CITY OF ALBUQUERQUE

June 7, 2006

Vincent Carrica, P.E.
Tierra West, LLC
8509 Jefferson NE
Albuquerque, NM 87113

Re: Cottonwood Corners Shops Phase III, 10420B Coors ByPass NW, Certificate of Occupancy

Engineer's Stamp dated 6-10-05 (A14-D7E)

Certification dated 6-01-06

Dear Mr. Carrica,

Based upon the information provided in your submittal received 6-07-06, the above referenced certification is approved for release of permanent Certificate of Occupancy by Hydrology.

If you have any questions, you can contact me at 924-3981.

Sincerely,

Kristal D. Metro, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

C: CO Clerk
File

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

CITY OF ALBUQUERQUE

December 7, 2005

Mr Ronald R. Bohannan, PE
TIERRA WEST, LLC
8509 Jefferson St. NE
Albuquerque, NM 87113

Re: COTTONWOOD CORNERS - BORDERS
10420 Coors By Pass NW
Approval of Permanent Certificate of Occupancy (C.O.)
Engineer's Stamp dated 06/10/2005 (A-14/D7E)
Certification dated 12/07/2005

Dear Ron:

Based upon the information provided in your submittal received 12/07/2005, the above referenced certification is approved for release of Permanent Certificate of Occupancy by Hydrology.

If you have any questions, you can contact me at 924-3982.

Sincerely,

Arlene V. Portillo

Arlene V. Portillo
Plan Checker, Planning Dept. - Hydrology
Development and Building Services

C: CO Clerk
File

P.O. Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

CITY OF ALBUQUERQUE

ALBUQUERQUE
Making History

September 13, 2004

Vincent Carrica, P.E.
Tierra West, LLC
8509 Jefferson NE
Albuquerque, NM 87113

Re: Cottonwood Corners – Circuit City, 10420 Coors By Pass, Certificate of Occupancy

Engineer's Stamp dated 6-19-03 (A14-D7E)

Certification dated 9-07-04

Dear Mr. Carrica,

Based upon the information provided in your submittal received 9-13-04, the above referenced certification is approved for release of Permanent Certificate of Occupancy by Hydrology.

If you have any questions, you can contact me at 924-3981.

Sincerely,

Kristal D. Metro
Engineering Associate, Planning Dept.
Development and Building Services

C: Phyllis Villanueva
file

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

June 7, 2004

Mr. Vincent Carrica, P.E.
TIERRA WEST, LLC
8509 Jefferson St. NE
Albuquerque, NM 87113

Re: ECKERDS AT COTTONWOOD CORNERS
3821 Ellison Drive NW
Approval of Permanent Certificate of Occupancy (C.O.)
Engineer's Stamp dated 07/07/2003 (A-14/D007E)
Certification dated 05/17/2004

Dear Vincent,

Based upon the information provided in your submittal received 06/07/2004, the above referenced certification is approved for release of Permanent Certificate of Occupancy by Hydrology.

If you have any questions, you can contact me at 924-3982.

Sincerely,
Arlene V. Portillo

Arlene V. Portillo
Plan Checker, Planning Dept. - Hydrology
Development and Building Services
BLB

C: Phyllis Villanueva
File ✓

CITY OF ALBUQUERQUE

ALBUQUERQUE
Making History

July 6, 2005

Ronald Ray Bohannan
Tierra West, LLC
8509 Jefferson NE
Albuquerque, NM 87113

Re: Cottonwood Corners - Borders & Shops, 3821 Ellision Dr. NW
Grading & Drainage Plan – Engineer's Stamp dated 6-10-05 (A14-D7E)

Dear Mr. Bohannan,

Based upon the information provided in your submittal dated 6-10-05, the above referenced plan is approved for Building Permit. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology. Additionally, prior to release of the Certificate of Occupancy an Engineer's Certification of the grading plan per the DPM checklist will be required.

P.O. Box 1293

This project requires a National Pollutant Discharge Elimination System (NPDES) permit. Refer to the attachment that is provided with this letter for details. If you have any questions please feel free to call the Municipal Development Department Hydrology section at 768-3654 (Charles Caruso).

Albuquerque

If you have any questions, you can contact me at 924-3990.

New Mexico 87103

Sincerely,

www.cabq.gov

Phillip J. Lovato, E.I., C.F.M.
Engineering Associate, Hydrology,
Development and Building Services,
Planning Department

cc: Charles Caruso, DMD
file

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 28, 2003

Ronald R. Bohannan, P.E.
Tierra West, LLC
8509 Jefferson NE
Albuquerque, New Mexico 87113

RE: RED LOBSTER RESTAURANT (A-14/D7E)
(10520 Coors By Pass Rd NW) (Cottonwood Corners Tr. B-3)
ENGINEERS CERTIFICATION FOR CERTIFICATE OF OCCUPANCY
ENGINEERS STAMP DATED 5/3/2002
ENGINEERS CERTIFICATION DATED 5/14/2003

Dear Mr. Bohannan:

Based upon the information provided in your Engineers Certification submittal dated 5/28/2003, the above referenced site is approved for a Permanent Certificate of Occupancy.

If I can be of further assistance, please contact me at 924-3981.

Sincerely,

Teresa A. Martin
Hydrology Plan Checker
Development & Bldg. Ser. Division

BLB

C: Certificate of Occupany Clerk, COA
approval file
drainage file

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 16, 2003

Ronald R. Bohannan, P.E.
Tierra West, LLC
8509 Jefferson NE
Albuquerque, New Mexico 87113

RE: OLIVE GARDEN RESTAURANT (A-14/D007E)
(10500 Coors By Pass Rd NW)
ENGINEERS CERTIFICATION FOR CERTIFICATE OF OCCUPANCY
ENGINEERS STAMP DATED 5/2/2002
ENGINEERS CERTIFICATION DATED 5/14/2003

Dear Mr. Bohannan:

Based upon the information provided in your Engineers Certification submittal dated 5/14/2003, the above referenced site is approved for Permanent Certificate of Occupancy.

If I can be of further assistance, please contact me at 924-3981.

Sincerely,

Teresa A. Martin
Hydrology Plan Checker
Development & Bldg. Ser. Div.

C: Certificate of Occupancy Clerk, COA
approval file
drainage file

DRAINAGE REPORT

For

Remaining Portion of Tract B
Cottonwood Corners

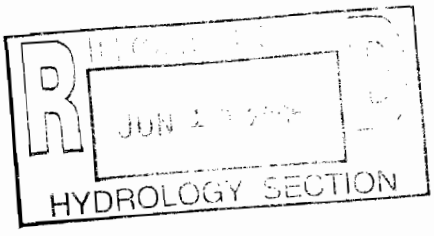
REVISED TO INCLUDE
BORDERS AND SHOPS
PAD SITES

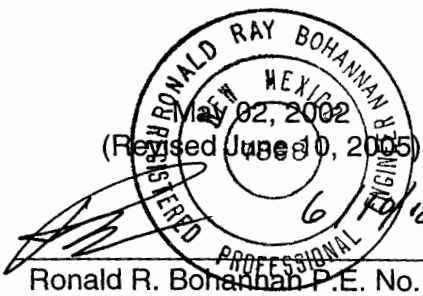
Prepared by

Tierra West, LLC
8509 Jefferson NE
Albuquerque, New Mexico 87113

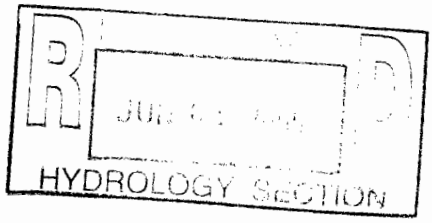
Prepared for

Las Colinas Realty
10200 Corrales Road NW
Albuquerque, New Mexico 87114





May 02, 2002
(Revised June 10, 2005)



Ronald R. Bohannan P.E. No. 7868

TABLE OF CONTENTS

LOCATION:

The 14-acre site is located in the northeast corner of the intersection of Coors Boulevard and Ellison Road, just west of State Road 528. The site is bordered on the east by the Cottonwood Drive. This site is one of the remaining portions of the Cottonwood area to be developed and it includes Tracts B3, B4, B5, and B6. All of the listed tracts are zoned SU-1. The purpose of this report is to revise the drainage analysis and management plan for the commercial site to include the proposed Borders Store and Shops for building permit in the central portion of the site.

DRAINAGE BASINS DESIGNATIONS:

For the purpose of this report, the existing and developed drainage basins were designated as follows.

Existing Undeveloped Basins:

Basin E1 Entire site consisting of Tracts B3, B4, B5 and B6.

Developed Conditions:

Basins A–K Developed parcels with on-site detention in parking lots

(Eckerd is proposed for Basins D & A)

EXISTING DRAINAGE CONDITIONS:

The site is currently developed with the exception of the Borders & Shops site. The proposed construction of the Borders and Shops will complete the development for the entire site. For the total 14 acres, the maximum flow rate allowed from the site is just less than 10 cfs. This maximum flow rate allowed from the site was established by the master drainage plan prepared for the entire cottonwood area by Easterling and Associates in 1994.

The site primarily drains from southwest to northeast into an onsite storm drain system that ties to an outfall in Cottonwood Drive. All off site flows are intercepted in the existing streets bordering

the site. No off site flows enter the site. The calculated undeveloped runoff from this site for a 100-year, 6-hour storm event under existing conditions is 18.46 cfs.

FIRM MAP AND SOIL CONDITIONS:

The site is located on FIRM Map 35001C0108 D and Map 35001C0109 D, Panel Numbers 108 and 109 of 825, as shown on the attached excerpts. The maps show that the site does partially lie within a 100-year flood plain. When the Cottonwood area was developed and the adjacent roadways and storm drains were constructed, the subject site was physically taken out of the flood plain. Easterling and Associates is currently in the process of preparing a Letter of Map Revision (LOMR) to officially remove the site from the flood plain.

The site contains a soil type designated as Bluepoint Series by the Soil Conservation Service Soil Survey of Bernalillo County. The Bluepoint series consists of deep, somewhat excessively drained soils formed in sandy alluvium and eolian sediments on alluvial fans and terraces. Slopes range from one to fifteen percent. Permeability is rapid. Runoff is slow and the hazard of blowing is severe.

ONSITE DRAINAGE MANAGEMENT PLAN:

The on-site developed basins A through K, as shown on exhibit B, consist of parcels containing commercial buildings and parking lots with on site shallow ponding. The basins will drain to individual drop inlets that are connected to an on site underground storm drain system. The storm drain system conveys the flows to the northeast corner of the site where it is tied to the master storm drain in Cottonwood Drive. Shallow parking lot ponds and orifice plates on the storm drains will control the runoff from the site to a maximum of 0.69 cfs per acre or 9.67 cfs for the total site. This is consistent with the master drainage management plan prepared for the Cottonwood area by

Easterling and Associates in 1994. A conceptual grading plan has been developed for the overall site including Tracts B-3, B-4, B-5 and B-6.

Due to the excessive grade differences between the site and the existing adjacent roadways, a combination of 1:1 rock plating and retaining walls are required along the west and north property lines. The entrance to the commercial center from the north was previously eliminated by Administrative Amendment due to required slopes and walls that would have been in excess of those allowed by the Development Process Manual (DPM).

The initial site developed was Basin B. This site contains a single drop inlet with an orifice plate used to control the runoff to a maximum of 0.69 cfs per acre. Ponding occurs on site in the parking lot. Events larger than a 100-year storm will result in the parking lot pond overflowing to the east into the adjacent tract and continuing into Cottonwood Drive. The finish floor elevations for Tract B-3-D-1 and for adjacent tracts will be a minimum of 1.22 feet above the emergency overflow elevation. A temporary retention pond was required in Basin D under interim conditions. The planned storm drain system was completed to the north and tied to the existing system in Cottonwood Drive with the construction of the Eckerd Store. This eliminated the need for the temporary retention pond in Basin D.

The restaurants and stores in Basins A, B, C, G, H, I, J & K have been constructed. Runoff from these basins is routed in the proposed storm drain to the existing storm drain in Cottonwood Drive. Orifice plates were constructed in the drop inlets to limit the discharge from the basins to under 0.69 cfs per acre. Parking lot ponding does occur in each basin. Flows in excess of a 100-yr event will overflow to adjacent basins and into the existing Cottonwood Drive. The finish floor elevations in the basins are above the emergency overflow elevations set for each basin. A chart is attached which tabulates all this pertinent data. The storm drain inlet structures will be constructed with a trap that is designed to intercept sediment and prevent the clogging of the required orifice plates.

FUTURE DEVELOPED CONDITIONS:

As the remaining tracts are developed the conceptual grading plan will be modified to conform to the required layouts. The temporary retention ponds required under interim conditions were eliminated as the storm drain system was extended to the north. When the storm drain system was tied to the existing system in Cottonwood Drive, the need for temporary retention ponds was eliminated. Each basin provides for shallow parking lot ponding to detain flows and control the runoff at a release rate of less than the 0.69 cfs allowed per acre. The onsite storm drain system collects discharge from the parking lot ponds and conveys the flows to the outlet at Cottonwood Drive.

CRITERIA:

The site was analyzed using the procedures outlined in the Development Process Manual Volume 2, Chapter 22. The Weighted-E method was used in estimating volumes and flow rates of runoff from off-site basins. The AHYMO computer program was used to analyze on site basins and the pond. The existing and developed conditions for on site basins were analyzed for a 100-year, 6-hour rainfall event.

SUMMARY:

The remaining portion of Tract B is to be developed as a commercial center. This includes Tracts B-3, B-4, B-5 and B-6. A conceptual master grading and drainage plan has been prepared. The conceptual plan complies with the maximum runoff allowed to enter the existing storm drain in Cottonwood Drive as outlined by the drainage master plan prepared by Easterling and Associates in 1994. Development of Basins A, B, C, G, H, I, J & K has been completed. The development of Basins B, D, E & F are proposed for a Borders Store and Shops. The grading and drainage plan for this site has been modified to include the new Borders pad site and shops pads and does follow the overall master plan. The drainage plan for Basins A, D, E and F does include parking lot ponding and

orifice controlled storm drain inlets. Emergency overflows for the parking lot ponds are provided and are well below the finish floor elevations within each basin.

Cottonwood Corners

Weighted E Method

Undeveloped Basins Zone # 1 ✓

												100-Year			10-Year		
Basin	Area (sf)	Area (acres)	Area (SQ MI)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
A	40008.00	0.918	0.0014351	100%	0.918457		0.000		0		0.000	0.440	0.034	1.18	0.080	0.006	0.22
B	38698.00	0.888	0.0013881	100%	0.888384		0.000		0		0.000	0.440	0.033	1.15	0.080	0.006	0.21
C	58765.00	1.349	0.0021079	100%	1.349059		0.000		0		0.000	0.440	0.049	1.74	0.080	0.009	0.32
D	6871.00	0.158	0.0002465	100%	0.157736		0.000		0		0.000	0.440	0.006	0.20	0.080	0.001	0.04
E	72419.00	1.663	0.0025977	100%	1.662511		0.000		0		0.000	0.440	0.061	2.14	0.080	0.011	0.40
F	126184.00	2.897	0.0045262	100%	2.896786		0.000		0		0.000	0.440	0.106	3.74	0.080	0.019	0.70
G	104805.00	2.406	0.0037594	100%	2.405992		0.000		0		0.000	0.440	0.088	3.10	0.080	0.016	0.58
H	43762.00	1.005	0.0015697	100%	1.004637		0.000		0		0.000	0.440	0.037	1.30	0.080	0.007	0.24
I	19534.00	0.448	0.0007007	100%	0.448439		0.000		0		0.000	0.440	0.016	0.58	0.080	0.003	0.11
J	52460.00	1.204	0.0018817	100%	1.204316		0.000		0		0.000	0.440	0.044	1.55	0.080	0.008	0.29
K	59712.00	1.371	0.0021419	100%	1.370799		0.000		0		0.000	0.440	0.050	1.77	0.080	0.009	0.33
Totals	623218.00	14.307			14.307								0.525	18.46 ✓		0.095	3.43

Equations:

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

Volume = Weighted D * Total Area

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

Cottonwood Corners

Weighted E Method

Developed Basins Zone # 1 ✓

											100-Year			10-Year		
Basin	Area (sf)	Area (acres)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
A	40008.00	0.918		0	15%	0.138		0	85%	0.781	1.775	0.136	3.69	1.087	0.083	2.36
B	38698.00	0.888		0	15%	0.133		0	85%	0.755	1.775	0.131	3.57	1.087	0.080	2.28
C	58765.00	1.349		0	15%	0.202		0	85%	1.147	1.775	0.200	5.42	1.087	0.122	3.47
D	6871.00	0.158		0	15%	0.024		0	85%	0.134	1.775	0.023	0.63	1.087	0.014	0.41
E	72419.00	1.663		0	15%	0.249		0	85%	1.413	1.775	0.246	6.68	1.087	0.151	4.27
F	126184.00	2.897		0	15%	0.435		0	85%	2.462	1.775	0.428	11.64	1.087	0.262	7.45
G	104805.00	2.406		0	15%	0.361		0	85%	2.045	1.775	0.356	9.67	1.087	0.218	6.18
H	43762.00	1.005		0	15%	0.151		0	85%	0.854	1.775	0.149	4.04	1.087	0.091	2.58
I	19534.00	0.448		0	15%	0.067		0	85%	0.381	1.775	0.066	1.80	1.087	0.041	1.15
J	52460.00	1.204		0	15%	0.181		0	85%	1.024	1.775	0.178	4.84	1.087	0.109	3.10
K	59712.00	1.371		0	15%	0.206		0	85%	1.165	1.775	0.203	5.51	1.087	0.124	3.52
Totals	623218.00	14.307										2.116	57.50		1.296	36.78

Equations:

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

Volume = Weighted D * Total Area

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

JN 21049
OLIVE GARDEN & RED LOBSTER @ COTTONWOOD CORNERS
CONCEPTUAL OVERALL DRAINAGE SUMMARY

Basin	Area (ACRE)	Drop Inlet Invert Elev.	Drop Inlet Rim Elev.	Ponding Capacity (AC-FT)	Max. Water Surface Elev.	Maximum Storage (AC-FT)	Orifice Diameter (INCH)	Peak Discharge (CFS)	Emergency Overflow Elevation	Finish Floor Elevation
A	0.918	5041.18	5044.01	0.076	5046.37	0.072	3.50	0.69	5046.40	5047.50
B	0.888	5041.30	5044.13	0.173	5044.91	0.078	3.30	0.53	5045.33	5046.60
C	1.349	5041.30	5044.13	0.385	5044.98	0.127	3.75	0.69	5045.33	5046.55
D	0.158	5041.18	5044.13	0.011	5047.00	0.005	2.50	0.37	5047.00	5047.50
E	1.663	5037.94	5046.70	0.209	5047.00	0.146	4.20	1.00	5047.00	5047.50
F	2.897	5040.81	5044.81	0.448	5045.88	0.252	5.60	1.76	5045.88	5049.20
G	2.406	5037.46	5041.56	0.297	5042.68	0.199	5.30	1.64	5043.00	5046.40
H	1.005	5040.00	5044.10	0.151	5044.76	0.063	4.25	1.02	5045.14	5046.00
I	0.448	5040.00	5044.10	0.077	5044.82	0.035	2.50	0.36	5045.20	5046.00
J	1.204	5039.70	5045.19	0.138	5046.03	0.108	3.30	0.70	5046.14	5047.40
K	1.371	5041.35	5045.97	0.234	5046.77	0.142	4.00	0.94	5047.00	5048.00
Outfall MH In CW DR		5032.12	5039.48				Total Q =	9.698		

Note: All storm drain pipes to be installed at 0.6 % slope

VOLUME CALCULATIONS

POND A

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

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

Ab =	20.00
At =	8,101.00
Dt =	0.80
C =	10101.25

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
41.6	0	0	0.000
45.60	4.00	0.0018	0.632
45.80	4.2	0.0066	0.648
46.00	4.4	0.0206	0.664
46.20	4.6	0.0439	0.679
46.40	4.8	0.0764	0.694

Orifice Equation
Q = CA SQRT(2gH)

C =	0.6
Diameter (in)	3.5
Area (ft^2)=	0.06681339
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

VOLUME CALCULATIONS

POND B

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

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

Ab =	20.00
At =	8,909.00
Dt =	1.20
C =	7407.50

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
41.3	0	0	0.000
42.30	1.00	0.0005	0.266
43.30	2	0.0010	0.390
44.13	2.83	0.0013	0.469
44.33	3.03	0.0061	0.486
44.83	3.53	0.0597	0.527
45.33	4.03	0.1726	0.564

Orifice Equation
Q = CA SQRT(2gH)

C =	0.6
Diameter (in)	3.3
Area (ft^2)=	0.05939574
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

VOLUME CALCULATIONS

POND C

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

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

Ab =	20.00
At =	14,867.00
Dt =	1.00
C =	14847.00

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
41.3	0	0	0.0000
44.13	2.83	0.0013	0.6039
44.33	3.03	0.0082	0.6260
44.53	3.23	0.0288	0.6475
44.73	3.43	0.0629	0.6682
44.93	3.63	0.1107	0.6883
45.13	3.83	0.1722	0.7078
45.33	4.03	0.2473	0.7269
45.53	4.23	0.3360	0.7454
45.63	4.33	0.3854	0.7545

Orifice Equation
Q = CA SQRT(2gH)

C =	0.6
Diameter (in)	3.75
Area (ft^2)=	0.07669904
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

VOLUME CALCULATIONS

POND D

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

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

Ab =	20.00
At =	2,456.00
Dt =	0.30
C =	8120.00

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
41.7	0	0	0.00
46.70	5.00	0.0023	0.36
46.90	5.20	0.0061	0.37
47.00	5.30	0.0108	0.37

Orifice Equation
Q = CA SQRT(2gH)

C =	0.6
Diameter (in)	2.5
Area (ft^2)=	0.03408846
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

VOLUME CALCULATIONS

POND E

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

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

Ab	=	20.00
At	=	18,018.00
Dt	=	1.00
C	=	17998.00

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
42	0	0	0.00
46.00	4.00	0.0018	0.91
46.20	4.20	0.0102	0.93
46.40	4.40	0.0351	0.95
46.60	4.60	0.0765	0.97
46.80	4.80	0.1344	1.00
47.00	5.00	0.2089	1.02

Orifice Equation
Q = CA SQRT(2gH)

C =	0.6
Diameter (in	4.2
Area (ft^2)=	0.0962113
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

VOLUME CALCULATIONS

POND F

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

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

Ab = 20.00
At = 36,300.00
Dt = 1.07
C = 33906.54

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
40.81	0	0	0.00
44.81	4.00	0.0018	1.60
45.01	4.20	0.0175	1.64
45.21	4.40	0.0643	1.68
45.41	4.60	0.1422	1.72
45.61	4.80	0.2513	1.76
45.81	5.00	0.3915	1.80
45.88	5.07	0.4479	1.81

Orifice Equation
Q = CA SQRT(2gH)

C = 0.6
Diameter (in) 5.6
Area (ft^2)= 0.1710423
g = 32.2
H (Ft) = Depth of water above center of orifice
Q (CFS)= Flow

VOLUME CALCULATIONS

POND G

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

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

Ab	=	20.00
At	=	18,366.00
Dt	=	1.40
C	=	13104.29

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
37.6	0	0	0.00
41.60	4.00	0.0018	1.43
41.80	4.20	0.0079	1.47
42.00	4.40	0.0261	1.51
42.20	4.60	0.0563	1.54
42.40	4.80	0.0985	1.58
42.60	5.00	0.1527	1.61
42.80	5.20	0.2190	1.65
43.00	5.40	0.2973	1.68

Orifice Equation

Q = CA SQRT(2gH)

C =	0.6	
Diameter (in	5.3	
Area (ft^2)=	0.1532072	
g =	32.2	
H (Ft) =	Depth of water above center of orifice	
Q (CFS)=	Flow	

VOLUME CALCULATIONS

POND H

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

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

Ab =	20.00
At =	12,497.00
Dt =	1.04
C =	11997.12

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
40	0	0	0.00
44.10	4.10	0.0019	0.94
44.30	4.30	0.0075	0.96
44.50	4.50	0.0241	0.99
44.70	4.70	0.0517	1.01
44.90	4.90	0.0904	1.03
45.10	5.10	0.1400	1.05
45.14	5.14	0.1513	1.06

Orifice Equation
Q = CA SQRT(2gH)

C =	0.6
Diameter (in)	4.25
Area (ft^2)=	0.0985157
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

VOLUME CALCULATIONS

POND I

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

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

Ab =	20.00
At =	5,826.00
Dt =	1.08
C =	5375.93

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
40	0	0	0.00
44.10	4.10	0.0019	0.33
44.30	4.30	0.0044	0.34
44.50	4.50	0.0119	0.34
44.70	4.70	0.0244	0.35
44.90	4.90	0.0417	0.36
45.10	5.10	0.0640	0.37
45.20	5.20	0.0771	0.37

Orifice Equation
Q = CA SQRT(2gH)

C =	0.6
Diameter (in)	2.5
Area (ft^2)=	0.03408846
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

VOLUME CALCULATIONS

POND J

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

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

Ab =	20.00
At =	13,022.00
Dt =	1.00
C =	13002.00

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
39.8	0	0	0.00
45.19	5.39	0.0025	0.66
45.39	5.59	0.0085	0.67
45.59	5.79	0.0265	0.68
45.79	5.99	0.0565	0.69
45.99	6.19	0.0984	0.70
46.14	6.34	0.1376	0.71

Orifice Equation
Q = CA SQRT(2gH)

C =	0.6
Diameter (in	3.3
Area (ft^2)=	0.0593957
g =	32.2

H (Ft) = Depth of water above center of orifice
Q (CFS)= Flow

VOLUME CALCULATIONS

POND K

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

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

Ab =	20.00
At =	19,620.00
Dt =	1.03
C =	19029.13

ACTUAL ELEV.	DEPTH (FT)	VOLUME (AC-FT)	Q (CFS)
41.45	0	0	0.00
45.97	4.52	0.0021	0.88
46.17	4.72	0.0109	0.90
46.37	4.92	0.0372	0.92
46.57	5.12	0.0810	0.94
46.77	5.32	0.1422	0.95
46.97	5.52	0.2210	0.97
47.00	5.55	0.2343	0.97

<u>Orifice Equation</u>
Q = CA SQRT(2gH)

C =	0.6
Diameter (in	4
Area (ft^2)=	0.0872665
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow