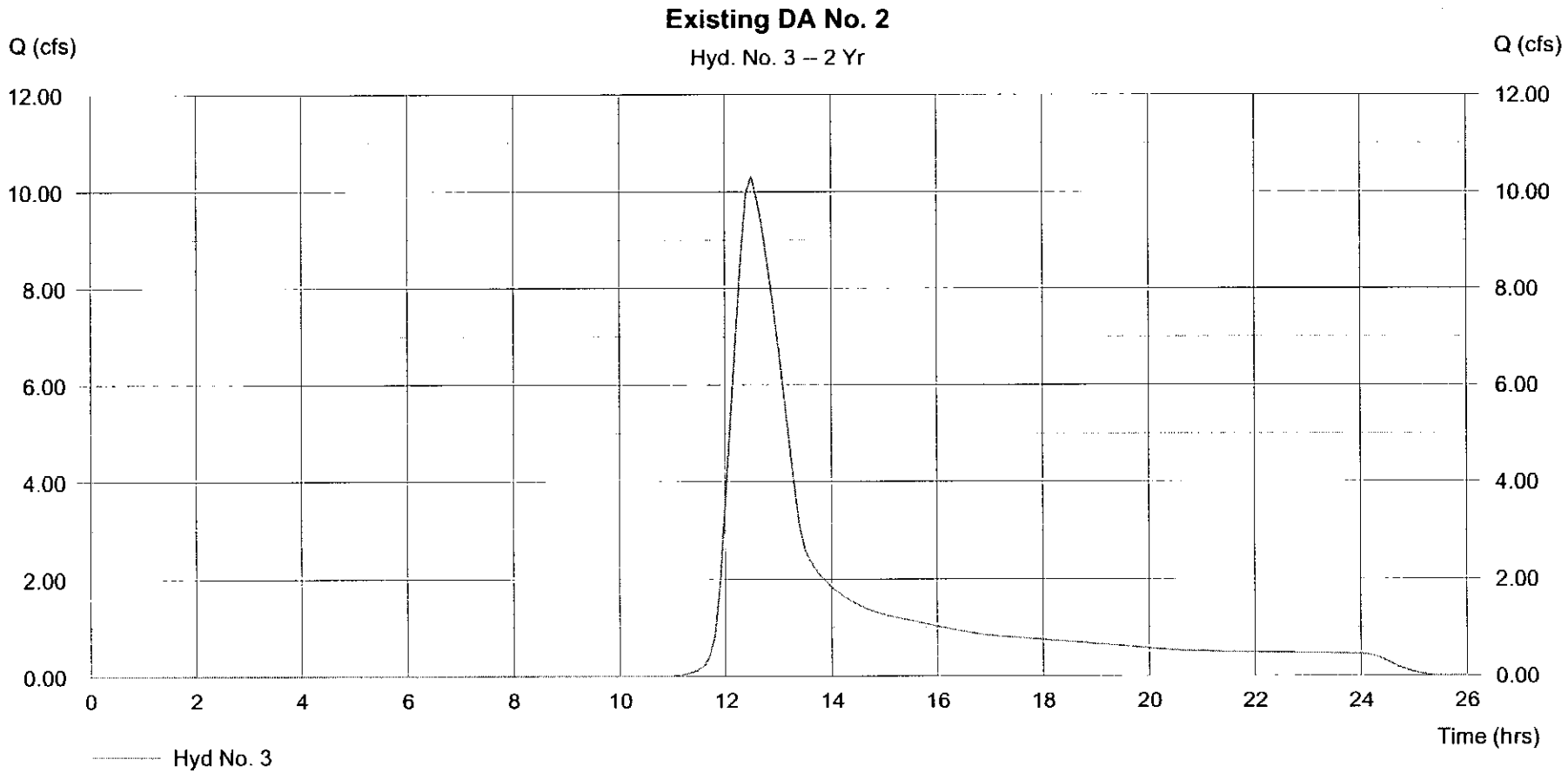
Thursday, May 3 2007, 4:2 PM

Hyd. No. 3

Existing DA No. 2

Hydrograph type	= SCS Runoff	Peak discharge	= 10.34 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 16.559 ac	Curve number	= 72.2
Basin Slope	= 1.2 %	Hydraulic length	= 1700 ft
Tc method	= LAG	Time of conc. (Tc)	= 56.40 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 1.654 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

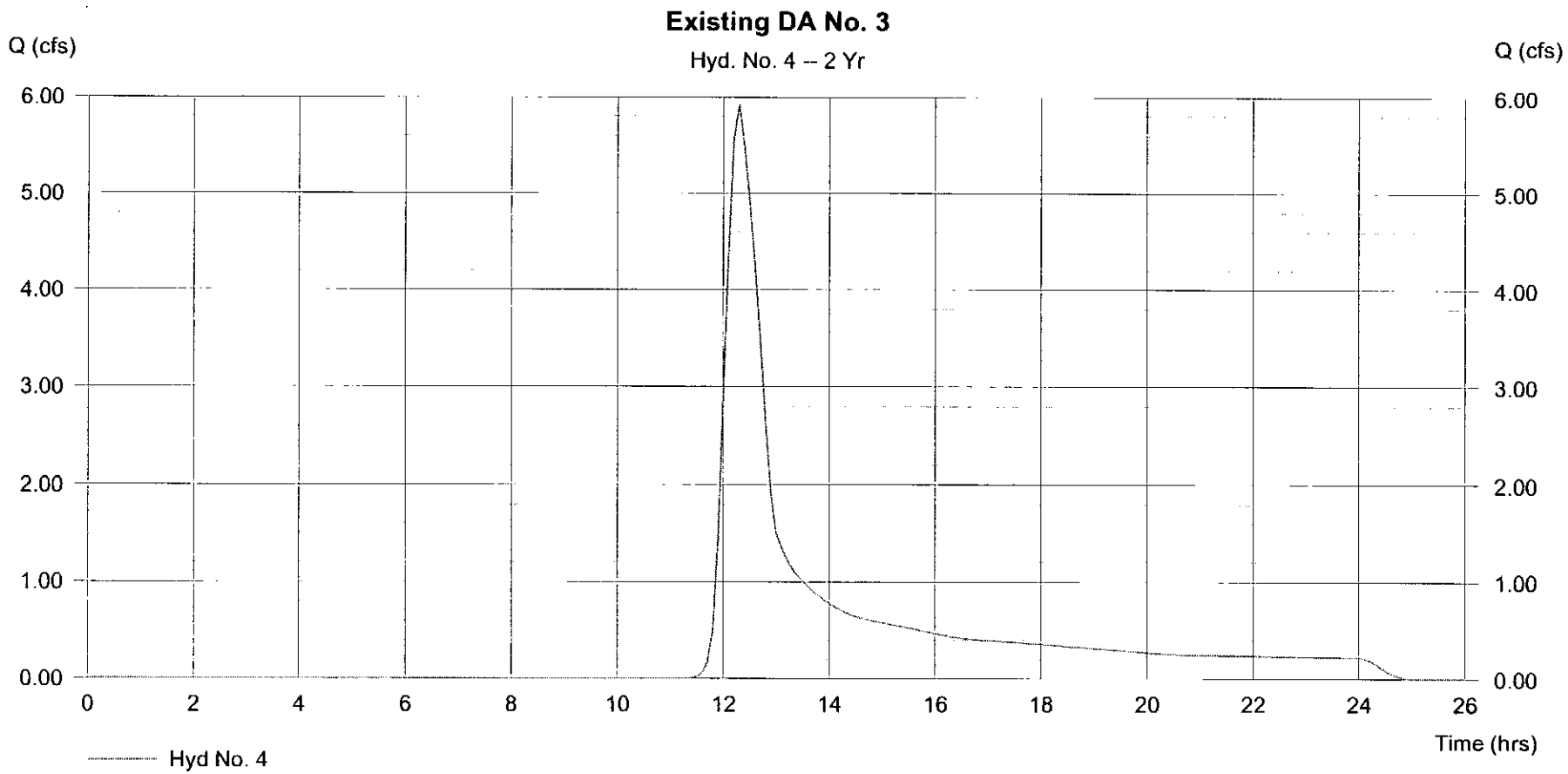
Thursday, May 3 2007, 4:2 PM

Hyd. No. 4

Existing DA No. 3

Hydrograph type	= SCS Runoff	Peak discharge	= 5.930 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 8.680 ac	Curve number	= 69
Basin Slope	= 1.2 %	Hydraulic length	= 1000 ft
Tc method	= LAG	Time of conc. (Tc)	= 39.80 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 0.757 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

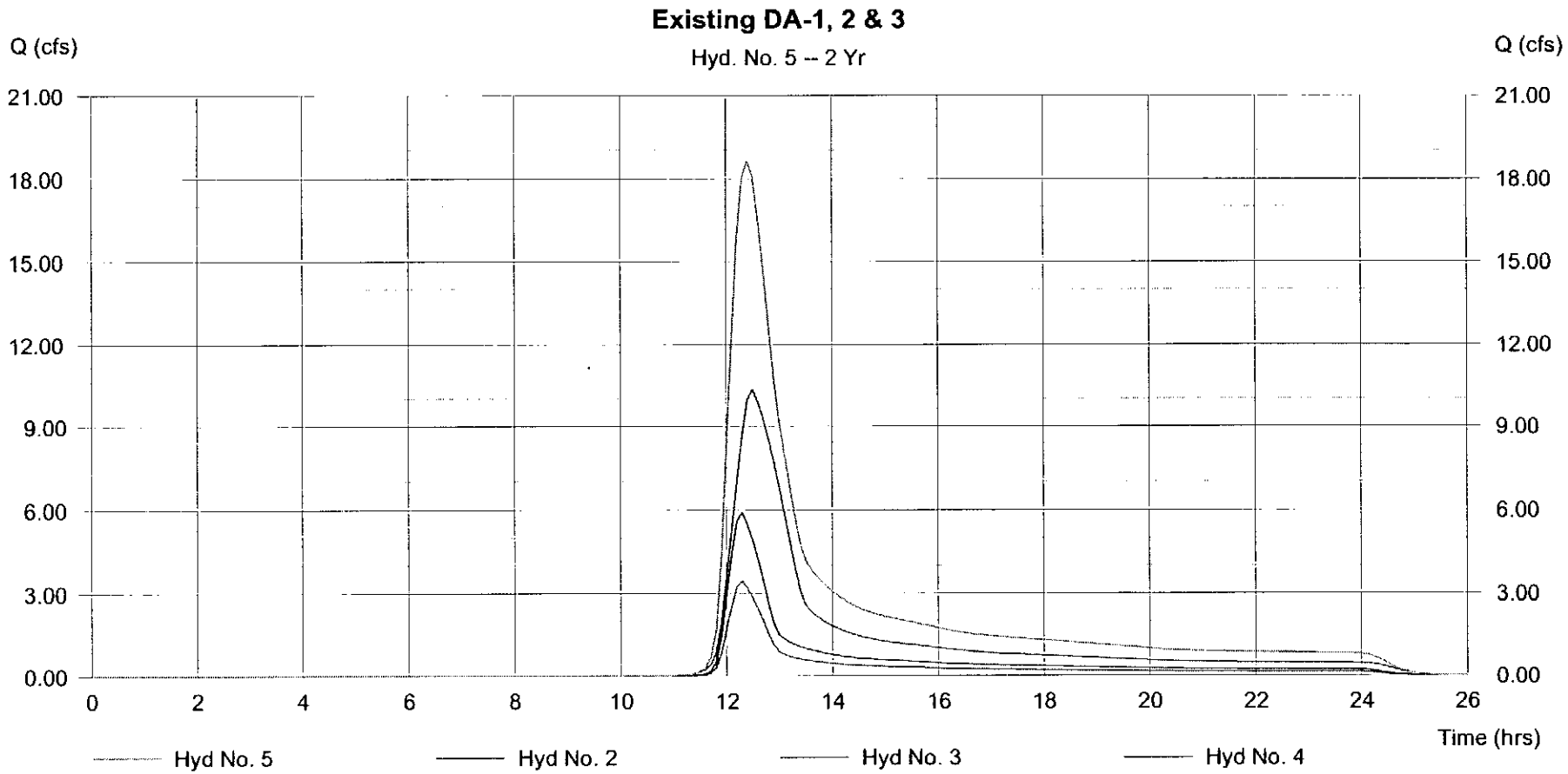
Thursday, May 3 2007, 4:2 PM

Hyd. No. 5

Existing DA-1, 2 & 3

Hydrograph type	= Combine	Peak discharge	= 18.64 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hyds.	= 2, 3, 4		

Hydrograph Volume = 2.852 acft



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	422.71	6	792	117.963	----	------	------	Basin
2	SCS Runoff	5.939	6	738	0.715	----	------	------	Existing DA No. 1
3	SCS Runoff	16.90	6	750	2.594	----	------	------	Existing DA No. 2
4	SCS Runoff	10.19	6	738	1.226	----	------	------	Existing DA No. 3
5	Combine	31.20	6	744	4.535	2, 3, 4	------	------	Existing DA-1, 2 & 3
6	SCS Runoff	18.06	6	720	1.286	----	------	------	Proposed DA No. 1
7	SCS Runoff	57.36	6	720	4.069	----	------	------	Proposed DA No. 2
8	Combine	81.00	6	720	6.581	4, 6, 7	------	------	Prop. DA-1 & 2 with Exist. DA-3
9	Reservoir	28.67	6	738	6.580	8	1343.39	2.398	East Detention Outlet

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

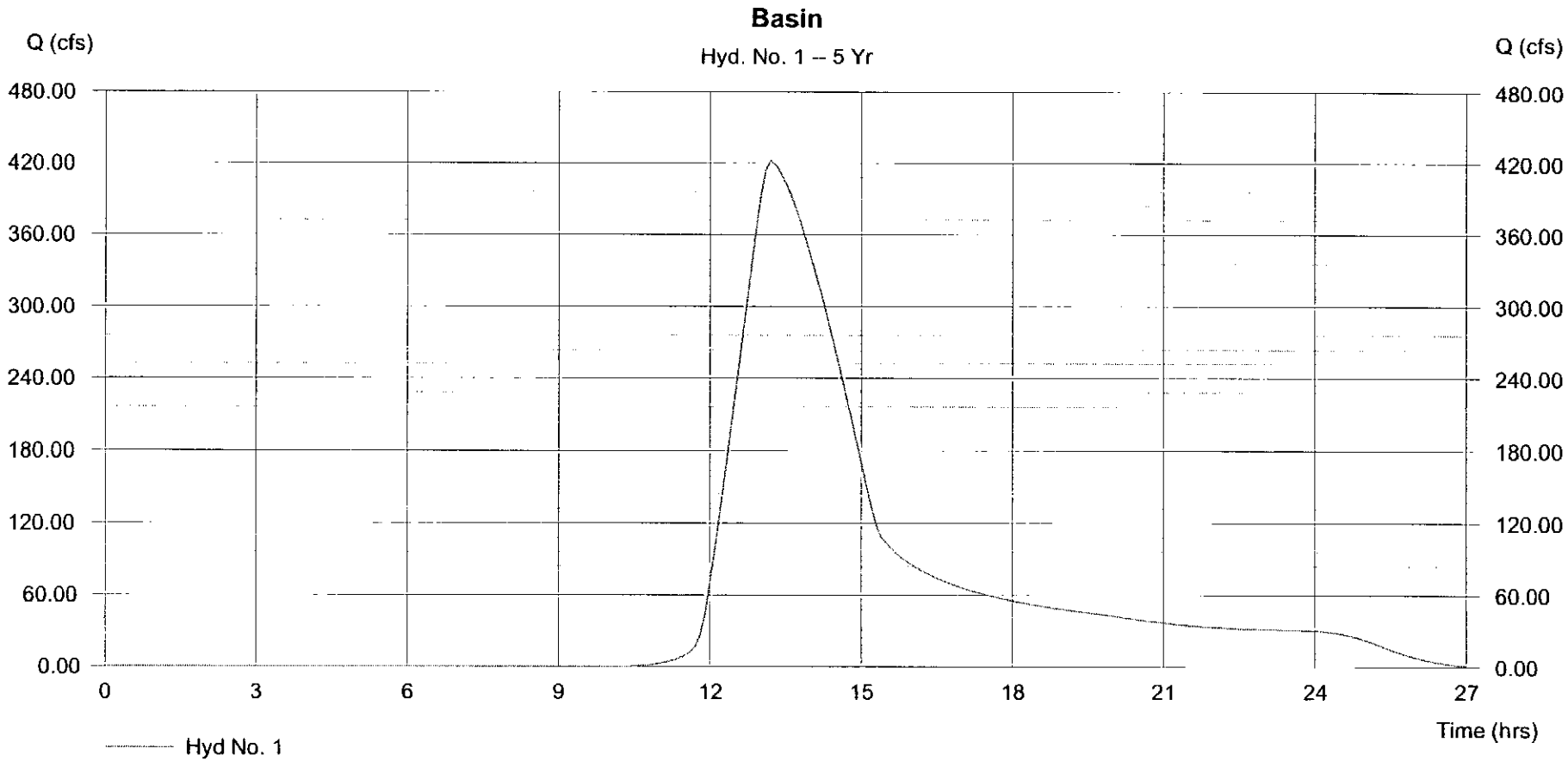
Thursday, May 3 2007, 4:3 PM

Hyd. No. 1

Basin

Hydrograph type	= SCS Runoff	Peak discharge	= 422.71 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Drainage area	= 754.917 ac	Curve number	= 71.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 128.90 min
Total precip.	= 4.56 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 117.963 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

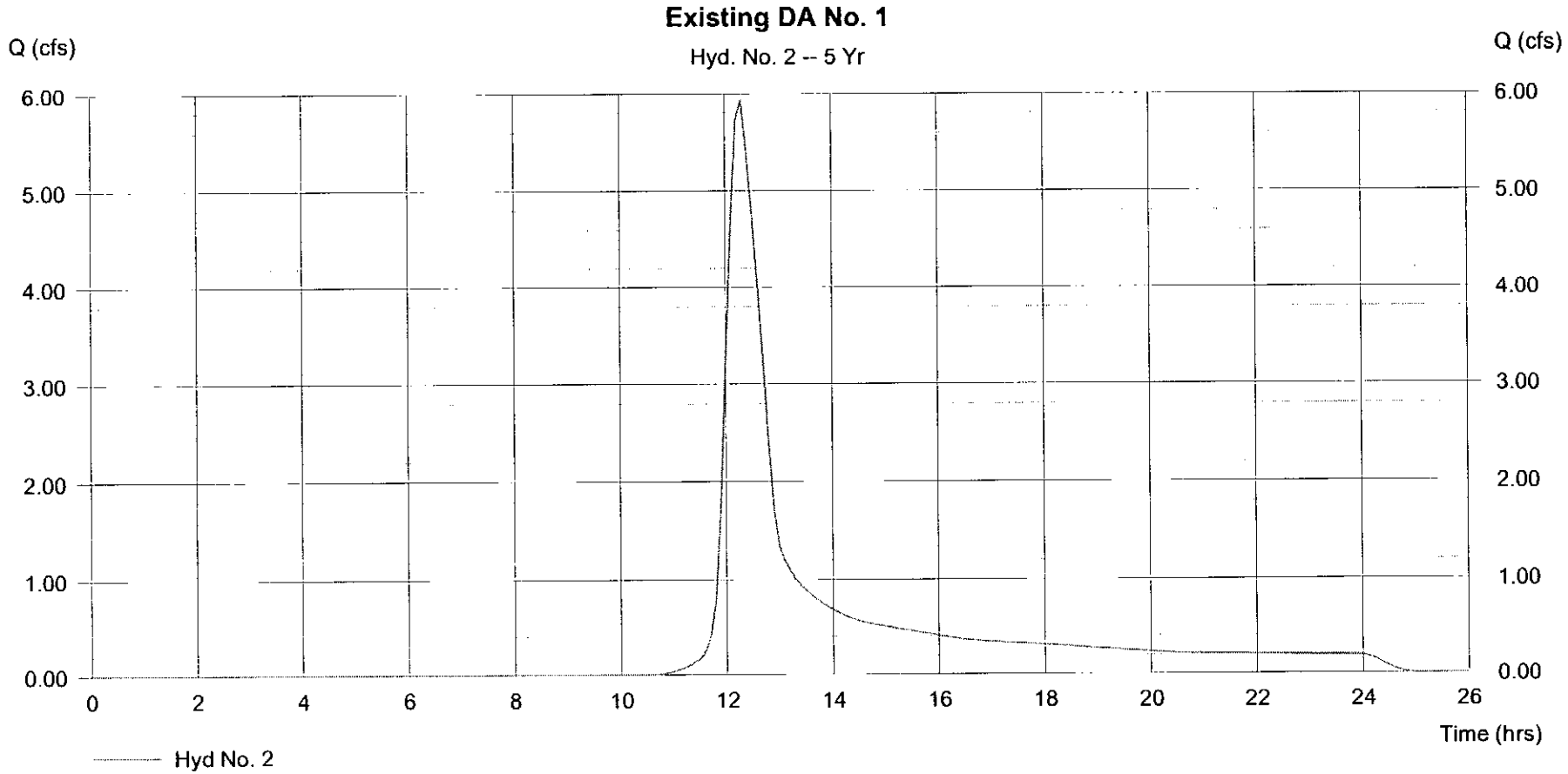
Thursday, May 3 2007, 4:3 PM

Hyd. No. 2

Existing DA No. 1

Hydrograph type	= SCS Runoff	Peak discharge	= 5.939 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Drainage area	= 5.059 ac	Curve number	= 69
Basin Slope	= 0.9 %	Hydraulic length	= 980 ft
Tc method	= USER	Time of conc. (Tc)	= 31.90 min
Total precip.	= 4.56 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 0.715 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

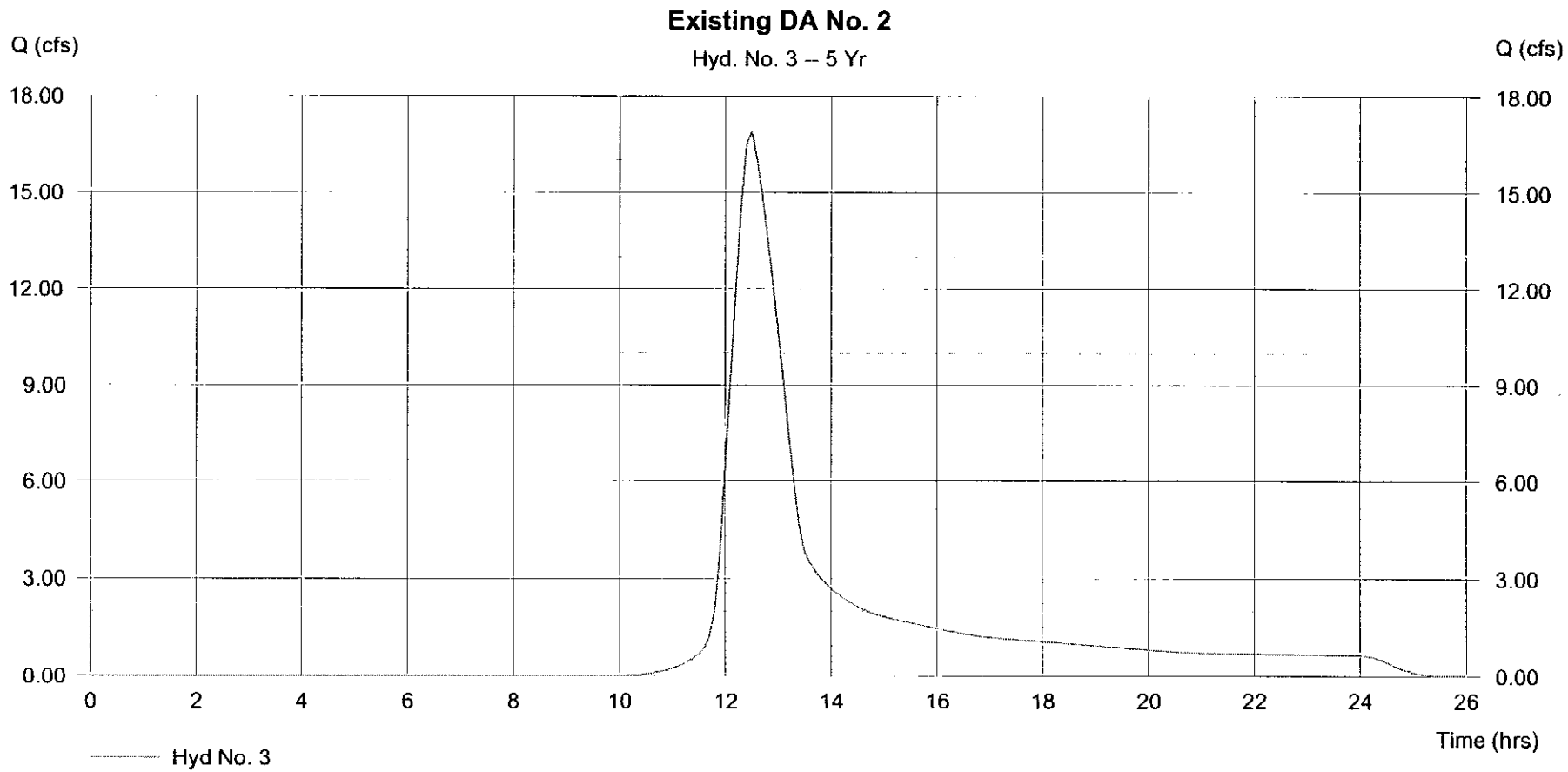
Thursday, May 3 2007, 4:3 PM

Hyd. No. 3

Existing DA No. 2

Hydrograph type	= SCS Runoff	Peak discharge	= 16.90 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Drainage area	= 16.559 ac	Curve number	= 72.2
Basin Slope	= 1.2 %	Hydraulic length	= 1700 ft
Tc method	= LAG	Time of conc. (Tc)	= 56.40 min
Total precip.	= 4.56 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 2.594 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

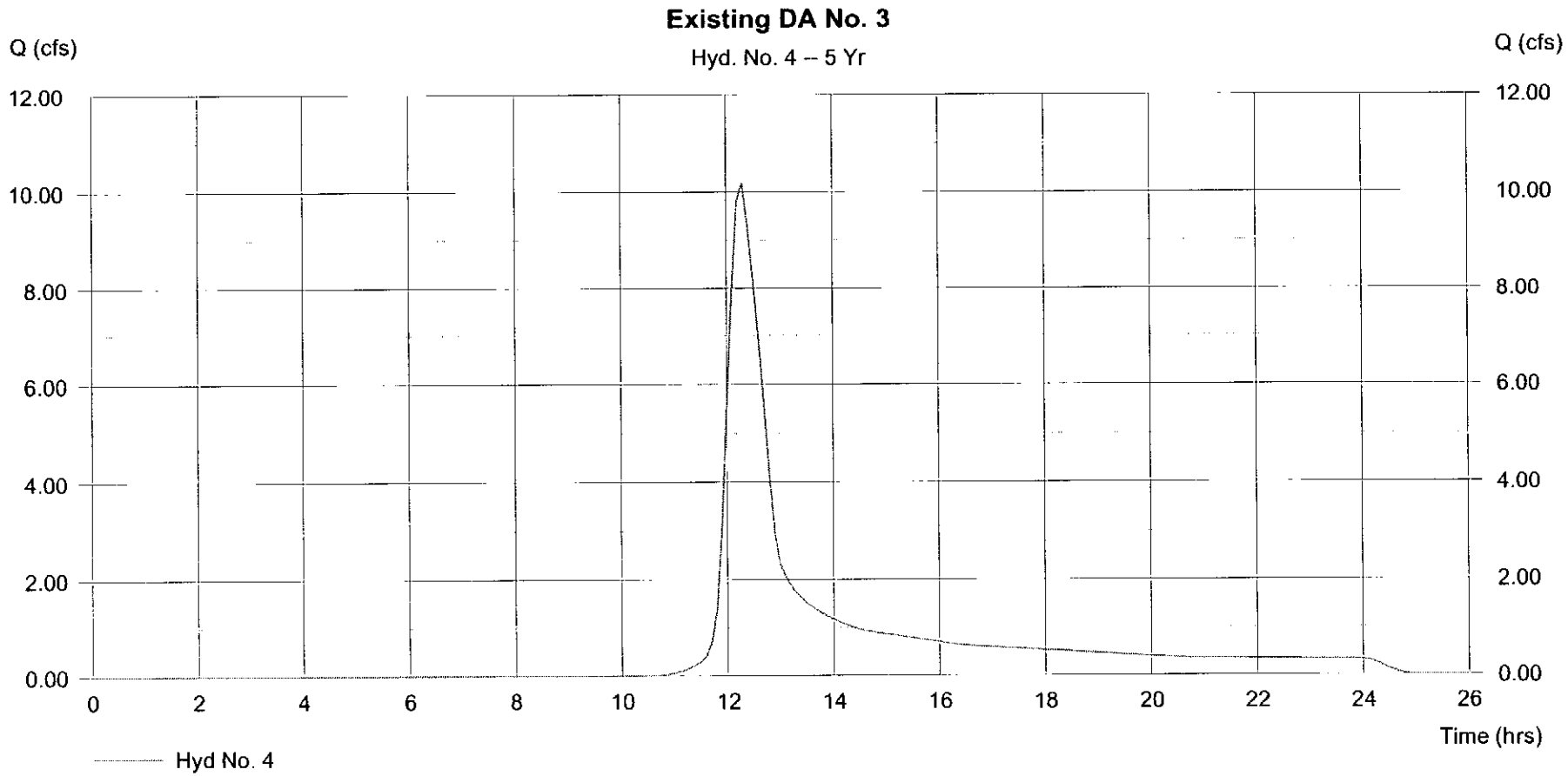
Thursday, May 3 2007, 4:3 PM

Hyd. No. 4

Existing DA No. 3

Hydrograph type	= SCS Runoff	Peak discharge	= 10.19 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Drainage area	= 8.680 ac	Curve number	= 69
Basin Slope	= 1.2 %	Hydraulic length	= 1000 ft
Tc method	= LAG	Time of conc. (Tc)	= 39.80 min
Total precip.	= 4.56 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 1.226 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

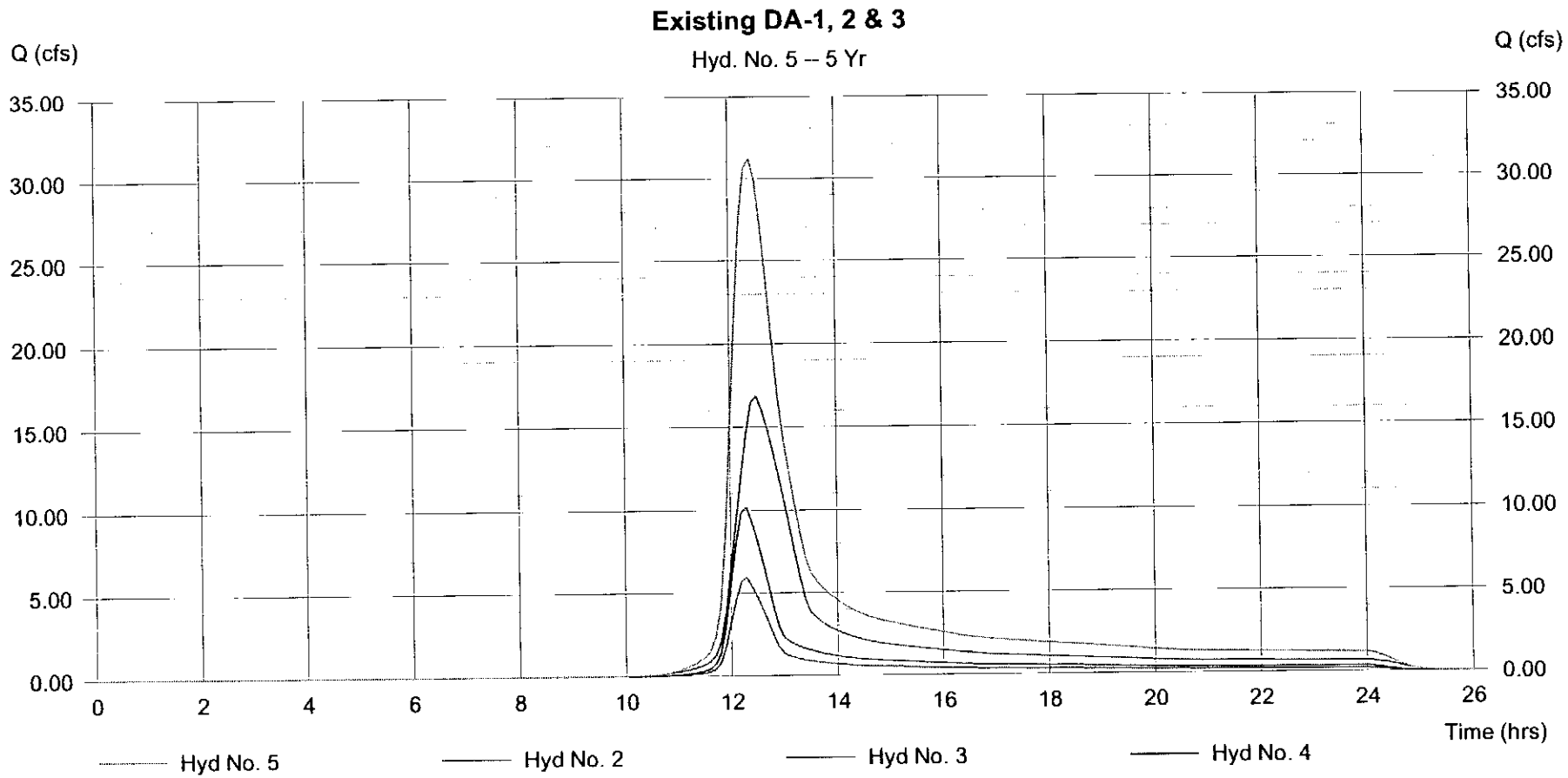
Thursday, May 3 2007, 4:3 PM

Hyd. No. 5

Existing DA-1, 2 & 3

Hydrograph type	= Combine	Peak discharge	= 31.20 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Inflow hyds.	= 2, 3, 4		

Hydrograph Volume = 4.535 acft



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	559.04	6	792	152.884	----	------	------	Basin
2	SCS Runoff	7.970	6	738	0.940	----	------	------	Existing DA No. 1
3	SCS Runoff	22.18	6	750	3.357	----	------	------	Existing DA No. 2
4	SCS Runoff	13.67	6	738	1.614	----	------	------	Existing DA No. 3
5	Combine	41.39	6	744	5.911	2, 3, 4	------	------	Existing DA-1, 2 & 3
6	SCS Runoff	21.71	6	720	1.555	----	------	------	Proposed DA No. 1
7	SCS Runoff	69.32	6	720	4.944	----	------	------	Proposed DA No. 2
8	Combine	98.86	6	720	8.113	4, 6, 7	------	------	Prop. DA-1 & 2 with Exist. DA-3
9	Reservoir	36.85	6	738	8.112	8	1343.88	2.896	East Detention Outlet

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

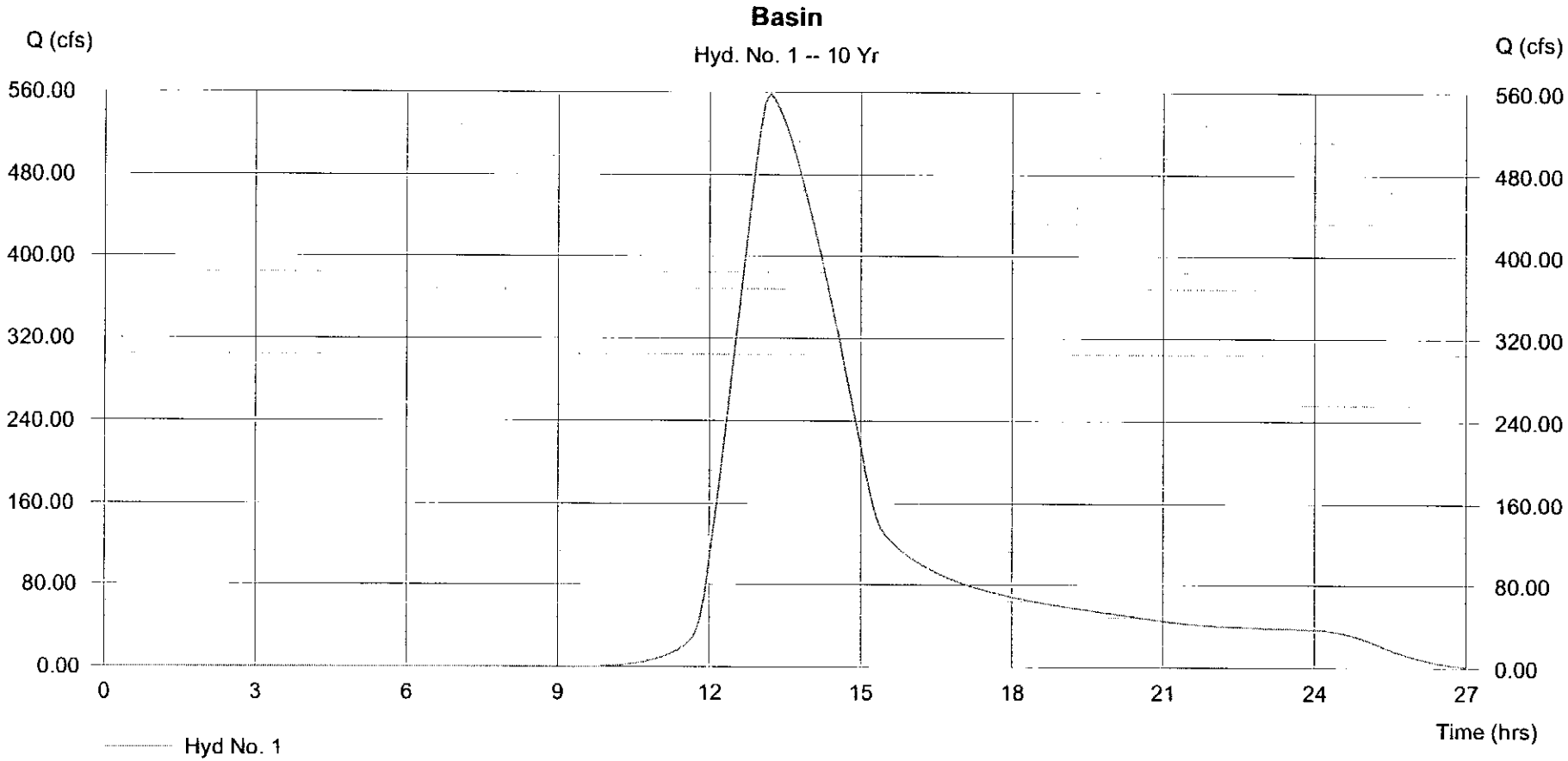
Thursday, May 3 2007, 4:3 PM

Hyd. No. 1

Basin

Hydrograph type	= SCS Runoff	Peak discharge	= 559.04 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 754.917 ac	Curve number	= 71.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 128.90 min
Total precip.	= 5.28 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 152.884 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

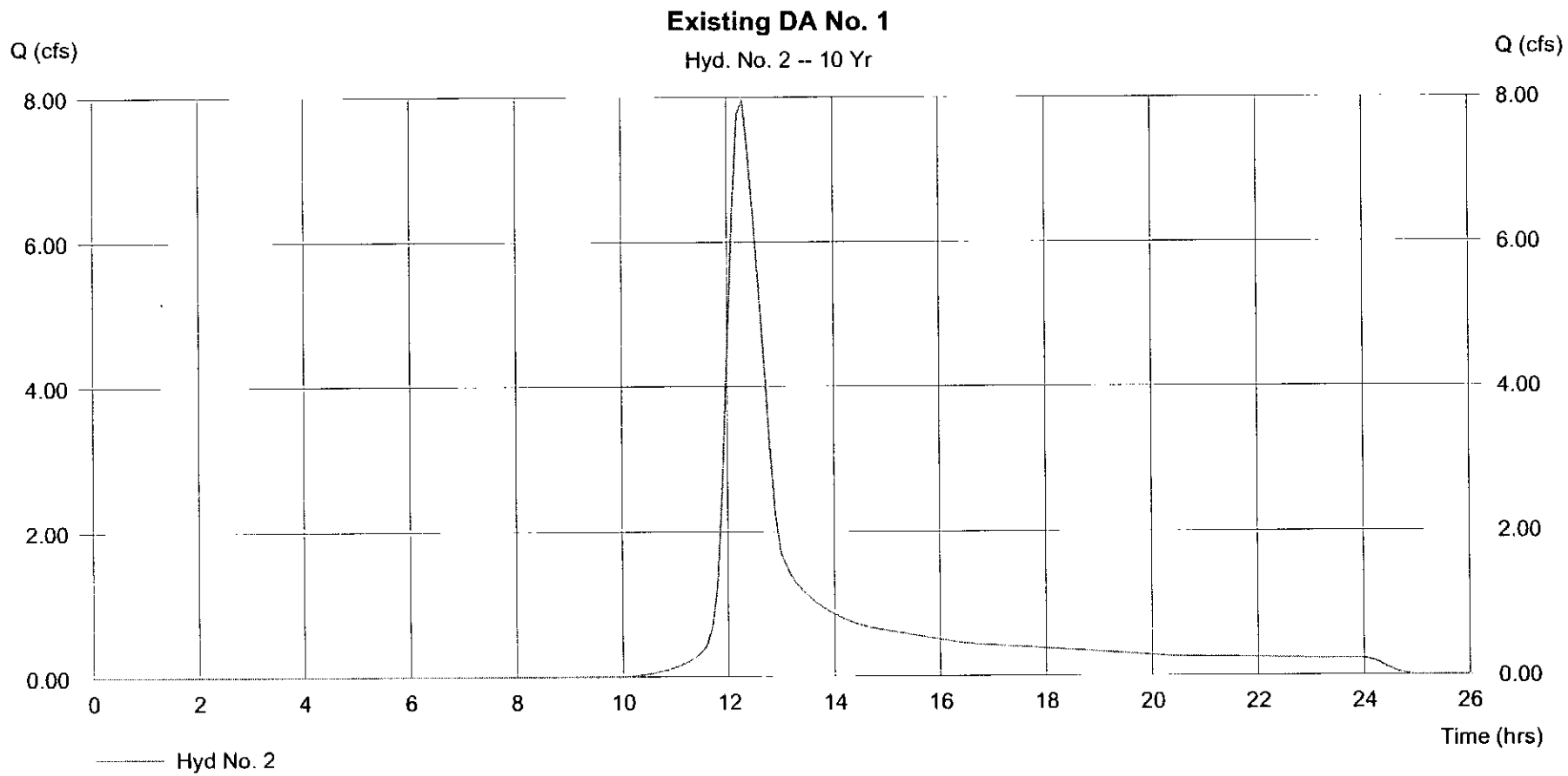
Thursday, May 3 2007, 4:3 PM

Hyd. No. 2

Existing DA No. 1

Hydrograph type	= SCS Runoff	Peak discharge	= 7.970 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 5.059 ac	Curve number	= 69
Basin Slope	= 0.9 %	Hydraulic length	= 980 ft
Tc method	= USER	Time of conc. (Tc)	= 31.90 min
Total precip.	= 5.28 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 0.940 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

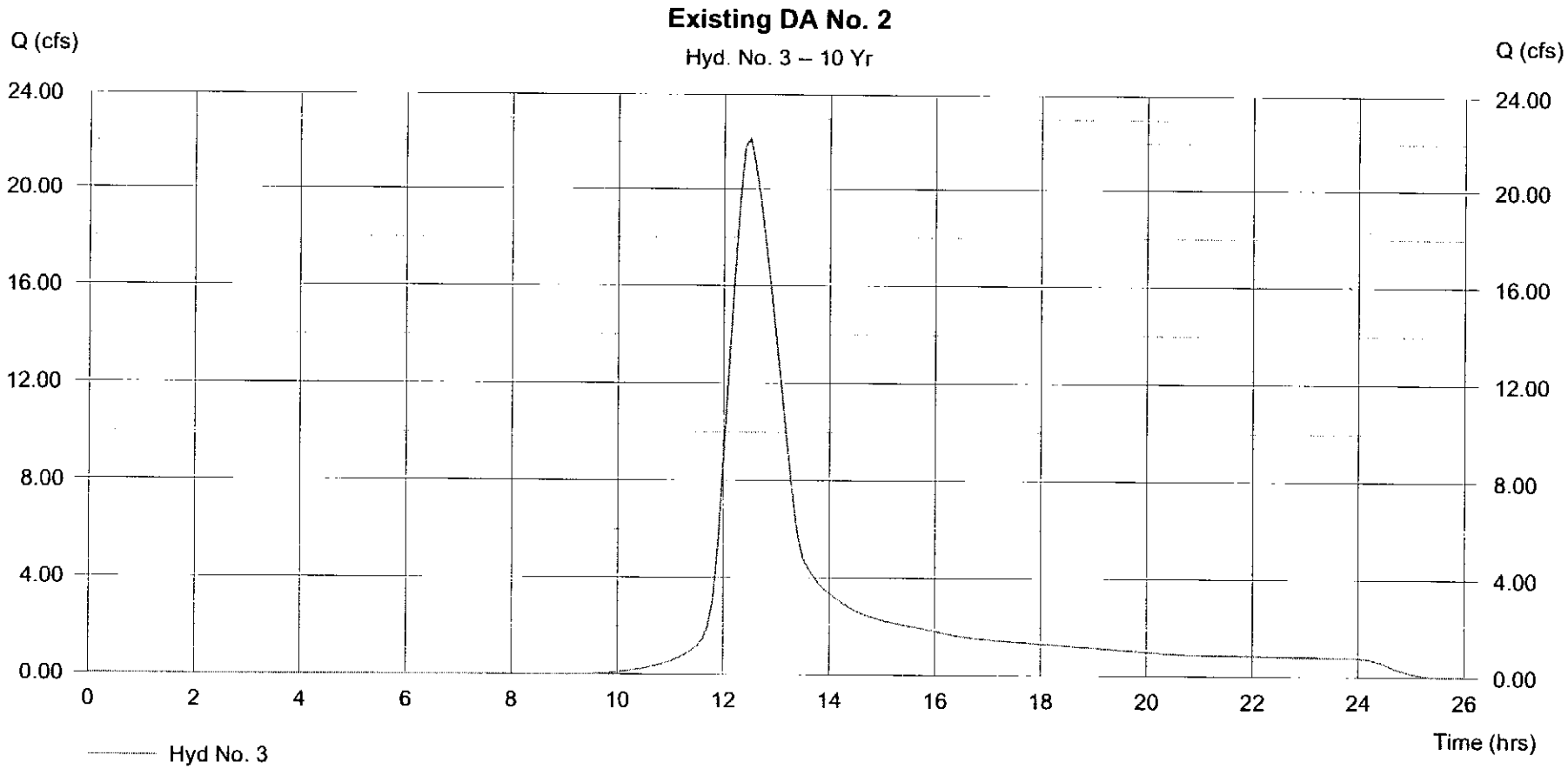
Thursday, May 3 2007, 4:3 PM

Hyd. No. 3

Existing DA No. 2

Hydrograph type	= SCS Runoff	Peak discharge	= 22.18 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 16.559 ac	Curve number	= 72.2
Basin Slope	= 1.2 %	Hydraulic length	= 1700 ft
Tc method	= LAG	Time of conc. (Tc)	= 56.40 min
Total precip.	= 5.28 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 3.357 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

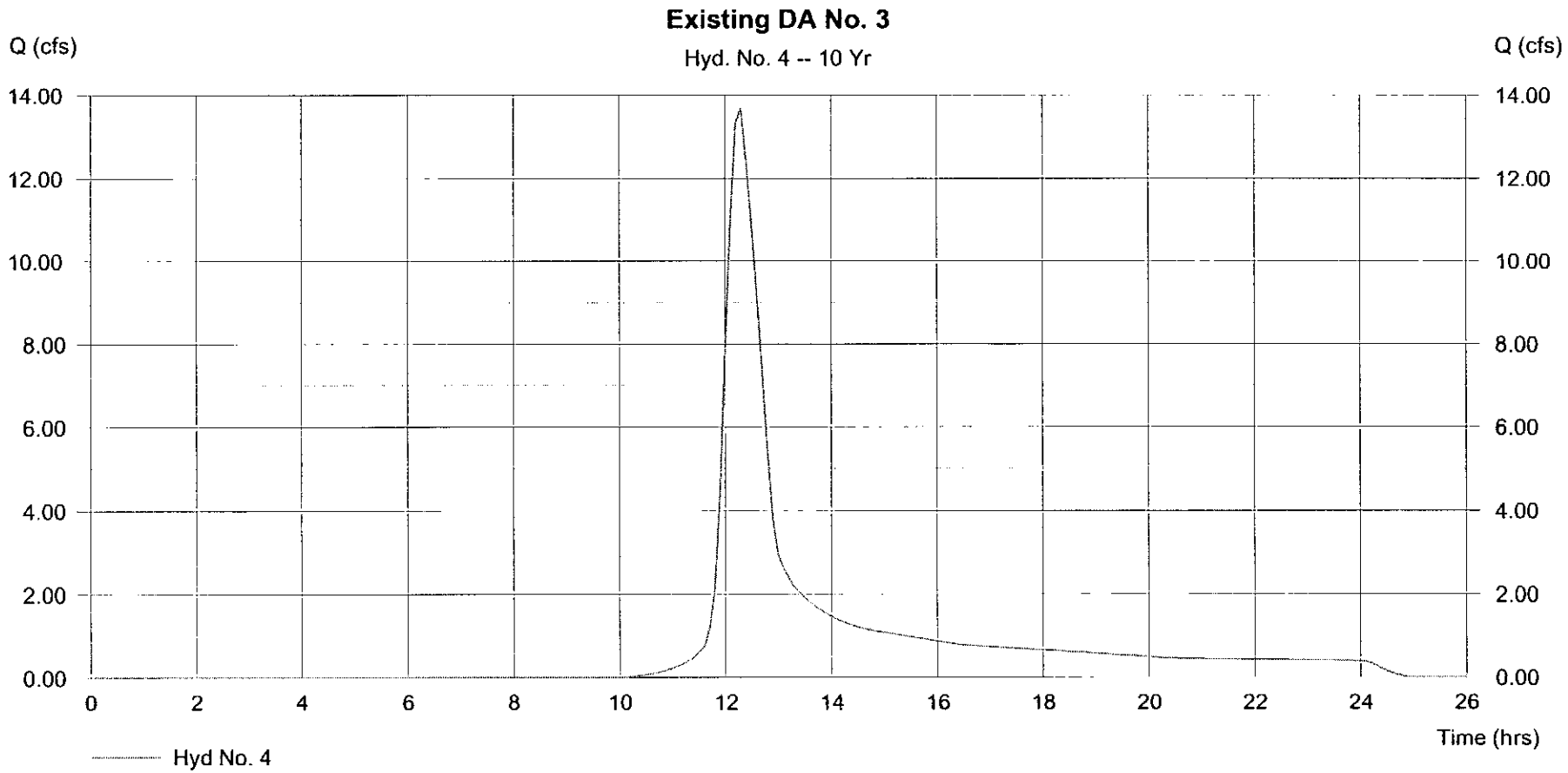
Thursday, May 3 2007, 4:3 PM

Hyd. No. 4

Existing DA No. 3

Hydrograph type	= SCS Runoff	Peak discharge	= 13.67 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 8.680 ac	Curve number	= 69
Basin Slope	= 1.2 %	Hydraulic length	= 1000 ft
Tc method	= LAG	Time of conc. (Tc)	= 39.80 min
Total precip.	= 5.28 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 1.614 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

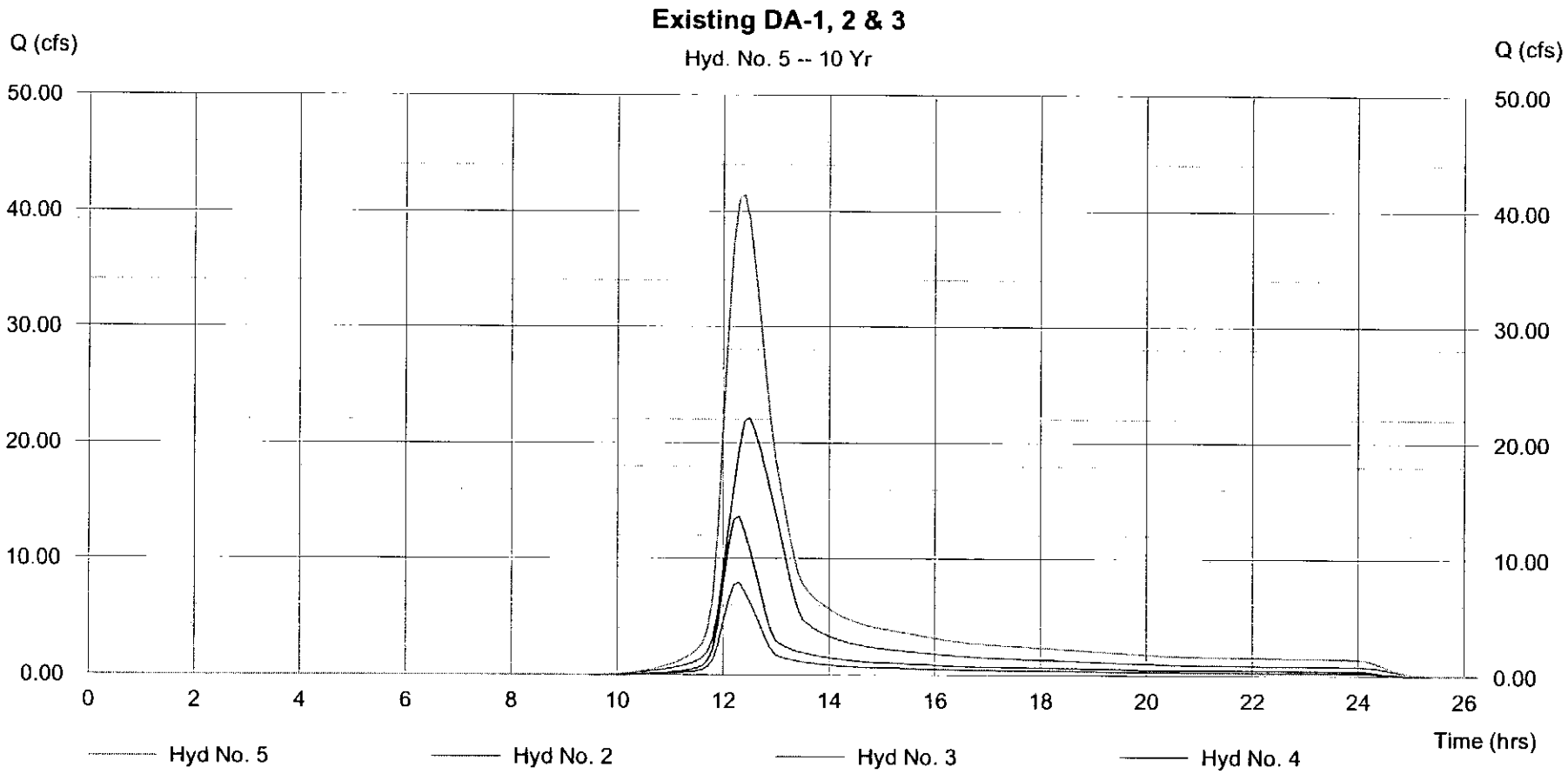
Thursday, May 3 2007, 4:3 PM

Hyd. No. 5

Existing DA-1, 2 & 3

Hydrograph type	= Combine	Peak discharge	= 41.39 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hyds.	= 2, 3, 4		

Hydrograph Volume = 5.911 acft



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	750.04	6	792	202.031	----	------	------	Basin
2	SCS Runoff	10.83	6	738	1.261	----	------	------	Existing DA No. 1
3	SCS Runoff	29.55	6	750	4.430	----	------	------	Existing DA No. 2
4	SCS Runoff	18.59	6	738	2.164	----	------	------	Existing DA No. 3
5	Combine	55.68	6	744	7.855	2, 3, 4	------	------	Existing DA-1, 2 & 3
6	SCS Runoff	26.57	6	720	1.920	----	------	------	Proposed DA No. 1
7	SCS Runoff	85.25	6	720	6.127	----	------	------	Proposed DA No. 2
8	Combine	122.90	6	720	10.211	4, 6, 7	------	------	Prop. DA-1 & 2 with Exist. DA-3
9	Reservoir	48.13	6	738	10.210	8	1344.50	3.555	East Detention Outlet

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

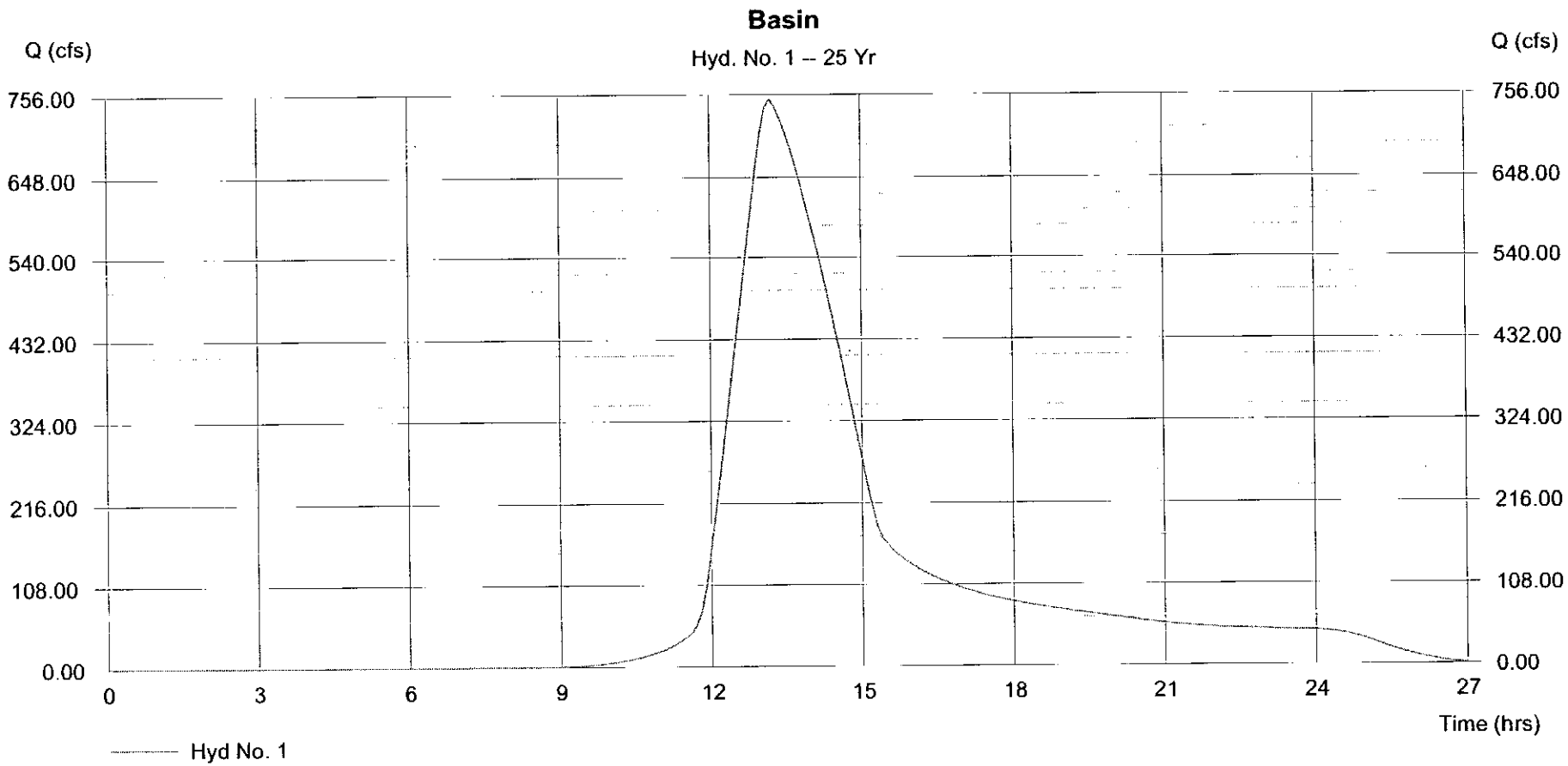
Thursday, May 3 2007, 4:5 PM

Hyd. No. 1

Basin

Hydrograph type	= SCS Runoff	Peak discharge	= 750.04 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Drainage area	= 754.917 ac	Curve number	= 71.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 128.90 min
Total precip.	= 6.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 202.031 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

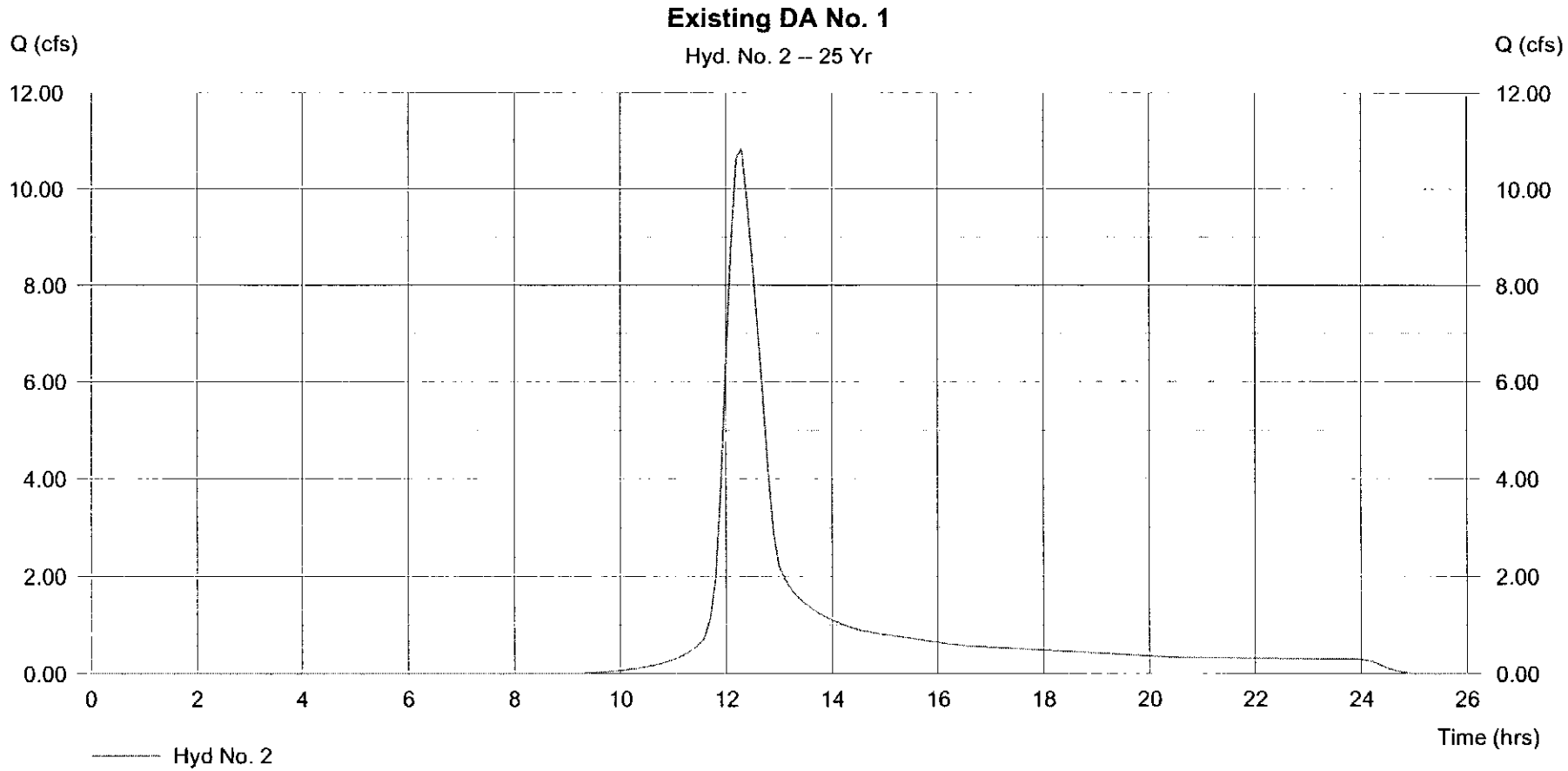
Thursday, May 3 2007, 4:5 PM

Hyd. No. 2

Existing DA No. 1

Hydrograph type	= SCS Runoff	Peak discharge	= 10.83 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Drainage area	= 5.059 ac	Curve number	= 69
Basin Slope	= 0.9 %	Hydraulic length	= 980 ft
Tc method	= USER	Time of conc. (Tc)	= 31.90 min
Total precip.	= 6.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 1.261 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

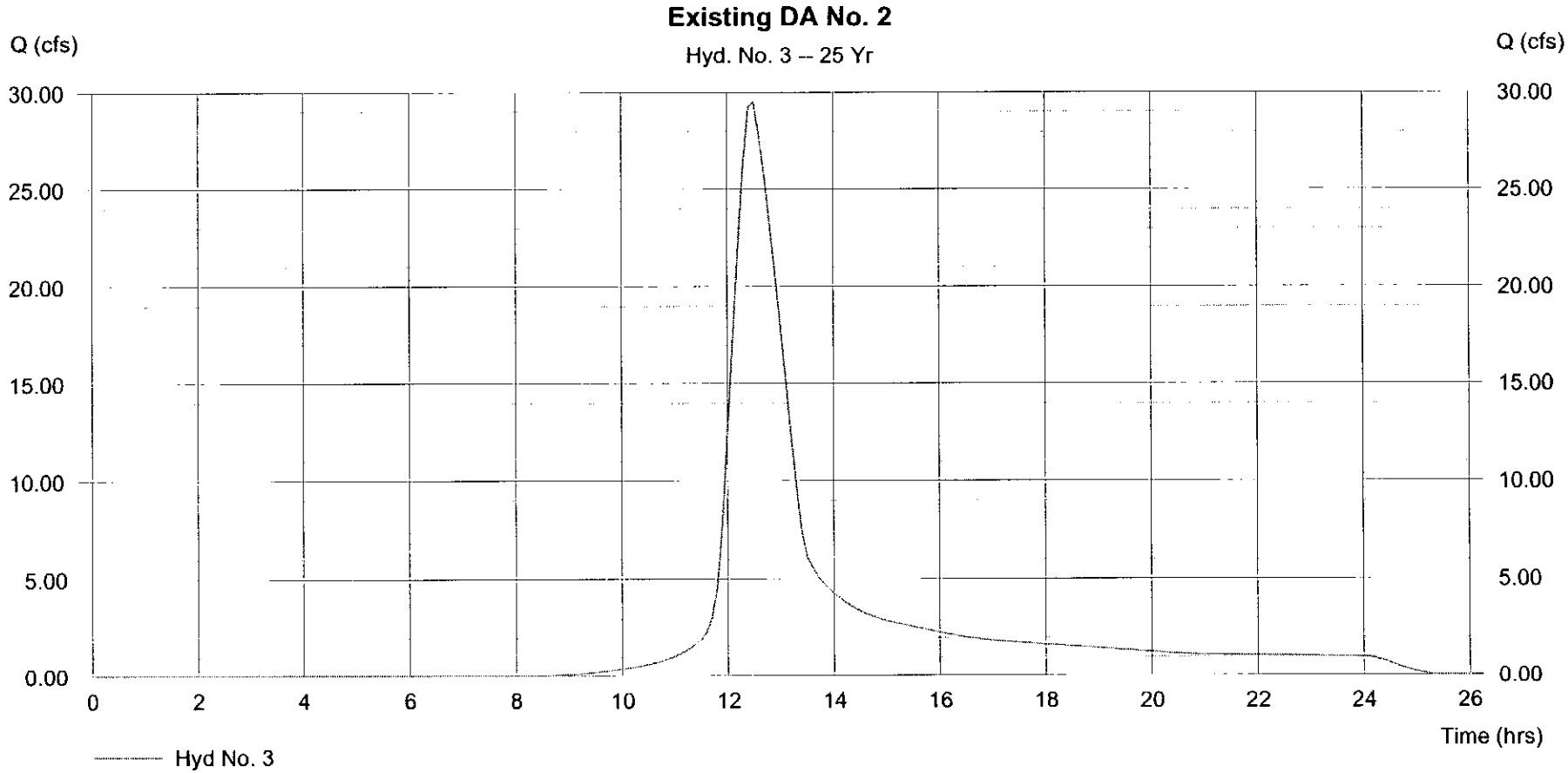
Thursday, May 3 2007, 4:5 PM

Hyd. No. 3

Existing DA No. 2

Hydrograph type	= SCS Runoff	Peak discharge	= 29.55 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Drainage area	= 16.559 ac	Curve number	= 72.2
Basin Slope	= 1.2 %	Hydraulic length	= 1700 ft
Tc method	= LAG	Time of conc. (Tc)	= 56.40 min
Total precip.	= 6.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 4.430 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

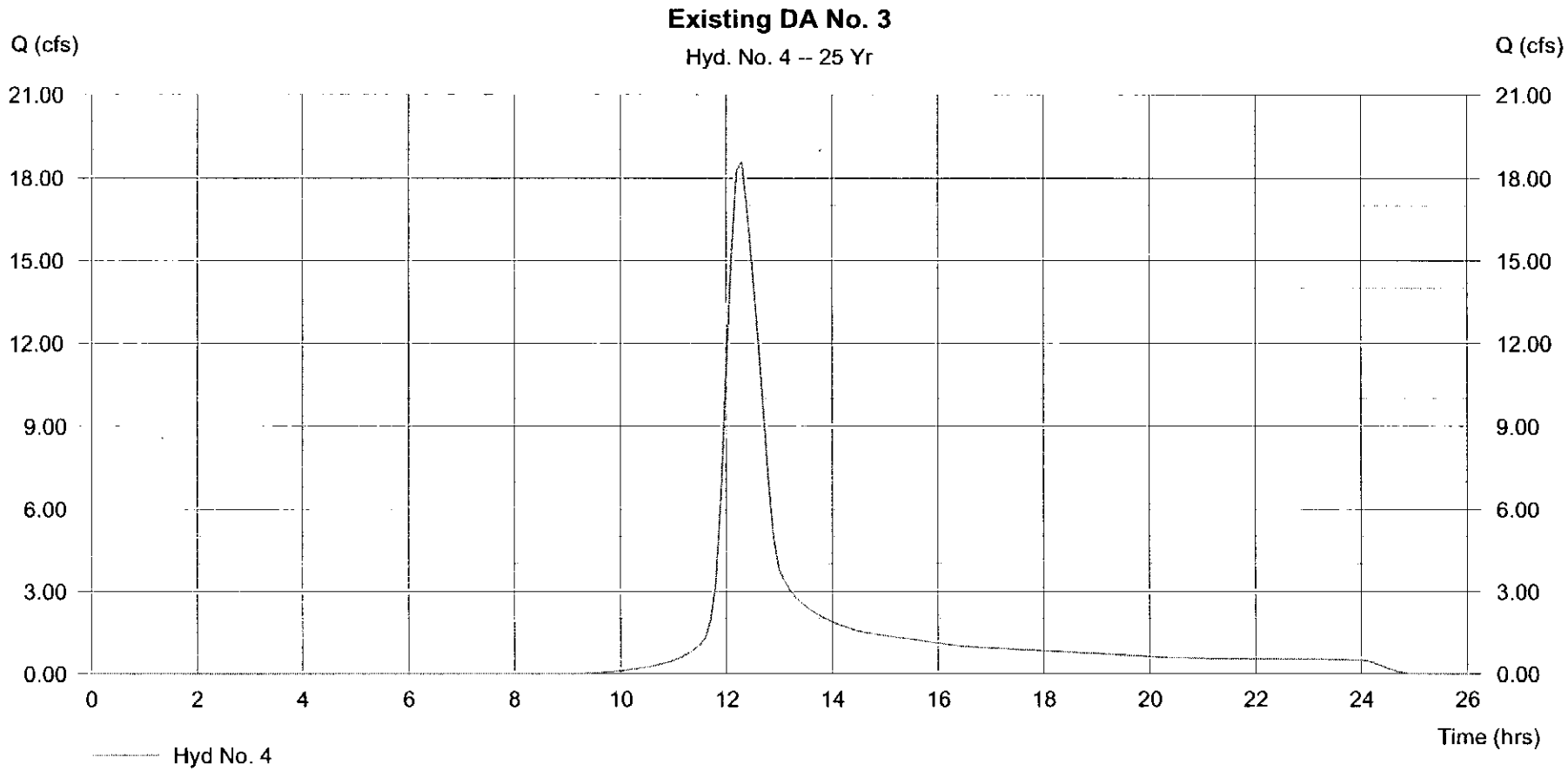
Thursday, May 3 2007, 4:5 PM

Hyd. No. 4

Existing DA No. 3

Hydrograph type	= SCS Runoff	Peak discharge	= 18.59 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Drainage area	= 8.680 ac	Curve number	= 69
Basin Slope	= 1.2 %	Hydraulic length	= 1000 ft
Tc method	= LAG	Time of conc. (Tc)	= 39.80 min
Total precip.	= 6.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 2.164 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

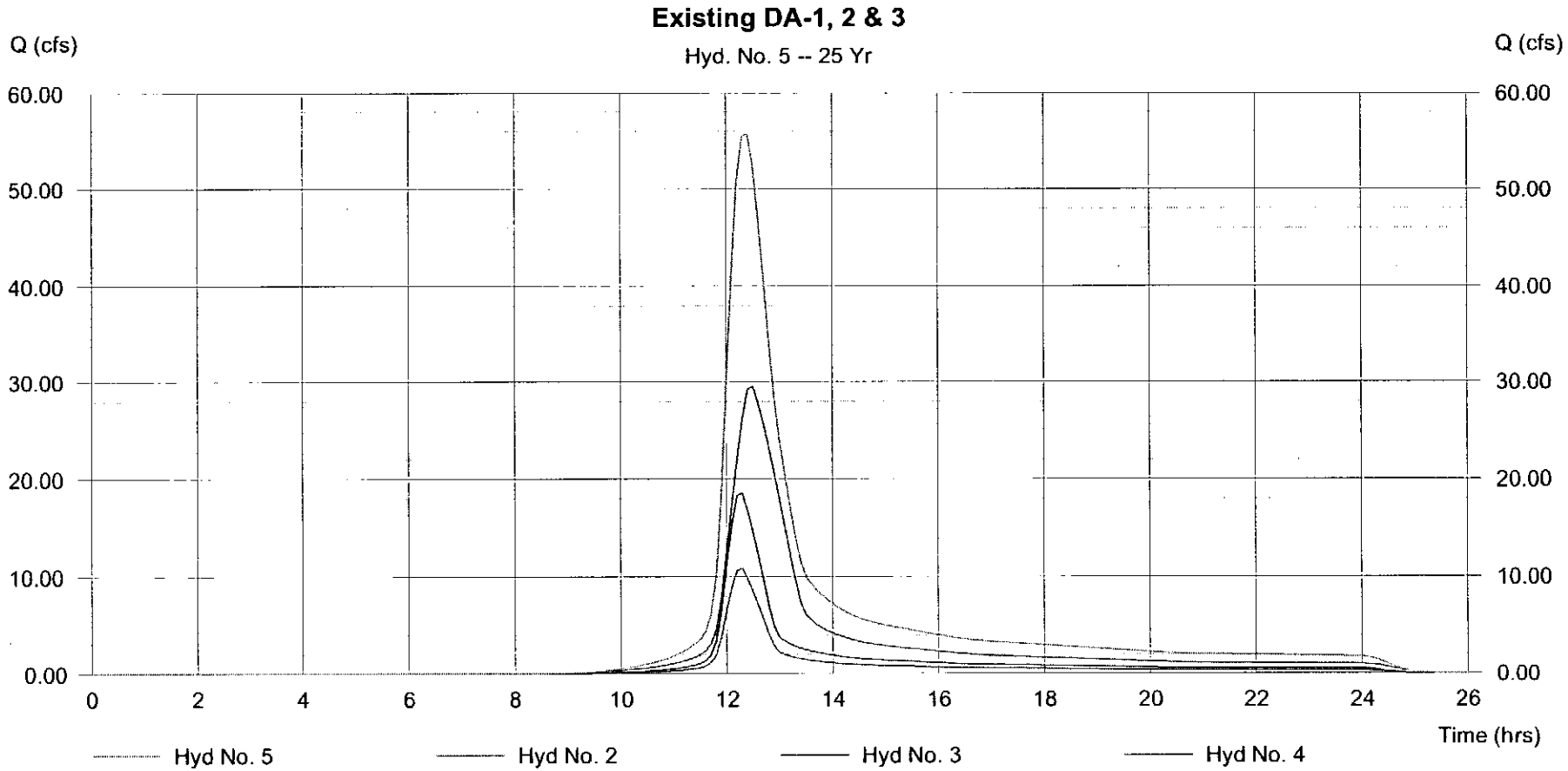
Thursday, May 3 2007, 4:5 PM

Hyd. No. 5

Existing DA-1, 2 & 3

Hydrograph type	= Combine	Peak discharge	= 55.68 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Inflow hyds.	= 2, 3, 4		

Hydrograph Volume = 7.855 acft



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	1049.52	6	792	279.690	----	------	------	Basin
2	SCS Runoff	15.35	6	738	1.773	----	------	------	Existing DA No. 1
3	SCS Runoff	41.05	6	750	6.123	----	------	------	Existing DA No. 2
4	SCS Runoff	26.33	6	738	3.043	----	------	------	Existing DA No. 3
5	Combine	78.45	6	738	10.939	2, 3, 4	------	------	Existing DA-1, 2 & 3
6	SCS Runoff	33.82	6	720	2.472	----	------	------	Proposed DA No. 1
7	SCS Runoff	109.05	6	720	7.926	----	------	------	Proposed DA No. 2
8	Combine	159.17	6	720	13.441	4, 6, 7	------	------	Prop. DA-1 & 2 with Exist. DA-3
9	Reservoir	65.47	6	738	13.440	8	1345.36	4.530	East Detention Outlet

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

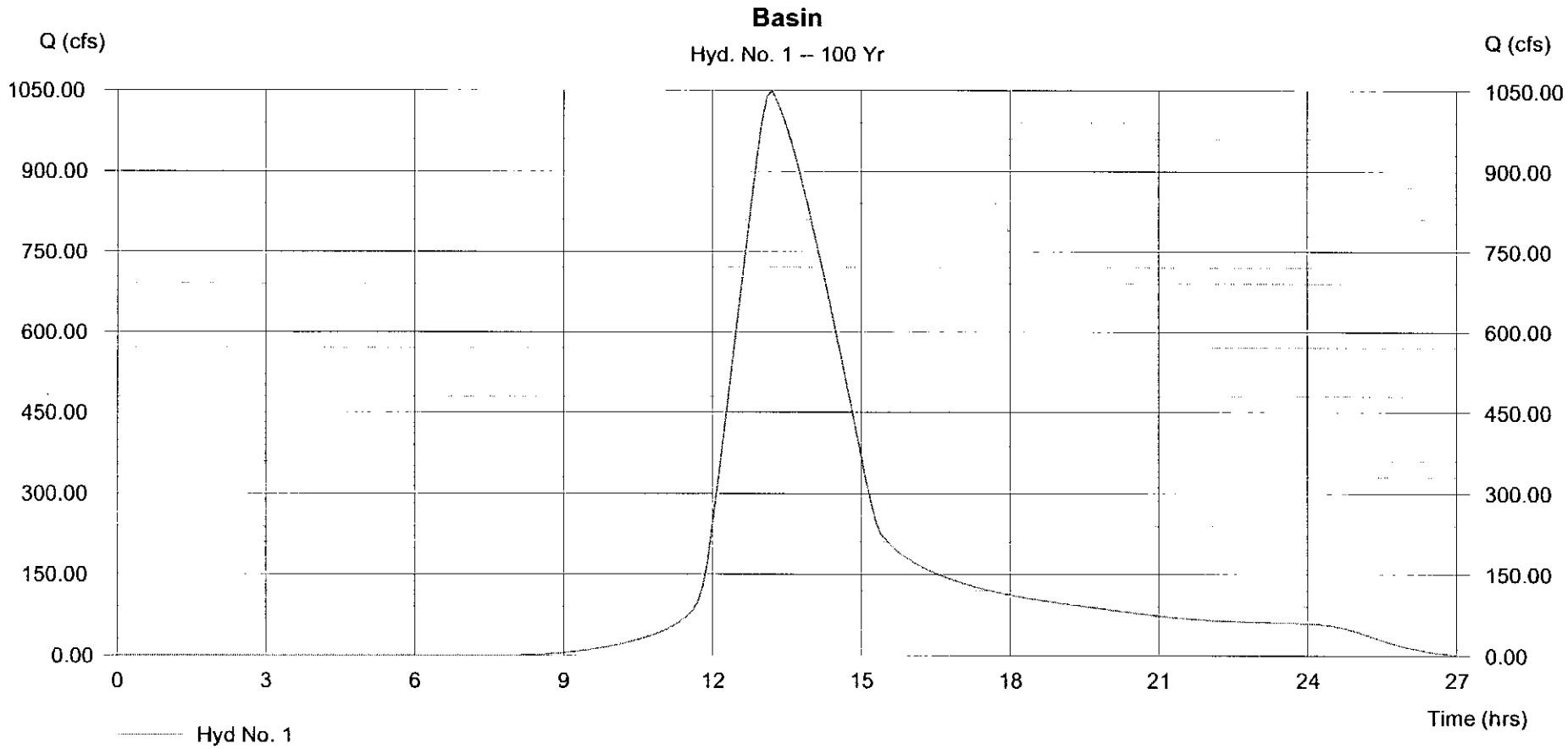
Thursday, May 3 2007, 4:5 PM

Hyd. No. 1

Basin

Hydrograph type	= SCS Runoff	Peak discharge	= 1049.52 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 754.917 ac	Curve number	= 71.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 128.90 min
Total precip.	= 7.68 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 279.690 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

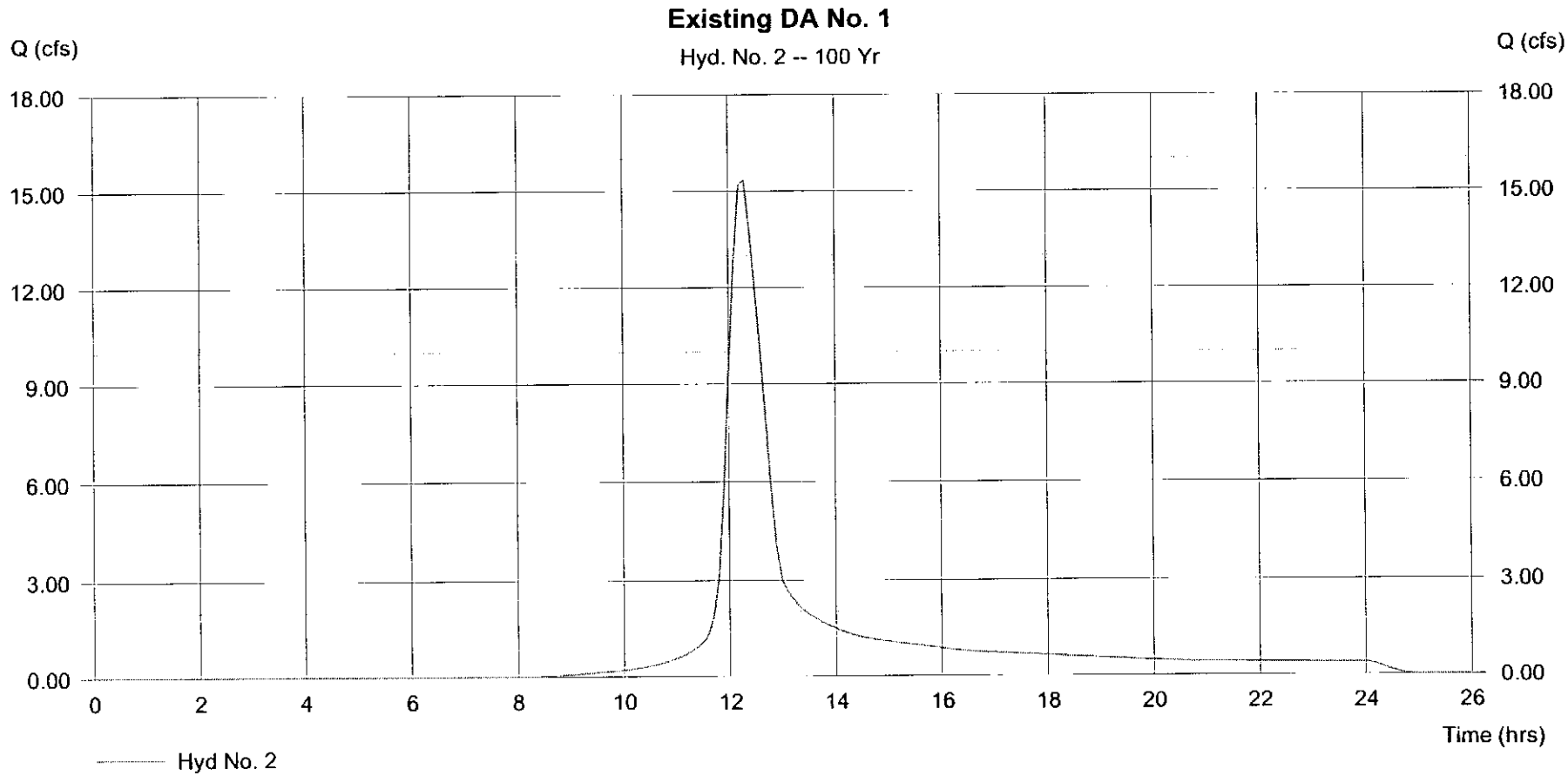
Thursday, May 3 2007, 4:5 PM

Hyd. No. 2

Existing DA No. 1

Hydrograph type	= SCS Runoff	Peak discharge	= 15.35 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 5.059 ac	Curve number	= 69
Basin Slope	= 0.9 %	Hydraulic length	= 980 ft
Tc method	= USER	Time of conc. (Tc)	= 31.90 min
Total precip.	= 7.68 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 1.773 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

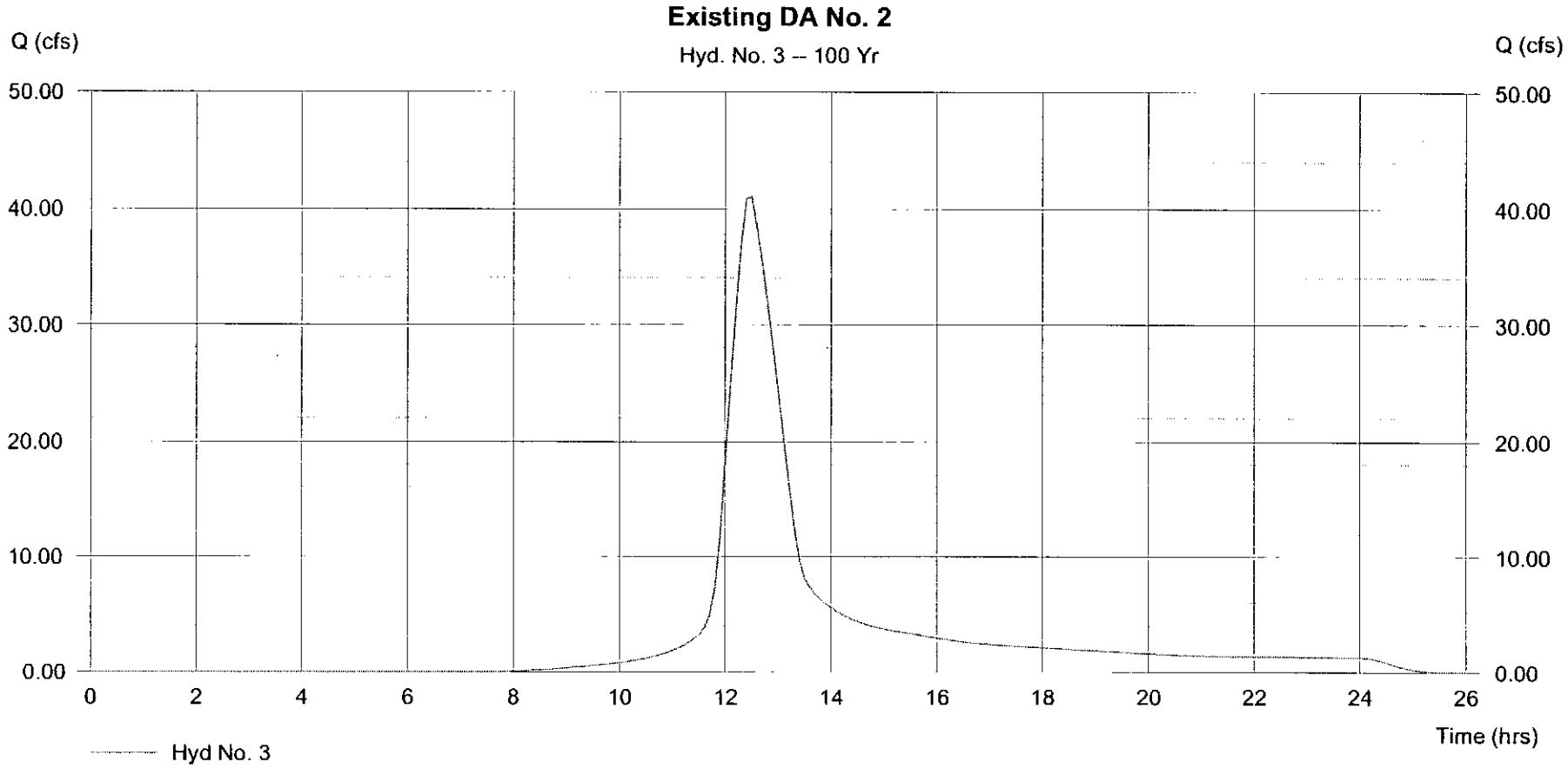
Thursday, May 3 2007, 4:5 PM

Hyd. No. 3

Existing DA No. 2

Hydrograph type	= SCS Runoff	Peak discharge	= 41.05 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 16.559 ac	Curve number	= 72.2
Basin Slope	= 1.2 %	Hydraulic length	= 1700 ft
Tc method	= LAG	Time of conc. (Tc)	= 56.40 min
Total precip.	= 7.68 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 6.123 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

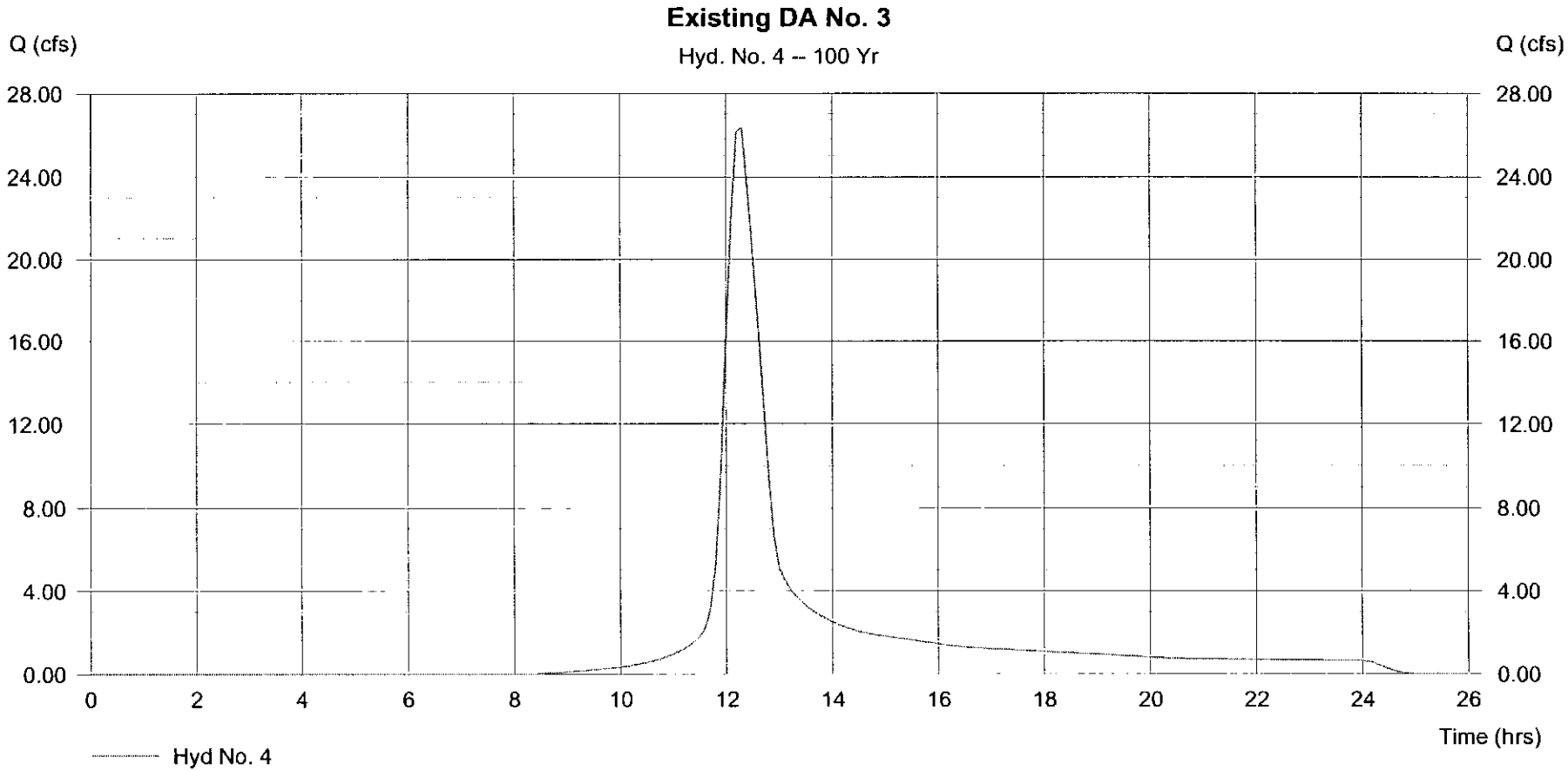
Thursday, May 3 2007, 4:5 PM

Hyd. No. 4

Existing DA No. 3

Hydrograph type	= SCS Runoff	Peak discharge	= 26.33 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 8.680 ac	Curve number	= 69
Basin Slope	= 1.2 %	Hydraulic length	= 1000 ft
Tc method	= LAG	Time of conc. (Tc)	= 39.80 min
Total precip.	= 7.68 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 3.043 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

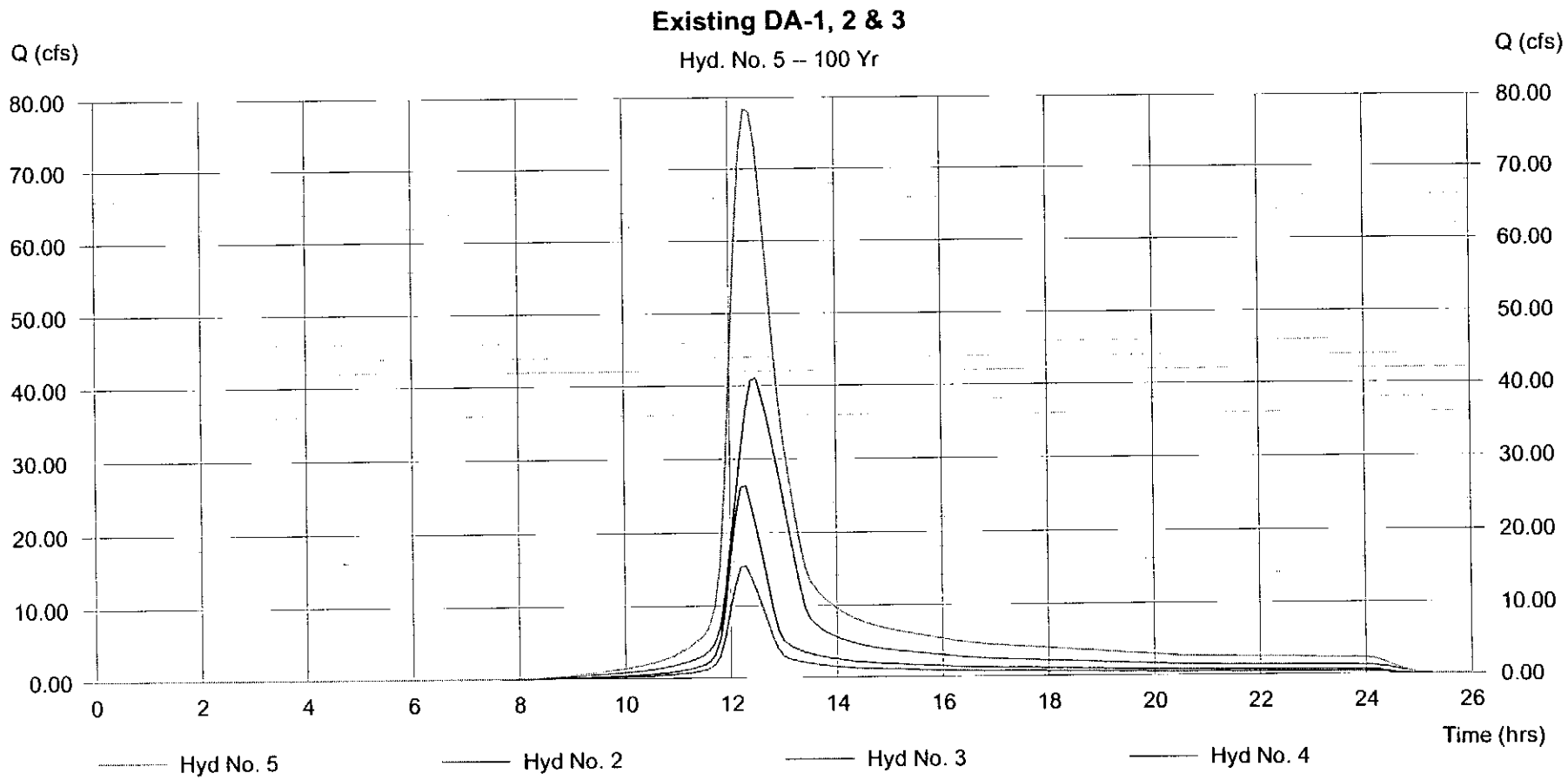
Thursday, May 3 2007, 4:5 PM

Hyd. No. 5

Existing DA-1, 2 & 3

Hydrograph type	= Combine	Peak discharge	= 78.45 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyds.	= 2, 3, 4		

Hydrograph Volume = 10.939 acft



Tab 3. Post-Development Hydrologic Analysis

A. Proposed conditions hydrologic and hydraulic analysis

The analysis was completed using the SCS Hydrograph method. The 2, 5, 10, 25, & 100 year, 24-hour storm events were evaluated. The information appears in Exhibits 3-1. The results are summarized in the following table.

	24-Hour Storm Flows (cfs)				
Area/Frequency	2-Year	5-Year	10-Year	25-Year	100-Year
DA-1	13.20	18.06	21.71	26.57	33.82
DA-2	41.51	57.36	69.32	85.25	109.05
DA-1, 2, & 3	57.61	81.00	98.86	122.90	159.17

B. Proposed times of concentration used in calculations

Area	T_c (min)
DA-1	15.0
DA-2	15.0
DA-3	39.8

C. Assumed post-developed runoff curve numbers

See table shown in Tab 2, Section O for proposed curve numbers.

D. Proposed contours for detention facilities

Proposed detention areas are shown on the drainage plan, Exhibit 1-7.

E. Preliminary sizing calculations for storm water controls

Sizing for all storm water controls is shown in Exhibit 3-1.

F. Stage-storage-discharge curve and inflow/outflow hydrographs for storage facilities

Storage facility calculations and results are found in Exhibit 3-1.

G. Final analysis of potential upstream/downstream impacts

No relevant impacts are noted from this analysis. Any flows entering the site will not be altered with this development. The proposed flows will be less than or equal to the existing flows leaving the site.

H. Existing and proposed structural elevations

No existing structures present on the site. Specific storm sewer networks are outside the scope of this report. However, any future storm sewer designs shall comply with the latest City of Wichita design criteria to convey added site runoff to any proposed on-site detention areas and through control structures with discharge rates at or below those existing prior to any development. The east detention pond design will discharge through a 2'-6" wide broad-crested weir at an elevation of 1340.70. The proposed minimum pad elevations on the site shall be set at least two feet above the 100-year design water surface elevation of detention facilities for any given drainage area unless a higher base flood elevation exists within the same site. The detention pond is shown on the drainage plan, Exhibit 1-7.

I. Design water surface elevations and normal pool elevations for ponds

The east detention pond shall have a normal pool elevation of 1340.70, that being controlled by a 2'-6" wide broad-crested weir at that elevation. Running the 100-year design storm through the outlet weir gives a design-water surface of 1345.36.

J. Typical details for structures

The broad-crested weir will be graded with compacted earth and rip-rap will be placed at the bottom to prevent erosion. Slopes on the side to existing ground will be a maximum of 4:1 with permanent grass seeding.

K. Proposed limits of clearing and grading

Clearing and grading shall be done throughout the site and will be established upon submittal for building construction. No grading will be allowed within the platted reserve at the southeast corner of DA-2.

L. Location of existing and proposed impervious areas

Existing impervious areas are shown on the drainage plan. The proposed areas will be delineated with final construction plans, but will not exceed 72% of the total site area as per design calculations.

M. Location of existing and proposed utilities and easements.

The drainage plan shows the location of existing utilities and stated in Tab 2, Section J. The plat (Exhibit 1-3) shows proposed easements, which will be the location for any future utilities.

N. Location of existing and proposed conveyance systems

Existing conveyance systems are discussed in Tab 2, Section K. Again, specific storm sewer networks are outside the scope of this report. Any future storm sewer designs shall comply

with the latest City of Wichita design criteria to convey added site runoff to any proposed on-site detention areas and through control structures with discharge rates at or below those existing rates prior to any development.

O. Preliminary location and dimensions of proposed channel modifications

This development will not require/include any channel modifications.

P. Preliminary selection and location of storm water controls

Storm water controls will include appropriate curb/drop inlets and pipe networks at locations to be determined as part of the construction plans. When these networks are needed, they will convey the five-year storm event and be routed to detention facilities designed as part of this drainage plan. Other controls will include any pond control structures as discussed above in sections H through J.

Q. Emergency overflow structure's flow path

The emergency overflow for the east detention pond will route any flows, beyond the 100-year rates, to the southeast corner of the site through the natural channel previously modified and shown on the drainage plan, Exhibit 1-7.

R. Detention facility freeboard

All detention facilities will have a minimum of one foot of freeboard above the design-water surface elevation.

S. The 100-year, 24-hour High Water Line

The HWL for the east detention pond is 1345.36. The site also contains a FEMA 100-year boundary as shown on the drainage plan, Exhibit 1-7.

T. Lowest opening elevation table

The minimum pad elevation is 1347.40, as determined by adding a minimum of two feet to the 100-year HWL. This information is also found on the plat, Exhibit 1-3.

U. Storm water management facilities located within a reserve

No facilities or construction activities are planned for the platted reserve.

V. Maintenance responsibility of storm water management facilities

The maintenance of storm water management facilities shall be the responsibility of the owner and shall be transferred to new owner upon the sale of any part thereof.

W. Off-site drainage easements or agreements

No off-site drainage easements or agreements will be required for this development.

NORTHRIDGE INDUSTRIAL SECOND ADDITION

EXHIBIT 3-1

Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	254.99	6	792	75.001	----	------	------	Basin
2	SCS Runoff	3.456	6	738	0.441	----	------	------	Existing DA No. 1
3	SCS Runoff	10.34	6	750	1.654	----	------	------	Existing DA No. 2
4	SCS Runoff	5.930	6	738	0.757	----	------	------	Existing DA No. 3
5	Combine	18.64	6	744	2.852	2, 3, 4	------	------	Existing DA-1, 2 & 3
6	SCS Runoff	13.20	6	720	0.933	----	------	------	Proposed DA No. 1
7	SCS Runoff	41.51	6	720	2.929	----	------	------	Proposed DA No. 2
8	Combine	57.61	6	720	4.618	4, 6, 7	------	------	Prop. DA-1 & 2 with Exist. DA-3
9	Reservoir	18.44	6	744	4.617	8	1342.70	1.733	East Detention Outlet

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

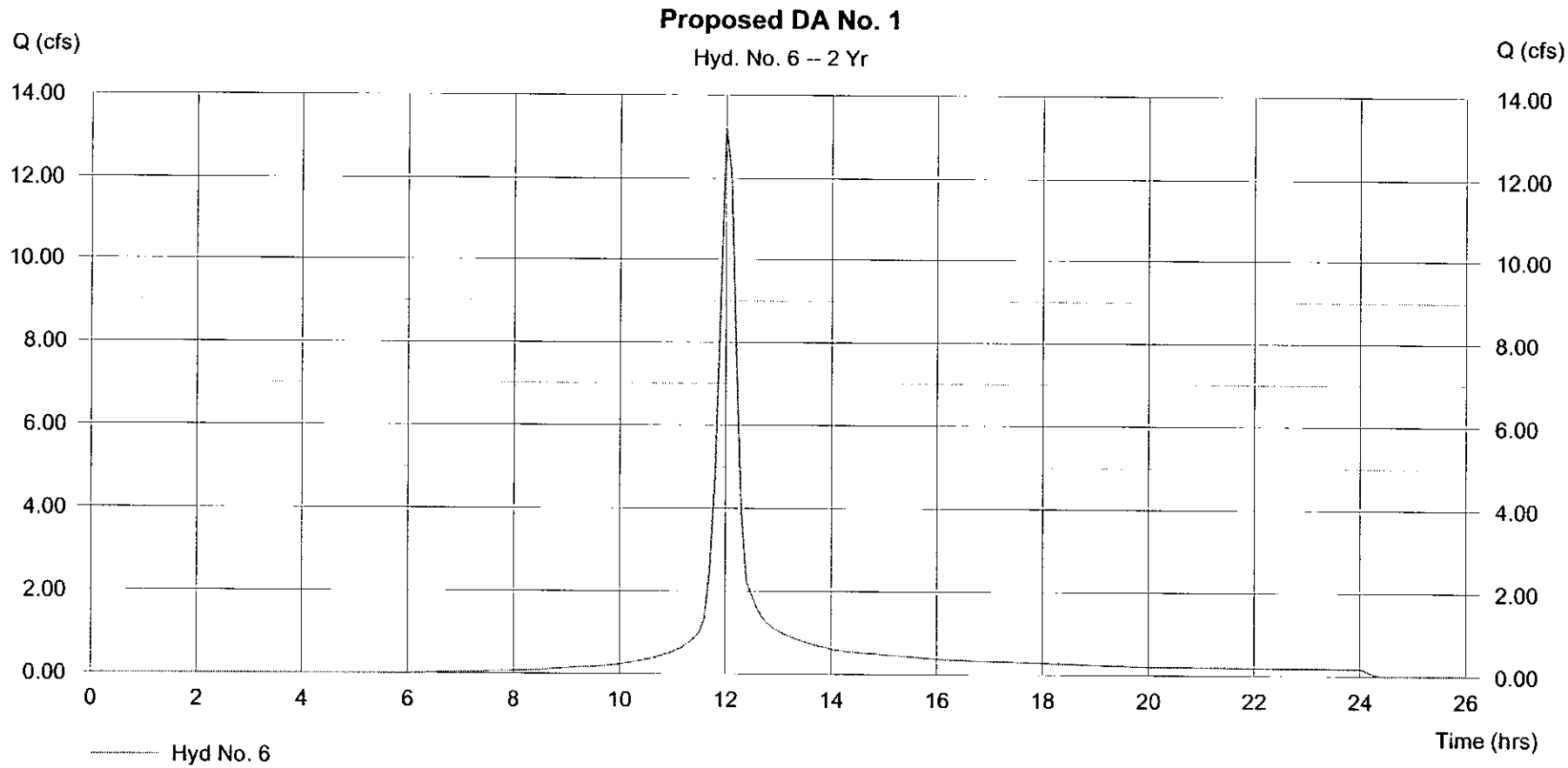
Thursday, May 3 2007, 4:9 PM

Hyd. No. 6

Proposed DA No. 1

Hydrograph type	= SCS Runoff	Peak discharge	= 13.20 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 5.059 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 0.933 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

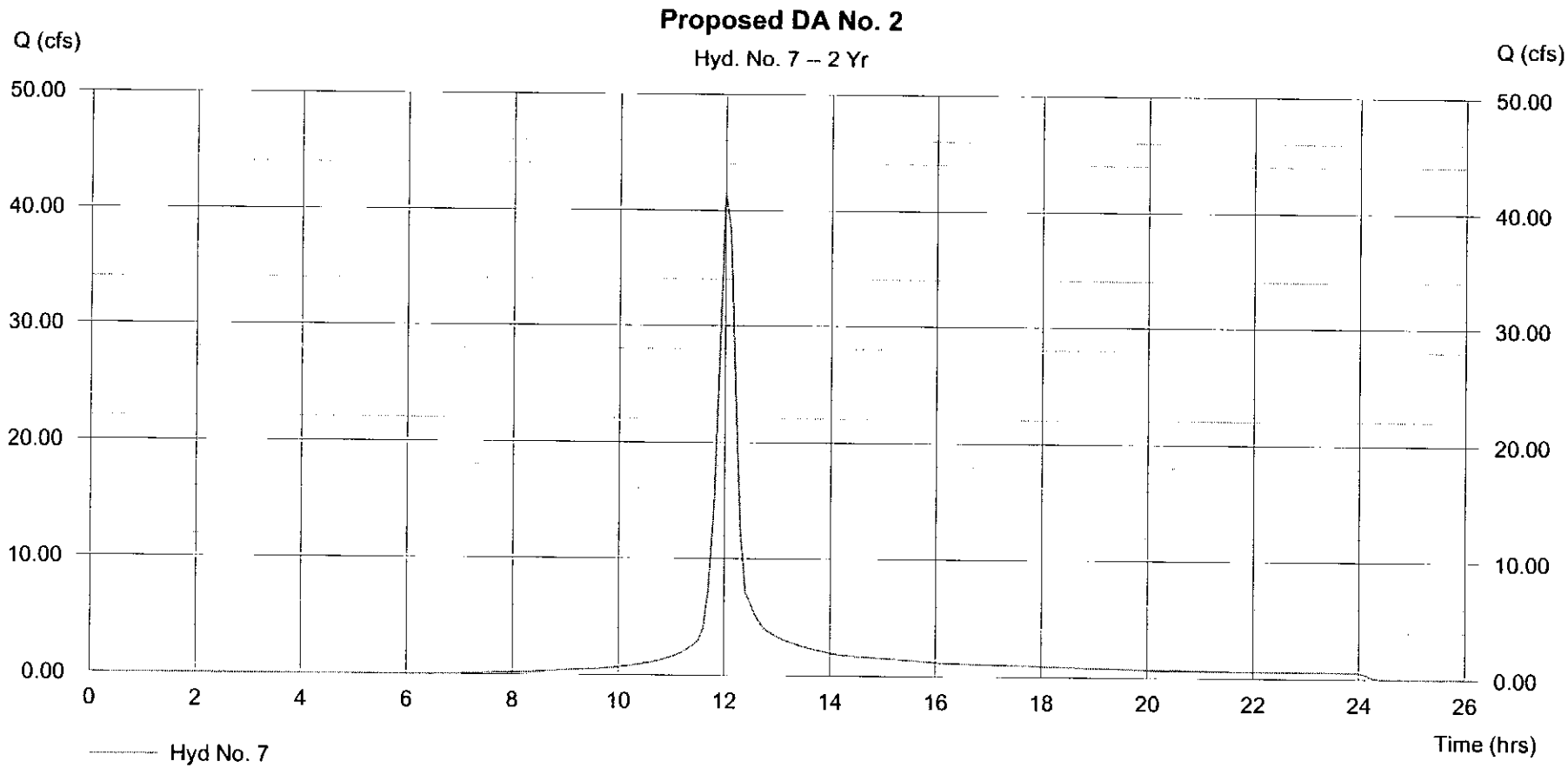
Thursday, May 3 2007, 4:9 PM

Hyd. No. 7

Proposed DA No. 2

Hydrograph type	= SCS Runoff	Peak discharge	= 41.51 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Drainage area	= 16.559 ac	Curve number	= 86.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 3.60 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 2.929 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

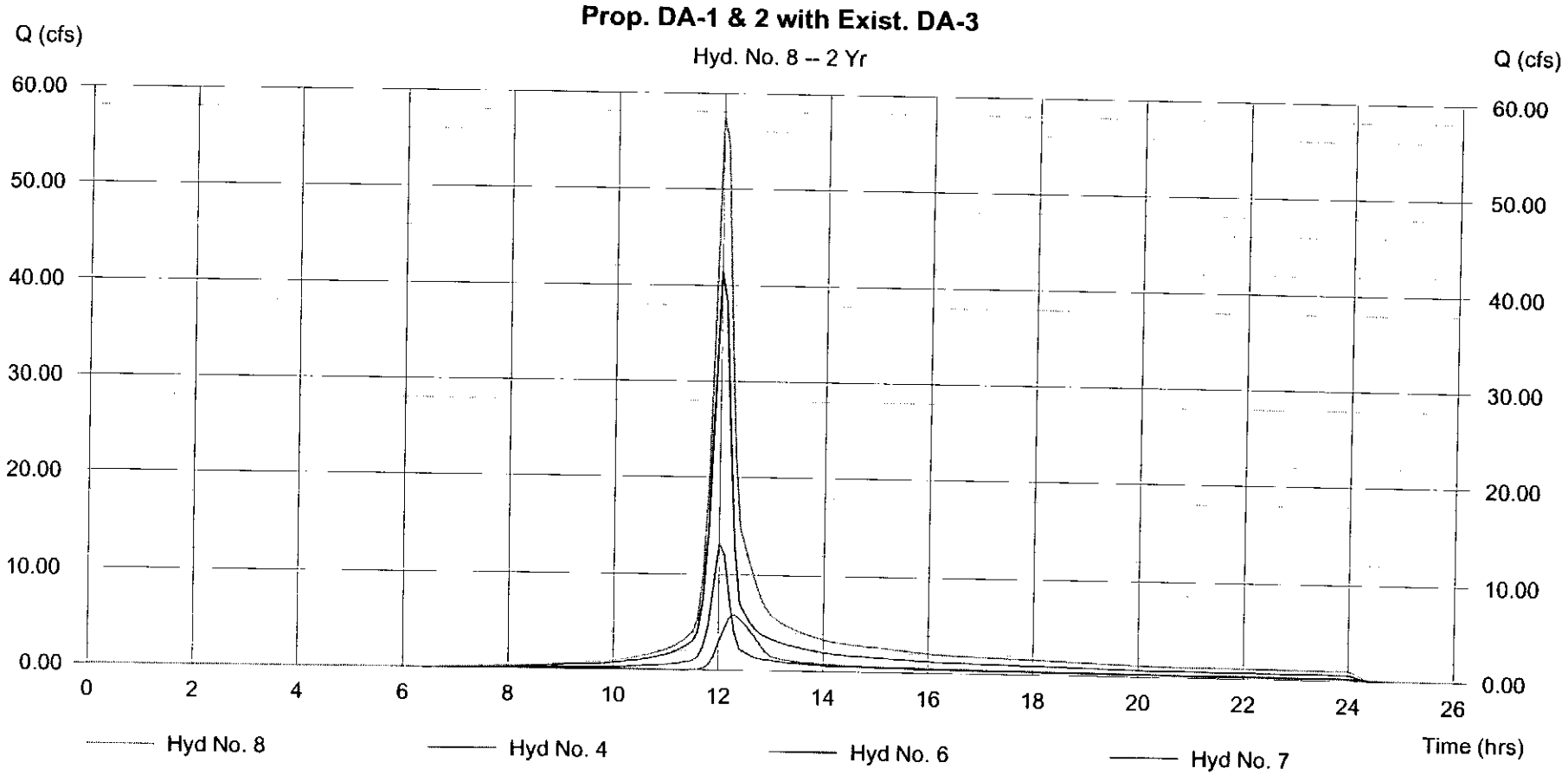
Thursday, May 3 2007, 4:9 PM

Hyd. No. 8

Prop. DA-1 & 2 with Exist. DA-3

Hydrograph type	= Combine	Peak discharge	= 57.61 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hyds.	= 4, 6, 7		

Hydrograph Volume = 4.618 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Thursday, May 3 2007, 4:9 PM

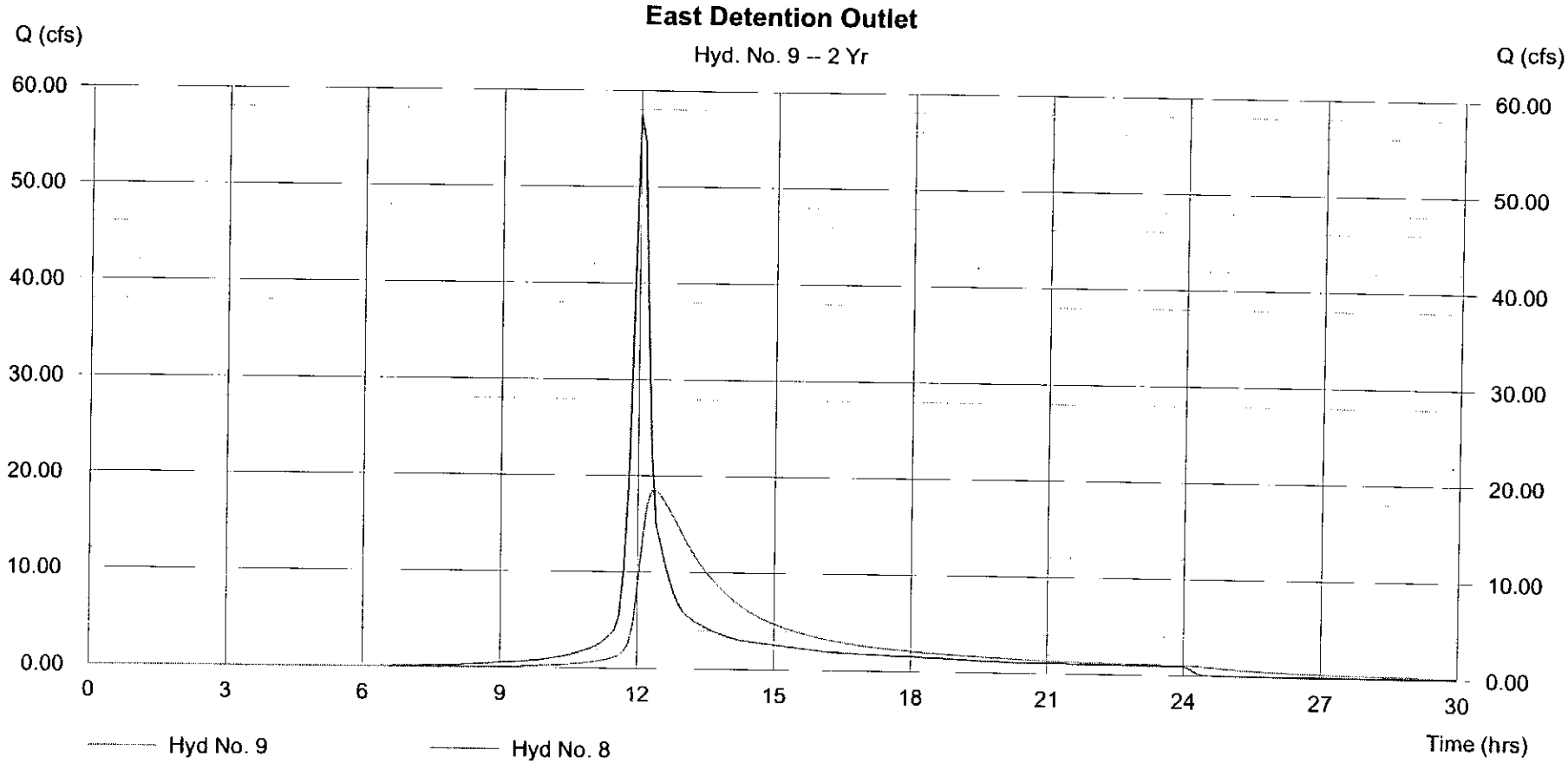
Hyd. No. 9

East Detention Outlet

Hydrograph type	= Reservoir	Peak discharge	= 18.44 cfs
Storm frequency	= 2 yrs	Time interval	= 6 min
Inflow hyd. No.	= 8	Max. Elevation	= 1342.70 ft
Reservoir name	= Detention Pond	Max. Storage	= 1.733 acft

Storage Indication method used.

Hydrograph Volume = 4.617 acft



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	422.71	6	792	117.963	----	------	------	Basin
2	SCS Runoff	5.939	6	738	0.715	----	------	------	Existing DA No. 1
3	SCS Runoff	16.90	6	750	2.594	----	------	------	Existing DA No. 2
4	SCS Runoff	10.19	6	738	1.226	----	------	------	Existing DA No. 3
5	Combine	31.20	6	744	4.535	2, 3, 4	------	------	Existing DA-1, 2 & 3
6	SCS Runoff	18.06	6	720	1.286	----	------	------	Proposed DA No. 1
7	SCS Runoff	57.36	6	720	4.069	----	------	------	Proposed DA No. 2
8	Combine	81.00	6	720	6.581	4, 6, 7	------	------	Prop. DA-1 & 2 with Exist. DA-3
9	Reservoir	28.67	6	738	6.580	8	1343.39	2.398	East Detention Outlet

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

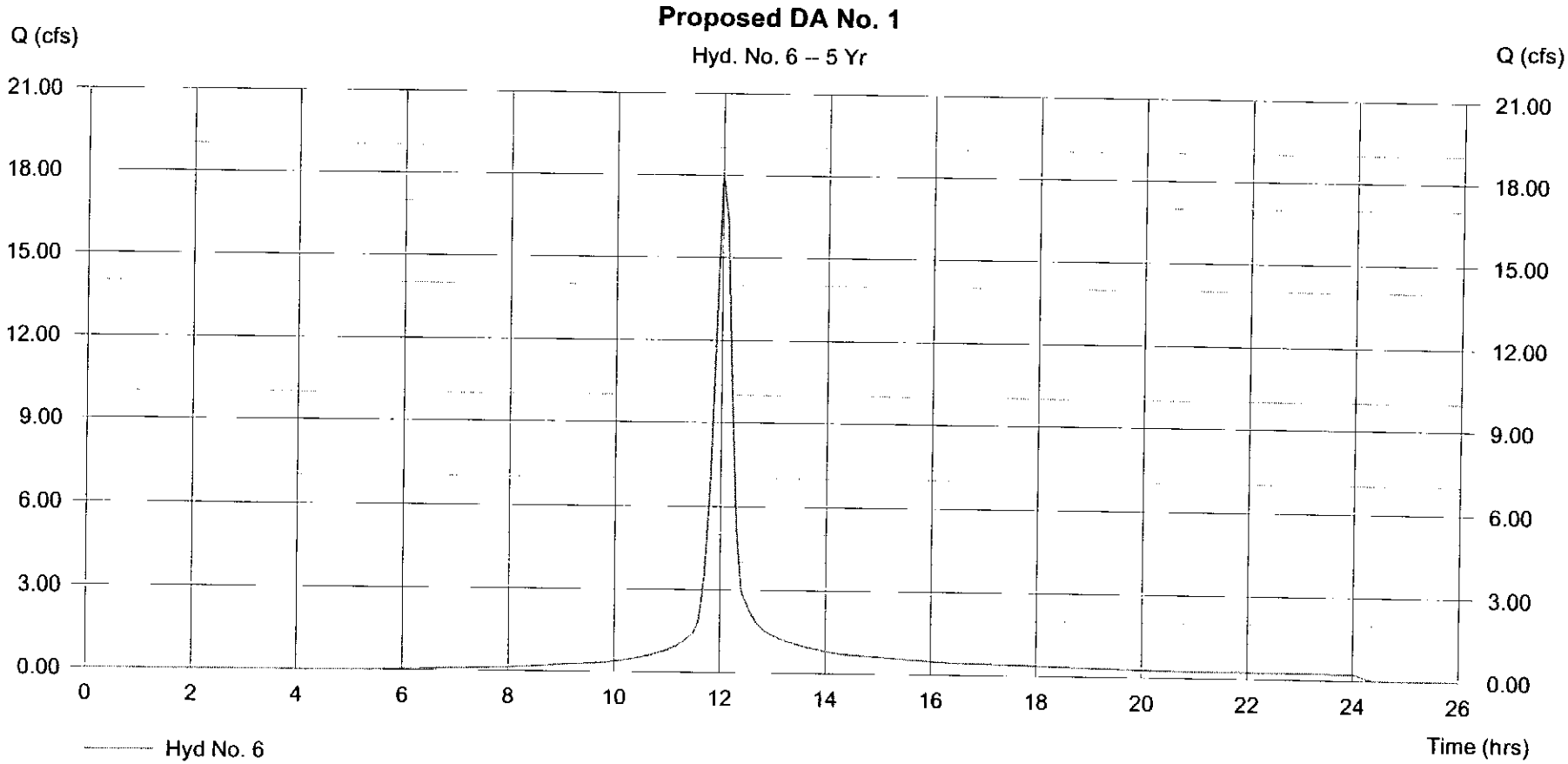
Thursday, May 3 2007, 4:10 PM

Hyd. No. 6

Proposed DA No. 1

Hydrograph type	= SCS Runoff	Peak discharge	= 18.06 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Drainage area	= 5.059 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.56 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 1.286 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

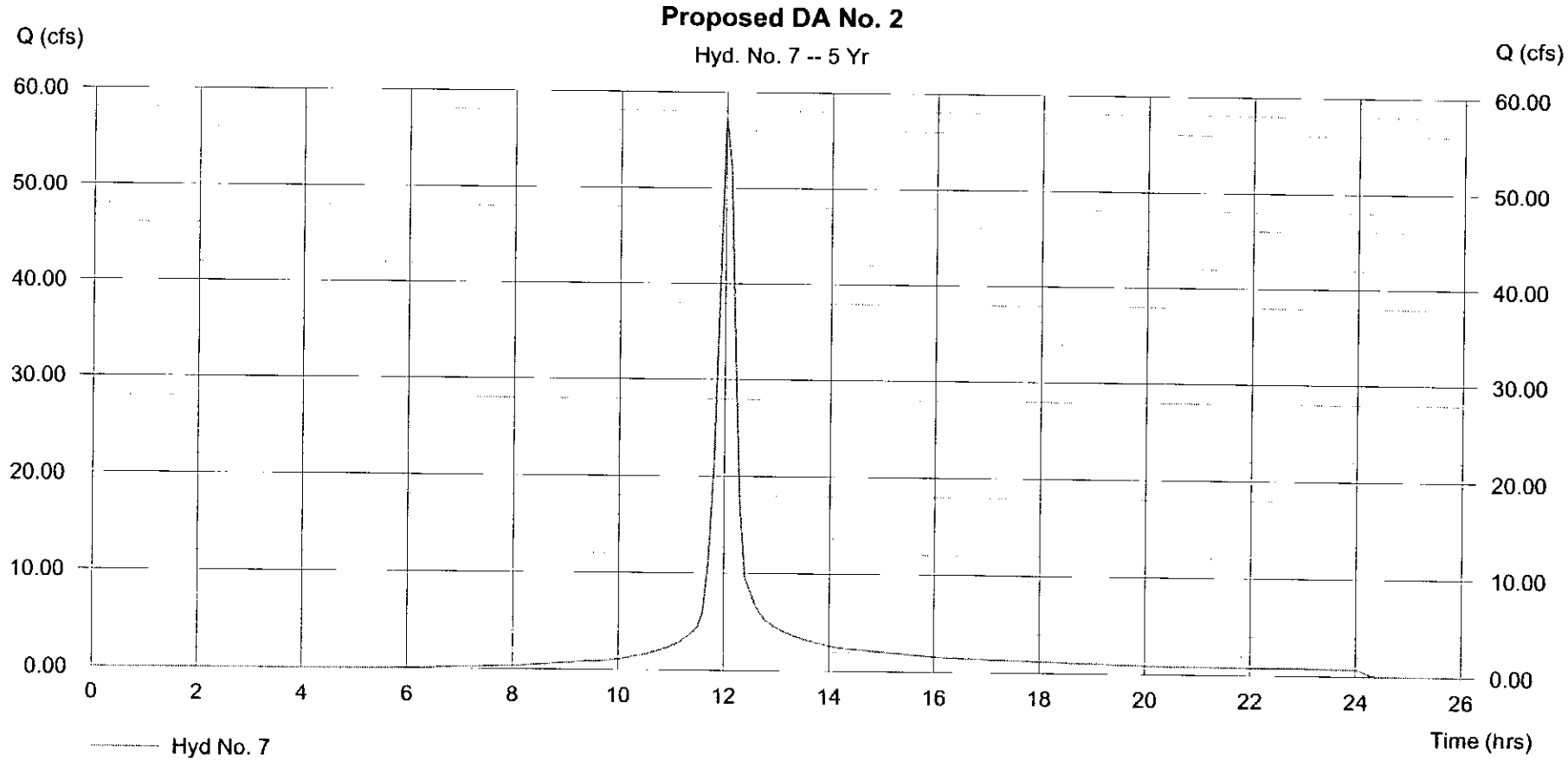
Thursday, May 3 2007, 4:10 PM

Hyd. No. 7

Proposed DA No. 2

Hydrograph type	= SCS Runoff	Peak discharge	= 57.36 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Drainage area	= 16.559 ac	Curve number	= 86.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.56 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 4.069 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

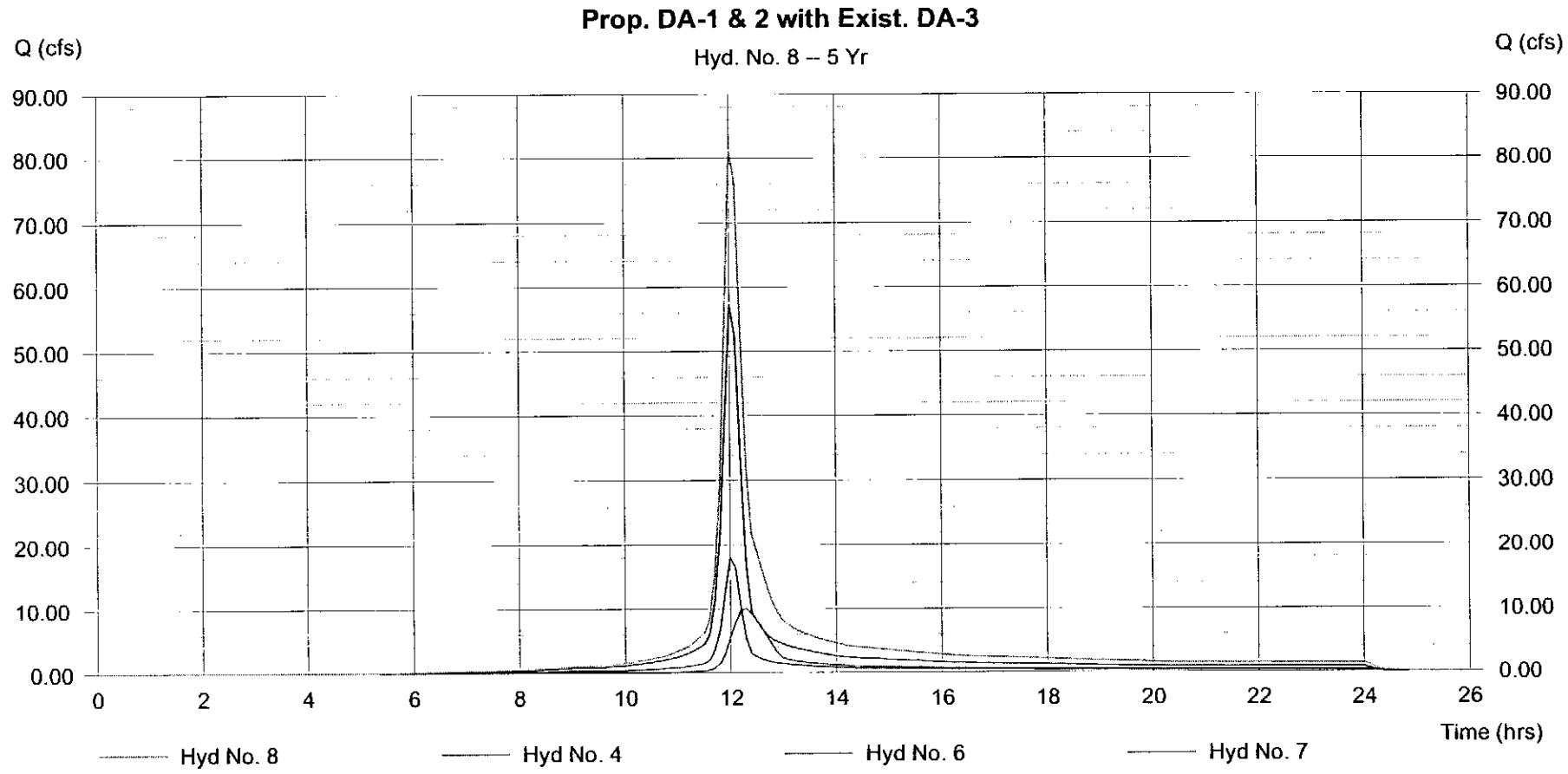
Thursday, May 3 2007, 4:10 PM

Hyd. No. 8

Prop. DA-1 & 2 with Exist. DA-3

Hydrograph type	= Combine	Peak discharge	= 81.00 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Inflow hyds.	= 4, 6, 7		

Hydrograph Volume = 6.581 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Thursday, May 3 2007, 4:10 PM

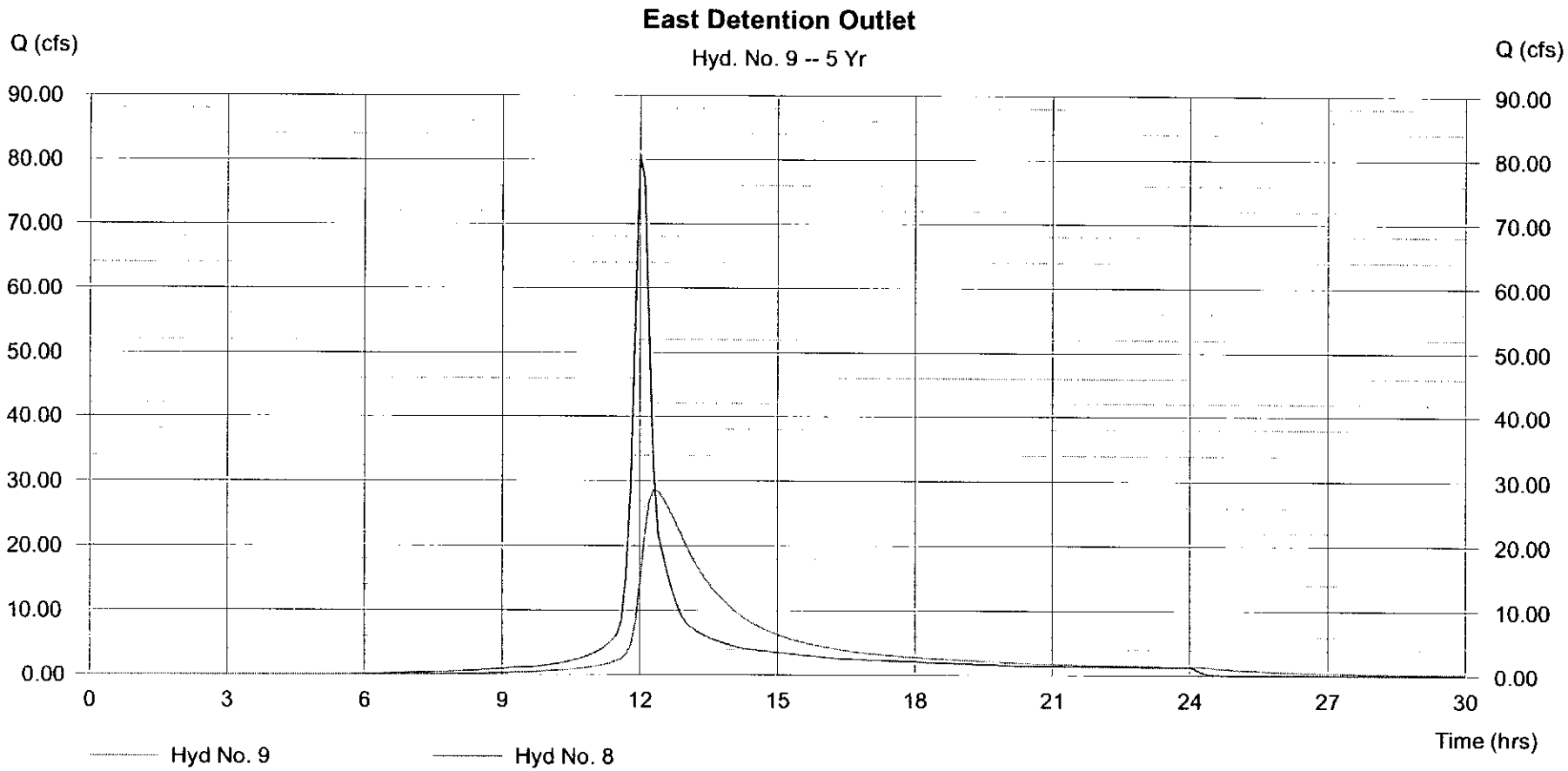
Hyd. No. 9

East Detention Outlet

Hydrograph type	= Reservoir	Peak discharge	= 28.67 cfs
Storm frequency	= 5 yrs	Time interval	= 6 min
Inflow hyd. No.	= 8	Max. Elevation	= 1343.39 ft
Reservoir name	= Detention Pond	Max. Storage	= 2.398 acft

Storage Indication method used.

Hydrograph Volume = 6.580 acft



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	559.04	6	792	152.884	----	------	------	Basin
2	SCS Runoff	7.970	6	738	0.940	----	------	------	Existing DA No. 1
3	SCS Runoff	22.18	6	750	3.357	----	------	------	Existing DA No. 2
4	SCS Runoff	13.67	6	738	1.614	----	------	------	Existing DA No. 3
5	Combine	41.39	6	744	5.911	2, 3, 4	------	------	Existing DA-1, 2 & 3
6	SCS Runoff	21.71	6	720	1.555	----	------	------	Proposed DA No. 1
7	SCS Runoff	69.32	6	720	4.944	----	------	------	Proposed DA No. 2
8	Combine	98.86	6	720	8.113	4, 6, 7	------	------	Prop. DA-1 & 2 with Exist. DA-3
9	Reservoir	36.85	6	738	8.112	8	1343.88	2.896	East Detention Outlet

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

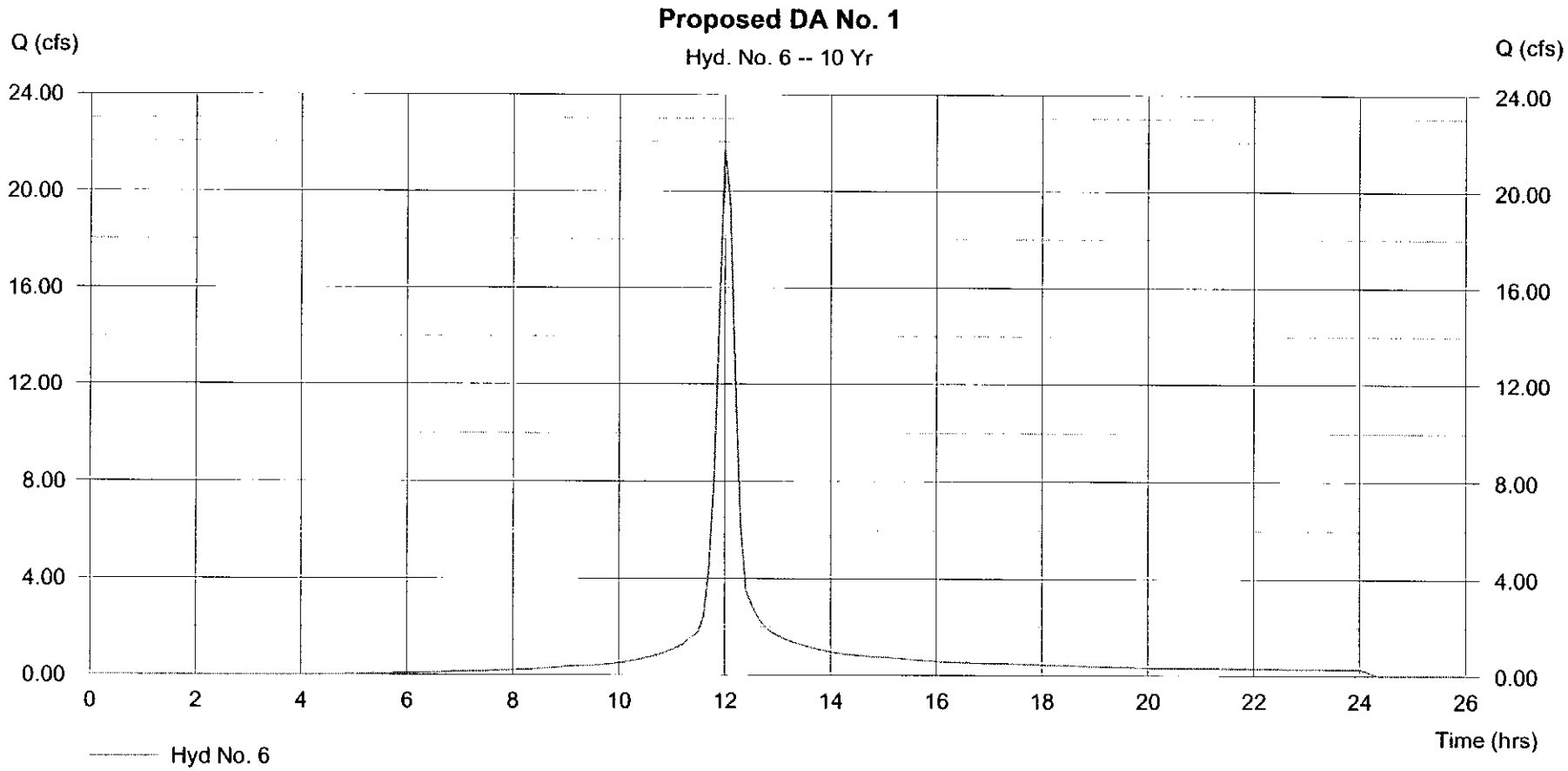
Thursday, May 3 2007, 4:10 PM

Hyd. No. 6

Proposed DA No. 1

Hydrograph type	= SCS Runoff	Peak discharge	= 21.71 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 5.059 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.28 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 1.555 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

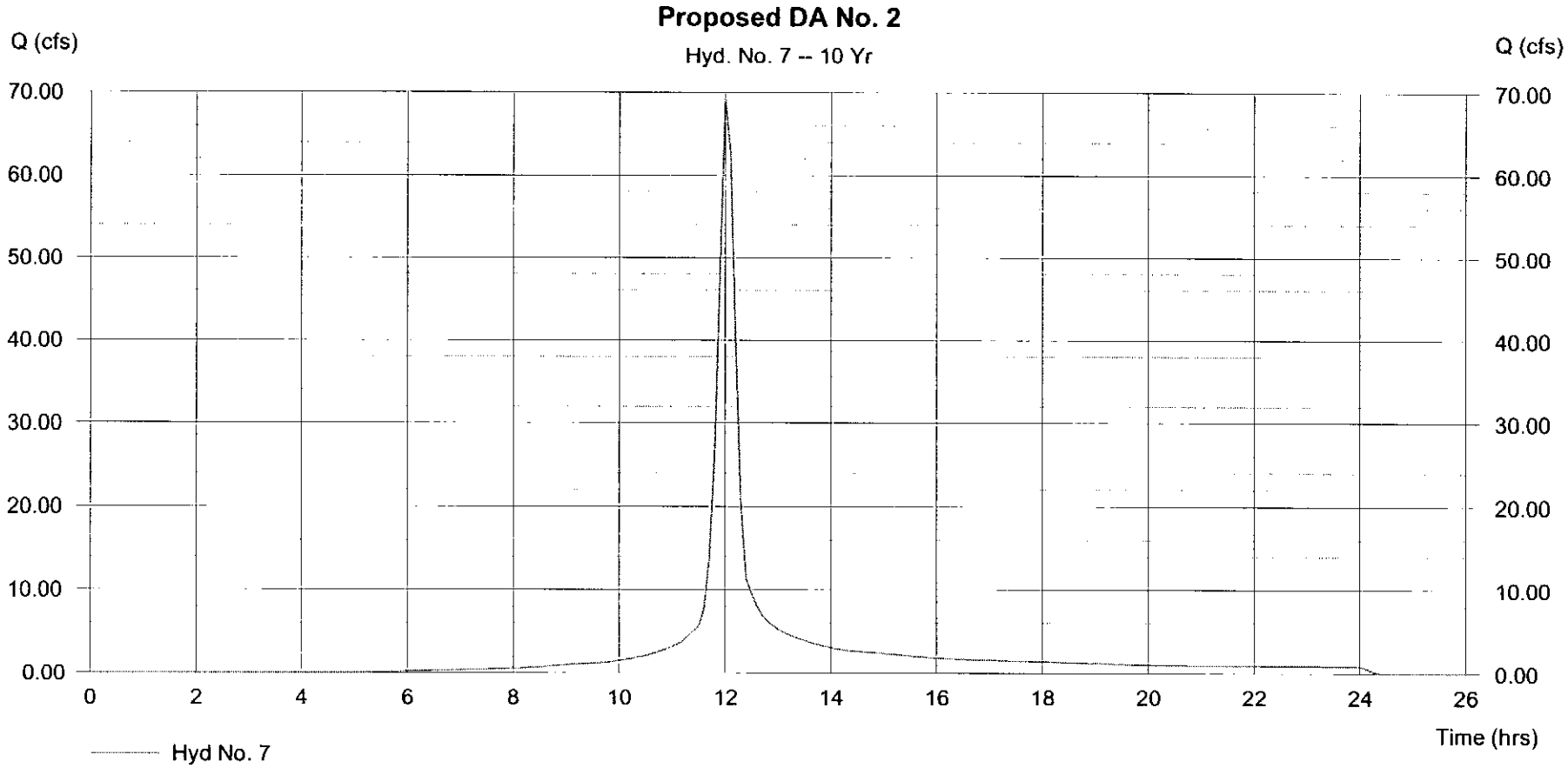
Thursday, May 3 2007, 4:10 PM

Hyd. No. 7

Proposed DA No. 2

Hydrograph type	= SCS Runoff	Peak discharge	= 69.32 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Drainage area	= 16.559 ac	Curve number	= 86.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 5.28 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 4.944 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

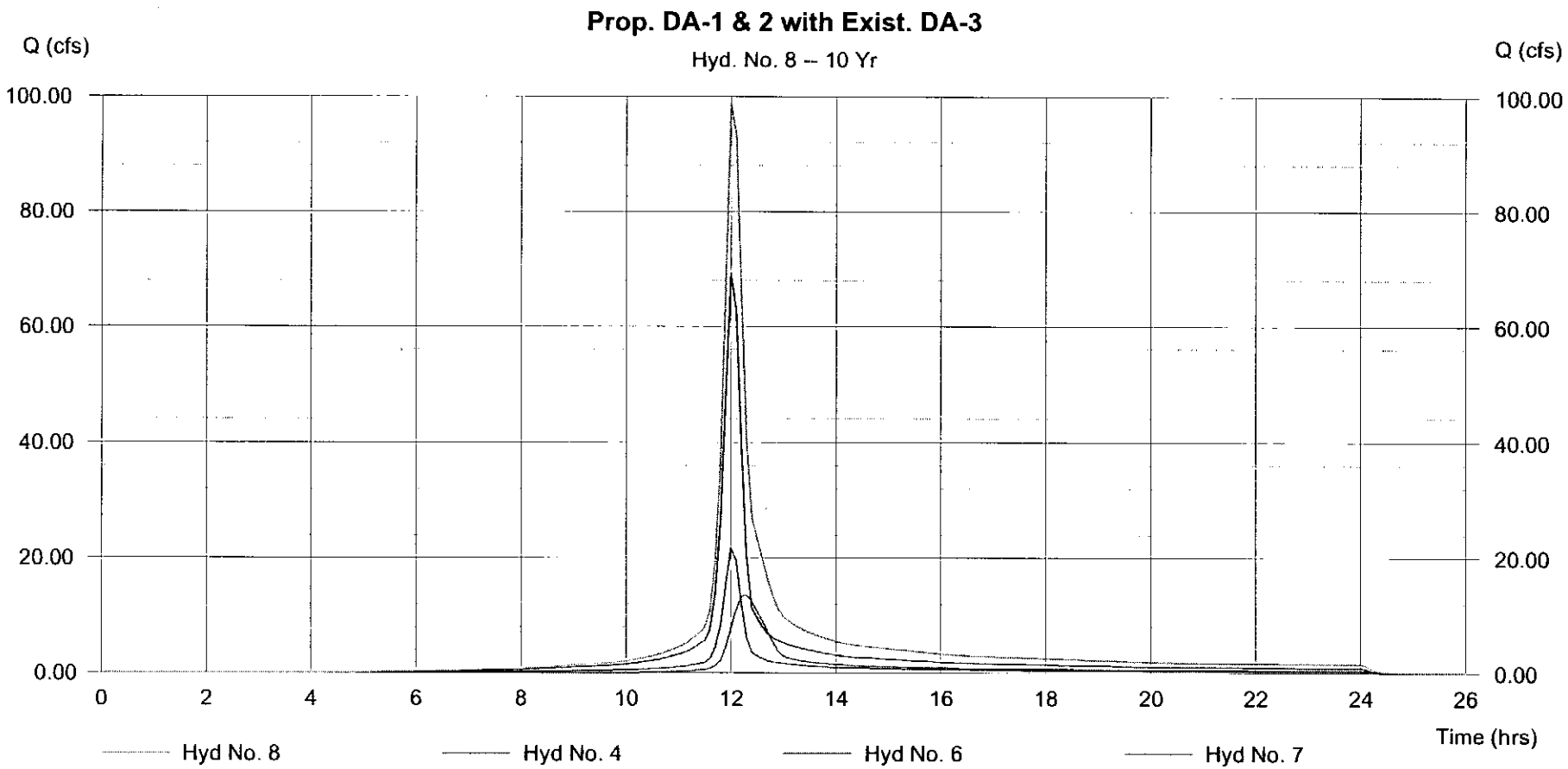
Thursday, May 3 2007, 4:10 PM

Hyd. No. 8

Prop. DA-1 & 2 with Exist. DA-3

Hydrograph type	= Combine	Peak discharge	= 98.86 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hyds.	= 4, 6, 7		

Hydrograph Volume = 8.113 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Thursday, May 3 2007, 4:10 PM

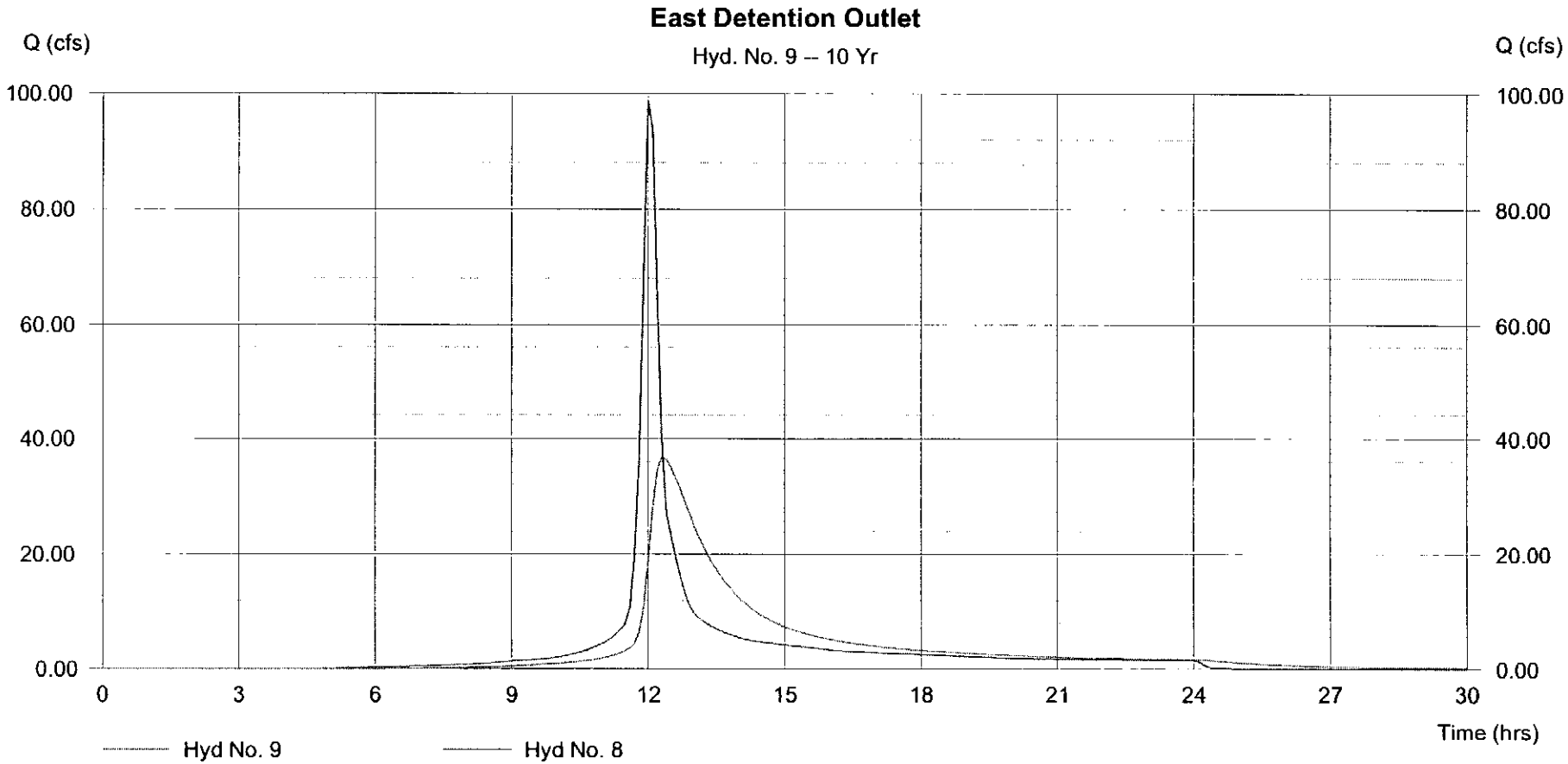
Hyd. No. 9

East Detention Outlet

Hydrograph type	= Reservoir	Peak discharge	= 36.85 cfs
Storm frequency	= 10 yrs	Time interval	= 6 min
Inflow hyd. No.	= 8	Max. Elevation	= 1343.88 ft
Reservoir name	= Detention Pond	Max. Storage	= 2.896 acft

Storage Indication method used.

Hydrograph Volume = 8.112 acft



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	750.04	6	792	202.031	----	------	------	Basin
2	SCS Runoff	10.83	6	738	1.261	----	------	------	Existing DA No. 1
3	SCS Runoff	29.55	6	750	4.430	----	------	------	Existing DA No. 2
4	SCS Runoff	18.59	6	738	2.164	----	------	------	Existing DA No. 3
5	Combine	55.68	6	744	7.855	2, 3, 4	------	------	Existing DA-1, 2 & 3
6	SCS Runoff	26.57	6	720	1.920	----	------	------	Proposed DA No. 1
7	SCS Runoff	85.25	6	720	6.127	----	------	------	Proposed DA No. 2
8	Combine	122.90	6	720	10.211	4, 6, 7	------	------	Prop. DA-1 & 2 with Exist. DA-3
9	Reservoir	48.13	6	738	10.210	8	1344.50	3.555	East Detention Outlet

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

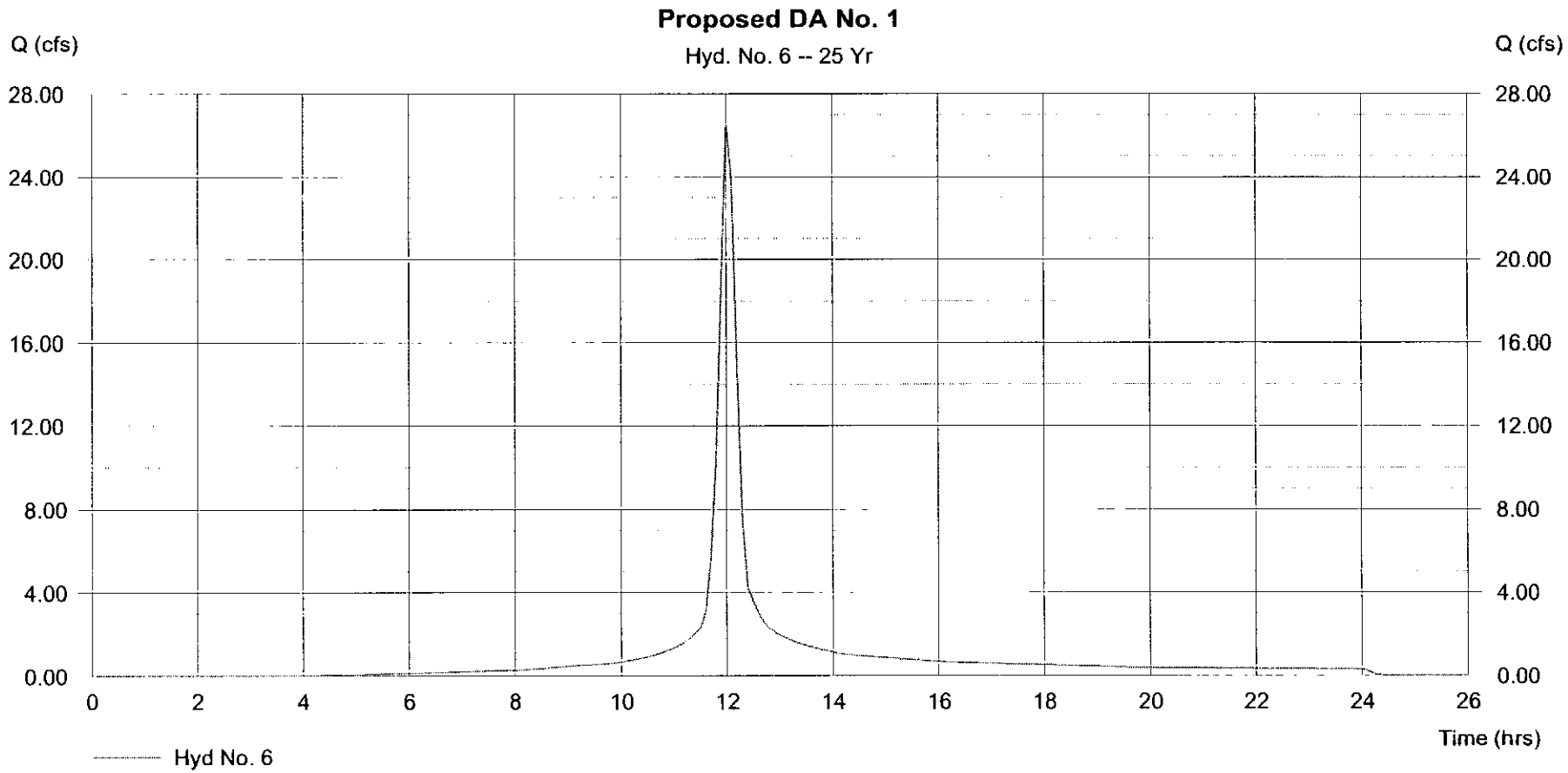
Thursday, May 3 2007, 4:11 PM

Hyd. No. 6

Proposed DA No. 1

Hydrograph type	= SCS Runoff	Peak discharge	= 26.57 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Drainage area	= 5.059 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 6.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 1.920 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

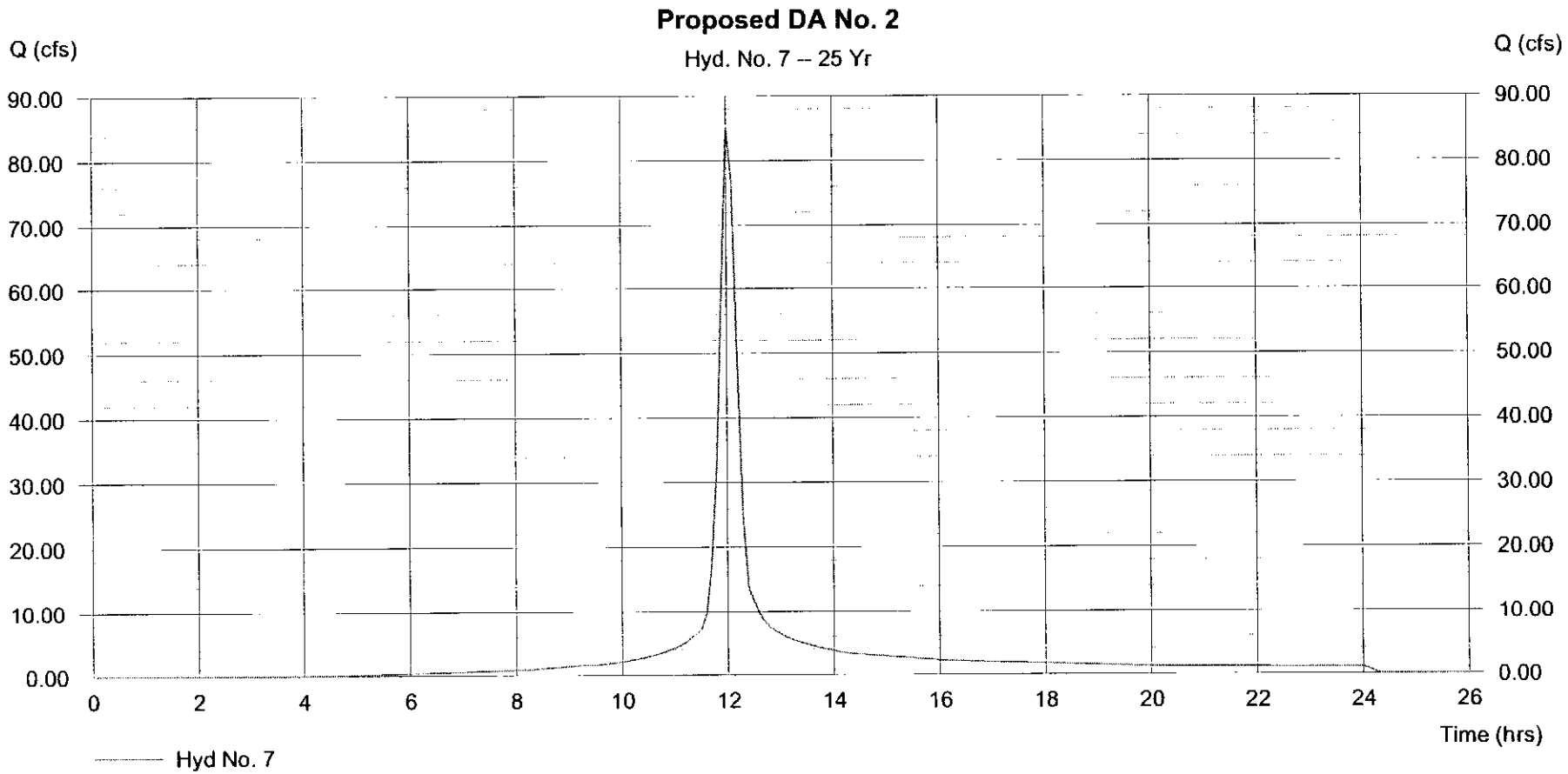
Thursday, May 3 2007, 4:11 PM

Hyd. No. 7

Proposed DA No. 2

Hydrograph type	= SCS Runoff	Peak discharge	= 85.25 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Drainage area	= 16.559 ac	Curve number	= 86.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 6.24 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 6.127 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

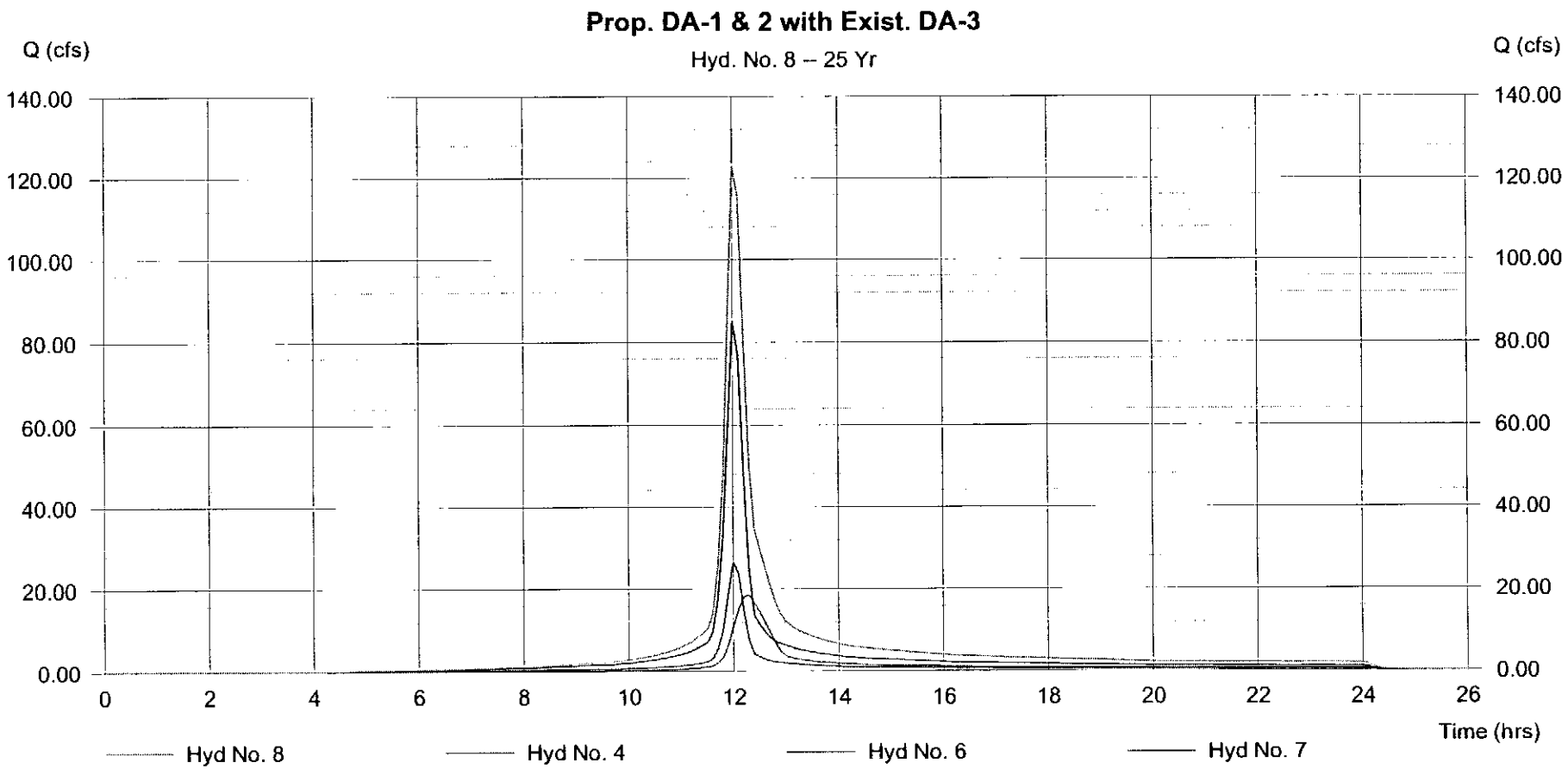
Thursday, May 3 2007, 4:11 PM

Hyd. No. 8

Prop. DA-1 & 2 with Exist. DA-3

Hydrograph type	= Combine	Peak discharge	= 122.90 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Inflow hyds.	= 4, 6, 7		

Hydrograph Volume = 10.211 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Thursday, May 3 2007, 4:11 PM

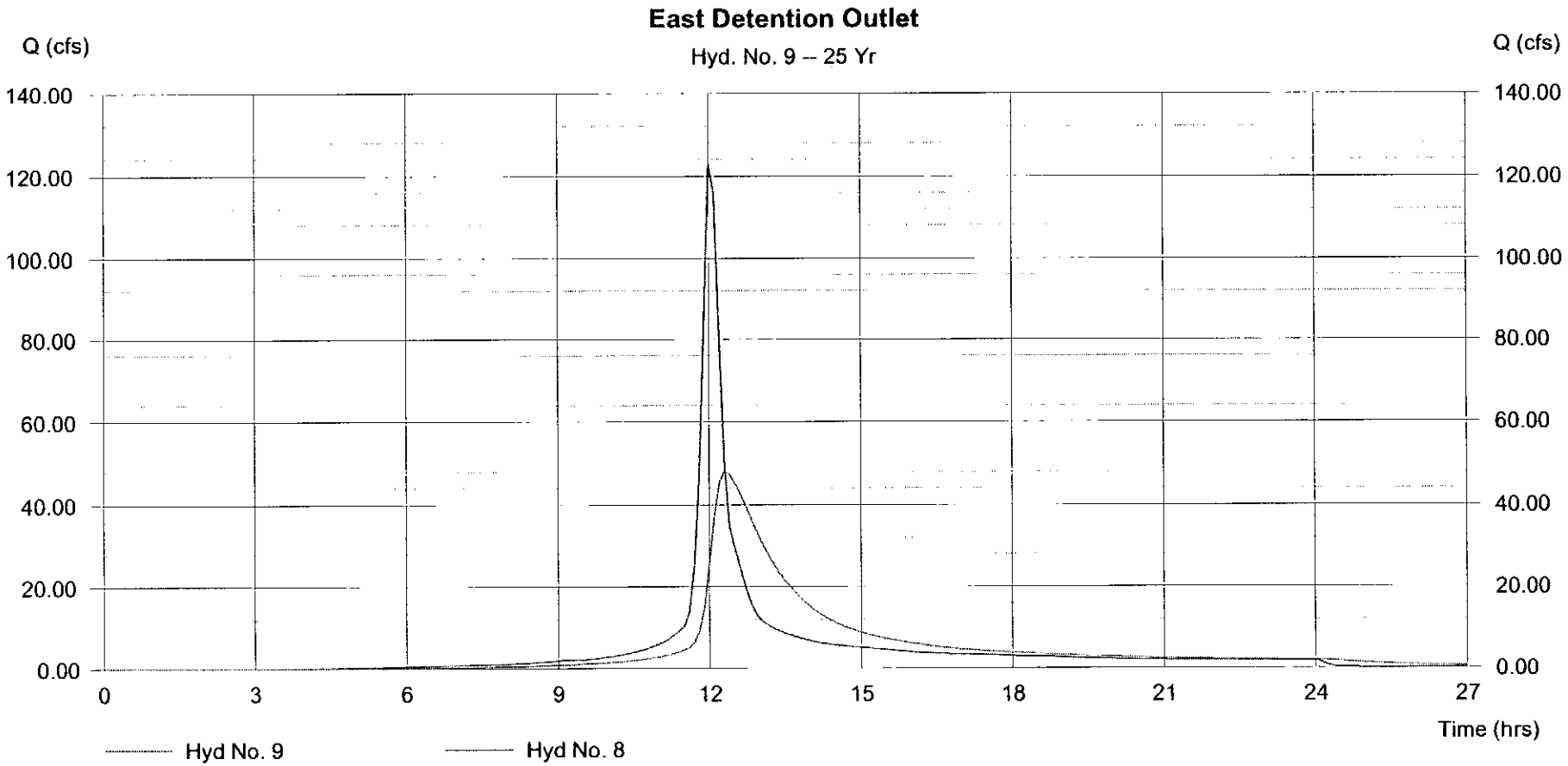
Hyd. No. 9

East Detention Outlet

Hydrograph type	= Reservoir	Peak discharge	= 48.13 cfs
Storm frequency	= 25 yrs	Time interval	= 6 min
Inflow hyd. No.	= 8	Max. Elevation	= 1344.50 ft
Reservoir name	= Detention Pond	Max. Storage	= 3.555 acft

Storage Indication method used.

Hydrograph Volume = 10.210 acft



Hydrograph Summary Report

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Maximum storage (acft)	Hydrograph description
1	SCS Runoff	1049.52	6	792	279.690	----	------	------	Basin
2	SCS Runoff	15.35	6	738	1.773	----	------	------	Existing DA No. 1
3	SCS Runoff	41.05	6	750	6.123	----	------	------	Existing DA No. 2
4	SCS Runoff	26.33	6	738	3.043	----	------	------	Existing DA No. 3
5	Combine	78.45	6	738	10.939	2, 3, 4	------	------	Existing DA-1, 2 & 3
6	SCS Runoff	33.82	6	720	2.472	----	------	------	Proposed DA No. 1
7	SCS Runoff	109.05	6	720	7.926	----	------	------	Proposed DA No. 2
8	Combine	159.17	6	720	13.441	4, 6, 7	------	------	Prop. DA-1 & 2 with Exist. DA-3
9	Reservoir	65.47	6	738	13.440	8	1345.36	4.530	East Detention Outlet

Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

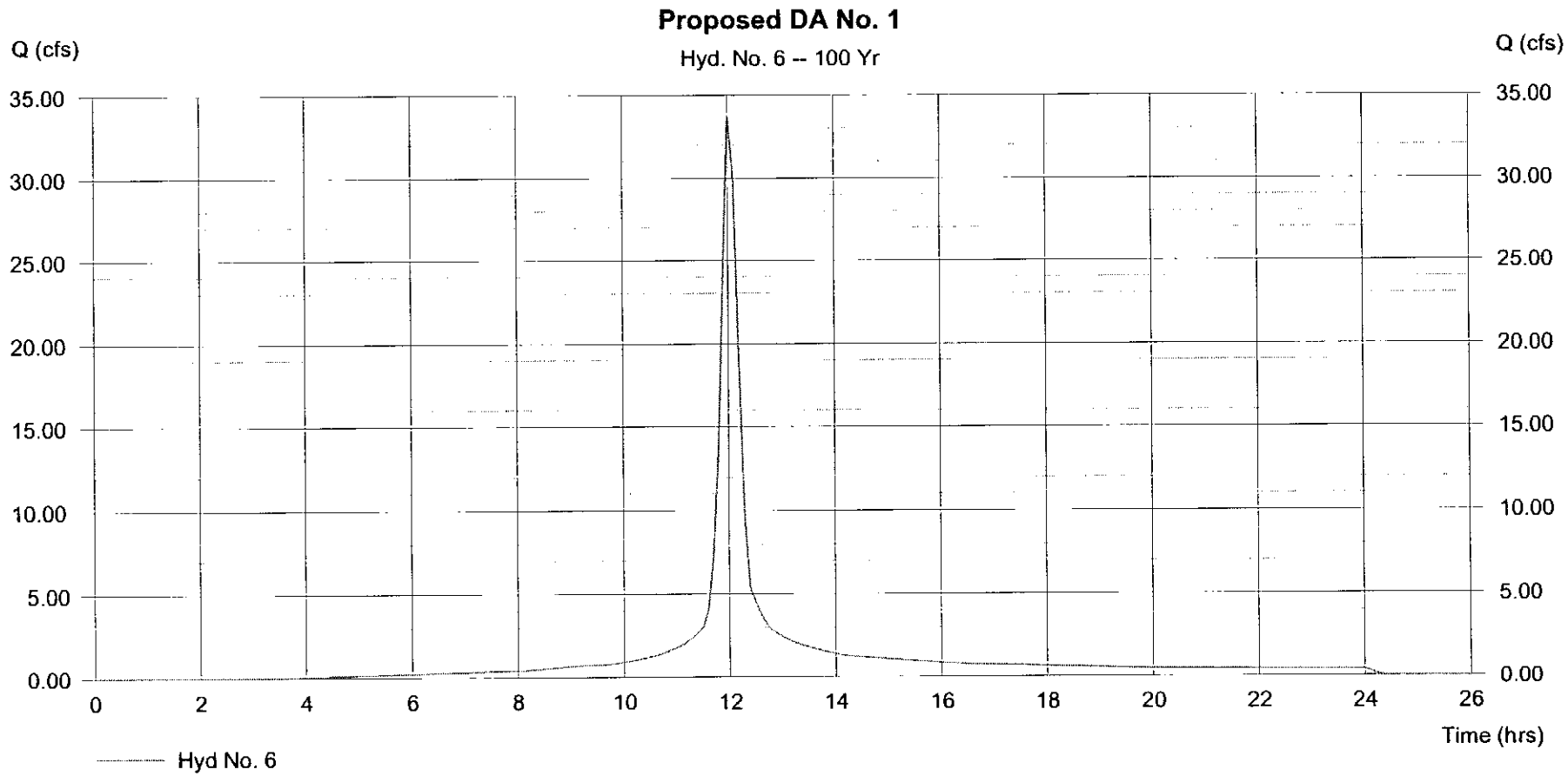
Thursday, May 3 2007, 4:12 PM

Hyd. No. 6

Proposed DA No. 1

Hydrograph type	= SCS Runoff	Peak discharge	= 33.82 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 5.059 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 7.68 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 2.472 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

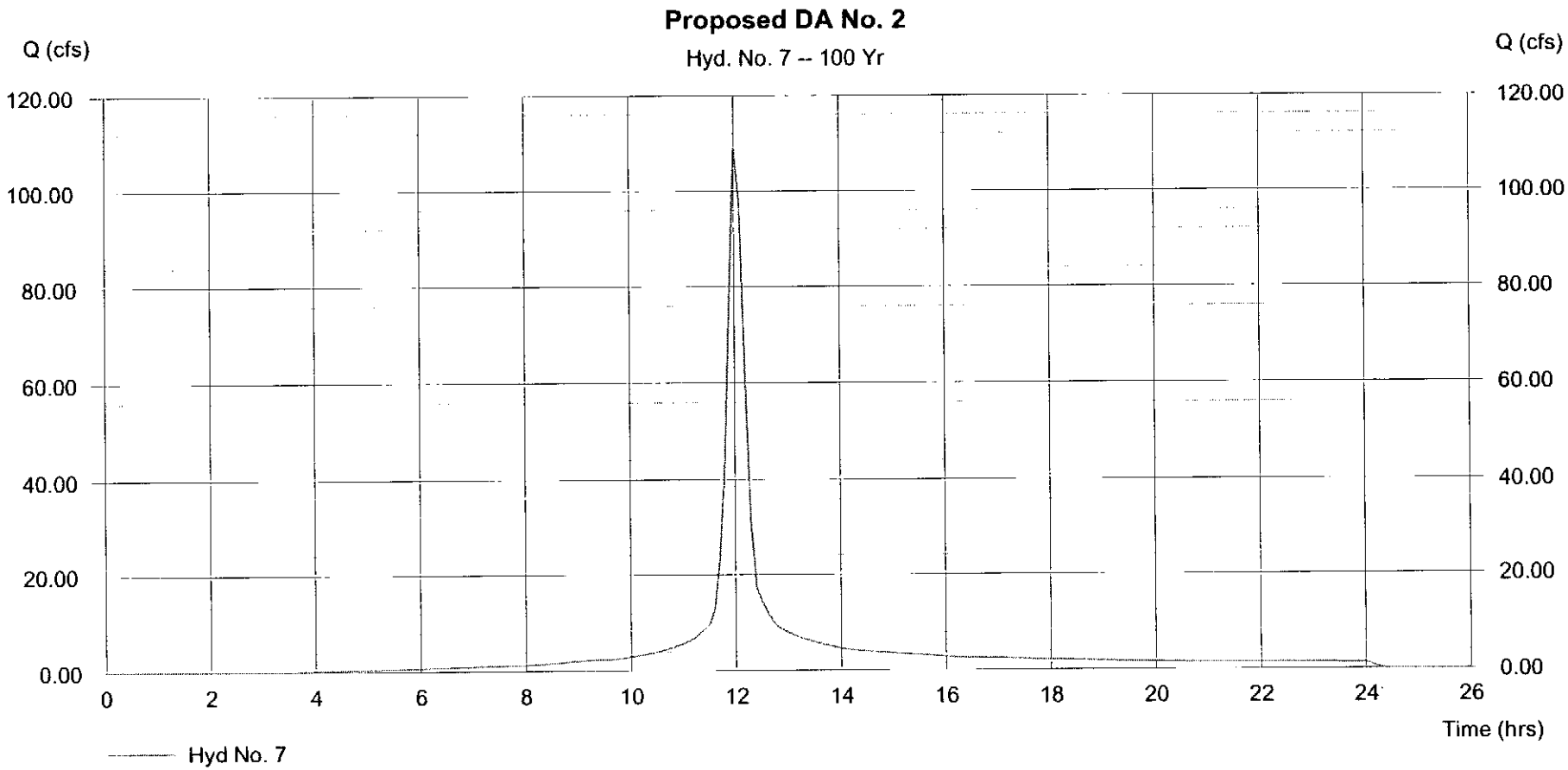
Thursday, May 3 2007, 4:12 PM

Hyd. No. 7

Proposed DA No. 2

Hydrograph type	= SCS Runoff	Peak discharge	= 109.05 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Drainage area	= 16.559 ac	Curve number	= 86.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= USER	Time of conc. (Tc)	= 15.00 min
Total precip.	= 7.68 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

Hydrograph Volume = 7.926 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

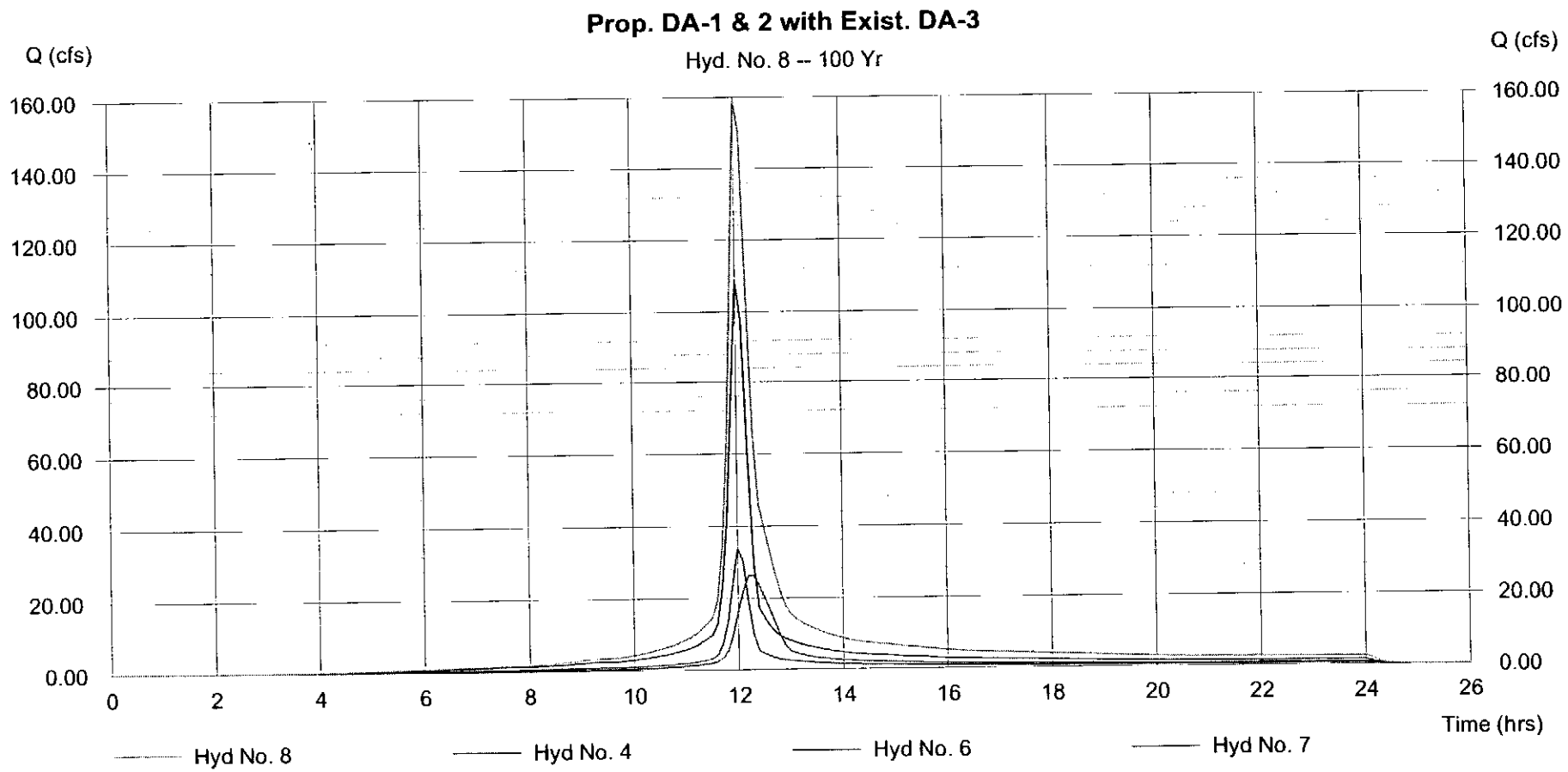
Thursday, May 3 2007, 4:12 PM

Hyd. No. 8

Prop. DA-1 & 2 with Exist. DA-3

Hydrograph type	= Combine	Peak discharge	= 159.17 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyds.	= 4, 6, 7		

Hydrograph Volume = 13.441 acft



Hydrograph Plot

Hydraflow Hydrographs by Intelisolve

Thursday, May 3 2007, 4:12 PM

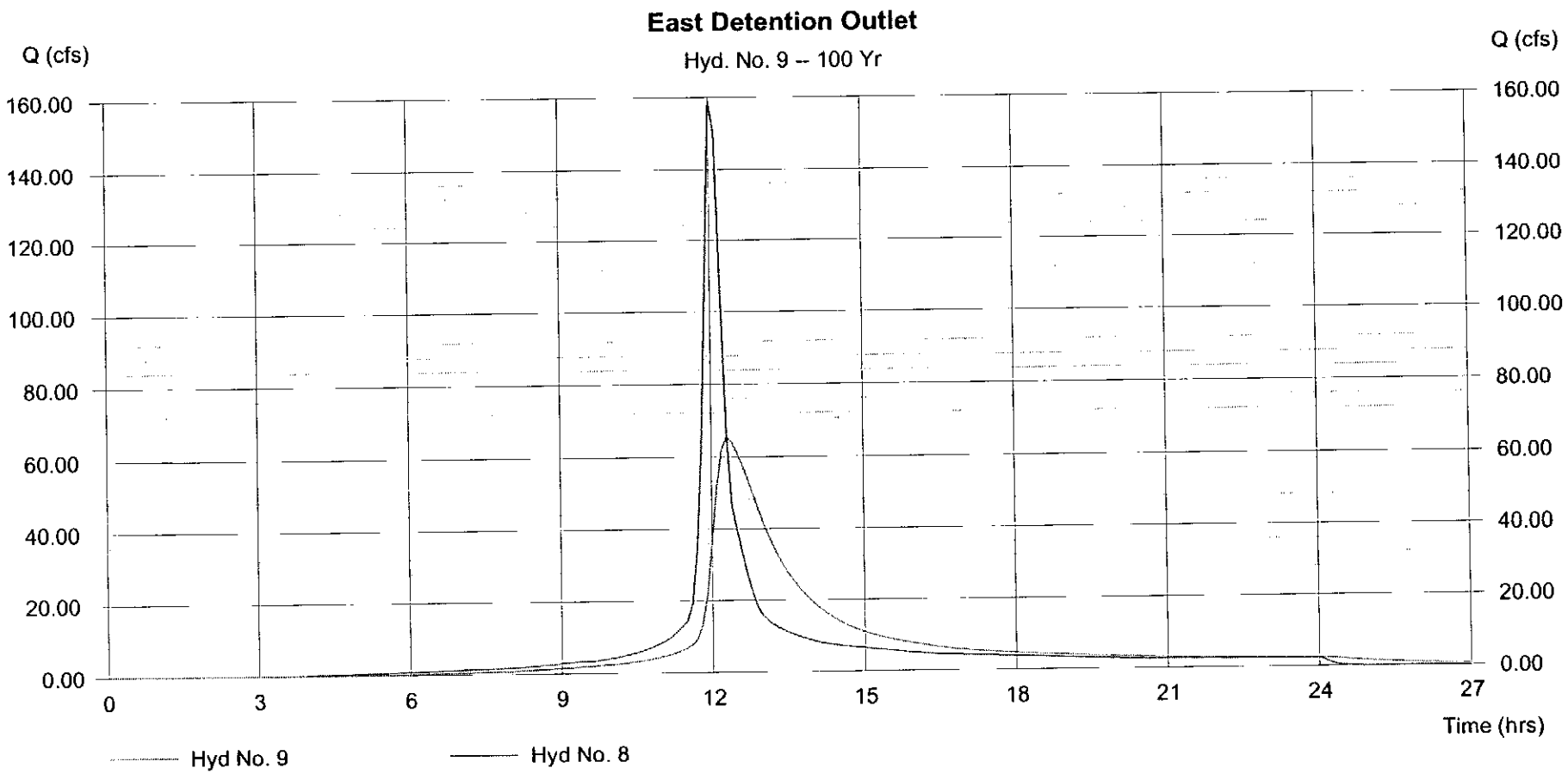
Hyd. No. 9

East Detention Outlet

Hydrograph type	= Reservoir	Peak discharge	= 65.47 cfs
Storm frequency	= 100 yrs	Time interval	= 6 min
Inflow hyd. No.	= 8	Max. Elevation	= 1345.36 ft
Reservoir name	= Detention Pond	Max. Storage	= 4.530 acft

Storage Indication method used.

Hydrograph Volume = 13.440 acft



Pond Report

Hydraflow Hydrographs by Intelisolve

Thursday, May 3 2007, 4:16 PM

Pond No. 1 - Detention Pond

Pond Data

Bottom LxW = 275.0 x 125.0 ft = 5.00 ft

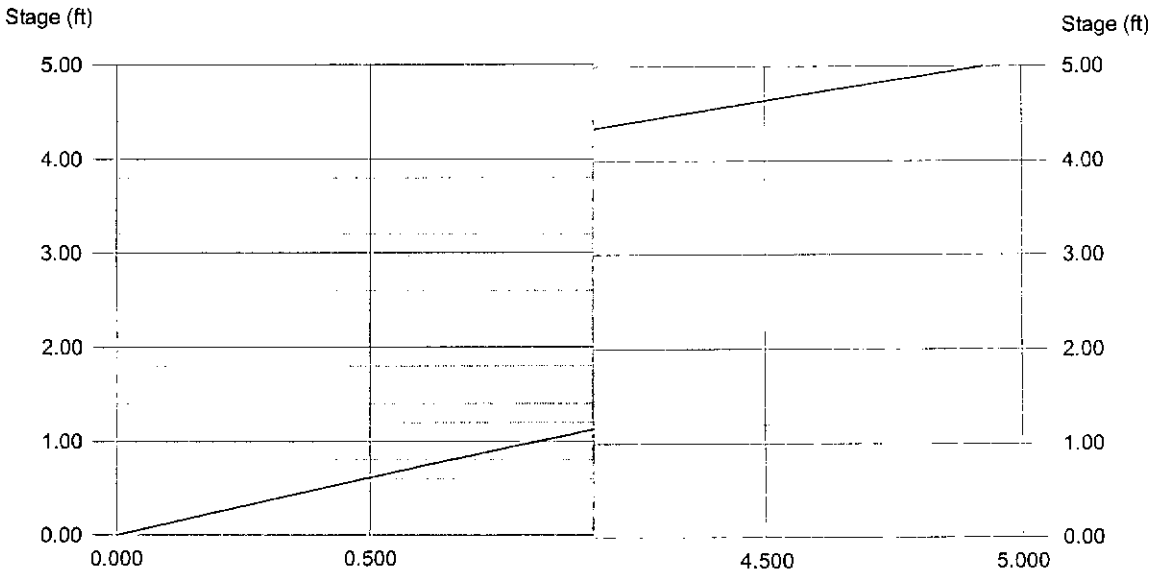
Stage / Storage Table

Stage (ft)	Elevation (ft)
0.00	1340.70
0.25	1340.95
0.50	1341.20
0.75	1341.45
1.00	1341.70
1.25	1341.95
1.50	1342.20
1.75	1342.45
2.00	1342.70
2.25	1342.95
2.50	1343.20
2.75	1343.45
3.00	1343.70
3.25	1343.95
3.50	1344.20
3.75	1344.45
4.00	1344.70
4.25	1344.95
4.50	1345.20
4.75	1345.45
5.00	1345.70

Culvert / Orifice Structures

	[A]	C]	[D]
Rise (in)	= 0.00	.00	0.00
Span (in)	= 0.00	.00	0.00
No. Barrels	= 0	.00	0.00
Invert El. (ft)	= 0.00	-	---
Length (ft)	= 0.00	lo	No
Slope (%)	= 0.00		
N-Value	= .000		
Orif. Coeff.	= 0.00		
Multi-Stage	= n/a		

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.



= 5.00 ft

Thursday, May 3 2007, 4:16 PM

Pond Report

Hydraflow Hydrographs by Intelisolve

Pond No. 1 - Detention P

Pond Data

Bottom LxW

Stage / Storage T

Stage (ft)

0.00
0.25
0.50
0.7
1

[D]

0.00
0.00
0.00

No

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.

Stage (ft)

5.00
4.00
3.00
2.00
1.00
0.00

70.00
77.00

Pond Report

Pond No. 1 - Detention Pond

Pond Data

Bottom LxW = 275.0 x 125.0 ft | Side slope = 4.0:1 | Bottom elev. = 1340.70 ft | Depth = 5.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1340.70	34,375	0.000	0.000
0.25	1340.95	35,179	0.200	0.200
0.50	1341.20	35,991	0.204	0.404
0.75	1341.45	36,811	0.209	0.613
1.00	1341.70	37,639	0.214	0.826
1.25	1341.95	38,475	0.218	1.045
1.50	1342.20	39,319	0.223	1.268
1.75	1342.45	40,171	0.228	1.496
2.00	1342.70	41,031	0.233	1.729
2.25	1342.95	41,899	0.238	1.967
2.50	1343.20	42,775	0.243	2.210
2.75	1343.45	43,659	0.248	2.458
3.00	1343.70	44,551	0.253	2.711
3.25	1343.95	45,451	0.258	2.969
3.50	1344.20	46,359	0.263	3.233
3.75	1344.45	47,275	0.269	3.502
4.00	1344.70	48,199	0.274	3.776
4.25	1344.95	49,131	0.279	4.055
4.50	1345.20	50,071	0.285	4.340
4.75	1345.45	51,019	0.290	4.630
5.00	1345.70	51,975	0.296	4.925

Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	0.00
N-Value	= .000	.000	.000	.000
Orif. Coeff.	= 0.00	0.00	0.00	0.00
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 2.50	0.00	0.00	0.00
Crest El. (ft)	= 1340.70	0.00	0.00	0.00
Weir Coeff.	= 2.60	0.00	0.00	0.00
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration = 0.000 in/hr (Wet area) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.