This appendix was prepared towards the development of a Drainage and Storm water Quality Master Plan for the South Broadway Area in general accordance with the requirements in the Scope of Work provided in the contract agreement between URS and the City of Albuquerque dated November 14, 2011. The information contained in this appendix was developed using existing drawings, reports, photographs, survey, and background information furnished by the City of Albuquerque and third parties. URS is neither responsible for, nor has confirmed the accuracy of this information. URS has relied on this information, as well as professional engineering judgment based on experience with similar projects, to develop this report. Additional investigations and analyses will be required for the future design phases of any drainage infrastructure within the limits of this study.

APPENDIX A
EXISTING CONDITIONS
HYDROLOGIC ANALYSIS

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LIST OF ACRONYMS AND ABBREVIATIONS

A	Area
AHYMO	Arid-lands Hydrologic Model
AMDS	Albuquerque Master Drainage Study
BN & SF	Burlington Northern & Santa Fe
cfs	Cubic Feet per Second
CN	Curve Number
COA	City of Albuquerque
DMP	Drainage Management Plan
EPA	United States Environmental Protection Agency
ft.	Foot or Feet
HSG	Hydrologic Soil Group
in.	inches
NMDOT	New Mexico Department of Transportation
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
Q	Flow (cfs)
SCS	Soil Conservation Service
SP&E	Specifications, Plans, and Estimates
sq. mi.	Square Mile
SSURGO	Soil Survey Geographic Database
SWMM	Storm Water Management Model
TR-55	Technical Release 55
USDA	United States Department of Agriculture

A.1 BACKGROUND

Under contract to the City of Albuquerque (COA), URS modeled the existing hydrologic conditions for the area affecting the South Broadway storm drain system. This system is bounded by Roma Avenue to the north, the city limit to the south (south of Woodward Road), Interstate-25 to the east, and the Burlington Northern & Santa Fe (BN & SF) Railroad to the west. This system will outlet into the San Jose Drain (SJD), which discharges to the Rio Grande. The hydrologic analysis consisted of the following steps:

- Delineating watershed boundaries
- Estimating each watershed curve number (CN)
- Determining each watershed's average area slope
- Estimating the percent of impervious surface
- Determining the "width" of the watershed
- Estimating annual precipitation, and
- Developing the Storm Water Management Model (SWMM) to perform hydrologic calculations.

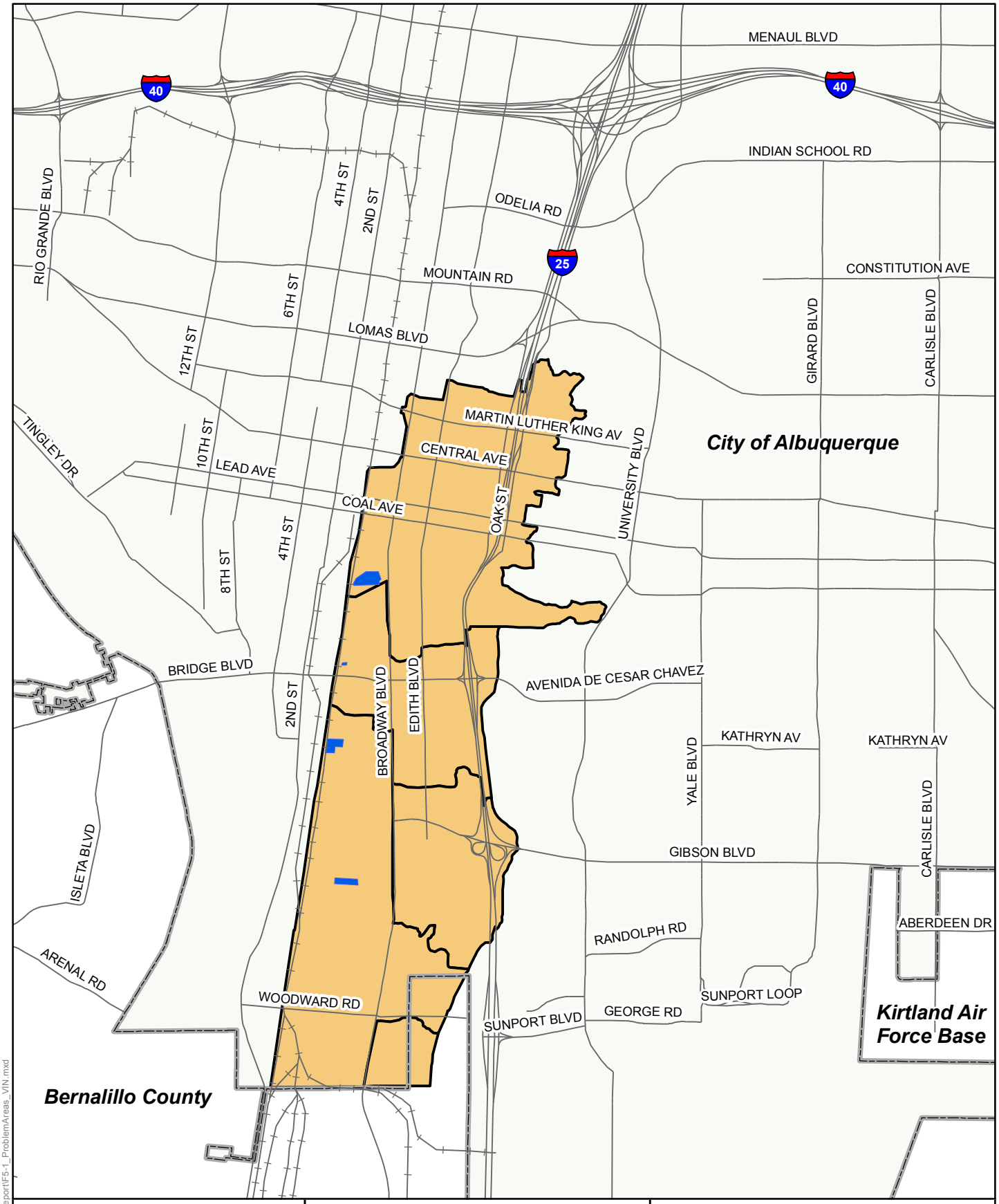
Detailed descriptions of the steps, assumptions, and results of the analysis are presented herein. An overview of the project area is provided on Figure A.1.

A.2 WATERSHED DELINEATION

The South Broadway Sector Drainage Management Plan (DMP) [1], completed in 1990, was used as the basis of the watershed boundaries as requested by the COA. The watersheds for this study remained comparable to the original watersheds of the DMP as much as possible. Watersheds were modified to reflect either new storm drain lines or a change in the topography. Watershed delineation was also conducted on the area east of Interstate-25 in order to determine the amount of runoff affecting the system from outside the project limits. The watersheds were digitized using ArcView, version 9.3.1. All watersheds were delineated and modified using 2-foot contours generated from COA topography, and available orthophotography. Please refer to Figure A.2 for a map of the watersheds.

A.2.1 WATERSHED DELINEATION – WITHIN PROJECT LIMITS

As previously stated, the watershed delineation and naming convention is based on the South Broadway Sector DMP [1]. Comparing the original watersheds with the available topography many watersheds maintained their original boundaries. Also, as in the original DMP analysis, watershed SJN – 750 was removed from the study. Watershed SJN – 750 drains directly to the South Diversion Channel and has no effect on the storm drain system of the area, which is why it is not included in this study.



N

0 1,500 3,000 Feet

1 : 36,000 or 1 inch = 3,000 Feet

URS

Legend

- Study Area
- Major Road
- Railroad
- City Boundary
- Pond

Project Location

South Broadway Drainage and Storm Water Quality Management Plan

Figure A.1	Page A.2

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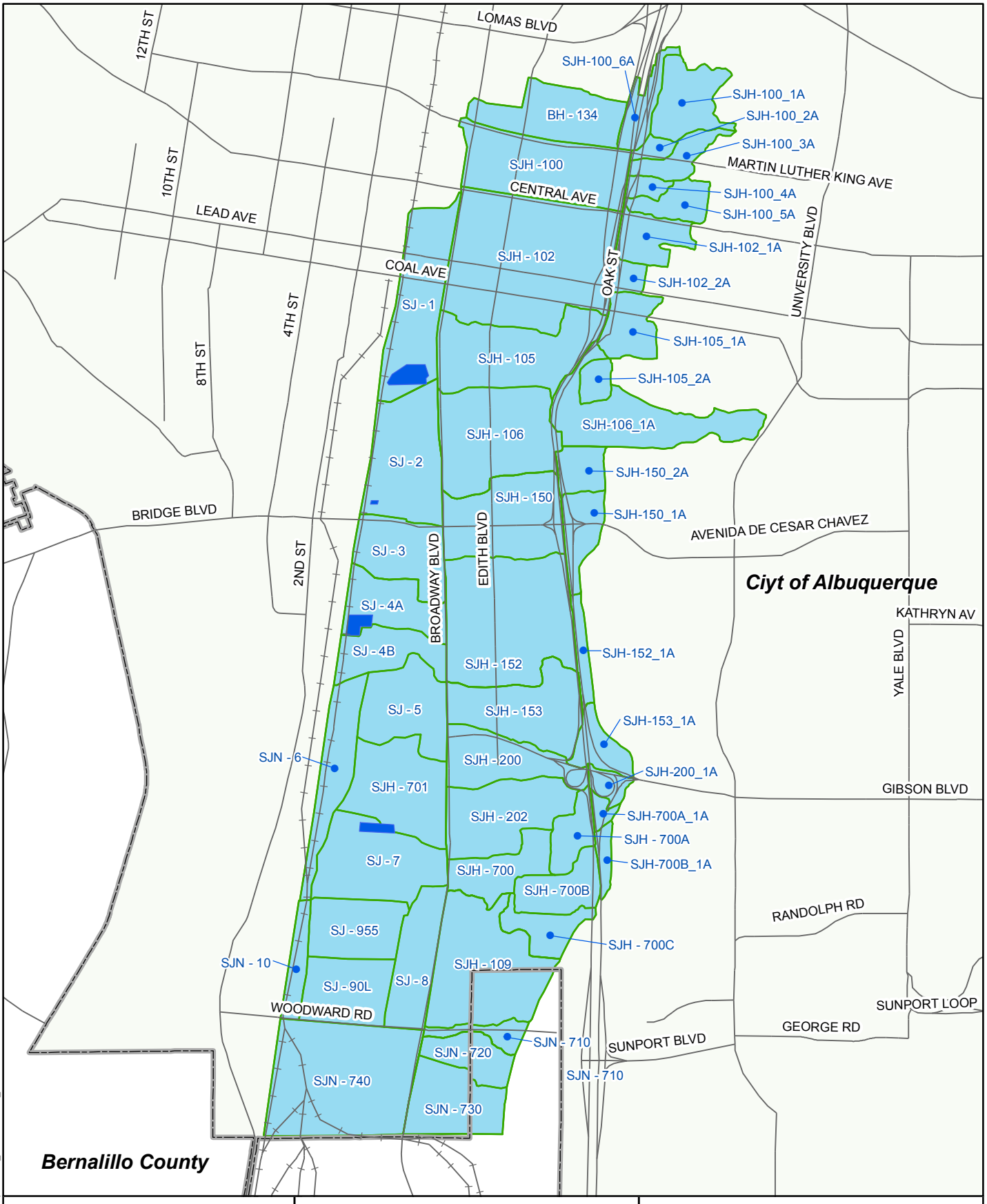

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1 : 24,000 or 1 inch = 2,000 Feet

URS

Legend

- Watershed
- Major Road
- Railroad
- City Boundary
- Pond

Watershed Delineation Map

South Broadway Drainage and Storm Water Quality Management Plan

Figure A.2	Page A.3

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While looking at the topography and available orthophotography many of the watersheds were adjusted. Some watersheds were adjusted to reflect the amount of runoff contributing to a specific storm drain. Other watersheds were adjusted to reflect new development. The modifications that were made based on storm drains were fairly minimal and did not alter the watershed beyond recognition of the original watershed. Watersheds that were changed to reflect development were altered significantly. The watersheds that underwent the most change are as follows:

- SJH – 109
- SJH – 202
- SJH – 700
- SJN – 710
- SJN – 720
- SJN – 730
- SJ – 2
- SJ – 3
- SJ – 4

A.2.1.1 Watershed Modification

Three watersheds that underwent major modifications are SJH – 109, SJH – 202 and SJH – 700, primarily due to the development of the Broadway Industrial Center [2]. This industrial center has been under planning and development since 1997. The development changed the topography of the area and introduced a new storm drain. As a result SJH – 109 and SJH – 202 were reduced in size and SJH – 700 increased in size. Three significant detention basins were also created under the industrial center. To account for the additional detention basins, watershed SJH – 700 was divided into 4 different watersheds. The four watersheds that resulted are SJH – 700, SJH – 700A, SJH – 700B, and SJH – 700C.

Watersheds SJN – 710, SJN – 720 and SJN – 730 were also modified significantly; however, the changes are due to updated topographic data. The area does not have much development but the topographic data used was not comparable to the original watersheds of the area. These watersheds do not affect the South Broadway storm drain system because they are located at the south end of the project and surface flow to the SJD or down South Broadway Blvd. Due to the lack of effects these watersheds have on the storm drain system, the watershed difference were not investigated further.

Watersheds SJ – 2, SJ – 3 and SJ – 4 were modified to improve understanding of the storm drain system in this area. South of the pump station on Bell Street and Commercial Avenue the storm drain system becomes very intricate. While analyzing the area it became apparent that in order to produce alternatives for this area the watersheds had to be adjusted. The boundary between watershed SJ – 2 and SJ – 3 was modified, making SJ – 3 larger and SJ – 2 smaller. Watershed SJ – 4 was subdivided into SJ – 4A and SJ – 4B. The original watershed of SJ – 4 can still be compared to the two watersheds SJ – 4A and SJ – 4B by adding them together.

Though these watersheds no longer follow the original watershed boundaries of the 1990 DMP [1], these adjustments were necessary to reflect current conditions.

A.2.2 WATERSHED DELINEATION – OUTSIDE PROJECT LIMITS

Watersheds to the east of Interstate-25 were delineated to determine their effects on the project storm drain system. A few assumptions had to be made in line with the scope of work. These assumptions are as follows:

- The east boundary of the watershed is limited by the South Diversion Channel.

- If the South Diversion Channel does not intercept the potential watershed a very large interceptor storm drain will act as the east boundary. The drain runs from Roma Avenue south on Cedar Street to Silver Avenue where it turns west for a block to Mulberry Street and then it turns south. After making some directional changes the pipe ends up on Oak Street to outlet to the South Diversion Channel.
- The large interceptor storm drain will capture all the flow to the east with no bypass.

These watersheds were digitized using Arc View as well as using the 2- foot contours from the COA topography and available orthophotography. The naming convention of these watersheds is based on which "project watershed" they potentially effect. Numbering from north to south and lettering from west to east. The number and lettering system is separated from the particular watershed name by an underscore (e.g., SJH–100_1A). The numbering denotes the offsite watershed that could potentially affect the particular watershed. The lettering identifies the location of the watershed relative to Interstate-25.

Watersheds east of the large interceptor drain were delineated to ensure the interceptor drain will capture most of the flow from the east as assumed. This assumption will require more analysis to determine how much bypass will actually affect the South Broadway system. These watersheds have the letters B through D assigned to them.

A.3 EFFECTS OF WATERSHEDS OUTSIDE PROJECT LIMITS

As stated above watersheds east of the large interceptor drain were delineated to determine the potential impact of the bypass flow from these watersheds on the project system. The Rational method was used to determine the peak runoff of these watersheds for the 100-year storm. The peak intensity and "c" coefficients for each watershed was determined using the COA DPM[3]. Table A.14 at the end of this analysis displays each watershed and the data used to determine the peak runoff. In order to calculate the bypass flow from each watershed the number of inlets within the watersheds was determined. Assuming each inlet is able to intake 4 cubic feet per second (cfs) this capacity was multiplied by the number of inlets per watershed, determining the potential maximum flow of the system. Assuming the inlet capacity is the limiting feature of the system the bypass flow was determined. Subtracting the watershed runoff from the potential max flow the amount of the bypass flow the inlets are able to catch was determined. Table A.1 displays the expected amount of bypass flow from each watershed.

Table A.1: Bypass Flow

Watershed ID	Q100 (cfs)	# of Inlets per Basin	Inlet Intake (cfs)	Bypass Q (cfs)
SJH-100_1B	114	20	4	34
SJH-100_3B	167	34	4	31
SJH-102_1B	169	25	4	69
SJH-102_1C	529	53	4	317
SJH-102_2B	63	12	4	15
SJH-102_2D	151	4	4	135
SJH-102_2C	139	25	4	39
SJH-105_1B	151	19	4	75

The two watersheds which contribute the most bypass flow are SJH-102_1C and SJH-102_2D. The flow from SJH-102_1C will travel down Central Avenue. This flow could potentially impact the South Broadway system. The flow running down Central Avenue is expected to flow right through the project and continue west. The flow from SJH-102_2D is expected to travel down Lead Avenue or Coal Avenue and possibly pond in the park. It was determined that the potential impacts of the bypass flow from these watersheds are negligible; however, these watersheds require an in-depth study to determine impacts conclusively.

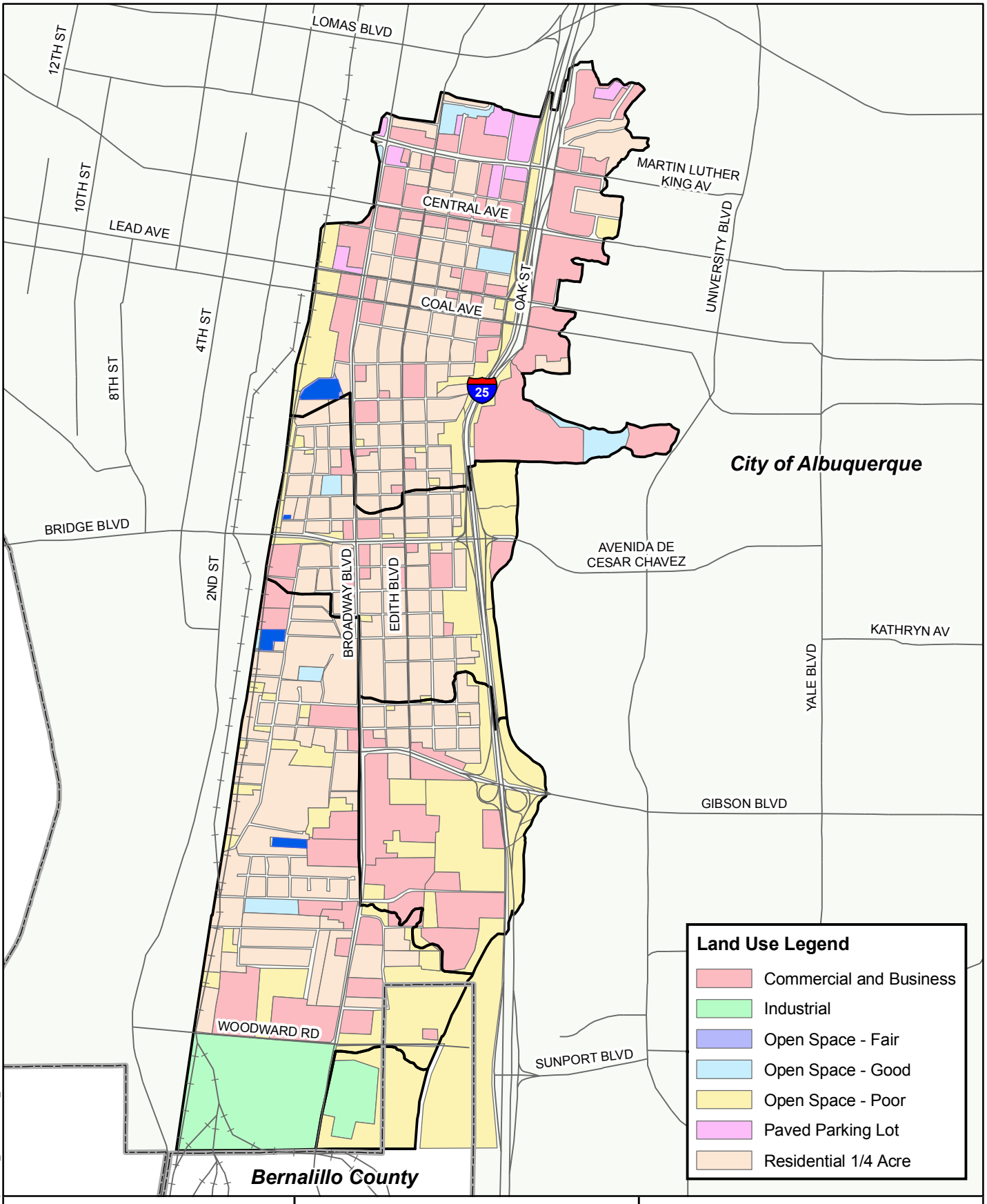
A.4 CURVE NUMBER

Runoff losses were modeled using the SWMM. This was done by selecting "rainfall/runoff" in the process model section and "Curve Number" in the Infiltration model section, while setting up the model options. This infiltration process requires the user to input the CN, drying time, and conductivity of each watershed. The SWMM manual [4] indicates that the conductivity property has been deprecated and is no longer used; therefore the default number of 0.5 was not changed. Drying time is used to determine the minimum infiltration rate. This was set to 7 days which is reasonable to reflect the number of days it will take for a fully saturated soil to dry. Curve numbers were assigned based on the combination of hydrologic soil groups (HSGs) and land use cover described according to Technical Release 55: Urban Hydrology for Small Watersheds [5].

Land use types were estimated using available orthophotography and hand delineated in ArcMap. Polygons were completed with the land use cover attributed to each polygon. Figure 3 displays the land use types.

HSGs were determined by using the soil type shapefile for Bernalillo County available from the Soil Survey Geographic Database (SSURGO) [6]. The SSURGO soil shapefile delineates soil according to soil types, which were correlated to HSGs based on a key code also available from SSURGO. Soils were classified as Soil Group A, B, C, or D. Figure 4 displays the soil groups used for each watershed.

A CN shapefile was created by combining the land use and soils shapefile with the watersheds shapefile using the ArcMap Union tool. The CN shapefile contained the land use ID and soil type for each individual polygon created. Curve numbers were assigned to each polygon according to Technical Release -55 [5] using the land use/HSG combination. The area-weighted average CN for each watershed was then calculated using the following equation: $CN_{avg} = \Sigma$ (Area*CN) / Σ (area sum).



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1 : 24,000 or 1 inch = 2,000 Feet

URS

Legend

- System
- Major Road
- Railroad
- City Boundary
- Pond

Land Use Map

South Broadway Drainage and Storm Water Quality Management Plan

Figure A.3	Page A.7

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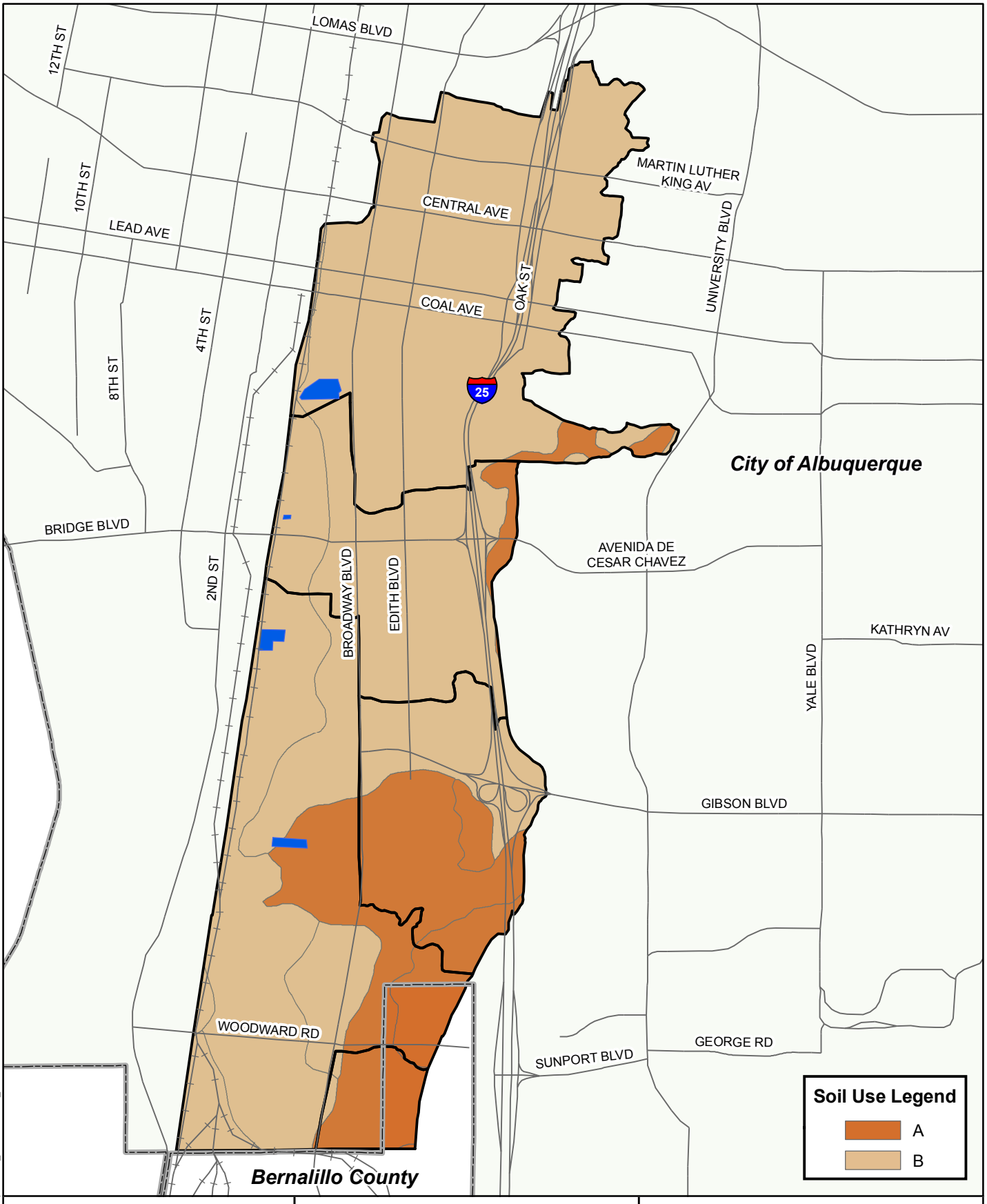

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Legend

- System
- Major Road
- Railroad
- City Boundary
- Pond

Hydrologic Soil Groups Map

South Broadway Drainage and Storm Water Quality Management Plan

Figure A.4	Page A.8

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A.5 HYDROLOGIC AREA WIDTH

As routing for each watersheds pervious area, SWMM only requires the area-weighted average width and slope be inputs for calculation. The area width takes into account the overland flow path length for each pervious land type within the watershed. This was calculated by applying the following equation:

$$W_{avg} = (PA_1/WA_1)*L_1 + (PA_2/WA_2)*L_2$$

Where: W_{avg} = area-weighted average width

PA = pervious area (ft^2)

WA = watershed area (ft^2)

L = overland flow length (ft)

The overland flow path length was determined using ArcMap and available orthophotography. The area-weighted average slope was calculated using the same equation only applying the slope of each pervious area within the watershed. The equation used is as follows:

$$S_{avg} = (PA_1/WA_1)*s_1 + (PA_2/WA_2)*s_2$$

Where: S_{avg} = area-weighted average slope (%)

PA = pervious area (ft^2)

WA = watershed area (ft^2)

s = pervious area slope (%)

The slope of the representative pervious areas was determined using ArcMap while using the 2-foot contour data from the COA topography and applying the overland flow length of the particular pervious type.

A.6 PERCENT IMPERVIOUS

The percent impervious was calculated for each watershed. The SWMM manual [4] describes the impervious area as the area which is impervious and drains directly to a storm water conveyance system such as a gutter, pipe, swale, etc. To be consistent among watersheds the road/street system is considered the impervious area. Parking lots and other impervious areas that are not typically considered roads are taken into consideration while calculating the CN of the block within the watershed. The percent impervious was calculated by taking the area of the impervious sections of the watershed and dividing by the total watershed area.

A.7 ESTIMATION OF RAINFALL

Precipitation was initially estimated by assuming a Soil Conservation Service (SCS) 24-hour Type II-75 rainfall distribution. The total rainfall depths, summarized in Table A.2 below, were applied to the SCS Type II-75 rainfall distribution in order to develop a rainfall distribution for input into the SWMM.

Table A.2: NOAA Atlas 14 Point Precipitation Depth (in.)

Duration	Average Recurrence Interval (Years)		
	2	10	100
6-hour	0.97	1.47	2.23
24-hour	1.23	1.77	2.60

To be consistent with the COA DPM [1] a 6-hour rainfall distribution was developed for the analysis. The COA requires the design of storm drain systems to be able to convey the 6-hour storm. The New Mexico Department of Transportation (NMDOT) Drainage Manual Volume 1: Hydrology [7], was used to create the 6-hour distribution, with the peak intensity at 1.5 hours. Placing the peak intensity at 1.5 hours was based on the 24-hour storm placing the peak at 6-hours. The 24-hour storm has a peak intensity occur at a quarter of the total storm duration; therefore applying the peak intensity at a quarter of the 6-hour storm places the peak intensity at 1.5 hours. The 100-year, 6-hour storm distribution created using the NMDOT procedure was compared to the Arid Lands Hydrology Model (AHYMO). In AHYMO the comparable rainfall type is identified as "rainfall Type 1." According to the user manual, a rainfall Type 1 is the 6-hour rainfall distribution based on the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 with peak intensity at 1.4 hours. Figure A.5: Cumulative 6-Hour Rainfall Distribution Comparison shows the distributions are very similar; therefore, the NMDOT distribution will be used for modeling purposes.

In order to keep the rainfall distributions consistent, the 24-hour storm distribution was also created using the NMDOT Drainage Manual. The rainfall distribution created was then compared to the AHYMO rainfall distribution. AHYMO refers to the 24-hour rainfall distribution as "rainfall Type 5," which is the 24-hour SCS Type II-75 distribution for New Mexico with peak intensity at 6-hours. Figure A.6: Cumulative 24-Hour Rainfall Distribution Comparison displays the rainfall distributions; they are also very close by comparison as well.

As a result, for consistent methodology as well as for a better representation of the runoff occurring in the area, the NMDOT rainfall distribution was used. The NOAA Atlas 14 total rainfall depth in conjunction with the NMDOT rainfall distribution became input into the SWMM. This was done for both the 24-hour and 6-hour storm durations. Cumulative depth and incremental depths are very similar, but with a difference in the peak. Figure A.7 displays the incremental depth curve of the 24-hour storm and as can be seen the two model peaks are not the same. As a result the runoff within the project area becomes a better representation of the runoff of the area. Tables A.7 through A.12 show the rainfall distribution for the 2-year, 24-hour storm; 2-year, 6-hour storm; 10-year, 24-hour storm; 10-year, 6-hour storm; 100-year, 24-hour storm; and 100-year, 6-hour storm.

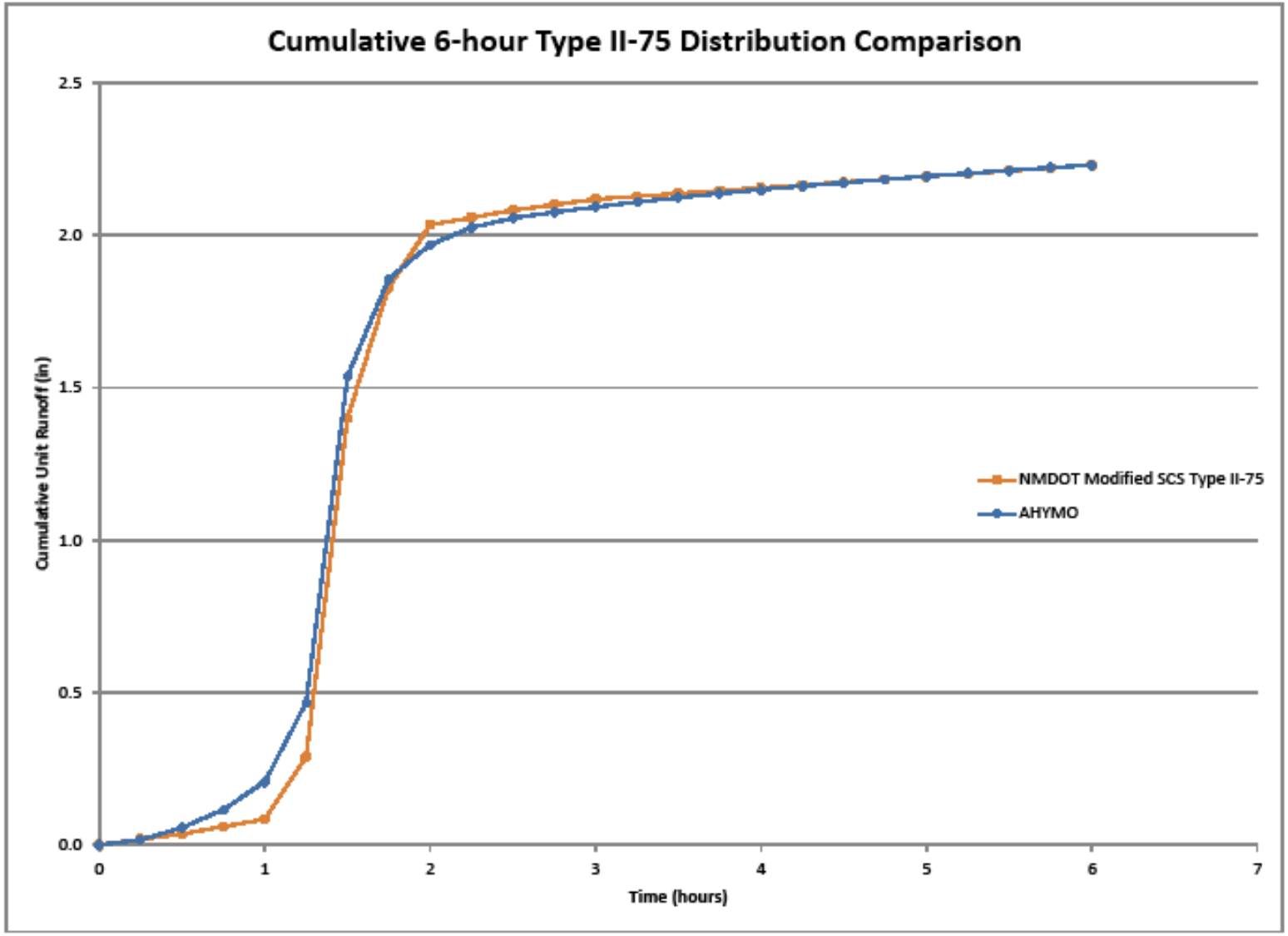

Figure A.5: Cumulative 6-Hour Rainfall Distribution Comparison

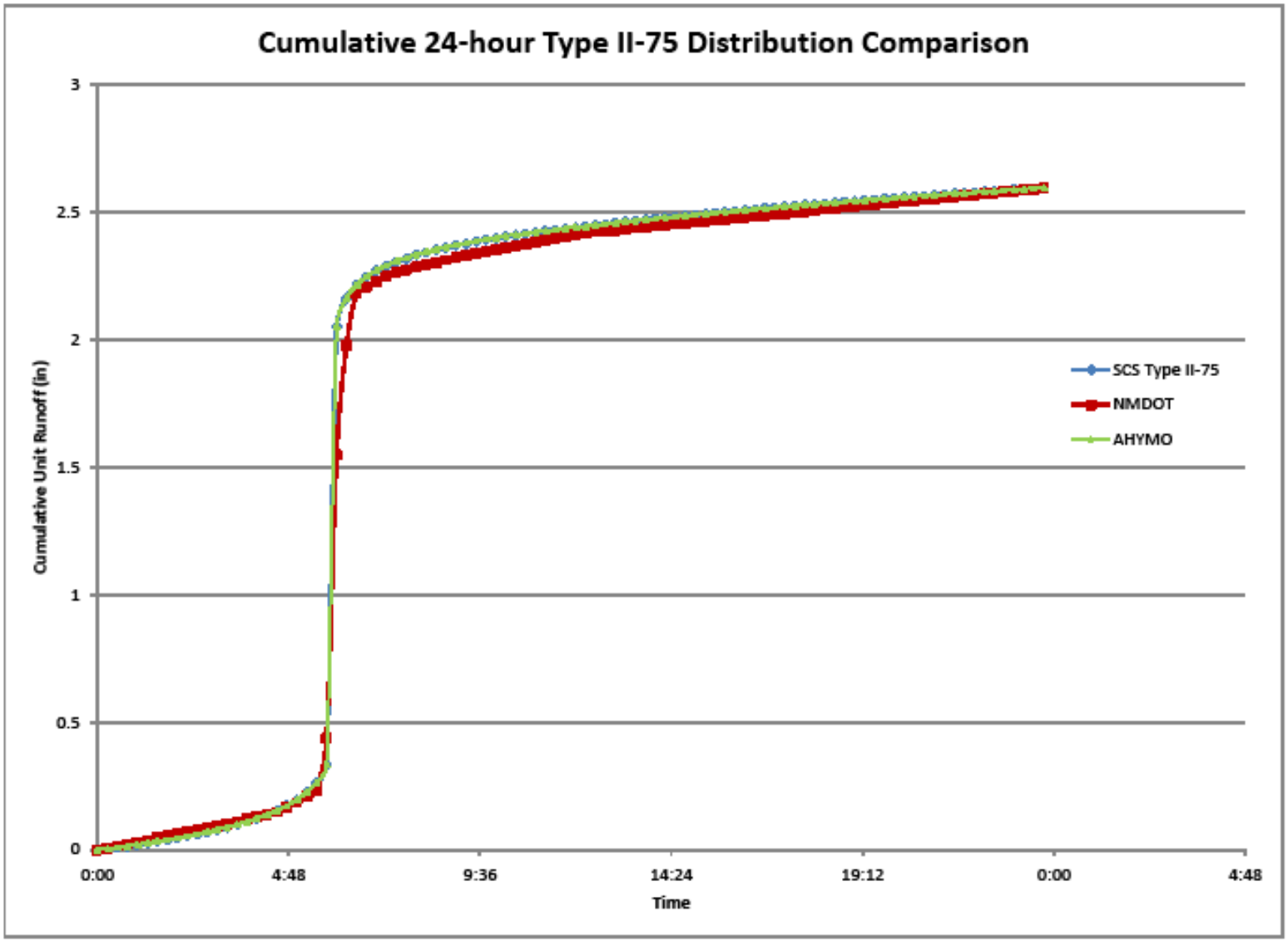

Figure A.6: Cumulative 24-Hour Rainfall Distribution Comparison

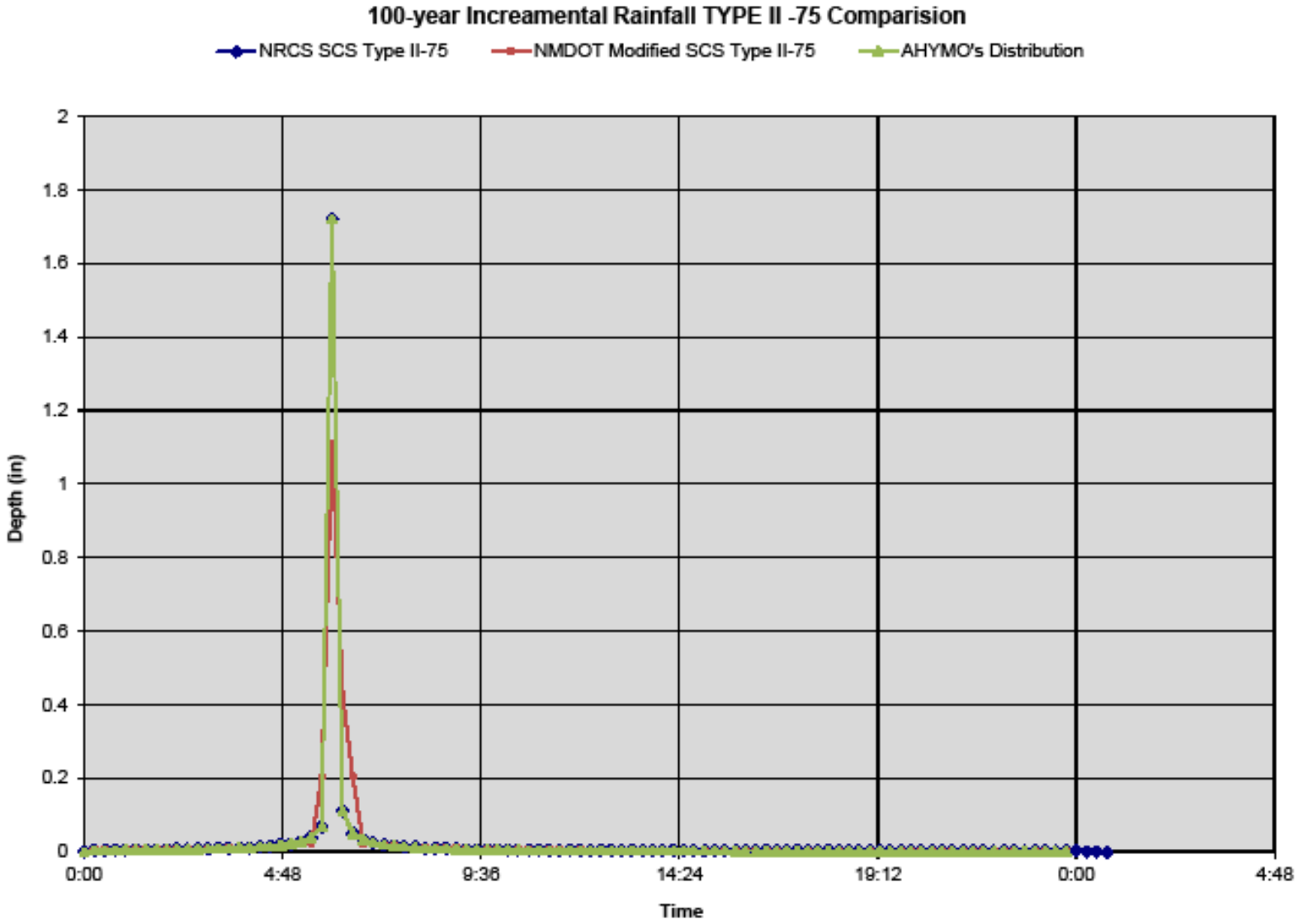

Figure A.7: 24-Hour Incremental Depth Duration Curve

A.8 ASSEMBLY OF HYDROLOGIC INPUT TO THE SWMM

Hydrologic elements were created for each watershed within the study area. Each element required the following input data as a representation of the actual watershed being modeled.

- Name – The name of the watershed being analyzed.
- Rain Gage – The rainfall distribution used as previously discussed.
- Outlet – The point in which the calculated flow of the watershed enters the hydraulic system of the model.
- Area – Total area of the watershed.
- Width – The characteristic of the overland flow path for sheet flow runoff, as previously described.
- % Slope – The average percent slope of the watershed, as previously described.
- % Impervious – The percent of land area that is impervious within the watershed, which has been identified in this analysis as the streets.
- N-Impervious – Manning's "n" of the overland flow over an impervious area. To be consistent within watersheds all N values were designated as 0.018, which is consistent with the COA DMP guidelines.
- N-Pervious – Manning's "n" of the overland flow over a pervious area. To be consistent within watersheds all N values were designated as 0.060 to account for major objects disturbing the flow path.
- D Store-Impervious – Depth of depression storage on the impervious area of the watershed. The user manual suggests a range of 0.05 - 0.10 inches. Due to the lack of storage expected on the streets, a value of 0.05 inches was used on all watersheds.
- D Store-Pervious – Depth of depression storage on the pervious areas of the watershed. The user manual suggests a range of 0.10 – 0.20 inches for lawns, and 0.20 inches for pastures. A value of 0.12 inches was used on all watersheds.
- % Zero-Impervious – The percent of impervious area with no depression storage. The default of 25% was used. It is expected that 25% of the runoff will not be affected by ponding, and will flow directly to the hydraulic element of the model.
- Subarea Routing – The internal routing of runoff between pervious and impervious areas. Impervious was used in this study. The impervious selection indicates that runoff from pervious areas will flow to impervious areas before draining to a storm water conveyance system.
- Percent Routed – Indicates the percent of runoff routed between the pervious/impervious areas. One hundred percent (100%) was used in this study.
- Infiltration – Indicates the method used to determine infiltration. The CN method was used as previously described.

Other input data not previously discussed has not been used or is irrelevant to the watershed modeling process. Table A.13 displays the SWMM input data for each watershed.

A.9 MODEL RESULTS

Model results for each watershed can be found in the table below.

Table A.3: Hydrologic Model Results

Watershed ID	Area (sq. mi.)	Peak Runoff 100-year, 24-hour Storm (cfs)	Peak Runoff 100-year, 6-hour Storm (cfs)
BH-134	0.054	106	96
SJH-100	0.083	175	163
SJH-102	0.165	264	236
SJH-105	0.081	124	109
SJH-106	0.089	130	114
SJH-150	0.073	117	104
SJH-152	0.127	166	142
SJH-153	0.065	97	86
SJH-200	0.047	70	62
SJH-202	0.064	71	58
SJH-700	0.034	46	39
SJH-109	0.099	107	89
SJN-710	0.012	11	9
SJN-720	0.026	27	22
SJN-730	0.049	51	42
SJN-740	0.129	99	88
SJ-8	0.045	70	62
SJ-90L	0.046	33	29
SJ-955	0.045	46	38
SJ-7	0.073	70	58
SJH-701	0.067	69	56
SJ-5	0.054	72	61
SJ-4A&B*	0.074	86	72
SJ-4A	0.040	52	44
SJ-4B	0.034	34	28
SJ-3	0.047	80	71
SJ-2	0.073	86	72
SJ-1	0.075	103	88
SJN-10	0.016	15	12
SJN-6	0.044	49	41

*Combination of SJ – 4A and SJ – 4B

While looking at the results and comparing them to the previous South Broadway DMP [1] it became apparent that the peak runoffs of the two studies are quite different. A comparison of the inputs and outputs of the two studies is displayed in Table A.4.

Table A.4: Result Comparison

Watershed ID	Current SWMM Model					S. Broadway DMP				
	Area (sq. mi.)	Input CN	Watershed CN	Slope (ft/ft)	Peak Q (cfs)	Area (sq. mi.)	Input CN	Watershed CN	Slope (ft/ft)	Peak Q (cfs)
BH-134	0.054	88	89	0.026	106	0.066	54	83	0.055	180
SJH-100*	0.083	87	90	0.028	175	0.097	54	80		210
SJH-102*	0.165	79	83	0.030	264	0.175	54	72		215
SJH-105*	0.081	79	82	0.027	124	0.071	54	69		103
SJH-106*	0.089	77	80	0.028	130	0.095	54	69		117
SJH-150*	0.073	79	83	0.026	117	0.075	54	69		126
SJH-152*	0.127	77	80	0.028	166	0.132	54	69		194
SJH-153*	0.065	77	80	0.032	97	0.062	54	72		108
SJH-200*	0.047	81	84	0.019	70	0.055	54	72		94
SJH-202*	0.064	79	80	0.025	71	0.082	54	58		28
SJH-700*	0.034	82	83	0.017	46	0.056	69	69		33
SJH-109	0.099	73	74	0.053	107	0.104	70	72	0.024	65
SJN-710	0.012	70	74	0.027	11	0.032	69	70	0.037	21
SJN-720	0.026	71	71	0.048	27	0.040	69	70	0.026	20
SJN-730	0.049	74	74	0.035	51	0.042	62	76	0.028	96
SJN-740	0.129	88	88	0.004	99	0.130	70	81	0.002	130
SJ-8	0.045	82	84	0.013	70	0.046	78	82	0.018	99
SJ-90L	0.046	88	88	0.003	33	0.050	79	86	0.002	54
SJ-955	0.045	76	78	0.010	46	0.041	79	86	0.002	58
SJ-7	0.073	70	73	0.019	70	0.068	65	76	0.008	70
SJH-701	0.067	77	78	0.021	69	0.078	69	78	0.010	96
SJ-5	0.054	79	81	0.022	72	0.041	62	76	0.007	48
SJ-4A&B**	0.074	76	78	0.015	86	0.188	66	77	0.007	105
SJ-4A	0.040	78		0.016	52					
SJ-4B	0.034	74		0.015	34					
SJ-3	0.047	82	85	0.021	80	0.023	64	76	0.012	41
SJ-2	0.073	76	79	0.017	86	0.098	65	77	0.004	88
SJ-1	0.075	84	85	0.020	103	0.079	60	71	0.005	48
SJN-10	0.016	76	77	0.012	15	0.016	79	83	0.000	12
SJN-6	0.044	76	79	0.011	49	0.052	70	78	0.001	26

*Basins which the S. Broadway DMP used all data except % impervious from Original AMDS report
** Combination of SJ – 4A and SJ – 4B

Table A.4 shows the difference in peak runoff between the current SWMM model and the previous South Broadway DMP [1]. There are many factors which resulted in these differences. For example, certain parameters have changed since the 1990 DMP, such as the rainfall data used to determine the areas hyetograph. The South Broadway DMP[1] used NOAA Atlas 2 and the current model used NOAA Atlas 14. The CN is another factor that affects peak runoff. The column titled "Input CN" is the CN that was determined using ArcMap and calculated for the pervious areas of each watershed. The column titled "Watershed CN" is the result of combining the pervious area CN with the impervious area. This combination provides a total watershed CN

rather than just a pervious area CN. The total watershed CN was determined using the following equation:

$$CN_{total} = (IA*98 + PA*CN_p) / A$$

Where: CN_{total} = total watershed CN

IA = impervious area (sq. mi.)

98 = TR-55 CN for impervious area

PA = pervious area (sq. mi.)

CN_p = CN of the pervious area (determined as input data)

A = total area of watershed (sq. mi.)

Table A.5 displays the values used to determine the total watershed CN as well as the results and comparison.

As can be seen in Table A.5, the watersheds that have a large difference in CN are those that have not been updated since the Albuquerque Master Drainage Study (AMDS) report [8]. All other watersheds have comparable CNs, which makes sense and is reasonable. The comparison of data inputs has not been able to explain the differences in peak Qs between the two different studies. With that said, a comparison of the peak Q per acre was also calculated. Table A.6 presents the results of a peak runoff per acre comparison.

The peak runoff per acre indicates how similar each study's results are. As can be seen the current SWMM model has an average runoff per acre of 2.1 cfs/acre and the South Broadway DMP [1] has an average runoff per acre of 1.8 cfs/acre. This comparison confirms that the current SWMM model results are reasonable and acceptable. It can also be seen that the standard deviation of the current model is less than the previous study. This means that the current model results are closer in relation to each other than those of the previous model, where there was more variation between watershed runoff.

Table A.5: Total Watershed CN

Watershed ID	Current SWMM Model						S. Broadway DMP						Δ CN
	Area (sq.mi.)	% Imperv.	Imperv. Area (sq.mi.)	Perv. Area (sq.mi.)	Perv. Area CN	**Total CN**	Area (sq.mi.)	% Imperv.	Imperv. Area (sq.mi.)	Perv. Area (sq.mi.)	Perv. Area CN	**Total CN**	
BH-134	0.053	10	0.0054	0.048	88	89	0.066	65	0.0429	0.023	54	83	6
SJH-100*	0.083	23	0.0191	0.064	87	90	0.097	60	0.0582	0.038	54	80	9
SJH-102*	0.165	21	0.0347	0.130	79	83	0.175	40	0.0700	0.105	54	72	11
SJH-105*	0.081	17	0.0138	0.067	79	82	0.071	35	0.0249	0.046	54	69	13
SJH-106*	0.089	16	0.0143	0.075	77	80	0.095	35	0.0333	0.061	54	69	11
SJH-150*	0.073	21	0.0153	0.057	79	83	0.075	35	0.0263	0.048	54	69	14
SJH-152*	0.126	14	0.0177	0.109	77	80	0.132	35	0.0462	0.085	54	69	11
SJH-153*	0.065	16	0.0105	0.054	77	80	0.062	40	0.0248	0.037	54	72	9
SJH-200*	0.047	20	0.0095	0.037	81	84	0.055	40	0.0220	0.033	54	72	13
SJH-202*	0.063	6	0.0038	0.060	79	80	0.082	10	0.0082	0.073	54	58	22
SJH-700*	0.033	7	0.0024	0.031	82	83	0.056	0	0.0000	0.056	69	69	14
SJH-109	0.099	5	0.0050	0.094	73	74	0.104	8	0.0083	0.095	70	72	2
SJN-710	0.012	13	0.0016	0.010	70	74	0.032	4	0.0013	0.030	69	70	3
SJN-720	0.025	0	0.0000	0.025	71	71	0.040	2	0.0008	0.040	69	70	1
SJN-730	0.048	0	0.0000	0.048	74	74	0.042	40	0.0169	0.025	62	76	-2
SJN-740	0.129	0	0.0000	0.129	88	88	0.130	40	0.0521	0.078	70	81	7
SJ-8	0.044	14	0.0062	0.038	82	84	0.046	20	0.0092	0.036	78	82	2
SJ-90L	0.045	2	0.0009	0.044	88	88	0.050	35	0.0176	0.032	79	86	3
SJ-955	0.044	11	0.0049	0.039	76	78	0.041	35	0.0147	0.027	79	86	-7
SJ-7	0.072	12	0.0087	0.064	70	73	0.068	32	0.0219	0.046	65	76	-2
SJH-701	0.067	3	0.0020	0.065	77	78	0.078	30	0.0236	0.055	69	78	0
SJ-5	0.054	11	0.0059	0.048	79	81	0.041	40	0.0166	0.024	62	76	5
SJ-4A&B	0.074	8.5	0.0063	0.068	76	78	0.188	35	0.0658	0.122	66	77	1
SJ-3	0.047	19	0.0090	0.038	82	85	0.023	35	0.0083	0.015	64	76	9
SJ-2	0.073	12	0.0088	0.064	76	79	0.098	35	0.0346	0.064	65	77	2
SJ-1	0.075	4	0.0030	0.072	84	85	0.079	30	0.0239	0.055	60	71	13
SJN-10	0.016	3	0.0005	0.015	76	77	0.016	20	0.0033	0.013	79	83	-6
SJN-6	0.044	13	0.0057	0.038	76	79	0.052	30	0.0158	0.036	70	78	0

*Basins which the S. Broadway DMP used all data except % impervious from Original AMDS report

Table A.6: CFS per Acre Comparison

Watershed	Current SWMM Model				S. Broadway DMP 1990				Δ cfs/acre
	Area (sq.mi.)	Area (acre)	Peak Q (cfs)	Peak Q / Acre	Area (sq.mi.)	Area (acre)	Peak Q (cfs)	Peak Q / Acre	
BH-134	0.05	34.30	105.7	3.1	0.066	42.24	180	4.3	-1.2
SJH-100	0.08	53.25	175.0	3.3	0.097	62.08	210	3.4	-0.1
SJH-102	0.17	105.79	264.1	2.5	0.175	112.00	215	1.9	0.6
SJH-105	0.08	52.03	123.9	2.4	0.071	45.44	103	2.3	0.1
SJH-106	0.09	57.15	130.2	2.3	0.095	60.80	117	1.9	0.4
SJH-150	0.07	46.72	116.7	2.5	0.075	48.00	126	2.6	-0.1
SJH-152	0.13	81.09	165.7	2.0	0.132	84.48	194	2.3	-0.3
SJH-153	0.07	41.86	97.4	2.3	0.062	39.68	108	2.7	-0.4
SJH-200	0.05	30.34	70.3	2.3	0.055	35.20	94	2.7	-0.4
SJH-202	0.06	40.83	71.1	1.7	0.082	52.48	28	0.5	1.2
SJH-700	0.03	21.63	45.7	2.1	0.057	36.16	33	0.9	1.2
SJH-109	0.10	63.42	106.9	1.7	0.104	66.69	65	1.0	0.7
SJN-710	0.01	7.94	11.2	1.4	0.032	20.54	21	1.0	0.4
SJN-720	0.03	16.58	26.6	1.6	0.041	26.18	20	0.8	0.8
SJN-730	0.05	31.17	51.4	1.6	0.042	27.07	96	3.5	-1.9
SJN-740	0.13	82.82	99.4	1.2	0.130	83.33	130	1.6	-0.4
SJ-8	0.04	28.48	70.1	2.5	0.046	29.44	99	3.4	-0.9
SJ-90L	0.05	29.25	33.1	1.1	0.050	32.26	54	1.7	-0.5
SJ-955	0.04	28.61	46.1	1.6	0.042	26.82	58	2.2	-0.6
SJ-7	0.07	46.59	70.4	1.5	0.068	43.78	70	1.6	-0.1
SJH-701	0.07	43.14	68.8	1.6	0.079	50.43	96	1.9	-0.3
SJ-5	0.05	34.56	71.8	2.1	0.041	26.50	48	1.8	0.3
SJ-4A&B*	0.07	47.62	86.3	1.8	0.188	120.38	105	0.9	0.9
SJ-3	0.05	30.21	80.0	2.6	0.024	15.17	41	2.7	-0.1
SJ-2	0.07	46.91	85.7	1.8	0.099	63.30	88	1.4	0.4
SJ-1	0.08	48.13	103.2	2.1	0.080	50.88	48	0.9	1.2
SJN-10	0.02	10.43	15.0	1.4	0.017	10.69	12	1.1	0.3
SJN-6	0.04	28.22	48.6	1.7	0.053	33.66	26	0.8	0.9
Statistics of Peak Q / Acre									
Average (cfs/acre)				2.1				1.8	
Standard Deviation				0.53				0.97	

*Combination of SJ – 4A and SJ – 4B

A.10 REFERENCES

1. Bohannan-Huston, Inc. 1990. *South Broadway Sector Drainage Management Plan*.
2. D. Mark Goodwin & Associates. 1997. *Drainage Report for Broadway Industrial Center*.
3. City of Albuquerque, 2008, *Albuquerque, New Mexico Development Process Manual.* American Legal Publishing Corp.
4. United States Environmental Protection Agency (EPA). 2010. *Storm Water Management Model User's Manual, Version 5.0*.
5. USDA NRCS. 1986. *Urban Hydrology for Small Watersheds TR-55*.
6. USDA National Resource Conservation Commission (NRCS). 2008. Soil Survey Geographic Database (SSURGO) Soil Data for Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico.
7. NMDOT Preliminary Design Bureau/Drainage Section. 1995. *Drainage Manual Volume 1, Hydrology*.
8. Bohannan-Huston, Inc. 1981. *Albuquerque Master Drainage Study*.

TABLES

HYDROLOGIC DATA

Table A.7: South Broadway
NMDOT Modified SCS Type II-75 Rainfall Distribution
2 year 6 hour

NMDOT's Modified SCS Type II - 75 Distribution

Depth-Duration-Frequency Worksheet

	2-yr	Units
15-min	0.52	(in)
30-min	0.73	(in)
1-hr**	0.92	(in)
2-hr	0.94	(in)
3-hr	0.95	(in)
6-hr*	0.98	(in)

(assuming Region 1)

*Data from NOAA website Atlas 14

** 1-hr point precipitation depth was computed by taking 75% of the 24-hr point precipitation depth
Unless otherwise stated all calculations and procedures in the above table are from NMDOT Drainage manual Vol. 1 section 3.3.1.2.1

The Modified NOAA-SCS Rainfall Distribution Worksheet

	Time (hrs)	Cumulative Depth (in)	Incremental Depth (in)	Incremental Rainfall (in)	Cumulative Rainfall Depth (in)	Ordinates
0	0	0.00	0	0.00	0.000	0.0000
1	0.25	0.52	0.52	0.00	0.004	0.0037
2	0.5	0.73	0.20	0.00	0.007	0.0074
3	0.75	0.82	0.10	0.00	0.012	0.0123
4	1	0.92	0.10	0.00	0.017	0.0172
5	1.25	0.92	0.00	0.10	0.113	0.1162
6	1.5	0.93	0.00	0.52	0.638	0.6535
7	1.75	0.93	0.00	0.20	0.840	0.8608
8	2	0.94	0.00	0.10	0.937	0.9598
9	2.25	0.94	0.00	0.00	0.942	0.9647
10	2.5	0.95	0.00	0.00	0.946	0.9696
11	2.75	0.95	0.00	0.00	0.950	0.9733
12	3	0.95	0.00	0.00	0.954	0.9770
13	3.25	0.96	0.00	0.00	0.955	0.9789
14	3.5	0.96	0.00	0.00	0.957	0.9808
15	3.75	0.96	0.00	0.00	0.959	0.9827
16	4	0.96	0.00	0.00	0.961	0.9847
17	4.25	0.96	0.00	0.00	0.963	0.9866
18	4.5	0.96	0.00	0.00	0.965	0.9885
19	4.75	0.97	0.00	0.00	0.967	0.9904
20	5	0.97	0.00	0.00	0.969	0.9923
21	5.25	0.97	0.00	0.00	0.970	0.9942
22	5.5	0.97	0.00	0.00	0.972	0.9962
23	5.75	0.97	0.00	0.00	0.974	0.9981
24	6	0.98	0.00	0.00	0.976	1.0000

Table A.8: South Broadway
NMDOT Modified SCS Type II-75 Rainfall Distribution
2 year 24hour

NMDOT's Modified SCS Type II - 75 Distribution

Depth-Duration-Frequency Worksheet

	2-yr	Units
15-min	0.53	(in)
30-min	0.73	(in)
1-hr**	0.92	(in)
2-hr	0.94	(in)
3-hr	0.95	(in)
6-hr*	0.98	(in)
12-hr	1.10	(in)
24-hr*	1.23	(in)

(assuming Region 1)

*Data from NOAA website Atlas 14

** 1-hr point precipitation depth was computed by taking 75% of the 24-hr point precipitation depth

Unless otherwise stated all calculations and procedures in the above table are from NMDOT Drainage manual Vol. 1 section 3.3.1.2.1

The Modified NOAA-SCS Rainfall Distribution Worksheet

NMDOT n	Time (hrs)	Cumulative Depth (in)	Incremental Depth (in)	Hyetograph Time Period (hrs)	Rearranged n	Incremental Depth (in)	Cumulative Depth (in)
0	0	0	0.000	0 - 1	19	0.0212	0.0212
1	0.25	0.53	0.526	1 - 2	17	0.0212	0.0423
2	0.5	0.73	0.203	2 - 3	15	0.0212	0.0635
3	0.75	0.83	0.097	3 - 4	13	0.0072	0.0707
4	1	0.92	0.097	4 - 4.5	11	0.0036	0.0742
5	1.25	0.93	0.005	4.5 - 5	9	0.0069	0.0811
6	1.5	0.93	0.005	5 - 5.25	7	0.0046	0.0857
7	1.75	0.94	0.005	5.25 - 5.5	5	0.0046	0.0902
8	2	0.94	0.005	5.5 - 5.75	3	0.0969	0.1871
9	2.5	0.95	0.007	5.75 - 6	1	0.5258	0.7129
10	3	0.95	0.007	6 - 6.25	2	0.2030	0.9159
11	3.5	0.96	0.004	6.25 - 6.5	4	0.0969	1.0128
12	4	0.96	0.004	6.5 - 6.75	6	0.0046	1.0173
13	5	0.97	0.007	6.75 - 7	8	0.0046	1.0219
14	6	0.98	0.007	7 - 7.5	10	0.0069	1.0288
15	7	1.00	0.021	7.5 - 8	12	0.0036	1.0323
16	8	1.02	0.021	8 - 9	14	0.0072	1.0395
17	9	1.04	0.021	9 - 10	16	0.0212	1.0607
18	10	1.06	0.021	10 - 11	18	0.0212	1.0818
19	11	1.08	0.021	11 - 12	20	0.0212	1.1030
20	12	1.10	0.021	12 - 14	21	0.0212	1.1242
21	14	1.12	0.021	14 - 16	22	0.0212	1.1453
22	16	1.15	0.021	16 - 18	23	0.0212	1.1665
23	18	1.17	0.021	18 - 20	24	0.0212	1.1877
24	20	1.19	0.021	20 - 22	25	0.0212	1.2088
25	22	1.21	0.021	22 - 24	26	0.0212	1.2300
26	24	1.23	0.021				

Table A.8: South Broadway
NMDOT Modified SCS Type II-75 Rainfall Distribution
2 year 24hour

The Modified NOAA-SCS Rainfall Distribution

	Time (hrs)	Cumulative Depth (in)	Incremental Depth (in)	Incremental Rainfall (in)	Cumulative Rainfall Depth (in)	Ordinates
0	0	0.00	0.0000	0	0	0.000
1	0.25	0.53	0.5258	0.0053	0.0053	0.004
2	0.5	0.73	0.2030	0.0053	0.0106	0.009
3	0.75	0.83	0.0969	0.0053	0.0159	0.013
4	1	0.92	0.0969	0.0053	0.0212	0.017
5	1.25	0.93	0.0046	0.0053	0.0265	0.022
6	1.5	0.93	0.0046	0.0053	0.0317	0.026
7	1.75	0.94	0.0046	0.0053	0.0370	0.030
8	2	0.94	0.0046	0.0053	0.0423	0.034
9	2.25	0.94	0.0034	0.0053	0.0476	0.039
10	2.5	0.95	0.0034	0.0053	0.0529	0.043
11	2.75	0.95	0.0034	0.0053	0.0582	0.047
12	3	0.95	0.0034	0.0053	0.0635	0.052
13	3.25	0.96	0.0018	0.0018	0.0653	0.053
14	3.5	0.96	0.0018	0.0018	0.0671	0.055
15	3.75	0.96	0.0018	0.0018	0.0689	0.056
16	4	0.96	0.0018	0.0018	0.0707	0.057
17	4.25	0.96	0.0018	0.0018	0.0724	0.059
18	4.5	0.97	0.0018	0.0018	0.0742	0.060
19	4.75	0.97	0.0018	0.0034	0.0777	0.063
20	5	0.97	0.0018	0.0034	0.0811	0.066
21	5.25	0.97	0.0018	0.0046	0.0857	0.070
22	5.5	0.97	0.0018	0.0046	0.0902	0.073
23	5.75	0.97	0.0018	0.0969	0.1871	0.152
24	6	0.98	0.0018	0.5258	0.7129	0.580
25	6.25	0.98	0.0053	0.2030	0.9159	0.745
26	6.5	0.99	0.0053	0.0969	1.0128	0.823
27	6.75	0.99	0.0053	0.0046	1.0173	0.827
28	7	1.00	0.0053	0.0046	1.0219	0.831
29	7.25	1.00	0.0053	0.0034	1.0253	0.834
30	7.5	1.01	0.0053	0.0034	1.0288	0.836
31	7.75	1.01	0.0053	0.0018	1.0306	0.838
32	8	1.02	0.0053	0.0018	1.0323	0.839
33	8.25	1.02	0.0053	0.0018	1.0341	0.841
34	8.5	1.03	0.0053	0.0018	1.0359	0.842
35	8.75	1.03	0.0053	0.0018	1.0377	0.844
36	9	1.04	0.0053	0.0018	1.0395	0.845
37	9.25	1.04	0.0053	0.0053	1.0448	0.849
38	9.5	1.05	0.0053	0.0053	1.0501	0.854
39	9.75	1.06	0.0053	0.0053	1.0554	0.858
40	10	1.06	0.0053	0.0053	1.0607	0.862
41	10.25	1.07	0.0053	0.0053	1.0660	0.867
42	10.5	1.07	0.0053	0.0053	1.0713	0.871
43	10.75	1.08	0.0053	0.0053	1.0765	0.875
44	11	1.08	0.0053	0.0053	1.0818	0.880
45	11.25	1.09	0.0053	0.0053	1.0871	0.884
46	11.5	1.09	0.0053	0.0053	1.0924	0.888

Table A.8: South Broadway
NMDOT Modified SCS Type II-75 Rainfall Distribution
2 year 24hour

	Time (hrs)	Cumulative Depth (in)	Incremental Depth (in)	Incremental Rainfall (in)	Cumulative Rainfall Depth (in)	Ordinates
47	11.75	1.10	0.0053	0.0053	1.0977	0.892
48	12	1.10	0.0053	0.0053	1.1030	0.897
49	12.25	1.11	0.0026	0.0026	1.1056	0.899
50	12.5	1.11	0.0026	0.0026	1.1083	0.901
51	12.75	1.11	0.0026	0.0026	1.1109	0.903
52	13	1.11	0.0026	0.0026	1.1136	0.905
53	13.25	1.12	0.0026	0.0026	1.1162	0.908
54	13.5	1.12	0.0026	0.0026	1.1189	0.910
55	13.75	1.12	0.0026	0.0026	1.1215	0.912
56	14	1.12	0.0026	0.0026	1.1242	0.914
57	14.25	1.13	0.0026	0.0026	1.1268	0.916
58	14.5	1.13	0.0026	0.0026	1.1295	0.918
59	14.75	1.13	0.0026	0.0026	1.1321	0.920
60	15	1.13	0.0026	0.0026	1.1348	0.923
61	15.25	1.14	0.0026	0.0026	1.1374	0.925
62	15.5	1.14	0.0026	0.0026	1.1400	0.927
63	15.75	1.14	0.0026	0.0026	1.1427	0.929
64	16	1.15	0.0026	0.0026	1.1453	0.931
65	16.25	1.15	0.0026	0.0026	1.1480	0.933
66	16.5	1.15	0.0026	0.0026	1.1506	0.935
67	16.75	1.15	0.0026	0.0026	1.1533	0.938
68	17	1.16	0.0026	0.0026	1.1559	0.940
69	17.25	1.16	0.0026	0.0026	1.1586	0.942
70	17.5	1.16	0.0026	0.0026	1.1612	0.944
71	17.75	1.16	0.0026	0.0026	1.1639	0.946
72	18	1.17	0.0026	0.0026	1.1665	0.948
73	18.25	1.17	0.0026	0.0026	1.1691	0.951
74	18.5	1.17	0.0026	0.0026	1.1718	0.953
75	18.75	1.17	0.0026	0.0026	1.1744	0.955
76	19	1.18	0.0026	0.0026	1.1771	0.957
77	19.25	1.18	0.0026	0.0026	1.1797	0.959
78	19.5	1.18	0.0026	0.0026	1.1824	0.961
79	19.75	1.19	0.0026	0.0026	1.1850	0.963
80	20	1.19	0.0026	0.0026	1.1877	0.966
81	20.25	1.19	0.0026	0.0026	1.1903	0.968
82	20.5	1.19	0.0026	0.0026	1.1930	0.970
83	20.75	1.20	0.0026	0.0026	1.1956	0.972
84	21	1.20	0.0026	0.0026	1.1983	0.974
85	21.25	1.20	0.0026	0.0026	1.2009	0.976
86	21.5	1.20	0.0026	0.0026	1.2035	0.978
87	21.75	1.21	0.0026	0.0026	1.2062	0.981
88	22	1.21	0.0026	0.0026	1.2088	0.983
89	22.25	1.21	0.0026	0.0026	1.2115	0.985
90	22.5	1.21	0.0026	0.0026	1.2141	0.987
91	22.75	1.22	0.0026	0.0026	1.2168	0.989
92	23	1.22	0.0026	0.0026	1.2194	0.991
93	23.25	1.22	0.0026	0.0026	1.2221	0.994
94	23.5	1.22	0.0026	0.0026	1.2247	0.996
95	23.75	1.23	0.0026	0.0026	1.2274	0.998
96	24	1.23	0.0026	0.0026	1.2300	1.000

Table A.9: South Broadway
NMDOT Modified SCS Type II-75 Rainfall Distribution
10 year 6hour

NMDOT's Modified SCS Type II - 75 Distribution

Depth-Duration-Frequency Worksheet

	10-yr	Units
15-min	0.76	(in)
30-min	1.05	(in)
1-hr**	1.33	(in)
2-hr	1.38	(in)
3-hr	1.41	(in)
6-hr*	1.47	(in)

(assuming Region 1)

*Data from NOAA website Atlas 14

** 1-hr point precipitation depth was computed by taking 75% of the 24-hr point precipitation depth
Unless otherwise stated all calculations and procedures in the above table are from NMDOT Drainage manual Vol. 1 section 3.3.1.2.1

The Modified NOAA-SCS Rainfall Distribution Worksheet

	Time (hrs)	Cumulative Depth (in)	Incremental Depth (in)	Incremental Rainfall (in)	Cumulative Rainfall Depth (in)	Ordinates
0	0	0.00	0	0.00	0.000	0.0000
1	0.25	0.76	0.76	0.01	0.009	0.0061
2	0.5	1.05	0.29	0.01	0.018	0.0122
3	0.75	1.19	0.14	0.01	0.030	0.0204
4	1	1.33	0.14	0.01	0.042	0.0285
5	1.25	1.34	0.01	0.14	0.182	0.1235
6	1.5	1.35	0.01	0.76	0.940	0.6392
7	1.75	1.37	0.01	0.29	1.232	0.8383
8	2	1.38	0.01	0.14	1.372	0.9333
9	2.25	1.39	0.01	0.01	1.384	0.9414
10	2.5	1.40	0.01	0.01	1.396	0.9496
11	2.75	1.40	0.01	0.01	1.405	0.9557
12	3	1.41	0.01	0.01	1.414	0.9618
13	3.25	1.42	0.00	0.00	1.419	0.9650
14	3.5	1.42	0.00	0.00	1.423	0.9682
15	3.75	1.43	0.00	0.00	1.428	0.9714
16	4	1.43	0.00	0.00	1.433	0.9745
17	4.25	1.44	0.00	0.00	1.437	0.9777
18	4.5	1.44	0.00	0.00	1.442	0.9809
19	4.75	1.45	0.00	0.00	1.447	0.9841
20	5	1.45	0.00	0.00	1.451	0.9873
21	5.25	1.46	0.00	0.00	1.456	0.9905
22	5.5	1.46	0.00	0.00	1.461	0.9936
23	5.75	1.47	0.00	0.00	1.465	0.9968
24	6	1.47	0.00	0.00	1.470	1.0000

Table A.10: South Broadway
NMDOT Modified SCS Type II-75 Rainfall Distribution
10 year 24hour

NMDOT's Modified SCS Type II - 75 Distribution

Depth-Duration-Frequency Worksheet

	10-yr	Units
15-min	0.76	(in)
30-min	1.05	(in)
1-hr**	1.33	(in)
2-hr	1.38	(in)
3-hr	1.41	(in)
6-hr*	1.47	(in)
12-hr	1.62	(in)
24-hr*	1.77	(in)

(assuming Region 1)

*Data from NOAA website Atlas 14

** 1-hr point precipitation depth was computed by taking 75% of the 24-hr point precipitation depth

Unless otherwise stated all calculations and procedures in the above table are from NMDOT Drainage manual Vol. 1 section 3.3.1.2.1

The Modified NOAA-SCS Rainfall Distribution Worksheet

NMDOT n	Time (hrs)	Cumulative Depth (in)	Incremental Depth (in)	Hyetograph Time Period (hrs)	Rearranged n	Incremental Depth (in)	Cumulative Depth (in)
0	0	0	0.000	0 - 1	19	0.0250	0.0250
1	0.25	0.76	0.757	1 - 2	17	0.0250	0.0500
2	0.5	1.05	0.292	2 - 3	15	0.0250	0.0750
3	0.75	1.19	0.139	3 - 4	13	0.0190	0.0940
4	1	1.33	0.139	4 - 4.5	11	0.0095	0.1036
5	1.25	1.34	0.012	4.5 - 5	9	0.0183	0.1219
6	1.5	1.35	0.012	5 - 5.25	7	0.0122	0.1341
7	1.75	1.36	0.012	5.25 - 5.5	5	0.0122	0.1463
8	2	1.38	0.012	5.5 - 5.75	3	0.1394	0.2856
9	2.5	1.39	0.018	5.75 - 6	1	0.7567	1.0423
10	3	1.41	0.018	6 - 6.25	2	0.2921	1.3344
11	3.5	1.42	0.010	6.25 - 6.5	4	0.1394	1.4738
12	4	1.43	0.010	6.5 - 6.75	6	0.0122	1.4859
13	5	1.45	0.019	6.75 - 7	8	0.0122	1.4981
14	6	1.47	0.019	7 - 7.5	10	0.0183	1.5164
15	7	1.50	0.025	7.5 - 8	12	0.0095	1.5260
16	8	1.52	0.025	8 - 9	14	0.0190	1.5450
17	9	1.55	0.025	9 - 10	16	0.0250	1.5700
18	10	1.57	0.025	10 - 11	18	0.0250	1.5950
19	11	1.60	0.025	11 - 12	20	0.0250	1.6200
20	12	1.62	0.025	12 - 14	21	0.0250	1.6450
21	14	1.65	0.025	14 - 16	22	0.0250	1.6700
22	16	1.67	0.025	16 - 18	23	0.0250	1.6950
23	18	1.70	0.025	18 - 20	24	0.0250	1.7200
24	20	1.72	0.025	20 - 22	25	0.0250	1.7450
25	22	1.75	0.025	22 - 24	26	0.0250	1.7700
26	24	1.77	0.025				

Table A.10: South Broadway
NMDOT Modified SCS Type II-75 Rainfall Distribution
10 year 24hour

The Modified NOAA-SCS Rainfall Distribution

	Time (hrs)	Cumulative Depth (in)	Incremental Depth (in)	Incremental Rainfall (in)	Cumulative Rainfall Depth (in)	Ordinates
0	0	0.00	0.0000	0	0	0.000
1	0.25	0.76	0.7567	0.0062	0.0062	0.004
2	0.5	1.05	0.2921	0.0062	0.0125	0.007
3	0.75	1.19	0.1394	0.0063	0.0187	0.011
4	1	1.33	0.1394	0.0063	0.0250	0.014
5	1.25	1.34	0.0122	0.0062	0.0312	0.018
6	1.5	1.35	0.0122	0.0063	0.0375	0.021
7	1.75	1.36	0.0122	0.0063	0.0438	0.025
8	2	1.38	0.0122	0.0063	0.0500	0.028
9	2.25	1.39	0.0092	0.0062	0.0562	0.032
10	2.5	1.39	0.0092	0.0062	0.0625	0.035
11	2.75	1.40	0.0092	0.0063	0.0687	0.039
12	3	1.41	0.0092	0.0063	0.0750	0.042
13	3.25	1.42	0.0048	0.0048	0.0798	0.045
14	3.5	1.42	0.0048	0.0048	0.0845	0.048
15	3.75	1.43	0.0048	0.0048	0.0893	0.050
16	4	1.43	0.0048	0.0048	0.0940	0.053
17	4.25	1.44	0.0048	0.0048	0.0988	0.056
18	4.5	1.44	0.0048	0.0048	0.1036	0.059
19	4.75	1.45	0.0048	0.0092	0.1127	0.064
20	5	1.45	0.0048	0.0092	0.1219	0.069
21	5.25	1.46	0.0048	0.0122	0.1341	0.076
22	5.5	1.46	0.0048	0.0122	0.1463	0.083
23	5.75	1.47	0.0048	0.1394	0.2856	0.161
24	6	1.47	0.0048	0.7567	1.0423	0.589
25	6.25	1.48	0.0063	0.2921	1.3344	0.754
26	6.5	1.48	0.0062	0.1394	1.4738	0.833
27	6.75	1.49	0.0063	0.0122	1.4859	0.840
28	7	1.50	0.0063	0.0122	1.4981	0.846
29	7.25	1.50	0.0062	0.0092	1.5073	0.852
30	7.5	1.51	0.0063	0.0092	1.5164	0.857
31	7.75	1.51	0.0062	0.0048	1.5212	0.859
32	8	1.52	0.0063	0.0048	1.5260	0.862
33	8.25	1.53	0.0063	0.0048	1.5307	0.865
34	8.5	1.53	0.0062	0.0048	1.5355	0.868
35	8.75	1.54	0.0063	0.0048	1.5402	0.870
36	9	1.55	0.0062	0.0048	1.5450	0.873
37	9.25	1.55	0.0063	0.0062	1.5513	0.876
38	9.5	1.56	0.0063	0.0063	1.5575	0.880
39	9.75	1.56	0.0062	0.0063	1.5638	0.883
40	10	1.57	0.0063	0.0063	1.5700	0.887
41	10.25	1.58	0.0063	0.0062	1.5763	0.891
42	10.5	1.58	0.0062	0.0062	1.5825	0.894
43	10.75	1.59	0.0063	0.0063	1.5888	0.898
44	11	1.60	0.0063	0.0063	1.5950	0.901
45	11.25	1.60	0.0062	0.0062	1.6013	0.905
46	11.5	1.61	0.0063	0.0063	1.6075	0.908

Table A.10: South Broadway
NMDOT Modified SCS Type II-75 Rainfall Distribution
10 year 24hour

	Time (hrs)	Cumulative Depth (in)	Incremental Depth (in)	Incremental Rainfall (in)	Cumulative Rainfall Depth (in)	Ordinates
47	11.75	1.61	0.0062	0.0063	1.6138	0.912
48	12	1.62	0.0063	0.0063	1.6200	0.915
49	12.25	1.62	0.0031	0.0031	1.6231	0.917
50	12.5	1.63	0.0031	0.0031	1.6263	0.919
51	12.75	1.63	0.0031	0.0031	1.6294	0.921
52	13	1.63	0.0031	0.0031	1.6325	0.922
53	13.25	1.64	0.0031	0.0031	1.6356	0.924
54	13.5	1.64	0.0031	0.0031	1.6388	0.926
55	13.75	1.64	0.0031	0.0031	1.6419	0.928
56	14	1.65	0.0031	0.0031	1.6450	0.929
57	14.25	1.65	0.0031	0.0031	1.6481	0.931
58	14.5	1.65	0.0031	0.0031	1.6513	0.933
59	14.75	1.65	0.0031	0.0031	1.6544	0.935
60	15	1.66	0.0031	0.0031	1.6575	0.936
61	15.25	1.66	0.0031	0.0031	1.6606	0.938
62	15.5	1.66	0.0031	0.0031	1.6638	0.940
63	15.75	1.67	0.0031	0.0031	1.6669	0.942
64	16	1.67	0.0031	0.0031	1.6700	0.944
65	16.25	1.67	0.0031	0.0031	1.6731	0.945
66	16.5	1.68	0.0031	0.0031	1.6763	0.947
67	16.75	1.68	0.0031	0.0031	1.6794	0.949
68	17	1.68	0.0031	0.0031	1.6825	0.951
69	17.25	1.69	0.0031	0.0031	1.6856	0.952
70	17.5	1.69	0.0031	0.0031	1.6888	0.954
71	17.75	1.69	0.0031	0.0031	1.6919	0.956
72	18	1.70	0.0031	0.0031	1.6950	0.958
73	18.25	1.70	0.0031	0.0031	1.6981	0.959
74	18.5	1.70	0.0031	0.0031	1.7013	0.961
75	18.75	1.70	0.0031	0.0031	1.7044	0.963
76	19	1.71	0.0031	0.0031	1.7075	0.965
77	19.25	1.71	0.0031	0.0031	1.7106	0.966
78	19.5	1.71	0.0031	0.0031	1.7138	0.968
79	19.75	1.72	0.0031	0.0031	1.7169	0.970
80	20	1.72	0.0031	0.0031	1.7200	0.972
81	20.25	1.72	0.0031	0.0031	1.7231	0.974
82	20.5	1.73	0.0031	0.0031	1.7263	0.975
83	20.75	1.73	0.0031	0.0031	1.7294	0.977
84	21	1.73	0.0031	0.0031	1.7325	0.979
85	21.25	1.74	0.0031	0.0031	1.7356	0.981
86	21.5	1.74	0.0031	0.0031	1.7388	0.982
87	21.75	1.74	0.0031	0.0031	1.7419	0.984
88	22	1.75	0.0031	0.0031	1.7450	0.986
89	22.25	1.75	0.0031	0.0031	1.7481	0.988
90	22.5	1.75	0.0031	0.0031	1.7513	0.989
91	22.75	1.75	0.0031	0.0031	1.7544	0.991
92	23	1.76	0.0031	0.0031	1.7575	0.993
93	23.25	1.76	0.0031	0.0031	1.7606	0.995
94	23.5	1.76	0.0031	0.0031	1.7638	0.996
95	23.75	1.77	0.0031	0.0031	1.7669	0.998
96	24	1.77	0.0031	0.0031	1.7700	1.000

Table A.11: South Broadway
NMDOT Modified SCS Type II-75 Rainfall Distribution
100 year 6hour

NMDOT's Modified SCS Type II - 75 Distribution

Depth-Duration-Frequency Worksheet

	100-yr	Units
15-min	1.11	(in)
30-min	1.54	(in)
1-hr**	1.95	(in)
2-hr	2.05	(in)
3-hr	2.12	(in)
6-hr*	2.23	(in)

(assuming Region 1)

*Data from NOAA website Atlas 14

** 1-hr point precipitation depth was computed by taking 75% of the 24-hr point precipitation depth
Unless otherwise stated all calculations and procedures in the above table are from NMDOT Drainage manual Vol. 1 section 3.3.1.2.1

The Modified NOAA-SCS Rainfall Distribution Worksheet

	Time (hrs)	Cumulative Depth (in)	Incremental Depth (in)	Incremental Rainfall (in)	Cumulative Rainfall Depth (in)	Ordinates	Peak @1.4hr AHYMO
0	0	0.00	0	0.00	0.000	0.0000	0
1	0.25	1.11	1.11	0.02	0.018	0.0081	0.0167
2	0.5	1.54	0.43	0.02	0.036	0.0161	0.0564
3	0.75	1.75	0.20	0.02	0.060	0.0269	0.1154
4	1	1.95	0.20	0.02	0.084	0.0376	0.2071
5	1.25	1.97	0.02	0.20	0.289	0.1294	0.4659
6	1.5	2.00	0.02	1.11	1.400	0.6279	1.5377
7	1.75	2.02	0.02	0.43	1.829	0.8202	1.8574
8	2	2.05	0.02	0.20	2.034	0.9120	1.9686
9	2.25	2.06	0.02	0.02	2.058	0.9228	2.0249
10	2.5	2.08	0.02	0.02	2.082	0.9335	2.0556
11	2.75	2.10	0.02	0.02	2.100	0.9416	2.0754
12	3	2.12	0.02	0.02	2.118	0.9497	2.0928
13	3.25	2.13	0.01	0.01	2.127	0.9538	2.1086
14	3.5	2.14	0.01	0.01	2.136	0.9580	2.1229
15	3.75	2.15	0.01	0.01	2.146	0.9622	2.1363
16	4	2.16	0.01	0.01	2.155	0.9664	2.1489
17	4.25	2.16	0.01	0.01	2.165	0.9706	2.1609
18	4.5	2.17	0.01	0.01	2.174	0.9748	2.1722
19	4.75	2.18	0.01	0.01	2.183	0.9790	2.1829
20	5	2.19	0.01	0.01	2.193	0.9832	2.1932
21	5.25	2.20	0.01	0.01	2.202	0.9874	2.203
22	5.5	2.21	0.01	0.01	2.211	0.9916	2.2124
23	5.75	2.22	0.01	0.01	2.221	0.9958	2.2214
24	6	2.23	0.01	0.01	2.230	1.0000	2.23

Table A.12: South Broadway
NMDOT Modified SCS Type II-75 Rainfall Distribution
100 year 24hour

NMDOT's Modified SCS Type II - 75 Distribution

Depth-Duration-Frequency Worksheet

	100-yr	Units
15-min	1.11	(in)
30-min	1.54	(in)
1-hr**	1.95	(in)
2-hr	2.05	(in)
3-hr	2.12	(in)
6-hr*	2.23	(in)
12-hr	2.42	(in)
24-hr*	2.60	(in)

(assuming Region 1)

*Data from NOAA website Atlas 14

** 1-hr point precipitation depth was computed by taking 75% of the 24-hr point precipitation depth

Unless otherwise stated all calculations and procedures in the above table are from NMDOT Drainage manual Vol. 1 section 3.3.1.2.1

The Modified NOAA-SCS Rainfall Distribution Worksheet

NMDOT n	Time (hrs)	Cumulative Depth (in)	Incremental Depth (in)	Hyetograph Time Period (hrs)	Rearranged n	Incremental Depth (in)	Cumulative Depth (in)
0	0	0	0.000	0 - 1	19	0.0308	0.0308
1	0.25	1.11	1.112	1 - 2	17	0.0308	0.0617
2	0.5	1.54	0.429	2 - 3	15	0.0308	0.0925
3	0.75	1.75	0.205	3 - 4	13	0.0374	0.1299
4	1	1.95	0.205	4 - 4.5	11	0.0187	0.1486
5	1.25	1.97	0.024	4.5 - 5	9	0.0360	0.1846
6	1.5	2.00	0.024	5 - 5.25	7	0.0239	0.2086
7	1.75	2.02	0.024	5.25 - 5.5	5	0.0239	0.2325
8	2	2.05	0.024	5.5 - 5.75	3	0.2048	0.4372
9	2.5	2.08	0.036	5.75 - 6	1	1.1115	1.5488
10	3	2.12	0.036	6 - 6.25	2	0.4290	1.9778
11	3.5	2.14	0.019	6.25 - 6.5	4	0.2048	2.1825
12	4	2.16	0.019	6.5 - 6.75	6	0.0239	2.2064
13	5	2.19	0.037	6.75 - 7	8	0.0239	2.2304
14	6	2.23	0.037	7 - 7.5	10	0.0360	2.2664
15	7	2.26	0.031	7.5 - 8	12	0.0187	2.2851
16	8	2.29	0.031	8 - 9	14	0.0374	2.3225
17	9	2.32	0.031	9 - 10	16	0.0308	2.3533
18	10	2.35	0.031	10 - 11	18	0.0308	2.3842
19	11	2.38	0.031	11 - 12	20	0.0308	2.4150
20	12	2.42	0.031	12 - 14	21	0.0308	2.4458
21	14	2.45	0.031	14 - 16	22	0.0308	2.4767
22	16	2.48	0.031	16 - 18	23	0.0308	2.5075
23	18	2.51	0.031	18 - 20	24	0.0308	2.5383
24	20	2.54	0.031	20 - 22	25	0.0308	2.5692
25	22	2.57	0.031	22 - 24	26	0.0308	2.6000
26	24	2.60	0.031				

Table A.12: South Broadway
NMDOT Modified SCS Type II-75 Rainfall Distribution
100 year 24hour

The Modified NOAA-SCS Rainfall Distribution

	Time (hrs)	Cumulative Depth (in)	Incremental Depth (in)	Incremental Rainfall (in)	Cumulative Rainfall Depth (in)	Ordinates
0	0	0.00	0.0000	0	0	0.000
1	0.25	1.11	1.1115	0.0077	0.0077	0.003
2	0.5	1.54	0.4290	0.0077	0.0154	0.006
3	0.75	1.75	0.2048	0.0077	0.0231	0.009
4	1	1.95	0.2048	0.0077	0.0308	0.012
5	1.25	1.97	0.0239	0.0077	0.0385	0.015
6	1.5	2.00	0.0239	0.0077	0.0463	0.018
7	1.75	2.02	0.0239	0.0077	0.0540	0.021
8	2	2.05	0.0239	0.0077	0.0617	0.024
9	2.25	2.06	0.0180	0.0077	0.0694	0.027
10	2.5	2.08	0.0180	0.0077	0.0771	0.030
11	2.75	2.10	0.0180	0.0077	0.0848	0.033
12	3	2.12	0.0180	0.0077	0.0925	0.036
13	3.25	2.13	0.0094	0.0094	0.1019	0.039
14	3.5	2.14	0.0094	0.0094	0.1112	0.043
15	3.75	2.15	0.0094	0.0094	0.1206	0.046
16	4	2.16	0.0094	0.0094	0.1299	0.050
17	4.25	2.16	0.0094	0.0094	0.1393	0.054
18	4.5	2.17	0.0094	0.0094	0.1486	0.057
19	4.75	2.18	0.0094	0.0180	0.1666	0.064
20	5	2.19	0.0094	0.0180	0.1846	0.071
21	5.25	2.20	0.0094	0.0239	0.2086	0.080
22	5.5	2.21	0.0094	0.0239	0.2325	0.089
23	5.75	2.22	0.0094	0.2048	0.4373	0.168
24	6	2.23	0.0094	1.1115	1.5488	0.596
25	6.25	2.24	0.0077	0.4290	1.9778	0.761
26	6.5	2.25	0.0077	0.2048	2.1825	0.839
27	6.75	2.25	0.0077	0.0239	2.2064	0.849
28	7	2.26	0.0077	0.0239	2.2304	0.858
29	7.25	2.27	0.0077	0.0180	2.2484	0.865
30	7.5	2.28	0.0077	0.0180	2.2664	0.872
31	7.75	2.28	0.0077	0.0094	2.2757	0.875
32	8	2.29	0.0077	0.0094	2.2851	0.879
33	8.25	2.30	0.0077	0.0094	2.2944	0.882
34	8.5	2.31	0.0077	0.0094	2.3038	0.886
35	8.75	2.31	0.0077	0.0094	2.3131	0.890
36	9	2.32	0.0077	0.0094	2.3225	0.893
37	9.25	2.33	0.0077	0.0077	2.3302	0.896
38	9.5	2.34	0.0077	0.0077	2.3379	0.899
39	9.75	2.35	0.0077	0.0077	2.3456	0.902
40	10	2.35	0.0077	0.0077	2.3533	0.905
41	10.25	2.36	0.0077	0.0077	2.3610	0.908
42	10.5	2.37	0.0077	0.0077	2.3688	0.911
43	10.75	2.38	0.0077	0.0077	2.3765	0.914
44	11	2.38	0.0077	0.0077	2.3842	0.917
45	11.25	2.39	0.0077	0.0077	2.3919	0.920
46	11.5	2.40	0.0077	0.0077	2.3996	0.923

Table A.12: South Broadway
NMDOT Modified SCS Type II-75 Rainfall Distribution
100 year 24hour

	Time (hrs)	Cumulative Depth (in)	Incremental Depth (in)	Incremental Rainfall (in)	Cumulative Rainfall Depth (in)	Ordinates
47	11.75	2.41	0.0077	0.0077	2.4073	0.926
48	12	2.42	0.0077	0.0077	2.4150	0.929
49	12.25	2.42	0.0039	0.0039	2.4189	0.930
50	12.5	2.42	0.0039	0.0039	2.4227	0.932
51	12.75	2.43	0.0039	0.0039	2.4266	0.933
52	13	2.43	0.0039	0.0039	2.4304	0.935
53	13.25	2.43	0.0039	0.0039	2.4343	0.936
54	13.5	2.44	0.0039	0.0039	2.4381	0.938
55	13.75	2.44	0.0039	0.0039	2.4420	0.939
56	14	2.45	0.0039	0.0039	2.4458	0.941
57	14.25	2.45	0.0039	0.0039	2.4497	0.942
58	14.5	2.45	0.0039	0.0039	2.4535	0.944
59	14.75	2.46	0.0039	0.0039	2.4574	0.945
60	15	2.46	0.0039	0.0039	2.4613	0.947
61	15.25	2.47	0.0039	0.0039	2.4651	0.948
62	15.5	2.47	0.0039	0.0039	2.4690	0.950
63	15.75	2.47	0.0039	0.0039	2.4728	0.951
64	16	2.48	0.0039	0.0039	2.4767	0.953
65	16.25	2.48	0.0039	0.0039	2.4805	0.954
66	16.5	2.48	0.0039	0.0039	2.4844	0.956
67	16.75	2.49	0.0039	0.0039	2.4882	0.957
68	17	2.49	0.0039	0.0039	2.4921	0.958
69	17.25	2.50	0.0039	0.0039	2.4959	0.960
70	17.5	2.50	0.0039	0.0039	2.4998	0.961
71	17.75	2.50	0.0039	0.0039	2.5036	0.963
72	18	2.51	0.0039	0.0039	2.5075	0.964
73	18.25	2.51	0.0039	0.0039	2.5114	0.966
74	18.5	2.52	0.0039	0.0039	2.5152	0.967
75	18.75	2.52	0.0039	0.0039	2.5191	0.969
76	19	2.52	0.0039	0.0039	2.5229	0.970
77	19.25	2.53	0.0039	0.0039	2.5268	0.972
78	19.5	2.53	0.0039	0.0039	2.5306	0.973
79	19.75	2.53	0.0039	0.0039	2.5345	0.975
80	20	2.54	0.0039	0.0039	2.5383	0.976
81	20.25	2.54	0.0039	0.0039	2.5422	0.978
82	20.5	2.55	0.0039	0.0039	2.5460	0.979
83	20.75	2.55	0.0039	0.0039	2.5499	0.981
84	21	2.55	0.0039	0.0039	2.5538	0.982
85	21.25	2.56	0.0039	0.0039	2.5576	0.984
86	21.5	2.56	0.0039	0.0039	2.5615	0.985
87	21.75	2.57	0.0039	0.0039	2.5653	0.987
88	22	2.57	0.0039	0.0039	2.5692	0.988
89	22.25	2.57	0.0039	0.0039	2.5730	0.990
90	22.5	2.58	0.0039	0.0039	2.5769	0.991
91	22.75	2.58	0.0039	0.0039	2.5807	0.993
92	23	2.58	0.0039	0.0039	2.5846	0.994
93	23.25	2.59	0.0039	0.0039	2.5884	0.996
94	23.5	2.59	0.0039	0.0039	2.5923	0.997
95	23.75	2.60	0.0039	0.0039	2.5961	0.999
96	24	2.60	0.0039	0.0039	2.6000	1.000

Table A.13: SWMM Input data

Name	Rain Gage	Outlet	Area	% Impervious	Width	% Slope	N-Impervious	N-Pervious	D Store-Impervious	D Store-Pervious	% Zero-Impervious	Subarea Routing	% Routed	Infiltration		
														Curve Number	Conductivity	Drying Time
BH-134	S.Broadway	BH134Route	34.31	10	9656	2.6	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	88	0.5	7
SJH-100	S.Broadway	SJH100Route	53.26	23	15745	2.8	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	87	0.5	7
SJH-102	S.Broadway	SJH102Route	105.81	21	27418	3	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	79	0.5	7
SJH-105	S.Broadway	SJH105Route	52.01	17	14380	2.7	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	79	0.5	7
SJH-106	S.Broadway	SJH106Route	57.16	16	18016	2.8	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	77	0.5	7
SJH-150	S.Broadway	SJH150Route	46.7	21	13062	2.6	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	79	0.5	7
SJH-152	S.Broadway	SJH152Route	81.1	14	19187	2.8	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	77	0.5	7
SJH-153	S.Broadway	SJH153Route	41.87	16	13563	3.2	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	77	0.5	7
SJH-200	S.Broadway	SJH200Route	30.36	20	6089	1.9	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	81	0.5	7
SJH-202	S.Broadway	SJH202Route	40.86	6	7878	2.5	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	79	0.5	7
SJH-700	S.Broadway	SJH700Route	21.64	7	5482	1.7	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	82	0.5	7
SJH-109	S.Broadway	SJH109Route	63.45	5	16760	5.3	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	73	0.5	7
SJN-710	S.Broadway	SJN710Route	7.92	13	1524	2.7	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	70	0.5	7
SJN-720	S.Broadway	M14CH3	16.6	0	5561	4.8	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	71	0.5	7
SJN-730	S.Broadway	RRculvertin	31.18	0	8901	3.5	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	74	0.5	7
SJN-740	S.Broadway	RRculvertin	82.79	0	7399	0.4	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	88	0.5	7
SJ-8	S.Broadway	SJ8Route	28.5	14	9802	1.3	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	82	0.5	7
SJ-90L	S.Broadway	M14641	29.26	2	2603	0.3	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	88	0.5	7
SJ-955	S.Broadway	SJ955Route	28.64	11	7752	1	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	76	0.5	7
SJ-7	S.Broadway	SJ7Route	46.61	12	13760	1.9	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	70	0.5	7
SJH-701	S.Broadway	SJH701Route	43.14	3	9922	2.1	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	77	0.5	7
SJ-5	S.Broadway	SJ5Route	34.57	11	8880	2.2	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	79	0.5	7
SJ-4A	S.Broadway	SJ4Route	25.8	10	8444	1.6	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	78	0.5	7
SJ-3	S.Broadway	SJ3Route	30.19	19	8607	2.1	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	82	0.5	7
SJ-2	S.Broadway	SJ2Route	46.92	12	12752	1.7	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	76	0.5	7
SJ-1	S.Broadway	SJ1Route	48.12	4	9689	2	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	84	0.5	7
SJN-10	S.Broadway	SJN10Route	10.42	3	2857	1.2	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	76	0.5	7
SJN-6	S.Broadway	SJN6Route	28.23	13	7707	1.1	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	76	0.5	7
SJH-100_1A	S.Broadway	SJH100_1ARoute	23.73	10	3174	1.4	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	86	0.5	7
SJH-100_2A	S.Broadway	SJH100_2ARoute	3.92	36	976	3.4	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	92	0.5	7
SJH-100_3A	S.Broadway	SJH100_3ARoute	11.71	18	4400	2.3	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	84	0.5	7
SJH-100_4A	S.Broadway	SJH100_4ARoute	4.49	36	1991	1.9	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	89	0.5	7
SJH-100_5A	S.Broadway	SJH100_5ARoute	12.29	12	4958	5.5	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	83	0.5	7
SJH-102_1A	S.Broadway	SJH102_1ARoute	16.21	24	3871	4.4	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	92	0.5	7
SJH-102_2A	S.Broadway	SJH102_2ARoute	5.51	48	1268	2.1	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	92	0.5	7
SJH-105_1A	S.Broadway	SJH105_1ARoute	16.99	11	5056	2.2	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	89	0.5	7
SJH-105_2A	S.Broadway	SJH105_2ARoute	6.51	0	1124	5.6	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	91	0.5	7
SJH-106_1A	S.Broadway	SJH106_1ARoute	46.5	7	4367	1.7	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	86	0.5	7
SJH-150_1A	S.Broadway	SJH150_1ARoute	15.11	16	1683	2.3	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	79	0.5	7
SJH-100_6A	S.Broadway	K15111	12.01	84	59448	3.9	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	80	0.5	7
SJH-150_2A	S.Broadway	L14262	11.3	8	1074	3.5	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	73	0.5	7
SJH-152_1A	S.Broadway	L14562	7.03	32	4976	22.7	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	78	0.5	7
SJH-153_1A	S.Broadway	L14883	12.35	14	12171	18.1	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	79	0.5	7
SJH-200_1A	S.Broadway	SJH200Route	5.75	29	1372	8.8	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	79	0.5	7
SJH-700A_1A	S.Broadway	SJH-700A_Pond	3.22	13	673	3.8	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	76	0.5	7
SJH-700B_1A	S.Broadway	SJH-700B_Pond	4.88	0	3254	6.1	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	68	0.5	7
SJH-700A	S.Broadway	SJH-700A_Pond	12.83	7	2813	1.5	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	75	0.5	7
SJH-700B	S.Broadway	SJH-700B_Pond	19.52	9	2745	6.4	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	82	0.5	7
SJH-700C	S.Broadway	SJH-700C_Pond	14.43	2	2753	1.8	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	81	0.5	7
SJ-4B	S.Broadway	L14641	21.83	7	7112	1.5	0.018	0.06	0.05	0.12	25	IMPERVIOUS	100	74	0.5	7

Table A.14: Offsite Drainage
Potentially Impacting Project Area

	Rational Method, Zone 2, Treatment C				watersheds larger then 40 acres							
Watershed ID	Area(ac)	C	I (in/hr)	Q100 (cfs)	L	K	KN	High	Low	s (ft/ft)	Lca	Tc (hrs)
SJH-100_1B	28.26	0.62	5.05	88.48								
SJH-100_3B	126.47	0.62	1.65	129.41	5196.89	3	0.021	5177	5172	0.00096	2711.68	1.13
SJH-102_1B	46.4	0.62	4.55	130.84	2204.56	3	0.021	5130	5075	0.02495	987.91	0.19
SJH-102_1C	208.03	0.62	3.18	409.80	8608.79	3	0.021	5280	5130	0.01742	5115.87	0.41
SJH-102_2B	15.68	0.62	5.05	49.09								
SJH-102_2D	37.38	0.62	5.05	117.04								
SJH-102_2C	49.53	0.62	3.51	107.86	5379.72	3	0.021	5186	5108	0.01450	2724.87	0.34
SJH-105_1B	37.4	0.62	5.05	117.10								

watersheds within equations limits

L= Distance of longest watercourse
K = conveyance factor value from table
Lca = Distance along L from point of concentration to centroid
s = overall slope of L
Kn = A basin factor from table